

## Output Powers – Ant 2B

REV 21.3 M  
02/15/2019

## LTE Band 25 as PCC

**Table 25**  
**Output Powers – Ant 2A**

| Combination                    |         | PCC      |              |                      |       |           |                  |              |                      |                 |          | SCC1         |              |                      |                 | SCC2     |              |              |                      | SCC3            |          |              |              | SCC4                 |                 |          |              | Power        |                      |                 |                          |                                         |
|--------------------------------|---------|----------|--------------|----------------------|-------|-----------|------------------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|-----------------|--------------------------|-----------------------------------------|
|                                |         | PCC Band | PCC BW [MHz] | PCC [UL] Freq. [MHz] | Mod.  | PCC UL RB | PCC UL RB Offset | PCC [DL] Ch. | PCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | LTE Tx Power (Enb) [dBm] | LTE Single Carrier Tx Power (Enb) [dBm] |
| CA SA-25A                      | LTE B25 | 20       | 20140        | 1800                 | 64QAM | 1         | 99               | 8140         | 1940                 | 4x4             | LTE B5   | 10           | 2325         | 881.5                | 2x2             | LTE B5   | 10           | 2325         | 881.5                | 2x2             | LTE B5   | 10           | 2325         | 881.5                | 2x2             | LTE B5   | 10           | 2325         | 881.5                | 2x2             | 14.98                    | 15.00                                   |
| CA 12A/25A                     | LTE B25 | 20       | 20140        | 1800                 | 64QAM | 1         | 99               | 8140         | 1940                 | 4x4             | LTE B12  | 10           | 5095         | 777.5                | 2x2             | LTE B12  | 10           | 5095         | 777.5                | 2x2             | LTE B12  | 10           | 5095         | 777.5                | 2x2             | LTE B12  | 10           | 5095         | 777.5                | 2x2             | 14.66                    | 14.68                                   |
| CA 25A/25A                     | LTE B25 | 20       | 20140        | 1800                 | 64QAM | 1         | 99               | 8140         | 1940                 | 4x4             | LTE B25  | 20           | 20140        | 1800                 | 4x4             | LTE B25  | 20           | 20140        | 1800                 | 4x4             | LTE B25  | 20           | 20140        | 1800                 | 4x4             | LTE B25  | 20           | 20140        | 1800                 | 4x4             | 14.79                    | 14.80                                   |
| CA 25A/46A                     | LTE B25 | 20       | 20140        | 1800                 | 64QAM | 1         | 99               | 8140         | 1940                 | 4x4             | LTE B46  | 20           | 50665        | 5537.5               | 2x2             | LTE B46  | 20           | 50665        | 5537.5               | 2x2             | LTE B46  | 20           | 50665        | 5537.5               | 2x2             | LTE B46  | 20           | 50665        | 5537.5               | 2x2             | 14.75                    | 14.76                                   |
| CA 25A/25A/20A                 | LTE B25 | 20       | 20140        | 1800                 | 64QAM | 1         | 99               | 8140         | 1940                 | 4x4             | LTE B25  | 20           | 8790         | 1385                 | 4x4             | LTE B20  | 5            | 8895         | 876.5                | 2x2             | LTE B20  | 5            | 8895         | 876.5                | 2x2             | LTE B20  | 5            | 8895         | 876.5                | 2x2             | 14.79                    | 14.80                                   |
| CA 25A/25A/46A                 | LTE B25 | 20       | 20140        | 1800                 | 64QAM | 1         | 99               | 8140         | 1940                 | 4x4             | LTE B25  | 20           | 8790         | 1385                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | 14.79                    | 14.80                                   |
| CA 25A/46C                     | LTE B25 | 20       | 20140        | 1800                 | 64QAM | 1         | 99               | 8140         | 1940                 | 4x4             | LTE B46  | 20           | 50665        | 5537.5               | 2x2             | LTE B46  | 20           | 50665        | 5537.5               | 2x2             | LTE B46  | 20           | 50665        | 5537.5               | 2x2             | LTE B46  | 20           | 50665        | 5537.5               | 2x2             | 14.75                    | 14.76                                   |
| CA 25A/46C/46C                 | LTE B25 | 20       | 20140        | 1800                 | 64QAM | 1         | 99               | 8140         | 1940                 | 4x4             | LTE B25  | 20           | 8790         | 1385                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | 14.75                    | 14.76                                   |
| CA 25A/46A/46C                 | LTE B25 | 20       | 20140        | 1800                 | 64QAM | 1         | 99               | 8140         | 1940                 | 4x4             | LTE B46  | 20           | 50665        | 5537.5               | 2x2             | LTE B46  | 20           | 50665        | 5537.5               | 2x2             | LTE B46  | 20           | 50665        | 5537.5               | 2x2             | LTE B46  | 20           | 50665        | 5537.5               | 2x2             | 14.75                    | 14.76                                   |
| CA 25A/46A/46C/46C             | LTE B25 | 20       | 20140        | 1800                 | 64QAM | 1         | 99               | 8140         | 1940                 | 4x4             | LTE B25  | 20           | 8790         | 1385                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | 14.75                    | 14.76                                   |
| CA 25A/46A/46C/46C/46C         | LTE B25 | 20       | 20140        | 1800                 | 64QAM | 1         | 99               | 8140         | 1940                 | 4x4             | LTE B25  | 20           | 8790         | 1385                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | 14.75                    | 14.76                                   |
| CA 25A/46A/46C/46C/46C/46C     | LTE B25 | 20       | 20140        | 1800                 | 64QAM | 1         | 99               | 8140         | 1940                 | 4x4             | LTE B25  | 20           | 8790         | 1385                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | 14.75                    | 14.76                                   |
| CA 25A/46A/46C/46C/46C/46C/46C | LTE B25 | 20       | 20140        | 1800                 | 64QAM | 1         | 99               | 8140         | 1940                 | 4x4             | LTE B25  | 20           | 8790         | 1385                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | LTE B46  | 20           | 40620        | 2593                 | 4x4             | 14.75                    | 14.76                                   |

## LTE Band 30 as PCC

**Table 26**  
**Output Powers – Ant 2A**

| Combination                 | PCB Band | PCB BW [MHz] | PCC [UL] [MHz] | Mod. | PCC    |                  |              |                      | DL Ant. Config. | SCC 1    |              |              |                      | DL Ant. Config. | SCC 2    |              |              |                      | DL Ant. Config. | SCC 3    |              |              |                      | DL Ant. Config. | SCC 4    |              |              |                      | Power              |                           |       |       |
|-----------------------------|----------|--------------|----------------|------|--------|------------------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|--------------------|---------------------------|-------|-------|
|                             |          |              |                |      | PCB RB | PCU UL BB Offset | PCC [DL] Ch. | PCC [DL] Freq. [MHz] |                 | SCC Band | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] |                 | SCC Band | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] |                 | SCC Band | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] |                 | SCC Band | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | LTE Tx Power [dBm] | LTE Sigs Car. Power [dBm] |       |       |
| CA [2C] [3D]                | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960               | 4x4                       | 18.80 | 18.80 |
| CA [2A] [2A] [3A] [4A]      | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B12      | 10           | 2520                 | 881.5              | 2x2                       | 18.81 | 18.81 |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B12      | 10           | 2520                 | 881.5           | 2x2      | LTE B12      | 10           | 2520                 | 881.5              | 2x2                       | 18.80 | 18.80 |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B12      | 10           | 2520                 | 881.5           | 2x2      | LTE B12      | 10           | 2520                 | 881.5              | 2x2                       | 18.80 | 18.80 |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 2x2      | LTE B20      | 20           | 66786                | 2145            | 4x4      | LTE B20      | 20           | 66786                | 2145            | 4x4      | LTE B20      | 20           | 66786                | 2145               | 4x4                       | 18.82 | 18.80 |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |
| CA [2A] [2A] [2A] [3A] [4A] | LTE B30  | 10           | 27710          | 2310 | 1G18M  | 1                | 25           | 2820                 | 2355            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B2       | 20           | 900                  | 1960            | 4x4      | LTE B20      | 10           | 2720                 | 722.5           | 2x2      | -            | -            | -                    | -                  | 18.80                     | 18.80 |       |

## LTE Band 7 as PCC

**Table 27**  
**Output Powers – Ant 4A**

| Combination             | PCC      |              |                      |                      |      |           |                  |                 |                 |                 |                 | SSC 1    |              |                      |                      | SSC 2           |                 |          |              | SSC 3           |                 |                 |                 | SSC 4    |              |                 |                 | Power           |                 |                   |                               |   |
|-------------------------|----------|--------------|----------------------|----------------------|------|-----------|------------------|-----------------|-----------------|-----------------|-----------------|----------|--------------|----------------------|----------------------|-----------------|-----------------|----------|--------------|-----------------|-----------------|-----------------|-----------------|----------|--------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------------------|---|
|                         | PCC Band | PCC BW [MHz] | PCC [DL Freq. (MHz)] | PCC [UL Freq. (MHz)] | Mod. | PCC UL RB | PCC UL RB Offset | PCC [DL Ch. ID] | PCC [UL Ch. ID] | DL Ant. Config. | UL Ant. Config. | SSC Band | SSC BW [MHz] | SSC [DL Freq. (MHz)] | SSC [UL Freq. (MHz)] | DL Ant. Config. | UL Ant. Config. | SSC Band | SSC BW [MHz] | SSC [DL Ch. ID] | SSC [UL Ch. ID] | DL Ant. Config. | UL Ant. Config. | SSC Band | SSC BW [MHz] | SSC [DL Ch. ID] | SSC [UL Ch. ID] | DL Ant. Config. | UL Ant. Config. | UL Tx Power (dBm) | UL Single Carrier Power (dBm) |   |
| CA 77B                  | LTE B7   | 15           | 20805                | 20075                | QAM  | 1         | 0                | 3330            | 2600            | 4A              | LTE B7          | 5        | 2918         | 2638                 | 4A                   | -               | -               | -        | -            | -               | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             |   |
| CA 5A/7A                | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B5          | 10       | 2125         | 2615                 | 2x2                  | -               | -               | -        | -            | -               | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             |   |
| CA 77B/5A               | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B5          | 10       | 2125         | 2615                 | 2x2                  | -               | -               | -        | -            | -               | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             |   |
| CA 17A/46A (1)          | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B46         | 20       | 5065A        | 5537.5               | 2x2                  | -               | -               | -        | -            | -               | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             |   |
| CA 17A/7A/17A (1)       | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B7          | 20       | 2830         | 2630                 | 4A                   | LTE B2          | 20              | 900      | 1860         | 4A              | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             | - |
| CA 17A/46A/7A (1)       | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B7          | 20       | 2830         | 2630                 | 4A                   | LTE B4          | 20              | 2175     | 2132.5       | 4A              | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             | - |
| CA 5A/17A (1)           | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B7          | 20       | 2830         | 2630                 | 4A                   | LTE B5          | 10              | 2125     | 2615         | 2x2             | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             | - |
| CA 17A/7A/5A            | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B7          | 20       | 2830         | 2630                 | 4A                   | LTE B5          | 10              | 2125     | 2615         | 2x2             | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             | - |
| CA 17A/7A/46A (1)       | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B7          | 20       | 2830         | 2630                 | 4A                   | LTE B46         | 20              | 5065     | 5537.5       | 2x2             | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             | - |
| CA 17C/46A (1)          | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B46         | 20       | 5065A        | 5537.5               | 2x2                  | -               | -               | -        | -            | -               | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             |   |
| CA 17C/46A/5A (1)       | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B46         | 20       | 5065A        | 5537.5               | 2x2                  | -               | -               | -        | -            | -               | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             |   |
| CA 17A/7A/16A (1)       | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B7          | 20       | 2830         | 2630                 | 4A                   | LTE B6          | 20              | 6578A    | 7245         | 4A              | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             | - |
| CA 17A/46D (1)          | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B46         | 20       | 5065A        | 5537.5               | 2x2                  | -               | -               | -        | -            | -               | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             |   |
| CA 17A/46A/5A (1)       | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B46         | 20       | 5065A        | 5537.5               | 2x2                  | -               | -               | -        | -            | -               | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             |   |
| CA 24A/44A/17A (1)      | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B7          | 20       | 2830         | 2630                 | 4A                   | LTE B4          | 20              | 2175     | 2132.5       | 4A              | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             | - |
| CA 17A/46A/17A (1)      | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B7          | 20       | 2830         | 2630                 | 4A                   | LTE B5          | 10              | 2125     | 2615         | 2x2             | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             | - |
| CA 24A/44A/7A/17A (1)   | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B7          | 20       | 2830         | 2630                 | 4A                   | LTE B12         | 20              | 2070     | 2173         | 2x2             | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             | - |
| CA 17A/7A/7A/16A (1)    | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B7          | 20       | 2830         | 2630                 | 4A                   | LTE B2          | 20              | 900      | 1860         | 2x2             | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             | - |
| CA 17A/7A/7A/46A (1)    | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B7          | 20       | 2830         | 2630                 | 4A                   | LTE B6          | 20              | 6578A    | 7245         | 4A              | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             | - |
| CA 17A/7A/7A/46A/5A (1) | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B7          | 20       | 2830         | 2630                 | 4A                   | LTE B6          | 20              | 6578A    | 7245         | 4A              | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             | - |
| CA 17C/46A              | LTE B7   | 20           | 21350                | 21600                | QPSK | 1         | 0                | 3330            | 2600            | 4A              | LTE B7          | 20       | 3132         | 2600.2               | 4A                   | LTE B46         | 20              | 5066A    | 5637.5       | 2x2             | -               | -               | -               | -        | -            | -               | -               | -               | -               | -                 | -                             | - |

**FIGURE 1B. POC10000**



## SAR EVALUATION REPORT

|              |                 |
|--------------|-----------------|
| Reviewed by: | Quality Manager |
|--------------|-----------------|

|                                            |
|--------------------------------------------|
| <b>Test Dates:</b><br>12/18/2019-1/28/2020 |
|--------------------------------------------|

|               |
|---------------|
| DUT Type:     |
| Tablet Device |

APPENDIX F:  
Page 13 of 16

## 1.4.12

## LTE Band 41 as PCC

Table 28  
Output Powers – Ant 4A

| Combination        | PCC Band | PCC BW [MHz] | PCC [UL] Ch. | PCC [DL] Freq. [MHz] | Mod. | PCC       |                  |                      |                 | SCC 1    |              |              |                      | SCC 2           |          |              |              | SCC 3                |                 |          |              | SCC 4        |                      |                 |          | Power        |              |                      |                 |                                       |                                   |       |       |       |
|--------------------|----------|--------------|--------------|----------------------|------|-----------|------------------|----------------------|-----------------|----------|--------------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|-----------------|---------------------------------------|-----------------------------------|-------|-------|-------|
|                    |          |              |              |                      |      | PCC UL RB | PCC UL RB Offset | PCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | LTE Tx Power with DL CA Enabled [dBm] | LTE Single Carrier Tx Power [dBm] |       |       |       |
| CA 41A1 (41A) (1)  | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 4A4      | LTE B41      | 20           | 41480                | 2680            | 4A4      | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -                                     | 16.82                             | 16.90 |       |       |
| CA 5A 41A1         | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 4A4      | LTE B5       | 10           | 2520                 | 881.5           | 2x2      | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -                                     | -                                 | 16.81 | 16.90 |       |
| CA 25A 41A1        | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 4A4      | LTE B25      | 10           | 8360                 | 876.5           | 2x2      | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -                                     | -                                 | 16.80 | 16.90 |       |
| CA 41A1 (41C)      | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 4A4      | LTE B41      | 20           | 41320                | 2660.2          | 4A4      | LTE B41      | 20           | 41480                | 2680            | 4A4      | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -                                     | -                                 | -     | 16.78 | 16.90 |
| CA 41C1 (41A1)     | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 4A4      | LTE B41      | 20           | 39948                | 2521.8          | 4A4      | LTE B41      | 20           | 41490                | 2680            | 4A4      | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -                                     | -                                 | -     | 16.77 | 16.90 |
| CA 15A1 (25A 41A1) | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 4A4      | LTE B25      | 20           | 8360                 | 1362.1          | 4A4      | LTE B25      | 20           | 8360                 | 1385            | 4A4      | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -                                     | -                                 | -     | 16.77 | 16.90 |
| CA 25A1 (41C1)     | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 4A4      | LTE B41      | 20           | 39948                | 2521.8          | 4A4      | LTE B25      | 20           | 8360                 | 1362.1          | 4A4      | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -                                     | -                                 | -     | 16.76 | 16.90 |
| CA 25A 41C1        | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 4A4      | LTE B41      | 20           | 39948                | 2521.8          | 4A4      | LTE B25      | 10           | 8360                 | 876.5           | 2x2      | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -                                     | -                                 | -     | 16.80 | 16.90 |
| CA 41A1 (41A1)     | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 4A4      | LTE B41      | 20           | 41320                | 2660.2          | 4A4      | LTE B41      | 20           | 41480                | 2680            | 4A4      | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -                                     | -                                 | -     | 16.78 | 16.90 |
| CA 41C1 (41A1)     | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 4A4      | LTE B41      | 20           | 39948                | 2521.8          | 4A4      | LTE B41      | 20           | 41490                | 2680            | 4A4      | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -                                     | -                                 | -     | 16.77 | 16.90 |
| CA 41C1 (41C1)     | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 4A4      | LTE B41      | 20           | 39948                | 2521.8          | 4A4      | LTE B41      | 20           | 41320                | 2660.2          | 4A4      | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -                                     | -                                 | -     | 16.77 | 16.90 |
| CA 15A1 (25A 41C1) | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 4A4      | LTE B41      | 20           | 39948                | 2521.8          | 4A4      | LTE B25      | 20           | 8360                 | 1362.1          | 4A4      | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -                                     | -                                 | -     | 16.77 | 16.90 |
| CA 15A1 (41C1)     | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 4A4      | LTE B41      | 20           | 39948                | 2521.8          | 4A4      | LTE B25      | 20           | 8360                 | 1385            | 4A4      | -            | -            | -                    | -               | -        | -            | -            | -                    | -               | -                                     | -                                 | -     | 16.77 | 16.90 |
| CA 41C1 41C        | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 2x2      | LTE B41      | 20           | 39948                | 2521.8          | 2x2      | LTE B41      | 20           | 41320                | 2660.2          | 4A4      | LTE B41      | 20           | 41320                | 2660.2          | 4A4      | LTE B41      | 20           | 41490                | 2680            | 4A4                                   | 16.76                             | 16.90 |       |       |
| CA 41C1 41C        | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 4A4      | LTE B41      | 20           | 39948                | 2521.8          | 4A4      | LTE B41      | 20           | 41490                | 2680            | 2x2      | LTE B41      | 20           | 41320                | 2660.2          | 2x2      | LTE B41      | 20           | 41490                | 2680            | 2x2                                   | 16.76                             | 16.90 |       |       |
| CA 15A1 (25A 41C1) | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 2x2      | LTE B41      | 20           | 39948                | 2521.8          | 2x2      | LTE B41      | 20           | 41490                | 2680            | 2x2      | LTE B25      | 20           | 8360                 | 1362.1          | 4A4      | LTE B25      | 20           | 8360                 | 1385            | 4A4                                   | 16.84                             | 16.90 |       |       |
| CA 15A1 (25A 41C1) | LTE B41  | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750                | 2506            | 2x2      | LTE B41      | 20           | 39948                | 2521.8          | 2x2      | LTE B41      | 20           | 41490                | 2680            | 2x2      | LTE B25      | 20           | 8360                 | 1362.1          | 4A4      | LTE B25      | 20           | 8360                 | 1385            | 4A4                                   | 16.84                             | 16.90 |       |       |

## 1.4.13

## LTE Band 41 PC2 as PCC

Table 29  
Output Powers – Ant 4A

| Combination       | PCC         |              |              |                      |      |           |                  |              |                      |                 | SCC 1       |              |              |                      | SCC 2           |             |              |              | SCC 3                |                 |             |              | SCC 4        |                      |                 |             | Power        |              |                      |                 |                                       |                                   |       |
|-------------------|-------------|--------------|--------------|----------------------|------|-----------|------------------|--------------|----------------------|-----------------|-------------|--------------|--------------|----------------------|-----------------|-------------|--------------|--------------|----------------------|-----------------|-------------|--------------|--------------|----------------------|-----------------|-------------|--------------|--------------|----------------------|-----------------|---------------------------------------|-----------------------------------|-------|
|                   | PCC Band    | PCC BW [MHz] | PCC [UL] Ch. | PCC [DL] Freq. [MHz] | Mod. | PCC UL RB | PCC UL RB Offset | PCC [DL] Ch. | PCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band    | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band    | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band    | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band    | SCC BW [MHz] | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | LTE Tx Power with DL CA Enabled [dBm] | LTE Single Carrier Tx Power [dBm] |       |
| CA 41A1(41A) (1)  | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 4A4             | LTE B41 PC2 | 20           | 41480        | 2680                 | 4A4             | -           | -            | -            | -                    | -               | -           | -            | -            | -                    | -               | -           | -            | -            | -                    | -               | 16.81                                 | 16.90                             |       |
| CA 5A 41A1        | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 4A4             | LTE B5      | 10           | 2520         | 881.5                | 2x2             | -           | -            | -            | -                    | -               | -           | -            | -            | -                    | -               | -           | -            | -            | -                    | -               | 16.80                                 | 16.90                             |       |
| CA 25A 41A1       | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 4A4             | LTE B25     | 10           | 8360         | 876.5                | 2x2             | -           | -            | -            | -                    | -               | -           | -            | -            | -                    | -               | -           | -            | -            | -                    | -               | 16.80                                 | 16.90                             |       |
| CA 41A1(41C)      | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 4A4             | LTE B41 PC2 | 20           | 41320        | 2660.2               | 4A4             | LTE B41 PC2 | 20           | 41490        | 2680                 | 4A4             | -           | -            | -            | -                    | -               | -           | -            | -            | -                    | -               | -                                     | 16.82                             | 16.90 |
| CA 41C1(41A1)     | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 4A4             | LTE B41 PC2 | 20           | 39948        | 2521.8               | 4A4             | LTE B41 PC2 | 20           | 41490        | 2680                 | 4A4             | -           | -            | -            | -                    | -               | -           | -            | -            | -                    | -               | -                                     | 16.81                             | 16.90 |
| CA 15A1(25A 41A1) | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 4A4             | LTE B41 PC2 | 20           | 39948        | 2521.8               | 4A4             | LTE B25     | 20           | 8360         | 1385                 | 4A4             | -           | -            | -            | -                    | -               | -           | -            | -            | -                    | -               | -                                     | 16.80                             | 16.90 |
| CA 15A1(41C1)     | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 4A4             | LTE B41 PC2 | 20           | 39948        | 2521.8               | 4A4             | LTE B25     | 10           | 8360         | 876.5                | 2x2             | -           | -            | -            | -                    | -               | -           | -            | -            | -                    | -               | -                                     | 16.82                             | 16.90 |
| CA 41C1(41C)      | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 4A4             | LTE B41 PC2 | 20           | 39948        | 2521.8               | 4A4             | LTE B41 PC2 | 20           | 41320        | 2660.2               | 4A4             | -           | -            | -            | -                    | -               | -           | -            | -            | -                    | -               | -                                     | 16.80                             | 16.90 |
| CA 41C1(41C1)     | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 4A4             | LTE B41 PC2 | 20           | 39948        | 2521.8               | 4A4             | LTE B41 PC2 | 20           | 41490        | 2680                 | 4A4             | -           | -            | -            | -                    | -               | -           | -            | -            | -                    | -               | -                                     | 16.81                             | 16.90 |
| CA 15A1(25A 41C1) | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 4A4             | LTE B41 PC2 | 20           | 39948        | 2521.8               | 4A4             | LTE B41 PC2 | 20           | 41490        | 2680                 | 4A4             | -           | -            | -            | -                    | -               | -           | -            | -            | -                    | -               | -                                     | 16.80                             | 16.90 |
| CA 15A1(41C1)     | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 4A4             | LTE B41 PC2 | 20           | 39948        | 2521.8               | 4A4             | LTE B41 PC2 | 20           | 41320        | 2660.2               | 4A4             | -           | -            | -            | -                    | -               | -           | -            | -            | -                    | -               | -                                     | 16.80                             | 16.90 |
| CA 41C1(41C1)     | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 2x2             | LTE B41 PC2 | 20           | 39948        | 2521.8               | 2x2             | LTE B41 PC2 | 20           | 41320        | 2660.2               | 4A4             | LTE B41 PC2 | 20           | 41320        | 2660.2               | 4A4             | LTE B41 PC2 | 20           | 41490        | 2680                 | 4A4             | 16.82                                 | 16.90                             |       |
| CA 41C1 41C       | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 4A4             | LTE B41 PC2 | 20           | 39948        | 2521.8               | 4A4             | LTE B41 PC2 | 20           | 41490        | 2680                 | 2x2             | LTE B41 PC2 | 20           | 41320        | 2660.2               | 2x2             | LTE B41 PC2 | 20           | 41490        | 2680                 | 2x2             | 16.84                                 | 16.90                             |       |
| CA 15A1(25A 41C1) | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 2x2             | LTE B41 PC2 | 20           | 39948        | 2521.8               | 2x2             | LTE B41 PC2 | 20           | 41490        | 2680                 | 2x2             | LTE B25     | 20           | 8360         | 1362.1               | 4A4             | LTE B25     | 20           | 8360         | 1385                 | 4A4             | 16.84                                 | 16.90                             |       |
| CA 15A1(25A 41C1) | LTE B41 PC2 | 20           | 39750        | 2506                 | QPSK | 1         | 0                | 39750        | 2506                 | 2x2             | LTE B41 PC2 | 20           | 39948        | 2521.8               | 2x2             | LTE B41 PC2 | 20           | 41490        | 2680                 | 2x2             | LTE B25     | 20           | 8360         | 1362.1               | 4A4             | LTE B25     | 20           | 8360         | 1385                 | 4A4             | 16.84                                 | 16.90                             |       |

FCC ID: BCGA2069



SAR EVALUATION REPORT

Reviewed by:  
Quality Manager

Test Dates:  
12/18/2019-1/28/2020

DUT Type:  
Tablet Device

APPENDIX F:  
Page 14 of 16

## LTE Band 48 as PCC

**Table 30**  
**Output Powers – Ant 3**

[illegible]

### 1.5 Downlink Carrier Aggregation with Uplink Carrier Aggregation enabled

This device supports uplink carrier aggregation (ULCA) with additional Carrier Aggregation configurations active in the downlink. Power measurements were performed with ULCA active and additional CA configurations active in the downlink for the configuration per Fall 2017 TCB Workshop Notes.

Per FCC Guidance, additional SAR measurements for these configurations were not required since their maximum output power was not more than 0.25 dB higher than the maximum output power for with only ULCA active.

### 1.5.1 DL Carrier Aggregation RF Conducted Powers

### 1.5.1.1 LTE Band 41

**Table 31**  
**Output Powers – Ant 4A**

| Combination | PCB Band | S/C 1        |              |             |      |                 |                  |             |              |             |          | S/C 2        |             |                  |             |              |             |          |              |             |                  | S/C 3       |              |             |          |              |             |                  |             |              |             | Frame          |                |      |      |
|-------------|----------|--------------|--------------|-------------|------|-----------------|------------------|-------------|--------------|-------------|----------|--------------|-------------|------------------|-------------|--------------|-------------|----------|--------------|-------------|------------------|-------------|--------------|-------------|----------|--------------|-------------|------------------|-------------|--------------|-------------|----------------|----------------|------|------|
|             |          | PCB BW (MHz) | PCB DUL (Hz) | PCB UL (Hz) | Mod  | PCB UL BW (MHz) | PCB UL BW Offset | PCB Channel | PCB DUL (Hz) | PCB UL (Hz) | S/C Band | S/C BW (MHz) | S/C UL (Hz) | S/C UL BW Offset | S/C Channel | S/C DUL (Hz) | S/C UL (Hz) | S/C Band | S/C BW (MHz) | S/C UL (Hz) | S/C UL BW Offset | S/C Channel | S/C DUL (Hz) | S/C UL (Hz) | S/C Band | S/C BW (MHz) | S/C UL (Hz) | S/C UL BW Offset | S/C Channel | S/C DUL (Hz) | S/C UL (Hz) | USCA S/F (MHz) | USCA T/F (MHz) |      |      |
| CA-41C-41A  | 1.75 GHz | 20           | 24100        | 24500       | QPSK | 1               | 0                | 41000       | 25400        | 1.75 GHz    | 20       | 25900        | 26300       | QPSK             | 1           | 0            | 41000       | 25900    | 26300        | 1.75 GHz    | 20               | 41000       | 41400        | QPSK        | 1        | 0            | 41000       | 41400            | 41800       | 1.75 GHz     | 20          | 41000          | 41400          | 1.75 | 1.75 |
| CA-41D-41A  | 1.75 GHz | 20           | 24100        | 24500       | QPSK | 1               | 0                | 41000       | 25400        | 1.75 GHz    | 20       | 25900        | 26300       | QPSK             | 1           | 0            | 41000       | 25900    | 26300        | 1.75 GHz    | 20               | 41000       | 41400        | QPSK        | 1        | 0            | 41000       | 41400            | 41800       | 1.75 GHz     | 20          | 41000          | 41400          | 1.75 | 1.75 |
| CA-41E-41D  | 1.75 GHz | 20           | 24100        | 24500       | QPSK | 1               | 0                | 41000       | 25400        | 1.75 GHz    | 20       | 25900        | 26300       | QPSK             | 1           | 0            | 41000       | 25900    | 26300        | 1.75 GHz    | 20               | 41000       | 41400        | QPSK        | 1        | 0            | 41000       | 41400            | 41800       | 1.75 GHz     | 20          | 41000          | 41400          | 1.75 | 1.75 |
| CA-41E-41E  | 1.75 GHz | 20           | 24100        | 24500       | QPSK | 1               | 0                | 41000       | 25400        | 1.75 GHz    | 20       | 25900        | 26300       | QPSK             | 1           | 0            | 41000       | 25900    | 26300        | 1.75 GHz    | 20               | 41000       | 41400        | QPSK        | 1        | 0            | 41000       | 41400            | 41800       | 1.75 GHz     | 20          | 41000          | 41400          | 1.75 | 1.75 |
| CA-41C-41D  | 1.75 GHz | 20           | 24100        | 24500       | QPSK | 1               | 0                | 41000       | 25400        | 1.75 GHz    | 20       | 25900        | 26300       | QPSK             | 1           | 0            | 41000       | 25900    | 26300        | 1.75 GHz    | 20               | 41000       | 41400        | QPSK        | 1        | 0            | 41000       | 41400            | 41800       | 1.75 GHz     | 20          | 41000          | 41400          | 1.75 | 1.75 |

### 1.5.1.2 LTE Band 41 PC2

**Table 32**  
**Output Powers – Ant 4A**

[illegible]

|                                            |                                                                                                                  |                                        |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| FCC ID: BCGA2069                           |  <b>SAR EVALUATION REPORT</b> | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Dates:</b><br>12/18/2019-1/28/2020 | <b>DUT Type:</b><br>Tablet Device                                                                                | APPENDIX F:<br>Page 15 of 16           |

## 1.5.2

## DL Carrier Aggregation with DL 4x4 MIMO RF Conducted Powers

Note: 4x4 DL MIMO is only operating in the downlink. Uplink transmission is limited to a single output stream for each component carrier of ULCA.

### 1.5.2.1 LTE Band 41

Table 33  
Output Powers – Ant 4A

| Combination | PCC      |              |              |                      |      |           |                  |                      |                 |          | SCC 1        |              |                      |        |          |           |              |                      |                 |          | SCC 2        |              |                      |      |          |           |              |                      |                 |          | SCC 3        |              |                      |      |          |           |              |                      |                 |          | SCC 4        |              |                      |      |          |           |              |                      |                 |                                                        | Power               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------|----------|--------------|--------------|----------------------|------|-----------|------------------|----------------------|-----------------|----------|--------------|--------------|----------------------|--------|----------|-----------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|------|----------|-----------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|------|----------|-----------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|------|----------|-----------|--------------|----------------------|-----------------|--------------------------------------------------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|             | PCC Band | PCC BW [MHz] | PCC [DL] Ch. | PCC [UL] Freq. [MHz] | Mod. | PCC UL RB | PCC UL RB Offset | PCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [UL] Ch. | SCC [DL] Freq. [MHz] | Mod.   | SCC UL # | SCC UL RB | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [UL] Ch. | SCC [DL] Freq. [MHz] | Mod. | SCC UL # | SCC UL RB | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [UL] Ch. | SCC [DL] Freq. [MHz] | Mod. | SCC UL # | SCC UL RB | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [UL] Ch. | SCC [DL] Freq. [MHz] | Mod. | SCC UL # | SCC UL RB | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | ULCA Tx Power with add'l CA config. active on DL (dBm) | ULCA Tx Power (dBm) |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CA (41)(41) | LTE B41  | 20           | 40350        | 2505.5               | QPSK | 1         | 0                | 40350                | 2505.5          | 4x4      | LTE B41      | 20           | 39987                | 2507.5 | QPSK     | 1         | 99           | 39987                | 2507.5          | 4x4      | LTE B41      | 20           | 41400                | 2508 | 4x4      | -         | -            | -                    | -               | -        | -            | -            | -                    | -    | -        | -         | -            | -                    | -               | -        | -            | -            | -                    | -    | -        | -         | -            | -                    | -               | -                                                      | -                   | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

### 1.5.2.2 LTE Band 41 PC2

Table 34  
Output Powers – Ant 4A

| Combination  | PCC      |              |              |                      |      |           |                  |                      |                 |          | SCC 1        |              |                      |      |          |           |              |                      |                 |          | SCC 2        |              |                      |      |          |           |              |                      |                 |          | SCC 3        |              |                      |      |          |           |              |                      |                 |          | SCC 4        |              |                      |      |          |           |              |                      |                 |                                                        | Power               |       |
|--------------|----------|--------------|--------------|----------------------|------|-----------|------------------|----------------------|-----------------|----------|--------------|--------------|----------------------|------|----------|-----------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|------|----------|-----------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|------|----------|-----------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|------|----------|-----------|--------------|----------------------|-----------------|--------------------------------------------------------|---------------------|-------|
|              | PCC Band | PCC BW [MHz] | PCC [DL] Ch. | PCC [UL] Freq. [MHz] | Mod. | PCC UL RB | PCC UL RB Offset | PCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [UL] Ch. | SCC [DL] Freq. [MHz] | Mod. | SCC UL # | SCC UL RB | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [UL] Ch. | SCC [DL] Freq. [MHz] | Mod. | SCC UL # | SCC UL RB | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [UL] Ch. | SCC [DL] Freq. [MHz] | Mod. | SCC UL # | SCC UL RB | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [UL] Ch. | SCC [DL] Freq. [MHz] | Mod. | SCC UL # | SCC UL RB | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | ULCA Tx Power with add'l CA config. active on DL (dBm) | ULCA Tx Power (dBm) |       |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 41400                | 2510 | 4x4      | LTE B41   | 20           | 40900                | 2510            | 4x4      | LTE B41      | 20           | 40400                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41)      | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4                                                    | 14.05               | 13.95 |
| CA (41) (41) | LTE B41  | 20           | 40350        | 2510                 | QPSK | 1         | 0                | 40350                | 2510            | 4x4      | LTE B41      | 20           | 39850                | 2510 | QPSK     | 1         | 99           | 39850                | 2510            | 4x4      | LTE B41      | 20           | 40350                | 2510 | 4x4      | LTE B41   | 20           | 40350                | 2510            | 4x4      |              |              |                      |      |          |           |              |                      |                 |          |              |              |                      |      |          |           |              |                      |                 |                                                        |                     |       |

### 1.5.2.3 LTE Band 7

Table 35  
Output Powers – Ant 4A

|             | PCC      |              |              |                      |      |           |                  |              |                      |                 | SCC 1    |              |              |                      |      |             |                  |              |                      |                 | Power                                                  |                     |  |  |
|-------------|----------|--------------|--------------|----------------------|------|-----------|------------------|--------------|----------------------|-----------------|----------|--------------|--------------|----------------------|------|-------------|------------------|--------------|----------------------|-----------------|--------------------------------------------------------|---------------------|--|--|
| Combination | PCC Band | PCC BW [MHz] | PCC [UL] Ch. | PCC [UL] Freq. [MHz] | Mod. | PCC UL RB | PCC UL RB Offset | PCC [DL] Ch. | PCC [DL] Freq. [MHz] | DL Ant. Config. | SCC Band | SCC BW [MHz] | SCC [UL] Ch. | SCC [UL] Freq. [MHz] | Mod  | SCC UL # RB | SCC UL RB Offset | SCC [DL] Ch. | SCC [DL] Freq. [MHz] | DL Ant. Config. | ULCA Tx Power with add'l CA config. active on DL (dBm) | ULCA Tx Power (dBm) |  |  |
| CA (7C)     | LTE B7   | 20           | 20850        | 2510                 | QPSK | 50        | 50               | 2850         | 2630                 | 4x4             | LTE B7   | 20           | 21048        | 2529.8               | QPSK | 50          | 0                | 3048         | 2649.8               | 4x4             | 14.05                                                  | 13.95               |  |  |

FCC ID: BCGA2069



SAR EVALUATION REPORT

Reviewed by:  
Quality Manager

Test Dates:  
12/18/2019-1/28/2020

DUT Type:  
Tablet Device

APPENDIX F:  
Page 16 of 16

## APPENDIX G: POWER REDUCTION VERIFICATION

|                                               |                                                                                                   |                              |                                        |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------|
| <b>FCC ID:</b> BCGA2069                       |  <b>PCTEST</b> | <b>SAR EVALUATION REPORT</b> | <b>Approved by:</b><br>Quality Manager |
| <b>Test Dates:</b><br>12/18/2019 – 01/28/2020 | <b>DUT:</b><br>Tablet Device                                                                      |                              | <b>APPENDIX G</b><br>Page 1 of 2       |

The device supports manufacturer's proprietary power reduction mechanism called "Detect Mode" for the Main Cellular Antenna. Details of this mechanism can be found in the Operational Description. When the device is being used "on-body" or "held in hand" by the user, the device will detect motion and reduce the power of the main antenna. Per the manufacturer, the mechanism is agnostic to different cellular air interfaces. Detect Mode operation was verified for two test cases, on-body and held in hand, for each supported cellular band. The power reduction verification results are below.

## 1.1 Main Antenna Power Reduction Verification Summary

**Table G-1**  
**Main Antenna Power Reduction Verification**

| Mode/Band                     | Antenna | Maximum Scenario<br>Maximum Allowed<br>Target Power [dBm] | Reduced Scenario<br>Maximum Allowed<br>Target Power [dBm] | Conducted Power [dBm] |             |             |         |
|-------------------------------|---------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------|-------------|-------------|---------|
|                               |         |                                                           |                                                           | Maximum               | Test Case 1 | Test Case 2 | Verdict |
| GPRS 850 (2 Tx)               | 1       | 30.00 (± 0.75)                                            | 25.95 (± 0.75)                                            | 30.31                 | 26.47       | 26.46       | PASS    |
|                               | 3       | 31.50 (± 0.75)                                            | 27.25 (± 0.75)                                            | 31.84                 | 26.83       | 26.81       | PASS    |
|                               | 2a      | 26.50 (± 0.75)                                            | 20.25 (± 0.75)                                            | 26.81                 | 20.00       | 20.00       | PASS    |
|                               | 2b      | 26.50 (± 0.75)                                            | 19.25 (± 0.75)                                            | 27.03                 | 19.80       | 19.80       | PASS    |
| GPRS 1900 (2 Tx)              | 4a      | 28.50 (± 0.75)                                            | 19.55 (± 0.75)                                            | 28.50                 | 19.68       | 19.66       | PASS    |
|                               | 4b      | 29.00 (± 0.75)                                            | 18.75 (± 0.75)                                            | 29.34                 | 19.27       | 19.28       | PASS    |
| WCDMA B5                      | 1       | 24.00 (± 0.5)                                             | 20.20 (± 0.5)                                             | 24.34                 | 20.70       | 20.70       | PASS    |
|                               | 3       | 25.00 (± 0.5)                                             | 21.30 (± 0.5)                                             | 25.50                 | 21.19       | 21.18       | PASS    |
| WCDMA B4                      | 2a      | 22.50 (± 0.5)                                             | 15.40 (± 0.5)                                             | 22.85                 | 15.66       | 15.66       | PASS    |
|                               | 2b      | 22.75 (± 0.5)                                             | 14.10 (± 1)                                               | 23.00                 | 14.50       | 14.50       | PASS    |
| WCDMA B2                      | 4a      | 24.50 (± 0.5)                                             | 13.80 (± 1)                                               | 24.40                 | 14.07       | 14.00       | PASS    |
|                               | 4b      | 25.20 (± 0.5)                                             | 12.50 (± 1)                                               | 25.62                 | 13.50       | 13.50       | PASS    |
| WCDMA B2                      | 2a      | 22.50 (± 0.5)                                             | 14.00 (± 1)                                               | 22.41                 | 14.00       | 14.00       | PASS    |
|                               | 2b      | 22.75 (± 0.5)                                             | 13.00 (± 1)                                               | 23.13                 | 13.82       | 13.80       | PASS    |
| LTE Band 71                   | 4a      | 24.50 (± 0.5)                                             | 13.80 (± 1)                                               | 24.41                 | 13.88       | 13.87       | PASS    |
|                               | 4b      | 25.20 (± 0.5)                                             | 12.50 (± 1)                                               | 25.43                 | 13.39       | 13.45       | PASS    |
| LTE Band 12                   | 1       | 24.00 (± 0.5)                                             | 21.90 (± 0.5)                                             | 24.30                 | 22.10       | 22.09       | PASS    |
|                               | 3       | 25.20 (± 0.5)                                             | 22.50 (± 0.5)                                             | 25.20                 | 22.80       | 22.78       | PASS    |
| LTE Band 17                   | 1       | 24.00 (± 0.5)                                             | 20.80 (± 0.5)                                             | 24.48                 | 20.78       | 20.77       | PASS    |
|                               | 3       | 25.20 (± 0.5)                                             | 21.30 (± 0.5)                                             | 25.33                 | 21.71       | 21.71       | PASS    |
| LTE Band 13                   | 1       | 24.00 (± 0.5)                                             | 20.80 (± 0.5)                                             | 24.20                 | 20.68       | 20.68       | PASS    |
|                               | 3       | 25.20 (± 0.5)                                             | 21.30 (± 0.5)                                             | 25.05                 | 21.43       | 21.42       | PASS    |
| LTE Band 14                   | 1       | 24.00 (± 0.5)                                             | 21.00 (± 0.5)                                             | 24.44                 | 21.50       | 21.50       | PASS    |
|                               | 3       | 25.20 (± 0.5)                                             | 21.30 (± 0.5)                                             | 25.37                 | 21.63       | 21.63       | PASS    |
| LTE Band 5                    | 1       | 24.00 (± 0.5)                                             | 21.00 (± 0.5)                                             | 24.26                 | 21.32       | 21.30       | PASS    |
|                               | 3       | 25.20 (± 0.5)                                             | 21.30 (± 0.5)                                             | 25.29                 | 21.45       | 21.45       | PASS    |
| LTE Band 26                   | 1       | 24.00 (± 0.5)                                             | 20.20 (± 0.5)                                             | 24.24                 | 20.70       | 20.70       | PASS    |
|                               | 3       | 25.20 (± 0.5)                                             | 21.00 (± 0.5)                                             | 25.12                 | 21.22       | 21.21       | PASS    |
| LTE Band 4                    | 1       | 24.00 (± 0.5)                                             | 20.20 (± 0.5)                                             | 24.38                 | 20.51       | 20.52       | PASS    |
|                               | 3       | 25.20 (± 0.5)                                             | 21.00 (± 0.5)                                             | 25.28                 | 20.51       | 20.57       | PASS    |
| LTE Band 66                   | 2a      | 22.50 (± 0.5)                                             | 13.90 (± 1)                                               | 22.52                 | 14.06       | 14.04       | PASS    |
|                               | 2b      | 23.00 (± 0.5)                                             | 14.10 (± 1)                                               | 23.06                 | 14.24       | 14.23       | PASS    |
| LTE Band 2                    | 4a      | 24.50 (± 0.5)                                             | 13.80 (± 1)                                               | 24.84                 | 14.53       | 14.50       | PASS    |
|                               | 4b      | 25.20 (± 0.5)                                             | 12.50 (± 1)                                               | 25.54                 | 12.78       | 12.77       | PASS    |
| LTE Band 25                   | 2a      | 22.50 (± 0.5)                                             | 13.90 (± 1)                                               | 22.89                 | 14.48       | 14.47       | PASS    |
|                               | 2b      | 23.00 (± 0.5)                                             | 14.10 (± 1)                                               | 23.40                 | 14.63       | 14.60       | PASS    |
| LTE Band 30                   | 4a      | 24.50 (± 0.5)                                             | 13.80 (± 1)                                               | 24.80                 | 14.42       | 14.45       | PASS    |
|                               | 4b      | 25.20 (± 0.5)                                             | 12.50 (± 1)                                               | 25.45                 | 13.06       | 13.05       | PASS    |
| LTE Band 41 (PC3)             | 2a      | 22.50 (± 0.5)                                             | 14.00 (± 1)                                               | 22.63                 | 14.20       | 14.20       | PASS    |
|                               | 2b      | 23.00 (± 0.5)                                             | 13.00 (± 1)                                               | 23.50                 | 14.00       | 13.95       | PASS    |
| LTE Band 41 (PC2)             | 4a      | 24.50 (± 0.5)                                             | 13.80 (± 1)                                               | 24.55                 | 13.90       | 13.89       | PASS    |
|                               | 4b      | 25.20 (± 0.5)                                             | 12.50 (± 1)                                               | 25.35                 | 13.44       | 13.45       | PASS    |
| LTE Band 48                   | 2a      | 22.50 (± 0.5)                                             | 14.00 (± 1)                                               | 22.50                 | 14.00       | 14.00       | PASS    |
|                               | 2b      | 23.00 (± 0.5)                                             | 13.00 (± 1)                                               | 23.50                 | 14.00       | 13.98       | PASS    |
| LTE B5 Intra-Band ULCA        | 4a      | 24.50 (± 0.5)                                             | 13.80 (± 1)                                               | 24.63                 | 13.88       | 13.86       | PASS    |
|                               | 4b      | 25.20 (± 0.5)                                             | 12.50 (± 1)                                               | 25.40                 | 13.50       | 13.49       | PASS    |
| LTE B7 Intra-Band ULCA        | 2a      | 21.70 (± 0.5)                                             | 13.00 (± 1)                                               | 22.20                 | 13.23       | 13.20       | PASS    |
|                               | 2b      | 22.75 (± 0.5)                                             | 12.10 (± 1)                                               | 23.25                 | 12.51       | 12.50       | PASS    |
| LTE B41 (PC3) Intra-Band ULCA | 4a      | 21.90 (± 0.5)                                             | 12.50 (± 1)                                               | 22.24                 | 12.50       | 12.52       | PASS    |
|                               | 4b      | 22.00 (± 0.5)                                             | 12.50 (± 1)                                               | 22.48                 | 12.66       | 12.65       | PASS    |
| LTE B41 (PC2) Intra-Band ULCA | 2a      | 22.50 (± 0.5)                                             | 13.10 (± 1)                                               | 22.74                 | 13.63       | 13.62       | PASS    |
|                               | 2b      | 22.50 (± 0.5)                                             | 10.80 (± 1)                                               | 22.80                 | 11.80       | 11.79       | PASS    |
| LTE B41 (PC3) Intra-Band ULCA | 4a      | 24.50 (± 0.5)                                             | 13.60 (± 1)                                               | 24.60                 | 13.80       | 13.79       | PASS    |
|                               | 4b      | 25.20 (± 0.5)                                             | 11.50 (± 1)                                               | 25.43                 | 12.06       | 12.05       | PASS    |
| LTE B41 (PC2) Intra-Band ULCA | 2a      | 22.00 (± 0.5)                                             | 15.90 (± 0.5)                                             | 21.95                 | 15.69       | 15.75       | PASS    |
|                               | 2b      | 22.50 (± 0.5)                                             | 12.80 (± 1)                                               | 22.69                 | 13.26       | 13.25       | PASS    |
| LTE B41 (PC3) Intra-Band ULCA | 4a      | 25.00 (± 0.5)                                             | 16.40 (± 0.5)                                             | 25.13                 | 16.24       | 16.23       | PASS    |
|                               | 4b      | 25.20 (± 0.5)                                             | 13.80 (± 1)                                               | 25.44                 | 14.80       | 14.80       | PASS    |
| LTE B41 (PC2) Intra-Band ULCA | 2a      | 25.00 (± 0.5)                                             | 15.90 (± 0.5)                                             | 24.92                 | 15.75       | 15.74       | PASS    |
|                               | 2b      | 24.50 (± 0.5)                                             | 12.80 (± 1)                                               | 24.60                 | 13.15       | 13.17       | PASS    |
| LTE B41 (PC3) Intra-Band ULCA | 4a      | 27.50 (± 0.5)                                             | 16.40 (± 0.5)                                             | 27.32                 | 16.13       | 16.12       | PASS    |
|                               | 4b      | 28.20 (± 0.5)                                             | 13.80 (± 1)                                               | 28.35                 | 14.80       | 14.80       | PASS    |
| LTE B41 (PC2) Intra-Band ULCA | 1       | 21.50 (± 0.5)                                             | 15.00 (± 0.5)                                             | 21.70                 | 15.42       | 15.43       | PASS    |
|                               | 3       | 24.50 (± 0.5)                                             | 17.00 (± 0.5)                                             | 24.84                 | 16.61       | 16.59       | PASS    |
| LTE B5 Intra-Band ULCA        | 2b      | 21.50 (± 0.5)                                             | 13.80 (± 1)                                               | 21.65                 | 14.69       | 14.70       | PASS    |
|                               | 4b      | 25.20 (± 0.5)                                             | 15.90 (± 0.5)                                             | 25.42                 | 15.43       | 15.42       | PASS    |
| LTE B7 Intra-Band ULCA        | 1       | 22.50 (± 1)                                               | 19.70 (± 1)                                               | 21.74                 | 20.70       | 20.69       | PASS    |
|                               | 3       | 24.00 (± 1)                                               | 20.50 (± 1)                                               | 23.75                 | 20.65       | 20.64       | PASS    |
| LTE B41 (PC3) Intra-Band ULCA | 2a      | 21.00 (± 1)                                               | 13.10 (± 1)                                               | 21.16                 | 13.02       | 13.01       | PASS    |
|                               | 2b      | 20.50 (± 1)                                               | 10.80 (± 1)                                               | 21.11                 | 11.20       | 11.15       | PASS    |
| LTE B41 (PC2) Intra-Band ULCA | 4a      | 23.50 (± 1)                                               | 13.80 (± 1)                                               | 23.29                 | 13.42       | 13.44       | PASS    |
|                               | 4b      | 24.00 (± 1)                                               | 11.50 (± 1)                                               | 24.04                 | 11.47       | 11.46       | PASS    |
| LTE B41 (PC3) Intra-Band ULCA | 2a      | 20.00 (± 1)                                               | 15.40 (± 1)                                               | 20.67                 | 15.43       | 15.45       | PASS    |
|                               | 2b      | 20.50 (± 1)                                               | 12.80 (± 1)                                               | 21.47                 | 13.13       | 13.14       | PASS    |
| LTE B41 (PC2) Intra-Band ULCA | 4a      | 23.50 (± 1)                                               | 15.90 (± 1)                                               | 23.60                 | 15.74       | 15.75       | PASS    |
|                               | 4b      | 24.00 (± 1)                                               | 13.80 (± 1)                                               | 24.16                 | 14.25       | 14.26       | PASS    |
| LTE B41 (PC3) Intra-Band ULCA | 2a      | 20.00 (± 1)                                               | 15.40 (± 1)                                               | 20.56                 | 15.42       | 15.41       | PASS    |
|                               | 2b      | 20.50 (± 1)                                               | 12.80 (± 1)                                               | 21.49                 | 12.98       | 12.99       | PASS    |
| LTE B41 (PC2) Intra-Band ULCA | 4a      | 23.50 (± 1)                                               | 15.90 (± 1)                                               | 24.35                 | 14.96       | 14.94       | PASS    |
|                               | 4b      | 24.00 (± 1)                                               | 13.80 (± 1)                                               | 25.00                 | 14.53       | 14.51       | PASS    |

Test Case 1: Device Held in Hand

Test Case 2: Device Resting on Lap

Test Cases represent typical scenarios in which the device power would be reduced. In these scenarios detect mode has been verified to identify typical on-body use-cases including when thin objects, such as a magazine or newspaper, are placed between the body and the device. In the absence of detect mode output, the device defaults to the most conservative power.

|                                        |                                                                                     |                              |                                 |
|----------------------------------------|-------------------------------------------------------------------------------------|------------------------------|---------------------------------|
| FCC ID: BCGA2069                       |  | <b>SAR EVALUATION REPORT</b> | Approved by:<br>Quality Manager |
| Test Dates:<br>12/18/2019 – 01/28/2020 | DUT:<br>Tablet Device                                                               |                              | APPENDIX G<br>Page 2 of 2       |

## APPENDIX H: IEEE 802.11AX RU SAR EXCLUSION

|                                               |                                                                                                                  |                                        |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> BCGA2069                       |  <b>SAR EVALUATION REPORT</b> | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Dates:</b><br>12/18/2019 – 01/28/2020 | <b>DUT Type:</b><br>Tablet Device                                                                                | <b>APPENDIX H:</b><br>Page 1 of 19     |

## 1.1 IEEE 802.11ax RU SAR Exclusion

To make the most efficient use of the additional available subcarriers (data tones), IEEE 802.11ax can utilize Orthogonal Frequency-Division Multiple Access (OFDMA) which divides the existing 802.11 channels into smaller subchannels called Resource Units (RUs). Possible RU sizes are: 26T, 52T, 106T, 242T, 484T and 996T.

Per FCC Guidance, 802.11ax was considered a higher order 802.11 mode when compared to a/b/g/n/ac to apply KDB Publication 248227 D01v02r02 for OFDM mode selection. Therefore, SAR tests were not required for 802.11ax based on the maximum allowed output powers of OFDM modes and the reported SAR values. Per FCC Guidance, maximum conducted powers were performed for each RU size to demonstrate that the output powers would not be higher than the other OFDM 802.11 modes.

## 1.2 IEEE 802.11ax RU Target Powers

### 1.2.1 802.11ax RU WLAN Maximum Output Power

#### A. Antenna 2A

| Mode/ Band                                                         |                     | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         |
|--------------------------------------------------------------------|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                                    |                     | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated<br>Average -<br>Single Tx Chain<br>(dBm) -<br>Antenna 2A | 20 MHz<br>Bandwidth | 1       | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |
|                                                                    |                     | 2       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                                    |                     | 3       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                                    |                     | 4       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                                    |                     | 5       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                                    |                     | 6       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                                    |                     | 7       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                                    |                     | 8       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                                    |                     | 9       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                                    |                     | 10      | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |
|                                                                    |                     | 11      | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    |
|                                                                    |                     | 12      | 8.00    | 6.50    | 8.00    | 6.50    | 8.00    | 6.50    | 8.00    | 6.50    |
|                                                                    |                     | 13      | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     |

| Mode/ Band                                                 |                     | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         |
|------------------------------------------------------------|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                            |                     | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated<br>Average - 2 Tx<br>Chain (dBm) -<br>Antenna 2A | 20 MHz<br>Bandwidth | 1       | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    |
|                                                            |                     | 2       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                            |                     | 3       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                            |                     | 4       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                            |                     | 5       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                            |                     | 6       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                            |                     | 7       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                            |                     | 8       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                            |                     | 9       | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |
|                                                            |                     | 10      | 11.00   | 9.50    | 11.00   | 9.50    | 11.00   | 9.50    | 11.00   | 9.50    |
|                                                            |                     | 11      | 9.50    | 8.00    | 9.50    | 8.00    | 9.50    | 8.00    | 9.50    | 8.00    |
|                                                            |                     | 12      | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                            |                     | 13      | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     |

Note: In MIMO operations, Antenna 2A transmits at maximum allowed powers at indicated above.

|                                        |                                                                                                   |                       |                                 |
|----------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------|---------------------------------|
| FCC ID: BCGA2069                       |  <b>PCTEST</b> | SAR EVALUATION REPORT | Reviewed by:<br>Quality Manager |
| Test Dates:<br>12/18/2019 – 01/28/2020 | DUT Type:<br>Tablet Device                                                                        |                       | APPENDIX H:<br>Page 2 of 19     |

## B. Antenna 4A

| Mode/ Band                                                         |                     | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         |
|--------------------------------------------------------------------|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                                    |                     | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated<br>Average -<br>Single Tx Chain<br>(dBm) -<br>Antenna 4A | 20 MHz<br>Bandwidth | 1       | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   |
|                                                                    |                     | 2       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                                    |                     | 3       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                                    |                     | 4       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                                    |                     | 5       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                                    |                     | 6       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                                    |                     | 7       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                                    |                     | 8       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                                    |                     | 9       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                                    |                     | 10      | 13.50   | 12.00   | 13.50   | 12.00   | 13.50   | 12.00   | 13.50   | 12.00   |
|                                                                    |                     | 11      | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   |
| 12                                                                 | 10.00               | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    |         |         |
| 13                                                                 | N/A                 | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     |         |

| Mode/ Band                                                 |                     | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         |
|------------------------------------------------------------|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                            |                     | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated<br>Average - 2 Tx<br>Chain (dBm) -<br>Antenna 4A | 20 MHz<br>Bandwidth | 1       | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   |
|                                                            |                     | 2       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                            |                     | 3       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                            |                     | 4       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                            |                     | 5       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                            |                     | 6       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                            |                     | 7       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                            |                     | 8       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                            |                     | 9       | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |
|                                                            |                     | 10      | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   |
|                                                            |                     | 11      | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |
|                                                            |                     | 12      | 9.00    | 7.50    | 9.00    | 7.50    | 9.00    | 7.50    | 9.00    | 7.50    |
|                                                            |                     | 13      | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     |

Note: In MIMO operations, Antenna 4A transmits at maximum allowed powers at indicated above.

|                                               |                                                                                                   |                              |                                        |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------|
| FCC ID: BCGA2069                              |  <b>PCTEST</b> | <b>SAR EVALUATION REPORT</b> | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Dates:</b><br>12/18/2019 – 01/28/2020 | <b>DUT Type:</b><br>Tablet Device                                                                 |                              | <b>APPENDIX H:</b><br>Page 3 of 19     |

### C. 5GHz ANTlower

| Mode/ Band                                                         |                  | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         | 484T    |         | 996T    |         |
|--------------------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                                    |                  | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated Average -<br>Single Tx Chain<br>(dBm) - 5GHz<br>ANTlower | 20 MHz Bandwidth | 36      | 11.00   | 9.50    | 14.00   | 12.50   | 15.00   | 13.50   | 15.00   | 13.50   |         |         |         |         |
|                                                                    |                  | 40      | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                    |                  | 44      | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                    |                  | 48      | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                    |                  | 52      | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   | 16.75   | 15.25   |         |         |         |         |
|                                                                    |                  | 56      | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   | 16.75   | 15.25   |         |         |         |         |
|                                                                    |                  | 60      | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   | 16.75   | 15.25   |         |         |         |         |
|                                                                    |                  | 64      | 11.00   | 9.50    | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |         |         |         |         |
|                                                                    |                  | 100     | 11.00   | 9.50    | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |         |         |         |         |
|                                                                    |                  | 104     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 108     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 112     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 116     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 120     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 124     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 128     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 132     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 136     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 140     | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                    | 40 MHz Bandwidth | 144     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 149     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 153     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 157     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 161     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 165     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 38      | 11.00   | 9.50    | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   |
|                                                                    |                  | 46      | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   | 17.00   | 15.50   | 17.00   | 15.50   | 17.00   | 15.50   |
|                                                                    |                  | 54      | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   | 16.75   | 15.25   | 16.75   | 15.25   | 16.75   | 15.25   |
|                                                                    |                  | 62      | 11.00   | 9.50    | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   |
|                                                                    | 80 MHz Bandwidth | 102     | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   |
|                                                                    |                  | 110     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                    |                  | 118     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                    |                  | 126     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                    |                  | 134     | 11.00   | 9.50    | 14.00   | 12.50   | 15.00   | 13.50   | 15.00   | 13.50   | 15.00   | 13.50   | 15.00   | 13.50   |
|                                                                    |                  | 142     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 11.50   | 10.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                    |                  | 151     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                    |                  | 159     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                    |                  | 42      | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   |
|                                                                    |                  | 58      | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |
|                                                                    |                  | 106     | 11.00   | 9.50    | 11.00   | 9.50    | 11.00   | 9.50    | 11.00   | 9.50    | 11.00   | 9.50    | 11.00   | 9.50    |
|                                                                    |                  | 122     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                    |                  | 138     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 11.50   | 10.00   | 15.00   | 13.50   | 15.50   | 14.00   |
|                                                                    |                  | 155     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |

|                                        |                                                                                                   |                       |                                 |
|----------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------|---------------------------------|
| FCC ID: BCGA2069                       |  <b>PCTEST</b> | SAR EVALUATION REPORT | Reviewed by:<br>Quality Manager |
| Test Dates:<br>12/18/2019 – 01/28/2020 | DUT Type:<br>Tablet Device                                                                        |                       | APPENDIX H:<br>Page 4 of 19     |

| Mode/ Band                                                        |                  | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         | 484T    |         | 996T    |         |
|-------------------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                                   |                  | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated Average -<br>2 Tx Chain (dBm)<br>CDD - 5GHz<br>ANTlower | 20 MHz Bandwidth | 36      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 14.00   | 12.50   |         |         |         |         |
|                                                                   |                  | 40      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                   |                  | 44      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                   |                  | 48      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                   |                  | 52      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   |         |         |         |         |
|                                                                   |                  | 56      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   |         |         |         |         |
|                                                                   |                  | 60      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   |         |         |         |         |
|                                                                   |                  | 64      | 8.00    | 6.50    | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   |         |         |         |         |
|                                                                   |                  | 100     | 7.00    | 5.50    | 10.00   | 8.50    | 12.75   | 11.25   | 12.75   | 11.25   |         |         |         |         |
|                                                                   |                  | 104     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 108     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 112     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 116     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 120     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 124     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 128     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 132     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 136     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 140     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                   |                  | 144     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 149     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 153     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 157     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 161     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 165     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                   | 40 MHz Bandwidth | 38      | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 10.50   | 9.00    |
|                                                                   |                  | 46      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   | 17.00   | 15.50   | 10.00   | 8.50    |
|                                                                   |                  | 54      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   | 16.75   | 15.25   | 10.00   | 8.50    |
|                                                                   |                  | 62      | 8.00    | 6.50    | 11.00   | 9.50    | 11.25   | 9.75    | 11.25   | 9.75    | 11.25   | 9.75    | 10.00   | 8.50    |
|                                                                   |                  | 102     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |
|                                                                   |                  | 110     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   | 15.50   | 14.00   | 10.50   | 9.00    |
|                                                                   |                  | 118     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   | 15.50   | 14.00   | 10.50   | 9.00    |
|                                                                   |                  | 126     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   | 15.50   | 14.00   | 10.50   | 9.00    |
|                                                                   |                  | 134     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 13.75   | 12.25   | 13.75   | 12.25   | 10.50   | 9.00    |
|                                                                   |                  | 142     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 10.50   | 9.00    | 15.50   | 14.00   | 10.50   | 9.00    |
|                                                                   |                  | 151     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 10.50   | 9.00    |
|                                                                   |                  | 159     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 10.50   | 9.00    |
|                                                                   | 80 MHz Bandwidth | 42      | 8.00    | 6.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |
|                                                                   |                  | 58      | 8.00    | 6.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    |
|                                                                   |                  | 106     | 7.00    | 5.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    |
|                                                                   |                  | 122     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                   |                  | 138     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 10.50   | 9.00    | 13.75   | 12.25   | 15.50   | 14.00   |
|                                                                   |                  | 155     | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |

|                                               |                                                                                                   |                              |                                        |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------|
| FCC ID: BCGA2069                              |  <b>PCTEST</b> | <b>SAR EVALUATION REPORT</b> | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Dates:</b><br>12/18/2019 – 01/28/2020 | <b>DUT Type:</b><br>Tablet Device                                                                 |                              | <b>APPENDIX H:</b><br>Page 5 of 19     |

| Mode/ Band                                                        |                  | Tones            | 26T     |         | 52T     |         | 106T    |         | 242T    |         | 484T    |         | 996T    |         |       |       |      |
|-------------------------------------------------------------------|------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|-------|------|
|                                                                   |                  | Channel          | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |       |       |      |
| Modulated Average -<br>2 Tx Chain (dBm)<br>SDM - 5GHz<br>ANTlower | 20 MHz Bandwidth | 36               | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 14.00   | 12.50   |         |         |         |         |       |       |      |
|                                                                   |                  | 40               | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   |         |         |         |         |       |       |      |
|                                                                   |                  | 44               | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   |         |         |         |         |       |       |      |
|                                                                   |                  | 48               | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   |         |         |         |         |       |       |      |
|                                                                   |                  | 52               | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   |         |         |         |         |       |       |      |
|                                                                   |                  | 56               | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   |         |         |         |         |       |       |      |
|                                                                   |                  | 60               | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   |         |         |         |         |       |       |      |
|                                                                   |                  | 64               | 8.00    | 6.50    | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   |         |         |         |         |       |       |      |
|                                                                   |                  | 100              | 8.00    | 6.50    | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   |         |         |         |         |       |       |      |
|                                                                   |                  | 104              | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |       |       |      |
|                                                                   |                  | 108              | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |       |       |      |
|                                                                   |                  | 112              | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |       |       |      |
|                                                                   |                  | 116              | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |       |       |      |
|                                                                   |                  | 120              | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |       |       |      |
|                                                                   |                  | 124              | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |       |       |      |
|                                                                   |                  | 128              | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |       |       |      |
|                                                                   |                  | 132              | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |       |       |      |
|                                                                   |                  | 136              | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |       |       |      |
|                                                                   |                  | 140              | 8.00    | 6.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |       |       |      |
|                                                                   |                  | 144              | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |       |       |      |
|                                                                   | 149              | 15.50            | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |         |       |       |      |
|                                                                   | 153              | 15.50            | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |         |       |       |      |
|                                                                   | 157              | 15.50            | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |         |       |       |      |
|                                                                   | 161              | 15.50            | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |         |       |       |      |
|                                                                   | 165              | 15.50            | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |         |       |       |      |
|                                                                   | 40 MHz Bandwidth | 38               | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |      |
|                                                                   |                  | 46               | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   | 17.00   | 15.50   |         |         |       |       |      |
|                                                                   |                  | 54               | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   | 16.75   | 15.25   |         |         |       |       |      |
|                                                                   |                  | 62               | 8.00    | 6.50    | 11.00   | 9.50    | 11.25   | 9.75    | 11.25   | 9.75    | 11.25   | 9.75    |         |         |       |       |      |
|                                                                   |                  | 102              | 8.00    | 6.50    | 11.00   | 9.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |       |       |      |
|                                                                   |                  | 110              | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |       |       |      |
|                                                                   |                  | 118              | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |       |       |      |
|                                                                   |                  | 126              | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |       |       |      |
|                                                                   |                  | 134              | 8.00    | 6.50    | 11.00   | 9.50    | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |         |         |       |       |      |
|                                                                   |                  | 142              | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 10.50   | 9.00    | 15.50   | 14.00   |         |         |       |       |      |
|                                                                   |                  | 151              | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |       |       |      |
|                                                                   |                  | 159              | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |       |       |      |
|                                                                   |                  | 80 MHz Bandwidth | 42      | 8.00    | 6.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00  | 10.50 | 9.00 |
|                                                                   |                  |                  | 58      | 8.00    | 6.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50  | 10.00 | 8.50 |
|                                                                   |                  |                  | 106     | 8.00    | 6.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50  | 10.00 | 8.50 |
|                                                                   | 122              |                  | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50 | 14.00 |      |
|                                                                   | 138              |                  | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 10.50   | 9.00    | 13.75   | 12.25   | 15.50   | 14.00   | 15.50 | 14.00 |      |
|                                                                   | 155              |                  | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00 | 12.50 |      |

Note: In MIMO operations, 5GHz ANTlower transmits at maximum allowed powers as indicated above for both 2 Tx CDD and 2 Tx SDM.

|                                               |                                                                                                   |                              |                                        |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------|
| FCC ID: BCGA2069                              |  <b>PCTEST</b> | <b>SAR EVALUATION REPORT</b> | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Dates:</b><br>12/18/2019 – 01/28/2020 | <b>DUT Type:</b><br>Tablet Device                                                                 |                              | <b>APPENDIX H:</b><br>Page 6 of 19     |

## D. 5GHz ANTupper

| Mode/ Band                                                         |                  | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         | 484T    |         | 996T    |         |
|--------------------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                                    |                  | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated Average -<br>Single Tx Chain<br>(dBm) - 5GHz<br>ANTupper | 20 MHz Bandwidth | 36      | 11.00   | 9.50    | 14.00   | 12.50   | 15.00   | 13.50   | 15.00   | 13.50   |         |         |         |         |
|                                                                    |                  | 40      | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                    |                  | 44      | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                    |                  | 48      | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                    |                  | 52      | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   | 16.75   | 15.25   |         |         |         |         |
|                                                                    |                  | 56      | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   | 16.75   | 15.25   |         |         |         |         |
|                                                                    |                  | 60      | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   | 16.75   | 15.25   |         |         |         |         |
|                                                                    |                  | 64      | 11.00   | 9.50    | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |         |         |         |         |
|                                                                    |                  | 100     | 11.00   | 9.50    | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |         |         |         |         |
|                                                                    |                  | 104     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 108     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 112     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 116     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 120     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 124     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 128     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 132     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 136     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 140     | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                    |                  | 144     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |         |         |
|                                                                    |                  | 149     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                    |                  | 153     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                    |                  | 157     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                    |                  | 161     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                    |                  | 165     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                    | 40 MHz Bandwidth | 38      | 11.00   | 9.50    | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   |
|                                                                    |                  | 46      | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   | 17.00   | 15.50   | 17.00   | 15.50   | 17.00   | 15.50   |
|                                                                    |                  | 54      | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   | 16.75   | 15.25   | 16.75   | 15.25   | 16.75   | 15.25   |
|                                                                    |                  | 62      | 11.00   | 9.50    | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   |
|                                                                    |                  | 102     | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   |
|                                                                    |                  | 110     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                    |                  | 118     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                    |                  | 126     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                    |                  | 134     | 11.00   | 9.50    | 14.00   | 12.50   | 15.00   | 13.50   | 15.00   | 13.50   | 15.00   | 13.50   | 15.00   | 13.50   |
|                                                                    |                  | 142     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 11.50   | 10.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                    |                  | 151     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |
|                                                                    |                  | 159     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |
|                                                                    | 80 MHz Bandwidth | 42      | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   |
|                                                                    |                  | 58      | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |
|                                                                    |                  | 106     | 11.00   | 9.50    | 11.00   | 9.50    | 11.00   | 9.50    | 11.00   | 9.50    | 11.00   | 9.50    | 11.00   | 9.50    |
|                                                                    |                  | 122     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                    |                  | 138     | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 11.50   | 10.00   | 15.00   | 13.50   | 15.50   | 14.00   |
|                                                                    |                  | 155     | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |

|                                        |                                                                                                   |                       |                                 |
|----------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------|---------------------------------|
| FCC ID: BCGA2069                       |  <b>PCTEST</b> | SAR EVALUATION REPORT | Reviewed by:<br>Quality Manager |
| Test Dates:<br>12/18/2019 – 01/28/2020 | DUT Type:<br>Tablet Device                                                                        |                       | APPENDIX H:<br>Page 7 of 19     |

| Mode/ Band                                                        |                  | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         | 484T    |         | 996T    |         |
|-------------------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                                   |                  | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated Average -<br>2 Tx Chain (dBm)<br>CDD - 5GHz<br>ANTupper | 20 MHz Bandwidth | 36      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 14.00   | 12.50   |         |         |         |         |
|                                                                   |                  | 40      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                   |                  | 44      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                   |                  | 48      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                   |                  | 52      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   |         |         |         |         |
|                                                                   |                  | 56      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   |         |         |         |         |
|                                                                   |                  | 60      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   |         |         |         |         |
|                                                                   |                  | 64      | 8.00    | 6.50    | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   |         |         |         |         |
|                                                                   |                  | 100     | 7.00    | 5.50    | 10.00   | 8.50    | 12.75   | 11.25   | 12.75   | 11.25   |         |         |         |         |
|                                                                   |                  | 104     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 108     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 112     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 116     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 120     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 124     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 128     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 132     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 136     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 140     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                   |                  | 144     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 149     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                   |                  | 153     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                   |                  | 157     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                   |                  | 161     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                   |                  | 165     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                   | 40 MHz Bandwidth | 38      | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |
|                                                                   |                  | 46      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   | 17.00   | 15.50   |         |         |
|                                                                   |                  | 54      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   | 16.75   | 15.25   |         |         |
|                                                                   |                  | 62      | 8.00    | 6.50    | 11.00   | 9.50    | 11.25   | 9.75    | 11.25   | 9.75    | 11.25   | 9.75    |         |         |
|                                                                   |                  | 102     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |
|                                                                   |                  | 110     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |
|                                                                   |                  | 118     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |
|                                                                   |                  | 126     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |
|                                                                   |                  | 134     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 13.75   | 12.25   | 13.75   | 12.25   |         |         |
|                                                                   |                  | 142     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 10.50   | 9.00    | 15.50   | 14.00   |         |         |
|                                                                   | 80 MHz Bandwidth | 151     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |
|                                                                   |                  | 159     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |
|                                                                   |                  | 42      | 8.00    | 6.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |
|                                                                   |                  | 58      | 8.00    | 6.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    |
|                                                                   |                  | 106     | 7.00    | 5.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    |
|                                                                   |                  | 122     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                   |                  | 138     | 7.00    | 5.50    | 10.00   | 8.50    | 13.00   | 11.50   | 10.50   | 9.00    | 13.75   | 12.25   | 15.50   | 14.00   |
|                                                                   |                  | 155     | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |

|                                        |                                                                                                   |                       |                                 |
|----------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------|---------------------------------|
| FCC ID: BCGA2069                       |  <b>PCTEST</b> | SAR EVALUATION REPORT | Reviewed by:<br>Quality Manager |
| Test Dates:<br>12/18/2019 – 01/28/2020 | DUT Type:<br>Tablet Device                                                                        |                       | APPENDIX H:<br>Page 8 of 19     |

| Mode/ Band                                                        |                  | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         | 484T    |         | 996T    |         |
|-------------------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                                   |                  | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated Average -<br>2 Tx Chain (dBm)<br>SDM - 5GHz<br>ANTupper | 20 MHz Bandwidth | 36      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 14.00   | 12.50   |         |         |         |         |
|                                                                   |                  | 40      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                   |                  | 44      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                   |                  | 48      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   |         |         |         |         |
|                                                                   |                  | 52      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   |         |         |         |         |
|                                                                   |                  | 56      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   |         |         |         |         |
|                                                                   |                  | 60      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   |         |         |         |         |
|                                                                   |                  | 64      | 8.00    | 6.50    | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   |         |         |         |         |
|                                                                   |                  | 100     | 8.00    | 6.50    | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   |         |         |         |         |
|                                                                   |                  | 104     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 108     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 112     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 116     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 120     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 124     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 128     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 132     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 136     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 140     | 8.00    | 6.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                   |                  | 144     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   |         |         |         |         |
|                                                                   |                  | 149     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                   |                  | 153     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                   |                  | 157     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                   |                  | 161     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                   |                  | 165     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |         |         |
|                                                                   | 40 MHz Bandwidth | 38      | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |
|                                                                   |                  | 46      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 17.00   | 15.50   | 17.00   | 15.50   |         |         |
|                                                                   |                  | 54      | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 16.75   | 15.25   | 16.75   | 15.25   |         |         |
|                                                                   |                  | 62      | 8.00    | 6.50    | 11.00   | 9.50    | 11.25   | 9.75    | 11.25   | 9.75    | 11.25   | 9.75    |         |         |
|                                                                   |                  | 102     | 8.00    | 6.50    | 11.00   | 9.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |
|                                                                   |                  | 110     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |
|                                                                   |                  | 118     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |
|                                                                   |                  | 126     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   |         |         |
|                                                                   |                  | 134     | 8.00    | 6.50    | 11.00   | 9.50    | 13.75   | 12.25   | 13.75   | 12.25   | 13.75   | 12.25   |         |         |
|                                                                   |                  | 142     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 10.50   | 9.00    | 15.50   | 14.00   |         |         |
|                                                                   |                  | 151     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |
|                                                                   |                  | 159     | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   | 15.75   | 14.25   |         |         |
|                                                                   | 80 MHz Bandwidth | 42      | 8.00    | 6.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |
|                                                                   |                  | 58      | 8.00    | 6.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    |
|                                                                   |                  | 106     | 8.00    | 6.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    |
|                                                                   |                  | 122     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 15.50   | 14.00   | 15.50   | 14.00   | 15.50   | 14.00   |
|                                                                   |                  | 138     | 8.00    | 6.50    | 11.00   | 9.50    | 14.00   | 12.50   | 10.50   | 9.00    | 13.75   | 12.25   | 15.50   | 14.00   |
|                                                                   |                  | 155     | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   | 14.00   | 12.50   |

Note: In MIMO operations, 5GHz ANTupper transmits at maximum allowed powers as indicated above for both 2 Tx CDD and 2 Tx SDM.

## 1.2.2 802.11ax RU WLAN Reduced Output Power

### A. Antenna 2A

| Mode/ Band                                                   |                  | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         |
|--------------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                              |                  | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated Average -<br>Single Tx Chain<br>(dBm) - Antenna 2A | 20 MHz Bandwidth | 1       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                              |                  | 2       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                              |                  | 3       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                              |                  | 4       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                              |                  | 5       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                              |                  | 6       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                              |                  | 7       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                              |                  | 8       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                              |                  | 9       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                              |                  | 10      | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                              |                  | 11      | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                              |                  | 12      | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                              |                  | 13      | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     |

|                                               |                                                                                                   |                              |                                        |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------|
| FCC ID: BCGA2069                              |  <b>PCTEST</b> | <b>SAR EVALUATION REPORT</b> | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Dates:</b><br>12/18/2019 – 01/28/2020 | <b>DUT Type:</b><br>Tablet Device                                                                 |                              | <b>APPENDIX H:</b><br>Page 9 of 19     |

| Mode/ Band                                              |                  | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         |
|---------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                         |                  | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated Average -<br>2 Tx Chain (dBm) -<br>Antenna 2A | 20 MHz Bandwidth | 1       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                         |                  | 2       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                         |                  | 3       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                         |                  | 4       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                         |                  | 5       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                         |                  | 6       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                         |                  | 7       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                         |                  | 8       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                         |                  | 9       | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                         |                  | 10      | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                         |                  | 11      | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                         |                  | 12      | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    | 7.00    | 5.50    |
|                                                         |                  | 13      | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     |

Note: In MIMO operations, Antenna 2A transmits at maximum allowed powers at indicated above.

#### B. Antenna 4A

| Mode/ Band                                                   |                  | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         |
|--------------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                              |                  | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated Average -<br>Single Tx Chain<br>(dBm) - Antenna 4A | 20 MHz Bandwidth | 1       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                              |                  | 2       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                              |                  | 3       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                              |                  | 4       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                              |                  | 5       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                              |                  | 6       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                              |                  | 7       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                              |                  | 8       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                              |                  | 9       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                              |                  | 10      | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                              |                  | 11      | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                              |                  | 12      | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                              |                  | 13      | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     |

| Mode/ Band                                              |                  | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         |
|---------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                         |                  | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated Average -<br>2 Tx Chain (dBm) -<br>Antenna 4A | 20 MHz Bandwidth | 1       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                         |                  | 2       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                         |                  | 3       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                         |                  | 4       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                         |                  | 5       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                         |                  | 6       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                         |                  | 7       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                         |                  | 8       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                         |                  | 9       | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                         |                  | 10      | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                         |                  | 11      | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                         |                  | 12      | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    | 6.75    | 5.25    |
|                                                         |                  | 13      | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     |

Note: In MIMO operations, Antenna 4A transmits at maximum allowed powers at indicated above.

|                                               |                                                                                                   |                              |                                        |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------|
| FCC ID: BCGA2069                              |  <b>PCTEST</b> | <b>SAR EVALUATION REPORT</b> | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Dates:</b><br>12/18/2019 – 01/28/2020 | <b>DUT Type:</b><br>Tablet Device                                                                 |                              | <b>APPENDIX H:</b><br>Page 10 of 19    |

### C. 5GHz ANTlower

| Mode/ Band                                                         |                  | Tones   |         | 26T     |         | 52T     |         | 106T    |         | 242T    |         | 484T    |         | 996T    |       |       |
|--------------------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|-------|
|                                                                    |                  | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |       |       |
| Modulated Average -<br>Single Tx Chain<br>(dBm) - 5GHz<br>ANTLower | 20 MHz Bandwidth | 36      | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   |         |         |       |       |
|                                                                    |                  | 40      | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   |         |         |       |       |
|                                                                    |                  | 44      | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   |         |         |       |       |
|                                                                    |                  | 48      | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   |         |         |       |       |
|                                                                    |                  | 52      | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   | 12.75   | 11.25   | 12.75   | 11.25   |         |         |       |       |
|                                                                    |                  | 56      | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   | 12.75   | 11.25   | 12.75   | 11.25   |         |         |       |       |
|                                                                    |                  | 60      | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   | 12.75   | 11.25   | 12.75   | 11.25   |         |         |       |       |
|                                                                    |                  | 64      | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   | 12.75   | 11.25   | 12.75   | 11.25   |         |         |       |       |
|                                                                    |                  | 100     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 104     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 108     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 112     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 116     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 120     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 124     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 128     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 132     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 136     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 140     | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 144     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 149     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 153     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 157     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 161     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    |                  | 165     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |       |
|                                                                    | 40 MHz Bandwidth | 38      | 11.00   | 9.50    | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   |       |       |
|                                                                    |                  | 46      | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   |       |       |
|                                                                    |                  | 54      | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   | 12.75   | 11.25   | 12.75   | 11.25   | 12.75   | 11.25   |       |       |
|                                                                    |                  | 62      | 11.00   | 9.50    | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   | 12.50   | 11.00   |       |       |
|                                                                    |                  | 102     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |       |       |
|                                                                    |                  | 110     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |       |       |
|                                                                    |                  | 118     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |       |       |
|                                                                    |                  | 126     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |       |       |
|                                                                    |                  | 134     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |       |       |
|                                                                    |                  | 142     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |       |       |
|                                                                    |                  | 151     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |       |       |
|                                                                    |                  | 159     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |       |       |
|                                                                    | 80 MHz Bandwidth | 42      | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00 | 10.50 |
|                                                                    |                  | 58      | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50 | 10.00 |
|                                                                    |                  | 106     | 11.00   | 9.50    | 11.00   | 9.50    | 11.00   | 9.50    | 11.00   | 9.50    | 11.00   | 9.50    | 11.00   | 9.50    | 11.00 | 9.50  |
|                                                                    |                  | 122     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50 | 10.00 |
|                                                                    |                  | 138     | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50 | 10.00 |
|                                                                    |                  | 155     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50 | 10.00 |
|                                                                    |                  |         |         |         |         |         |         |         |         |         |         |         |         |         |       |       |

| Mode/ Band                                                        |                  | Tones   |         | 26T     |         | 52T     |         | 106T    |         | 242T    |         | 484T    |         | 996T    |  |
|-------------------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
|                                                                   |                  | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |  |
| Modulated Average -<br>2 Tx Chain (dBm)<br>CDD - 5GHz<br>ANTLower | 20 MHz Bandwidth | 36      | 8.00    | 6.50    | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   |         |         |         |         |  |
|                                                                   |                  | 40      | 8.00    | 6.50    | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   |         |         |         |         |  |
|                                                                   |                  | 44      | 8.00    | 6.50    | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   |         |         |         |         |  |
|                                                                   |                  | 48      | 8.00    | 6.50    | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   |         |         |         |         |  |
|                                                                   |                  | 52      | 8.00    | 6.50    | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   |         |         |         |         |  |
|                                                                   |                  | 56      | 8.00    | 6.50    | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   |         |         |         |         |  |
|                                                                   |                  | 60      | 8.00    | 6.50    | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   |         |         |         |         |  |
|                                                                   |                  | 64      | 8.00    | 6.50    | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   |         |         |         |         |  |
|                                                                   |                  | 100     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 104     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 108     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 112     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 116     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 120     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 124     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 128     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 132     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 136     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 140     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |  |
|                                                                   |                  | 144     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 149     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 153     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 157     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 161     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   |                  | 165     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |  |
|                                                                   | 40 MHz Bandwidth | 38      | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |  |
|                                                                   |                  | 46      | 8.00    | 6.50    | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   |         |         |  |
|                                                                   |                  | 54      | 8.00    | 6.50    | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   | 12.75   | 11.25   |         |         |  |
|                                                                   |                  | 62      | 8.00    | 6.50    | 11.00   | 9.50    | 11.25   | 9.75    | 11.25   | 9.75    | 11.25   | 9.75    |         |         |  |
|                                                                   |                  | 102     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |  |
|                                                                   |                  | 110     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |  |
|                                                                   |                  | 118     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |  |
|                                                                   |                  | 126     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |  |
|                                                                   |                  | 134     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |  |
|                                                                   |                  | 142     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 10.50   | 9.00    | 11.50   | 10.00   |         |         |  |
|                                                                   |                  | 151     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |  |
|                                                                   |                  | 159     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |  |
|                                                                   | 80 MHz Bandwidth | 42      | 8.00    | 6.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |  |
|                                                                   |                  | 58      | 8.00    | 6.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    |  |
|                                                                   |                  | 106     | 7.00    | 5.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    |  |
|                                                                   |                  | 122     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |  |
|                                                                   |                  | 138     | 7.00    | 5.50    | 10.00   | 8.50    | 11.50   | 10.00   | 10.50   | 9.00    | 11.50   | 10.00   | 11.50   | 10.00   |  |
|                                                                   |                  | 155     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |  |
|                                                                   |                  |         |         |         |         |         |         |         |         |         |         |         |         |         |  |

|                                        |                                                                                                   |                       |                                 |
|----------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------|---------------------------------|
| FCC ID: BCGA2069                       |  <b>PCTEST</b> | SAR EVALUATION REPORT | Reviewed by:<br>Quality Manager |
| Test Dates:<br>12/18/2019 – 01/28/2020 | DUT Type:<br>Tablet Device                                                                        |                       | APPENDIX H:<br>Page 11 of 1     |

| Mode/ Band                                                        |                  | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         | 484T    |         | 996T    |         |
|-------------------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                                   |                  | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated Average -<br>2 Tx Chain (dBm)<br>SDM - 5GHz<br>ANTlower | 20 MHz Bandwidth | 36      | 8.00    | 6.50    | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   |         |         |         |         |
|                                                                   |                  | 40      | 8.00    | 6.50    | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   |         |         |         |         |
|                                                                   |                  | 44      | 8.00    | 6.50    | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   |         |         |         |         |
|                                                                   |                  | 48      | 8.00    | 6.50    | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   |         |         |         |         |
|                                                                   |                  | 52      | 8.00    | 6.50    | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   |         |         |         |         |
|                                                                   |                  | 56      | 8.00    | 6.50    | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   |         |         |         |         |
|                                                                   |                  | 60      | 8.00    | 6.50    | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   |         |         |         |         |
|                                                                   |                  | 64      | 8.00    | 6.50    | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   |         |         |         |         |
|                                                                   |                  | 100     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 104     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 108     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 112     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 116     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 120     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 124     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 128     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 132     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 136     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 140     | 8.00    | 6.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                   |                  | 144     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 149     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 153     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 157     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 161     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   |                  | 165     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |         |         |
|                                                                   | 40 MHz Bandwidth | 38      | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 10.00   | 10.00   | 11.50   | 10.00   |         |         |
|                                                                   |                  | 46      | 8.00    | 6.50    | 11.00   | 9.50    | 13.00   | 11.50   | 13.00   | 11.50   | 13.00   | 11.50   |         |         |
|                                                                   |                  | 54      | 8.00    | 6.50    | 11.00   | 9.50    | 12.75   | 11.25   | 12.75   | 11.25   | 12.75   | 11.25   |         |         |
|                                                                   |                  | 62      | 8.00    | 6.50    | 11.00   | 9.50    | 11.25   | 9.75    | 11.25   | 9.75    | 11.25   | 9.75    |         |         |
|                                                                   |                  | 102     | 8.00    | 6.50    | 11.00   | 9.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |
|                                                                   |                  | 110     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |
|                                                                   |                  | 118     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |
|                                                                   |                  | 126     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |
|                                                                   |                  | 134     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |
|                                                                   |                  | 142     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 10.50   | 9.00    | 11.50   | 10.00   |         |         |
|                                                                   |                  | 151     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |
|                                                                   |                  | 159     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |
|                                                                   | 80 MHz Bandwidth | 42      | 8.00    | 6.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |
|                                                                   |                  | 58      | 8.00    | 6.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    |
|                                                                   |                  | 106     | 8.00    | 6.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    |
|                                                                   |                  | 122     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |
|                                                                   |                  | 138     | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 10.50   | 9.00    | 11.50   | 10.00   | 11.50   | 10.00   |
|                                                                   |                  | 155     | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |
|                                                                   |                  |         |         |         |         |         |         |         |         |         |         |         |         |         |

Note: In MIMO operations, 5GHz ANTlower transmits at maximum allowed powers as indicated above for both 2 Tx CDD and 2 Tx SDM.

#### D. 5GHz ANTupper

| Mode/ Band                                                      |                  | Tones   | 26T     |         | 52T     |         | 106T    |         | 242T    |         | 484T    |         | 996T    |         |
|-----------------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                                 |                  | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |
| Modulated Average -<br>Single Tx Chain (dBm) - 5GHz<br>ANTupper | 20 MHz Bandwidth | 36      | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   |         |         |         |         |
|                                                                 |                  | 40      | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   |         |         |         |         |
|                                                                 |                  | 44      | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   |         |         |         |         |
|                                                                 |                  | 48      | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   |         |         |         |         |
|                                                                 |                  | 52      | 11.00   | 9.50    | 11.75   | 10.25   | 11.75   | 10.25   | 11.75   | 10.25   |         |         |         |         |
|                                                                 |                  | 56      | 11.00   | 9.50    | 11.75   | 10.25   | 11.75   | 10.25   | 11.75   | 10.25   |         |         |         |         |
|                                                                 |                  | 60      | 11.00   | 9.50    | 11.75   | 10.25   | 11.75   | 10.25   | 11.75   | 10.25   |         |         |         |         |
|                                                                 |                  | 64      | 11.00   | 9.50    | 11.75   | 10.25   | 11.75   | 10.25   | 11.75   | 10.25   |         |         |         |         |
|                                                                 |                  | 100     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                 |                  | 104     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                 |                  | 108     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                 |                  | 112     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                 |                  | 116     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                 |                  | 120     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                 |                  | 124     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                 |                  | 128     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                 |                  | 132     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                 |                  | 136     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                 |                  | 140     | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                 |                  | 144     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |
|                                                                 |                  | 149     | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |         |         |         |
|                                                                 |                  | 153     | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |         |         |         |
|                                                                 |                  | 157     | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |         |         |         |
|                                                                 |                  | 161     | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |         |         |         |
|                                                                 |                  | 165     | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |         |         |         |
|                                                                 | 40 MHz Bandwidth | 38      | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   |         |         |
|                                                                 |                  | 46      | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   |         |         |
|                                                                 |                  | 54      | 11.00   | 9.50    | 11.75   | 10.25   | 11.75   | 10.25   | 11.75   | 10.25   | 11.75   | 10.25   |         |         |
|                                                                 |                  | 62      | 11.00   | 9.50    | 11.75   | 10.25   | 11.75   | 10.25   | 11.75   | 10.25   | 11.75   | 10.25   |         |         |
|                                                                 |                  | 102     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |
|                                                                 |                  | 110     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |
|                                                                 |                  | 118     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |
|                                                                 |                  | 126     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |
|                                                                 |                  | 134     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |
|                                                                 |                  | 142     | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |
|                                                                 |                  | 151     | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |         |
|                                                                 |                  | 159     | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |         |
|                                                                 | 80 MHz Bandwidth | 42      | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   | 12.00   | 10.50   |
|                                                                 |                  | 58      | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |
| 106                                                             |                  | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |
| 122                                                             |                  | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |
| 138                                                             |                  | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |
| 155                                                             |                  | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |

| Mode/ Band                                                       |                  | Tones   |         | 26T     |         | 52T     |         | 106T    |         | 242T    |         | 484T    |         | 996T    |       |
|------------------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
|                                                                  |                  | Channel | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal |       |
| Modulated Average -<br>2 Tx Chain (dBm)<br>CDD - 5GHz<br>ANUpper | 20 MHz Bandwidth | 36      | 8.00    | 6.50    | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   |         |         |         |         |       |
|                                                                  |                  | 40      | 8.00    | 6.50    | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   |         |         |         |         |       |
|                                                                  |                  | 44      | 8.00    | 6.50    | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   |         |         |         |         |       |
|                                                                  |                  | 48      | 8.00    | 6.50    | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   |         |         |         |         |       |
|                                                                  |                  | 52      | 8.00    | 6.50    | 11.00   | 9.50    | 11.75   | 10.25   | 11.75   | 10.25   |         |         |         |         |       |
|                                                                  |                  | 56      | 8.00    | 6.50    | 11.00   | 9.50    | 11.75   | 10.25   | 11.75   | 10.25   |         |         |         |         |       |
|                                                                  |                  | 60      | 8.00    | 6.50    | 11.00   | 9.50    | 11.75   | 10.25   | 11.75   | 10.25   |         |         |         |         |       |
|                                                                  |                  | 64      | 8.00    | 6.50    | 11.00   | 9.50    | 11.75   | 10.25   | 11.75   | 10.25   |         |         |         |         |       |
|                                                                  |                  | 100     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |       |
|                                                                  |                  | 104     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |       |
|                                                                  |                  | 108     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |       |
|                                                                  |                  | 112     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |       |
|                                                                  |                  | 116     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |       |
|                                                                  |                  | 120     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |       |
|                                                                  |                  | 124     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |       |
|                                                                  |                  | 128     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |       |
|                                                                  |                  | 132     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |       |
|                                                                  |                  | 136     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |       |
|                                                                  |                  | 140     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |       |
|                                                                  |                  | 144     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |         |         |       |
|                                                                  | 149              | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |         |         |         |         |       |
|                                                                  | 153              | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |         |         |         |         |       |
|                                                                  | 157              | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |         |         |         |         |       |
|                                                                  | 161              | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |         |         |         |         |       |
|                                                                  | 165              | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |         |         |         |         |       |
|                                                                  | 40 MHz Bandwidth | 38      | 8.00    | 6.50    | 11.00   | 9.50    | 11.50   | 10.00   | 11.50   | 10.00   | 11.50   | 10.00   |         |         |       |
|                                                                  |                  | 46      | 8.00    | 6.50    | 11.00   | 9.50    | 12.00   | 10.50   | 12.00   | 10.50   |         |         |         |         |       |
|                                                                  |                  | 54      | 8.00    | 6.50    | 11.00   | 9.50    | 11.75   | 10.25   | 11.75   | 10.25   | 11.75   | 10.25   |         |         |       |
|                                                                  |                  | 62      | 8.00    | 6.50    | 11.00   | 9.50    | 11.25   | 9.75    | 11.25   | 9.75    | 11.25   | 9.75    |         |         |       |
|                                                                  |                  | 102     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |       |
|                                                                  |                  | 110     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |       |
|                                                                  |                  | 118     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |       |
|                                                                  |                  | 126     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |       |
|                                                                  |                  | 134     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |       |
|                                                                  |                  | 142     | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         |         |       |
|                                                                  | 80 MHz Bandwidth | 151     | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |         |       |
|                                                                  |                  | 159     | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    |         |         |       |
|                                                                  |                  | 42      | 8.00    | 6.50    | 11.00   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    |         | 10.50   | 9.00  |
|                                                                  |                  | 58      | 8.00    | 6.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00 |
|                                                                  |                  | 106     | 7.00    | 5.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00   | 8.50    | 10.00 |
| 122                                                              |                  | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   |       |
| 138                                                              |                  | 7.00    | 5.50    | 10.00   | 8.50    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   | 9.00    | 10.50   |       |
| 155                                                              |                  | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   | 9.25    | 10.75   |       |

Note: In MIMO operations, 5GHz ANTupper transmits at maximum allowed powers as indicated above for both 2 Tx CDD and 2 Tx SDM.

|                                               |                                                                                                                  |                                        |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> BCGA2069                       |  <b>SAR EVALUATION REPORT</b> | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Dates:</b><br>12/18/2019 – 01/28/2020 | <b>DUT Type:</b><br>Tablet Device                                                                                | <b>APPENDIX H:</b><br>Page 13 of 19    |

### 1.3 IEEE 802.11ax Measured Powers

**Table 1**  
**Maximum 2.4 GHz 802.11ax RU Output Power – Ant 2a**

| Freq [MHz] | Channel | Tones | RU Index | Avg Conducted Powers (dBm) | Freq [MHz] | Channel | Tones | RU Index | Avg Conducted Powers (dBm) |
|------------|---------|-------|----------|----------------------------|------------|---------|-------|----------|----------------------------|
| 2412       | 1       | 26T   | 0        | 9.72                       | 2412       | 1       | 52T   | 37       | 9.93                       |
|            |         |       | 4        | 10.45                      |            |         |       | 38       | 9.82                       |
|            |         |       | 8        | 10.49                      |            |         |       | 40       | 10.50                      |
| 2417       | 2       | 26T   | 0        | 12.43                      | 2417       | 2       | 52T   | 37       | 12.51                      |
|            |         |       | 4        | 12.91                      |            |         |       | 38       | 12.80                      |
|            |         |       | 8        | 13.56                      |            |         |       | 40       | 13.70                      |
| 2437       | 6       | 26T   | 0        | 14.00                      | 2437       | 6       | 52T   | 37       | 13.94                      |
|            |         |       | 4        | 14.00                      |            |         |       | 38       | 13.90                      |
|            |         |       | 8        | 13.70                      |            |         |       | 40       | 13.85                      |
| 2452       | 9       | 26T   | 0        | 12.06                      | 2417       | 9       | 52T   | 37       | 12.13                      |
|            |         |       | 4        | 13.96                      |            |         |       | 38       | 13.05                      |
|            |         |       | 8        | 13.22                      |            |         |       | 40       | 13.08                      |
| 2457       | 10      | 26T   | 0        | 11.44                      | 2457       | 10      | 52T   | 37       | 11.17                      |
|            |         |       | 4        | 11.50                      |            |         |       | 38       | 11.05                      |
|            |         |       | 8        | 10.67                      |            |         |       | 40       | 10.92                      |
| 2462       | 11      | 26T   | 0        | 10.00                      | 2462       | 11      | 52T   | 37       | 10.00                      |
|            |         |       | 4        | 9.83                       |            |         |       | 38       | 9.95                       |
|            |         |       | 8        | 9.61                       |            |         |       | 40       | 9.20                       |
| 2467       | 12      | 26T   | 0        | 8.00                       | 2467       | 12      | 52T   | 37       | 7.96                       |
|            |         |       | 4        | 7.66                       |            |         |       | 38       | 8.00                       |
|            |         |       | 8        | 6.20                       |            |         |       | 40       | 6.07                       |

| Freq [MHz] | Channel | Tones | RU Index | Avg Conducted Powers (dBm) | Freq [MHz] | Channel | Tones | RU Index | Avg Conducted Powers (dBm) |
|------------|---------|-------|----------|----------------------------|------------|---------|-------|----------|----------------------------|
| 2412       | 1       | 106T  | 53       | 9.98                       | 2412       | 1       | 242T  | 61       | 10.43                      |
|            |         |       | 54       | 10.43                      |            |         |       |          |                            |
| 2417       | 2       | 106T  | 53       | 12.70                      |            |         |       |          |                            |
|            |         |       | 54       | 13.47                      |            |         |       |          |                            |
| 2437       | 6       | 106T  | 53       | 13.87                      |            |         |       |          |                            |
|            |         |       | 54       | 13.83                      |            |         |       |          |                            |
| 2457       | 9       | 106T  | 53       | 13.05                      |            |         |       |          |                            |
|            |         |       | 54       | 13.76                      |            |         |       |          |                            |
| 2457       | 10      | 106T  | 53       | 10.72                      |            |         |       |          |                            |
|            |         |       | 54       | 10.53                      |            |         |       |          |                            |
| 2462       | 11      | 106T  | 53       | 9.97                       |            |         |       |          |                            |
|            |         |       | 54       | 9.35                       |            |         |       |          |                            |
| 2467       | 12      | 106T  | 53       | 7.95                       |            |         |       |          |                            |
|            |         |       | 54       | 6.47                       |            |         |       |          |                            |

**Table 2**

|                                        |                                                                                                                  |                                 |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: BCGA2069                       |  <b>SAR EVALUATION REPORT</b> | Reviewed by:<br>Quality Manager |
| Test Dates:<br>12/18/2019 – 01/28/2020 | DUT Type:<br>Tablet Device                                                                                       | APPENDIX H:<br>Page 14 of 19    |

**Maximum 2.4 GHz 802.11ax RU Output Power – Ant 4a**

| Freq [MHz] | Channel | Tones | RU Index | Avg Conducted Powers (dBm) | Freq [MHz] | Channel | Tones | RU Index | Avg Conducted Powers (dBm) |
|------------|---------|-------|----------|----------------------------|------------|---------|-------|----------|----------------------------|
| 2412       | 1       | 26T   | 0        | 11.63                      | 2412       | 1       | 52T   | 37       | 11.64                      |
|            |         |       | 4        | 12.47                      |            |         |       | 38       | 12.16                      |
|            |         |       | 8        | 12.14                      |            |         |       | 40       | 12.50                      |
| 2417       | 2       | 26T   | 0        | 12.32                      | 2417       | 2       | 52T   | 37       | 12.46                      |
|            |         |       | 4        | 12.89                      |            |         |       | 38       | 12.45                      |
|            |         |       | 8        | 13.71                      |            |         |       | 40       | 13.38                      |
| 2437       | 6       | 26T   | 0        | 13.23                      | 2437       | 6       | 52T   | 37       | 13.11                      |
|            |         |       | 4        | 13.53                      |            |         |       | 38       | 13.44                      |
|            |         |       | 8        | 13.71                      |            |         |       | 40       | 13.68                      |
| 2452       | 9       | 26T   | 0        | 11.75                      | 2417       | 9       | 52T   | 37       | 12.08                      |
|            |         |       | 4        | 13.65                      |            |         |       | 38       | 13.12                      |
|            |         |       | 8        | 13.75                      |            |         |       | 40       | 13.69                      |
| 2457       | 10      | 26T   | 0        | 13.50                      | 2457       | 10      | 52T   | 37       | 13.22                      |
|            |         |       | 4        | 13.24                      |            |         |       | 38       | 13.15                      |
|            |         |       | 8        | 13.20                      |            |         |       | 40       | 13.38                      |
| 2462       | 11      | 26T   | 0        | 11.94                      | 2462       | 11      | 52T   | 37       | 11.93                      |
|            |         |       | 4        | 11.44                      |            |         |       | 38       | 12.00                      |
|            |         |       | 8        | 10.89                      |            |         |       | 40       | 11.25                      |
| 2467       | 12      | 26T   | 0        | 9.99                       | 2467       | 12      | 52T   | 37       | 9.54                       |
|            |         |       | 4        | 9.77                       |            |         |       | 38       | 9.86                       |
|            |         |       | 8        | 8.56                       |            |         |       | 40       | 8.61                       |

| Freq [MHz] | Channel | Tones | RU Index | Avg Conducted Powers (dBm) |                       |                    |                  |                     |                                       |
|------------|---------|-------|----------|----------------------------|-----------------------|--------------------|------------------|---------------------|---------------------------------------|
| 2412       | 1       | 106T  | 53       | 12.06                      | <div>Freq [MHz]</div> | <div>Channel</div> | <div>Tones</div> | <div>RU Index</div> | <div>Avg Conducted Powers (dBm)</div> |
|            |         |       | 54       | 12.50                      |                       |                    |                  |                     |                                       |
| 2417       | 2       | 106T  | 53       | 12.48                      |                       |                    |                  |                     |                                       |
|            |         |       | 54       | 13.17                      |                       |                    |                  |                     |                                       |
| 2437       | 6       | 106T  | 53       | 13.53                      |                       |                    |                  |                     |                                       |
|            |         |       | 54       | 13.65                      |                       |                    |                  |                     |                                       |
| 2457       | 9       | 106T  | 53       | 12.20                      |                       |                    |                  |                     |                                       |
|            |         |       | 54       | 13.48                      |                       |                    |                  |                     |                                       |
| 2457       | 10      | 106T  | 53       | 12.86                      |                       |                    |                  |                     |                                       |
|            |         |       | 54       | 12.93                      |                       |                    |                  |                     |                                       |
| 2462       | 11      | 106T  | 53       | 11.96                      |                       |                    |                  |                     |                                       |
|            |         |       | 54       | 11.56                      |                       |                    |                  |                     |                                       |
| 2467       | 12      | 106T  | 53       | 10.00                      |                       |                    |                  |                     |                                       |
|            |         |       | 54       | 9.43                       |                       |                    |                  |                     |                                       |

|                                               |                                                                                                                  |                                        |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> BCGA2069                       |  <b>SAR EVALUATION REPORT</b> | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Dates:</b><br>12/18/2019 – 01/28/2020 | <b>DUT Type:</b><br>Tablet Device                                                                                | <b>APPENDIX H:</b><br>Page 15 of 19    |

**Table 3**  
**Maximum 5 GHz 802.11ax RU Output Power – 5GHz ANTlower**

| 20MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|----------|------|------------|---------|-------|---------------------------|-------|-------|
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 0                         | 4     | 8     |
|          |      |            |         |       |                           |       |       |
| 20MHz BW | 1    | 5180       | 36      | 26T   | 10.50                     | 11.00 | 11.00 |
|          |      | 5200       | 40      | 26T   | 10.36                     | 11.00 | 11.00 |
|          |      | 5240       | 48      | 26T   | 10.38                     | 10.97 | 11.00 |
|          | 2A   | 5260       | 52      | 26T   | 10.45                     | 11.00 | 11.00 |
|          |      | 5300       | 60      | 26T   | 10.58                     | 11.00 | 11.00 |
|          |      | 5320       | 64      | 26T   | 10.69                     | 11.00 | 11.00 |
|          | 2C   | 5500       | 100     | 26T   | 10.87                     | 11.00 | 11.00 |
|          |      | 5520       | 104     | 26T   | 10.58                     | 11.00 | 10.99 |
|          |      | 5580       | 116     | 26T   | 10.86                     | 11.00 | 11.00 |
|          |      | 5660       | 132     | 26T   | 10.83                     | 11.00 | 11.00 |
|          |      | 5680       | 136     | 26T   | 10.87                     | 11.00 | 10.88 |
|          |      | 5700       | 140     | 26T   | 10.00                     | 10.00 | 10.00 |
|          |      | 5720       | 144     | 26T   | 10.90                     | 11.00 | 10.97 |
|          | 3    | 5745       | 149     | 26T   | 15.45                     | 15.50 | 15.50 |
|          |      | 5785       | 157     | 26T   | 15.50                     | 15.50 | 15.50 |
|          |      | 5825       | 165     | 26T   | 15.32                     | 15.50 | 15.50 |

| 20MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |     |
|----------|------|------------|---------|-------|---------------------------|-------|-----|
|          |      |            |         |       | RU Index                  |       |     |
|          |      |            |         |       | 53                        | 54    | N/A |
|          |      |            |         |       |                           |       |     |
| 20MHz BW | 1    | 5180       | 36      | 106T  | 14.77                     | 15.00 |     |
|          |      | 5200       | 40      | 106T  | 16.44                     | 17.00 |     |
|          |      | 5240       | 48      | 106T  | 16.49                     | 17.00 |     |
|          | 2A   | 5260       | 52      | 106T  | 16.32                     | 16.75 |     |
|          |      | 5300       | 60      | 106T  | 16.69                     | 16.75 |     |
|          |      | 5320       | 64      | 106T  | 13.97                     | 14.00 |     |
|          | 2C   | 5500       | 100     | 106T  | 13.88                     | 14.00 |     |
|          |      | 5520       | 104     | 106T  | 15.36                     | 15.50 |     |
|          |      | 5580       | 116     | 106T  | 15.50                     | 15.50 |     |
|          |      | 5660       | 132     | 106T  | 15.50                     | 15.50 |     |
|          |      | 5680       | 136     | 106T  | 15.50                     | 15.50 |     |
|          |      | 5700       | 140     | 106T  | 11.50                     | 11.50 |     |
|          |      | 5720       | 144     | 106T  | 15.45                     | 15.50 |     |
|          | 3    | 5745       | 149     | 106T  | 15.50                     | 15.50 |     |
|          |      | 5785       | 157     | 106T  | 15.50                     | 15.50 |     |
|          |      | 5825       | 165     | 106T  | 15.41                     | 15.50 |     |

| 40MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|----------|------|------------|---------|-------|---------------------------|-------|-------|
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 0                         | 8     | 17    |
|          |      |            |         |       |                           |       |       |
| 40MHz BW | 1    | 5190       | 38      | 26T   | 9.89                      | 11.00 | 10.68 |
|          |      | 5230       | 46      | 26T   | 10.33                     | 11.00 | 11.00 |
|          |      | 5270       | 54      | 26T   | 10.30                     | 11.00 | 11.00 |
|          | 2A   | 5310       | 62      | 26T   | 10.43                     | 10.95 | 11.00 |
|          |      | 5510       | 102     | 26T   | 10.57                     | 10.71 | 10.92 |
|          |      | 5550       | 110     | 26T   | 10.68                     | 10.86 | 10.99 |
|          | 2C   | 5590       | 118     | 26T   | 10.73                     | 10.94 | 11.00 |
|          |      | 5630       | 126     | 26T   | 10.32                     | 10.52 | 10.35 |
|          |      | 5670       | 134     | 26T   | 10.75                     | 10.77 | 10.93 |
|          |      | 5710       | 142     | 26T   | 10.97                     | 10.80 | 11.00 |
|          | 3    | 5755       | 151     | 26T   | 15.33                     | 15.50 | 15.47 |
|          |      | 5795       | 159     | 26T   | 15.31                     | 15.31 | 15.50 |

|                                        |                                                                                                           |                                 |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: BCGA2069                       |  SAR EVALUATION REPORT | Reviewed by:<br>Quality Manager |
| Test Dates:<br>12/18/2019 – 01/28/2020 | DUT Type:<br>Tablet Device                                                                                | APPENDIX H:<br>Page 16 of 19    |

| 40MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|----------|------|------------|---------|-------|---------------------------|-------|-------|
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 53                        | 54    | 56    |
|          |      |            |         |       |                           |       |       |
| 1        |      | 5190       | 38      | 106T  | 11.70                     | 12.37 | 12.19 |
|          |      | 5230       | 46      | 106T  | 16.35                     | 16.74 | 16.78 |
| 2A       |      | 5270       | 54      | 106T  | 15.89                     | 16.27 | 16.38 |
|          |      | 5310       | 62      | 106T  | 12.00                     | 12.04 | 12.22 |
| 2C       |      | 5510       | 102     | 106T  | 11.74                     | 11.98 | 11.87 |
|          |      | 5550       | 110     | 106T  | 14.81                     | 15.10 | 14.94 |
|          |      | 5590       | 118     | 106T  | 15.03                     | 15.08 | 15.23 |
|          |      | 5670       | 126     | 106T  | 15.08                     | 15.16 | 15.24 |
|          |      | 5630       | 134     | 106T  | 14.38                     | 14.41 | 14.51 |
|          |      | 5710       | 142     | 106T  | 15.06                     | 15.18 | 15.14 |
| 3        |      | 5755       | 151     | 106T  | 14.86                     | 14.83 | 14.98 |
|          |      | 5795       | 159     | 106T  | 15.04                     | 14.91 | 15.01 |

| 40MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |     |
|----------|------|------------|---------|-------|---------------------------|-------|-----|
|          |      |            |         |       | RU Index                  |       |     |
|          |      |            |         |       | 61                        | 62    | N/A |
|          |      |            |         |       |                           |       |     |
| 1        |      | 5190       | 38      | 242T  | 12.49                     | 12.30 |     |
|          |      | 5230       | 46      | 242T  | 16.82                     | 16.84 |     |
| 2A       |      | 5270       | 54      | 242T  | 16.60                     | 16.75 |     |
|          |      | 5310       | 62      | 242T  | 12.33                     | 12.37 |     |
| 2C       |      | 5510       | 102     | 242T  | 11.79                     | 11.93 |     |
|          |      | 5550       | 110     | 242T  | 15.40                     | 15.50 |     |
|          |      | 5590       | 118     | 242T  | 15.41                     | 15.50 |     |
|          |      | 5630       | 126     | 242T  | 15.29                     | 15.40 |     |
|          |      | 5670       | 134     | 242T  | 14.99                     | 14.93 |     |
|          |      | 5710       | 142     | 242T  | 11.36                     | 11.43 |     |
| 3        |      | 5755       | 151     | 242T  | 15.48                     | 15.50 |     |
|          |      | 5795       | 159     | 242T  | 15.46                     | 15.50 |     |

| 40MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |     |     |
|----------|------|------------|---------|-------|---------------------------|-----|-----|
|          |      |            |         |       | RU Index                  |     |     |
|          |      |            |         |       | 65                        | N/A | N/A |
|          |      |            |         |       |                           |     |     |
| 1        |      | 5190       | 38      | 484T  | 12.50                     |     |     |
|          |      | 5230       | 46      | 484T  | 16.96                     |     |     |
| 2A       |      | 5270       | 54      | 484T  | 16.75                     |     |     |
|          |      | 5310       | 62      | 484T  | 12.50                     |     |     |
| 2C       |      | 5510       | 102     | 484T  | 12.00                     |     |     |
|          |      | 5550       | 110     | 484T  | 15.46                     |     |     |
|          |      | 5590       | 118     | 484T  | 15.44                     |     |     |
|          |      | 5630       | 126     | 484T  | 15.48                     |     |     |
|          |      | 5670       | 134     | 484T  | 15.00                     |     |     |
|          |      | 5710       | 142     | 484T  | 15.50                     |     |     |
| 3        |      | 5755       | 151     | 484T  | 15.40                     |     |     |
|          |      | 5795       | 159     | 484T  | 15.40                     |     |     |

| 80MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|----------|------|------------|---------|-------|---------------------------|-------|-------|
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 0                         | 18    | 36    |
|          |      |            |         |       |                           |       |       |
| 1        |      | 5210       | 42      | 26T   | 10.28                     | 11.00 | 11.00 |
| 2A       |      | 5290       | 58      | 26T   | 10.30                     | 10.92 | 10.75 |
|          |      | 5530       | 106     | 26T   | 10.41                     | 10.99 | 10.61 |
| 2C       |      | 5610       | 122     | 26T   | 10.32                     | 11.00 | 10.67 |
|          |      | 5690       | 138     | 26T   | 10.44                     | 10.94 | 10.41 |
| 3        |      | 5775       | 155     | 26T   | 15.03                     | 15.50 | 14.97 |

| 80MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|----------|------|------------|---------|-------|---------------------------|-------|-------|
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 37                        | 44    | 52    |
|          |      |            |         |       |                           |       |       |
| 1        |      | 5210       | 42      | 52T   | 10.94                     | 11.56 | 11.34 |
| 2A       |      | 5290       | 58      | 52T   | 10.68                     | 11.26 | 10.91 |
|          |      | 5530       | 106     | 52T   | 10.40                     | 10.79 | 10.66 |
| 2C       |      | 5610       | 122     | 52T   | 13.20                     | 13.48 | 13.30 |
|          |      | 5690       | 138     | 52T   | 13.59                     | 13.80 | 13.49 |
| 3        |      | 5775       | 155     | 52T   | 14.75                     | 14.90 | 14.68 |

| 80MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|----------|------|------------|---------|-------|---------------------------|-------|-------|
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 53                        | 56    | 60    |
|          |      |            |         |       |                           |       |       |
| 1        |      | 5210       | 42      | 106T  | 11.14                     | 11.53 | 11.37 |
| 2A       |      | 5290       | 58      | 106T  | 10.91                     | 11.15 | 11.07 |
|          |      | 5530       | 106     | 106T  | 10.62                     | 10.80 | 10.76 |
| 2C       |      | 5610       | 122     | 106T  | 15.00                     | 15.19 | 14.83 |
|          |      | 5690       | 138     | 106T  | 15.17                     | 15.30 | 15.16 |
| 3        |      | 5775       | 155     | 106T  | 15.01                     | 15.11 | 15.00 |

| 80MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|----------|------|------------|---------|-------|---------------------------|-------|-------|
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 61                        | 62    | 64    |
|          |      |            |         |       |                           |       |       |
| 1        |      | 5210       | 42      | 242T  | 11.46                     | 11.94 | 11.36 |
| 2A       |      | 5290       | 58      | 242T  | 10.91                     | 11.46 | 11.02 |
|          |      | 5530       | 106     | 242T  | 10.48                     | 11.00 | 10.43 |
| 2C       |      | 5610       | 122     | 242T  | 15.22                     | 15.48 | 15.04 |
|          |      | 5690       | 138     | 242T  | 10.93                     | 11.09 | 10.87 |
| 3        |      | 5775       | 155     | 242T  | 15.17                     | 15.47 | 15.05 |

| 80MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |     |
|----------|------|------------|---------|-------|---------------------------|-------|-----|
|          |      |            |         |       | RU Index                  |       |     |
|          |      |            |         |       | 65                        | 66    | N/A |
|          |      |            |         |       |                           |       |     |
| 1        |      | 5210       | 42      | 484T  | 11.98                     | 12.00 |     |
| 2A       |      | 5290       | 58      | 484T  | 11.44                     | 11.33 |     |
|          |      | 5530       | 106     | 484T  | 11.00                     | 11.00 |     |
| 2C       |      | 5610       | 122     | 484T  | 15.50                     | 15.41 |     |
|          |      | 5690       | 138     | 484T  | 14.94                     | 14.97 |     |
| 3        |      | 5775       | 155     | 484T  | 15.50                     | 15.50 |     |

| 80MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |     |     |
|----------|------|------------|---------|-------|---------------------------|-----|-----|
|          |      |            |         |       | RU Index                  |     |     |
|          |      |            |         |       | 67                        | N/A | N/A |
|          |      |            |         |       |                           |     |     |
| 1        |      | 5210       | 42      | 996T  | 12.00                     |     |     |
| 2A       |      | 5290       | 58      | 996T  | 11.47                     |     |     |
|          |      | 5530       | 106     | 996T  | 11.00                     |     |     |
| 2C       |      | 5610       | 122     | 996T  | 15.45                     |     |     |
|          |      | 5690       | 138     | 996T  | 15.50                     |     |     |
| 3        |      | 5775       | 155     | 996T  | 15.45                     |     |     |

|                                        |                                                                                                           |                                 |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: BCGA2069                       |  SAR EVALUATION REPORT | Reviewed by:<br>Quality Manager |
| Test Dates:<br>12/18/2019 – 01/28/2020 | DUT Type:<br>Tablet Device                                                                                | APPENDIX H:<br>Page 17 of 19    |

**Table 4**  
**Maximum 5 GHz 802.11ax RU Output Power – 5GHz ANTupper**

| 20MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|----------|------|------------|---------|-------|---------------------------|-------|-------|
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 0                         | 4     | 8     |
| 20MHz BW | 1    | 5180       | 36      | 26T   | 10.16                     | 10.77 | 10.99 |
|          |      | 5200       | 40      | 26T   | 10.14                     | 10.75 | 10.90 |
|          |      | 5240       | 48      | 26T   | 10.60                     | 10.97 | 11.00 |
|          | 2A   | 5260       | 52      | 26T   | 10.37                     | 10.77 | 10.94 |
|          |      | 5300       | 60      | 26T   | 10.55                     | 10.98 | 11.00 |
|          |      | 5320       | 64      | 26T   | 10.52                     | 10.96 | 10.90 |
|          | 2C   | 5500       | 100     | 26T   | 10.61                     | 10.93 | 10.74 |
|          |      | 5520       | 104     | 26T   | 10.63                     | 10.99 | 10.86 |
|          |      | 5580       | 116     | 26T   | 10.85                     | 11.00 | 10.87 |
|          |      | 5660       | 132     | 26T   | 10.70                     | 11.00 | 10.96 |
|          |      | 5680       | 136     | 26T   | 10.63                     | 10.99 | 10.96 |
|          |      | 5700       | 140     | 26T   | 9.66                      | 9.95  | 9.90  |
|          |      | 5720       | 144     | 26T   | 10.52                     | 10.85 | 10.75 |
|          |      | 5745       | 149     | 26T   | 15.30                     | 15.69 | 15.62 |
|          | 3    | 5785       | 157     | 26T   | 15.45                     | 15.75 | 15.74 |
|          |      | 5825       | 165     | 26T   | 15.36                     | 15.75 | 15.69 |
| 20MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 37                        | 39    | 40    |
| 20MHz BW | 1    | 5180       | 36      | 52T   | 13.16                     | 13.65 | 13.63 |
|          |      | 5200       | 40      | 52T   | 13.35                     | 13.83 | 13.79 |
|          |      | 5240       | 48      | 52T   | 13.41                     | 13.90 | 13.68 |
|          | 2A   | 5260       | 52      | 52T   | 13.46                     | 13.89 | 13.80 |
|          |      | 5300       | 60      | 52T   | 13.31                     | 13.77 | 13.81 |
|          |      | 5320       | 64      | 52T   | 13.46                     | 13.83 | 13.69 |
|          | 2C   | 5500       | 100     | 52T   | 13.40                     | 13.64 | 13.49 |
|          |      | 5520       | 104     | 52T   | 13.37                     | 13.60 | 13.46 |
|          |      | 5580       | 116     | 52T   | 13.58                     | 13.70 | 13.53 |
|          |      | 5660       | 132     | 52T   | 13.65                     | 13.82 | 13.67 |
|          |      | 5680       | 136     | 52T   | 13.60                     | 13.88 | 13.65 |
|          |      | 5700       | 140     | 52T   | 10.65                     | 10.86 | 10.73 |
|          |      | 5720       | 144     | 52T   | 13.36                     | 13.62 | 13.48 |
|          |      | 5745       | 149     | 52T   | 15.00                     | 15.26 | 15.23 |
|          | 3    | 5785       | 157     | 52T   | 15.02                     | 15.27 | 15.09 |
|          |      | 5825       | 165     | 52T   | 14.84                     | 15.11 | 15.07 |

| 20MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |     |
|----------|------|------------|---------|-------|---------------------------|-------|-----|
|          |      |            |         |       | RU Index                  |       |     |
|          |      |            |         |       | 53                        | 54    | N/A |
| 20MHz BW | 1    | 5180       | 36      | 106T  | 14.55                     | 15.00 |     |
|          |      | 5200       | 40      | 106T  | 16.37                     | 16.84 |     |
|          |      | 5240       | 48      | 106T  | 16.62                     | 16.98 |     |
|          | 2A   | 5260       | 52      | 106T  | 16.23                     | 16.58 |     |
|          |      | 5300       | 60      | 106T  | 16.43                     | 16.74 |     |
|          |      | 5320       | 64      | 106T  | 13.79                     | 14.00 |     |
|          | 2C   | 5500       | 100     | 106T  | 13.95                     | 14.00 |     |
|          |      | 5520       | 104     | 106T  | 15.34                     | 15.49 |     |
|          |      | 5580       | 116     | 106T  | 15.35                     | 15.48 |     |
|          |      | 5660       | 132     | 106T  | 15.16                     | 15.35 |     |
|          |      | 5680       | 136     | 106T  | 15.18                     | 15.41 |     |
|          |      | 5700       | 140     | 106T  | 11.23                     | 11.46 |     |
|          |      | 5720       | 144     | 106T  | 15.19                     | 15.36 |     |
|          | 3    | 5745       | 149     | 106T  | 15.50                     | 15.71 |     |
|          |      | 5785       | 157     | 106T  | 15.62                     | 15.75 |     |
|          |      | 5825       | 165     | 106T  | 15.63                     | 15.75 |     |
| 20MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |     |
|          |      |            |         |       | RU Index                  |       |     |
|          |      |            |         |       | 61                        | N/A   | N/A |
| 20MHz BW | 1    | 5180       | 36      | 242T  | 15.00                     |       |     |
|          |      | 5200       | 40      | 242T  | 16.94                     |       |     |
|          |      | 5240       | 48      | 242T  | 17.00                     |       |     |
|          | 2A   | 5260       | 52      | 242T  | 16.75                     |       |     |
|          |      | 5300       | 60      | 242T  | 16.75                     |       |     |
|          |      | 5320       | 64      | 242T  | 14.00                     |       |     |
|          | 2C   | 5500       | 100     | 242T  | 14.00                     |       |     |
|          |      | 5520       | 104     | 242T  | 15.50                     |       |     |
|          |      | 5550       | 116     | 242T  | 15.50                     |       |     |
|          |      | 5680       | 132     | 242T  | 15.49                     |       |     |
|          |      | 5680       | 136     | 242T  | 15.49                     |       |     |
|          |      | 5700       | 140     | 242T  | 11.50                     |       |     |
|          |      | 5720       | 144     | 242T  | 15.50                     |       |     |
|          | 3    | 5745       | 149     | 242T  | 15.60                     |       |     |
|          |      | 5785       | 157     | 242T  | 15.75                     |       |     |
|          |      | 5825       | 165     | 242T  | 15.68                     |       |     |

| 40MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|----------|------|------------|---------|-------|---------------------------|-------|-------|
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 0                         | 8     | 17    |
| 40MHz BW | 1    | 5190       | 38      | 26T   | 9.78                      | 10.95 | 10.53 |
|          |      | 5230       | 46      | 26T   | 10.30                     | 10.77 | 10.99 |
|          |      | 5270       | 54      | 26T   | 10.47                     | 10.73 | 10.97 |
|          | 2A   | 5310       | 62      | 26T   | 10.41                     | 10.89 | 10.84 |
|          |      | 5510       | 102     | 26T   | 10.81                     | 10.84 | 10.94 |
|          |      | 5550       | 110     | 26T   | 10.81                     | 10.96 | 11.00 |
|          | 2C   | 5590       | 118     | 26T   | 10.99                     | 10.91 | 11.00 |
|          |      | 5630       | 126     | 26T   | 10.38                     | 10.43 | 10.52 |
|          |      | 5670       | 134     | 26T   | 10.68                     | 10.85 | 11.00 |
|          |      | 5710       | 142     | 26T   | 10.55                     | 10.68 | 10.97 |
|          |      | 5755       | 151     | 26T   | 15.30                     | 15.54 | 15.74 |
|          | 3    | 5795       | 159     | 26T   | 15.43                     | 15.63 | 15.75 |
| 40MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 37                        | 40    | 44    |
| 40MHz BW | 1    | 5190       | 38      | 52T   | 11.67                     | 12.44 | 11.83 |
|          |      | 5230       | 46      | 52T   | 13.35                     | 13.65 | 13.87 |
|          |      | 5270       | 54      | 52T   | 13.51                     | 13.69 | 13.76 |
|          | 2A   | 5310       | 62      | 52T   | 11.80                     | 12.23 | 12.11 |
|          |      | 5510       | 102     | 52T   | 11.68                     | 11.59 | 11.71 |
|          |      | 5550       | 110     | 52T   | 13.48                     | 13.45 | 13.67 |
|          | 2C   | 5590       | 118     | 52T   | 13.67                     | 13.51 | 13.70 |
|          |      | 5630       | 126     | 52T   | 13.65                     | 13.56 | 13.72 |
|          |      | 5670       | 134     | 52T   | 13.56                     | 13.49 | 13.67 |
|          |      | 5710       | 142     | 52T   | 13.70                     | 13.65 | 13.95 |
|          |      | 5755       | 151     | 52T   | 15.31                     | 15.39 | 15.70 |
|          | 3    | 5795       | 159     | 52T   | 15.25                     | 15.23 | 15.44 |

|                                               |                                                                                                                  |                                        |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| FCC ID: BCGA2069                              |  <b>SAR EVALUATION REPORT</b> | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Dates:</b><br>12/18/2019 – 01/28/2020 | <b>DUT Type:</b><br>Tablet Device                                                                                | <b>APPENDIX H:</b><br>Page 18 of 19    |

| 40MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|----------|------|------------|---------|-------|---------------------------|-------|-------|
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 53                        | 54    | 56    |
|          |      |            |         |       |                           |       |       |
| 1        |      | 5190       | 38      | 106T  | 12.02                     | 12.45 | 11.82 |
|          |      | 5230       | 46      | 106T  | 16.44                     | 16.53 | 16.60 |
| 2A       |      | 5270       | 54      | 106T  | 16.27                     | 16.22 | 16.07 |
|          |      | 5310       | 62      | 106T  | 12.07                     | 12.44 | 12.16 |
| 2C       |      | 5510       | 102     | 106T  | 11.74                     | 11.66 | 11.50 |
|          |      | 5550       | 110     | 106T  | 15.16                     | 15.03 | 14.89 |
|          |      | 5590       | 118     | 106T  | 15.04                     | 14.98 | 14.89 |
|          |      | 5670       | 126     | 106T  | 15.08                     | 15.04 | 14.95 |
|          |      | 5630       | 134     | 106T  | 14.92                     | 14.88 | 14.90 |
|          |      | 5710       | 142     | 106T  | 15.16                     | 15.20 | 15.03 |
| 3        |      | 5755       | 151     | 106T  | 15.25                     | 15.37 | 15.19 |
|          |      | 5795       | 159     | 106T  | 15.21                     | 15.16 | 15.12 |

| 40MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |     |
|----------|------|------------|---------|-------|---------------------------|-------|-----|
|          |      |            |         |       | RU Index                  |       |     |
|          |      |            |         |       | 61                        | 62    | N/A |
|          |      |            |         |       |                           |       |     |
| 1        |      | 5190       | 38      | 242T  | 12.50                     | 12.50 |     |
|          |      | 5230       | 46      | 242T  | 16.98                     | 17.00 |     |
| 2A       |      | 5270       | 54      | 242T  | 16.75                     | 16.75 |     |
|          |      | 5310       | 62      | 242T  | 12.50                     | 12.50 |     |
| 2C       |      | 5510       | 102     | 242T  | 11.89                     | 11.97 |     |
|          |      | 5550       | 110     | 242T  | 15.50                     | 15.49 |     |
|          |      | 5590       | 118     | 242T  | 15.42                     | 14.44 |     |
|          |      | 5630       | 126     | 242T  | 15.04                     | 15.12 |     |
|          |      | 5670       | 134     | 242T  | 15.00                     | 15.00 |     |
|          |      | 5710       | 142     | 242T  | 11.36                     | 11.47 |     |
| 3        |      | 5755       | 151     | 242T  | 15.75                     | 15.75 |     |
|          |      | 5795       | 159     | 242T  | 15.75                     | 15.75 |     |

| 40MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |     |     |
|----------|------|------------|---------|-------|---------------------------|-----|-----|
|          |      |            |         |       | RU Index                  |     |     |
|          |      |            |         |       | 65                        | N/A | N/A |
|          |      |            |         |       |                           |     |     |
| 1        |      | 5190       | 38      | 484T  | 12.50                     |     |     |
|          |      | 5230       | 46      | 484T  | 17.00                     |     |     |
| 2A       |      | 5270       | 54      | 484T  | 16.75                     |     |     |
|          |      | 5310       | 62      | 484T  | 12.50                     |     |     |
| 2C       |      | 5510       | 102     | 484T  | 12.00                     |     |     |
|          |      | 5550       | 110     | 484T  | 15.50                     |     |     |
|          |      | 5590       | 118     | 484T  | 15.46                     |     |     |
|          |      | 5630       | 126     | 484T  | 15.27                     |     |     |
|          |      | 5670       | 134     | 484T  | 15.00                     |     |     |
|          |      | 5710       | 142     | 484T  | 15.50                     |     |     |
| 3        |      | 5755       | 151     | 484T  | 15.75                     |     |     |
|          |      | 5795       | 159     | 484T  | 15.75                     |     |     |

| 80MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|----------|------|------------|---------|-------|---------------------------|-------|-------|
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 0                         | 18    | 36    |
|          |      |            |         |       |                           |       |       |
| 1        |      | 5210       | 42      | 26T   | 10.83                     | 11.00 | 11.00 |
| 2A       |      | 5290       | 58      | 26T   | 10.79                     | 11.00 | 10.71 |
|          |      | 5530       | 106     | 26T   | 10.91                     | 11.00 | 10.75 |
| 2C       |      | 5610       | 122     | 26T   | 11.00                     | 11.00 | 10.92 |
|          |      | 5690       | 138     | 26T   | 11.00                     | 11.00 | 10.92 |
| 3        |      | 5775       | 155     | 26T   | 15.17                     | 15.50 | 14.97 |

| 80MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|----------|------|------------|---------|-------|---------------------------|-------|-------|
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 37                        | 44    | 52    |
|          |      |            |         |       |                           |       |       |
| 1        |      | 5210       | 42      | 52T   | 10.94                     | 11.43 | 11.19 |
| 2A       |      | 5290       | 58      | 52T   | 10.69                     | 11.10 | 10.89 |
|          |      | 5530       | 106     | 52T   | 10.73                     | 10.87 | 10.77 |
| 2C       |      | 5610       | 122     | 52T   | 13.27                     | 13.47 | 13.32 |
|          |      | 5690       | 138     | 52T   | 13.60                     | 13.88 | 13.68 |
| 3        |      | 5775       | 155     | 52T   | 14.80                     | 15.10 | 14.83 |

| 80MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|----------|------|------------|---------|-------|---------------------------|-------|-------|
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 53                        | 56    | 60    |
|          |      |            |         |       |                           |       |       |
| 1        |      | 5210       | 42      | 106T  | 11.09                     | 11.43 | 11.24 |
| 2A       |      | 5290       | 58      | 106T  | 10.88                     | 11.26 | 10.97 |
|          |      | 5530       | 106     | 106T  | 10.84                     | 10.95 | 10.80 |
| 2C       |      | 5610       | 122     | 106T  | 14.91                     | 15.06 | 14.93 |
|          |      | 5690       | 138     | 106T  | 15.29                     | 15.47 | 15.19 |
| 3        |      | 5775       | 155     | 106T  | 15.06                     | 15.20 | 15.09 |

| 80MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |       |
|----------|------|------------|---------|-------|---------------------------|-------|-------|
|          |      |            |         |       | RU Index                  |       |       |
|          |      |            |         |       | 61                        | 62    | 64    |
|          |      |            |         |       |                           |       |       |
| 1        |      | 5210       | 42      | 242T  | 11.49                     | 11.89 | 11.27 |
| 2A       |      | 5290       | 58      | 242T  | 11.08                     | 11.44 | 11.03 |
|          |      | 5530       | 106     | 242T  | 10.71                     | 10.78 | 10.72 |
| 2C       |      | 5610       | 122     | 242T  | 15.14                     | 15.23 | 15.01 |
|          |      | 5690       | 138     | 242T  | 11.44                     | 11.48 | 11.33 |
| 3        |      | 5775       | 155     | 242T  | 15.23                     | 15.50 | 15.28 |

| 80MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |       |     |
|----------|------|------------|---------|-------|---------------------------|-------|-----|
|          |      |            |         |       | RU Index                  |       |     |
|          |      |            |         |       | 65                        | 66    | N/A |
|          |      |            |         |       |                           |       |     |
| 1        |      | 5210       | 42      | 484T  | 12.00                     | 12.00 |     |
| 2A       |      | 5290       | 58      | 484T  | 11.50                     | 11.50 |     |
|          |      | 5530       | 106     | 484T  | 11.00                     | 11.00 |     |
| 2C       |      | 5610       | 122     | 484T  | 15.50                     | 15.50 |     |
|          |      | 5690       | 138     | 484T  | 15.00                     | 15.00 |     |
| 3        |      | 5775       | 155     | 484T  | 15.50                     | 15.50 |     |

| 80MHz BW | Band | Freq [MHz] | Channel | Tones | Avg Conducted Power (dBm) |     |     |
|----------|------|------------|---------|-------|---------------------------|-----|-----|
|          |      |            |         |       | RU Index                  |     |     |
|          |      |            |         |       | 67                        | N/A | N/A |
|          |      |            |         |       |                           |     |     |
| 1        |      | 5210       | 42      | 996T  | 12.00                     |     |     |
| 2A       |      | 5290       | 58      | 996T  | 11.50                     |     |     |
|          |      | 5530       | 106     | 996T  | 11.00                     |     |     |
| 2C       |      | 5610       | 122     | 996T  | 15.50                     |     |     |
|          |      | 5690       | 138     | 996T  | 15.50                     |     |     |
| 3        |      | 5775       | 155     | 996T  | 15.50                     |     |     |

|                                        |                                                                                                           |                                 |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: BCGA2069                       |  SAR EVALUATION REPORT | Reviewed by:<br>Quality Manager |
| Test Dates:<br>12/18/2019 – 01/28/2020 | DUT Type:<br>Tablet Device                                                                                | APPENDIX H:<br>Page 19 of 19    |

## APPENDIX I: PROBE AND DIPOLE CALIBRATION CERTIFICATES



Accredited by the Swiss Accreditation Service (SAS)  
 The Swiss Accreditation Service is one of the signatories to the EA  
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D750V3-1034\_May18**

## CALIBRATION CERTIFICATE

Object **D750V3 - SN:1034**

Calibration procedure(s) **QA CAL-05.v10**  
**Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **May 18, 2018**

SC ✓  
 5/31/2018  
 BN ✓  
 05/01/2019

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter NRP             | SN: 104778         | 04-Apr-18 (No. 217-02672/02673)   | Apr-19                 |
| Power sensor NRP-Z91        | SN: 103244         | 04-Apr-18 (No. 217-02672)         | Apr-19                 |
| Power sensor NRP-Z91        | SN: 103245         | 04-Apr-18 (No. 217-02673)         | Apr-19                 |
| Reference 20 dB Attenuator  | SN: 5058 (20k)     | 04-Apr-18 (No. 217-02682)         | Apr-19                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 04-Apr-18 (No. 217-02683)         | Apr-19                 |
| Reference Probe EX3DV4      | SN: 7349           | 30-Dec-17 (No. EX3-7349_Dec17)    | Dec-18                 |
| DAE4                        | SN: 601            | 26-Oct-17 (No. DAE4-601_Oct17)    | Oct-18                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| Power meter EPM-442A        | SN: GB37480704     | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| Power sensor HP 8481A       | SN: US37292783     | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| Power sensor HP 8481A       | SN: MY41092317     | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| RF generator R&S SMT-06     | SN: 100972         | 15-Jun-15 (in house check Oct-16) | In house check: Oct-18 |
| Network Analyzer HP 8753E   | SN: US37390585     | 18-Oct-01 (in house check Oct-17) | In house check: Oct-18 |

|                |                           |                                          |               |
|----------------|---------------------------|------------------------------------------|---------------|
| Calibrated by: | Name<br><b>Manu Seitz</b> | Function<br><b>Laboratory Technician</b> | Signature<br> |
| Approved by:   | <b>Katja Pokovic</b>      | <b>Technical Manager</b>                 |               |

Issued: May 22, 2018

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

### Glossary:

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A   | not applicable or not measured  |

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

### Additional Documentation:

- DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                                     |                        |             |
|-------------------------------------|------------------------|-------------|
| <b>DASY Version</b>                 | DASY5                  | V52.10.1    |
| <b>Extrapolation</b>                | Advanced Extrapolation |             |
| <b>Phantom</b>                      | Modular Flat Phantom   |             |
| <b>Distance Dipole Center - TSL</b> | 15 mm                  | with Spacer |
| <b>Zoom Scan Resolution</b>         | dx, dy, dz = 5 mm      |             |
| <b>Frequency</b>                    | 750 MHz $\pm$ 1 MHz    |             |

## Head TSL parameters

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 41.9           | 0.89 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 41.0 $\pm$ 6 % | 0.89 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | < 0.5 °C            | ----           | ----                 |

## SAR result with Head TSL

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | Condition          |                                                |
| SAR measured                                                | 250 mW input power | 2.09 W/kg                                      |
| SAR for nominal Head TSL parameters                         | normalized to 1W   | <b>8.32 W/kg <math>\pm</math> 17.0 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | condition          |                                                |
| SAR measured                                                  | 250 mW input power | 1.36 W/kg                                      |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>5.42 W/kg <math>\pm</math> 16.5 % (k=2)</b> |

## Body TSL parameters

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Body TSL parameters</b>             | 22.0 °C             | 55.5           | 0.96 mho/m           |
| <b>Measured Body TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 54.7 $\pm$ 6 % | 0.96 mho/m $\pm$ 6 % |
| <b>Body TSL temperature change during test</b> | < 0.5 °C            | ----           | ----                 |

## SAR result with Body TSL

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Body TSL</b> | Condition          |                                                |
| SAR measured                                                | 250 mW input power | 2.15 W/kg                                      |
| SAR for nominal Body TSL parameters                         | normalized to 1W   | <b>8.57 W/kg <math>\pm</math> 17.0 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Body TSL</b> | condition          |                                                |
| SAR measured                                                  | 250 mW input power | 1.42 W/kg                                      |
| SAR for nominal Body TSL parameters                           | normalized to 1W   | <b>5.67 W/kg <math>\pm</math> 16.5 % (k=2)</b> |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 55.3 $\Omega$ + 0.0 j $\Omega$ |
| Return Loss                          | - 26.0 dB                      |

### Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 50.0 $\Omega$ - 3.2 j $\Omega$ |
| Return Loss                          | - 29.8 dB                      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.034 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |               |
|-----------------|---------------|
| Manufactured by | SPEAG         |
| Manufactured on | July 06, 2011 |

## DASY5 Validation Report for Head TSL

Date: 17.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1034**

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used:  $f = 750$  MHz;  $\sigma = 0.89$  S/m;  $\epsilon_r = 41$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.22, 10.22, 10.22) @ 750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

**Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:**

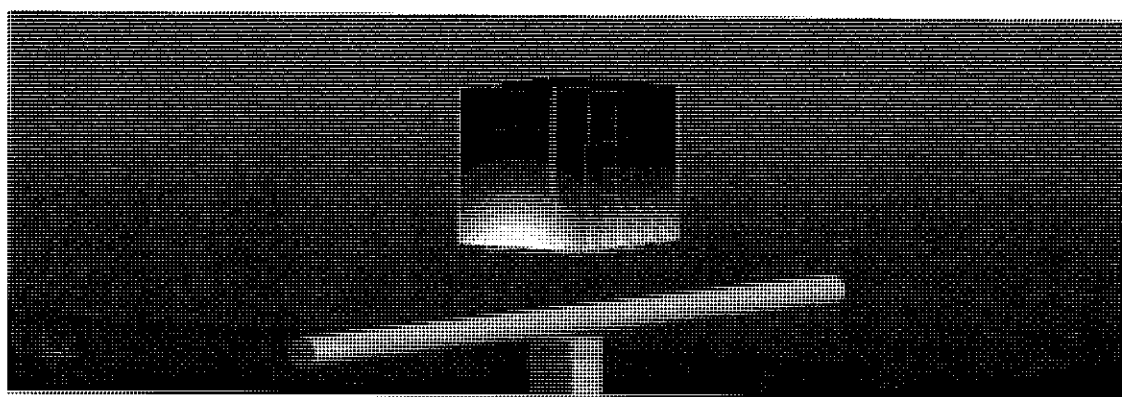
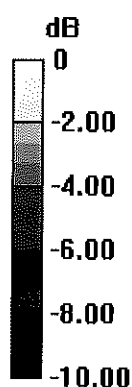
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 59.66 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 3.18 W/kg

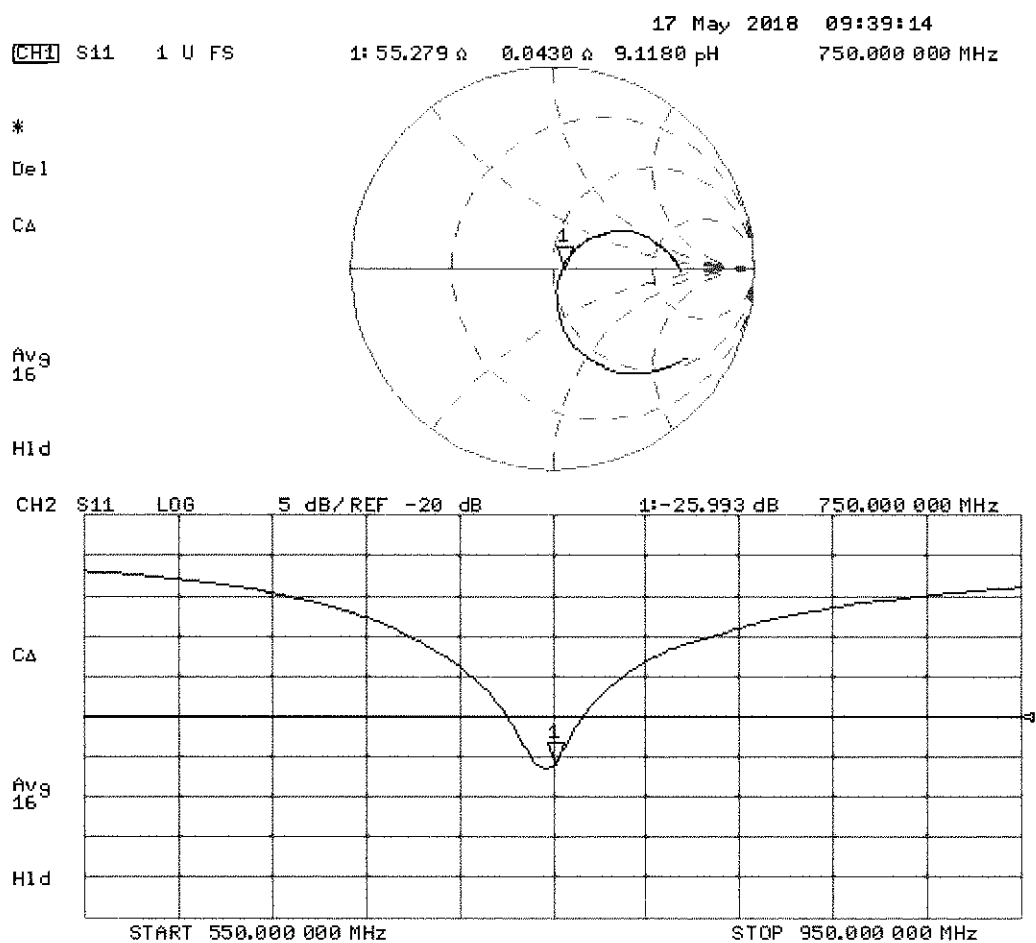
**SAR(1 g) = 2.09 W/kg; SAR(10 g) = 1.36 W/kg**

Maximum value of SAR (measured) = 2.82 W/kg



0 dB = 2.82 W/kg = 4.50 dBW/kg

## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 18.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1034**

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used:  $f = 750 \text{ MHz}$ ;  $\sigma = 0.96 \text{ S/m}$ ;  $\epsilon_r = 54.7$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.19, 10.19, 10.19) @ 750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

### **Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:**

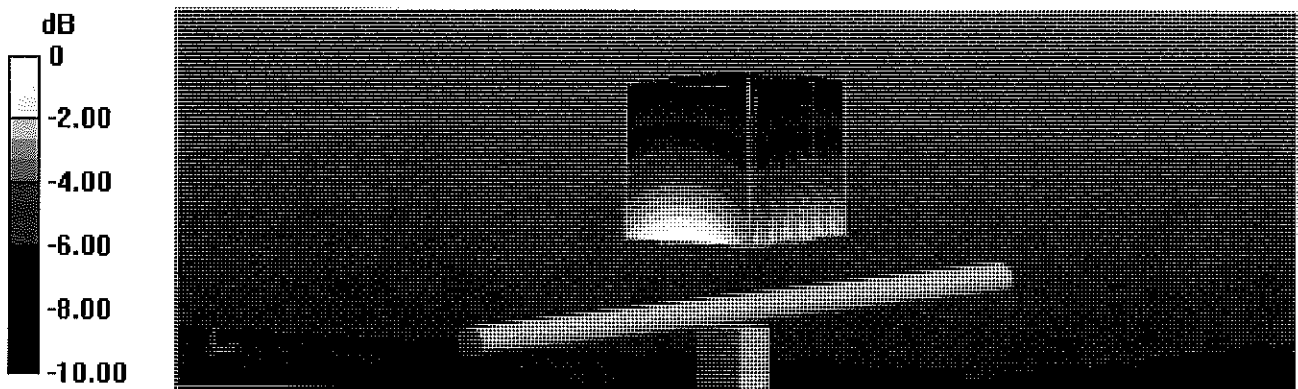
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 57.60 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.16 W/kg

**SAR(1 g) = 2.15 W/kg; SAR(10 g) = 1.42 W/kg**

Maximum value of SAR (measured) = 2.83 W/kg

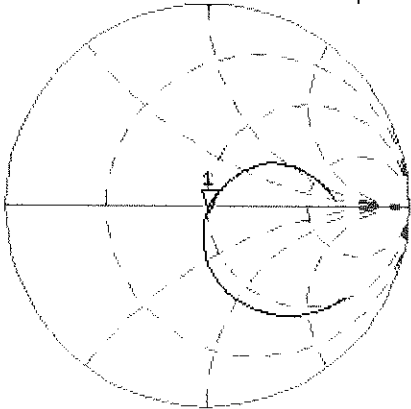


0 dB = 2.83 W/kg = 4.52 dBW/kg

Impedance Measurement Plot for Body TSL

18 May 2018 09:54:01  
CH1 S11 1 U FS 1: 49.951  $\angle$  -3.2324  $\angle$  65.649 pF 750.000 000 MHz

\*  
De1  
Cor



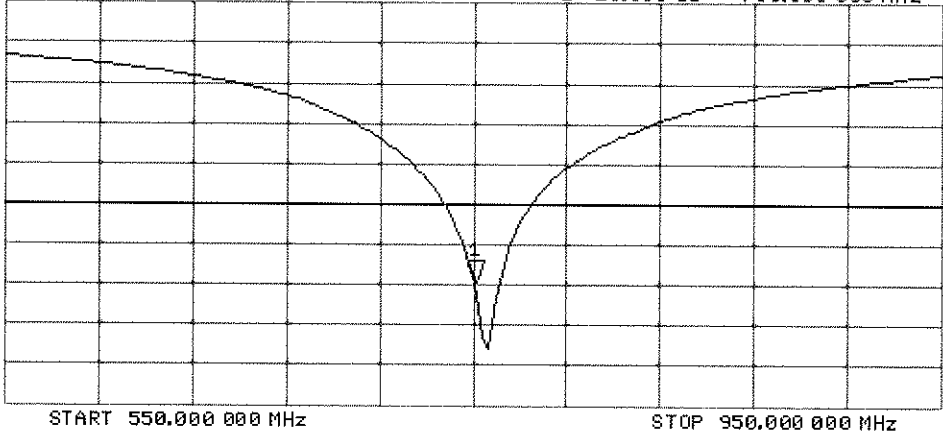
Avg  
16  
H1d

CH2 S11 LOG 5 dB/REF -20 dB 1:-29.809 dB 750.000 000 MHz

Cor

Avg  
16

H1d



# Certification of Calibration

Object D750V3 – SN: 1034

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Extended Calibration date: May 16, 2019

Description: SAR Validation Dipole at 750 MHz.

## Calibration Equipment used:

| Manufacturer          | Model     | Description                                             | Cal Date   | Cal Interval | Cal Due    | Serial Number |
|-----------------------|-----------|---------------------------------------------------------|------------|--------------|------------|---------------|
| Agilent               | 8753ES    | S-Parameter Network Analyzer                            | 10/2/2018  | Annual       | 10/2/2019  | US39170118    |
| Agilent               | N5182A    | MXG Vector Signal Generator                             | 6/15/2018  | Annual       | 6/15/2019  | MY47420837    |
| Amplifier Research    | 15S1G6    | Amplifier                                               | CBT        | N/A          | CBT        | 343972        |
| Anritsu               | ML2495A   | Power Meter                                             | 10/21/2018 | Annual       | 10/21/2019 | 941001        |
| Anritsu               | MA2411B   | Pulse Power Sensor                                      | 10/30/2018 | Annual       | 10/30/2019 | 1207470       |
| Anritsu               | MA2411B   | Pulse Power Sensor                                      | 11/20/2018 | Annual       | 11/20/2019 | 1339007       |
| Control Company       | 4040      | Temperature / Humidity Monitor                          | 2/28/2018  | Biennial     | 2/28/2020  | 150761911     |
| Control Company       | 4352      | Ultra Long Stem Thermometer                             | 2/28/2018  | Biennial     | 2/28/2020  | 170330160     |
| Keysight              | 772D      | Dual Directional Coupler                                | CBT        | N/A          | CBT        | MY52180215    |
| Keysight Technologies | 85033E    | Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm) | 6/4/2018   | Annual       | 6/4/2019   | MY53401181    |
| Mini-Circuits         | BW-N20W5+ | DC to 18 GHz Precision Fixed 20 dB Attenuator           | CBT        | N/A          | CBT        | N/A           |
| Mini-Circuits         | NLP-2950+ | Low Pass Filter DC to 2700 MHz                          | CBT        | N/A          | CBT        | N/A           |
| Narda                 | 4772-3    | Attenuator (3dB)                                        | CBT        | N/A          | CBT        | 9406          |
| Pasternack            | PE2208-6  | Bidirectional Coupler                                   | CBT        | N/A          | CBT        | N/A           |
| Pasternack            | PE5011-1  | Torque Wrench                                           | 7/19/2017  | Biennial     | 7/19/2019  | N/A           |
| SPEAG                 | DAKS-3.5  | Portable DAK                                            | 9/11/2018  | Annual       | 9/11/2019  | 1045          |
| SPEAG                 | EX3DV4    | SAR Probe                                               | 7/20/2018  | Annual       | 7/20/2019  | 7416          |
| SPEAG                 | DAE4      | Dasy Data Acquisition Electronics                       | 7/10/2018  | Annual       | 7/10/2019  | 1402          |

Measurement Uncertainty =  $\pm 23\%$  (k=2)

|                | Name            | Function                 | Signature           |
|----------------|-----------------|--------------------------|---------------------|
| Calibrated By: | Parker Jones    | Team Lead Engineer       | <i>Parker Jones</i> |
| Approved By:   | Kaitlin O'Keefe | Senior Technical Manager | <i>KOK</i>          |

# DIPOLE CALIBRATION EXTENSION

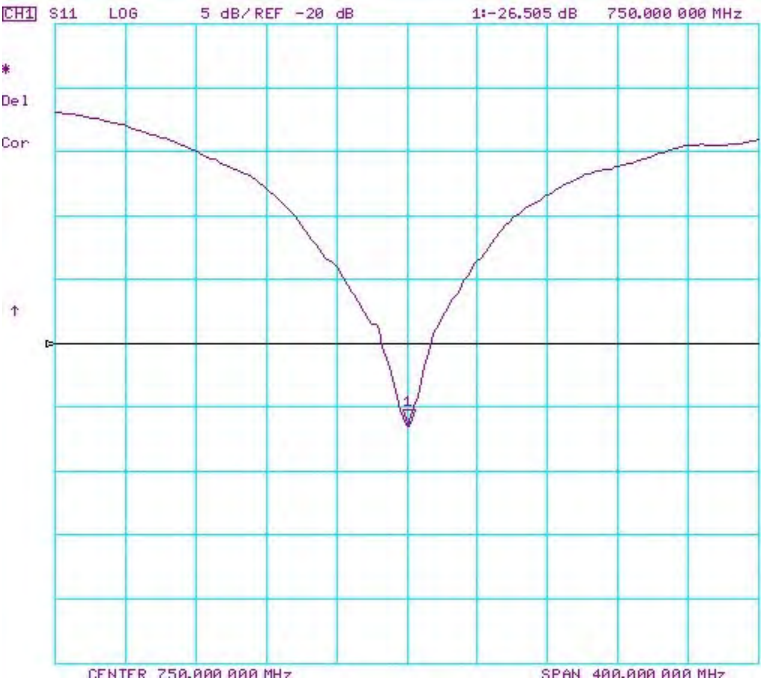
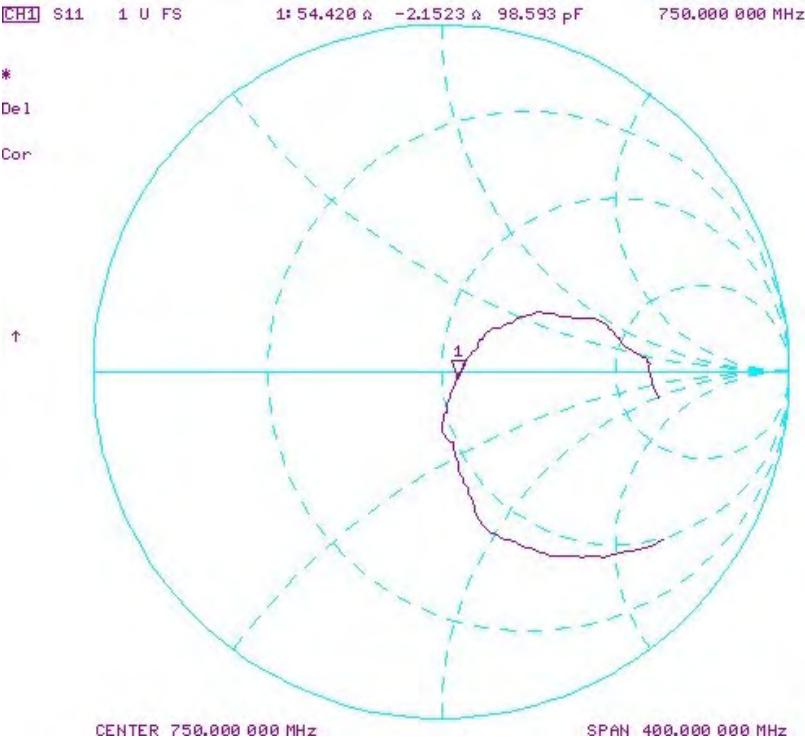
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

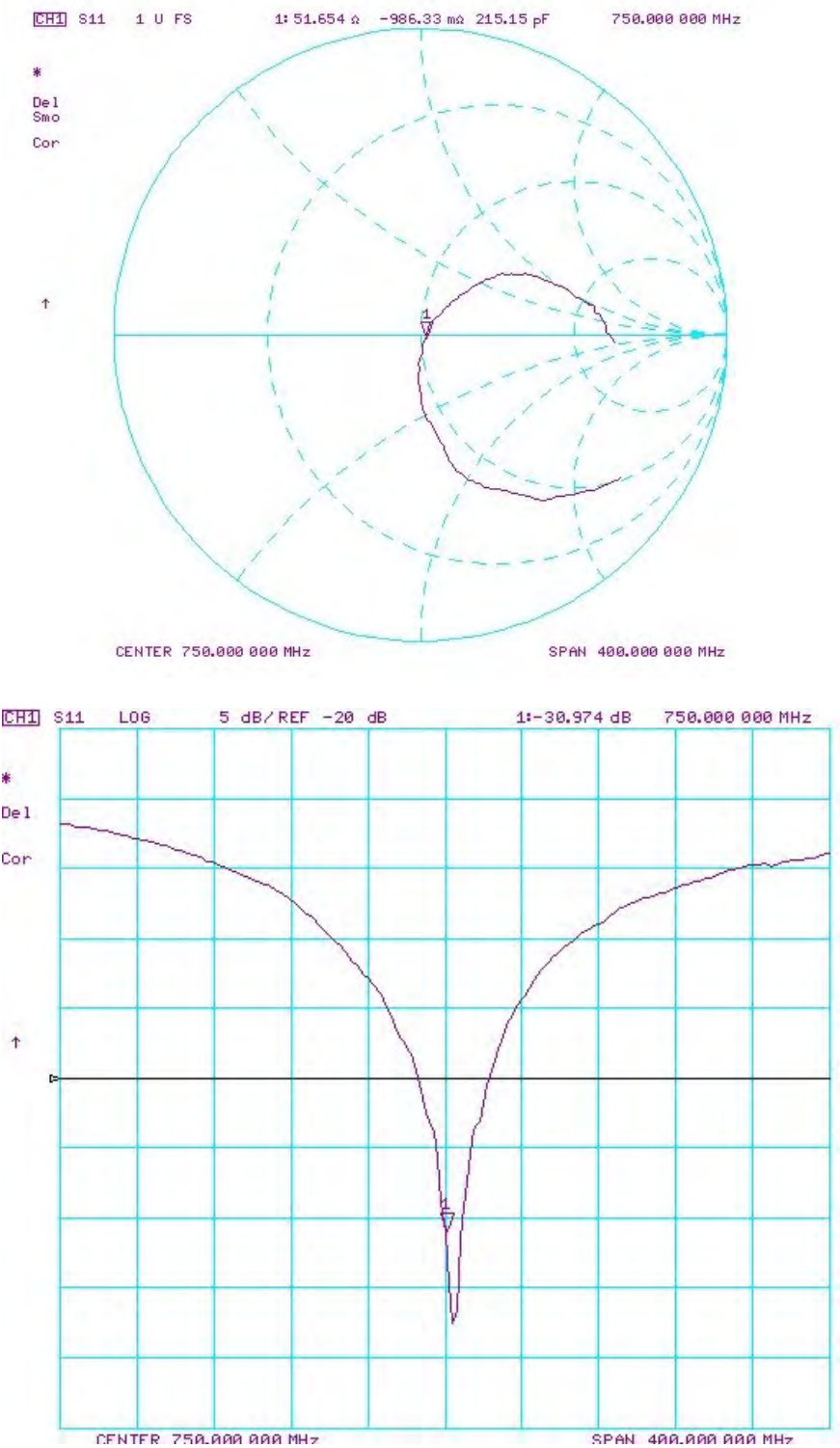
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Head (1g) W/kg @ 23.0 dBm | Measured Head SAR (1g) W/kg @ 23.0 dBm | Deviation 1g (%) | Certificate SAR Target Head (10g) W/kg @ 23.0 dBm | Measured Head SAR (10g) W/kg @ 23.0 dBm | Deviation 10g (%) | Certificate Impedance Head (Ohm) Real | Measured Impedance Head (Ohm) Real | Difference (Ohm) Real | Certificate Impedance Head (Ohm) Imaginary | Measured Impedance Head (Ohm) Imaginary | Difference (Ohm) Imaginary | Certificate Return Loss Head (dB) | Measured Return Loss Head (dB) | Deviation (%) | PASS/FAIL |
|------------------|----------------|-----------------------------------|--------------------------------------------------|----------------------------------------|------------------|---------------------------------------------------|-----------------------------------------|-------------------|---------------------------------------|------------------------------------|-----------------------|--------------------------------------------|-----------------------------------------|----------------------------|-----------------------------------|--------------------------------|---------------|-----------|
| 5/18/2018        | 5/16/2019      | 1.034                             | 1.664                                            | 1.65                                   | -0.84%           | 1.064                                             | 1.08                                    | -0.37%            | 55.3                                  | 54.4                               | 0.9                   | 0                                          | -2.2                                    | 2.2                        | -26                               | -26.5                          | -1.90%        | PASS      |
| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Body (1g) W/kg @ 23.0 dBm | Measured Body SAR (1g) W/kg @ 23.0 dBm | Deviation 1g (%) | Certificate SAR Target Body (10g) W/kg @ 23.0 dBm | Measured Body SAR (10g) W/kg @ 23.0 dBm | Deviation 10g (%) | Certificate Impedance Body (Ohm) Real | Measured Impedance Body (Ohm) Real | Difference (Ohm) Real | Certificate Impedance Body (Ohm) Imaginary | Measured Impedance Body (Ohm) Imaginary | Difference (Ohm) Imaginary | Certificate Return Loss Body (dB) | Measured Return Loss Body (dB) | Deviation (%) | PASS/FAIL |
| 5/18/2018        | 5/16/2019      | 1.034                             | 1.714                                            | 1.81                                   | 5.60%            | 1.134                                             | 1.19                                    | 4.94%             | 50                                    | 51.7                               | 1.7                   | -3.2                                       | -1                                      | 2.2                        | -29.8                             | -31                            | -3.90%        | PASS      |

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D835V2-4d040\_Jun19**

## CALIBRATION CERTIFICATE

Object **D835V2 - SN:4d040**

Calibration procedure(s) **QA CAL-05.v11**  
**Calibration Procedure for SAR Validation Sources between 0.7-3 GHz**

✓  
 ATM  
 6/28/19

Calibration date: **June 20, 2019**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards               | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|---------------------------------|--------------------|-----------------------------------|------------------------|
| Power meter NRP                 | SN: 104778         | 03-Apr-19 (No. 217-02892/02893)   | Apr-20                 |
| Power sensor NRP-Z91            | SN: 103244         | 03-Apr-19 (No. 217-02892)         | Apr-20                 |
| Power sensor NRP-Z91            | SN: 103245         | 03-Apr-19 (No. 217-02893)         | Apr-20                 |
| Reference 20 dB Attenuator      | SN: 5058 (20k)     | 04-Apr-19 (No. 217-02894)         | Apr-20                 |
| Type-N mismatch combination     | SN: 5047.2 / 06327 | 04-Apr-19 (No. 217-02895)         | Apr-20                 |
| Reference Probe EX3DV4          | SN: 7349           | 29-May-19 (No. EX3-7349_May19)    | May-20                 |
| DAE4                            | SN: 601            | 30-Apr-19 (No. DAE4-601_Apr19)    | Apr-20                 |
| Secondary Standards             | ID #               | Check Date (in house)             | Scheduled Check        |
| Power meter E4419B              | SN: GB39512475     | 30-Oct-14 (in house check Feb-19) | In house check: Oct-20 |
| Power sensor HP 8481A           | SN: US37292783     | 07-Oct-15 (in house check Oct-18) | In house check: Oct-20 |
| Power sensor HP 8481A           | SN: MY41092317     | 07-Oct-15 (in house check Oct-18) | In house check: Oct-20 |
| RF generator R&S SMT-06         | SN: 100972         | 15-Jun-15 (in house check Oct-18) | In house check: Oct-20 |
| Network Analyzer Agilent E8358A | SN: US41080477     | 31-Mar-14 (in house check Oct-18) | In house check: Oct-19 |

Calibrated by: **Manu Seitz** **Laboratory Technician**

Approved by: **Katja Pokovic** **Technical Manager**

Signature

Issued: June 21, 2019

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



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Accreditation No.: **SCS 0108**

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Multilateral Agreement for the recognition of calibration certificates

### Glossary:

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A   | not applicable or not measured  |

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

### Additional Documentation:

- DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                                     |                        |             |
|-------------------------------------|------------------------|-------------|
| <b>DASY Version</b>                 | DASY5                  | V52.10.2    |
| <b>Extrapolation</b>                | Advanced Extrapolation |             |
| <b>Phantom</b>                      | Modular Flat Phantom   |             |
| <b>Distance Dipole Center - TSL</b> | 15 mm                  | with Spacer |
| <b>Zoom Scan Resolution</b>         | dx, dy, dz = 5 mm      |             |
| <b>Frequency</b>                    | 835 MHz $\pm$ 1 MHz    |             |

## Head TSL parameters

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 41.5           | 0.90 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 41.8 $\pm$ 6 % | 0.91 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | < 0.5 °C            | ----           | ----                 |

## SAR result with Head TSL

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | Condition          |                                                |
| SAR measured                                                | 250 mW input power | 2.39 W/kg                                      |
| SAR for nominal Head TSL parameters                         | normalized to 1W   | <b>9.50 W/kg <math>\pm</math> 17.0 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | condition          |                                                |
| SAR measured                                                  | 250 mW input power | 1.54 W/kg                                      |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>6.13 W/kg <math>\pm</math> 16.5 % (k=2)</b> |

## Body TSL parameters

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Body TSL parameters</b>             | 22.0 °C             | 55.2           | 0.97 mho/m           |
| <b>Measured Body TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 55.4 $\pm$ 6 % | 0.98 mho/m $\pm$ 6 % |
| <b>Body TSL temperature change during test</b> | < 0.5 °C            | ----           | ----                 |

## SAR result with Body TSL

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Body TSL</b> | Condition          |                                                |
| SAR measured                                                | 250 mW input power | 2.40 W/kg                                      |
| SAR for nominal Body TSL parameters                         | normalized to 1W   | <b>9.53 W/kg <math>\pm</math> 17.0 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Body TSL</b> | condition          |                                                |
| SAR measured                                                  | 250 mW input power | 1.57 W/kg                                      |
| SAR for nominal Body TSL parameters                           | normalized to 1W   | <b>6.24 W/kg <math>\pm</math> 16.5 % (k=2)</b> |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 49.6 $\Omega$ - 4.1 j $\Omega$ |
| Return Loss                          | - 27.7 dB                      |

### Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 46.6 $\Omega$ - 6.5 j $\Omega$ |
| Return Loss                          | - 22.4 dB                      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.393 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |       |
|-----------------|-------|
| Manufactured by | SPEAG |
|-----------------|-------|

## DASY5 Validation Report for Head TSL

Date: 20.06.2019

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d040**

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.91 \text{ S/m}$ ;  $\epsilon_r = 41.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.89, 9.89, 9.89) @ 835 MHz; Calibrated: 29.05.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.2(1504); SEMCAD X 14.6.12(7470)

### Dipole Calibration for Head Tissue/ $P_{in}=250 \text{ mW}$ , $d=15\text{mm}$ /Zoom Scan (7x7x7)/Cube 0:

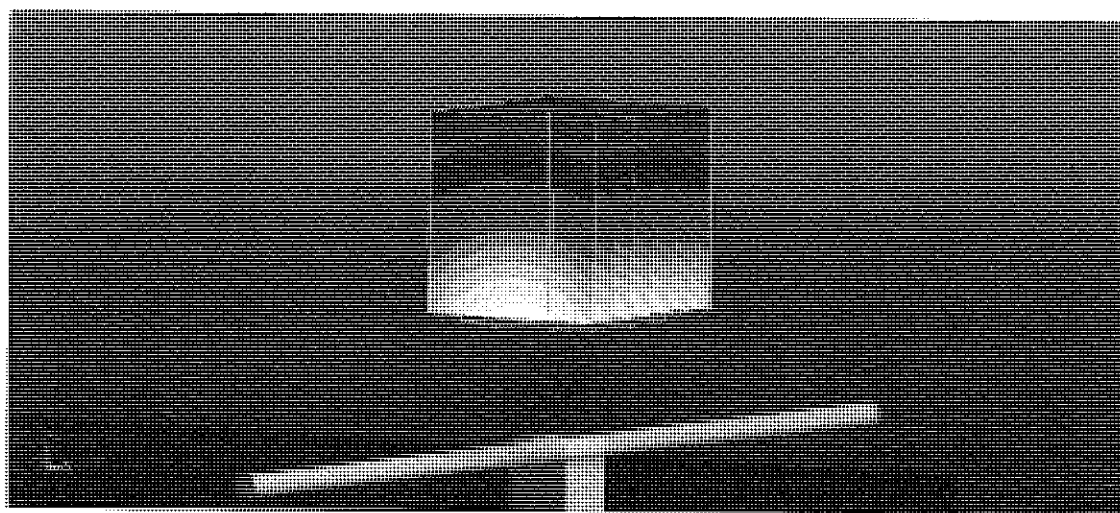
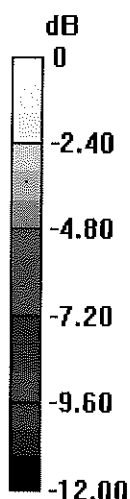
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 63.05 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 3.60 W/kg

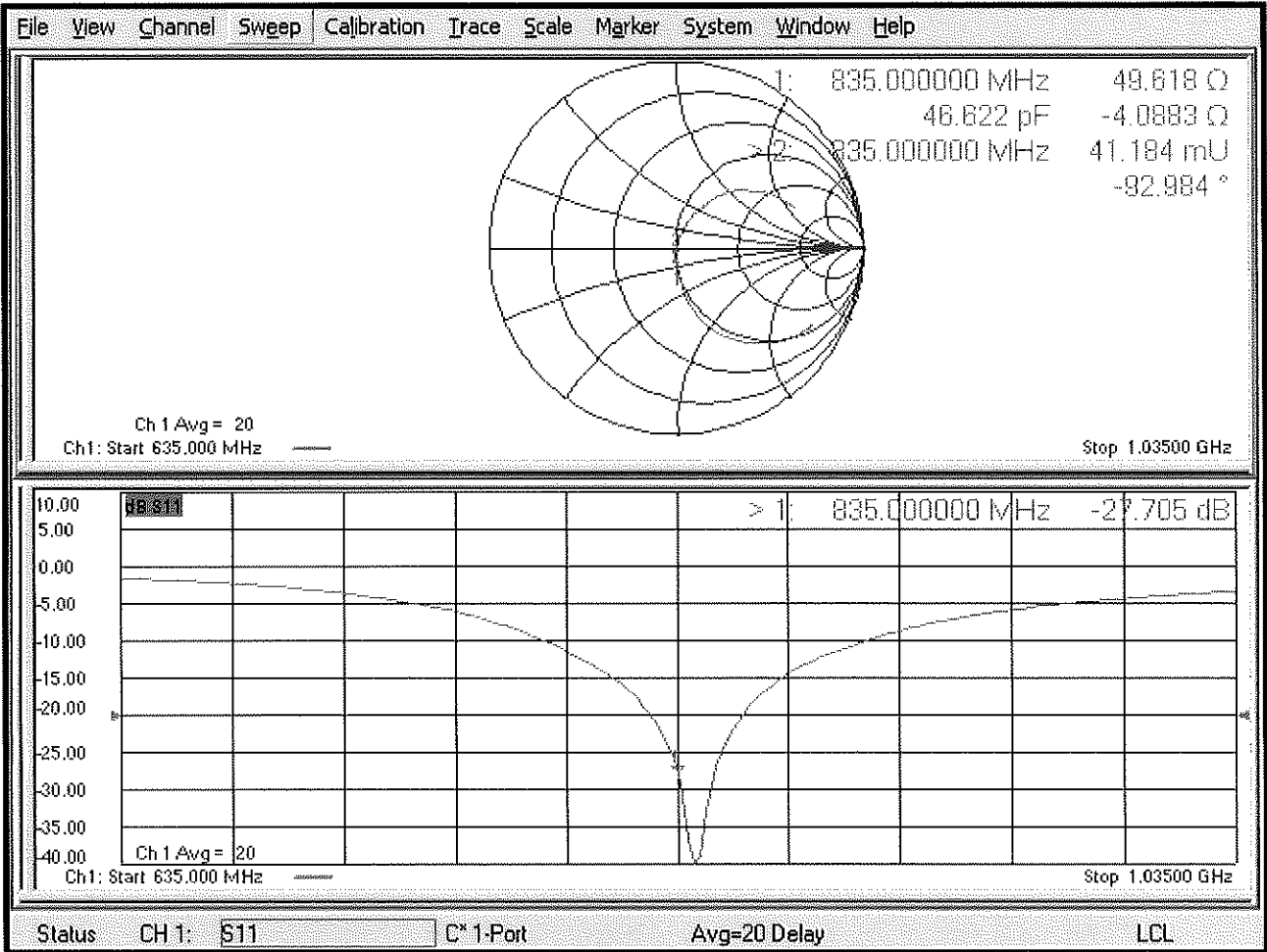
**SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.54 W/kg**

Maximum value of SAR (measured) = 3.19 W/kg



0 dB = 3.19 W/kg = 5.04 dBW/kg

Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 13.06.2019

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d040**

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.98 \text{ S/m}$ ;  $\epsilon_r = 55.4$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.16, 10.16, 10.16) @ 835 MHz; Calibrated: 29.05.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.2(1504); SEMCAD X 14.6.12(7470)

### Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

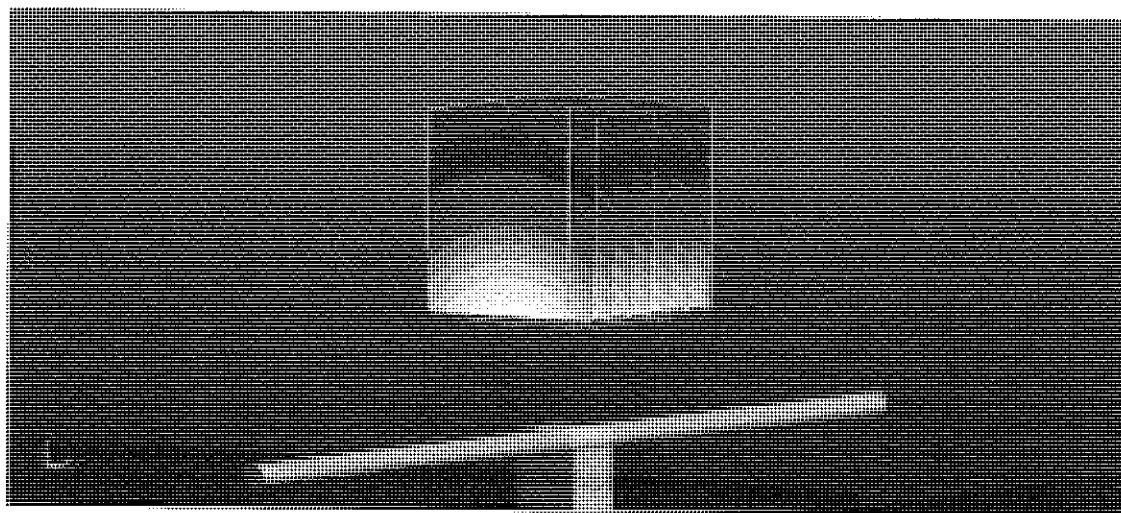
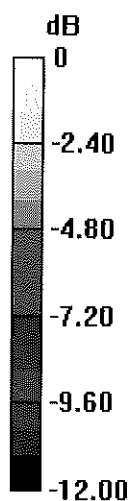
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 57.73 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 3.59 W/kg

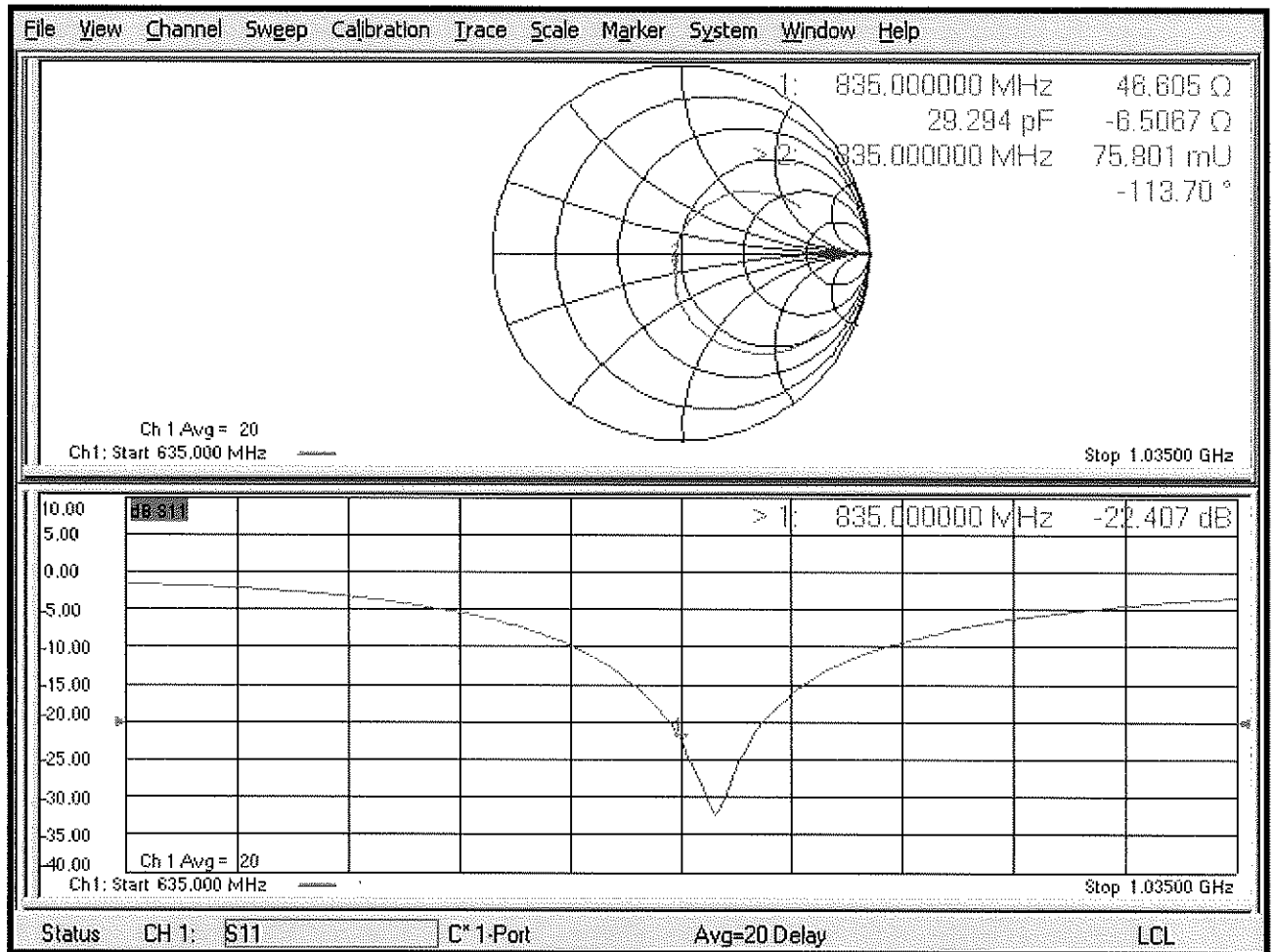
**SAR(1 g) = 2.4 W/kg; SAR(10 g) = 1.57 W/kg**

Maximum value of SAR (measured) = 3.21 W/kg



0 dB = 3.21 W/kg = 5.07 dBW/kg

## Impedance Measurement Plot for Body TSL





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Accreditation No.: **SCS 0108**

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Client **PC Test**

Certificate No: **D1750V2-1083\_Jun19**

## CALIBRATION CERTIFICATE

Object **D1750V2 - SN:1083**

Calibration procedure(s) **QA CAL-05.v11  
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz**

Calibration date: **June 19, 2019**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)      | Scheduled Calibration |
|-----------------------------|--------------------|---------------------------------|-----------------------|
| Power meter NRP             | SN: 104778         | 03-Apr-19 (No. 217-02892/02893) | Apr-20                |
| Power sensor NRP-Z91        | SN: 103244         | 03-Apr-19 (No. 217-02892)       | Apr-20                |
| Power sensor NRP-Z91        | SN: 103245         | 03-Apr-19 (No. 217-02893)       | Apr-20                |
| Reference 20 dB Attenuator  | SN: 5058 (20k)     | 04-Apr-19 (No. 217-02894)       | Apr-20                |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 04-Apr-19 (No. 217-02895)       | Apr-20                |
| Reference Probe EX3DV4      | SN: 7349           | 29-May-19 (No. EX3-7349_May19)  | May-20                |
| DAE4                        | SN: 601            | 30-Apr-19 (No. DAE4-601_Apr19)  | Apr-20                |

| Secondary Standards             | ID #           | Check Date (in house)             | Scheduled Check        |
|---------------------------------|----------------|-----------------------------------|------------------------|
| Power meter E4419B              | SN: GB39512475 | 30-Oct-14 (in house check Feb-19) | In house check: Oct-20 |
| Power sensor HP 8481A           | SN: US37292783 | 07-Oct-15 (in house check Oct-18) | In house check: Oct-20 |
| Power sensor HP 8481A           | SN: MY41092317 | 07-Oct-15 (in house check Oct-18) | In house check: Oct-20 |
| RF generator R&S SMT-06         | SN: 100972     | 15-Jun-15 (in house check Oct-18) | In house check: Oct-20 |
| Network Analyzer Agilent E8358A | SN: US41080477 | 31-Mar-14 (in house check Oct-18) | In house check: Oct-19 |

Calibrated by: **Claudio Leubler** Function: **Laboratory Technician**

Approved by: **Katja Pokovic** Technical Manager

Signature

Issued: June 20, 2019

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Accreditation No.: **SCS 0108**

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### Glossary:

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A   | not applicable or not measured  |

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

### Additional Documentation:

- DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                                     |                        |             |
|-------------------------------------|------------------------|-------------|
| <b>DASY Version</b>                 | DASY5                  | V52.10.2    |
| <b>Extrapolation</b>                | Advanced Extrapolation |             |
| <b>Phantom</b>                      | Modular Flat Phantom   |             |
| <b>Distance Dipole Center - TSL</b> | 10 mm                  | with Spacer |
| <b>Zoom Scan Resolution</b>         | dx, dy, dz = 5 mm      |             |
| <b>Frequency</b>                    | 1750 MHz $\pm$ 1 MHz   |             |

## Head TSL parameters

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 40.1           | 1.37 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 40.0 $\pm$ 6 % | 1.34 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | < 0.5 °C            | ----           | ----                 |

## SAR result with Head TSL

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | Condition          |                                                |
| SAR measured                                                | 250 mW input power | 8.91 W/kg                                      |
| SAR for nominal Head TSL parameters                         | normalized to 1W   | <b>36.1 W/kg <math>\pm</math> 17.0 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | condition          |                                                |
| SAR measured                                                  | 250 mW input power | 4.70 W/kg                                      |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>19.0 W/kg <math>\pm</math> 16.5 % (k=2)</b> |

## Body TSL parameters

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Body TSL parameters</b>             | 22.0 °C             | 53.4           | 1.49 mho/m           |
| <b>Measured Body TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 53.9 $\pm$ 6 % | 1.46 mho/m $\pm$ 6 % |
| <b>Body TSL temperature change during test</b> | < 0.5 °C            | ----           | ----                 |

## SAR result with Body TSL

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Body TSL</b> | Condition          |                                                |
| SAR measured                                                | 250 mW input power | 9.14 W/kg                                      |
| SAR for nominal Body TSL parameters                         | normalized to 1W   | <b>37.1 W/kg <math>\pm</math> 17.0 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Body TSL</b> | condition          |                                                |
| SAR measured                                                  | 250 mW input power | 4.88 W/kg                                      |
| SAR for nominal Body TSL parameters                           | normalized to 1W   | <b>19.7 W/kg <math>\pm</math> 16.5 % (k=2)</b> |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 50.6 $\Omega$ - 1.1 j $\Omega$ |
| Return Loss                          | - 38.0 dB                      |

### Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 46.1 $\Omega$ - 2.4 j $\Omega$ |
| Return Loss                          | - 28.0 dB                      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.220 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |       |
|-----------------|-------|
| Manufactured by | SPEAG |
|-----------------|-------|

## DASY5 Validation Report for Head TSL

Date: 19.06.2019

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1083**

Communication System: UID 0 - CW; Frequency: 1750 MHz

Medium parameters used:  $f = 1750$  MHz;  $\sigma = 1.34$  S/m;  $\epsilon_r = 40$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.67, 8.67, 8.67) @ 1750 MHz; Calibrated: 29.05.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.2(1504); SEMCAD X 14.6.12(7470)

### Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 105.8 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 16.7 W/kg

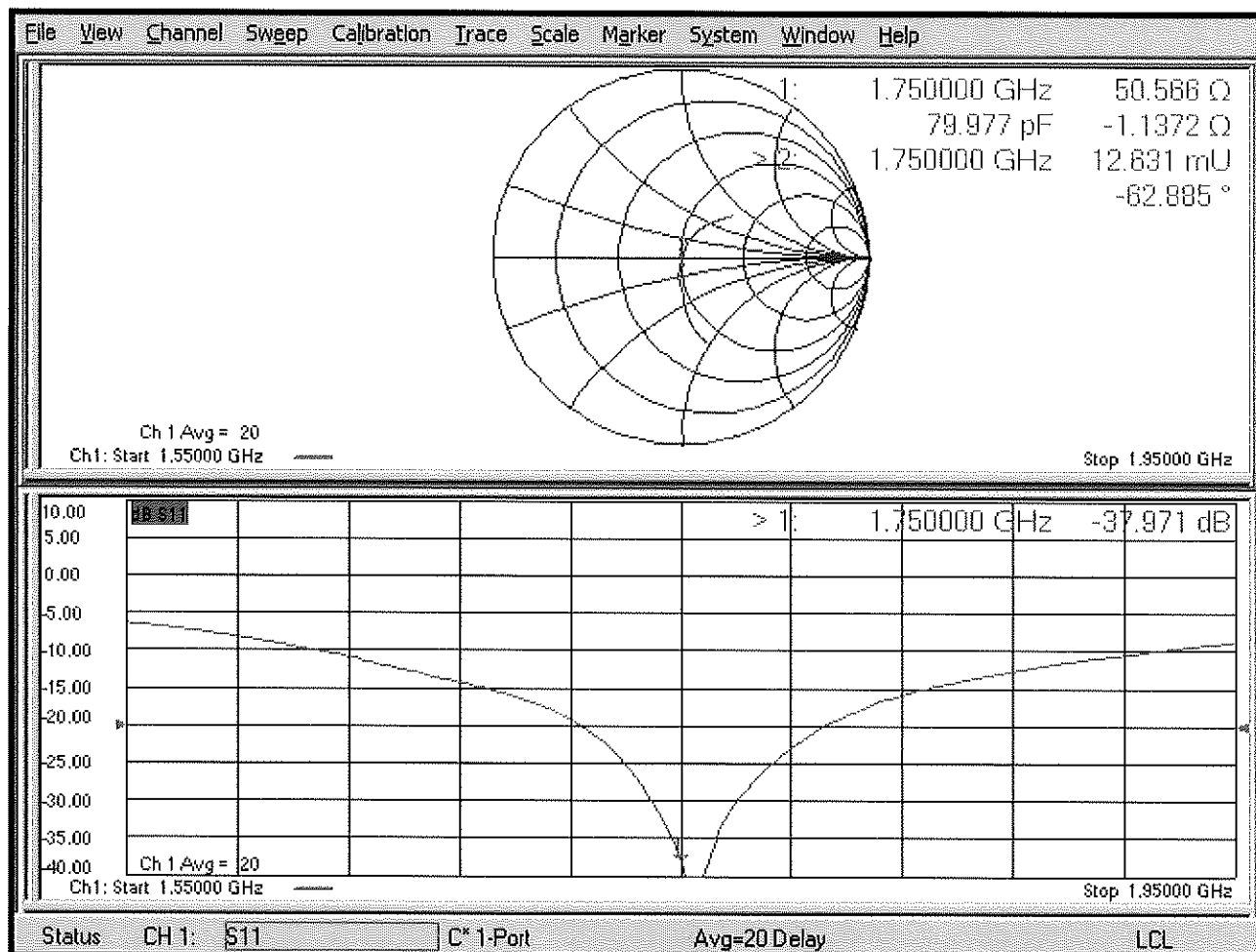
**SAR(1 g) = 8.91 W/kg; SAR(10 g) = 4.7 W/kg**

Maximum value of SAR (measured) = 13.9 W/kg



0 dB = 13.9 W/kg = 11.43 dBW/kg

## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 13.06.2019

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1083**

Communication System: UID 0 - CW; Frequency: 1750 MHz

Medium parameters used:  $f = 1750$  MHz;  $\sigma = 1.46$  S/m;  $\epsilon_r = 53.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.45, 8.45, 8.45) @ 1750 MHz; Calibrated: 29.05.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.2(1504); SEMCAD X 14.6.12(7470)

### Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

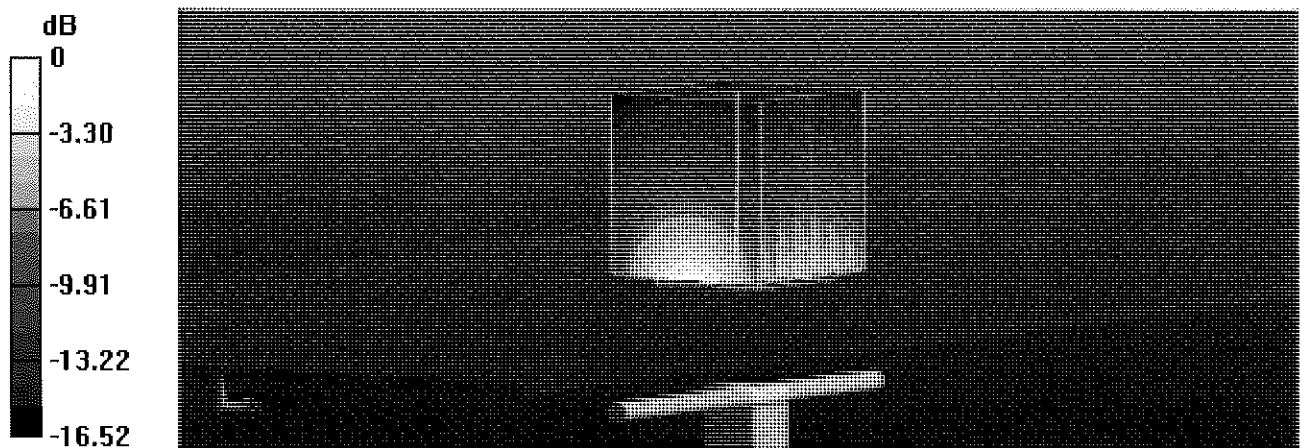
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 101.8 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 16.2 W/kg

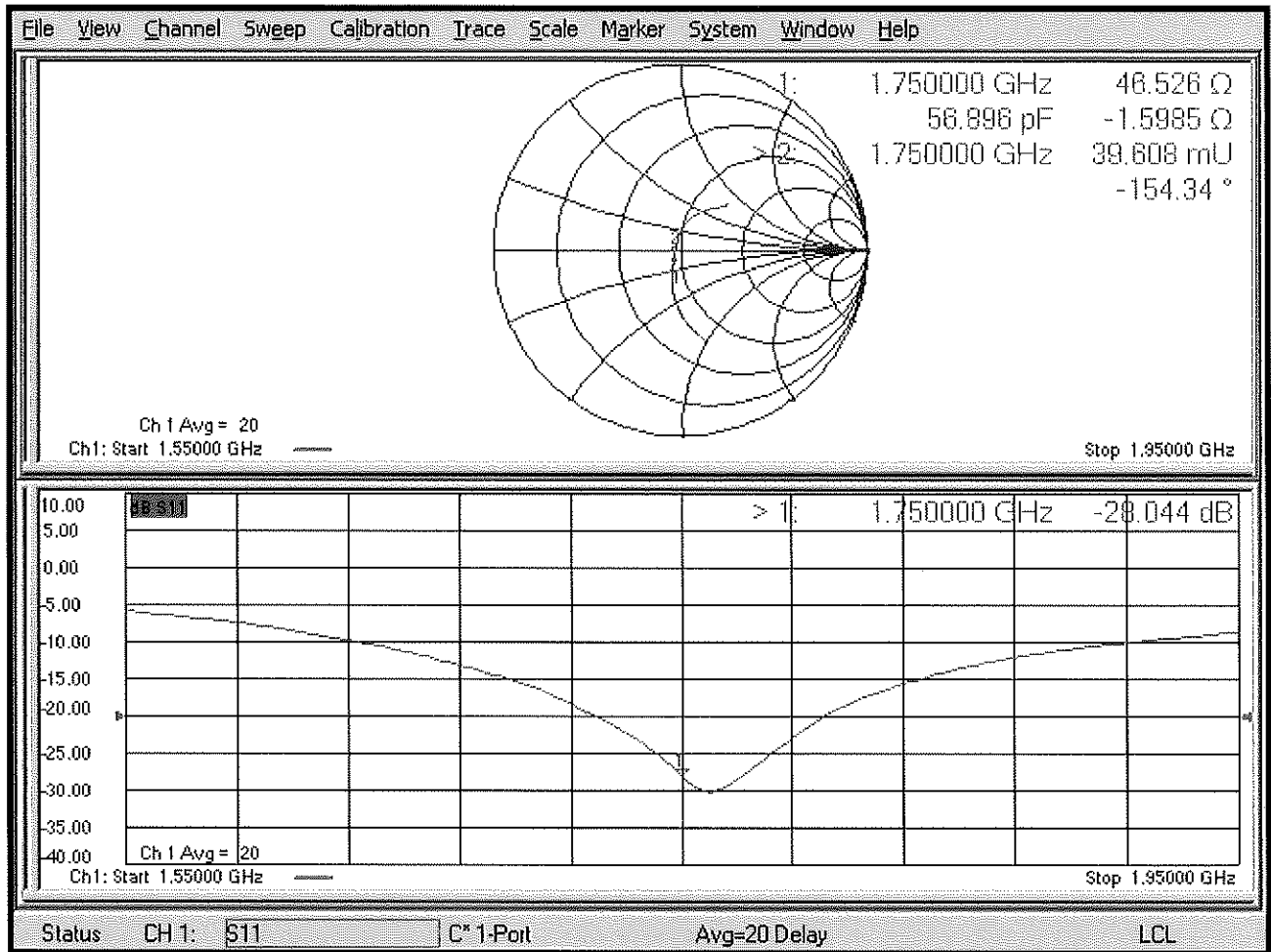
**SAR(1 g) = 9.14 W/kg; SAR(10 g) = 4.88 W/kg**

Maximum value of SAR (measured) = 13.7 W/kg



0 dB = 13.7 W/kg = 11.37 dBW/kg

## Impedance Measurement Plot for Body TSL





Accredited by the Swiss Accreditation Service (SAS)  
 The Swiss Accreditation Service is one of the signatories to the EA  
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D1900V2-5d026\_May18**

## CALIBRATION CERTIFICATE

Object **D1900V2 - SN:5d026**

Calibration procedure(s) **Cal. Cal-15 v10  
 Calibration procedure for cable validation with above 700 MHz**

Calibration date: **May 14, 2018**

SC ✓  
 7/31/2018

BN ✓  
 06/01/2019

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter NRP             | SN: 104778         | 04-Apr-18 (No. 217-02672/02673)   | Apr-19                 |
| Power sensor NRP-Z91        | SN: 103244         | 04-Apr-18 (No. 217-02672)         | Apr-19                 |
| Power sensor NRP-Z91        | SN: 103245         | 04-Apr-18 (No. 217-02673)         | Apr-19                 |
| Reference 20 dB Attenuator  | SN: 5058 (20k)     | 04-Apr-18 (No. 217-02682)         | Apr-19                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 04-Apr-18 (No. 217-02683)         | Apr-19                 |
| Reference Probe EX3DV4      | SN: 7349           | 30-Dec-17 (No. EX3-7349_Dec17)    | Dec-18                 |
| DAE4                        | SN: 601            | 26-Oct-17 (No. DAE4-601_Oct17)    | Oct-18                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| Power meter EPM-442A        | SN: GB37480704     | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| Power sensor HP 8481A       | SN: US37292783     | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| Power sensor HP 8481A       | SN: MY41092317     | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| RF generator R&S SMT-06     | SN: 100972         | 15-Jun-15 (in house check Oct-16) | In house check: Oct-18 |
| Network Analyzer HP 8753E   | SN: US37390585     | 18-Oct-01 (in house check Oct-17) | In house check: Oct-18 |

Calibrated by: **Jeton Kastrati** Name **Laboratory Technician** Function

Signature

Approved by: **Katja Pokovic** Technical Manager

Signature

Issued: May 14, 2018

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

**Glossary:**

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A   | not applicable or not measured  |

**Calibration is Performed According to the Following Standards:**

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

**Additional Documentation:**

- DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

- Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:* SAR measured at the stated antenna input power.
- SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                              |                        |             |
|------------------------------|------------------------|-------------|
| DASY Version                 | DASY5                  | V52.10.1    |
| Extrapolation                | Advanced Extrapolation |             |
| Phantom                      | Modular Flat Phantom   |             |
| Distance Dipole Center - TSL | 10 mm                  | with Spacer |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm      |             |
| Frequency                    | 1900 MHz $\pm$ 1 MHz   |             |

## Head TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C             | 40.0           | 1.40 mho/m           |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2) °C | 41.2 $\pm$ 6 % | 1.35 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

## SAR result with Head TSL

|                                                       |                    |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                              |
| SAR measured                                          | 250 mW input power | 9.78 W/kg                    |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 40.2 W/kg $\pm$ 17.0 % (k=2) |

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                              |
| SAR measured                                            | 250 mW input power | 5.19 W/kg                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 21.1 W/kg $\pm$ 16.5 % (k=2) |

## Body TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Body TSL parameters             | 22.0 °C             | 53.3           | 1.52 mho/m           |
| Measured Body TSL parameters            | (22.0 $\pm$ 0.2) °C | 55.3 $\pm$ 6 % | 1.46 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

## SAR result with Body TSL

|                                                       |                    |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL | Condition          |                              |
| SAR measured                                          | 250 mW input power | 9.65 W/kg                    |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 39.9 W/kg $\pm$ 17.0 % (k=2) |

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                              |
| SAR measured                                            | 250 mW input power | 5.19 W/kg                    |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 21.2 W/kg $\pm$ 16.5 % (k=2) |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $53.0 \Omega + 8.0 j\Omega$ |
| Return Loss                          | - 21.6 dB                   |

### Antenna Parameters with Body TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $47.1 \Omega + 7.4 j\Omega$ |
| Return Loss                          | - 21.8 dB                   |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.199 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |                   |
|-----------------|-------------------|
| Manufactured by | SPEAG             |
| Manufactured on | December 17, 2002 |

## DASY5 Validation Report for Head TSL

Date: 14.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d026**

Communication System: UID 0 - CW; Frequency: 1900 MHz

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.35$  S/m;  $\epsilon_r = 41.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.18, 8.18, 8.18) @ 1900 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

### **Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

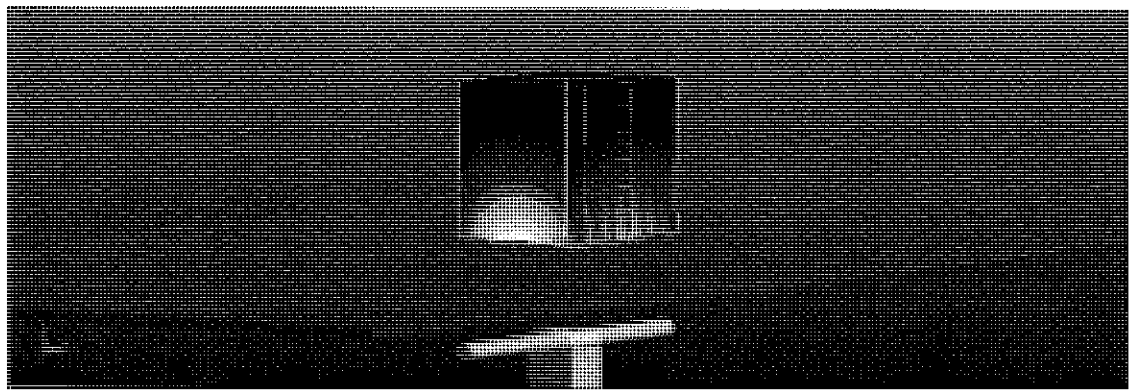
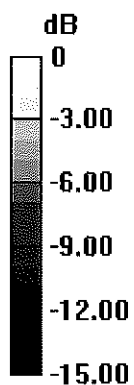
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 109.9 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 17.8 W/kg

**SAR(1 g) = 9.78 W/kg; SAR(10 g) = 5.19 W/kg**

Maximum value of SAR (measured) = 15.0 W/kg

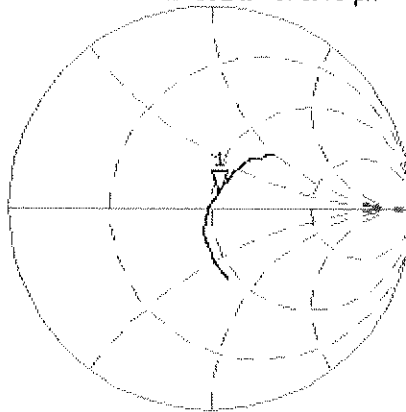


0 dB = 15.0 W/kg = 11.76 dBW/kg

# Impedance Measurement Plot for Head TSL

14 May 2018 09:14:41  
 [CH1] S11 1 U FS 1: 52.955  $\Omega$  8.0391  $\Omega$  673.40  $\mu$ H 1 900.000 000 MHz

\*  
 Del  
 CA



Avg  
 16

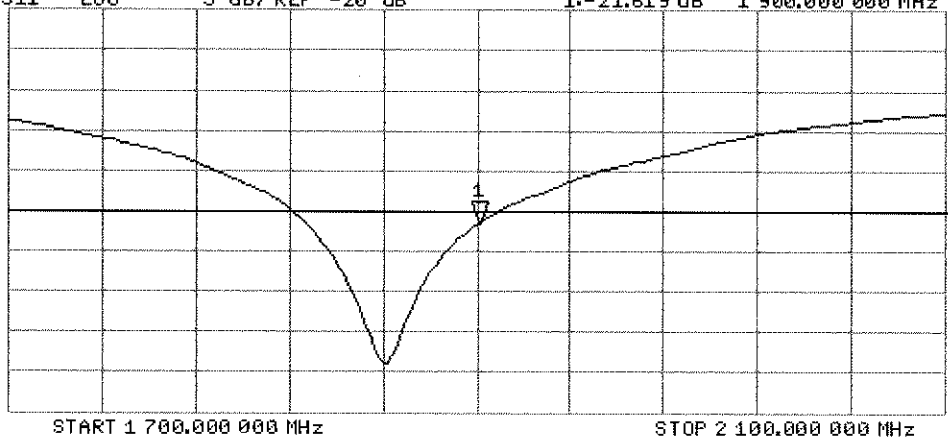
H1d

CH2 S11 LOG 5 dB/REF -20 dB 1:-21.619 dB 1 900.000 000 MHz

CA

Avg  
 16

H1d



## DASY5 Validation Report for Body TSL

Date: 14.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d026**

Communication System: UID 0 - CW; Frequency: 1900 MHz

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.46$  S/m;  $\epsilon_r = 55.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.15, 8.15, 8.15) @ 1900 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

### **Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

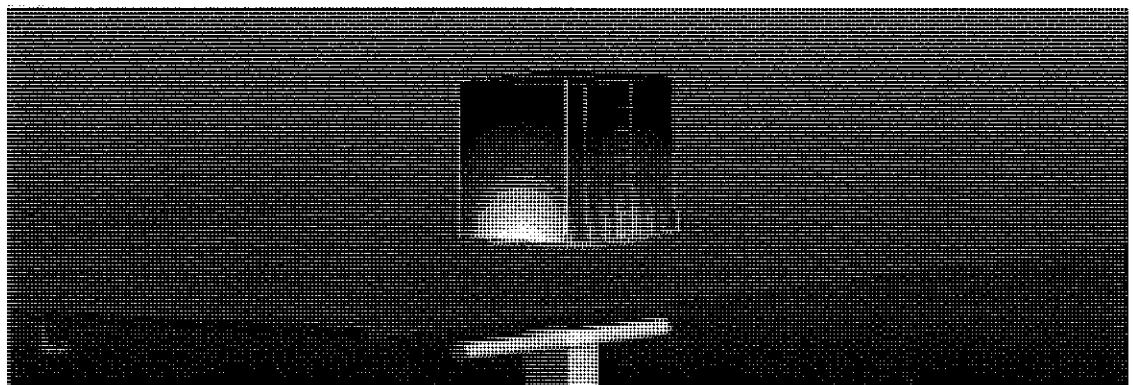
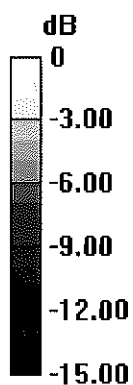
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 104.5 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 16.7 W/kg

**SAR(1 g) = 9.65 W/kg; SAR(10 g) = 5.19 W/kg**

Maximum value of SAR (measured) = 14.4 W/kg

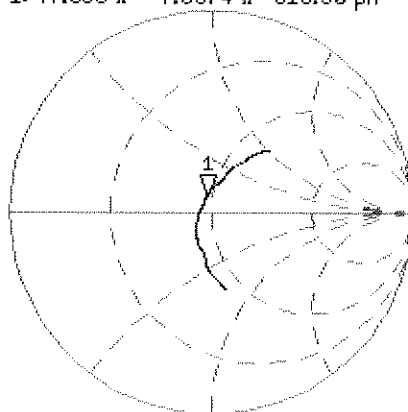


0 dB = 14.4 W/kg = 11.58 dBW/kg

# Impedance Measurement Plot for Body TSL

14 May 2018 09:13:46  
 CH1 S11 1 U FS 1: 47.053  $\Omega$  7.3574  $\Omega$  616.30 pF 1 900.000 000 MHz

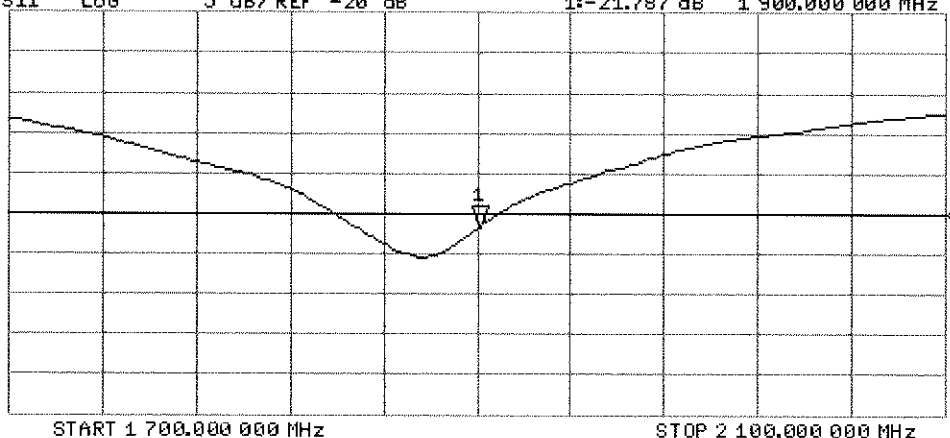
\*  
 Del  
 CA



Avg  
 16  
 H1d

CH2 S11 LOG 5 dB/REF -20 dB 1: -21.787 dB 1 900.000 000 MHz

CA  
 Avg  
 16  
 H1d



# Certification of Calibration

Object D1900V2 – SN: 5d026

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Extended Calibration date: May 14, 2019

Description: SAR Validation Dipole at 1900 MHz.

## Calibration Equipment used:

| Manufacturer          | Model     | Description                                             | Cal Date   | Cal Interval | Cal Due    | Serial Number |
|-----------------------|-----------|---------------------------------------------------------|------------|--------------|------------|---------------|
| Agilent               | 8753ES    | S-Parameter Network Analyzer                            | 10/2/2018  | Annual       | 10/2/2019  | US39170118    |
| Agilent               | N5182A    | MXG Vector Signal Generator                             | 6/15/2018  | Annual       | 6/15/2019  | MY47420837    |
| Amplifier Research    | 15S1G6    | Amplifier                                               | CBT        | N/A          | CBT        | 343972        |
| Anritsu               | ML2495A   | Power Meter                                             | 10/21/2018 | Annual       | 10/21/2019 | 941001        |
| Anritsu               | MA2411B   | Pulse Power Sensor                                      | 10/30/2018 | Annual       | 10/30/2019 | 1207470       |
| Anritsu               | MA2411B   | Pulse Power Sensor                                      | 11/20/2018 | Annual       | 11/20/2019 | 1339007       |
| Control Company       | 4040      | Temperature / Humidity Monitor                          | 2/28/2018  | Biennial     | 2/28/2020  | 150761911     |
| Control Company       | 4352      | Ultra Long Stem Thermometer                             | 2/28/2018  | Biennial     | 2/28/2020  | 170330160     |
| Keysight              | 772D      | Dual Directional Coupler                                | CBT        | N/A          | CBT        | MY52180215    |
| Keysight Technologies | 85033E    | Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm) | 6/4/2018   | Annual       | 6/4/2019   | MY53401181    |
| Mini-Circuits         | BW-N20W5+ | DC to 18 GHz Precision Fixed 20 dB Attenuator           | CBT        | N/A          | CBT        | N/A           |
| Mini-Circuits         | NLP-2950+ | Low Pass Filter DC to 2700 MHz                          | CBT        | N/A          | CBT        | N/A           |
| Narda                 | 4772-3    | Attenuator (3dB)                                        | CBT        | N/A          | CBT        | 9406          |
| Pasternack            | PE2209-10 | Bidirectional Coupler                                   | CBT        | N/A          | CBT        | N/A           |
| Pasternack            | PE5011-1  | Torque Wrench                                           | 7/19/2017  | Biennial     | 7/19/2019  | N/A           |
| SPEAG                 | DAKS-3.5  | Portable DAK                                            | 9/11/2018  | Annual       | 9/11/2019  | 1045          |
| SPEAG                 | EX3DV4    | SAR Probe                                               | 7/20/2018  | Annual       | 7/20/2019  | 7416          |
| SPEAG                 | DAE4      | Dasy Data Acquisition Electronics                       | 7/10/2018  | Annual       | 7/10/2019  | 1402          |

Measurement Uncertainty =  $\pm 23\%$  (k=2)

|                | Name            | Function                 | Signature           |
|----------------|-----------------|--------------------------|---------------------|
| Calibrated By: | Parker Jones    | Team Lead Engineer       | <i>Parker Jones</i> |
| Approved By:   | Kaitlin O'Keefe | Senior Technical Manager | <i>KOK</i>          |

# DIPOLE CALIBRATION EXTENSION

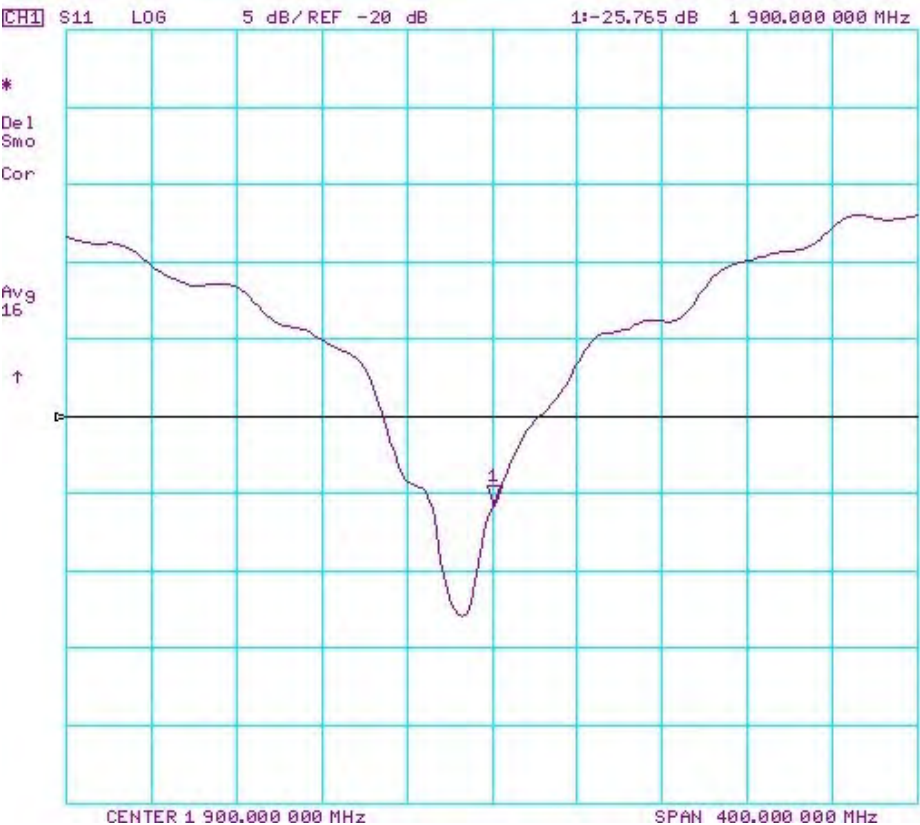
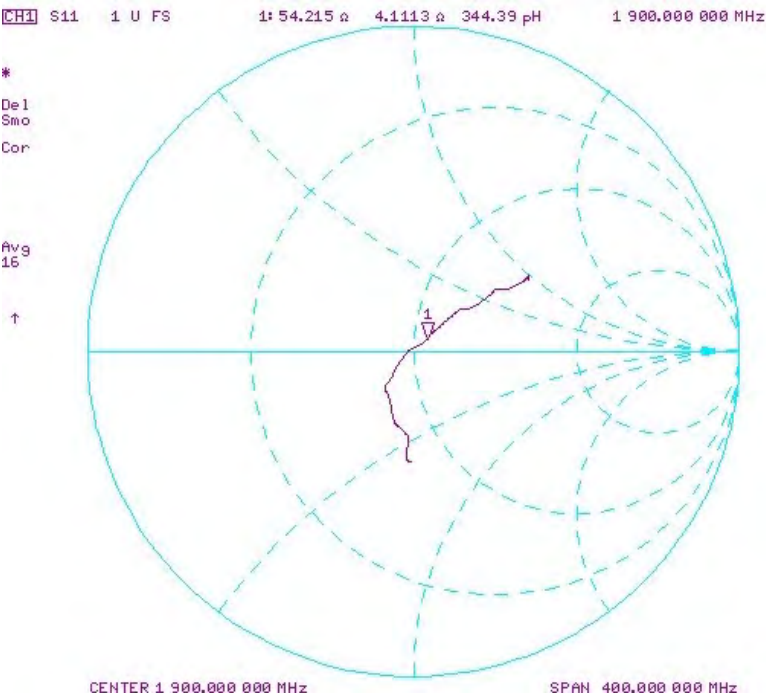
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

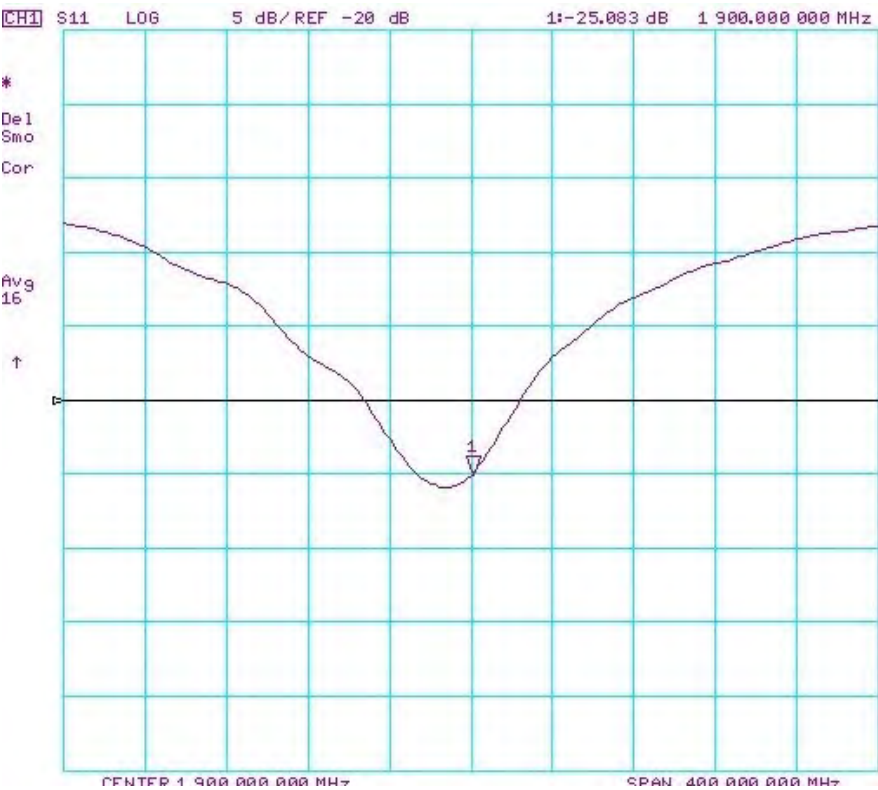
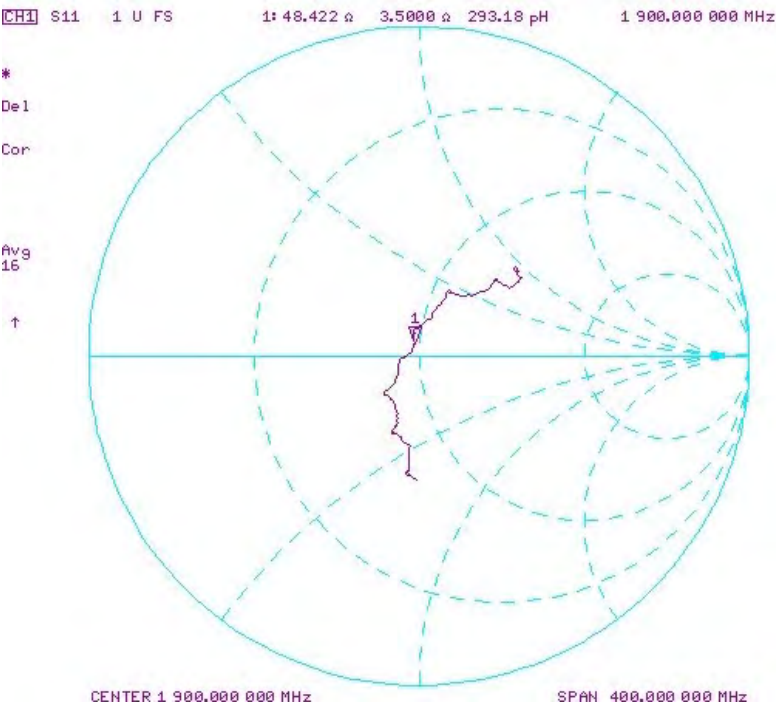
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Head (1g) W/kg @ 20.0 dBm | Measured Head SAR (1g) W/kg @ 20.0 dBm | Deviation 1g (%) | Certificate SAR Target Head (10g) W/kg @ 20.0 dBm | Measured Head SAR (10g) W/kg @ 20.0 dBm | Deviation 10g (%) | Certificate Impedance Head (Ohm) Real | Measured Impedance Head (Ohm) Real | Difference (Ohm) Real | Certificate Impedance Head (Ohm) Imaginary | Measured Impedance Head (Ohm) Imaginary | Difference (Ohm) Imaginary | Certificate Return Loss Head (dB) | Measured Return Loss Head (dB) | Deviation (%) | PASS/FAIL |
|------------------|----------------|-----------------------------------|--------------------------------------------------|----------------------------------------|------------------|---------------------------------------------------|-----------------------------------------|-------------------|---------------------------------------|------------------------------------|-----------------------|--------------------------------------------|-----------------------------------------|----------------------------|-----------------------------------|--------------------------------|---------------|-----------|
| 5/14/2018        | 5/14/2019      | 1.199                             | 4.02                                             | 3.98                                   | -1.00%           | 2.11                                              | 2.05                                    | -2.84%            | 53                                    | 54.2                               | 1.2                   | 8                                          | 4.1                                     | 3.9                        | -21.6                             | -25.8                          | -19.30%       | PASS      |
| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Body (1g) W/kg @ 20.0 dBm | Measured Body SAR (1g) W/kg @ 20.0 dBm | Deviation 1g (%) | Certificate SAR Target Body (10g) W/kg @ 20.0 dBm | Measured Body SAR (10g) W/kg @ 20.0 dBm | Deviation 10g (%) | Certificate Impedance Body (Ohm) Real | Measured Impedance Body (Ohm) Real | Difference (Ohm) Real | Certificate Impedance Body (Ohm) Imaginary | Measured Impedance Body (Ohm) Imaginary | Difference (Ohm) Imaginary | Certificate Return Loss Body (dB) | Measured Return Loss Body (dB) | Deviation (%) | PASS/FAIL |
| 5/14/2018        | 5/14/2019      | 1.199                             | 3.99                                             | 3.97                                   | -0.50%           | 2.12                                              | 2.04                                    | -3.77%            | 47.1                                  | 46.4                               | -1.3                  | 7.4                                        | 3.5                                     | 3.9                        | -21.8                             | -25.1                          | -15.10%       | PASS      |

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





Accredited by the Swiss Accreditation Service (SAS)  
 The Swiss Accreditation Service is one of the signatories to the EA  
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D2300V2-1038\_Mar18**

## CALIBRATION CERTIFICATE

Object **D2300V2 - SN:1038**

Calibration procedure(s) **QA CAL-05.v10**  
**Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **March 07, 2018**

SC ✓  
 3/21/18  
 SC ✓  
 4/25/19

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter NRP             | SN: 104778         | 04-Apr-17 (No. 217-02521/02522)   | Apr-18                 |
| Power sensor NRP-Z91        | SN: 103244         | 04-Apr-17 (No. 217-02521)         | Apr-18                 |
| Power sensor NRP-Z91        | SN: 103245         | 04-Apr-17 (No. 217-02522)         | Apr-18                 |
| Reference 20 dB Attenuator  | SN: 5058 (20k)     | 07-Apr-17 (No. 217-02528)         | Apr-18                 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 07-Apr-17 (No. 217-02529)         | Apr-18                 |
| Reference Probe EX3DV4      | SN: 7349           | 30-Dec-17 (No. EX3-7349_Dec17)    | Dec-18                 |
| DAE4                        | SN: 601            | 26-Oct-17 (No. DAE4-601_Oct17)    | Oct-18                 |
| Secondary Standards         | ID #               | Check Date (in house)             | Scheduled Check        |
| Power meter EPM-442A        | SN: GB37480704     | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| Power sensor HP 8481A       | SN: US37292783     | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| Power sensor HP 8481A       | SN: MY41092317     | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| RF generator R&S SMT-06     | SN: 100972         | 15-Jun-15 (in house check Oct-16) | In house check: Oct-18 |
| Network Analyzer HP 8753E   | SN: US37390585     | 18-Oct-01 (in house check Oct-17) | In house check: Oct-18 |

Calibrated by: **Claudio Leubler** **Laboratory Technician**

Signature

Approved by: **Katja Pokovic** **Technical Manager**

Issued: March 9, 2018

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Accreditation Service (SAS)  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

**Glossary:**

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A   | not applicable or not measured  |

**Calibration is Performed According to the Following Standards:**

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

**Additional Documentation:**

- DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                              |                        |             |
|------------------------------|------------------------|-------------|
| DASY Version                 | DASY5                  | V52.10.0    |
| Extrapolation                | Advanced Extrapolation |             |
| Phantom                      | Modular Flat Phantom   |             |
| Distance Dipole Center - TSL | 10 mm                  | with Spacer |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm      |             |
| Frequency                    | 2300 MHz $\pm$ 1 MHz   |             |

## Head TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C             | 39.5           | 1.67 mho/m           |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2) °C | 38.6 $\pm$ 6 % | 1.70 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

## SAR result with Head TSL

|                                                       |                    |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                              |
| SAR measured                                          | 250 mW input power | 12.5 W/kg                    |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 49.3 W/kg $\pm$ 17.0 % (k=2) |

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                              |
| SAR measured                                            | 250 mW input power | 5.94 W/kg                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 23.6 W/kg $\pm$ 16.5 % (k=2) |

## Body TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Body TSL parameters             | 22.0 °C             | 52.9           | 1.81 mho/m           |
| Measured Body TSL parameters            | (22.0 $\pm$ 0.2) °C | 51.6 $\pm$ 6 % | 1.86 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

## SAR result with Body TSL

|                                                       |                    |                              |
|-------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL | Condition          |                              |
| SAR measured                                          | 250 mW input power | 11.9 W/kg                    |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | 46.7 W/kg $\pm$ 17.0 % (k=2) |

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                              |
| SAR measured                                            | 250 mW input power | 5.69 W/kg                    |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 22.5 W/kg $\pm$ 16.5 % (k=2) |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 47.8 $\Omega$ - 4.9 j $\Omega$ |
| Return Loss                          | - 25.2 dB                      |

### Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 45.9 $\Omega$ - 3.4 j $\Omega$ |
| Return Loss                          | - 25.0 dB                      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.170 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |               |
|-----------------|---------------|
| Manufactured by | SPEAG         |
| Manufactured on | July 02, 2013 |

## DASY5 Validation Report for Head TSL

Date: 07.03.2018

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2300 MHz; Type: D2300V2; Serial: D2300V2 - SN:1038**

Communication System: UID 0 - CW; Frequency: 2300 MHz

Medium parameters used:  $f = 2300$  MHz;  $\sigma = 1.7$  S/m;  $\epsilon_r = 38.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.08, 8.08, 8.08); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

### **Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

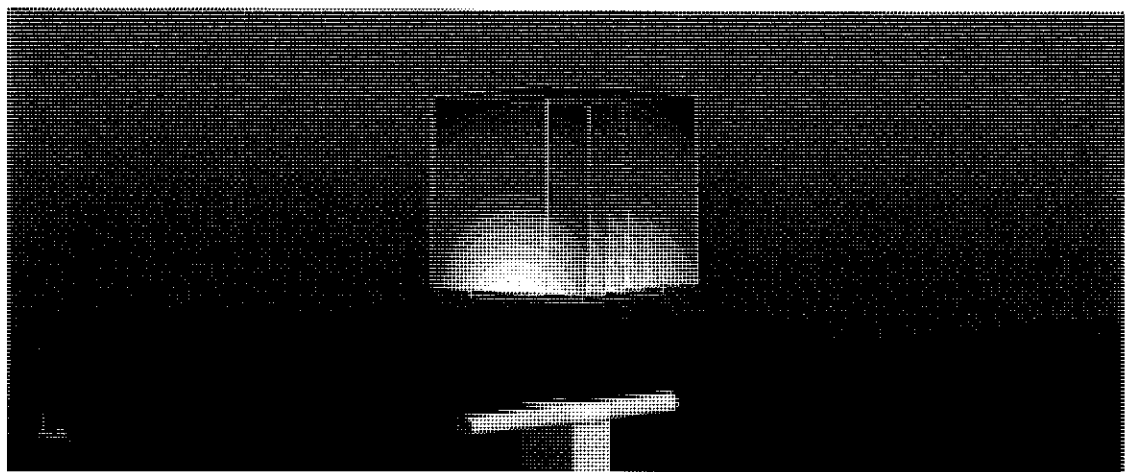
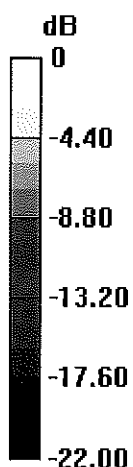
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 112.4 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 24.5 W/kg

**SAR(1 g) = 12.5 W/kg; SAR(10 g) = 5.94 W/kg**

Maximum value of SAR (measured) = 19.6 W/kg



0 dB = 19.6 W/kg = 12.92 dBW/kg

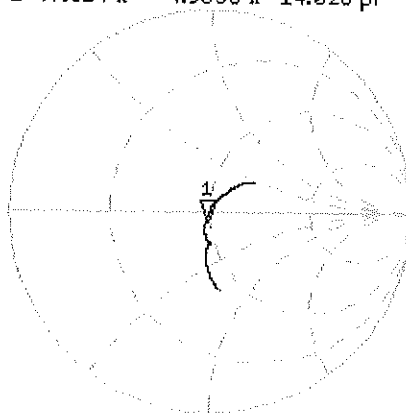
# Impedance Measurement Plot for Head TSL

7 Mar 2018 13:16:07  
 CH1 S11 1 U FS 1: 47.824  $\Omega$  -4.9336  $\Omega$  14.026 pF 2 300.000 000 MHz

\*  
 Del  
 Cor

Avg  
 16

H1d

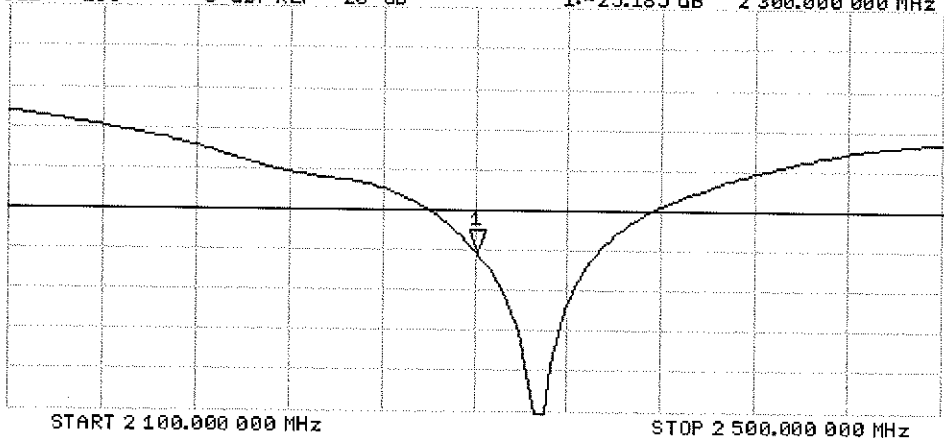


CH2 S11 LOG 5 dB/REF -20 dB 1:-25.185 dB 2 300.000 000 MHz

Cor

Avg  
 16

H1d



## DASY5 Validation Report for Body TSL

Date: 07.03.2018

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2300 MHz; Type: D2300V2; Serial: D2300V2 - SN:1038**

Communication System: UID 0 - CW; Frequency: 2300 MHz

Medium parameters used:  $f = 2300$  MHz;  $\sigma = 1.86$  S/m;  $\epsilon_r = 51.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.08, 8.08, 8.08); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

**Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

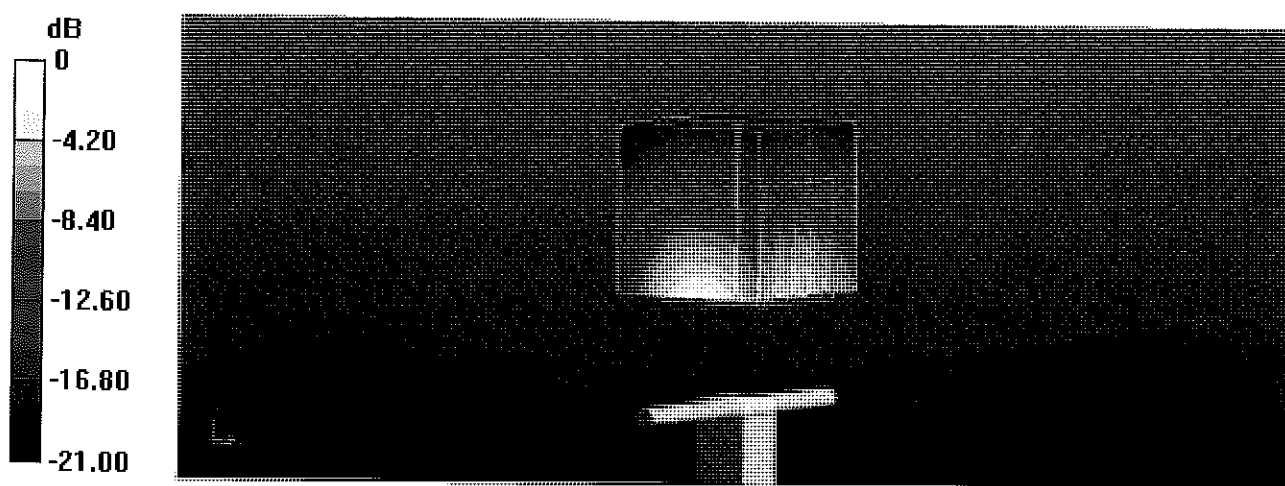
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 104.5 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 23.0 W/kg

**SAR(1 g) = 11.9 W/kg; SAR(10 g) = 5.69 W/kg**

Maximum value of SAR (measured) = 18.2 W/kg

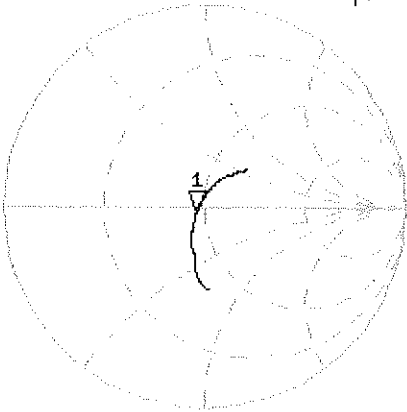


0 dB = 18.2 W/kg = 12.60 dBW/kg

Impedance Measurement Plot for Body TSL

7 Mar 2018 13:11:08  
CH1 S11 1 U FS 1: 45.861  $\Omega$  -3.4160  $\Omega$  20.257 pF 2 300.000 000 MHz

\*  
De1  
Cor

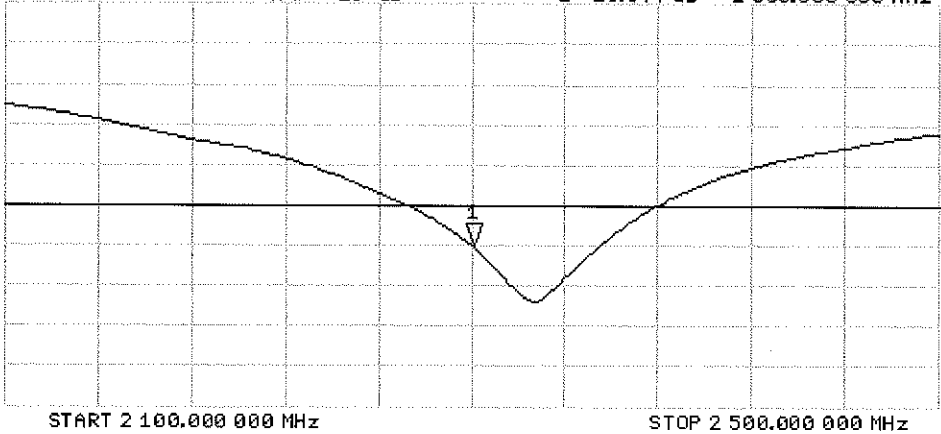


Avg  
16  
H1d

CH2 S11 LOG 5 dB/REF -20 dB 1:-25.044 dB 2 300.000 000 MHz

Cor

Avg  
16  
H1d



# Certification of Calibration

Object D2300V2 – SN: 1038

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

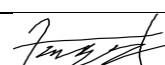
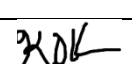
Extended Calibration date: February 25, 2019

Description: SAR Validation Dipole at 2300 MHz.

## Calibration Equipment used:

| Manufacturer       | Model     | Description                                   | Cal Date   | Cal Interval | Cal Due    | Serial Number |
|--------------------|-----------|-----------------------------------------------|------------|--------------|------------|---------------|
| Agilent            | 8753ES    | S-Parameter Network Analyzer                  | 10/2/2018  | Annual       | 10/2/2019  | US39170118    |
| Agilent            | N5182A    | MXG Vector Signal Generator                   | 6/15/2018  | Annual       | 6/15/2019  | MY47420837    |
| Amplifier Research | 15S1G6    | Amplifier                                     | CBT        | N/A          | CBT        | 343972        |
| Anritsu            | MA2411B   | Pulse Power Sensor                            | 10/30/2018 | Annual       | 10/30/2019 | 1207470       |
| Anritsu            | MA2411B   | Pulse Power Sensor                            | 11/20/2018 | Annual       | 11/20/2019 | 1339007       |
| Anritsu            | ML2496A   | Power Meter                                   | 10/21/2018 | Annual       | 10/21/2019 | 1138001       |
| Control Company    | 4040      | Therm./Clock/Humidity Monitor                 | 3/31/2017  | Biennial     | 3/31/2019  | 170232394     |
| Control Company    | 4352      | Ultra Long Stem Thermometer                   | 5/2/2017   | Biennial     | 5/2/2019   | 170330156     |
| Keysight           | 772D      | Dual Directional Coupler                      | CBT        | N/A          | CBT        | MY52180215    |
| Agilent            | 85033E    | 3.5mm Standard Calibration Kit                | 8/13/2018  | Annual       | 8/13/2019  | MY53402352    |
| MiniCircuits       | VLF-6000+ | Low Pass Filter                               | CBT        | N/A          | CBT        | N/A           |
| Mini-Circuits      | BW-N20W5+ | DC to 18 GHz Precision Fixed 20 dB Attenuator | CBT        | N/A          | CBT        | N/A           |
| Narda              | 4772-3    | Attenuator (3dB)                              | CBT        | N/A          | CBT        | 9406          |
| Seekonk            | NC-100    | Torque Wrench                                 | 7/11/2018  | Annual       | 7/11/2019  | N/A           |
| SPEAG              | DAE4      | Dasy Data Acquisition Electronics             | 4/12/2018  | Annual       | 4/12/2019  | 501           |
| SPEAG              | DAE4      | Dasy Data Acquisition Electronics             | 10/18/2018 | Annual       | 10/18/2019 | 1364          |
| SPEAG              | DAK-3.5   | Dielectric Assessment Kit                     | 5/15/2018  | Annual       | 5/15/2019  | 1070          |
| SPEAG              | ES3DV3    | SAR Probe                                     | 4/12/2018  | Annual       | 4/12/2019  | 3275          |
| SPEAG              | EX3DV4    | SAR Probe                                     | 7/20/2018  | Annual       | 7/20/2019  | 7491          |

Measurement Uncertainty =  $\pm 23\%$  (k=2)

|                | Name            | Function           | Signature                                                                             |
|----------------|-----------------|--------------------|---------------------------------------------------------------------------------------|
| Calibrated By: | Sangmin Cha     | Team Lead Engineer |  |
| Approved By:   | Kaitlin O'Keefe | Managing Director  |  |

# DIPOLE CALIBRATION EXTENSION

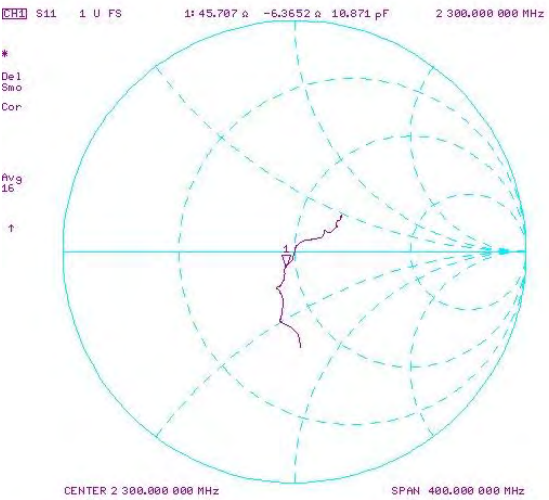
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

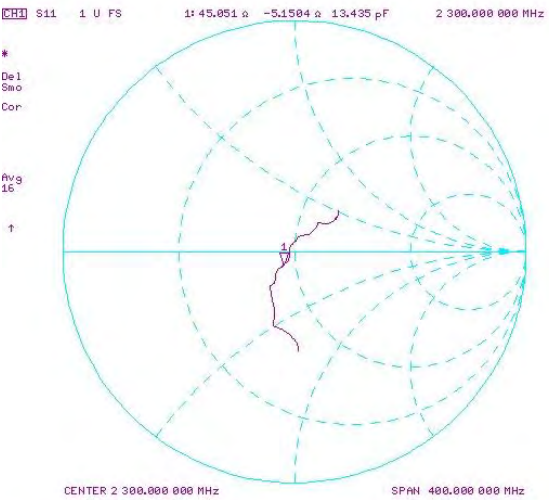
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Head (1g) W/kg @ 20.0 dBm | Measured Head SAR (1g) W/kg @ 20.0 dBm | Deviation 1g (%) | Certificate SAR Target Head (10g) W/kg @ 20.0 dBm | Measured Head SAR (10g) W/kg @ 20.0 dBm | Deviation 10g (%) | Certificate Impedance Head (Ohm) Real | Measured Impedance Head (Ohm) Real | Difference (Ohm) Real | Certificate Impedance Head (Ohm) Imaginary | Measured Impedance Head (Ohm) Imaginary | Difference (Ohm) Imaginary | Certificate Return Loss Head (dB) | Measured Return Loss Head (dB) | Deviation (%) | PASS/FAIL |
|------------------|----------------|-----------------------------------|--------------------------------------------------|----------------------------------------|------------------|---------------------------------------------------|-----------------------------------------|-------------------|---------------------------------------|------------------------------------|-----------------------|--------------------------------------------|-----------------------------------------|----------------------------|-----------------------------------|--------------------------------|---------------|-----------|
| 3/7/2018         | 2/25/2019      | 1.17                              | 4.93                                             | 4.77                                   | -3.25%           | 2.36                                              | 2.29                                    | -2.97%            | 47.8                                  | 45.7                               | 2.1                   | -4.9                                       | -6.4                                    | 1.5                        | -25.2                             | -22.1                          | 12.30%        | PASS      |
| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Body (1g) W/kg @ 20.0 dBm | Measured Body SAR (1g) W/kg @ 20.0 dBm | Deviation 1g (%) | Certificate SAR Target Body (10g) W/kg @ 20.0 dBm | Measured Body SAR (10g) W/kg @ 20.0 dBm | Deviation 10g (%) | Certificate Impedance Body (Ohm) Real | Measured Impedance Body (Ohm) Real | Difference (Ohm) Real | Certificate Impedance Body (Ohm) Imaginary | Measured Impedance Body (Ohm) Imaginary | Difference (Ohm) Imaginary | Certificate Return Loss Body (dB) | Measured Return Loss Body (dB) | Deviation (%) | PASS/FAIL |
| 3/7/2018         | 2/25/2019      | 1.17                              | 4.67                                             | 4.82                                   | 3.21%            | 2.25                                              | 2.27                                    | 0.89%             | 45.9                                  | 45.1                               | 0.8                   | -3.4                                       | -5.2                                    | 1.8                        | -25                               | -22.7                          | 9.20%         | PASS      |

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D2450V2-921 Nov18**

## CALIBRATION CERTIFICATE

Object **D2450V2 - SN:921**

Calibration procedure(s) **QA CAL-05.v10**  
**Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **November 12, 2018**

SC ✓  
 12/11/2018  
 BNV ✓  
 12/31/2019

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards               | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|---------------------------------|--------------------|-----------------------------------|------------------------|
| Power meter NRP                 | SN: 104778         | 04-Apr-18 (No. 217-02672/02673)   | Apr-19                 |
| Power sensor NRP-Z91            | SN: 103244         | 04-Apr-18 (No. 217-02672)         | Apr-19                 |
| Power sensor NRP-Z91            | SN: 103245         | 04-Apr-18 (No. 217-02673)         | Apr-19                 |
| Reference 20 dB Attenuator      | SN: 5058 (20k)     | 04-Apr-18 (No. 217-02682)         | Apr-19                 |
| Type-N mismatch combination     | SN: 5047.2 / 06327 | 04-Apr-18 (No. 217-02683)         | Apr-19                 |
| Reference Probe EX3DV4          | SN: 7349           | 30-Dec-17 (No. EX3-7349_Dec17)    | Dec-18                 |
| DAE4                            | SN: 601            | 04-Oct-18 (No. DAE4-601_Oct18)    | Oct-19                 |
| Secondary Standards             | ID #               | Check Date (in house)             | Scheduled Check        |
| Power meter EPM-442A            | SN: GB37480704     | 07-Oct-15 (in house check Oct-18) | In house check: Oct-20 |
| Power sensor HP 8481A           | SN: US37292783     | 07-Oct-15 (in house check Oct-18) | In house check: Oct-20 |
| Power sensor HP 8481A           | SN: MY41092317     | 07-Oct-15 (in house check Oct-18) | In house check: Oct-20 |
| RF generator R&S SMT-06         | SN: 100972         | 15-Jun-15 (in house check Oct-18) | In house check: Oct-20 |
| Network Analyzer Agilent E8358A | SN: US41080477     | 31-Mar-14 (in house check Oct-18) | In house check: Oct-19 |

Calibrated by: **Manu Seitz** **Laboratory Technician**

Approved by: **Katja Pokovic** **Technical Manager**

Signature

Issued: November 12, 2018

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

### Glossary:

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A   | not applicable or not measured  |

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

### Additional Documentation:

- DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                                     |                        |             |
|-------------------------------------|------------------------|-------------|
| <b>DASY Version</b>                 | DASY5                  | V52.10.2    |
| <b>Extrapolation</b>                | Advanced Extrapolation |             |
| <b>Phantom</b>                      | Modular Flat Phantom   |             |
| <b>Distance Dipole Center - TSL</b> | 10 mm                  | with Spacer |
| <b>Zoom Scan Resolution</b>         | dx, dy, dz = 5 mm      |             |
| <b>Frequency</b>                    | 2450 MHz $\pm$ 1 MHz   |             |

## Head TSL parameters

The following parameters and calculations were applied.

|                                                | <b>Temperature</b>  | <b>Permittivity</b> | <b>Conductivity</b>  |
|------------------------------------------------|---------------------|---------------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 39.2                | 1.80 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 37.9 $\pm$ 6 %      | 1.86 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | < 0.5 °C            | ----                | ----                 |

## SAR result with Head TSL

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | Condition          |                                                |
| SAR measured                                                | 250 mW input power | 13.6 W/kg                                      |
| SAR for nominal Head TSL parameters                         | normalized to 1W   | <b>53.1 W/kg <math>\pm</math> 17.0 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | condition          |                                                |
| SAR measured                                                  | 250 mW input power | 6.28 W/kg                                      |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>24.8 W/kg <math>\pm</math> 16.5 % (k=2)</b> |

## Body TSL parameters

The following parameters and calculations were applied.

|                                                | <b>Temperature</b>  | <b>Permittivity</b> | <b>Conductivity</b>  |
|------------------------------------------------|---------------------|---------------------|----------------------|
| <b>Nominal Body TSL parameters</b>             | 22.0 °C             | 52.7                | 1.95 mho/m           |
| <b>Measured Body TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 51.4 $\pm$ 6 %      | 2.02 mho/m $\pm$ 6 % |
| <b>Body TSL temperature change during test</b> | < 0.5 °C            | ----                | ----                 |

## SAR result with Body TSL

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Body TSL</b> | Condition          |                                                |
| SAR measured                                                | 250 mW input power | 13.0 W/kg                                      |
| SAR for nominal Body TSL parameters                         | normalized to 1W   | <b>50.8 W/kg <math>\pm</math> 17.0 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Body TSL</b> | condition          |                                                |
| SAR measured                                                  | 250 mW input power | 6.03 W/kg                                      |
| SAR for nominal Body TSL parameters                           | normalized to 1W   | <b>23.8 W/kg <math>\pm</math> 16.5 % (k=2)</b> |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $54.7 \Omega + 6.5 j\Omega$ |
| Return Loss                          | - 22.3 dB                   |

### Antenna Parameters with Body TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $50.7 \Omega + 7.8 j\Omega$ |
| Return Loss                          | - 22.2 dB                   |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.157 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |                    |
|-----------------|--------------------|
| Manufactured by | SPEAG              |
| Manufactured on | September 26, 2013 |

## DASY5 Validation Report for Head TSL

Date: 12.11.2018

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:921**

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.86$  S/m;  $\epsilon_r = 37.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.88, 7.88, 7.88) @ 2450 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

### Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

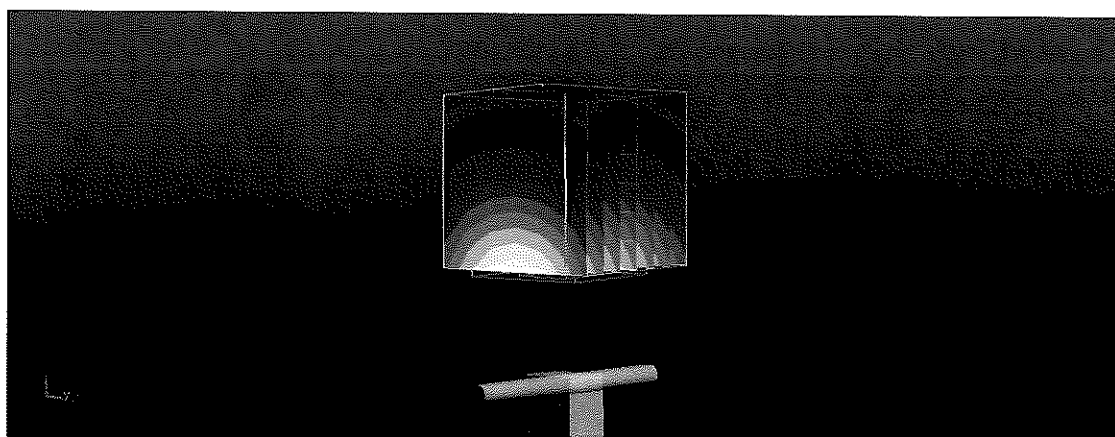
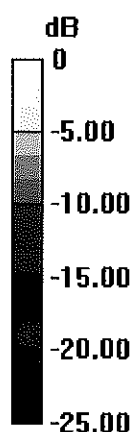
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 117.7 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 27.4 W/kg

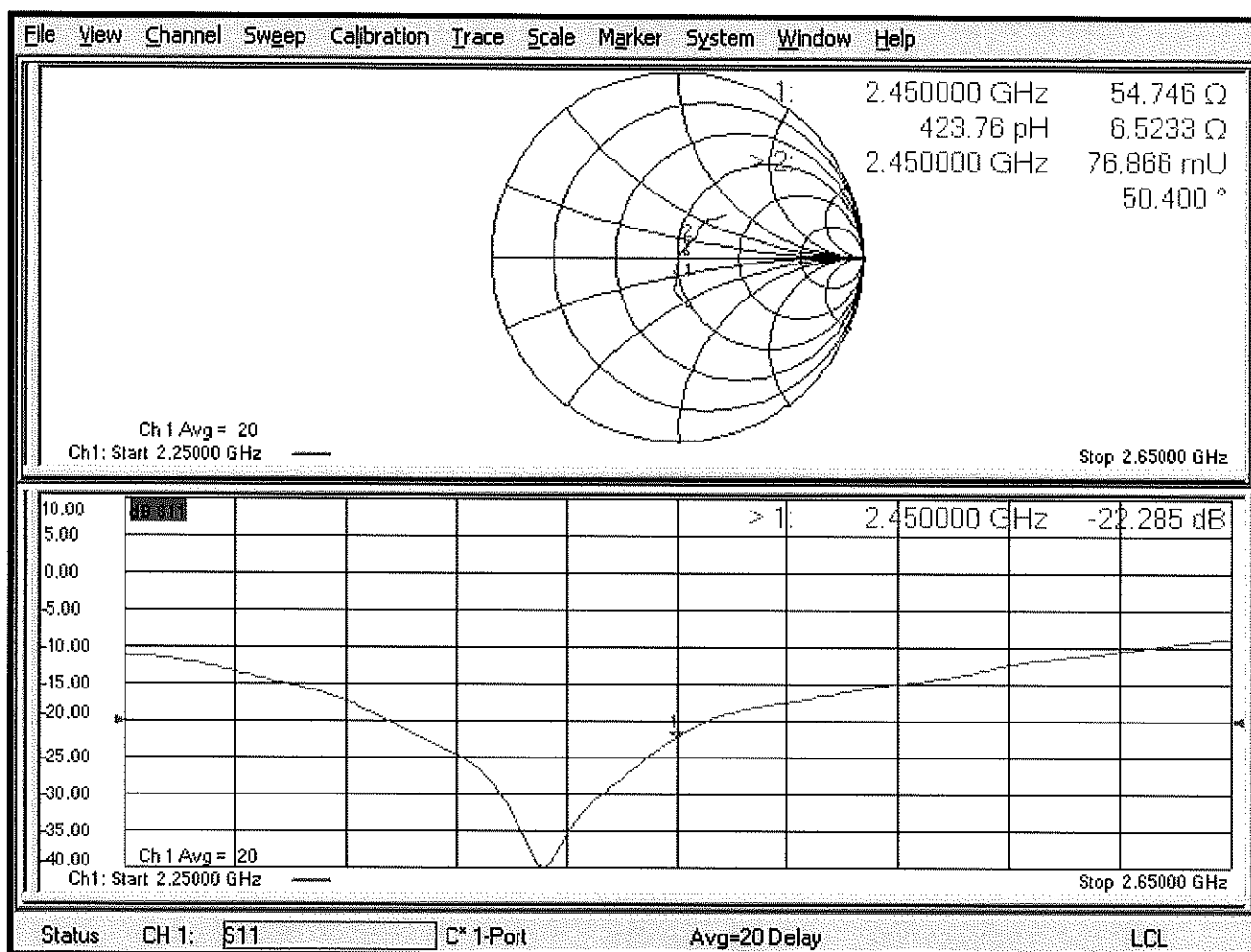
**SAR(1 g) = 13.6 W/kg; SAR(10 g) = 6.28 W/kg**

Maximum value of SAR (measured) = 22.4 W/kg



0 dB = 22.4 W/kg = 13.50 dBW/kg

## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 12.11.2018

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:921**

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 2.02$  S/m;  $\epsilon_r = 51.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.01, 8.01, 8.01) @ 2450 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

### **Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

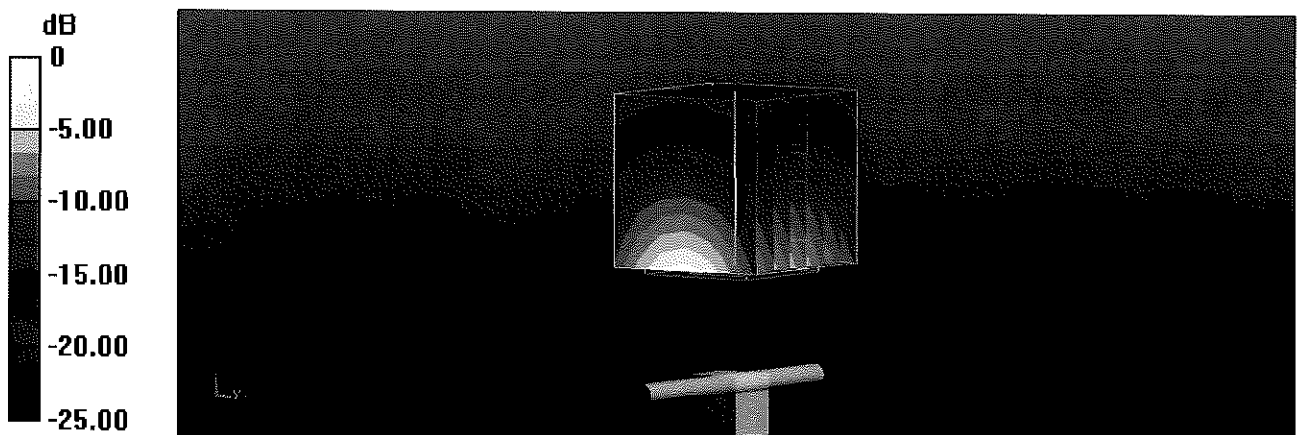
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 108.6 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 26.1 W/kg

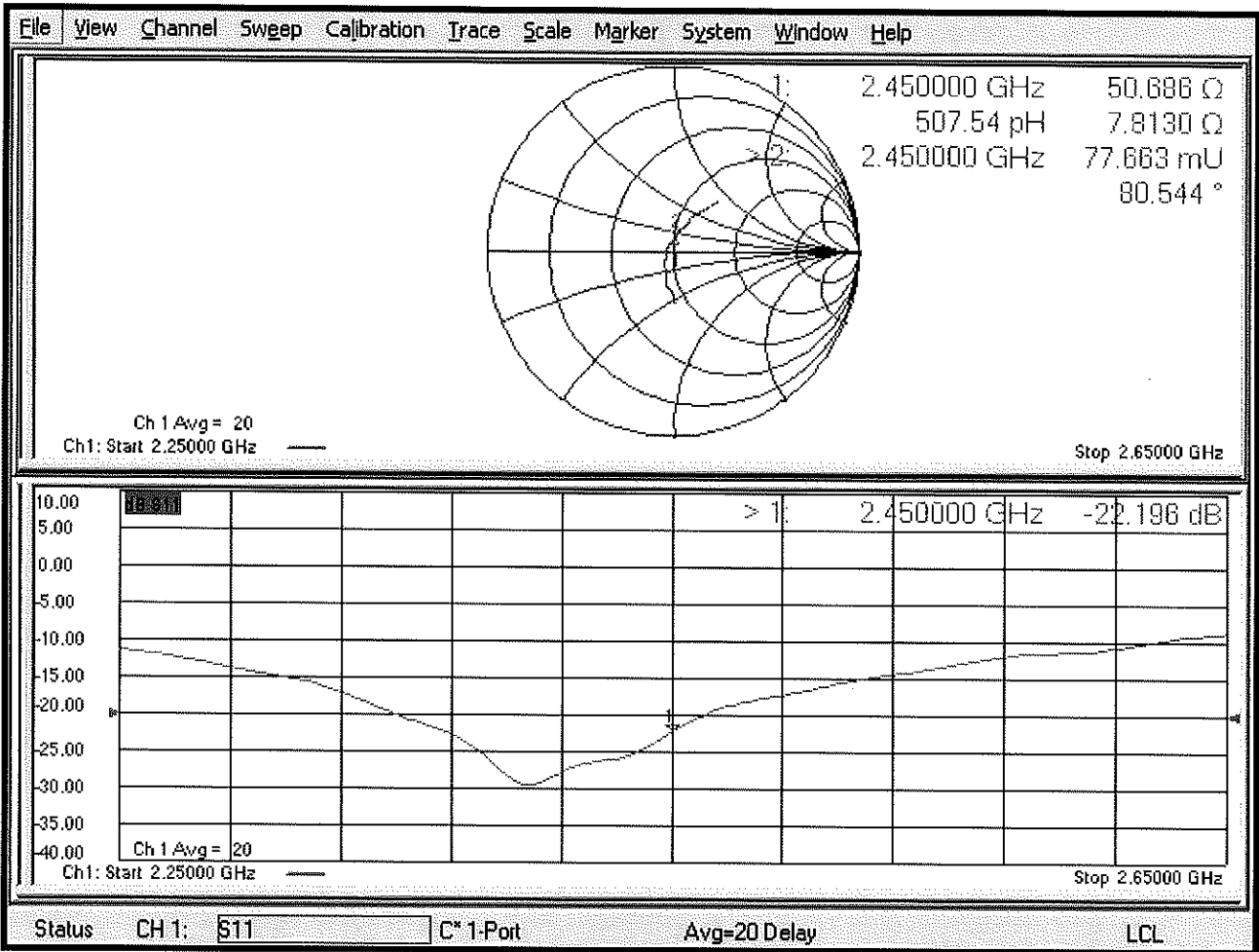
**SAR(1 g) = 13 W/kg; SAR(10 g) = 6.03 W/kg**

Maximum value of SAR (measured) = 21.3 W/kg



0 dB = 21.3 W/kg = 13.28 dBW/kg

Impedance Measurement Plot for Body TSL



# Certification of Calibration

Object D2450V2 – SN: 921

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Extended Calibration date: November 11, 2019

Description: SAR Validation Dipole at 2450 MHz.

## Calibration Equipment used:

| Manufacturer          | Model     | Description                                             | Cal Date   | Cal Interval | Cal Due    | Serial Number |
|-----------------------|-----------|---------------------------------------------------------|------------|--------------|------------|---------------|
| Agilent               | 8753ES    | S-Parameter Network Analyzer                            | 8/26/2019  | Annual       | 8/26/2020  | MY40000670    |
| Agilent               | E4438C    | ESG Vector Signal Generator                             | 6/27/2019  | Annual       | 6/27/2020  | MY45093852    |
| Amplifier Research    | 15S1G6    | Amplifier                                               | CBT        | N/A          | CBT        | 343972        |
| Anritsu               | ML2495A   | Power Meter                                             | 11/20/2018 | Annual       | 11/20/2019 | 1039008       |
| Anritsu               | MA2411B   | Pulse Power Sensor                                      | 11/20/2018 | Annual       | 11/20/2019 | 1027293       |
| Anritsu               | MA2411B   | Pulse Power Sensor                                      | 11/20/2018 | Annual       | 11/20/2019 | 1339007       |
| Control Company       | 4040      | Temperature / Humidity Monitor                          | 2/28/2018  | Biennial     | 2/28/2020  | 150761911     |
| Control Company       | 4352      | Ultra Long Stem Thermometer                             | 2/28/2018  | Biennial     | 2/28/2020  | 170330160     |
| Keysight Technologies | 85033E    | Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm) | 7/2/2019   | Annual       | 7/2/2020   | MY53401181    |
| Keysight              | 772D      | Dual Directional Coupler                                | CBT        | N/A          | CBT        | MY52180215    |
| Mini-Circuits         | BW-N20W5+ | DC to 18 GHz Precision Fixed 20 dB Attenuator           | CBT        | N/A          | CBT        | N/A           |
| Mini-Circuits         | NLP-2950+ | Low Pass Filter DC to 2700 MHz                          | CBT        | N/A          | CBT        | N/A           |
| Narda                 | 4772-3    | Attenuator (3dB)                                        | CBT        | N/A          | CBT        | 9406          |
| Pasternack            | PE2209-10 | Bidirectional Coupler                                   | CBT        | N/A          | CBT        | N/A           |
| Seekonk               | NC-100    | Torque Wrench                                           | 5/4/2018   | Biennial     | 5/4/2020   | 22216         |
| SPEAG                 | DAK-3.5   | Dielectric Assessment Kit                               | 5/7/2019   | Annual       | 5/7/2020   | 1070          |
| SPEAG                 | EX3DV4    | SAR Probe                                               | 1/24/2019  | Annual       | 1/24/2020  | 7490          |
| SPEAG                 | DAE4      | Data Acquisition Electronics                            | 1/15/2019  | Annual       | 1/15/2020  | 1532          |

Measurement Uncertainty =  $\pm 23\%$  (k=2)

|                | Name            | Function                 | Signature           |
|----------------|-----------------|--------------------------|---------------------|
| Calibrated By: | Parker Jones    | Team Lead Engineer       | <i>Parker Jones</i> |
| Approved By:   | Kaitlin O'Keefe | Senior Technical Manager | <i>KOK</i>          |

# DIPOLE CALIBRATION EXTENSION

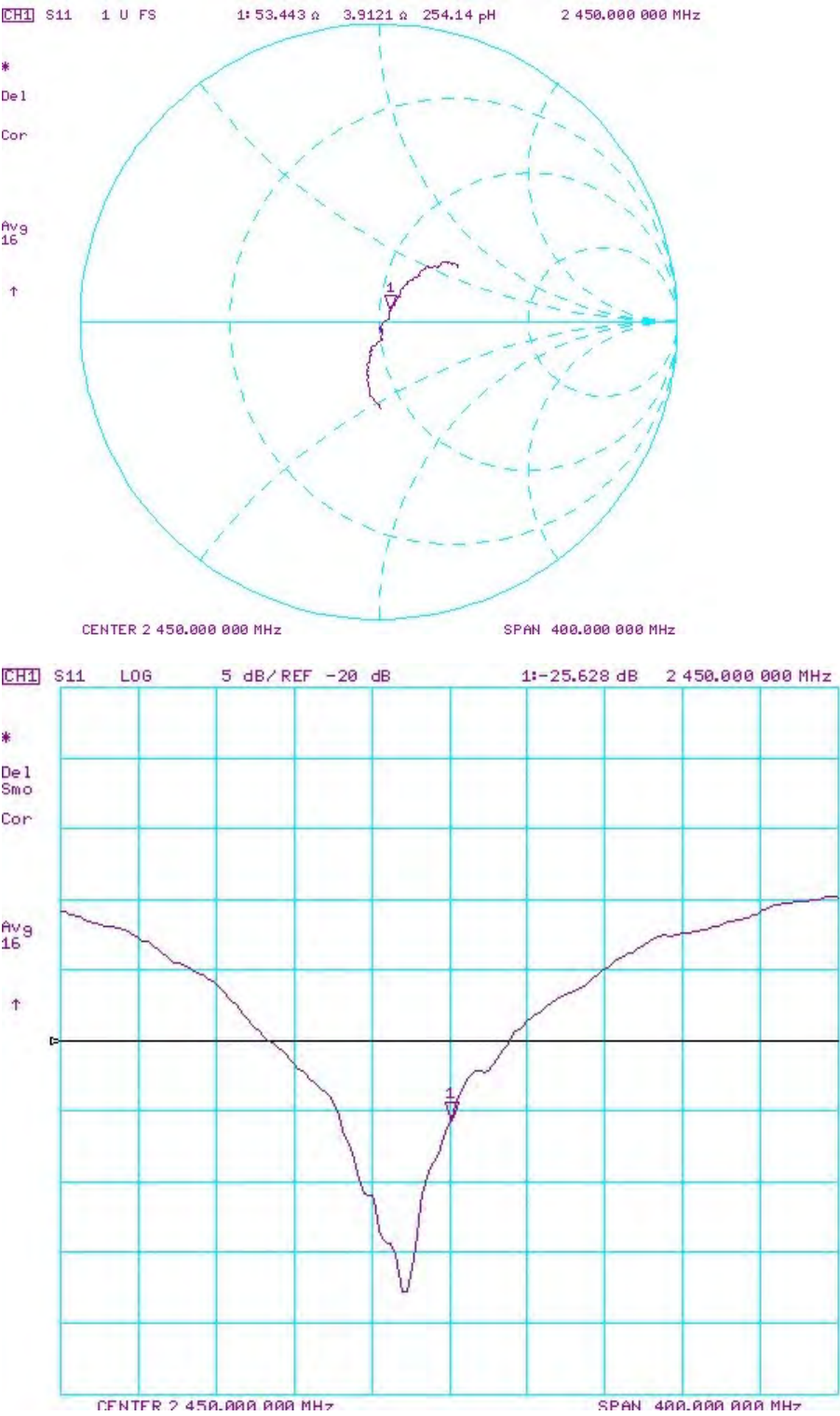
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

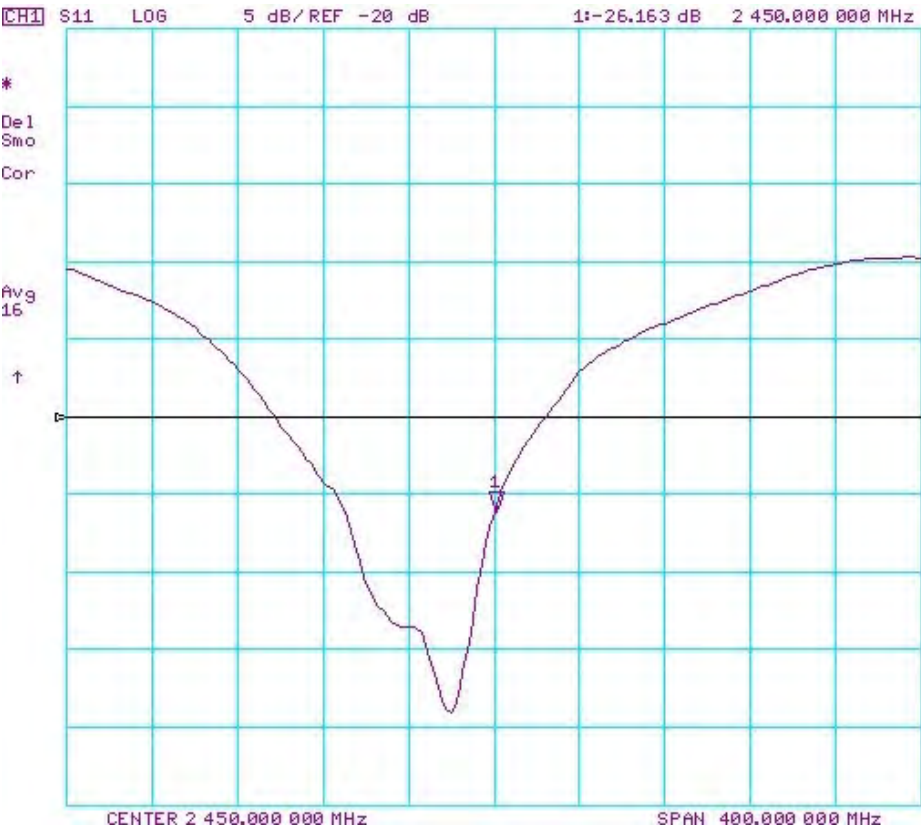
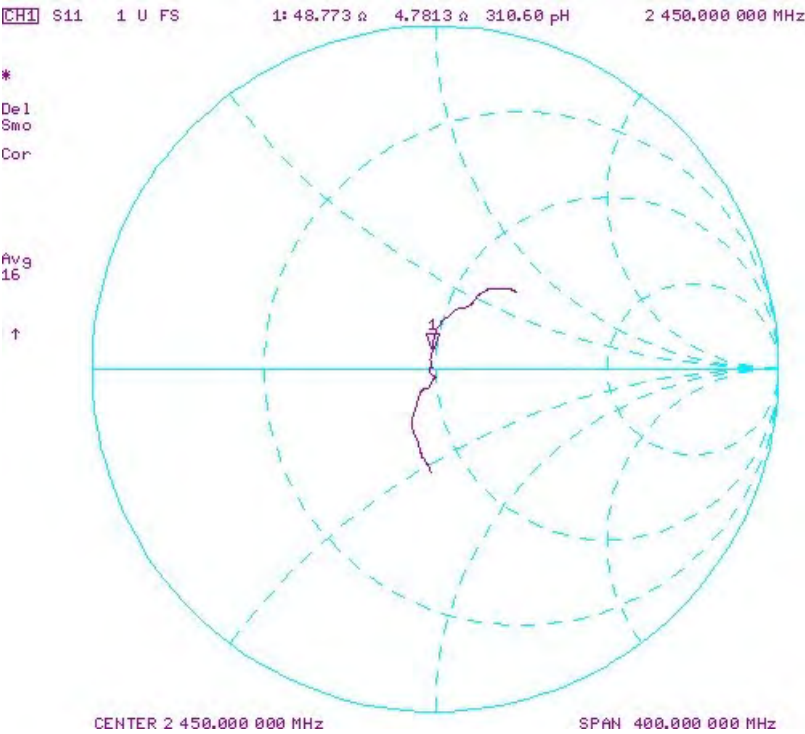
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Head (1g) W/kg @ 20.0 dBm | Measured Head SAR (1g) W/kg @ 20.0 dBm | Deviation 1g (%) | Certificate SAR Target Body (10g) W/kg @ 20.0 dBm | Measured Body SAR (10g) W/kg @ 20.0 dBm | Deviation 10g (%) | Certificate Impedance Head (Ohm) Real | Measured Impedance Head (Ohm) Real | Difference (Ohm) Real | Certificate Impedance Head (Ohm) Imaginary | Measured Impedance Head (Ohm) Imaginary | Difference (Ohm) Imaginary | Certificate Return Loss Head (dB) | Measured Return Loss Head (dB) | Deviation (%) | PASS/FAIL |
|------------------|----------------|-----------------------------------|--------------------------------------------------|----------------------------------------|------------------|---------------------------------------------------|-----------------------------------------|-------------------|---------------------------------------|------------------------------------|-----------------------|--------------------------------------------|-----------------------------------------|----------------------------|-----------------------------------|--------------------------------|---------------|-----------|
| 11/12/2018       | 11/11/2019     | 1.157                             | 5.31                                             | 5.28                                   | -0.56%           | 2.48                                              | 2.38                                    | -4.03%            | 54.7                                  | 53.4                               | 1.3                   | 6.5                                        | 3.9                                     | 2.6                        | -22.3                             | -25.6                          | -14.80%       | PASS      |
| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Body (1g) W/kg @ 20.0 dBm | Measured Body SAR (1g) W/kg @ 20.0 dBm | Deviation 1g (%) | Certificate SAR Target Body (10g) W/kg @ 20.0 dBm | Measured Body SAR (10g) W/kg @ 20.0 dBm | Deviation 10g (%) | Certificate Impedance Body (Ohm) Real | Measured Impedance Body (Ohm) Real | Difference (Ohm) Real | Certificate Impedance Body (Ohm) Imaginary | Measured Impedance Body (Ohm) Imaginary | Difference (Ohm) Imaginary | Certificate Return Loss Body (dB) | Measured Return Loss Body (dB) | Deviation (%) | PASS/FAIL |
| 11/12/2018       | 11/11/2019     | 1.157                             | 5.08                                             | 5.41                                   | 6.50%            | 2.38                                              | 2.47                                    | 3.78%             | 50.7                                  | 48.8                               | 1.9                   | 7.8                                        | 4.8                                     | 3                          | -22.2                             | -26.2                          | -18.00%       | PASS      |

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D2450V2-945\_May18**

## CALIBRATION CERTIFICATE

Object **D2450V2 - SN:945**

Calibration procedure(s) **QA CAL-05.v10**  
**Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **May 16, 2018**

*SCV*  
*5/31/2018*  
*BNV*  
*06/01/2019*

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)      | Scheduled Calibration |
|-----------------------------|--------------------|---------------------------------|-----------------------|
| Power meter NRP             | SN: 104778         | 04-Apr-18 (No. 217-02672/02673) | Apr-19                |
| Power sensor NRP-Z91        | SN: 103244         | 04-Apr-18 (No. 217-02672)       | Apr-19                |
| Power sensor NRP-Z91        | SN: 103245         | 04-Apr-18 (No. 217-02673)       | Apr-19                |
| Reference 20 dB Attenuator  | SN: 5058 (20k)     | 04-Apr-18 (No. 217-02682)       | Apr-19                |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 04-Apr-18 (No. 217-02683)       | Apr-19                |
| Reference Probe EX3DV4      | SN: 7349           | 30-Dec-17 (No. EX3-7349_Dec17)  | Dec-18                |
| DAE4                        | SN: 601            | 26-Oct-17 (No. DAE4-601_Oct17)  | Oct-18                |

| Secondary Standards       | ID #           | Check Date (in house)             | Scheduled Check        |
|---------------------------|----------------|-----------------------------------|------------------------|
| Power meter EPM-442A      | SN: GB37480704 | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| Power sensor HP 8481A     | SN: US37292783 | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| Power sensor HP 8481A     | SN: MY41092317 | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| RF generator R&S SMT-06   | SN: 100972     | 15-Jun-15 (in house check Oct-16) | In house check: Oct-18 |
| Network Analyzer HP 8753E | SN: US37390585 | 18-Oct-01 (in house check Oct-17) | In house check: Oct-18 |

|                |               |                       |                    |
|----------------|---------------|-----------------------|--------------------|
|                | Name          | Function              | Signature          |
| Calibrated by: | Manu Seltz    | Laboratory Technician | <i>[Signature]</i> |
| Approved by:   | Katja Pokovic | Technical Manager     | <i>[Signature]</i> |

Issued: May 17, 2018

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

**Glossary:**

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A   | not applicable or not measured  |

**Calibration is Performed According to the Following Standards:**

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

**Additional Documentation:**

- DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                                     |                        |             |
|-------------------------------------|------------------------|-------------|
| <b>DASY Version</b>                 | DASY5                  | V52.10.1    |
| <b>Extrapolation</b>                | Advanced Extrapolation |             |
| <b>Phantom</b>                      | Modular Flat Phantom   |             |
| <b>Distance Dipole Center - TSL</b> | 10 mm                  | with Spacer |
| <b>Zoom Scan Resolution</b>         | dx, dy, dz = 5 mm      |             |
| <b>Frequency</b>                    | 2450 MHz $\pm$ 1 MHz   |             |

## Head TSL parameters

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 39.2           | 1.80 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 38.2 $\pm$ 6 % | 1.85 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | < 0.5 °C            | ----           | ----                 |

## SAR result with Head TSL

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | Condition          |                                                |
| SAR measured                                                | 250 mW input power | 13.0 W/kg                                      |
| SAR for nominal Head TSL parameters                         | normalized to 1W   | <b>51.0 W/kg <math>\pm</math> 17.0 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | condition          |                                                |
| SAR measured                                                  | 250 mW input power | 6.02 W/kg                                      |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>23.8 W/kg <math>\pm</math> 16.5 % (k=2)</b> |

## Body TSL parameters

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Body TSL parameters</b>             | 22.0 °C             | 52.7           | 1.95 mho/m           |
| <b>Measured Body TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 52.3 $\pm$ 6 % | 1.99 mho/m $\pm$ 6 % |
| <b>Body TSL temperature change during test</b> | < 0.5 °C            | ----           | ----                 |

## SAR result with Body TSL

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Body TSL</b> | Condition          |                                                |
| SAR measured                                                | 250 mW input power | 12.5 W/kg                                      |
| SAR for nominal Body TSL parameters                         | normalized to 1W   | <b>49.4 W/kg <math>\pm</math> 17.0 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Body TSL</b> | condition          |                                                |
| SAR measured                                                  | 250 mW input power | 5.83 W/kg                                      |
| SAR for nominal Body TSL parameters                           | normalized to 1W   | <b>23.2 W/kg <math>\pm</math> 16.5 % (k=2)</b> |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $56.1 \Omega + 3.7 j\Omega$ |
| Return Loss                          | - 23.5 dB                   |

### Antenna Parameters with Body TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $51.9 \Omega + 5.0 j\Omega$ |
| Return Loss                          | - 25.7 dB                   |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.157 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |                |
|-----------------|----------------|
| Manufactured by | SPEAG          |
| Manufactured on | March 15, 2014 |

## DASY5 Validation Report for Head TSL

Date: 16.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:945**

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.85$  S/m;  $\epsilon_r = 38.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.88, 7.88, 7.88) @ 2450 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

### Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

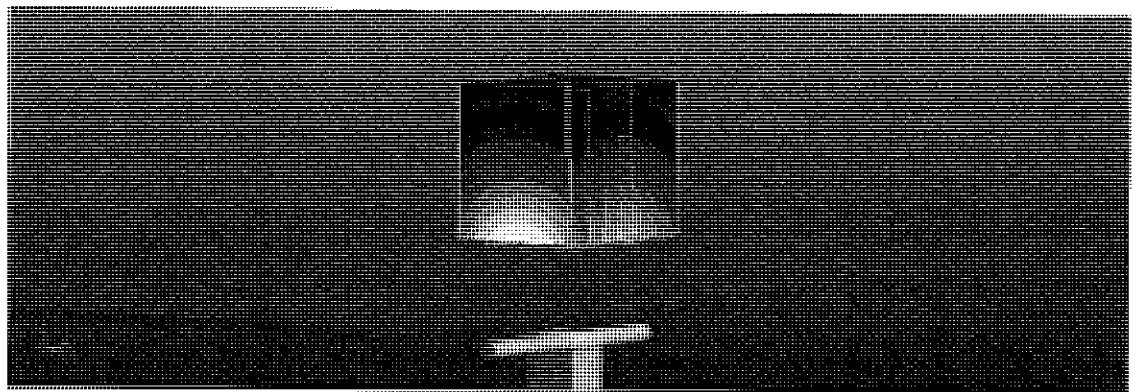
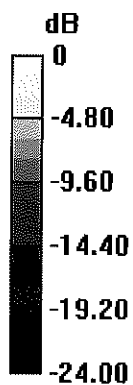
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 114.8 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 25.9 W/kg

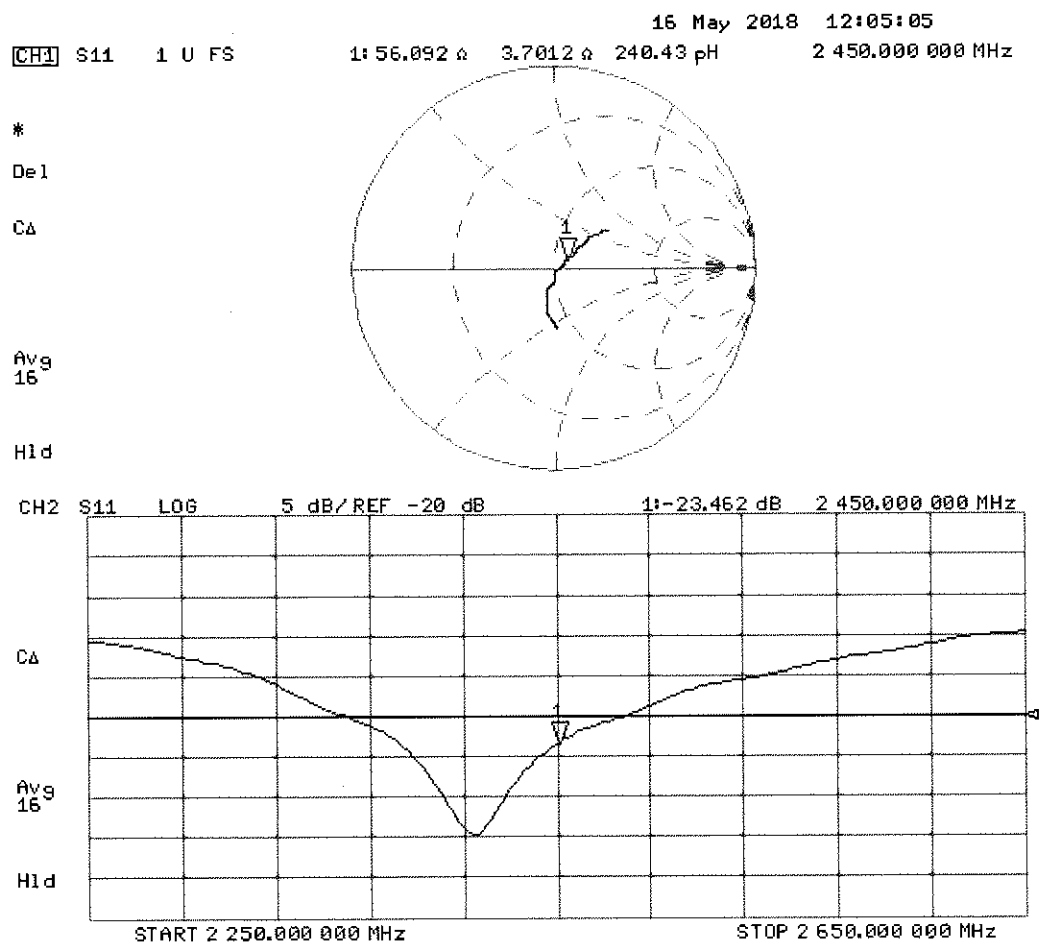
**SAR(1 g) = 13 W/kg; SAR(10 g) = 6.02 W/kg**

Maximum value of SAR (measured) = 21.4 W/kg



0 dB = 21.4 W/kg = 13.30 dBW/kg

# Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 16.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:945**

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.99$  S/m;  $\epsilon_r = 52.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.01, 8.01, 8.01) @ 2450 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

### **Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

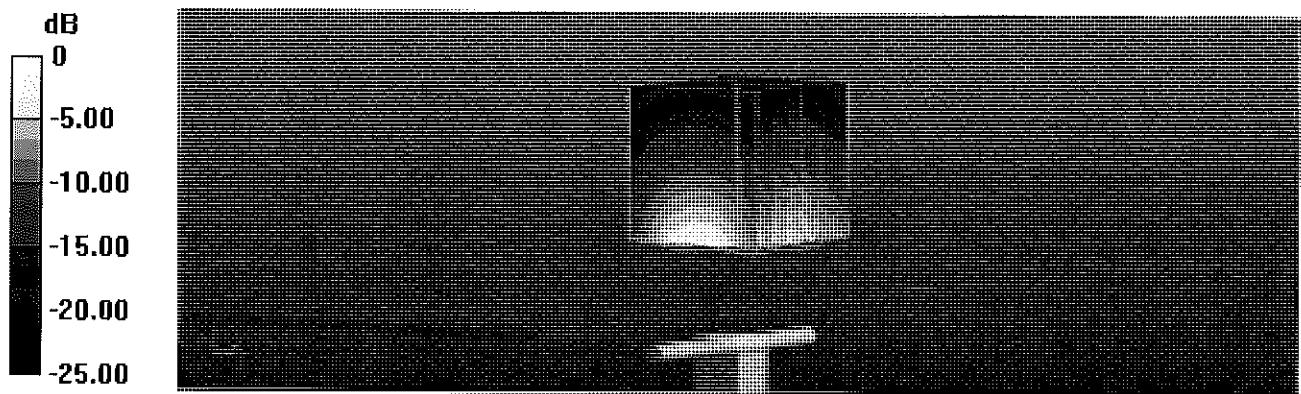
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 106.8 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 25.0 W/kg

**SAR(1 g) = 12.5 W/kg; SAR(10 g) = 5.83 W/kg**

Maximum value of SAR (measured) = 20.2 W/kg

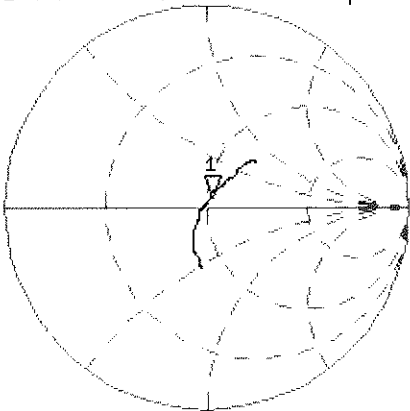


0 dB = 20.2 W/kg = 13.05 dBW/kg

Impedance Measurement Plot for Body TSL

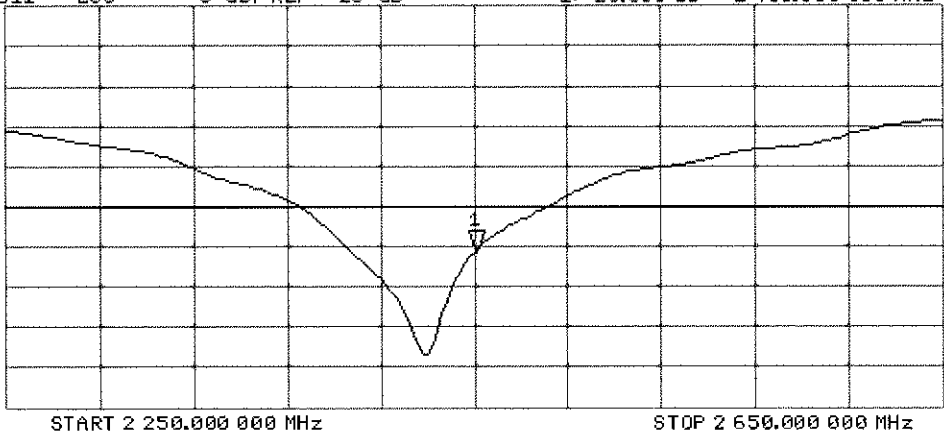
16 May 2018 12:03:43  
[CH1] S11 1 U FS 1: 51.910  $\Omega$  4.9629  $\Omega$  322.40  $\mu$ H 2 450.000 000 MHz

\*  
De1  
CA  
Avg  
16  
H1d



CH2 S11 LOG 5 dB/REF -20 dB 1:-25.659 dB 2 450.000 000 MHz

CA  
Avg  
16  
H1d



# Certification of Calibration

Object D2450V2 – SN: 945

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Extended Calibration date: May 16, 2019

Description: SAR Validation Dipole at 2450 MHz.

## Calibration Equipment used:

| Manufacturer          | Model     | Description                                             | Cal Date   | Cal Interval | Cal Due    | Serial Number |
|-----------------------|-----------|---------------------------------------------------------|------------|--------------|------------|---------------|
| Agilent               | 8753ES    | S-Parameter Network Analyzer                            | 10/2/2018  | Annual       | 10/2/2019  | US39170118    |
| Agilent               | N5182A    | MXG Vector Signal Generator                             | 6/15/2018  | Annual       | 6/15/2019  | MY47420837    |
| Amplifier Research    | 15S1G6    | Amplifier                                               | CBT        | N/A          | CBT        | 343972        |
| Anritsu               | ML2495A   | Power Meter                                             | 10/21/2018 | Annual       | 10/21/2019 | 941001        |
| Anritsu               | MA2411B   | Pulse Power Sensor                                      | 10/30/2018 | Annual       | 10/30/2019 | 1207470       |
| Anritsu               | MA2411B   | Pulse Power Sensor                                      | 11/20/2018 | Annual       | 11/20/2019 | 1339007       |
| Control Company       | 4040      | Temperature / Humidity Monitor                          | 2/28/2018  | Biennial     | 2/28/2020  | 150761911     |
| Control Company       | 4352      | Ultra Long Stem Thermometer                             | 2/28/2018  | Biennial     | 2/28/2020  | 170330160     |
| Keysight              | 772D      | Dual Directional Coupler                                | CBT        | N/A          | CBT        | MY52180215    |
| Keysight Technologies | 85033E    | Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm) | 6/4/2018   | Annual       | 6/4/2019   | MY53401181    |
| Mini-Circuits         | BW-N20W5+ | DC to 18 GHz Precision Fixed 20 dB Attenuator           | CBT        | N/A          | CBT        | N/A           |
| Mini-Circuits         | NLP-2950+ | Low Pass Filter DC to 2700 MHz                          | CBT        | N/A          | CBT        | N/A           |
| Narda                 | 4772-3    | Attenuator (3dB)                                        | CBT        | N/A          | CBT        | 9406          |
| Pasternack            | PE2209-10 | Bidirectional Coupler                                   | CBT        | N/A          | CBT        | N/A           |
| Pasternack            | PE5011-1  | Torque Wrench                                           | 7/19/2017  | Biennial     | 7/19/2019  | N/A           |
| SPEAG                 | DAKS-3.5  | Portable DAK                                            | 9/11/2018  | Annual       | 9/11/2019  | 1045          |
| SPEAG                 | EX3DV4    | SAR Probe                                               | 7/20/2018  | Annual       | 7/20/2019  | 7416          |
| SPEAG                 | DAE4      | Dasy Data Acquisition Electronics                       | 7/10/2018  | Annual       | 7/10/2019  | 1402          |

Measurement Uncertainty =  $\pm 23\%$  (k=2)

|                | Name            | Function                 | Signature           |
|----------------|-----------------|--------------------------|---------------------|
| Calibrated By: | Parker Jones    | Team Lead Engineer       | <i>Parker Jones</i> |
| Approved By:   | Kaitlin O'Keefe | Senior Technical Manager | <i>KOK</i>          |

# DIPOLE CALIBRATION EXTENSION

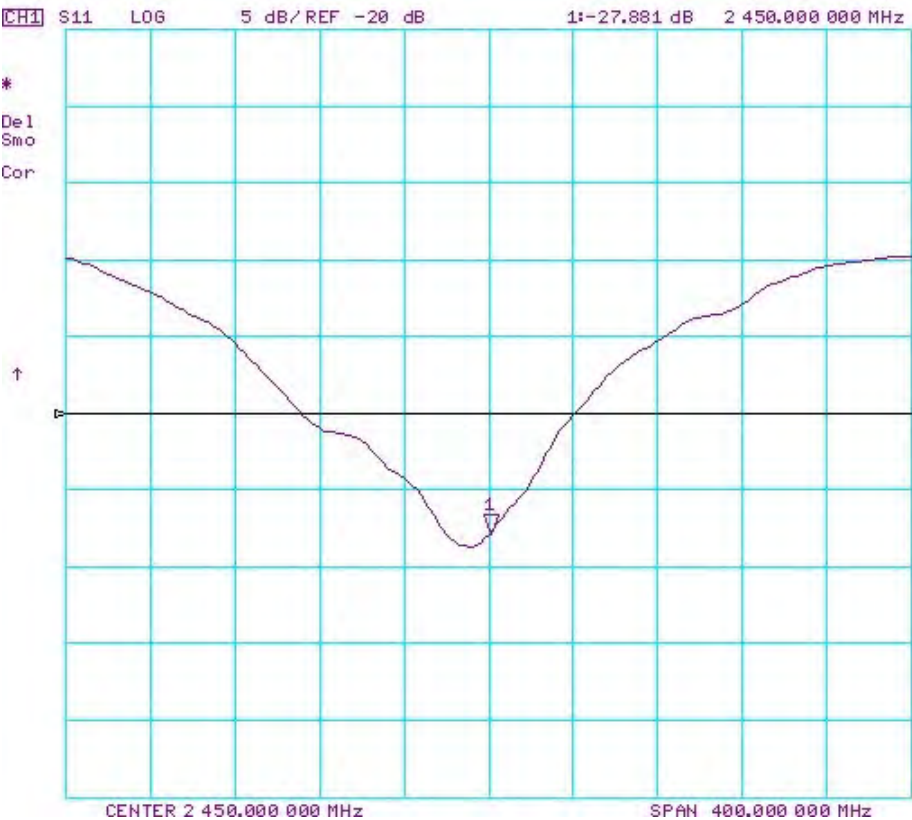
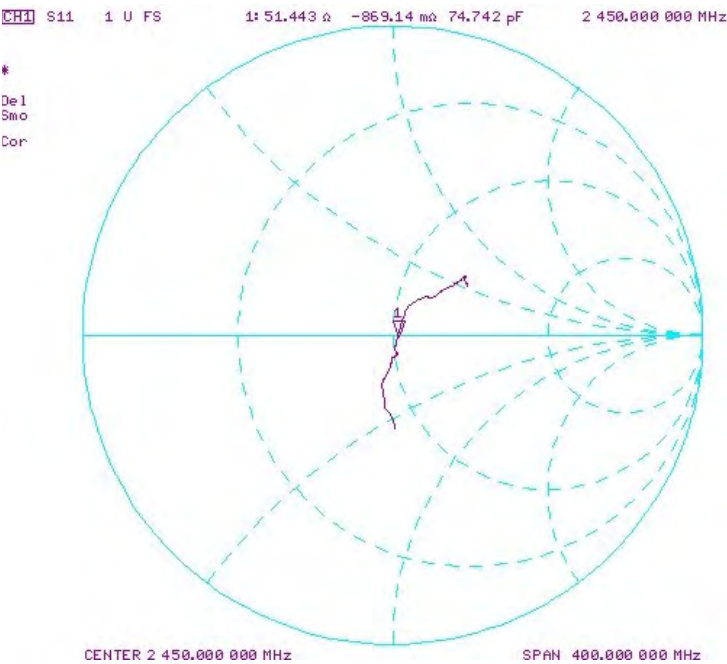
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

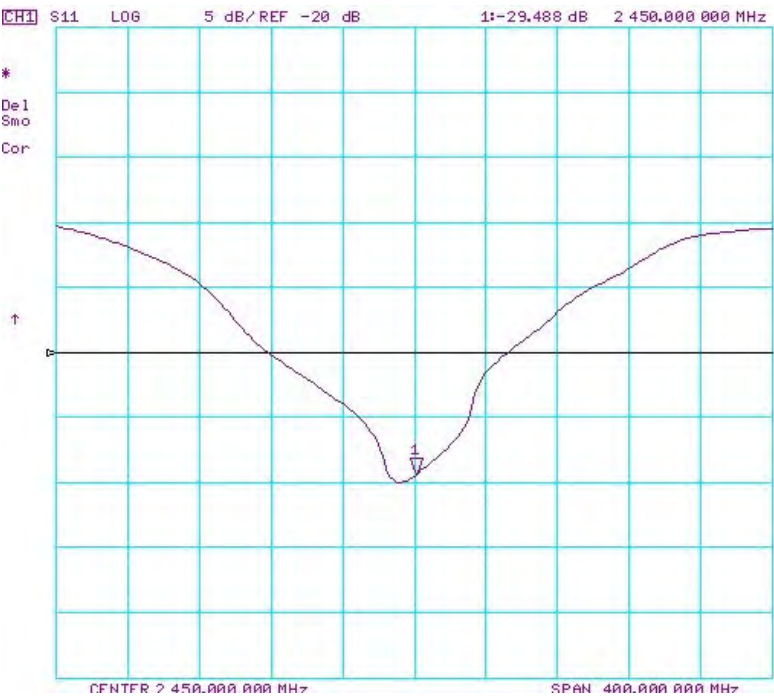
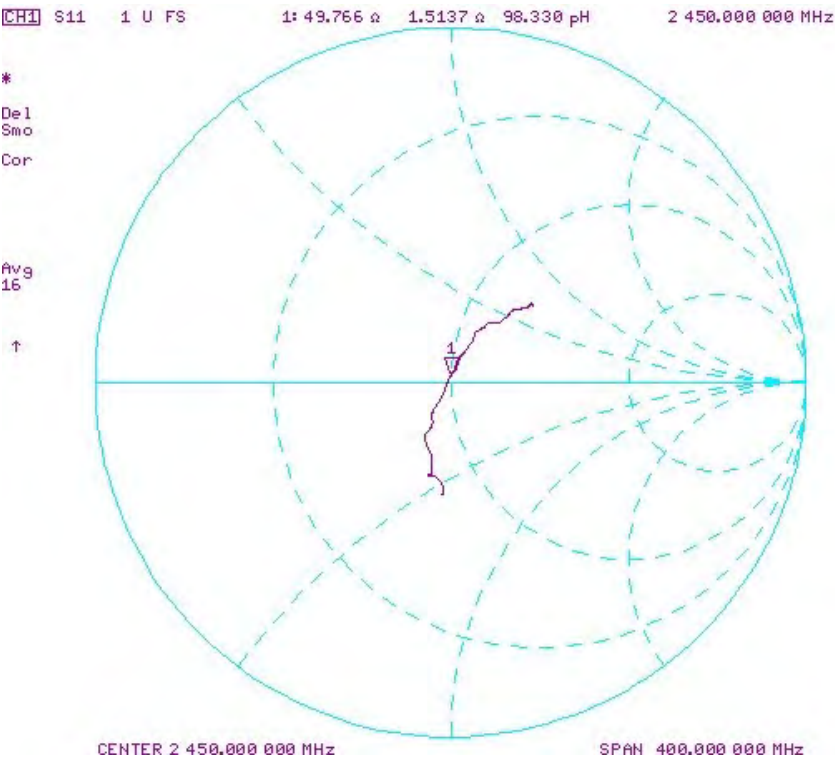
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Head (1g) W/kg @ 20.0 dBm | Measured Head SAR (1g) W/kg @ 20.0 dBm | Deviation 1g (%) | Certificate SAR Target Body (10g) W/kg @ 20.0 dBm | Measured Body SAR (10g) W/kg @ 20.0 dBm | Deviation 10g (%) | Certificate Impedance Head (Ohm) Real | Measured Impedance Head (Ohm) Real | Difference (Ohm) Real | Certificate Impedance Head (Ohm) Imaginary | Measured Impedance Head (Ohm) Imaginary | Difference (Ohm) Imaginary | Certificate Return Loss Head (dB) | Measured Return Loss Head (dB) | Deviation (%) | PASS/FAIL |
|------------------|----------------|-----------------------------------|--------------------------------------------------|----------------------------------------|------------------|---------------------------------------------------|-----------------------------------------|-------------------|---------------------------------------|------------------------------------|-----------------------|--------------------------------------------|-----------------------------------------|----------------------------|-----------------------------------|--------------------------------|---------------|-----------|
| 5/16/2018        | 5/16/2019      | 1.157                             | 5.1                                              | 5.23                                   | 3.73%            | 2.38                                              | 2.44                                    | 2.52%             | 56.1                                  | 51.4                               | 4.7                   | 3.7                                        | -0.9                                    | 4.6                        | -23.5                             | -27.9                          | -18.60%       | PASS      |
| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Body (1g) W/kg @ 20.0 dBm | Measured Body SAR (1g) W/kg @ 20.0 dBm | Deviation 1g (%) | Certificate SAR Target Body (10g) W/kg @ 20.0 dBm | Measured Body SAR (10g) W/kg @ 20.0 dBm | Deviation 10g (%) | Certificate Impedance Body (Ohm) Real | Measured Impedance Body (Ohm) Real | Difference (Ohm) Real | Certificate Impedance Body (Ohm) Imaginary | Measured Impedance Body (Ohm) Imaginary | Difference (Ohm) Imaginary | Certificate Return Loss Body (dB) | Measured Return Loss Body (dB) | Deviation (%) | PASS/FAIL |
| 5/16/2018        | 5/16/2019      | 1.157                             | 4.94                                             | 5.21                                   | 5.47%            | 2.32                                              | 2.38                                    | 2.59%             | 51.9                                  | 49.8                               | 2.1                   | 5                                          | 1.5                                     | 3.5                        | -25.7                             | -29.5                          | -14.70%       | PASS      |

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





Accredited by the Swiss Accreditation Service (SAS)  
 The Swiss Accreditation Service is one of the signatories to the EA  
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PG Test**

Certificate No: **D2600V2-1009 Jun18**

## CALIBRATION CERTIFICATE

Object **D2600V2 - SN:1009**

Calibration procedure(s) **QA CAL-05.v10**  
**Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **June 19, 2018**

SC ✓  
 6/28/18

BN ✓  
 7/01/18

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)      | Scheduled Calibration |
|-----------------------------|--------------------|---------------------------------|-----------------------|
| Power meter NRP             | SN: 104778         | 04-Apr-18 (No. 217-02672/02673) | Apr-19                |
| Power sensor NRP-Z91        | SN: 103244         | 04-Apr-18 (No. 217-02672)       | Apr-19                |
| Power sensor NRP-Z91        | SN: 103245         | 04-Apr-18 (No. 217-02673)       | Apr-19                |
| Reference 20 dB Attenuator  | SN: 5058 (20k)     | 04-Apr-18 (No. 217-02682)       | Apr-19                |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 04-Apr-18 (No. 217-02683)       | Apr-19                |
| Reference Probe EX3DV4      | SN: 7349           | 30-Dec-17 (No. EX3-7349_Dec17)  | Dec-18                |
| DAE4                        | SN: 601            | 26-Oct-17 (No. DAE4-601_Oct17)  | Oct-18                |

| Secondary Standards       | ID #           | Check Date (in house)             | Scheduled Check        |
|---------------------------|----------------|-----------------------------------|------------------------|
| Power meter EPM-442A      | SN: GB37480704 | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| Power sensor HP 8481A     | SN: US37292783 | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| Power sensor HP 8481A     | SN: MY41092317 | 07-Oct-15 (in house check Oct-16) | In house check: Oct-18 |
| RF generator R&S SMT-06   | SN: 100972     | 15-Jun-15 (in house check Oct-16) | In house check: Oct-18 |
| Network Analyzer HP 8753E | SN: US37390585 | 18-Oct-01 (in house check Oct-17) | In house check: Oct-18 |

Calibrated by: **Claudio Leubler** **Laboratory Technician**

Approved by: **Katja Pokovic** **Technical Manager**

Signature

Issued: June 21, 2018

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



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The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

### Glossary:

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A   | not applicable or not measured  |

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

### Additional Documentation:

- DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                              |                        |             |
|------------------------------|------------------------|-------------|
| DASY Version                 | DASY5                  | V52.10.1    |
| Extrapolation                | Advanced Extrapolation |             |
| Phantom                      | Modular Flat Phantom   |             |
| Distance Dipole Center - TSL | 10 mm                  | with Spacer |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm      |             |
| Frequency                    | 2600 MHz $\pm$ 1 MHz   |             |

## Head TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C             | 39.0           | 1.96 mho/m           |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2) °C | 37.4 $\pm$ 6 % | 2.03 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

## SAR result with Head TSL

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | Condition          |                                                |
| SAR measured                                                | 250 mW input power | 14.3 W/kg                                      |
| SAR for nominal Head TSL parameters                         | normalized to 1W   | <b>55.8 W/kg <math>\pm</math> 17.0 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | condition          |                                                |
| SAR measured                                                  | 250 mW input power | 6.38 W/kg                                      |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>25.1 W/kg <math>\pm</math> 16.5 % (k=2)</b> |

## Body TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Body TSL parameters             | 22.0 °C             | 52.5           | 2.16 mho/m           |
| Measured Body TSL parameters            | (22.0 $\pm$ 0.2) °C | 51.8 $\pm$ 6 % | 2.22 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | < 0.5 °C            | ----           | ----                 |

## SAR result with Body TSL

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Body TSL</b> | Condition          |                                                |
| SAR measured                                                | 250 mW input power | 14.1 W/kg                                      |
| SAR for nominal Body TSL parameters                         | normalized to 1W   | <b>55.5 W/kg <math>\pm</math> 17.0 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Body TSL</b> | condition          |                                                |
| SAR measured                                                  | 250 mW input power | 6.31 W/kg                                      |
| SAR for nominal Body TSL parameters                           | normalized to 1W   | <b>25.0 W/kg <math>\pm</math> 16.5 % (k=2)</b> |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 49.8 $\Omega$ - 5.0 j $\Omega$ |
| Return Loss                          | - 26.0 dB                      |

### Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 44.3 $\Omega$ - 4.8 j $\Omega$ |
| Return Loss                          | - 22.1 dB                      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.153 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |                |
|-----------------|----------------|
| Manufactured by | SPEAG          |
| Manufactured on | April 12, 2007 |

## DASY5 Validation Report for Head TSL

Date: 13.06.2018

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1009**

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medium parameters used:  $f = 2600$  MHz;  $\sigma = 2.03$  S/m;  $\epsilon_r = 37.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.7, 7.7, 7.7) @ 2600 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

### **Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

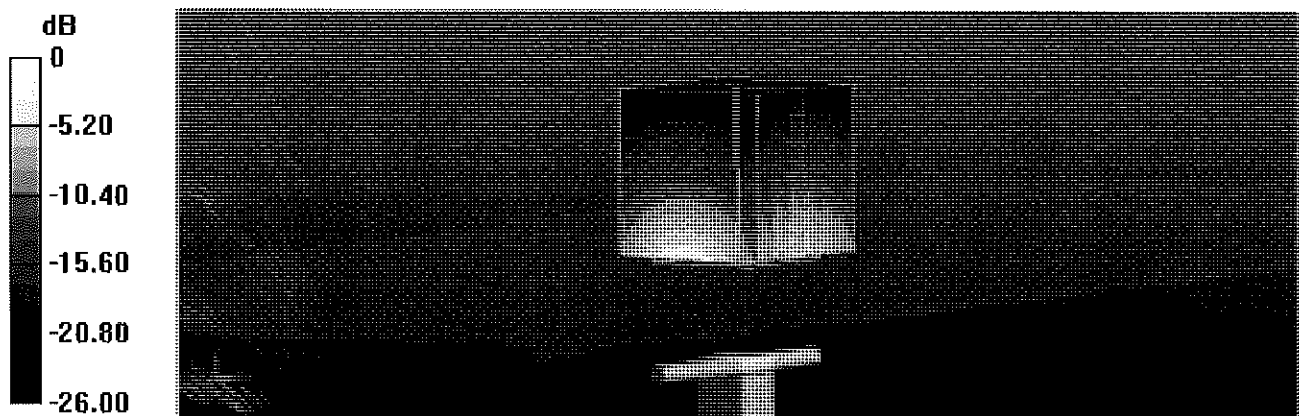
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 117.9 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 28.4 W/kg

**SAR(1 g) = 14.3 W/kg; SAR(10 g) = 6.38 W/kg**

Maximum value of SAR (measured) = 23.7 W/kg

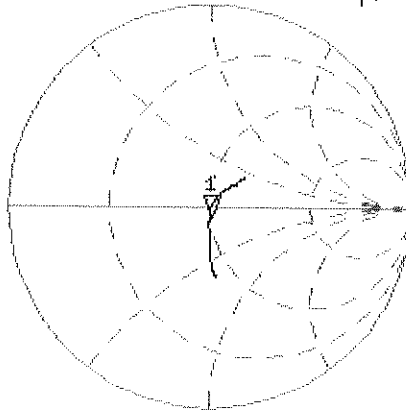


0 dB = 23.7 W/kg = 13.75 dBW/kg

# Impedance Measurement Plot for Head TSL

13 Jun 2018 12:15:33  
 CH1 S11 1 U FS 1: 49.844  $\Omega$  -4.9863  $\Omega$  12.276 pF 2 500.000 000 MHz

\*  
 Del  
 CA



Av9  
 16

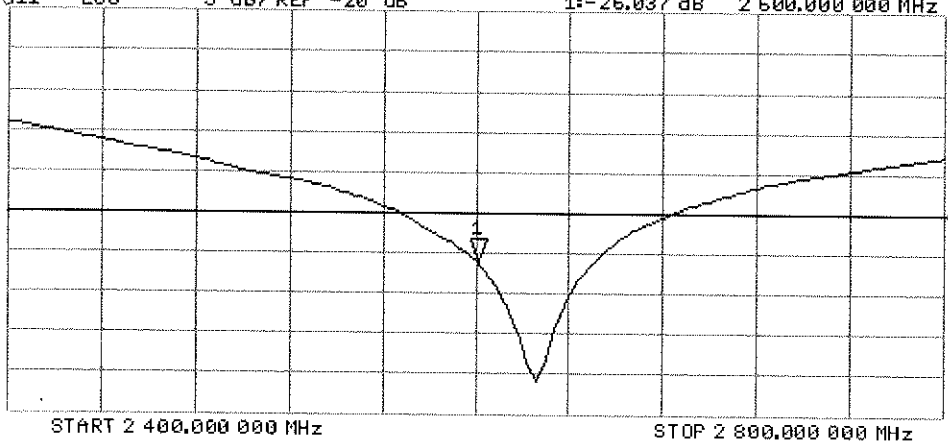
H1d

CH2 S11 LOG 5 dB/REF -20 dB 1: -26.037 dB 2 500.000 000 MHz

CA

Av9  
 16

H1d



## DASY5 Validation Report for Body TSL

Date: 19.06.2018

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1009**

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medium parameters used:  $f = 2600$  MHz;  $\sigma = 2.22$  S/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.81, 7.81, 7.81) @ 2600 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

### **Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

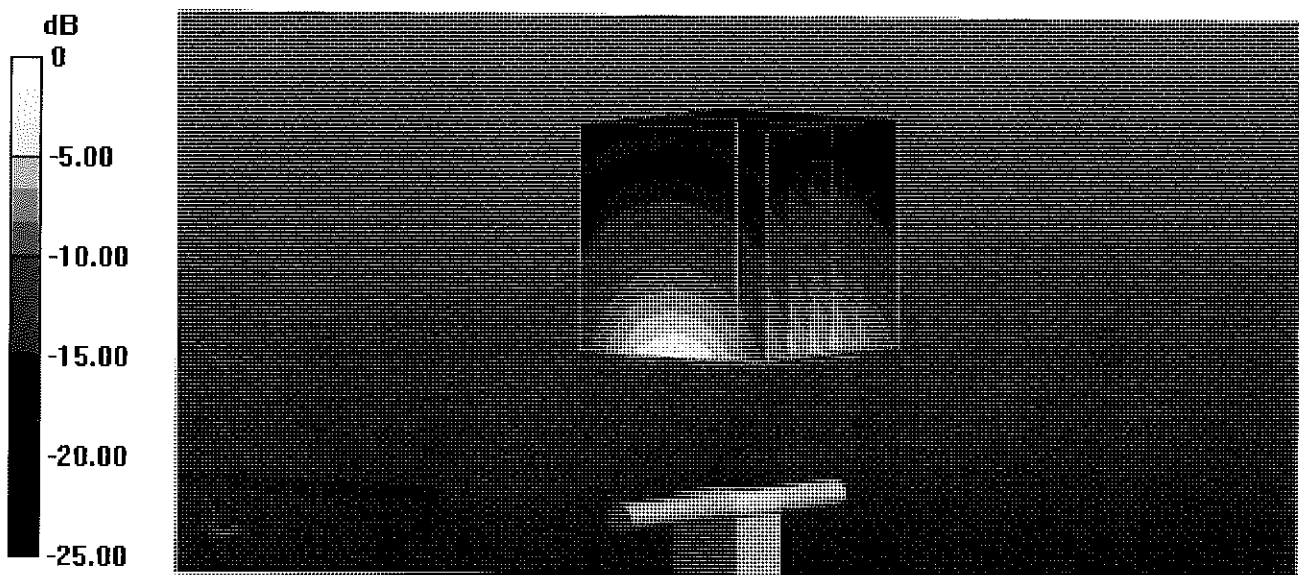
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 109.4 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 28.7 W/kg

**SAR(1 g) = 14.1 W/kg; SAR(10 g) = 6.31 W/kg**

Maximum value of SAR (measured) = 23.7 W/kg

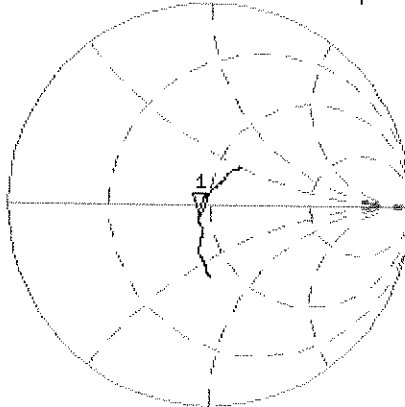


0 dB = 23.7 W/kg = 13.75 dBW/kg

# Impedance Measurement Plot for Body TSL

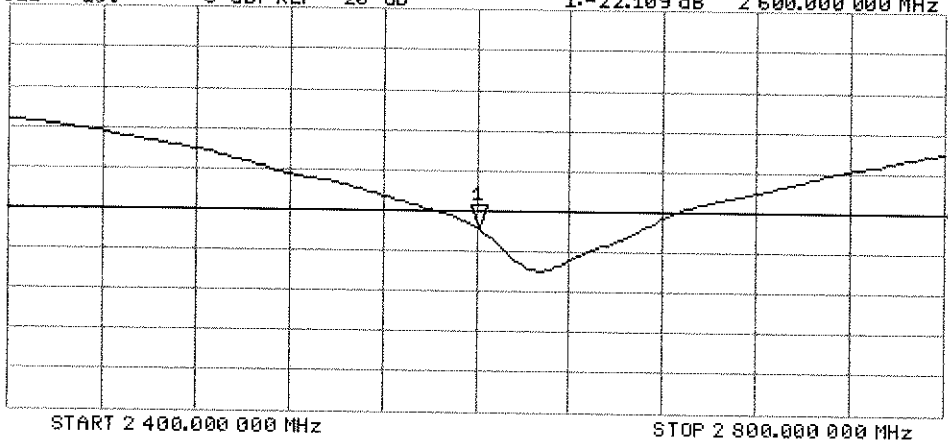
19 Jun 2018 10:04:18  
 CH1 S11 1 U FS 1: 44.344  $\Omega$  -4.7832  $\Omega$  12.798 pF 2 500.000 000 MHz

\*  
 Del  
 CA  
 Avg  
 16  
 H1d



CH2 S11 LOG 5 dB/REF -20 dB 1:-22.109 dB 2 500.000 000 MHz

CA  
 Avg  
 16  
 H1d



# Certification of Calibration

Object D2600V2 – SN: 1009

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Extended Calibration date: June 19, 2019

Description: SAR Validation Dipole at 2600 MHz.

## Calibration Equipment used:

| Manufacturer       | Model     | Description                                   | Cal Date   | Cal Interval | Cal Due    | Serial Number |
|--------------------|-----------|-----------------------------------------------|------------|--------------|------------|---------------|
| Agilent            | 8753ES    | S-Parameter Network Analyzer                  | 10/2/2018  | Annual       | 10/2/2019  | US39170118    |
| Agilent            | E4438C    | ESG Vector Signal Generator                   | 6/26/2018  | Annual       | 6/26/2019  | MY42081752    |
| Agilent            | 85033E    | 3.5mm Standard Calibration Kit                | 8/13/2018  | Annual       | 8/13/2019  | MY53402352    |
| Amplifier Research | 1551G6    | Amplifier                                     | CBT        | N/A          | CBT        | 343972        |
| Anritsu            | ML2495A   | Power Meter                                   | 10/21/2018 | Annual       | 10/21/2019 | 941001        |
| Anritsu            | MA2411B   | Pulse Power Sensor                            | 10/30/2018 | Annual       | 10/30/2019 | 1207470       |
| Anritsu            | MA2411B   | Pulse Power Sensor                            | 11/20/2018 | Annual       | 11/20/2019 | 1339007       |
| Control Company    | 4040      | Temperature / Humidity Monitor                | 2/28/2018  | Biennial     | 2/28/2020  | 150761911     |
| Control Company    | 4352      | Ultra Long Stem Thermometer                   | 2/28/2018  | Biennial     | 2/28/2020  | 170330160     |
| Keysight           | 772D      | Dual Directional Coupler                      | CBT        | N/A          | CBT        | MY52180215    |
| Mini-Circuits      | BW-N20W5+ | DC to 18 GHz Precision Fixed 20 dB Attenuator | CBT        | N/A          | CBT        | N/A           |
| Mini-Circuits      | NLP-2950+ | Low Pass Filter DC to 2700 MHz                | CBT        | N/A          | CBT        | N/A           |
| Narda              | 4772-3    | Attenuator (3dB)                              | CBT        | N/A          | CBT        | 9406          |
| Pasternack         | PE2209-10 | Bidirectional Coupler                         | CBT        | N/A          | CBT        | N/A           |
| Pasternack         | PE5011-1  | Torque Wrench                                 | 7/19/2017  | Biennial     | 7/19/2019  | N/A           |
| SPEAG              | DAKS-3.5  | Portable DAK                                  | 9/11/2018  | Annual       | 9/11/2019  | 1045          |
| SPEAG              | ES3DV3    | SAR Probe                                     | 11/19/2018 | Annual       | 11/19/2019 | 3318          |
| SPEAG              | EX3DV4    | E-field Probes                                | 2/19/2019  | Annual       | 2/19/2020  | 7427          |
| SPEAG              | DAE4      | Dasy Data Acquisition Electronics             | 8/14/2018  | Annual       | 8/14/2019  | 1408          |
| SPEAG              | DAE4      | Dasy Data Acquisition Electronics             | 2/13/2019  | Annual       | 2/13/2020  | 1403          |

Measurement Uncertainty =  $\pm 23\%$  (k=2)

|                | Name            | Function                 | Signature           |
|----------------|-----------------|--------------------------|---------------------|
| Calibrated By: | Parker Jones    | Team Lead Engineer       | <i>Parker Jones</i> |
| Approved By:   | Kaitlin O'Keefe | Senior Technical Manager | <i>KOK</i>          |

# DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

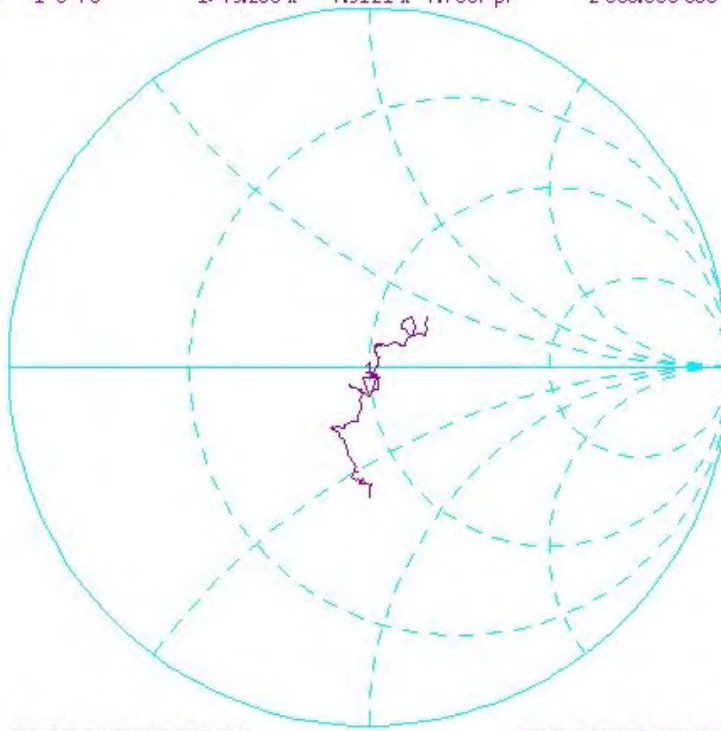
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Head (1g) W/kg @ 20.0 dBm | Measured Head SAR (1g) W/kg @ 20.0 dBm | Deviation 1g (%) | Certificate SAR Target Body (10g) W/kg @ 20.0 dBm | Measured Body SAR (10g) W/kg @ 20.0 dBm | Deviation 10g (%) | Certificate Impedance Head (Ohm) Real | Measured Impedance Head (Ohm) Real | Difference (Ohm) Real | Certificate Impedance Head (Ohm) Imaginary | Measured Impedance Head (Ohm) Imaginary | Difference (Ohm) Imaginary | Certificate Return Loss Head (dB) | Measured Return Loss Head (dB) | Deviation (%) | PASS/FAIL |
|------------------|----------------|-----------------------------------|--------------------------------------------------|----------------------------------------|------------------|---------------------------------------------------|-----------------------------------------|-------------------|---------------------------------------|------------------------------------|-----------------------|--------------------------------------------|-----------------------------------------|----------------------------|-----------------------------------|--------------------------------|---------------|-----------|
| 6/19/2018        | 6/19/2019      | 1.153                             | 5.58                                             | 5.87                                   | 5.20%            | 2.51                                              | 2.61                                    | 3.98%             | 49.8                                  | 49.3                               | 0.5                   | -5                                         | -7.9                                    | 2.9                        | -26                               | -23.2                          | 10.70%        | PASS      |
| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Body (1g) W/kg @ 20.0 dBm | Measured Body SAR (1g) W/kg @ 20.0 dBm | Deviation 1g (%) | Certificate SAR Target Body (10g) W/kg @ 20.0 dBm | Measured Body SAR (10g) W/kg @ 20.0 dBm | Deviation 10g (%) | Certificate Impedance Body (Ohm) Real | Measured Impedance Body (Ohm) Real | Difference (Ohm) Real | Certificate Impedance Body (Ohm) Imaginary | Measured Impedance Body (Ohm) Imaginary | Difference (Ohm) Imaginary | Certificate Return Loss Body (dB) | Measured Return Loss Body (dB) | Deviation (%) | PASS/FAIL |
| 6/19/2018        | 6/19/2019      | 1.153                             | 5.55                                             | 5.39                                   | -2.88%           | 2.5                                               | 2.39                                    | -4.40%            | 44.3                                  | 46.7                               | 2.3                   | -4.8                                       | -5.3                                    | 0.5                        | -22.1                             | -24.1                          | -8.90%        | PASS      |

# Impedance & Return-Loss Measurement Plot for Head TSL

CH1 S11 1 U FS 1: 49.258  $\Omega$  -7.9121  $\Omega$  7.7367 pF 2 600.000 000 MHz

\*  
De1  
Cor  
Avg  
16  
↑

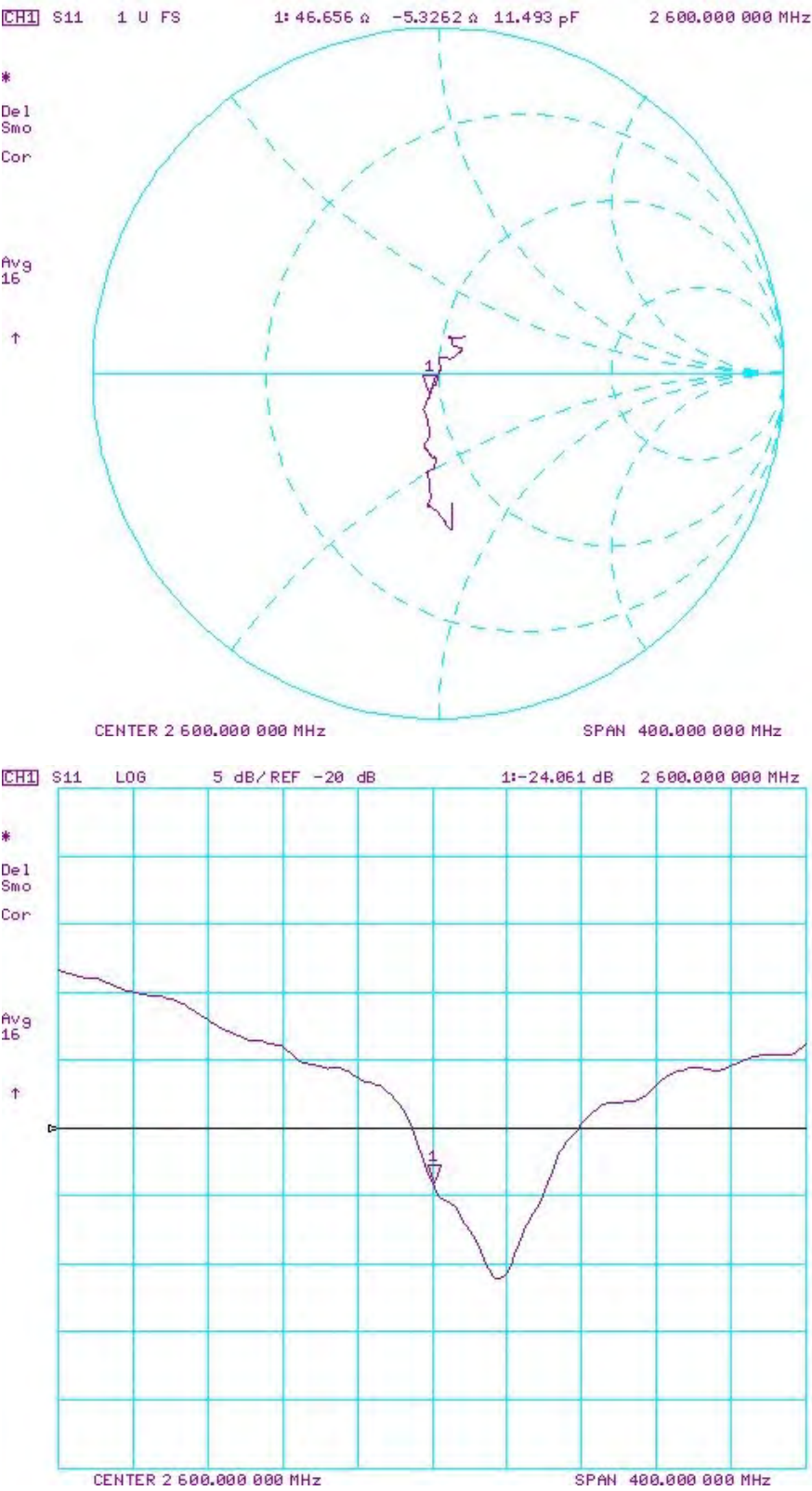


CH1 S11 LOG 5 dB/REF -20 dB 1: -23.218 dB 2 600.000 000 MHz

\*  
De1  
Smo  
Cor  
Avg  
12  
↑



Impedance & Return-Loss Measurement Plot for Body TSL





Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA  
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D3500V2-1068\_Dec19**

## CALIBRATION CERTIFICATE

Object **D3500V2 - SN:1068**

Calibration procedure(s) **QA CAL-22.v4**  
**Calibration Procedure for SAR Validation Sources between 3-6 GHz**

Calibration date: **December 04, 2019**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards               | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|---------------------------------|--------------------|-----------------------------------|------------------------|
| Power meter NRP                 | SN: 104778         | 03-Apr-19 (No. 217-02892/02893)   | Apr-20                 |
| Power sensor NRP-Z91            | SN: 103244         | 03-Apr-19 (No. 217-02892)         | Apr-20                 |
| Power sensor NRP-Z91            | SN: 103245         | 03-Apr-19 (No. 217-02893)         | Apr-20                 |
| Reference 20 dB Attenuator      | SN: 5058 (20k)     | 04-Apr-19 (No. 217-02894)         | Apr-20                 |
| Type-N mismatch combination     | SN: 5047.2 / 06327 | 04-Apr-19 (No. 217-02895)         | Apr-20                 |
| Reference Probe EX3DV4          | SN: 3503           | 25-Mar-19 (No. EX3-3503_Mar19)    | Mar-20                 |
| DAE4                            | SN: 601            | 30-Apr-19 (No. DAE4-601_Apr19)    | Apr-20                 |
| Secondary Standards             | ID #               | Check Date (in house)             | Scheduled Check        |
| Power meter E4419B              | SN: GB39512475     | 30-Oct-14 (in house check Feb-19) | In house check: Oct-20 |
| Power sensor HP 8481A           | SN: US37292783     | 07-Oct-15 (in house check Oct-18) | In house check: Oct-20 |
| Power sensor HP 8481A           | SN: MY41092317     | 07-Oct-15 (in house check Oct-18) | In house check: Oct-20 |
| RF generator R&S SMT-06         | SN: 100972         | 15-Jun-15 (in house check Oct-18) | In house check: Oct-20 |
| Network Analyzer Agilent E8358A | SN: US41080477     | 31-Mar-14 (in house check Oct-19) | In house check: Oct-20 |

Calibrated by: **Leif Klysner** **Function** **Laboratory Technician** **Signature**

Approved by: **Katja Pokovic** **Technical Manager**

Issued: December 6, 2019

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

### Glossary:

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A   | not applicable or not measured  |

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

### Additional Documentation:

- DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                                     |                            |                                  |
|-------------------------------------|----------------------------|----------------------------------|
| <b>DASY Version</b>                 | DASY5                      | V52.10.3                         |
| <b>Extrapolation</b>                | Advanced Extrapolation     |                                  |
| <b>Phantom</b>                      | Modular Flat Phantom       |                                  |
| <b>Distance Dipole Center - TSL</b> | 10 mm                      | with Spacer                      |
| <b>Zoom Scan Resolution</b>         | dx, dy = 4 mm, dz = 1.4 mm | Graded Ratio = 1.4 (Z direction) |
| <b>Frequency</b>                    | 3500 MHz $\pm$ 1 MHz       |                                  |

## Head TSL parameters

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 37.9           | 2.91 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 37.0 $\pm$ 6 % | 2.89 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | < 0.5 °C            | ----           | ----                 |

## SAR result with Head TSL

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | Condition          |                                                |
| SAR measured                                                | 100 mW input power | 6.71 W/kg                                      |
| SAR for nominal Head TSL parameters                         | normalized to 1W   | <b>66.9 W/kg <math>\pm</math> 19.9 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | condition          |                                                |
| SAR measured                                                  | 100 mW input power | 2.52 W/kg                                      |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>25.1 W/kg <math>\pm</math> 19.5 % (k=2)</b> |

## Body TSL parameters

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Body TSL parameters</b>             | 22.0 °C             | 51.3           | 3.31 mho/m           |
| <b>Measured Body TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 50.0 $\pm$ 6 % | 3.34 mho/m $\pm$ 6 % |
| <b>Body TSL temperature change during test</b> | < 0.5 °C            | ----           | ----                 |

## SAR result with Body TSL

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Body TSL</b> | Condition          |                                                |
| SAR measured                                                | 100 mW input power | 6.58 W/kg                                      |
| SAR for nominal Body TSL parameters                         | normalized to 1W   | <b>65.3 W/kg <math>\pm</math> 19.9 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Body TSL</b> | condition          |                                                |
| SAR measured                                                  | 100 mW input power | 2.45 W/kg                                      |
| SAR for nominal Body TSL parameters                           | normalized to 1W   | <b>24.3 W/kg <math>\pm</math> 19.5 % (k=2)</b> |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 53.5 $\Omega$ - 4.6 j $\Omega$ |
| Return Loss                          | - 25.1 dB                      |

### Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 52.5 $\Omega$ - 3.5 j $\Omega$ |
| Return Loss                          | - 27.6 dB                      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.132 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |       |
|-----------------|-------|
| Manufactured by | SPEAG |
|-----------------|-------|

## DASY5 Validation Report for Head TSL

Date: 04.12.2019

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 3500 MHz; Type: D3500V2; Serial: D3500V2 - SN:1068**

Communication System: UID 0 - CW; Frequency: 3500 MHz

Medium parameters used:  $f = 3500$  MHz;  $\sigma = 2.89$  S/m;  $\epsilon_r = 37$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(7.75, 7.75, 7.75) @ 3500 MHz; Calibrated: 25.03.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

**Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm, f=3500MHz/Zoom Scan, dist=1.4mm (8x8x8)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 70.28 V/m; Power Drift = 0.11 dB

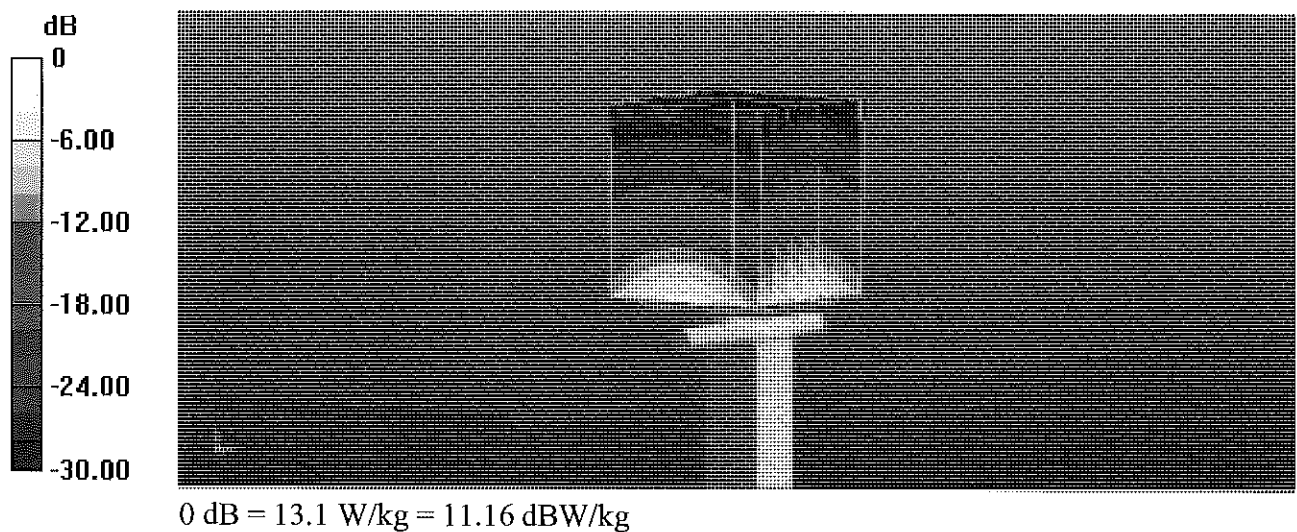
Peak SAR (extrapolated) = 18.6 W/kg

**SAR(1 g) = 6.71 W/kg; SAR(10 g) = 2.52 W/kg**

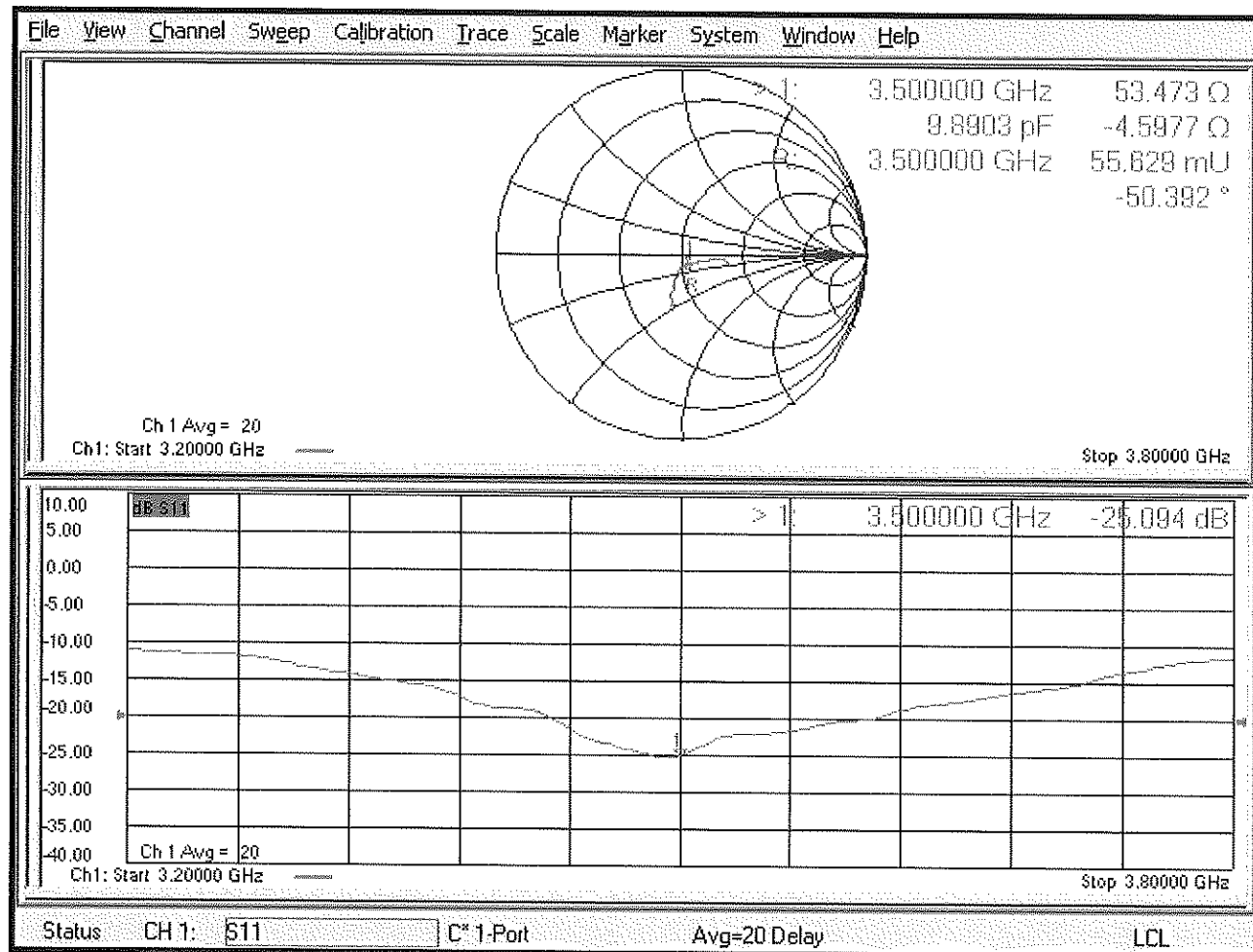
Smallest distance from peaks to all points 3 dB below = 8.4 mm

Ratio of SAR at M2 to SAR at M1 = 73.7%

Maximum value of SAR (measured) = 13.1 W/kg



# Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 04.12.2019

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 3500 MHz; Type: D3500V2; Serial: D3500V2 - SN:1068**

Communication System: UID 0 - CW; Frequency: 3500 MHz

Medium parameters used:  $f = 3500$  MHz;  $\sigma = 3.34$  S/m;  $\epsilon_r = 50$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(7.35, 7.35, 7.35) @ 3500 MHz; Calibrated: 25.03.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

**Dipole Calibration for Body Tissue/Pin=100 mW, d=10mm, f=3500MHz/Zoom Scan , dist=1.4mm (8x8x8)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 65.74 V/m; Power Drift = -0.04 dB

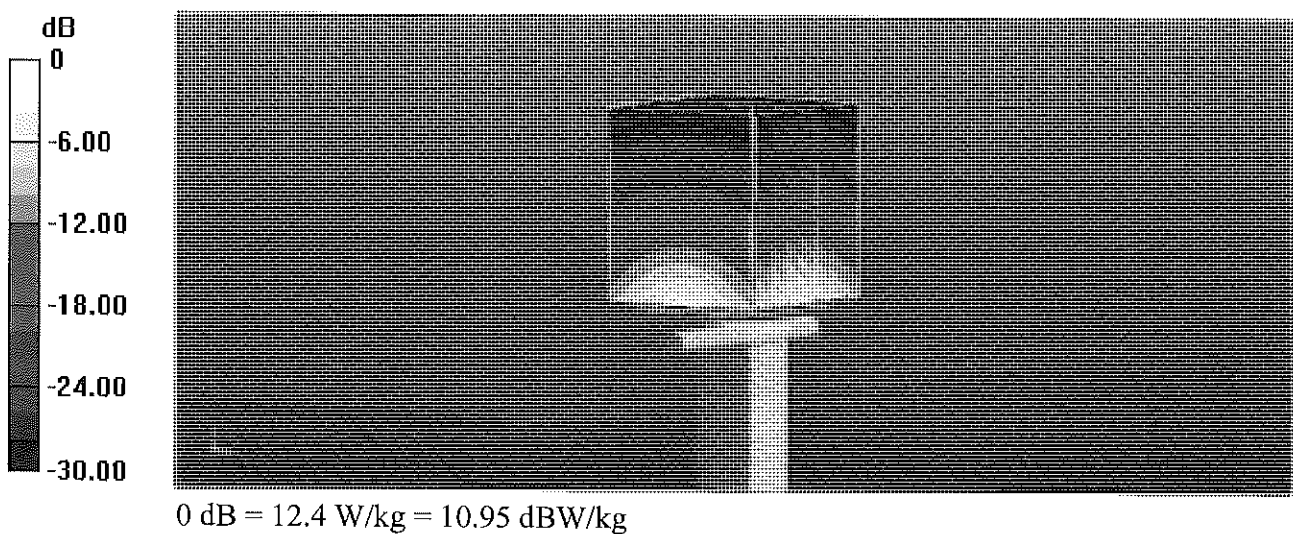
Peak SAR (extrapolated) = 17.7 W/kg

**SAR(1 g) = 6.58 W/kg; SAR(10 g) = 2.45 W/kg**

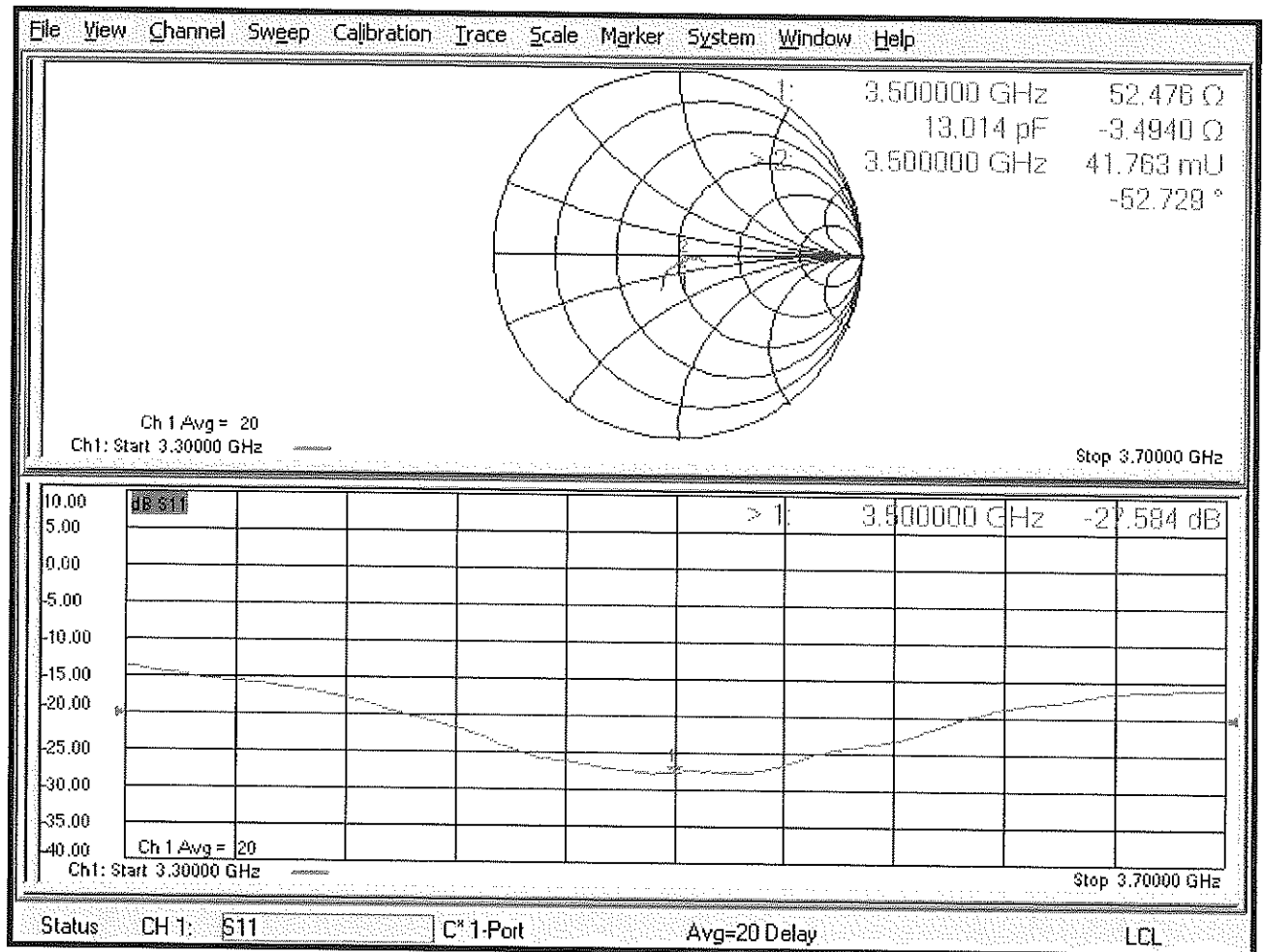
Smallest distance from peaks to all points 3 dB below = 8 mm

Ratio of SAR at M2 to SAR at M1 = 75%

Maximum value of SAR (measured) = 12.4 W/kg



# Impedance Measurement Plot for Body TSL





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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D3700V2-1029\_Dec19**

## CALIBRATION CERTIFICATE

Object **D3700V2 - SN:1029**

Calibration procedure(s) **QA CAL 22.v4  
 Calibration Procedure for SAR Validation Sources between 3-6 GHz**

Calibration date: **December 04, 2019**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards               | ID #               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|---------------------------------|--------------------|-----------------------------------|------------------------|
| Power meter NRP                 | SN: 104778         | 03-Apr-19 (No. 217-02892/02893)   | Apr-20                 |
| Power sensor NRP-Z91            | SN: 103244         | 03-Apr-19 (No. 217-02892)         | Apr-20                 |
| Power sensor NRP-Z91            | SN: 103245         | 03-Apr-19 (No. 217-02893)         | Apr-20                 |
| Reference 20 dB Attenuator      | SN: 5058 (20k)     | 04-Apr-19 (No. 217-02894)         | Apr-20                 |
| Type-N mismatch combination     | SN: 5047.2 / 06327 | 04-Apr-19 (No. 217-02895)         | Apr-20                 |
| Reference Probe EX3DV4          | SN: 3503           | 25-Mar-19 (No. EX3-3503_Mar19)    | Mar-20                 |
| DAE4                            | SN: 601            | 30-Apr-19 (No. DAE4-601_Apr19)    | Apr-20                 |
| Secondary Standards             | ID #               | Check Date (in house)             | Scheduled Check        |
| Power meter E4419B              | SN: GB39512475     | 30-Oct-14 (in house check Feb-19) | In house check: Oct-20 |
| Power sensor HP 8481A           | SN: US37292783     | 07-Oct-15 (in house check Oct-18) | In house check: Oct-20 |
| Power sensor HP 8481A           | SN: MY41092317     | 07-Oct-15 (in house check Oct-18) | In house check: Oct-20 |
| RF generator R&S SMT-06         | SN: 100972         | 15-Jun-15 (in house check Oct-18) | In house check: Oct-20 |
| Network Analyzer Agilent E8358A | SN: US41080477     | 31-Mar-14 (in house check Oct-19) | In house check: Oct-20 |

Calibrated by: **Leif Klysner** **Function: Laboratory Technician** **Signature: [Signature]**

Approved by: **Katja Pokovic** **Technical Manager** **Signature: [Signature]**

Issued: December 6, 2019

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Accreditation Service (SAS)  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

**Glossary:**

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A   | not applicable or not measured  |

**Calibration is Performed According to the Following Standards:**

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

**Additional Documentation:**

- DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

- Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:* SAR measured at the stated antenna input power.
- SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                              |                            |                                  |
|------------------------------|----------------------------|----------------------------------|
| DASY Version                 | DASY5                      | V52.10.3                         |
| Extrapolation                | Advanced Extrapolation     |                                  |
| Phantom                      | Modular Flat Phantom       |                                  |
| Distance Dipole Center - TSL | 10 mm                      | with Spacer                      |
| Zoom Scan Resolution         | dx, dy = 4 mm, dz = 1.4 mm | Graded Ratio = 1.4 (Z direction) |
| Frequency                    | 3700 MHz $\pm$ 1 MHz       |                                  |

## Head TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C             | 37.7           | 3.12 mho/m           |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2) °C | 36.8 $\pm$ 6 % | 3.05 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | < 0.5 °C            | ---            | ---                  |

## SAR result with Head TSL

|                                                       |                    |                                                |
|-------------------------------------------------------|--------------------|------------------------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                                                |
| SAR measured                                          | 100 mW input power | 6.87 W/kg                                      |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | <b>68.6 W/kg <math>\pm</math> 19.9 % (k=2)</b> |

|                                                         |                    |                                                |
|---------------------------------------------------------|--------------------|------------------------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                                                |
| SAR measured                                            | 100 mW input power | 2.48 W/kg                                      |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | <b>24.7 W/kg <math>\pm</math> 19.5 % (k=2)</b> |

## Body TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Body TSL parameters             | 22.0 °C             | 51.0           | 3.55 mho/m           |
| Measured Body TSL parameters            | (22.0 $\pm$ 0.2) °C | 49.7 $\pm$ 6 % | 3.55 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | < 0.5 °C            | ---            | ---                  |

## SAR result with Body TSL

|                                                       |                    |                                                |
|-------------------------------------------------------|--------------------|------------------------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL | Condition          |                                                |
| SAR measured                                          | 100 mW input power | 6.53 W/kg                                      |
| SAR for nominal Body TSL parameters                   | normalized to 1W   | <b>64.9 W/kg <math>\pm</math> 19.9 % (k=2)</b> |

|                                                         |                    |                                                |
|---------------------------------------------------------|--------------------|------------------------------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                                                |
| SAR measured                                            | 100 mW input power | 2.33 W/kg                                      |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | <b>23.2 W/kg <math>\pm</math> 19.5 % (k=2)</b> |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $45.1 \Omega - 1.9 j\Omega$ |
| Return Loss                          | - 25.1 dB                   |

### Antenna Parameters with Body TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $43.9 \Omega + 0.5 j\Omega$ |
| Return Loss                          | - 23.7 dB                   |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.139 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |       |
|-----------------|-------|
| Manufactured by | SPEAG |
|-----------------|-------|

## DASY5 Validation Report for Head TSL

Date: 04.12.2019

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 3700 MHz; Type: D3700V2; Serial: D3700V2 - SN:1029**

Communication System: UID 0 - CW; Frequency: 3700 MHz

Medium parameters used:  $f = 3700$  MHz;  $\sigma = 3.05$  S/m;  $\epsilon_r = 36.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(7.5, 7.5, 7.5) @ 3700 MHz; Calibrated: 25.03.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

**Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm/Zoom Scan, dist=1.4mm (8x8x8)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 71.30 V/m; Power Drift = -0.02 dB

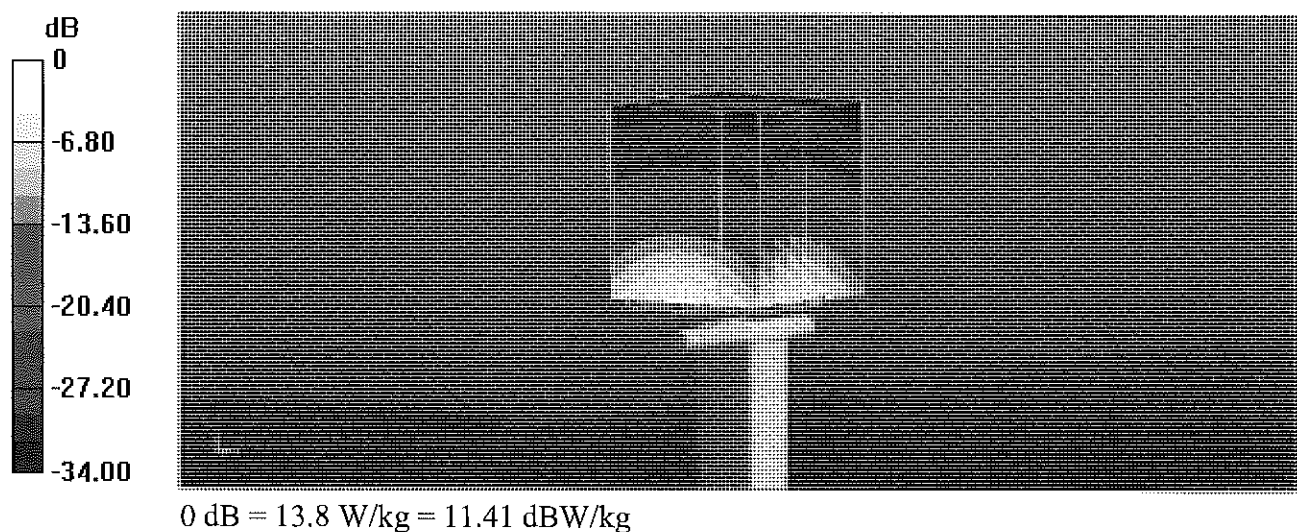
Peak SAR (extrapolated) = 19.8 W/kg

**SAR(1 g) = 6.87 W/kg; SAR(10 g) = 2.48 W/kg**

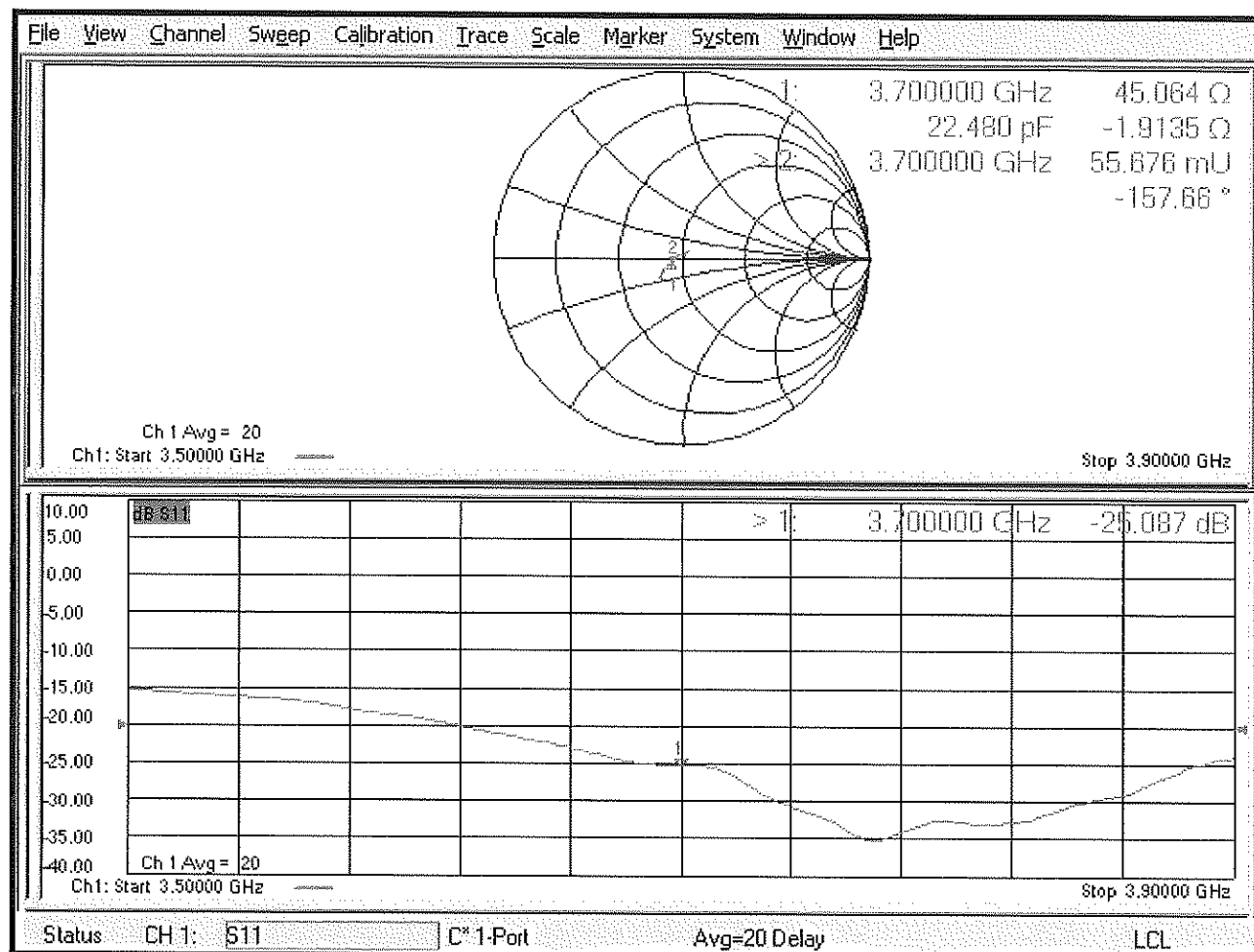
Smallest distance from peaks to all points 3 dB below = 8 mm

Ratio of SAR at M2 to SAR at M1 = 72.7%

Maximum value of SAR (measured) = 13.8 W/kg



# Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 04.12.2019

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 3700 MHz; Type: D3700V2; Serial: D3700V2 - SN:1029**

Communication System: UID 0 - CW; Frequency: 3700 MHz

Medium parameters used:  $f = 3700$  MHz;  $\sigma = 3.55$  S/m;  $\epsilon_r = 49.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(7.1, 7.1, 7.1) @ 3700 MHz; Calibrated: 25.03.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

**Dipole Calibration for Body Tissue/Pin=100 mW, d=10mm/Zoom Scan , dist=1.4mm**

**(8x8x8)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 65.42 V/m; Power Drift = -0.05 dB

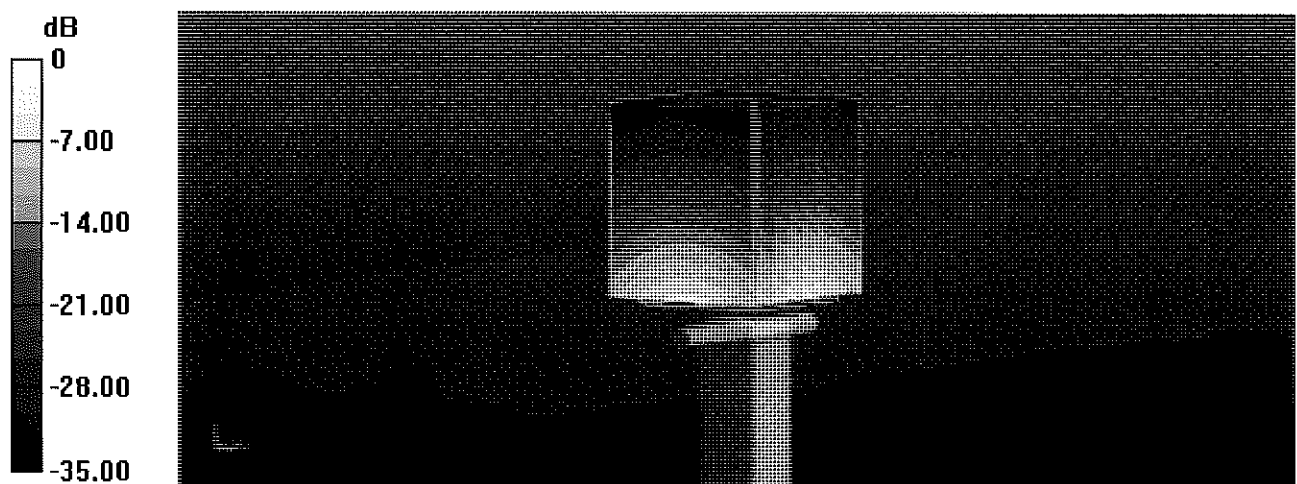
Peak SAR (extrapolated) = 18.3 W/kg

**SAR(1 g) = 6.53 W/kg; SAR(10 g) = 2.33 W/kg**

Smallest distance from peaks to all points 3 dB below = 8 mm

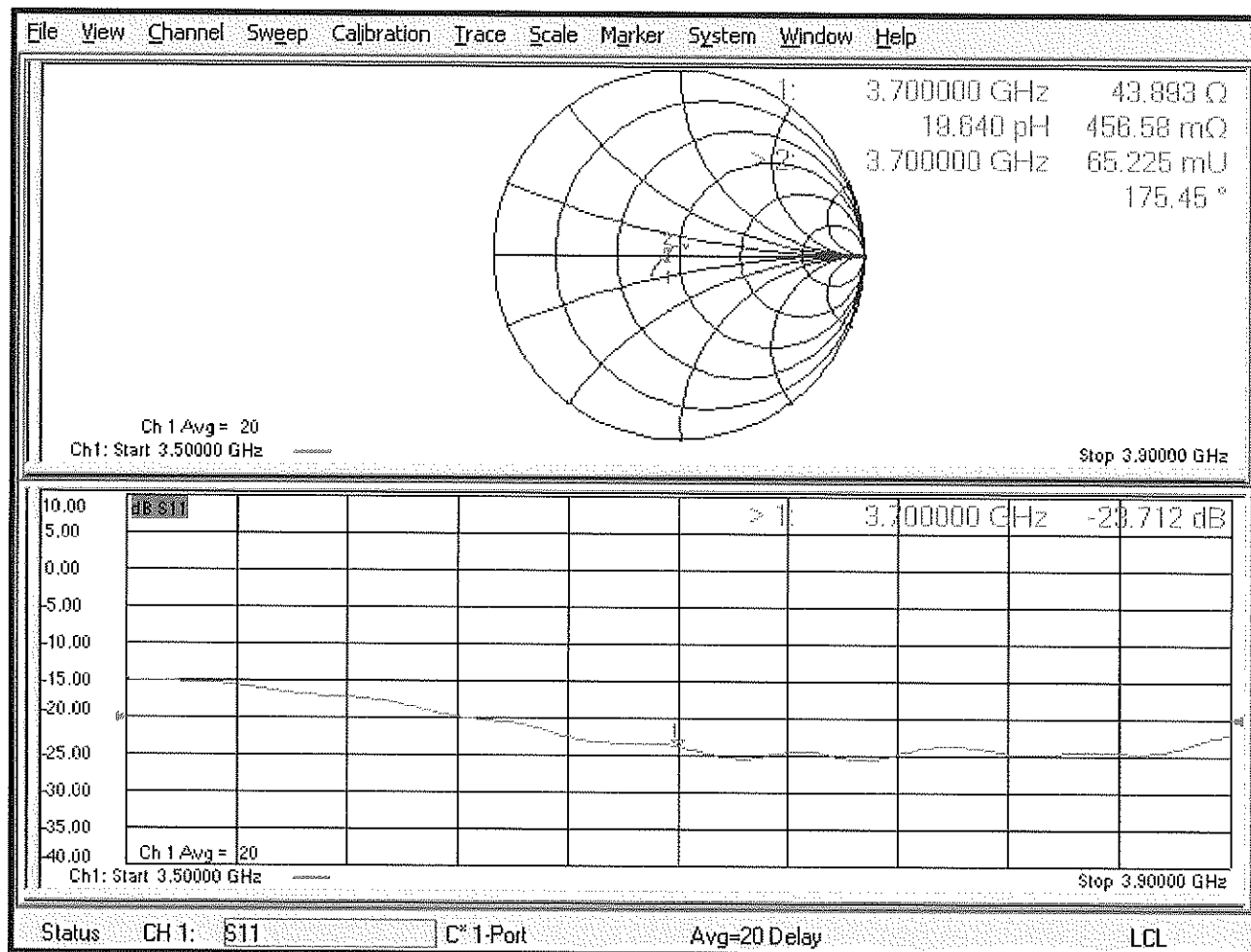
Ratio of SAR at M2 to SAR at M1 = 74.2%

Maximum value of SAR (measured) = 12.9 W/kg



0 dB = 12.9 W/kg = 11.11 dBW/kg

## Impedance Measurement Plot for Body TSL





Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

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 Multilateral Agreement for the recognition of calibration certificates

Client **PC Test**

Certificate No: **D5GHzV2-1123\_Mar18**

## CALIBRATION CERTIFICATE

Object **D5GHzV2 - SN:1123**

Calibration procedure(s) **QA CAL-22.v2**  
**Calibration procedure for dipole validation kits between 3-6 GHz**

SC ✓  
 3/21/18

Calibration date: **March 13, 2018**

SC ✓  
 3/12/19

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #               | Cal Date (Certificate No.)      | Scheduled Calibration |
|-----------------------------|--------------------|---------------------------------|-----------------------|
| Power meter NRP             | SN: 104778         | 04-Apr-17 (No. 217-02521/02522) | Apr-18                |
| Power sensor NRP-Z91        | SN: 103244         | 04-Apr-17 (No. 217-02521)       | Apr-18                |
| Power sensor NRP-Z91        | SN: 103245         | 04-Apr-17 (No. 217-02522)       | Apr-18                |
| Reference 20 dB Attenuator  | SN: 5058 (20k)     | 07-Apr-17 (No. 217-02528)       | Apr-18                |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 07-Apr-17 (No. 217-02529)       | Apr-18                |
| Reference Probe EX3DV4      | SN: 3503           | 30-Dec-17 (No. EX3-3503_Dec17)  | Dec-18                |
| DAE4                        | SN: 601            | 26-Oct-17 (No. DAE4-601_Oct17)  | Oct-18                |

| Secondary Standards       | ID #           | Check Date (in house)             | Scheduled Check        |
|---------------------------|----------------|-----------------------------------|------------------------|
| Power meter EPM-442A      | SN: GB37480704 | 07-Oct-16 (No. 217-02222)         | In house check: Oct-18 |
| Power sensor HP 8481A     | SN: US37292783 | 07-Oct-16 (No. 217-02222)         | In house check: Oct-18 |
| Power sensor HP 8481A     | SN: MY41092317 | 07-Oct-16 (No. 217-02223)         | In house check: Oct-18 |
| RF generator R&S SMT-06   | SN: 100972     | 15-Jun-15 (in house check Oct-16) | In house check: Oct-18 |
| Network Analyzer HP 8753E | SN: US37390585 | 18-Oct-01 (in house check Oct-17) | In house check: Oct-18 |

|                |                       |                                   |               |
|----------------|-----------------------|-----------------------------------|---------------|
| Calibrated by: | Name<br>Leif Klysner  | Function<br>Laboratory Technician | Signature<br> |
| Approved by:   | Name<br>Katja Pokovic | Function<br>Technical Manager     | Signature<br> |

Issued: March 14, 2018

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Accreditation No.: **SCS 0108**

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Multilateral Agreement for the recognition of calibration certificates

### Glossary:

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A   | not applicable or not measured  |

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

### Additional Documentation:

- DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                                     |                                                                      |                                  |
|-------------------------------------|----------------------------------------------------------------------|----------------------------------|
| <b>DASY Version</b>                 | DASY5                                                                | V52.10.0                         |
| <b>Extrapolation</b>                | Advanced Extrapolation                                               |                                  |
| <b>Phantom</b>                      | Modular Flat Phantom V5.0                                            |                                  |
| <b>Distance Dipole Center - TSL</b> | 10 mm                                                                | with Spacer                      |
| <b>Zoom Scan Resolution</b>         | dx, dy = 4.0 mm, dz = 1.4 mm                                         | Graded Ratio = 1.4 (Z direction) |
| <b>Frequency</b>                    | 5250 MHz $\pm$ 1 MHz<br>5600 MHz $\pm$ 1 MHz<br>5750 MHz $\pm$ 1 MHz |                                  |

## Head TSL parameters at 5250 MHz

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 35.9           | 4.71 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 36.2 $\pm$ 6 % | 4.58 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | < 0.5 °C            | ----           | ----                 |

## SAR result with Head TSL at 5250 MHz

| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | Condition          |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| SAR measured                                                | 100 mW input power | 8.15 W/kg                                      |
| SAR for nominal Head TSL parameters                         | normalized to 1W   | <b>81.6 W/kg <math>\pm</math> 19.9 % (k=2)</b> |

| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | condition          |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| SAR measured                                                  | 100 mW input power | 2.35 W/kg                                      |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>23.5 W/kg <math>\pm</math> 19.5 % (k=2)</b> |

## Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 35.5           | 5.07 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 35.7 $\pm$ 6 % | 4.94 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | < 0.5 °C            | ----           | ----                 |

## SAR result with Head TSL at 5600 MHz

| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | Condition          |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| SAR measured                                                | 100 mW input power | 8.51 W/kg                                      |
| SAR for nominal Head TSL parameters                         | normalized to 1W   | <b>85.1 W/kg <math>\pm</math> 19.9 % (k=2)</b> |

| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | condition          |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| SAR measured                                                  | 100 mW input power | 2.43 W/kg                                      |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>24.3 W/kg <math>\pm</math> 19.5 % (k=2)</b> |

## Head TSL parameters at 5750 MHz

The following parameters and calculations were applied.

|                                         | Temperature     | Permittivity | Conductivity     |
|-----------------------------------------|-----------------|--------------|------------------|
| Nominal Head TSL parameters             | 22.0 °C         | 35.4         | 5.22 mho/m       |
| Measured Head TSL parameters            | (22.0 ± 0.2) °C | 35.5 ± 6 %   | 5.10 mho/m ± 6 % |
| Head TSL temperature change during test | < 0.5 °C        | ----         | ----             |

## SAR result with Head TSL at 5750 MHz

|                                                             |                    |                                 |
|-------------------------------------------------------------|--------------------|---------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | Condition          |                                 |
| SAR measured                                                | 100 mW input power | 8.06 W/kg                       |
| SAR for nominal Head TSL parameters                         | normalized to 1W   | <b>80.6 W/kg ± 19.9 % (k=2)</b> |

|                                                               |                    |                                 |
|---------------------------------------------------------------|--------------------|---------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | condition          |                                 |
| SAR measured                                                  | 100 mW input power | 2.29 W/kg                       |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>22.9 W/kg ± 19.5 % (k=2)</b> |

### Body TSL parameters at 5250 MHz

The following parameters and calculations were applied.

|                                         | Temperature     | Permittivity | Conductivity     |
|-----------------------------------------|-----------------|--------------|------------------|
| Nominal Body TSL parameters             | 22.0 °C         | 48.9         | 5.36 mho/m       |
| Measured Body TSL parameters            | (22.0 ± 0.2) °C | 47.1 ± 6 %   | 5.49 mho/m ± 6 % |
| Body TSL temperature change during test | < 0.5 °C        | ----         | ----             |

### SAR result with Body TSL at 5250 MHz

|                                                             |                    |                                 |
|-------------------------------------------------------------|--------------------|---------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Body TSL</b> | Condition          |                                 |
| SAR measured                                                | 100 mW input power | 7.45 W/kg                       |
| SAR for nominal Body TSL parameters                         | normalized to 1W   | <b>74.0 W/kg ± 19.9 % (k=2)</b> |

|                                                               |                    |                                 |
|---------------------------------------------------------------|--------------------|---------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Body TSL</b> | condition          |                                 |
| SAR measured                                                  | 100 mW input power | 2.08 W/kg                       |
| SAR for nominal Body TSL parameters                           | normalized to 1W   | <b>20.6 W/kg ± 19.5 % (k=2)</b> |

### Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

|                                         | Temperature     | Permittivity | Conductivity     |
|-----------------------------------------|-----------------|--------------|------------------|
| Nominal Body TSL parameters             | 22.0 °C         | 48.5         | 5.77 mho/m       |
| Measured Body TSL parameters            | (22.0 ± 0.2) °C | 46.4 ± 6 %   | 5.97 mho/m ± 6 % |
| Body TSL temperature change during test | < 0.5 °C        | ----         | ----             |

### SAR result with Body TSL at 5600 MHz

|                                                             |                    |                                 |
|-------------------------------------------------------------|--------------------|---------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Body TSL</b> | Condition          |                                 |
| SAR measured                                                | 100 mW input power | 7.82 W/kg                       |
| SAR for nominal Body TSL parameters                         | normalized to 1W   | <b>77.6 W/kg ± 19.9 % (k=2)</b> |

|                                                               |                    |                                 |
|---------------------------------------------------------------|--------------------|---------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Body TSL</b> | condition          |                                 |
| SAR measured                                                  | 100 mW input power | 2.19 W/kg                       |
| SAR for nominal Body TSL parameters                           | normalized to 1W   | <b>21.7 W/kg ± 19.5 % (k=2)</b> |

### Body TSL parameters at 5750 MHz

The following parameters and calculations were applied.

|                                         | Temperature     | Permittivity | Conductivity     |
|-----------------------------------------|-----------------|--------------|------------------|
| Nominal Body TSL parameters             | 22.0 °C         | 48.3         | 5.94 mho/m       |
| Measured Body TSL parameters            | (22.0 ± 0.2) °C | 46.2 ± 6 %   | 6.18 mho/m ± 6 % |
| Body TSL temperature change during test | < 0.5 °C        | ----         | ----             |

### SAR result with Body TSL at 5750 MHz

|                                                             |                    |                                 |
|-------------------------------------------------------------|--------------------|---------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Body TSL</b> | Condition          |                                 |
| SAR measured                                                | 100 mW input power | 7.52 W/kg                       |
| SAR for nominal Body TSL parameters                         | normalized to 1W   | <b>74.7 W/kg ± 19.9 % (k=2)</b> |

|                                                               |                    |                                 |
|---------------------------------------------------------------|--------------------|---------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Body TSL</b> | condition          |                                 |
| SAR measured                                                  | 100 mW input power | 2.10 W/kg                       |
| SAR for nominal Body TSL parameters                           | normalized to 1W   | <b>20.8 W/kg ± 19.5 % (k=2)</b> |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL at 5250 MHz

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 53.2 $\Omega$ - 5.2 j $\Omega$ |
| Return Loss                          | - 24.6 dB                      |

### Antenna Parameters with Head TSL at 5600 MHz

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 57.2 $\Omega$ - 0.4 j $\Omega$ |
| Return Loss                          | - 23.4 dB                      |

### Antenna Parameters with Head TSL at 5750 MHz

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 56.7 $\Omega$ + 0.9 j $\Omega$ |
| Return Loss                          | - 23.9 dB                      |

### Antenna Parameters with Body TSL at 5250 MHz

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 51.6 $\Omega$ - 4.3 j $\Omega$ |
| Return Loss                          | - 26.9 dB                      |

### Antenna Parameters with Body TSL at 5600 MHz

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 59.0 $\Omega$ - 0.3 j $\Omega$ |
| Return Loss                          | - 21.7 dB                      |

### Antenna Parameters with Body TSL at 5750 MHz

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 57.8 $\Omega$ + 1.0 j $\Omega$ |
| Return Loss                          | - 22.7 dB                      |

## General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.205 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |                    |
|-----------------|--------------------|
| Manufactured by | SPEAG              |
| Manufactured on | September 08, 2011 |

## DASY5 Validation Report for Head TSL

Date: 13.03.2018

Test Laboratory: SPEAG, Zurich, Switzerland

### DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1123

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz

Medium parameters used:  $f = 5250$  MHz;  $\sigma = 4.58$  S/m;  $\epsilon_r = 36.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>,

Medium parameters used:  $f = 5600$  MHz;  $\sigma = 4.94$  S/m;  $\epsilon_r = 35.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>,

Medium parameters used:  $f = 5750$  MHz;  $\sigma = 5.1$  S/m;  $\epsilon_r = 35.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

#### DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.51, 5.51, 5.51); Calibrated: 30.12.2017, ConvF(5.05, 5.05, 5.05); Calibrated: 30.12.2017, ConvF(4.98, 4.98, 4.98); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

#### Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 73.12 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 28.1 W/kg

**SAR(1 g) = 8.15 W/kg; SAR(10 g) = 2.35 W/kg**

Maximum value of SAR (measured) = 18.4 W/kg

#### Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 72.34 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 32.4 W/kg

**SAR(1 g) = 8.51 W/kg; SAR(10 g) = 2.43 W/kg**

Maximum value of SAR (measured) = 19.8 W/kg

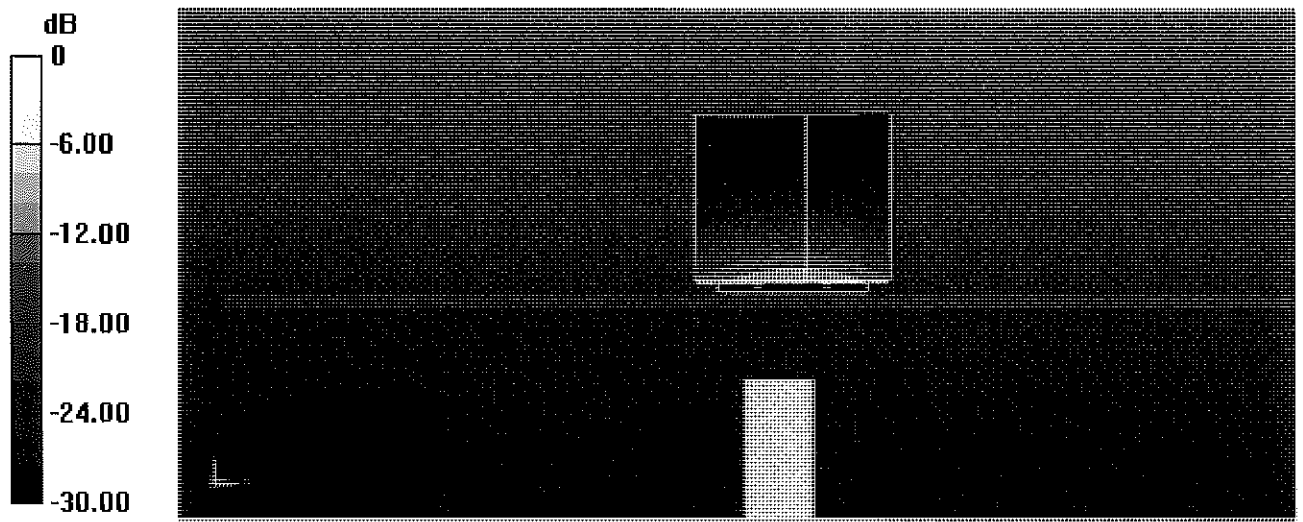
#### Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 70.38 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 31.4 W/kg

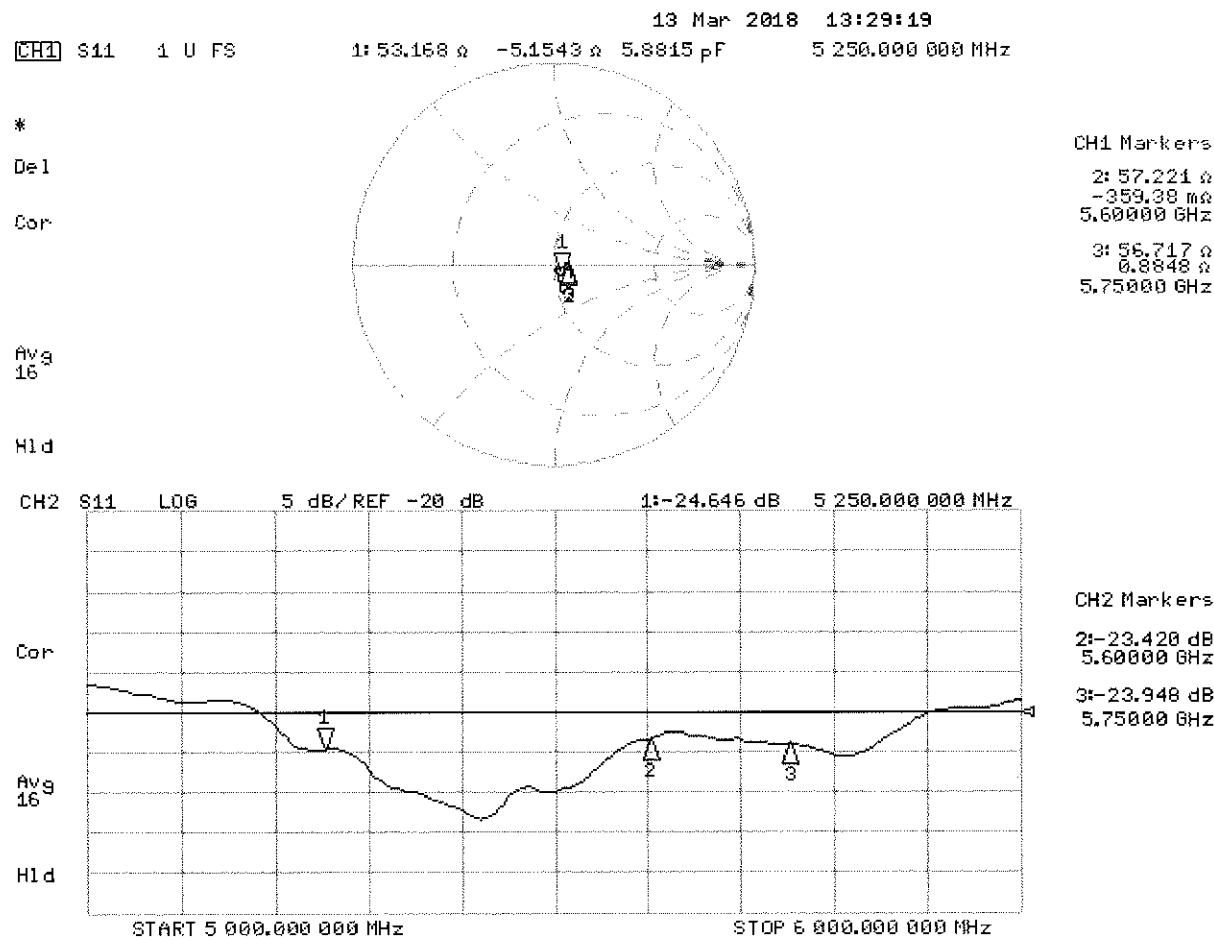
**SAR(1 g) = 8.06 W/kg; SAR(10 g) = 2.29 W/kg**

Maximum value of SAR (measured) = 19.1 W/kg



0 dB = 19.1 W/kg = 12.81 dBW/kg

Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 12.03.2018

Test Laboratory: SPEAG, Zurich, Switzerland

### DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1123

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz

Medium parameters used:  $f = 5250$  MHz;  $\sigma = 5.49$  S/m;  $\epsilon_r = 47.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>,

Medium parameters used:  $f = 5600$  MHz;  $\sigma = 5.97$  S/m;  $\epsilon_r = 46.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>,

Medium parameters used:  $f = 5750$  MHz;  $\sigma = 6.18$  S/m;  $\epsilon_r = 46.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

#### DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.26, 5.26, 5.26); Calibrated: 30.12.2017, ConvF(4.65, 4.65, 4.65); Calibrated: 30.12.2017, ConvF(4.57, 4.57, 4.57); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

#### Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 63.35 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 28.3 W/kg

**SAR(1 g) = 7.45 W/kg; SAR(10 g) = 2.08 W/kg**

Maximum value of SAR (measured) = 17.6 W/kg

#### Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 63.20 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 32.5 W/kg

**SAR(1 g) = 7.82 W/kg; SAR(10 g) = 2.19 W/kg**

Maximum value of SAR (measured) = 19.0 W/kg

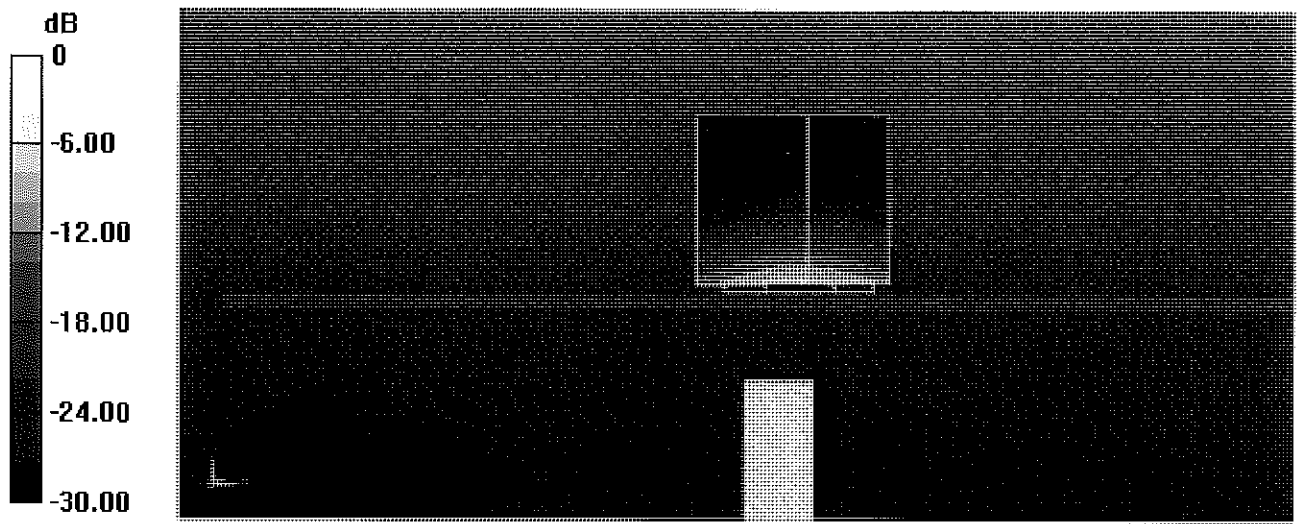
#### Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 61.74 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 31.8 W/kg

**SAR(1 g) = 7.52 W/kg; SAR(10 g) = 2.1 W/kg**

Maximum value of SAR (measured) = 18.5 W/kg



0 dB = 18.5 W/kg = 12.67 dBW/kg

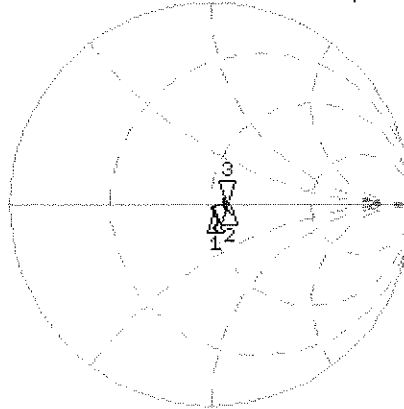
# Impedance Measurement Plot for Body TSL

12 Mar 2018 09:33:31  
 CH1 S11 1 U FS 3: 57.789  $\Omega$  1.0371  $\Omega$  28.706 pH 5 750.000 000 MHz

\*  
 Del  
 Cor

Avg  
 16

H1d



CH1 Markers

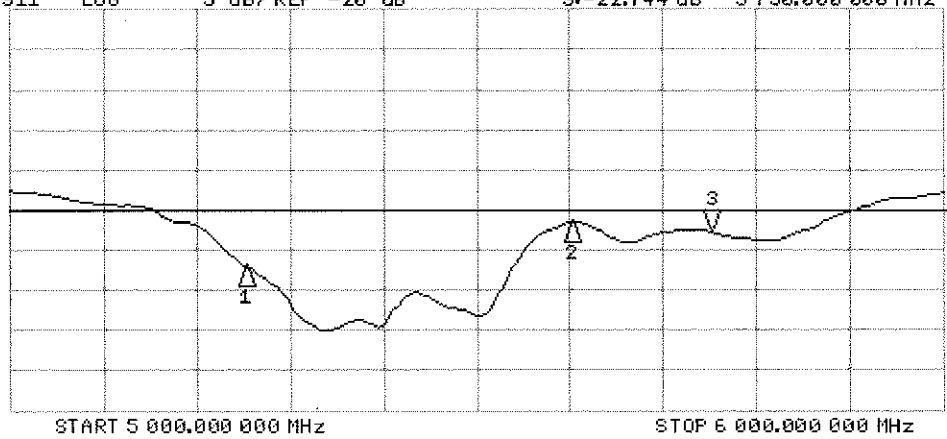
1: 51.600  $\Omega$   
 -4.3008  $\Omega$   
 5.25000 GHz  
 2: 58.990  $\Omega$   
 -261.72 m $\Omega$   
 5.60000 GHz

CH2 S11 LOG 5 dB/REF -20 dB 3: -22.744 dB 5 750.000 000 MHz

Cor

Avg  
 16

H1d



CH2 Markers

1: -26.909 dB  
 5.25000 GHz  
 2: -21.670 dB  
 5.60000 GHz

# Certification of Calibration

Object D5GHzV2 – SN: 1123

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

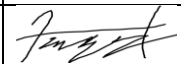
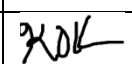
Extension Calibration date: 3/12/2019

Description: SAR Validation Dipole at 5250, 5600, and 5750 MHz.

## Calibration Equipment used:

| Manufacturer          | Model     | Description                                             | Cal Date   | Cal Interval | Cal Due    | Serial Number |
|-----------------------|-----------|---------------------------------------------------------|------------|--------------|------------|---------------|
| Agilent               | 8753ES    | S-Parameter Network Analyzer                            | 10/2/2018  | Annual       | 10/2/2019  | US39170118    |
| Agilent               | N5182A    | MXG Vector Signal Generator                             | 6/15/2018  | Annual       | 6/15/2019  | MY47420837    |
| Amplifier Research    | 15S1G6    | Amplifier                                               | CBT        | N/A          | CBT        | 343972        |
| Anritsu               | MA2411B   | Pulse Power Sensor                                      | 10/30/2018 | Annual       | 10/30/2019 | 1207470       |
| Anritsu               | MA2411B   | Pulse Power Sensor                                      | 11/20/2018 | Annual       | 11/20/2019 | 1339007       |
| Anritsu               | ML2495A   | Power Meter                                             | 10/21/2018 | Annual       | 10/21/2019 | 941001        |
| Control Company       | 4040      | Temperature / Humidity Monitor                          | 2/28/2018  | Biennial     | 2/28/2020  | 150761911     |
| Control Company       | 4352      | Ultra Long Stem Thermometer                             | 5/2/2017   | Biennial     | 5/2/2019   | 170330158     |
| Keysight              | 772D      | Dual Directional Coupler                                | CBT        | N/A          | CBT        | MY52180215    |
| Keysight Technologies | 85033E    | Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm) | 6/4/2018   | Annual       | 6/4/2019   | MY53401181    |
| MiniCircuits          | VLF-6000+ | Low Pass Filter                                         | CBT        | N/A          | CBT        | N/A           |
| Mini-Circuits         | BW-N20W5+ | DC to 18 GHz Precision Fixed 20 dB Attenuator           | CBT        | N/A          | CBT        | N/A           |
| Narda                 | 4772-3    | Attenuator (3dB)                                        | CBT        | N/A          | CBT        | 9406          |
| Pasternack            | PE2209-10 | Bidirectional Coupler                                   | CBT        | N/A          | CBT        | N/A           |
| Seekonk               | NC-100    | Torque Wrench                                           | 7/11/2018  | Annual       | 7/11/2019  | N/A           |
| SPEAG                 | DAE4      | Dasy Data Acquisition Electronics                       | 7/10/2018  | Annual       | 7/10/2019  | 1402          |
| SPEAG                 | DAE4      | Dasy Data Acquisition Electronics                       | 10/18/2018 | Annual       | 10/18/2019 | 1364          |
| SPEAG                 | DAK-3.5   | Dielectric Assessment Kit                               | 5/15/2018  | Annual       | 5/15/2019  | 1070          |
| SPEAG                 | EX3DV4    | SAR Probe                                               | 7/20/2018  | Annual       | 7/20/2019  | 7416          |
| SPEAG                 | EX3DV4    | SAR Probe                                               | 7/20/2018  | Annual       | 7/20/2019  | 7491          |

Measurement Uncertainty =  $\pm 23\%$  (k=2)

|                | Name            | Function           | Signature                                                                             |
|----------------|-----------------|--------------------|---------------------------------------------------------------------------------------|
| Calibrated By: | Sangmin Cha     | Team Lead Engineer |  |
| Approved By:   | Kaitlin O'Keefe | Managing Director  |  |

# DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

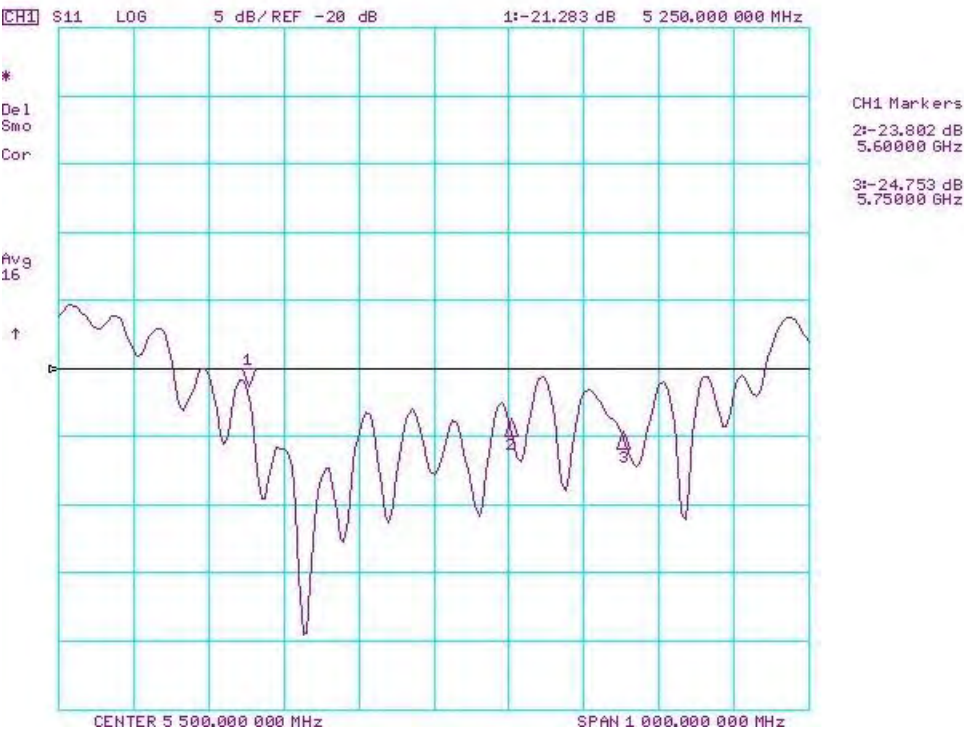
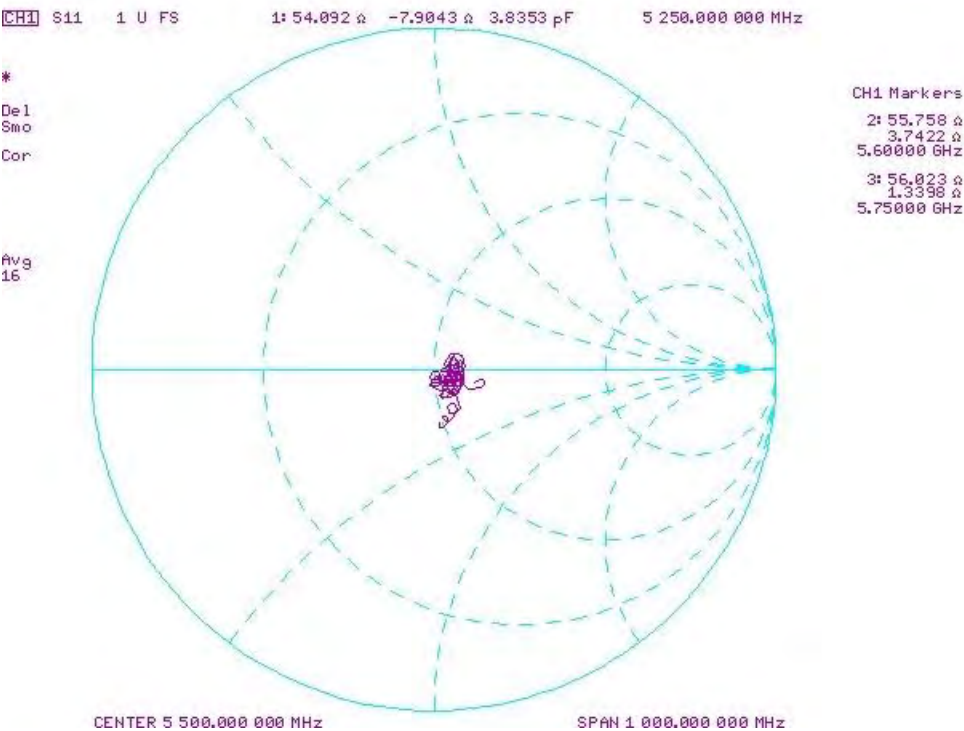
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

| Frequency (MHz) | Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Head (1g) W/kg @ 17.0 dBm | Measured Head SAR (1g) W/kg @ 17.0 dBm | Deviation 1g (%) | Certificate SAR Target Head (10g) W/kg @ 17.0 dBm | Measured Head SAR (10g) W/kg @ 17.0 dBm | Deviation 10g (%) | Certificate Impedance Head (Ohm) Real | Measured Impedance Head (Ohm) Real | Difference (Ohm) Real | Certificate Impedance Head (Ohm) Imaginary | Measured Impedance Head (Ohm) Imaginary | Difference (Ohm) Imaginary | Certificate Return Loss Head (dB) | Measured Return Loss Head (dB) | Deviation (%) | PASS/FAIL |
|-----------------|------------------|----------------|-----------------------------------|--------------------------------------------------|----------------------------------------|------------------|---------------------------------------------------|-----------------------------------------|-------------------|---------------------------------------|------------------------------------|-----------------------|--------------------------------------------|-----------------------------------------|----------------------------|-----------------------------------|--------------------------------|---------------|-----------|
| 5250            | 3/13/2018        | 3/12/2019      | 1.205                             | 4.08                                             | 3.84                                   | -5.88%           | 1.18                                              | 1.09                                    | -7.63%            | 53.2                                  | 54.1                               | 0.9                   | -5.2                                       | -7.9                                    | 2.7                        | -24.6                             | -21.3                          | 13.40%        | PASS      |
| 5600            | 3/13/2018        | 3/12/2019      | 1.205                             | 4.26                                             | 4                                      | -6.10%           | 1.22                                              | 1.13                                    | -7.38%            | 57.2                                  | 55.8                               | 1.4                   | -0.4                                       | 3.7                                     | 4.1                        | -23.4                             | -23.8                          | -1.70%        | PASS      |
| 5750            | 3/13/2018        | 3/12/2019      | 1.205                             | 4.03                                             | 3.73                                   | -7.44%           | 1.15                                              | 1.06                                    | -7.83%            | 56.7                                  | 56                                 | 0.7                   | 0.9                                        | 1.3                                     | 0.4                        | -23.9                             | -24.8                          | -3.80%        | PASS      |

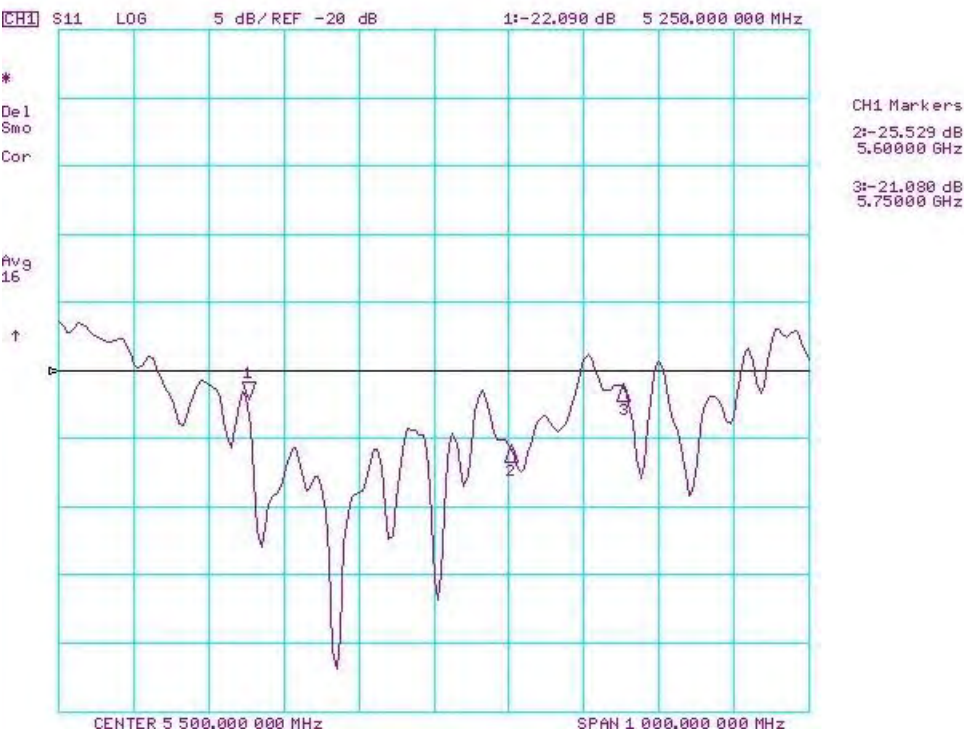
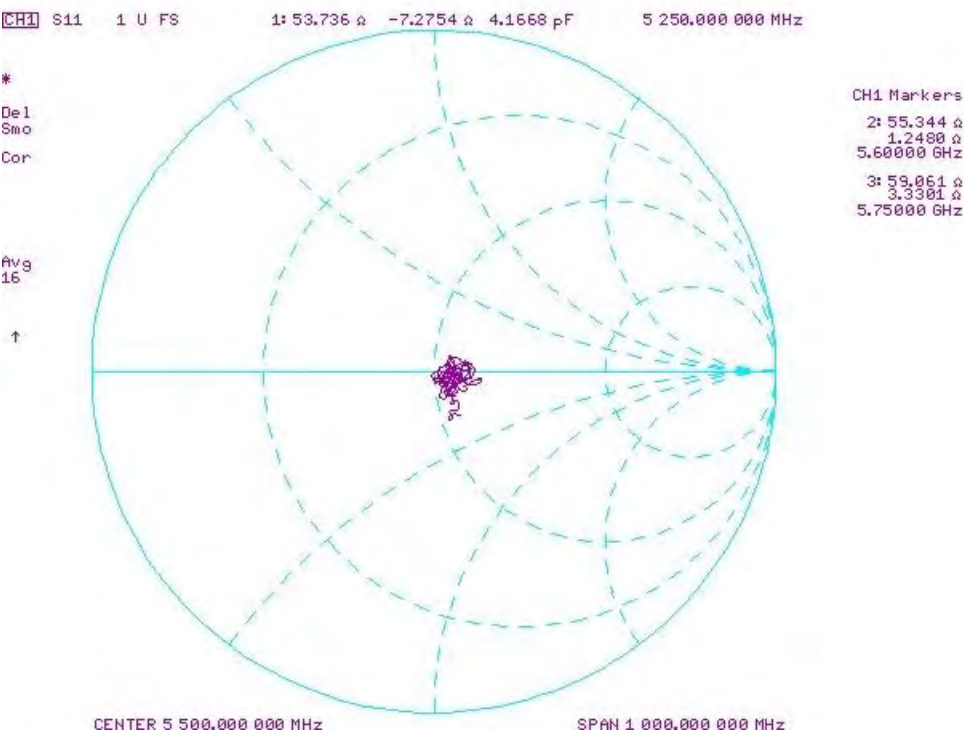
  

| Frequency (MHz) | Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Body (1g) W/kg @ 17.0 dBm | Measured Body SAR (1g) W/kg @ 17.0 dBm | Deviation 1g (%) | Certificate SAR Target Body (10g) W/kg @ 17.0 dBm | Measured Body SAR (10g) W/kg @ 17.0 dBm | Deviation 10g (%) | Certificate Impedance Body (Ohm) Real | Measured Impedance Body (Ohm) Real | Difference (Ohm) Real | Certificate Impedance Body (Ohm) Imaginary | Measured Impedance Body (Ohm) Imaginary | Difference (Ohm) Imaginary | Certificate Return Loss Body (dB) | Measured Return Loss Body (dB) | Deviation (%) | PASS/FAIL |
|-----------------|------------------|----------------|-----------------------------------|--------------------------------------------------|----------------------------------------|------------------|---------------------------------------------------|-----------------------------------------|-------------------|---------------------------------------|------------------------------------|-----------------------|--------------------------------------------|-----------------------------------------|----------------------------|-----------------------------------|--------------------------------|---------------|-----------|
| 5250            | 3/13/2018        | 3/12/2019      | 1.205                             | 3.7                                              | 3.63                                   | 3.51%            | 1.03                                              | 1.07                                    | 3.88%             | 51.6                                  | 53.7                               | 2.1                   | -4.3                                       | -7.3                                    | 3                          | -26.9                             | -22.1                          | 17.80%        | PASS      |
| 5600            | 3/13/2018        | 3/12/2019      | 1.205                             | 3.88                                             | 3.97                                   | 2.32%            | 1.09                                              | 1.09                                    | 0.00%             | 59                                    | 55.3                               | 3.7                   | -0.3                                       | 1.2                                     | 1.5                        | -21.7                             | -25.5                          | -17.50%       | PASS      |
| 5750            | 3/13/2018        | 3/12/2019      | 1.205                             | 3.74                                             | 3.76                                   | 0.53%            | 1.04                                              | 1.03                                    | -0.96%            | 57.8                                  | 59.1                               | 1.3                   | 1                                          | 3.3                                     | 2.3                        | -22.7                             | -21.1                          | 7.00%         | PASS      |

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA  
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **EX3-7421\_Mar19**

## CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:7421**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v7**  
**Calibration procedure for dosimetric E-field probes**

Calibration date: **March 18, 2019**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^\circ\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|----------------------------|------------------|-----------------------------------|------------------------|
| Power meter NRP            | SN: 104778       | 04-Apr-18 (No. 217-02672/02673)   | Apr-19                 |
| Power sensor NRP-Z91       | SN: 103244       | 04-Apr-18 (No. 217-02672)         | Apr-19                 |
| Power sensor NRP-Z91       | SN: 103245       | 04-Apr-18 (No. 217-02673)         | Apr-19                 |
| Reference 20 dB Attenuator | SN: S5277 (20x)  | 04-Apr-18 (No. 217-02682)         | Apr-19                 |
| DAE4                       | SN: 660          | 19-Dec-18 (No. DAE4-660_Dec18)    | Dec-19                 |
| Reference Probe ES3DV2     | SN: 3013         | 31-Dec-18 (No. ES3-3013_Dec18)    | Dec-19                 |
| Secondary Standards        | ID               | Check Date (in house)             | Scheduled Check        |
| Power meter E4419B         | SN: GB41293874   | 06-Apr-16 (in house check Jun-18) | In house check: Jun-20 |
| Power sensor E4412A        | SN: MY41498087   | 06-Apr-16 (in house check Jun-18) | In house check: Jun-20 |
| Power sensor E4412A        | SN: 000110210    | 06-Apr-16 (in house check Jun-18) | In house check: Jun-20 |
| RF generator HP 8648C      | SN: US3642U01700 | 04-Aug-99 (in house check Jun-18) | In house check: Jun-20 |
| Network Analyzer E8358A    | SN: US41080477   | 31-Mar-14 (in house check Oct-18) | In house check: Oct-19 |

|                |                                |                                          |               |
|----------------|--------------------------------|------------------------------------------|---------------|
| Calibrated by: | Name<br><b>Claudio Leubler</b> | Function<br><b>Laboratory Technician</b> | Signature<br> |
| Approved by:   | Name<br><b>Katja Pokovic</b>   | Function<br><b>Technical Manager</b>     | Signature<br> |

Issued: March 18, 2019

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

The Swiss Accreditation Service is one of the signatories to the EA  
 Multilateral Agreement for the recognition of calibration certificates

### Glossary:

|                          |                                                                                                                                                         |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| TSL                      | tissue simulating liquid                                                                                                                                |
| NORM <sub>x,y,z</sub>    | sensitivity in free space                                                                                                                               |
| ConvF                    | sensitivity in TSL / NORM <sub>x,y,z</sub>                                                                                                              |
| DCP                      | diode compression point                                                                                                                                 |
| CF                       | crest factor (1/duty_cycle) of the RF signal                                                                                                            |
| A, B, C, D               | modulation dependent linearization parameters                                                                                                           |
| Polarization $\varphi$   | $\varphi$ rotation around probe axis                                                                                                                    |
| Polarization $\vartheta$ | $\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center),<br>i.e., $\vartheta = 0$ is normal to probe axis |
| Connector Angle          | information used in DASY system to align probe sensor X to the robot coordinate system                                                                  |

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

### Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the  $E^2$ -field uncertainty inside TSL (see below ConvF).
- NORM(f)<sub>x,y,z</sub>** = NORM<sub>x,y,z</sub> \* frequency\_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; D<sub>x,y,z</sub>; VR<sub>x,y,z</sub>**: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  MHz) and inside waveguide using analytical field distributions based on power measurements for  $f > 800$  MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> \* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$  MHz to  $\pm 100$  MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM<sub>x</sub> (no uncertainty required).

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:7421

## Basic Calibration Parameters

|                                                           | Sensor X | Sensor Y | Sensor Z | Unc (k=2)     |
|-----------------------------------------------------------|----------|----------|----------|---------------|
| Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup> | 0.56     | 0.27     | 0.59     | $\pm 10.1 \%$ |
| DCP (mV) <sup>B</sup>                                     | 102.3    | 97.6     | 102.2    |               |

## Calibration Results for Modulation Response

| UID       | Communication System Name   |   | A<br>dB | B<br>dB/ $\mu\text{V}$ | C     | D<br>dB | VR<br>mV | Max<br>dev.  | Max<br>Unc <sup>E</sup><br>(k=2) |
|-----------|-----------------------------|---|---------|------------------------|-------|---------|----------|--------------|----------------------------------|
| 0         | CW                          | X | 0.00    | 0.00                   | 1.00  | 0.00    | 148.2    | $\pm 3.0 \%$ | $\pm 4.7 \%$                     |
|           |                             | Y | 0.00    | 0.00                   | 1.00  |         | 147.6    |              |                                  |
|           |                             | Z | 0.00    | 0.00                   | 1.00  |         | 154.1    |              |                                  |
| 10352-AAA | Pulse Waveform (200Hz, 10%) | X | 15.00   | 87.49                  | 19.01 | 10.00   | 60.0     | $\pm 3.4 \%$ | $\pm 9.6 \%$                     |
|           |                             | Y | 15.00   | 83.20                  | 17.32 |         | 60.0     |              |                                  |
|           |                             | Z | 15.00   | 86.81                  | 18.60 |         | 60.0     |              |                                  |
| 10353-AAA | Pulse Waveform (200Hz, 20%) | X | 15.00   | 91.65                  | 20.00 | 6.99    | 80.0     | $\pm 2.2 \%$ | $\pm 9.6 \%$                     |
|           |                             | Y | 15.00   | 85.13                  | 16.62 |         | 80.0     |              |                                  |
|           |                             | Z | 15.00   | 89.63                  | 18.87 |         | 80.0     |              |                                  |
| 10354-AAA | Pulse Waveform (200Hz, 40%) | X | 15.00   | 102.81                 | 24.04 | 3.98    | 95.0     | $\pm 1.1 \%$ | $\pm 9.6 \%$                     |
|           |                             | Y | 1.12    | 65.38                  | 8.21  |         | 95.0     |              |                                  |
|           |                             | Z | 15.00   | 95.41                  | 20.31 |         | 95.0     |              |                                  |
| 10355-AAA | Pulse Waveform (200Hz, 60%) | X | 15.00   | 124.46                 | 32.48 | 2.22    | 120.0    | $\pm 1.5 \%$ | $\pm 9.6 \%$                     |
|           |                             | Y | 0.30    | 60.00                  | 3.81  |         | 120.0    |              |                                  |
|           |                             | Z | 15.00   | 104.07                 | 22.98 |         | 120.0    |              |                                  |
| 10387-AAA | QPSK Waveform, 1 MHz        | X | 0.72    | 62.94                  | 9.47  | 0.00    | 150.0    | $\pm 3.3 \%$ | $\pm 9.6 \%$                     |
|           |                             | Y | 0.54    | 60.01                  | 7.21  |         | 150.0    |              |                                  |
|           |                             | Z | 0.65    | 61.74                  | 8.58  |         | 150.0    |              |                                  |
| 10388-AAA | QPSK Waveform, 10 MHz       | X | 2.48    | 70.63                  | 17.28 | 0.00    | 150.0    | $\pm 1.2 \%$ | $\pm 9.6 \%$                     |
|           |                             | Y | 2.25    | 68.74                  | 16.08 |         | 150.0    |              |                                  |
|           |                             | Z | 2.35    | 69.49                  | 16.55 |         | 150.0    |              |                                  |
| 10396-AAA | 64-QAM Waveform, 100 kHz    | X | 3.27    | 73.34                  | 20.27 | 3.01    | 150.0    | $\pm 0.8 \%$ | $\pm 9.6 \%$                     |
|           |                             | Y | 3.06    | 71.22                  | 19.53 |         | 150.0    |              |                                  |
|           |                             | Z | 2.96    | 71.38                  | 19.18 |         | 150.0    |              |                                  |
| 10399-AAA | 64-QAM Waveform, 40 MHz     | X | 3.63    | 68.11                  | 16.47 | 0.00    | 150.0    | $\pm 2.9 \%$ | $\pm 9.6 \%$                     |
|           |                             | Y | 3.50    | 67.23                  | 16.01 |         | 150.0    |              |                                  |
|           |                             | Z | 3.45    | 67.19                  | 15.90 |         | 150.0    |              |                                  |
| 10414-AAA | WLAN CCDF, 64-QAM, 40MHz    | X | 4.90    | 66.22                  | 15.97 | 0.00    | 150.0    | $\pm 5.2 \%$ | $\pm 9.6 \%$                     |
|           |                             | Y | 4.87    | 65.62                  | 15.79 |         | 150.0    |              |                                  |
|           |                             | Z | 4.73    | 65.55                  | 15.54 |         | 150.0    |              |                                  |

Note: For details on UID parameters see Appendix

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

<sup>A</sup> The uncertainties of Norm X,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).

<sup>B</sup> Numerical linearization parameter; uncertainty not required.

<sup>E</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:7421

### Sensor Model Parameters

|   | C1<br>fF | C2<br>fF | $\alpha$<br>$V^{-1}$ | T1<br>$ms.V^{-2}$ | T2<br>$ms.V^{-1}$ | T3<br>ms | T4<br>$V^{-2}$ | T5<br>$V^{-1}$ | T6   |
|---|----------|----------|----------------------|-------------------|-------------------|----------|----------------|----------------|------|
| X | 40.3     | 299.31   | 35.47                | 10.06             | 0.00              | 5.08     | 1.47           | 0.19           | 1.01 |
| Y | 47.0     | 377.47   | 40.51                | 5.50              | 0.68              | 5.07     | 0.00           | 0.58           | 1.01 |
| Z | 40.1     | 297.66   | 35.27                | 9.72              | 0.00              | 5.07     | 1.15           | 0.22           | 1.00 |

### Other Probe Parameters

|                                               |            |
|-----------------------------------------------|------------|
| Sensor Arrangement                            | Triangular |
| Connector Angle (°)                           | 58.7       |
| Mechanical Surface Detection Mode             | enabled    |
| Optical Surface Detection Mode                | disabled   |
| Probe Overall Length                          | 337 mm     |
| Probe Body Diameter                           | 10 mm      |
| Tip Length                                    | 9 mm       |
| Tip Diameter                                  | 2.5 mm     |
| Probe Tip to Sensor X Calibration Point       | 1 mm       |
| Probe Tip to Sensor Y Calibration Point       | 1 mm       |
| Probe Tip to Sensor Z Calibration Point       | 1 mm       |
| Recommended Measurement Distance from Surface | 1.4 mm     |

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:7421

### Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unc (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-----------|
| 750                  | 41.9                               | 0.89                            | 9.64    | 9.64    | 9.64    | 0.55               | 0.80                    | ± 12.0 %  |
| 835                  | 41.5                               | 0.90                            | 9.32    | 9.32    | 9.32    | 0.38               | 0.99                    | ± 12.0 %  |
| 1750                 | 40.1                               | 1.37                            | 7.99    | 7.99    | 7.99    | 0.36               | 0.86                    | ± 12.0 %  |
| 1900                 | 40.0                               | 1.40                            | 7.69    | 7.69    | 7.69    | 0.34               | 0.85                    | ± 12.0 %  |
| 2300                 | 39.5                               | 1.67                            | 7.55    | 7.55    | 7.55    | 0.38               | 0.88                    | ± 12.0 %  |
| 2450                 | 39.2                               | 1.80                            | 7.21    | 7.21    | 7.21    | 0.37               | 0.89                    | ± 12.0 %  |
| 2600                 | 39.0                               | 1.96                            | 6.97    | 6.97    | 6.97    | 0.43               | 0.87                    | ± 12.0 %  |

<sup>C</sup> Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:7421

### Calibration Parameter Determined in Body Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unc (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-----------|
| 750                  | 55.5                               | 0.96                            | 9.66    | 9.66    | 9.66    | 0.50               | 0.80                    | ± 12.0 %  |
| 835                  | 55.2                               | 0.97                            | 9.48    | 9.48    | 9.48    | 0.40               | 0.80                    | ± 12.0 %  |
| 1750                 | 53.4                               | 1.49                            | 7.90    | 7.90    | 7.90    | 0.35               | 0.85                    | ± 12.0 %  |
| 1900                 | 53.3                               | 1.52                            | 7.60    | 7.60    | 7.60    | 0.34               | 0.84                    | ± 12.0 %  |
| 2300                 | 52.9                               | 1.81                            | 7.53    | 7.53    | 7.53    | 0.38               | 0.85                    | ± 12.0 %  |
| 2450                 | 52.7                               | 1.95                            | 7.46    | 7.46    | 7.46    | 0.27               | 0.93                    | ± 12.0 %  |
| 2600                 | 52.5                               | 2.16                            | 7.29    | 7.29    | 7.29    | 0.24               | 0.99                    | ± 12.0 %  |

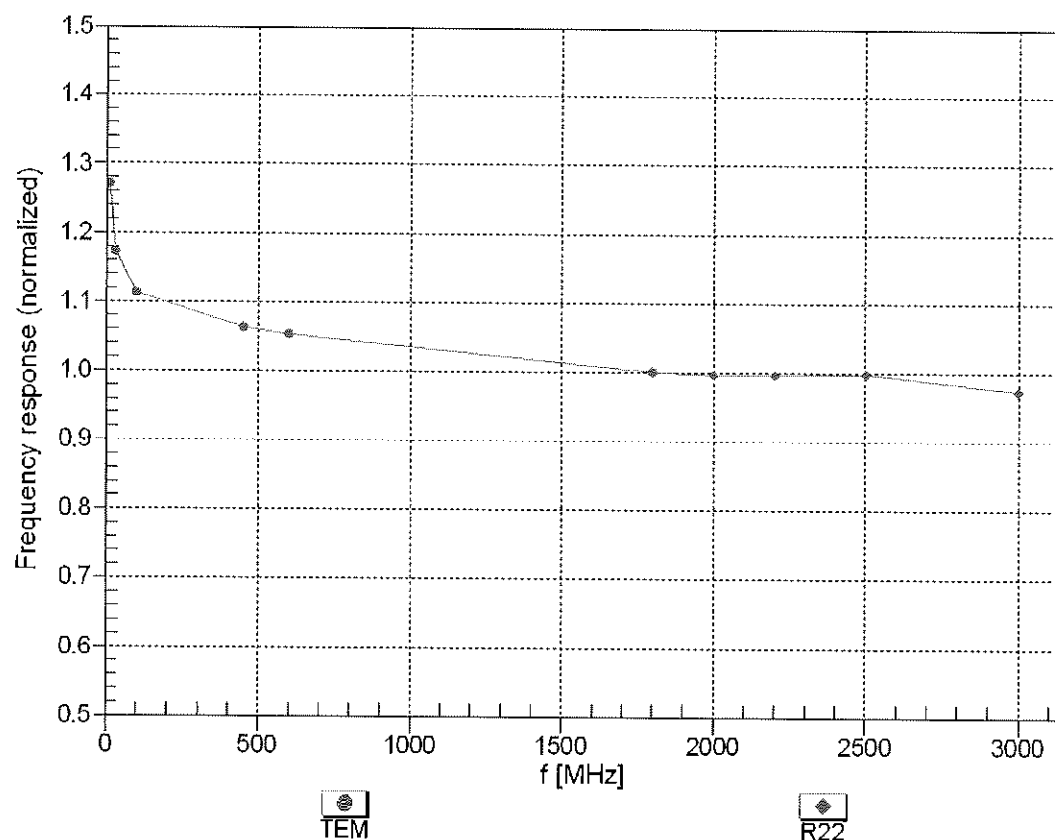
<sup>C</sup> Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

## Frequency Response of E-Field

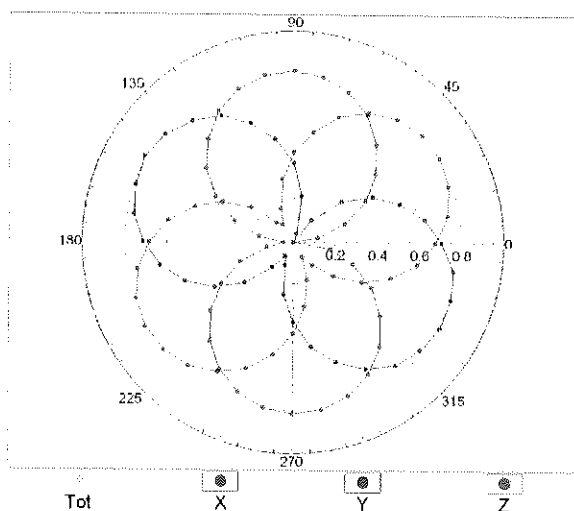
(TEM-Cell:ifi110 EXX, Waveguide: R22)



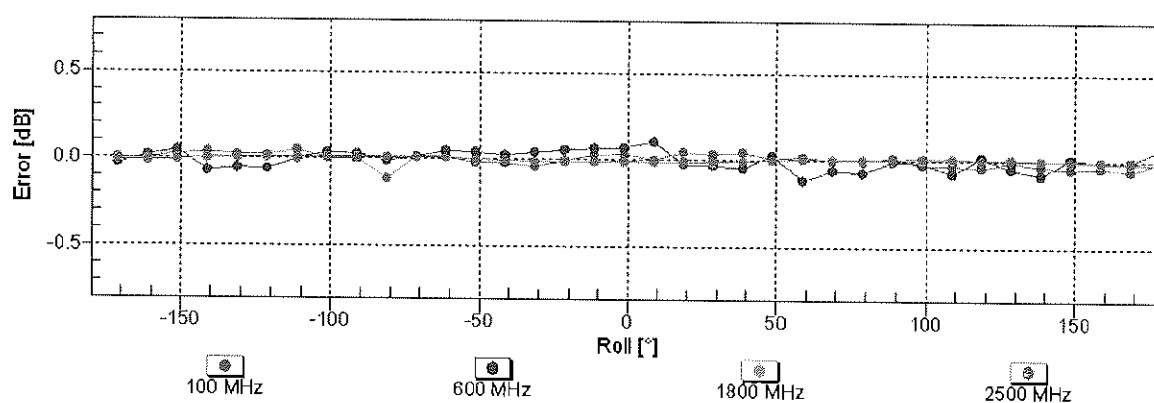
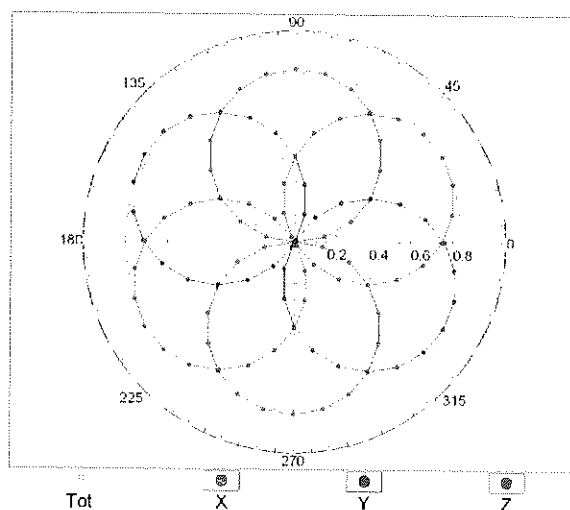
Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

## Receiving Pattern ( $\phi$ ), $\theta = 0^\circ$

f=600 MHz,TEM

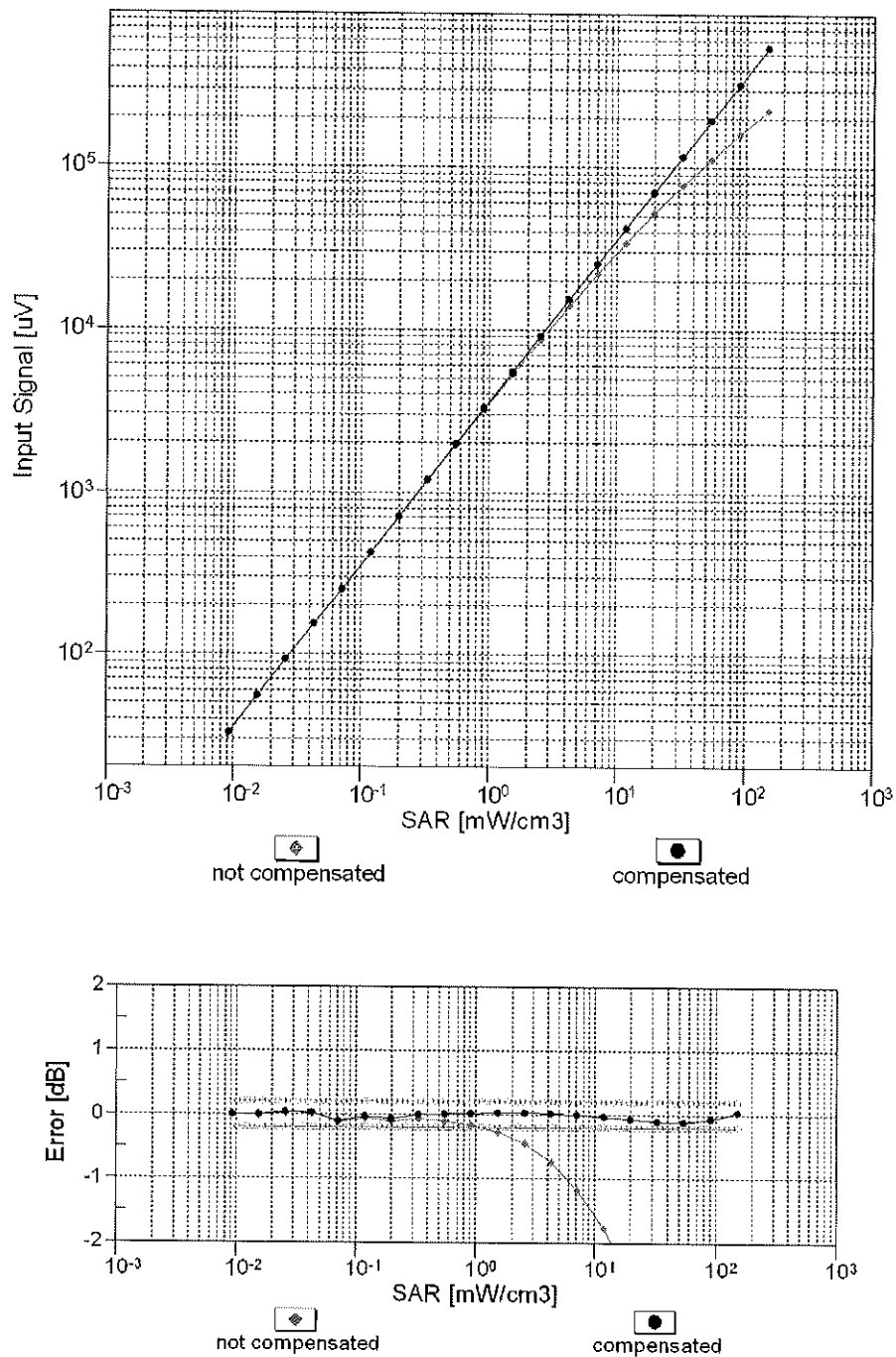


f=1800 MHz,R22



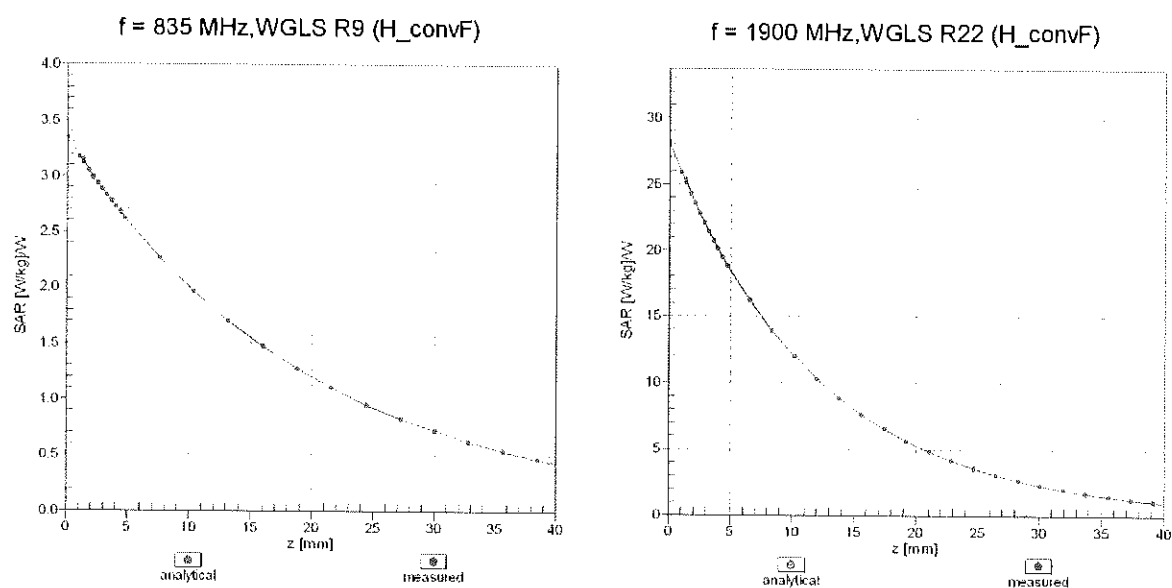
Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  (k=2)

## Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell, $f_{\text{eval}} = 1900 \text{ MHz}$ )



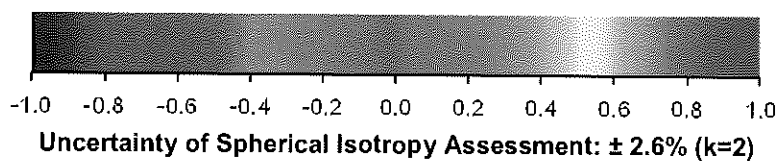
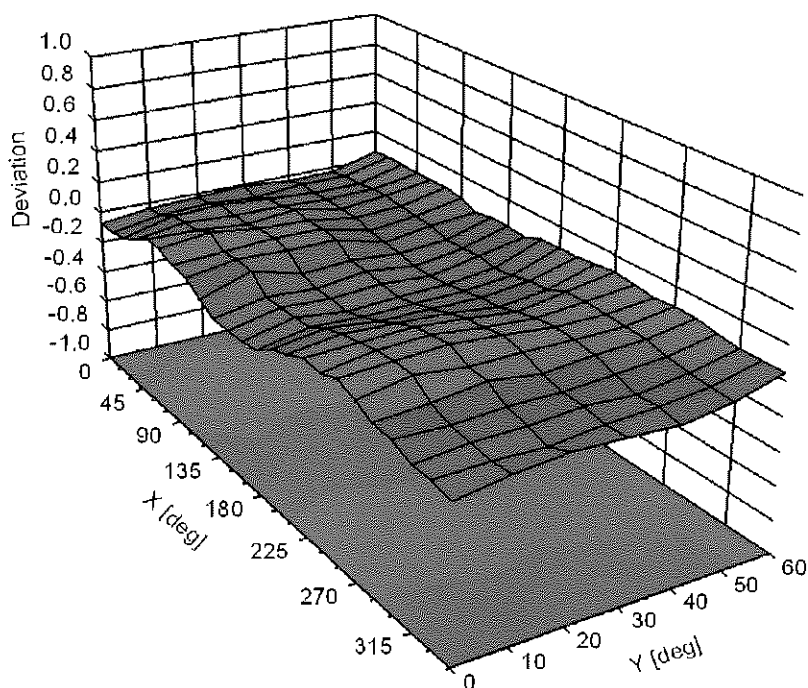
Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )

## Conversion Factor Assessment



## Deviation from Isotropy in Liquid

Error ( $\phi, \theta$ ),  $f = 900 \text{ MHz}$



Uncertainty of Spherical Isotropy Assessment:  $\pm 2.6\%$  ( $k=2$ )

**Appendix: Modulation Calibration Parameters**

| UID   | Rev | Communication System Name                           | Group     | PAR (dB) | Unc <sup>E</sup> (k=2) |
|-------|-----|-----------------------------------------------------|-----------|----------|------------------------|
| 0     |     | CW                                                  | CW        | 0.00     | ± 4.7 %                |
| 10010 | CAA | SAR Validation (Square, 100ms, 10ms)                | Test      | 10.00    | ± 9.6 %                |
| 10011 | CAB | UMTS-FDD (WCDMA)                                    | WCDMA     | 2.91     | ± 9.6 %                |
| 10012 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)            | WLAN      | 1.87     | ± 9.6 %                |
| 10013 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)       | WLAN      | 9.46     | ± 9.6 %                |
| 10021 | DAC | GSM-FDD (TDMA, GMSK)                                | GSM       | 9.39     | ± 9.6 %                |
| 10023 | DAC | GPRS-FDD (TDMA, GMSK, TN 0)                         | GSM       | 9.57     | ± 9.6 %                |
| 10024 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1)                       | GSM       | 6.56     | ± 9.6 %                |
| 10025 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0)                         | GSM       | 12.62    | ± 9.6 %                |
| 10026 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1)                       | GSM       | 9.55     | ± 9.6 %                |
| 10027 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2)                     | GSM       | 4.80     | ± 9.6 %                |
| 10028 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)                   | GSM       | 3.55     | ± 9.6 %                |
| 10029 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2)                     | GSM       | 7.78     | ± 9.6 %                |
| 10030 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH1)                 | Bluetooth | 5.30     | ± 9.6 %                |
| 10031 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH3)                 | Bluetooth | 1.87     | ± 9.6 %                |
| 10032 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH5)                 | Bluetooth | 1.16     | ± 9.6 %                |
| 10033 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)           | Bluetooth | 7.74     | ± 9.6 %                |
| 10034 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)           | Bluetooth | 4.53     | ± 9.6 %                |
| 10035 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)           | Bluetooth | 3.83     | ± 9.6 %                |
| 10036 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH1)               | Bluetooth | 8.01     | ± 9.6 %                |
| 10037 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH3)               | Bluetooth | 4.77     | ± 9.6 %                |
| 10038 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH5)               | Bluetooth | 4.10     | ± 9.6 %                |
| 10039 | CAB | CDMA2000 (1xRTT, RC1)                               | CDMA2000  | 4.57     | ± 9.6 %                |
| 10042 | CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate) | AMPS      | 7.78     | ± 9.6 %                |
| 10044 | CAA | IS-91/EIA/TIA-553 FDD (FDMA, FM)                    | AMPS      | 0.00     | ± 9.6 %                |
| 10048 | CAA | DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)           | DECT      | 13.80    | ± 9.6 %                |
| 10049 | CAA | DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)         | DECT      | 10.79    | ± 9.6 %                |
| 10056 | CAA | UMTS-TDD (TD-SCDMA, 1.28 Mcps)                      | TD-SCDMA  | 11.01    | ± 9.6 %                |
| 10058 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)                   | GSM       | 6.52     | ± 9.6 %                |
| 10059 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)            | WLAN      | 2.12     | ± 9.6 %                |
| 10060 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)          | WLAN      | 2.83     | ± 9.6 %                |
| 10061 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)           | WLAN      | 3.60     | ± 9.6 %                |
| 10062 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)            | WLAN      | 8.68     | ± 9.6 %                |
| 10063 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)            | WLAN      | 8.63     | ± 9.6 %                |
| 10064 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)           | WLAN      | 9.09     | ± 9.6 %                |
| 10065 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)           | WLAN      | 9.00     | ± 9.6 %                |
| 10066 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)           | WLAN      | 9.38     | ± 9.6 %                |
| 10067 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)           | WLAN      | 10.12    | ± 9.6 %                |
| 10068 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)           | WLAN      | 10.24    | ± 9.6 %                |
| 10069 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)           | WLAN      | 10.56    | ± 9.6 %                |
| 10071 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)       | WLAN      | 9.83     | ± 9.6 %                |
| 10072 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)      | WLAN      | 9.62     | ± 9.6 %                |
| 10073 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)      | WLAN      | 9.94     | ± 9.6 %                |
| 10074 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)      | WLAN      | 10.30    | ± 9.6 %                |
| 10075 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)      | WLAN      | 10.77    | ± 9.6 %                |
| 10076 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)      | WLAN      | 10.94    | ± 9.6 %                |
| 10077 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)      | WLAN      | 11.00    | ± 9.6 %                |
| 10081 | CAB | CDMA2000 (1xRTT, RC3)                               | CDMA2000  | 3.97     | ± 9.6 %                |
| 10082 | CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate) | AMPS      | 4.77     | ± 9.6 %                |
| 10090 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-4)                       | GSM       | 6.56     | ± 9.6 %                |
| 10097 | CAB | UMTS-FDD (HSDPA)                                    | WCDMA     | 3.98     | ± 9.6 %                |
| 10098 | CAB | UMTS-FDD (HSDPA, Subtest 2)                         | WCDMA     | 3.98     | ± 9.6 %                |
| 10099 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-4)                       | GSM       | 9.55     | ± 9.6 %                |
| 10100 | CAE | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)            | LTE-FDD   | 5.67     | ± 9.6 %                |
| 10101 | CAE | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)          | LTE-FDD   | 6.42     | ± 9.6 %                |
| 10102 | CAE | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)          | LTE-FDD   | 6.60     | ± 9.6 %                |
| 10103 | CAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)            | LTE-TDD   | 9.29     | ± 9.6 %                |
| 10104 | CAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)          | LTE-TDD   | 9.97     | ± 9.6 %                |
| 10105 | CAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)          | LTE-TDD   | 10.01    | ± 9.6 %                |
| 10108 | CAG | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)            | LTE-FDD   | 5.80     | ± 9.6 %                |

|       |     |                                                |         |       |         |
|-------|-----|------------------------------------------------|---------|-------|---------|
| 10109 | CAG | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)     | LTE-FDD | 6.43  | ± 9.6 % |
| 10110 | CAG | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)        | LTE-FDD | 5.75  | ± 9.6 % |
| 10111 | CAG | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)      | LTE-FDD | 6.44  | ± 9.6 % |
| 10112 | CAG | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)     | LTE-FDD | 6.59  | ± 9.6 % |
| 10113 | CAG | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)      | LTE-FDD | 6.62  | ± 9.6 % |
| 10114 | CAC | IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)  | WLAN    | 8.10  | ± 9.6 % |
| 10115 | CAC | IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)  | WLAN    | 8.46  | ± 9.6 % |
| 10116 | CAC | IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM) | WLAN    | 8.15  | ± 9.6 % |
| 10117 | CAC | IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)       | WLAN    | 8.07  | ± 9.6 % |
| 10118 | CAC | IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)       | WLAN    | 8.59  | ± 9.6 % |
| 10119 | CAC | IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)      | WLAN    | 8.13  | ± 9.6 % |
| 10140 | CAE | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)     | LTE-FDD | 6.49  | ± 9.6 % |
| 10141 | CAE | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)     | LTE-FDD | 6.53  | ± 9.6 % |
| 10142 | CAE | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)        | LTE-FDD | 5.73  | ± 9.6 % |
| 10143 | CAE | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)      | LTE-FDD | 6.35  | ± 9.6 % |
| 10144 | CAE | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)      | LTE-FDD | 6.65  | ± 9.6 % |
| 10145 | CAF | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)      | LTE-FDD | 5.76  | ± 9.6 % |
| 10146 | CAF | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)    | LTE-FDD | 6.41  | ± 9.6 % |
| 10147 | CAF | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)    | LTE-FDD | 6.72  | ± 9.6 % |
| 10149 | CAE | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)      | LTE-FDD | 6.42  | ± 9.6 % |
| 10150 | CAE | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)      | LTE-FDD | 6.60  | ± 9.6 % |
| 10151 | CAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)        | LTE-TDD | 9.28  | ± 9.6 % |
| 10152 | CAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)      | LTE-TDD | 9.92  | ± 9.6 % |
| 10153 | CAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)      | LTE-TDD | 10.05 | ± 9.6 % |
| 10154 | CAG | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)        | LTE-FDD | 5.75  | ± 9.6 % |
| 10155 | CAG | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)      | LTE-FDD | 6.43  | ± 9.6 % |
| 10156 | CAG | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)         | LTE-FDD | 5.79  | ± 9.6 % |
| 10157 | CAG | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)       | LTE-FDD | 6.49  | ± 9.6 % |
| 10158 | CAG | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)      | LTE-FDD | 6.62  | ± 9.6 % |
| 10159 | CAG | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)       | LTE-FDD | 6.56  | ± 9.6 % |
| 10160 | CAE | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)        | LTE-FDD | 5.82  | ± 9.6 % |
| 10161 | CAE | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)      | LTE-FDD | 6.43  | ± 9.6 % |
| 10162 | CAE | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)      | LTE-FDD | 6.58  | ± 9.6 % |
| 10166 | CAF | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)       | LTE-FDD | 5.46  | ± 9.6 % |
| 10167 | CAF | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)     | LTE-FDD | 6.21  | ± 9.6 % |
| 10168 | CAF | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)     | LTE-FDD | 6.79  | ± 9.6 % |
| 10169 | CAE | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)          | LTE-FDD | 5.73  | ± 9.6 % |
| 10170 | CAE | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)        | LTE-FDD | 6.52  | ± 9.6 % |
| 10171 | AAE | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)        | LTE-FDD | 6.49  | ± 9.6 % |
| 10172 | CAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)          | LTE-TDD | 9.21  | ± 9.6 % |
| 10173 | CAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)        | LTE-TDD | 9.48  | ± 9.6 % |
| 10174 | CAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)        | LTE-TDD | 10.25 | ± 9.6 % |
| 10175 | CAG | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)          | LTE-FDD | 5.72  | ± 9.6 % |
| 10176 | CAG | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)        | LTE-FDD | 6.52  | ± 9.6 % |
| 10177 | CAI | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)           | LTE-FDD | 5.73  | ± 9.6 % |
| 10178 | CAG | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)         | LTE-FDD | 6.52  | ± 9.6 % |
| 10179 | CAG | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)        | LTE-FDD | 6.50  | ± 9.6 % |
| 10180 | CAG | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)         | LTE-FDD | 6.50  | ± 9.6 % |
| 10181 | CAE | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)          | LTE-FDD | 5.72  | ± 9.6 % |
| 10182 | CAE | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)        | LTE-FDD | 6.52  | ± 9.6 % |
| 10183 | AAD | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)        | LTE-FDD | 6.50  | ± 9.6 % |
| 10184 | CAE | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)           | LTE-FDD | 5.73  | ± 9.6 % |
| 10185 | CAE | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)         | LTE-FDD | 6.51  | ± 9.6 % |
| 10186 | AAE | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)         | LTE-FDD | 6.50  | ± 9.6 % |
| 10187 | CAF | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)         | LTE-FDD | 5.73  | ± 9.6 % |
| 10188 | CAF | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)       | LTE-FDD | 6.52  | ± 9.6 % |
| 10189 | AAF | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)       | LTE-FDD | 6.50  | ± 9.6 % |
| 10193 | CAC | IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)   | WLAN    | 8.09  | ± 9.6 % |
| 10194 | CAC | IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)  | WLAN    | 8.12  | ± 9.6 % |
| 10195 | CAC | IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)  | WLAN    | 8.21  | ± 9.6 % |
| 10196 | CAC | IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)        | WLAN    | 8.10  | ± 9.6 % |
| 10197 | CAC | IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)       | WLAN    | 8.13  | ± 9.6 % |
| 10198 | CAC | IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)       | WLAN    | 8.27  | ± 9.6 % |
| 10219 | CAC | IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)        | WLAN    | 8.03  | ± 9.6 % |

|       |     |                                             |          |       |         |
|-------|-----|---------------------------------------------|----------|-------|---------|
| 10220 | CAC | IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)  | WLAN     | 8.13  | ± 9.6 % |
| 10221 | CAC | IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)  | WLAN     | 8.27  | ± 9.6 % |
| 10222 | CAC | IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)      | WLAN     | 8.06  | ± 9.6 % |
| 10223 | CAC | IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)    | WLAN     | 8.48  | ± 9.6 % |
| 10224 | CAC | IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)   | WLAN     | 8.08  | ± 9.6 % |
| 10225 | CAB | UMTS-FDD (HSPA+)                            | WCDMA    | 5.97  | ± 9.6 % |
| 10226 | CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)    | LTE-TDD  | 9.49  | ± 9.6 % |
| 10227 | CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)    | LTE-TDD  | 10.26 | ± 9.6 % |
| 10228 | CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)      | LTE-TDD  | 9.22  | ± 9.6 % |
| 10229 | CAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)      | LTE-TDD  | 9.48  | ± 9.6 % |
| 10230 | CAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)      | LTE-TDD  | 10.25 | ± 9.6 % |
| 10231 | CAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)        | LTE-TDD  | 9.19  | ± 9.6 % |
| 10232 | CAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)      | LTE-TDD  | 9.48  | ± 9.6 % |
| 10233 | CAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)      | LTE-TDD  | 10.25 | ± 9.6 % |
| 10234 | CAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)        | LTE-TDD  | 9.21  | ± 9.6 % |
| 10235 | CAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)     | LTE-TDD  | 9.48  | ± 9.6 % |
| 10236 | CAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)     | LTE-TDD  | 10.25 | ± 9.6 % |
| 10237 | CAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)       | LTE-TDD  | 9.21  | ± 9.6 % |
| 10238 | CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)     | LTE-TDD  | 9.48  | ± 9.6 % |
| 10239 | CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)     | LTE-TDD  | 10.25 | ± 9.6 % |
| 10240 | CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)       | LTE-TDD  | 9.21  | ± 9.6 % |
| 10241 | CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)  | LTE-TDD  | 9.82  | ± 9.6 % |
| 10242 | CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)  | LTE-TDD  | 9.86  | ± 9.6 % |
| 10243 | CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)    | LTE-TDD  | 9.46  | ± 9.6 % |
| 10244 | CAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)    | LTE-TDD  | 10.06 | ± 9.6 % |
| 10245 | CAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)    | LTE-TDD  | 10.06 | ± 9.6 % |
| 10246 | CAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)      | LTE-TDD  | 9.30  | ± 9.6 % |
| 10247 | CAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)    | LTE-TDD  | 9.91  | ± 9.6 % |
| 10248 | CAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)    | LTE-TDD  | 10.09 | ± 9.6 % |
| 10249 | CAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)      | LTE-TDD  | 9.29  | ± 9.6 % |
| 10250 | CAF | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)   | LTE-TDD  | 9.81  | ± 9.6 % |
| 10251 | CAF | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)   | LTE-TDD  | 10.17 | ± 9.6 % |
| 10252 | CAF | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)     | LTE-TDD  | 9.24  | ± 9.6 % |
| 10253 | CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)   | LTE-TDD  | 9.90  | ± 9.6 % |
| 10254 | CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)   | LTE-TDD  | 10.14 | ± 9.6 % |
| 10255 | CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)     | LTE-TDD  | 9.20  | ± 9.6 % |
| 10256 | CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM) | LTE-TDD  | 9.96  | ± 9.6 % |
| 10257 | CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM) | LTE-TDD  | 10.08 | ± 9.6 % |
| 10258 | CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)   | LTE-TDD  | 9.34  | ± 9.6 % |
| 10259 | CAC | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)   | LTE-TDD  | 9.98  | ± 9.6 % |
| 10260 | CAC | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)   | LTE-TDD  | 9.97  | ± 9.6 % |
| 10261 | CAC | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)     | LTE-TDD  | 9.24  | ± 9.6 % |
| 10262 | CAF | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)   | LTE-TDD  | 9.83  | ± 9.6 % |
| 10263 | CAF | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)   | LTE-TDD  | 10.16 | ± 9.6 % |
| 10264 | CAF | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)     | LTE-TDD  | 9.23  | ± 9.6 % |
| 10265 | CAF | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)  | LTE-TDD  | 9.92  | ± 9.6 % |
| 10266 | CAF | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)  | LTE-TDD  | 10.07 | ± 9.6 % |
| 10267 | CAF | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)    | LTE-TDD  | 9.30  | ± 9.6 % |
| 10268 | CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)  | LTE-TDD  | 10.06 | ± 9.6 % |
| 10269 | CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)  | LTE-TDD  | 10.13 | ± 9.6 % |
| 10270 | CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)    | LTE-TDD  | 9.58  | ± 9.6 % |
| 10274 | CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)   | WCDMA    | 4.87  | ± 9.6 % |
| 10275 | CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)    | WCDMA    | 3.96  | ± 9.6 % |
| 10277 | CAA | PHS (QPSK)                                  | PHS      | 11.81 | ± 9.6 % |
| 10278 | CAA | PHS (QPSK, BW 884MHz, Rolloff 0.5)          | PHS      | 11.81 | ± 9.6 % |
| 10279 | CAA | PHS (QPSK, BW 884MHz, Rolloff 0.38)         | PHS      | 12.18 | ± 9.6 % |
| 10290 | AAB | CDMA2000, RC1, SO55, Full Rate              | CDMA2000 | 3.91  | ± 9.6 % |
| 10291 | AAB | CDMA2000, RC3, SO55, Full Rate              | CDMA2000 | 3.46  | ± 9.6 % |
| 10292 | AAB | CDMA2000, RC3, SO32, Full Rate              | CDMA2000 | 3.39  | ± 9.6 % |
| 10293 | AAB | CDMA2000, RC3, SO3, Full Rate               | CDMA2000 | 3.50  | ± 9.6 % |
| 10295 | AAB | CDMA2000, RC1, SO3, 1/8th Rate 25 fr.       | CDMA2000 | 12.49 | ± 9.6 % |
| 10297 | AAD | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)     | LTE-FDD  | 5.81  | ± 9.6 % |
| 10298 | AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)      | LTE-FDD  | 5.72  | ± 9.6 % |
| 10299 | AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)    | LTE-FDD  | 6.39  | ± 9.6 % |

|       |     |                                                                                 |          |       |         |
|-------|-----|---------------------------------------------------------------------------------|----------|-------|---------|
| 10300 | AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)                                        | LTE-FDD  | 6.60  | ± 9.6 % |
| 10301 | AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)                              | WiMAX    | 12.03 | ± 9.6 % |
| 10302 | AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols)              | WiMAX    | 12.57 | ± 9.6 % |
| 10303 | AAA | IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)                             | WiMAX    | 12.52 | ± 9.6 % |
| 10304 | AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)                             | WiMAX    | 11.86 | ± 9.6 % |
| 10305 | AAA | IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)                | WiMAX    | 15.24 | ± 9.6 % |
| 10306 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)                | WiMAX    | 14.67 | ± 9.6 % |
| 10307 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)                 | WiMAX    | 14.49 | ± 9.6 % |
| 10308 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)                            | WiMAX    | 14.46 | ± 9.6 % |
| 10309 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)             | WiMAX    | 14.58 | ± 9.6 % |
| 10310 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)              | WiMAX    | 14.57 | ± 9.6 % |
| 10311 | AAD | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)                                        | LTE-FDD  | 6.06  | ± 9.6 % |
| 10313 | AAA | IDEN 1:3                                                                        | IDEN     | 10.51 | ± 9.6 % |
| 10314 | AAA | IDEN 1:6                                                                        | IDEN     | 13.48 | ± 9.6 % |
| 10315 | AAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)                       | WLAN     | 1.71  | ± 9.6 % |
| 10316 | AAB | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)                   | WLAN     | 8.36  | ± 9.6 % |
| 10317 | AAC | IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)                         | WLAN     | 8.36  | ± 9.6 % |
| 10352 | AAA | Pulse Waveform (200Hz, 10%)                                                     | Generic  | 10.00 | ± 9.6 % |
| 10353 | AAA | Pulse Waveform (200Hz, 20%)                                                     | Generic  | 6.99  | ± 9.6 % |
| 10354 | AAA | Pulse Waveform (200Hz, 40%)                                                     | Generic  | 3.98  | ± 9.6 % |
| 10355 | AAA | Pulse Waveform (200Hz, 60%)                                                     | Generic  | 2.22  | ± 9.6 % |
| 10356 | AAA | Pulse Waveform (200Hz, 80%)                                                     | Generic  | 0.97  | ± 9.6 % |
| 10387 | AAA | QPSK Waveform, 1 MHz                                                            | Generic  | 5.10  | ± 9.6 % |
| 10388 | AAA | QPSK Waveform, 10 MHz                                                           | Generic  | 5.22  | ± 9.6 % |
| 10396 | AAA | 64-QAM Waveform, 100 kHz                                                        | Generic  | 6.27  | ± 9.6 % |
| 10399 | AAA | 64-QAM Waveform, 40 MHz                                                         | Generic  | 6.27  | ± 9.6 % |
| 10400 | AAD | IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)                             | WLAN     | 8.37  | ± 9.6 % |
| 10401 | AAD | IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)                             | WLAN     | 8.60  | ± 9.6 % |
| 10402 | AAD | IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)                             | WLAN     | 8.53  | ± 9.6 % |
| 10403 | AAB | CDMA2000 (1xEV-DO, Rev. 0)                                                      | CDMA2000 | 3.76  | ± 9.6 % |
| 10404 | AAB | CDMA2000 (1xEV-DO, Rev. A)                                                      | CDMA2000 | 3.77  | ± 9.6 % |
| 10406 | AAB | CDMA2000, RC3, SO32, SCH0, Full Rate                                            | CDMA2000 | 5.22  | ± 9.6 % |
| 10410 | AAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9, Subframe Conf=4) | LTE-TDD  | 7.82  | ± 9.6 % |
| 10414 | AAA | WLAN CCDF, 64-QAM, 40MHz                                                        | Generic  | 8.54  | ± 9.6 % |
| 10415 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)                       | WLAN     | 1.54  | ± 9.6 % |
| 10416 | AAA | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)                   | WLAN     | 8.23  | ± 9.6 % |
| 10417 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)                       | WLAN     | 8.23  | ± 9.6 % |
| 10418 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preamble)   | WLAN     | 8.14  | ± 9.6 % |
| 10419 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preamble)  | WLAN     | 8.19  | ± 9.6 % |
| 10422 | AAB | IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)                                    | WLAN     | 8.32  | ± 9.6 % |
| 10423 | AAB | IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)                                 | WLAN     | 8.47  | ± 9.6 % |
| 10424 | AAB | IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)                                 | WLAN     | 8.40  | ± 9.6 % |
| 10425 | AAB | IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)                                     | WLAN     | 8.41  | ± 9.6 % |
| 10426 | AAB | IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)                                   | WLAN     | 8.45  | ± 9.6 % |
| 10427 | AAB | IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)                                  | WLAN     | 8.41  | ± 9.6 % |
| 10430 | AAD | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)                                                | LTE-FDD  | 8.28  | ± 9.6 % |
| 10431 | AAD | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)                                               | LTE-FDD  | 8.38  | ± 9.6 % |
| 10432 | AAC | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)                                               | LTE-FDD  | 8.34  | ± 9.6 % |
| 10433 | AAC | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)                                               | LTE-FDD  | 8.34  | ± 9.6 % |
| 10434 | AAA | W-CDMA (BS Test Model 1, 64 DPCH)                                               | WCDMA    | 8.60  | ± 9.6 % |
| 10435 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)                  | LTE-TDD  | 7.82  | ± 9.6 % |
| 10447 | AAD | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)                                  | LTE-FDD  | 7.56  | ± 9.6 % |
| 10448 | AAD | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)                                 | LTE-FDD  | 7.53  | ± 9.6 % |
| 10449 | AAC | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)                                 | LTE-FDD  | 7.51  | ± 9.6 % |
| 10450 | AAC | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)                                 | LTE-FDD  | 7.48  | ± 9.6 % |

|       |     |                                                                        |          |      |         |
|-------|-----|------------------------------------------------------------------------|----------|------|---------|
| 10451 | AAA | W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)                        | WCDMA    | 7.59 | ± 9.6 % |
| 10456 | AAB | IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)                   | WLAN     | 8.63 | ± 9.6 % |
| 10457 | AAA | UMTS-FDD (DC-HSDPA)                                                    | WCDMA    | 6.62 | ± 9.6 % |
| 10458 | AAA | CDMA2000 (1xEV-DO, Rev. B, 2 carriers)                                 | CDMA2000 | 6.55 | ± 9.6 % |
| 10459 | AAA | CDMA2000 (1xEV-DO, Rev. B, 3 carriers)                                 | CDMA2000 | 8.25 | ± 9.6 % |
| 10460 | AAA | UMTS-FDD (WCDMA, AMR)                                                  | WCDMA    | 2.39 | ± 9.6 % |
| 10461 | AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 7.82 | ± 9.6 % |
| 10462 | AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.30 | ± 9.6 % |
| 10463 | AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.56 | ± 9.6 % |
| 10464 | AAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)       | LTE-TDD  | 7.82 | ± 9.6 % |
| 10465 | AAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 8.32 | ± 9.6 % |
| 10466 | AAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 8.57 | ± 9.6 % |
| 10467 | AAE | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)       | LTE-TDD  | 7.82 | ± 9.6 % |
| 10468 | AAE | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 8.32 | ± 9.6 % |
| 10469 | AAE | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 8.56 | ± 9.6 % |
| 10470 | AAE | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)      | LTE-TDD  | 7.82 | ± 9.6 % |
| 10471 | AAE | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.32 | ± 9.6 % |
| 10472 | AAE | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.57 | ± 9.6 % |
| 10473 | AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)      | LTE-TDD  | 7.82 | ± 9.6 % |
| 10474 | AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.32 | ± 9.6 % |
| 10475 | AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.57 | ± 9.6 % |
| 10477 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.32 | ± 9.6 % |
| 10478 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.57 | ± 9.6 % |
| 10479 | AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 7.74 | ± 9.6 % |
| 10480 | AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9) | LTE-TDD  | 8.18 | ± 9.6 % |
| 10481 | AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9) | LTE-TDD  | 8.45 | ± 9.6 % |
| 10482 | AAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 7.71 | ± 9.6 % |
| 10483 | AAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.39 | ± 9.6 % |
| 10484 | AAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.47 | ± 9.6 % |
| 10485 | AAE | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 7.59 | ± 9.6 % |
| 10486 | AAE | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.38 | ± 9.6 % |
| 10487 | AAE | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.60 | ± 9.6 % |
| 10488 | AAE | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 7.70 | ± 9.6 % |
| 10489 | AAE | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)  | LTE-TDD  | 8.31 | ± 9.6 % |
| 10490 | AAE | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)  | LTE-TDD  | 8.54 | ± 9.6 % |
| 10491 | AAE | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 7.74 | ± 9.6 % |

|       |     |                                                                      |         |      |         |
|-------|-----|----------------------------------------------------------------------|---------|------|---------|
| 10492 | AAE | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.41 | ± 9.6 % |
| 10493 | AAE | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.55 | ± 9.6 % |
| 10494 | AAF | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | LTE-TDD | 7.74 | ± 9.6 % |
| 10495 | AAF | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.37 | ± 9.6 % |
| 10496 | AAF | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.54 | ± 9.6 % |
| 10497 | AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 7.67 | ± 9.6 % |
| 10498 | AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.40 | ± 9.6 % |
| 10499 | AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.68 | ± 9.6 % |
| 10500 | AAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | LTE-TDD | 7.67 | ± 9.6 % |
| 10501 | AAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.44 | ± 9.6 % |
| 10502 | AAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.52 | ± 9.6 % |
| 10503 | AAE | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | LTE-TDD | 7.72 | ± 9.6 % |
| 10504 | AAE | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.31 | ± 9.6 % |
| 10505 | AAE | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.54 | ± 9.6 % |
| 10506 | AAE | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)    | LTE-TDD | 7.74 | ± 9.6 % |
| 10507 | AAE | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.36 | ± 9.6 % |
| 10508 | AAE | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.55 | ± 9.6 % |
| 10509 | AAE | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)    | LTE-TDD | 7.99 | ± 9.6 % |
| 10510 | AAE | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.49 | ± 9.6 % |
| 10511 | AAE | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.51 | ± 9.6 % |
| 10512 | AAF | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)    | LTE-TDD | 7.74 | ± 9.6 % |
| 10513 | AAF | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.42 | ± 9.6 % |
| 10514 | AAF | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.45 | ± 9.6 % |
| 10515 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)            | WLAN    | 1.58 | ± 9.6 % |
| 10516 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)          | WLAN    | 1.57 | ± 9.6 % |
| 10517 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)           | WLAN    | 1.58 | ± 9.6 % |
| 10518 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)            | WLAN    | 8.23 | ± 9.6 % |
| 10519 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)           | WLAN    | 8.39 | ± 9.6 % |
| 10520 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)           | WLAN    | 8.12 | ± 9.6 % |
| 10521 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)           | WLAN    | 7.97 | ± 9.6 % |
| 10522 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)           | WLAN    | 8.45 | ± 9.6 % |
| 10523 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)           | WLAN    | 8.08 | ± 9.6 % |
| 10524 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)           | WLAN    | 8.27 | ± 9.6 % |
| 10525 | AAB | IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)                    | WLAN    | 8.36 | ± 9.6 % |
| 10526 | AAB | IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)                    | WLAN    | 8.42 | ± 9.6 % |
| 10527 | AAB | IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)                    | WLAN    | 8.21 | ± 9.6 % |
| 10528 | AAB | IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)                    | WLAN    | 8.36 | ± 9.6 % |
| 10529 | AAB | IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)                    | WLAN    | 8.36 | ± 9.6 % |
| 10531 | AAB | IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)                    | WLAN    | 8.43 | ± 9.6 % |
| 10532 | AAB | IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)                    | WLAN    | 8.29 | ± 9.6 % |
| 10533 | AAB | IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)                    | WLAN    | 8.38 | ± 9.6 % |
| 10534 | AAB | IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)                    | WLAN    | 8.45 | ± 9.6 % |

|       |     |                                                                 |      |      |         |
|-------|-----|-----------------------------------------------------------------|------|------|---------|
| 10535 | AAB | IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)               | WLAN | 8.45 | ± 9.6 % |
| 10536 | AAB | IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)               | WLAN | 8.32 | ± 9.6 % |
| 10537 | AAB | IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)               | WLAN | 8.44 | ± 9.6 % |
| 10538 | AAB | IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)               | WLAN | 8.54 | ± 9.6 % |
| 10540 | AAB | IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)               | WLAN | 8.39 | ± 9.6 % |
| 10541 | AAB | IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)               | WLAN | 8.46 | ± 9.6 % |
| 10542 | AAB | IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)               | WLAN | 8.65 | ± 9.6 % |
| 10543 | AAB | IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)               | WLAN | 8.65 | ± 9.6 % |
| 10544 | AAB | IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)               | WLAN | 8.47 | ± 9.6 % |
| 10545 | AAB | IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)               | WLAN | 8.55 | ± 9.6 % |
| 10546 | AAB | IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)               | WLAN | 8.35 | ± 9.6 % |
| 10547 | AAB | IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)               | WLAN | 8.49 | ± 9.6 % |
| 10548 | AAB | IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)               | WLAN | 8.37 | ± 9.6 % |
| 10550 | AAB | IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)               | WLAN | 8.38 | ± 9.6 % |
| 10551 | AAB | IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)               | WLAN | 8.50 | ± 9.6 % |
| 10552 | AAB | IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)               | WLAN | 8.42 | ± 9.6 % |
| 10553 | AAB | IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)               | WLAN | 8.45 | ± 9.6 % |
| 10554 | AAC | IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)              | WLAN | 8.48 | ± 9.6 % |
| 10555 | AAC | IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)              | WLAN | 8.47 | ± 9.6 % |
| 10556 | AAC | IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)              | WLAN | 8.50 | ± 9.6 % |
| 10557 | AAC | IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)              | WLAN | 8.52 | ± 9.6 % |
| 10558 | AAC | IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)              | WLAN | 8.61 | ± 9.6 % |
| 10560 | AAC | IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle)              | WLAN | 8.73 | ± 9.6 % |
| 10561 | AAC | IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)              | WLAN | 8.56 | ± 9.6 % |
| 10562 | AAC | IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)              | WLAN | 8.69 | ± 9.6 % |
| 10563 | AAC | IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)              | WLAN | 8.77 | ± 9.6 % |
| 10564 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)  | WLAN | 8.25 | ± 9.6 % |
| 10565 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle) | WLAN | 8.45 | ± 9.6 % |
| 10566 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle) | WLAN | 8.13 | ± 9.6 % |
| 10567 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle) | WLAN | 8.00 | ± 9.6 % |
| 10568 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle) | WLAN | 8.37 | ± 9.6 % |
| 10569 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle) | WLAN | 8.10 | ± 9.6 % |
| 10570 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle) | WLAN | 8.30 | ± 9.6 % |
| 10571 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)       | WLAN | 1.99 | ± 9.6 % |
| 10572 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)       | WLAN | 1.99 | ± 9.6 % |
| 10573 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)     | WLAN | 1.98 | ± 9.6 % |
| 10574 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)      | WLAN | 1.98 | ± 9.6 % |
| 10575 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)  | WLAN | 8.59 | ± 9.6 % |
| 10576 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)  | WLAN | 8.60 | ± 9.6 % |
| 10577 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle) | WLAN | 8.70 | ± 9.6 % |
| 10578 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle) | WLAN | 8.49 | ± 9.6 % |
| 10579 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle) | WLAN | 8.36 | ± 9.6 % |
| 10580 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle) | WLAN | 8.76 | ± 9.6 % |
| 10581 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle) | WLAN | 8.35 | ± 9.6 % |
| 10582 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) | WLAN | 8.67 | ± 9.6 % |
| 10583 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)       | WLAN | 8.59 | ± 9.6 % |
| 10584 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)       | WLAN | 8.60 | ± 9.6 % |
| 10585 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)      | WLAN | 8.70 | ± 9.6 % |
| 10586 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)      | WLAN | 8.49 | ± 9.6 % |
| 10587 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)      | WLAN | 8.36 | ± 9.6 % |

|       |     |                                                            |          |       |         |
|-------|-----|------------------------------------------------------------|----------|-------|---------|
| 10588 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle) | WLAN     | 8.76  | ± 9.6 % |
| 10589 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle) | WLAN     | 8.35  | ± 9.6 % |
| 10590 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle) | WLAN     | 8.67  | ± 9.6 % |
| 10591 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)      | WLAN     | 8.63  | ± 9.6 % |
| 10592 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)      | WLAN     | 8.79  | ± 9.6 % |
| 10593 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)      | WLAN     | 8.64  | ± 9.6 % |
| 10594 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)      | WLAN     | 8.74  | ± 9.6 % |
| 10595 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)      | WLAN     | 8.74  | ± 9.6 % |
| 10596 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)      | WLAN     | 8.71  | ± 9.6 % |
| 10597 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)      | WLAN     | 8.72  | ± 9.6 % |
| 10598 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)      | WLAN     | 8.50  | ± 9.6 % |
| 10599 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)      | WLAN     | 8.79  | ± 9.6 % |
| 10600 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)      | WLAN     | 8.88  | ± 9.6 % |
| 10601 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)      | WLAN     | 8.82  | ± 9.6 % |
| 10602 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)      | WLAN     | 8.94  | ± 9.6 % |
| 10603 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)      | WLAN     | 9.03  | ± 9.6 % |
| 10604 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)      | WLAN     | 8.76  | ± 9.6 % |
| 10605 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)      | WLAN     | 8.97  | ± 9.6 % |
| 10606 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)      | WLAN     | 8.82  | ± 9.6 % |
| 10607 | AAB | IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)          | WLAN     | 8.64  | ± 9.6 % |
| 10608 | AAB | IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)          | WLAN     | 8.77  | ± 9.6 % |
| 10609 | AAB | IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)          | WLAN     | 8.57  | ± 9.6 % |
| 10610 | AAB | IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)          | WLAN     | 8.78  | ± 9.6 % |
| 10611 | AAB | IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)          | WLAN     | 8.70  | ± 9.6 % |
| 10612 | AAB | IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)          | WLAN     | 8.77  | ± 9.6 % |
| 10613 | AAB | IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)          | WLAN     | 8.94  | ± 9.6 % |
| 10614 | AAB | IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)          | WLAN     | 8.59  | ± 9.6 % |
| 10615 | AAB | IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)          | WLAN     | 8.82  | ± 9.6 % |
| 10616 | AAB | IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)          | WLAN     | 8.82  | ± 9.6 % |
| 10617 | AAB | IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)          | WLAN     | 8.81  | ± 9.6 % |
| 10618 | AAB | IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)          | WLAN     | 8.58  | ± 9.6 % |
| 10619 | AAB | IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)          | WLAN     | 8.86  | ± 9.6 % |
| 10620 | AAB | IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)          | WLAN     | 8.87  | ± 9.6 % |
| 10621 | AAB | IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)          | WLAN     | 8.77  | ± 9.6 % |
| 10622 | AAB | IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)          | WLAN     | 8.68  | ± 9.6 % |
| 10623 | AAB | IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)          | WLAN     | 8.82  | ± 9.6 % |
| 10624 | AAB | IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)          | WLAN     | 8.96  | ± 9.6 % |
| 10625 | AAB | IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)          | WLAN     | 8.96  | ± 9.6 % |
| 10626 | AAB | IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)          | WLAN     | 8.83  | ± 9.6 % |
| 10627 | AAB | IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)          | WLAN     | 8.88  | ± 9.6 % |
| 10628 | AAB | IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)          | WLAN     | 8.71  | ± 9.6 % |
| 10629 | AAB | IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)          | WLAN     | 8.85  | ± 9.6 % |
| 10630 | AAB | IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)          | WLAN     | 8.72  | ± 9.6 % |
| 10631 | AAB | IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)          | WLAN     | 8.81  | ± 9.6 % |
| 10632 | AAB | IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)          | WLAN     | 8.74  | ± 9.6 % |
| 10633 | AAB | IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)          | WLAN     | 8.83  | ± 9.6 % |
| 10634 | AAB | IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)          | WLAN     | 8.80  | ± 9.6 % |
| 10635 | AAB | IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)          | WLAN     | 8.81  | ± 9.6 % |
| 10636 | AAC | IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle)         | WLAN     | 8.83  | ± 9.6 % |
| 10637 | AAC | IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)         | WLAN     | 8.79  | ± 9.6 % |
| 10638 | AAC | IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle)         | WLAN     | 8.86  | ± 9.6 % |
| 10639 | AAC | IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)         | WLAN     | 8.85  | ± 9.6 % |
| 10640 | AAC | IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)         | WLAN     | 8.98  | ± 9.6 % |
| 10641 | AAC | IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)         | WLAN     | 9.06  | ± 9.6 % |
| 10642 | AAC | IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)         | WLAN     | 9.06  | ± 9.6 % |
| 10643 | AAC | IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)         | WLAN     | 8.89  | ± 9.6 % |
| 10644 | AAC | IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)         | WLAN     | 9.05  | ± 9.6 % |
| 10645 | AAC | IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)         | WLAN     | 9.11  | ± 9.6 % |
| 10646 | AAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)      | LTE-TDD  | 11.96 | ± 9.6 % |
| 10647 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)     | LTE-TDD  | 11.96 | ± 9.6 % |
| 10648 | AAA | CDMA2000 (1x Advanced)                                     | CDMA2000 | 3.45  | ± 9.6 % |
| 10652 | AAD | LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)             | LTE-TDD  | 6.91  | ± 9.6 % |
| 10653 | AAD | LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)            | LTE-TDD  | 7.42  | ± 9.6 % |
| 10654 | AAD | LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)            | LTE-TDD  | 6.96  | ± 9.6 % |

|       |     |                                                 |           |       |         |
|-------|-----|-------------------------------------------------|-----------|-------|---------|
| 10655 | AAE | LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%) | LTE-TDD   | 7.21  | ± 9.6 % |
| 10658 | AAA | Pulse Waveform (200Hz, 10%)                     | Test      | 10.00 | ± 9.6 % |
| 10659 | AAA | Pulse Waveform (200Hz, 20%)                     | Test      | 6.99  | ± 9.6 % |
| 10660 | AAA | Pulse Waveform (200Hz, 40%)                     | Test      | 3.98  | ± 9.6 % |
| 10661 | AAA | Pulse Waveform (200Hz, 60%)                     | Test      | 2.22  | ± 9.6 % |
| 10662 | AAA | Pulse Waveform (200Hz, 80%)                     | Test      | 0.97  | ± 9.6 % |
| 10670 | AAA | Bluetooth Low Energy                            | Bluetooth | 2.19  | ± 9.6 % |
| 10671 | AAA | IEEE 802.11ax (20MHz, MCS0, 90pc duty cycle)    | WLAN      | 9.09  | ± 9.6 % |
| 10672 | AAA | IEEE 802.11ax (20MHz, MCS1, 90pc duty cycle)    | WLAN      | 8.57  | ± 9.6 % |
| 10673 | AAA | IEEE 802.11ax (20MHz, MCS2, 90pc duty cycle)    | WLAN      | 8.78  | ± 9.6 % |
| 10674 | AAA | IEEE 802.11ax (20MHz, MCS3, 90pc duty cycle)    | WLAN      | 8.74  | ± 9.6 % |
| 10675 | AAA | IEEE 802.11ax (20MHz, MCS4, 90pc duty cycle)    | WLAN      | 8.90  | ± 9.6 % |
| 10676 | AAA | IEEE 802.11ax (20MHz, MCS5, 90pc duty cycle)    | WLAN      | 8.77  | ± 9.6 % |
| 10677 | AAA | IEEE 802.11ax (20MHz, MCS6, 90pc duty cycle)    | WLAN      | 8.73  | ± 9.6 % |
| 10678 | AAA | IEEE 802.11ax (20MHz, MCS7, 90pc duty cycle)    | WLAN      | 8.78  | ± 9.6 % |
| 10679 | AAA | IEEE 802.11ax (20MHz, MCS8, 90pc duty cycle)    | WLAN      | 8.89  | ± 9.6 % |
| 10680 | AAA | IEEE 802.11ax (20MHz, MCS9, 90pc duty cycle)    | WLAN      | 8.80  | ± 9.6 % |
| 10681 | AAA | IEEE 802.11ax (20MHz, MCS10, 90pc duty cycle)   | WLAN      | 8.62  | ± 9.6 % |
| 10682 | AAA | IEEE 802.11ax (20MHz, MCS11, 90pc duty cycle)   | WLAN      | 8.83  | ± 9.6 % |
| 10683 | AAA | IEEE 802.11ax (20MHz, MCS0, 99pc duty cycle)    | WLAN      | 8.42  | ± 9.6 % |
| 10684 | AAA | IEEE 802.11ax (20MHz, MCS1, 99pc duty cycle)    | WLAN      | 8.26  | ± 9.6 % |
| 10685 | AAA | IEEE 802.11ax (20MHz, MCS2, 99pc duty cycle)    | WLAN      | 8.33  | ± 9.6 % |
| 10686 | AAA | IEEE 802.11ax (20MHz, MCS3, 99pc duty cycle)    | WLAN      | 8.28  | ± 9.6 % |
| 10687 | AAA | IEEE 802.11ax (20MHz, MCS4, 99pc duty cycle)    | WLAN      | 8.45  | ± 9.6 % |
| 10688 | AAA | IEEE 802.11ax (20MHz, MCS5, 99pc duty cycle)    | WLAN      | 8.29  | ± 9.6 % |
| 10689 | AAA | IEEE 802.11ax (20MHz, MCS6, 99pc duty cycle)    | WLAN      | 8.55  | ± 9.6 % |
| 10690 | AAA | IEEE 802.11ax (20MHz, MCS7, 99pc duty cycle)    | WLAN      | 8.29  | ± 9.6 % |
| 10691 | AAA | IEEE 802.11ax (20MHz, MCS8, 99pc duty cycle)    | WLAN      | 8.25  | ± 9.6 % |
| 10692 | AAA | IEEE 802.11ax (20MHz, MCS9, 99pc duty cycle)    | WLAN      | 8.29  | ± 9.6 % |
| 10693 | AAA | IEEE 802.11ax (20MHz, MCS10, 99pc duty cycle)   | WLAN      | 8.25  | ± 9.6 % |
| 10694 | AAA | IEEE 802.11ax (20MHz, MCS11, 99pc duty cycle)   | WLAN      | 8.57  | ± 9.6 % |
| 10695 | AAA | IEEE 802.11ax (40MHz, MCS0, 90pc duty cycle)    | WLAN      | 8.78  | ± 9.6 % |
| 10696 | AAA | IEEE 802.11ax (40MHz, MCS1, 90pc duty cycle)    | WLAN      | 8.91  | ± 9.6 % |
| 10697 | AAA | IEEE 802.11ax (40MHz, MCS2, 90pc duty cycle)    | WLAN      | 8.61  | ± 9.6 % |
| 10698 | AAA | IEEE 802.11ax (40MHz, MCS3, 90pc duty cycle)    | WLAN      | 8.89  | ± 9.6 % |
| 10699 | AAA | IEEE 802.11ax (40MHz, MCS4, 90pc duty cycle)    | WLAN      | 8.82  | ± 9.6 % |
| 10700 | AAA | IEEE 802.11ax (40MHz, MCS5, 90pc duty cycle)    | WLAN      | 8.73  | ± 9.6 % |
| 10701 | AAA | IEEE 802.11ax (40MHz, MCS6, 90pc duty cycle)    | WLAN      | 8.86  | ± 9.6 % |
| 10702 | AAA | IEEE 802.11ax (40MHz, MCS7, 90pc duty cycle)    | WLAN      | 8.70  | ± 9.6 % |
| 10703 | AAA | IEEE 802.11ax (40MHz, MCS8, 90pc duty cycle)    | WLAN      | 8.82  | ± 9.6 % |
| 10704 | AAA | IEEE 802.11ax (40MHz, MCS9, 90pc duty cycle)    | WLAN      | 8.56  | ± 9.6 % |
| 10705 | AAA | IEEE 802.11ax (40MHz, MCS10, 90pc duty cycle)   | WLAN      | 8.69  | ± 9.6 % |
| 10706 | AAA | IEEE 802.11ax (40MHz, MCS11, 90pc duty cycle)   | WLAN      | 8.66  | ± 9.6 % |
| 10707 | AAA | IEEE 802.11ax (40MHz, MCS0, 99pc duty cycle)    | WLAN      | 8.32  | ± 9.6 % |
| 10708 | AAA | IEEE 802.11ax (40MHz, MCS1, 99pc duty cycle)    | WLAN      | 8.55  | ± 9.6 % |
| 10709 | AAA | IEEE 802.11ax (40MHz, MCS2, 99pc duty cycle)    | WLAN      | 8.33  | ± 9.6 % |
| 10710 | AAA | IEEE 802.11ax (40MHz, MCS3, 99pc duty cycle)    | WLAN      | 8.29  | ± 9.6 % |
| 10711 | AAA | IEEE 802.11ax (40MHz, MCS4, 99pc duty cycle)    | WLAN      | 8.39  | ± 9.6 % |
| 10712 | AAA | IEEE 802.11ax (40MHz, MCS5, 99pc duty cycle)    | WLAN      | 8.67  | ± 9.6 % |
| 10713 | AAA | IEEE 802.11ax (40MHz, MCS6, 99pc duty cycle)    | WLAN      | 8.33  | ± 9.6 % |
| 10714 | AAA | IEEE 802.11ax (40MHz, MCS7, 99pc duty cycle)    | WLAN      | 8.26  | ± 9.6 % |
| 10715 | AAA | IEEE 802.11ax (40MHz, MCS8, 99pc duty cycle)    | WLAN      | 8.45  | ± 9.6 % |
| 10716 | AAA | IEEE 802.11ax (40MHz, MCS9, 99pc duty cycle)    | WLAN      | 8.30  | ± 9.6 % |
| 10717 | AAA | IEEE 802.11ax (40MHz, MCS10, 99pc duty cycle)   | WLAN      | 8.48  | ± 9.6 % |
| 10718 | AAA | IEEE 802.11ax (40MHz, MCS11, 99pc duty cycle)   | WLAN      | 8.24  | ± 9.6 % |
| 10719 | AAA | IEEE 802.11ax (80MHz, MCS0, 90pc duty cycle)    | WLAN      | 8.81  | ± 9.6 % |
| 10720 | AAA | IEEE 802.11ax (80MHz, MCS1, 90pc duty cycle)    | WLAN      | 8.87  | ± 9.6 % |
| 10721 | AAA | IEEE 802.11ax (80MHz, MCS2, 90pc duty cycle)    | WLAN      | 8.76  | ± 9.6 % |
| 10722 | AAA | IEEE 802.11ax (80MHz, MCS3, 90pc duty cycle)    | WLAN      | 8.55  | ± 9.6 % |
| 10723 | AAA | IEEE 802.11ax (80MHz, MCS4, 90pc duty cycle)    | WLAN      | 8.70  | ± 9.6 % |
| 10724 | AAA | IEEE 802.11ax (80MHz, MCS5, 90pc duty cycle)    | WLAN      | 8.90  | ± 9.6 % |
| 10725 | AAA | IEEE 802.11ax (80MHz, MCS6, 90pc duty cycle)    | WLAN      | 8.74  | ± 9.6 % |
| 10726 | AAA | IEEE 802.11ax (80MHz, MCS7, 90pc duty cycle)    | WLAN      | 8.72  | ± 9.6 % |
| 10727 | AAA | IEEE 802.11ax (80MHz, MCS8, 90pc duty cycle)    | WLAN      | 8.66  | ± 9.6 % |

|       |     |                                                |      |      |         |
|-------|-----|------------------------------------------------|------|------|---------|
| 10728 | AAA | IEEE 802.11ax (80MHz, MCS9, 90pc duty cycle)   | WLAN | 8.65 | ± 9.6 % |
| 10729 | AAA | IEEE 802.11ax (80MHz, MCS10, 90pc duty cycle)  | WLAN | 8.64 | ± 9.6 % |
| 10730 | AAA | IEEE 802.11ax (80MHz, MCS11, 90pc duty cycle)  | WLAN | 8.67 | ± 9.6 % |
| 10731 | AAA | IEEE 802.11ax (80MHz, MCS0, 99pc duty cycle)   | WLAN | 8.42 | ± 9.6 % |
| 10732 | AAA | IEEE 802.11ax (80MHz, MCS1, 99pc duty cycle)   | WLAN | 8.46 | ± 9.6 % |
| 10733 | AAA | IEEE 802.11ax (80MHz, MCS2, 99pc duty cycle)   | WLAN | 8.40 | ± 9.6 % |
| 10734 | AAA | IEEE 802.11ax (80MHz, MCS3, 99pc duty cycle)   | WLAN | 8.25 | ± 9.6 % |
| 10735 | AAA | IEEE 802.11ax (80MHz, MCS4, 99pc duty cycle)   | WLAN | 8.33 | ± 9.6 % |
| 10736 | AAA | IEEE 802.11ax (80MHz, MCS5, 99pc duty cycle)   | WLAN | 8.27 | ± 9.6 % |
| 10737 | AAA | IEEE 802.11ax (80MHz, MCS6, 99pc duty cycle)   | WLAN | 8.36 | ± 9.6 % |
| 10738 | AAA | IEEE 802.11ax (80MHz, MCS7, 99pc duty cycle)   | WLAN | 8.42 | ± 9.6 % |
| 10739 | AAA | IEEE 802.11ax (80MHz, MCS8, 99pc duty cycle)   | WLAN | 8.29 | ± 9.6 % |
| 10740 | AAA | IEEE 802.11ax (80MHz, MCS9, 99pc duty cycle)   | WLAN | 8.48 | ± 9.6 % |
| 10741 | AAA | IEEE 802.11ax (80MHz, MCS10, 99pc duty cycle)  | WLAN | 8.40 | ± 9.6 % |
| 10742 | AAA | IEEE 802.11ax (80MHz, MCS11, 99pc duty cycle)  | WLAN | 8.43 | ± 9.6 % |
| 10743 | AAA | IEEE 802.11ax (160MHz, MCS0, 90pc duty cycle)  | WLAN | 8.94 | ± 9.6 % |
| 10744 | AAA | IEEE 802.11ax (160MHz, MCS1, 90pc duty cycle)  | WLAN | 9.16 | ± 9.6 % |
| 10745 | AAA | IEEE 802.11ax (160MHz, MCS2, 90pc duty cycle)  | WLAN | 8.93 | ± 9.6 % |
| 10746 | AAA | IEEE 802.11ax (160MHz, MCS3, 90pc duty cycle)  | WLAN | 9.11 | ± 9.6 % |
| 10747 | AAA | IEEE 802.11ax (160MHz, MCS4, 90pc duty cycle)  | WLAN | 9.04 | ± 9.6 % |
| 10748 | AAA | IEEE 802.11ax (160MHz, MCS5, 90pc duty cycle)  | WLAN | 8.93 | ± 9.6 % |
| 10749 | AAA | IEEE 802.11ax (160MHz, MCS6, 90pc duty cycle)  | WLAN | 8.90 | ± 9.6 % |
| 10750 | AAA | IEEE 802.11ax (160MHz, MCS7, 90pc duty cycle)  | WLAN | 8.79 | ± 9.6 % |
| 10751 | AAA | IEEE 802.11ax (160MHz, MCS8, 90pc duty cycle)  | WLAN | 8.82 | ± 9.6 % |
| 10752 | AAA | IEEE 802.11ax (160MHz, MCS9, 90pc duty cycle)  | WLAN | 8.81 | ± 9.6 % |
| 10753 | AAA | IEEE 802.11ax (160MHz, MCS10, 90pc duty cycle) | WLAN | 9.00 | ± 9.6 % |
| 10754 | AAA | IEEE 802.11ax (160MHz, MCS11, 90pc duty cycle) | WLAN | 8.94 | ± 9.6 % |
| 10755 | AAA | IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle)  | WLAN | 8.64 | ± 9.6 % |
| 10756 | AAA | IEEE 802.11ax (160MHz, MCS1, 99pc duty cycle)  | WLAN | 8.77 | ± 9.6 % |
| 10757 | AAA | IEEE 802.11ax (160MHz, MCS2, 99pc duty cycle)  | WLAN | 8.77 | ± 9.6 % |
| 10758 | AAA | IEEE 802.11ax (160MHz, MCS3, 99pc duty cycle)  | WLAN | 8.69 | ± 9.6 % |
| 10759 | AAA | IEEE 802.11ax (160MHz, MCS4, 99pc duty cycle)  | WLAN | 8.58 | ± 9.6 % |
| 10760 | AAA | IEEE 802.11ax (160MHz, MCS5, 99pc duty cycle)  | WLAN | 8.49 | ± 9.6 % |
| 10761 | AAA | IEEE 802.11ax (160MHz, MCS6, 99pc duty cycle)  | WLAN | 8.58 | ± 9.6 % |
| 10762 | AAA | IEEE 802.11ax (160MHz, MCS7, 99pc duty cycle)  | WLAN | 8.49 | ± 9.6 % |
| 10763 | AAA | IEEE 802.11ax (160MHz, MCS8, 99pc duty cycle)  | WLAN | 8.53 | ± 9.6 % |
| 10764 | AAA | IEEE 802.11ax (160MHz, MCS9, 99pc duty cycle)  | WLAN | 8.54 | ± 9.6 % |
| 10765 | AAA | IEEE 802.11ax (160MHz, MCS10, 99pc duty cycle) | WLAN | 8.54 | ± 9.6 % |
| 10766 | AAA | IEEE 802.11ax (160MHz, MCS11, 99pc duty cycle) | WLAN | 8.51 | ± 9.6 % |

<sup>E</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.



Accredited by the Swiss Accreditation Service (SAS)  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **EX3-7427\_Feb19**

## CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:7427**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v7  
Calibration procedure for dosimetric E-field probes**

3/12/19  
SCV

Calibration date: **February 19, 2019**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^\circ\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|----------------------------|------------------|-----------------------------------|------------------------|
| Power meter NRP            | SN: 104778       | 04-Apr-18 (No. 217-02672/02673)   | Apr-19                 |
| Power sensor NRP-Z91       | SN: 103244       | 04-Apr-18 (No. 217-02672)         | Apr-19                 |
| Power sensor NRP-Z91       | SN: 103245       | 04-Apr-18 (No. 217-02673)         | Apr-19                 |
| Reference 20 dB Attenuator | SN: S5277 (20x)  | 04-Apr-18 (No. 217-02682)         | Apr-19                 |
| DAE4                       | SN: 660          | 19-Dec-18 (No. DAE4-660_Dec18)    | Dec-19                 |
| Reference Probe ES3DV2     | SN: 3013         | 31-Dec-18 (No. ES3-3013_Dec18)    | Dec-19                 |
| Secondary Standards        | ID               | Check Date (in house)             | Scheduled Check        |
| Power meter E4419B         | SN: GB41293874   | 06-Apr-16 (in house check Jun-18) | In house check: Jun-20 |
| Power sensor E4412A        | SN: MY41498087   | 06-Apr-16 (in house check Jun-18) | In house check: Jun-20 |
| Power sensor E4412A        | SN: 000110210    | 06-Apr-16 (in house check Jun-18) | In house check: Jun-20 |
| RF generator HP 8648C      | SN: US3642U01700 | 04-Aug-99 (in house check Jun-18) | In house check: Jun-20 |
| Network Analyzer E8358A    | SN: US41080477   | 31-Mar-14 (in house check Oct-18) | In house check: Oct-19 |

|                                                                                                                                                         |                         |                                   |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------|---------------|
| Calibrated by:                                                                                                                                          | Name<br>Claudio Leubler | Function<br>Laboratory Technician | Signature<br> |
| Approved by:                                                                                                                                            | Katja Pokovic           | Technical Manager                 |               |
| <p>Issued: February 20, 2019</p> <p>This calibration certificate shall not be reproduced except in full without written approval of the laboratory.</p> |                         |                                   |               |



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

The Swiss Accreditation Service is one of the signatories to the EA  
 Multilateral Agreement for the recognition of calibration certificates

## Glossary:

|                          |                                                                                                                                                         |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| TSL                      | tissue simulating liquid                                                                                                                                |
| NORM <sub>x,y,z</sub>    | sensitivity in free space                                                                                                                               |
| ConvF                    | sensitivity in TSL / NORM <sub>x,y,z</sub>                                                                                                              |
| DCP                      | diode compression point                                                                                                                                 |
| CF                       | crest factor (1/duty_cycle) of the RF signal                                                                                                            |
| A, B, C, D               | modulation dependent linearization parameters                                                                                                           |
| Polarization $\varphi$   | $\varphi$ rotation around probe axis                                                                                                                    |
| Polarization $\vartheta$ | $\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center),<br>i.e., $\vartheta = 0$ is normal to probe axis |
| Connector Angle          | information used in DASY system to align probe sensor X to the robot coordinate system                                                                  |

## Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the E<sup>2</sup>-field uncertainty inside TSL (see below *ConvF*).
- NORM(*f*)<sub>x,y,z</sub>** = NORM<sub>x,y,z</sub> \* *frequency\_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- DCP<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; D<sub>x,y,z</sub>; VR<sub>x,y,z</sub>**: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  MHz) and inside waveguide using analytical field distributions based on power measurements for  $f > 800$  MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> \* *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$  MHz to  $\pm 100$  MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM<sub>x</sub> (no uncertainty required).

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:7427

## Basic Calibration Parameters

|                                       | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---------------------------------------|----------|----------|----------|-----------|
| Norm ( $\mu V/(V/m)^2$ ) <sup>A</sup> | 0.56     | 0.42     | 0.56     | ± 10.1 %  |
| DCP (mV) <sup>B</sup>                 | 97.9     | 94.9     | 96.2     |           |

## Calibration Results for Modulation Response

| UID           | Communication System Name   |   | A<br>dB | B<br>dB/μV | C     | D<br>dB | VR<br>mV | Max<br>dev. | Max<br>Unc <sup>E</sup><br>(k=2) |
|---------------|-----------------------------|---|---------|------------|-------|---------|----------|-------------|----------------------------------|
| 0             | CW                          | X | 0.00    | 0.00       | 1.00  | 0.00    | 133.0    | ± 3.5 %     | ± 4.7 %                          |
|               |                             | Y | 0.00    | 0.00       | 1.00  |         | 141.7    |             |                                  |
|               |                             | Z | 0.00    | 0.00       | 1.00  |         | 148.8    |             |                                  |
| 10352-<br>AAA | Pulse Waveform (200Hz, 10%) | X | 15.00   | 87.84      | 19.22 | 10.00   | 60.0     | ± 3.4 %     | ± 9.6 %                          |
|               |                             | Y | 1.77    | 62.84      | 8.98  |         | 60.0     |             |                                  |
|               |                             | Z | 15.00   | 88.84      | 19.88 |         | 60.0     |             |                                  |
| 10353-<br>AAA | Pulse Waveform (200Hz, 20%) | X | 15.00   | 91.36      | 19.89 | 6.99    | 80.0     | ± 2.3 %     | ± 9.6 %                          |
|               |                             | Y | 1.31    | 63.69      | 8.05  |         | 80.0     |             |                                  |
|               |                             | Z | 15.00   | 94.19      | 21.48 |         | 80.0     |             |                                  |
| 10354-<br>AAA | Pulse Waveform (200Hz, 40%) | X | 15.00   | 99.87      | 22.69 | 3.98    | 95.0     | ± 1.2 %     | ± 9.6 %                          |
|               |                             | Y | 0.41    | 60.00      | 4.84  |         | 95.0     |             |                                  |
|               |                             | Z | 15.00   | 106.95     | 26.23 |         | 95.0     |             |                                  |
| 10355-<br>AAA | Pulse Waveform (200Hz, 60%) | X | 15.00   | 114.72     | 28.20 | 2.22    | 120.0    | ± 1.2 %     | ± 9.6 %                          |
|               |                             | Y | 0.32    | 60.00      | 3.11  |         | 120.0    |             |                                  |
|               |                             | Z | 15.00   | 131.03     | 35.59 |         | 120.0    |             |                                  |
| 10387-<br>AAA | QPSK Waveform, 1 MHz        | X | 0.83    | 64.07      | 10.41 | 0.00    | 150.0    | ± 3.4 %     | ± 9.6 %                          |
|               |                             | Y | 0.45    | 60.00      | 4.95  |         | 150.0    |             |                                  |
|               |                             | Z | 0.85    | 64.33      | 10.70 |         | 150.0    |             |                                  |
| 10388-<br>AAA | QPSK Waveform, 10 MHz       | X | 2.53    | 70.61      | 17.25 | 0.00    | 150.0    | ± 1.1 %     | ± 9.6 %                          |
|               |                             | Y | 1.88    | 66.70      | 15.04 |         | 150.0    |             |                                  |
|               |                             | Z | 2.54    | 70.70      | 17.28 |         | 150.0    |             |                                  |
| 10396-<br>AAA | 64-QAM Waveform, 100 kHz    | X | 3.01    | 71.18      | 19.27 | 3.01    | 150.0    | ± 1.5 %     | ± 9.6 %                          |
|               |                             | Y | 2.05    | 66.24      | 17.18 |         | 150.0    |             |                                  |
|               |                             | Z | 3.37    | 73.47      | 20.28 |         | 150.0    |             |                                  |
| 10399-<br>AAA | 64-QAM Waveform, 40 MHz     | X | 3.57    | 67.64      | 16.25 | 0.00    | 150.0    | ± 2.3 %     | ± 9.6 %                          |
|               |                             | Y | 3.27    | 66.45      | 15.47 |         | 150.0    |             |                                  |
|               |                             | Z | 3.67    | 68.15      | 16.49 |         | 150.0    |             |                                  |
| 10414-<br>AAA | WLAN CCDF, 64-QAM, 40MHz    | X | 4.83    | 65.73      | 15.74 | 0.00    | 150.0    | ± 4.2 %     | ± 9.6 %                          |
|               |                             | Y | 4.71    | 65.96      | 15.77 |         | 150.0    |             |                                  |
|               |                             | Z | 4.97    | 66.21      | 15.99 |         | 150.0    |             |                                  |

Note: For details on UID parameters see Appendix

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

<sup>A</sup> The uncertainties of Norm X,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).

<sup>B</sup> Numerical linearization parameter: uncertainty not required.

<sup>E</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:7427

### Sensor Model Parameters

|   | C1<br>fF | C2<br>fF | $\alpha$<br>$V^{-1}$ | T1<br>$ms.V^{-2}$ | T2<br>$ms.V^{-1}$ | T3<br>ms | T4<br>$V^{-2}$ | T5<br>$V^{-1}$ | T6   |
|---|----------|----------|----------------------|-------------------|-------------------|----------|----------------|----------------|------|
| X | 43.0     | 322.40   | 35.95                | 10.31             | 0.00              | 5.08     | 0.69           | 0.34           | 1.00 |
| Y | 31.0     | 240.14   | 37.80                | 3.42              | 0.15              | 5.03     | 0.00           | 0.25           | 1.01 |
| Z | 45.0     | 337.68   | 36.03                | 10.29             | 0.00              | 5.10     | 1.39           | 0.25           | 1.01 |

### Other Probe Parameters

|                                               |            |
|-----------------------------------------------|------------|
| Sensor Arrangement                            | Triangular |
| Connector Angle (°)                           | -31.9      |
| Mechanical Surface Detection Mode             | enabled    |
| Optical Surface Detection Mode                | disabled   |
| Probe Overall Length                          | 337 mm     |
| Probe Body Diameter                           | 10 mm      |
| Tip Length                                    | 9 mm       |
| Tip Diameter                                  | 2.5 mm     |
| Probe Tip to Sensor X Calibration Point       | 1 mm       |
| Probe Tip to Sensor Y Calibration Point       | 1 mm       |
| Probe Tip to Sensor Z Calibration Point       | 1 mm       |
| Recommended Measurement Distance from Surface | 1.4 mm     |

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:7427

### Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unc (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-----------|
| 750                  | 41.9                               | 0.89                            | 10.11   | 10.11   | 10.11   | 0.62               | 0.84                    | ± 12.0 %  |
| 835                  | 41.5                               | 0.90                            | 9.92    | 9.92    | 9.92    | 0.48               | 0.91                    | ± 12.0 %  |
| 1750                 | 40.1                               | 1.37                            | 8.58    | 8.58    | 8.58    | 0.37               | 0.85                    | ± 12.0 %  |
| 1900                 | 40.0                               | 1.40                            | 8.18    | 8.18    | 8.18    | 0.37               | 0.85                    | ± 12.0 %  |
| 2300                 | 39.5                               | 1.67                            | 7.82    | 7.82    | 7.82    | 0.31               | 0.85                    | ± 12.0 %  |
| 2450                 | 39.2                               | 1.80                            | 7.42    | 7.42    | 7.42    | 0.32               | 0.97                    | ± 12.0 %  |
| 2600                 | 39.0                               | 1.96                            | 7.14    | 7.14    | 7.14    | 0.44               | 0.90                    | ± 12.0 %  |

<sup>C</sup> Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:7427

### Calibration Parameter Determined in Body Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unc (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-----------|
| 750                  | 55.5                               | 0.96                            | 10.34   | 10.34   | 10.34   | 0.50               | 0.83                    | ± 12.0 %  |
| 835                  | 55.2                               | 0.97                            | 10.18   | 10.18   | 10.18   | 0.48               | 0.84                    | ± 12.0 %  |
| 1750                 | 53.4                               | 1.49                            | 8.14    | 8.14    | 8.14    | 0.44               | 0.84                    | ± 12.0 %  |
| 1900                 | 53.3                               | 1.52                            | 7.75    | 7.75    | 7.75    | 0.28               | 0.98                    | ± 12.0 %  |
| 2300                 | 52.9                               | 1.81                            | 7.56    | 7.56    | 7.56    | 0.39               | 0.86                    | ± 12.0 %  |
| 2450                 | 52.7                               | 1.95                            | 7.47    | 7.47    | 7.47    | 0.25               | 0.97                    | ± 12.0 %  |
| 2600                 | 52.5                               | 2.16                            | 7.35    | 7.35    | 7.35    | 0.21               | 1.10                    | ± 12.0 %  |

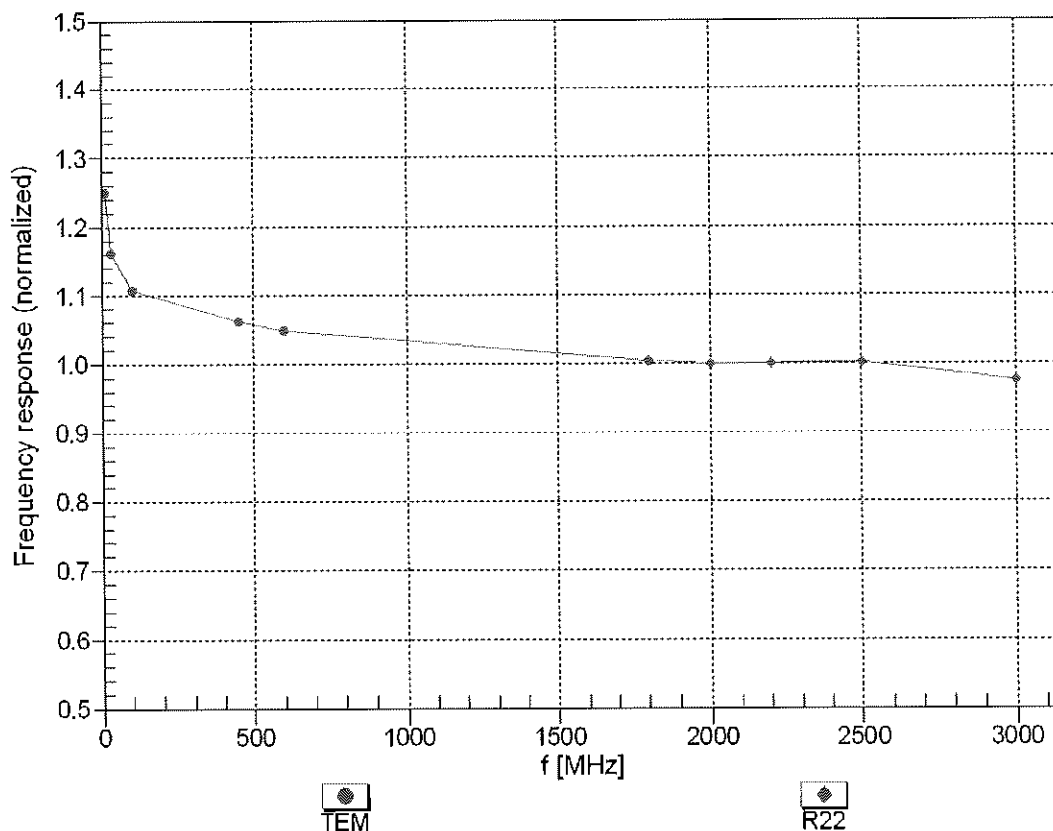
<sup>C</sup> Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

## Frequency Response of E-Field

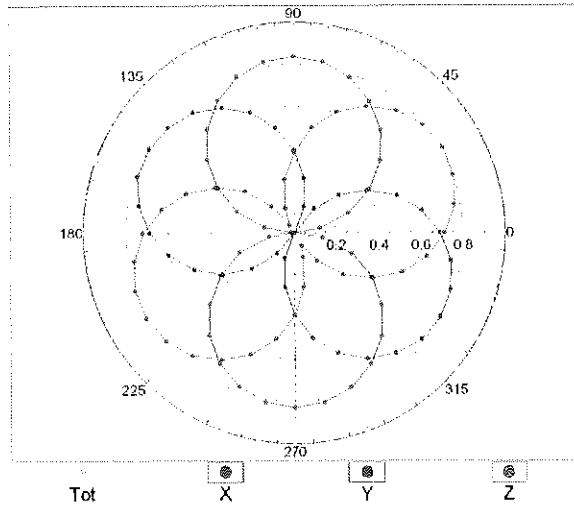
(TEM-Cell:ifi110 EXX, Waveguide: R22)



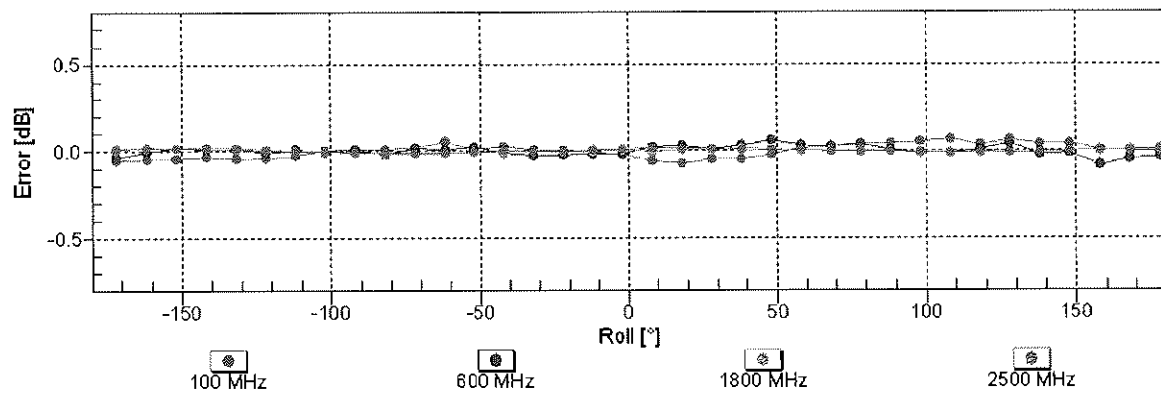
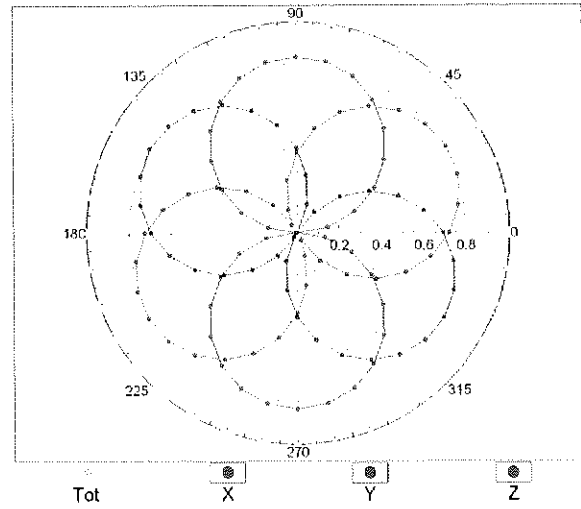
Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

## Receiving Pattern ( $\phi$ ), $\theta = 0^\circ$

f=600 MHz,TEM

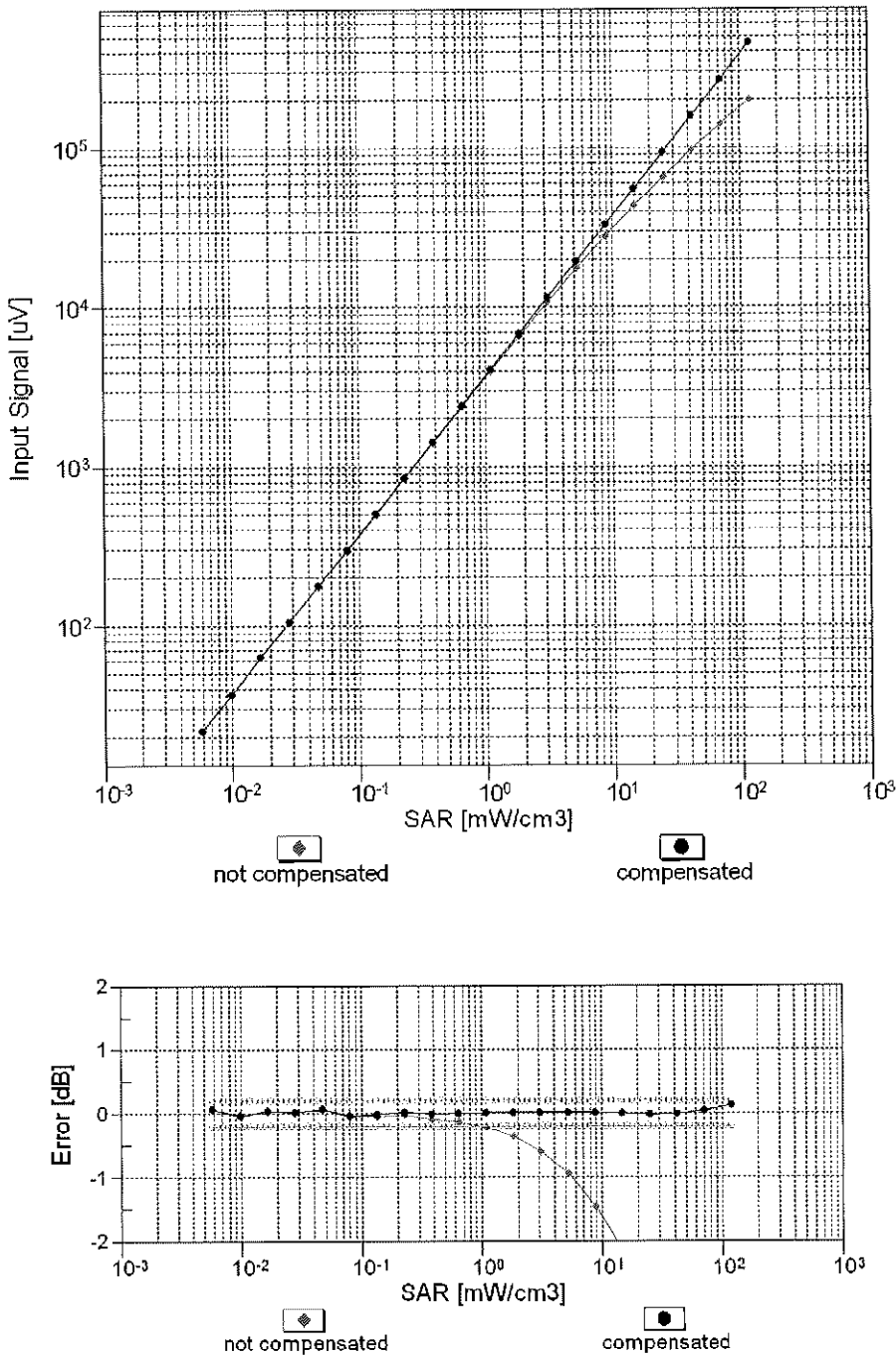


f=1800 MHz,R22



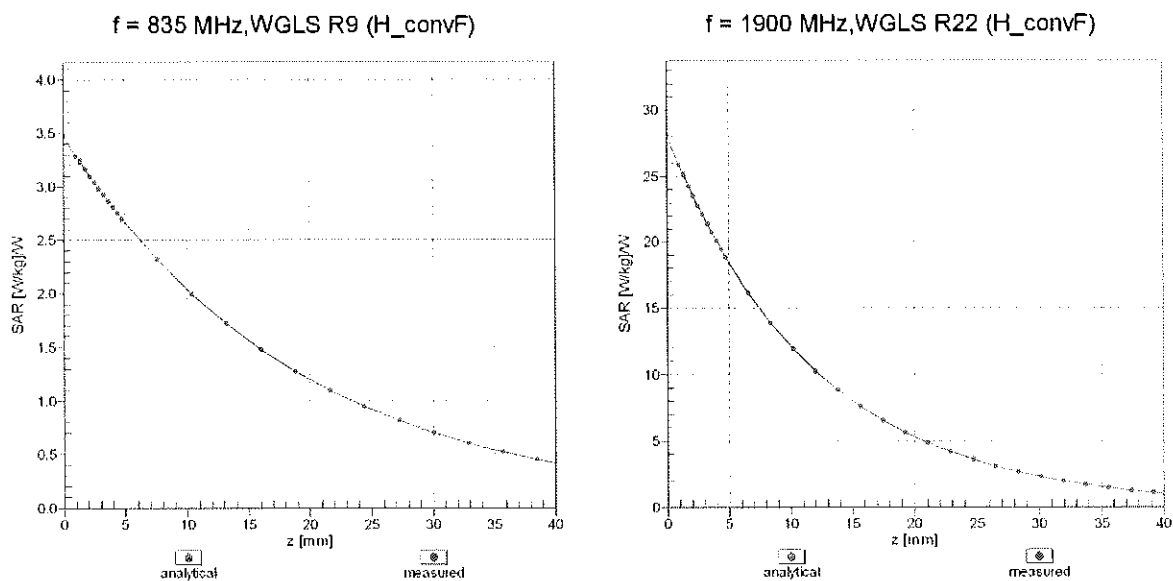
Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )

Dynamic Range f(SAR<sub>head</sub>)  
(TEM cell , f<sub>eval</sub>= 1900 MHz)



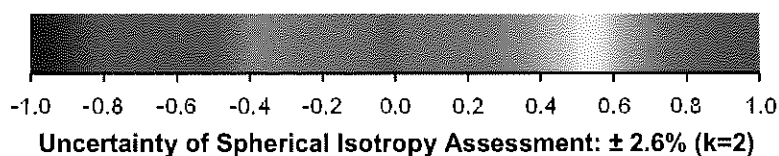
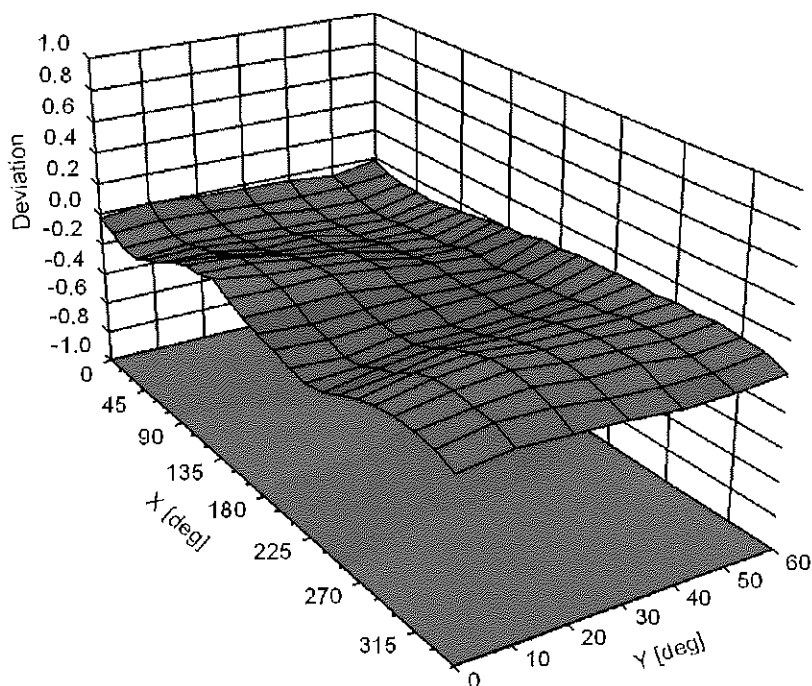
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

## Conversion Factor Assessment



## Deviation from Isotropy in Liquid

Error ( $\phi, \theta$ ),  $f = 900 \text{ MHz}$



**Appendix: Modulation Calibration Parameters**

| UID   | Rev | Communication System Name                           | Group     | PAR (dB) | Unc <sup>E</sup> (k=2) |
|-------|-----|-----------------------------------------------------|-----------|----------|------------------------|
| 0     |     | CW                                                  | CW        | 0.00     | ± 4.7 %                |
| 10010 | CAA | SAR Validation (Square, 100ms, 10ms)                | Test      | 10.00    | ± 9.6 %                |
| 10011 | CAB | UMTS-FDD (WCDMA)                                    | WCDMA     | 2.91     | ± 9.6 %                |
| 10012 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)            | WLAN      | 1.87     | ± 9.6 %                |
| 10013 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)       | WLAN      | 9.46     | ± 9.6 %                |
| 10021 | DAC | GSM-FDD (TDMA, GMSK)                                | GSM       | 9.39     | ± 9.6 %                |
| 10023 | DAC | GPRS-FDD (TDMA, GMSK, TN 0)                         | GSM       | 9.57     | ± 9.6 %                |
| 10024 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1)                       | GSM       | 6.56     | ± 9.6 %                |
| 10025 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0)                         | GSM       | 12.62    | ± 9.6 %                |
| 10026 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1)                       | GSM       | 9.55     | ± 9.6 %                |
| 10027 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2)                     | GSM       | 4.80     | ± 9.6 %                |
| 10028 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)                   | GSM       | 3.55     | ± 9.6 %                |
| 10029 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2)                     | GSM       | 7.78     | ± 9.6 %                |
| 10030 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH1)                 | Bluetooth | 5.30     | ± 9.6 %                |
| 10031 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH3)                 | Bluetooth | 1.87     | ± 9.6 %                |
| 10032 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH5)                 | Bluetooth | 1.16     | ± 9.6 %                |
| 10033 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)           | Bluetooth | 7.74     | ± 9.6 %                |
| 10034 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)           | Bluetooth | 4.53     | ± 9.6 %                |
| 10035 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)           | Bluetooth | 3.83     | ± 9.6 %                |
| 10036 | CAA | IEEE 802.15.1 Bluetooth (8-PSK, DH1)                | Bluetooth | 8.01     | ± 9.6 %                |
| 10037 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH3)               | Bluetooth | 4.77     | ± 9.6 %                |
| 10038 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH5)               | Bluetooth | 4.10     | ± 9.6 %                |
| 10039 | CAB | CDMA2000 (1xRTT, RC1)                               | CDMA2000  | 4.57     | ± 9.6 %                |
| 10042 | CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate) | AMPS      | 7.78     | ± 9.6 %                |
| 10044 | CAA | IS-91/EIA/TIA-553 FDD (FDMA, FM)                    | AMPS      | 0.00     | ± 9.6 %                |
| 10048 | CAA | DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)           | DECT      | 13.80    | ± 9.6 %                |
| 10049 | CAA | DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)         | DECT      | 10.79    | ± 9.6 %                |
| 10056 | CAA | UMTS-TDD (TD-SCDMA, 1.28 Mcps)                      | TD-SCDMA  | 11.01    | ± 9.6 %                |
| 10058 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)                   | GSM       | 6.52     | ± 9.6 %                |
| 10059 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)            | WLAN      | 2.12     | ± 9.6 %                |
| 10060 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)          | WLAN      | 2.83     | ± 9.6 %                |
| 10061 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)           | WLAN      | 3.60     | ± 9.6 %                |
| 10062 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)            | WLAN      | 8.68     | ± 9.6 %                |
| 10063 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)            | WLAN      | 8.63     | ± 9.6 %                |
| 10064 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)           | WLAN      | 9.09     | ± 9.6 %                |
| 10065 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)           | WLAN      | 9.00     | ± 9.6 %                |
| 10066 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)           | WLAN      | 9.38     | ± 9.6 %                |
| 10067 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)           | WLAN      | 10.12    | ± 9.6 %                |
| 10068 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)           | WLAN      | 10.24    | ± 9.6 %                |
| 10069 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)           | WLAN      | 10.56    | ± 9.6 %                |
| 10071 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)       | WLAN      | 9.83     | ± 9.6 %                |
| 10072 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)      | WLAN      | 9.62     | ± 9.6 %                |
| 10073 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)      | WLAN      | 9.94     | ± 9.6 %                |
| 10074 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)      | WLAN      | 10.30    | ± 9.6 %                |
| 10075 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)      | WLAN      | 10.77    | ± 9.6 %                |
| 10076 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)      | WLAN      | 10.94    | ± 9.6 %                |
| 10077 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)      | WLAN      | 11.00    | ± 9.6 %                |
| 10081 | CAB | CDMA2000 (1xRTT, RC3)                               | CDMA2000  | 3.97     | ± 9.6 %                |
| 10082 | CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate) | AMPS      | 4.77     | ± 9.6 %                |
| 10090 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-4)                       | GSM       | 6.56     | ± 9.6 %                |
| 10097 | CAB | UMTS-FDD (HSDPA)                                    | WCDMA     | 3.98     | ± 9.6 %                |
| 10098 | CAB | UMTS-FDD (HSUPA, Subtest 2)                         | WCDMA     | 3.98     | ± 9.6 %                |
| 10099 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-4)                       | GSM       | 9.55     | ± 9.6 %                |
| 10100 | CAE | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)            | LTE-FDD   | 5.67     | ± 9.6 %                |
| 10101 | CAE | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)          | LTE-FDD   | 6.42     | ± 9.6 %                |
| 10102 | CAE | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)          | LTE-FDD   | 6.60     | ± 9.6 %                |
| 10103 | CAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)            | LTE-TDD   | 9.29     | ± 9.6 %                |
| 10104 | CAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)          | LTE-TDD   | 9.97     | ± 9.6 %                |
| 10105 | CAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)          | LTE-TDD   | 10.01    | ± 9.6 %                |
| 10108 | CAG | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)            | LTE-FDD   | 5.80     | ± 9.6 %                |

|       |     |                                                |         |       |         |
|-------|-----|------------------------------------------------|---------|-------|---------|
| 10109 | CAG | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)     | LTE-FDD | 6.43  | ± 9.6 % |
| 10110 | CAG | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)        | LTE-FDD | 5.75  | ± 9.6 % |
| 10111 | CAG | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)      | LTE-FDD | 6.44  | ± 9.6 % |
| 10112 | CAG | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)     | LTE-FDD | 6.59  | ± 9.6 % |
| 10113 | CAG | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)      | LTE-FDD | 6.62  | ± 9.6 % |
| 10114 | CAC | IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)  | WLAN    | 8.10  | ± 9.6 % |
| 10115 | CAC | IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)  | WLAN    | 8.46  | ± 9.6 % |
| 10116 | CAC | IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM) | WLAN    | 8.15  | ± 9.6 % |
| 10117 | CAC | IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)       | WLAN    | 8.07  | ± 9.6 % |
| 10118 | CAC | IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)       | WLAN    | 8.59  | ± 9.6 % |
| 10119 | CAC | IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)      | WLAN    | 8.13  | ± 9.6 % |
| 10140 | CAE | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)     | LTE-FDD | 6.49  | ± 9.6 % |
| 10141 | CAE | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)     | LTE-FDD | 6.53  | ± 9.6 % |
| 10142 | CAE | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)        | LTE-FDD | 5.73  | ± 9.6 % |
| 10143 | CAE | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)      | LTE-FDD | 6.35  | ± 9.6 % |
| 10144 | CAE | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)      | LTE-FDD | 6.65  | ± 9.6 % |
| 10145 | CAF | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)      | LTE-FDD | 5.76  | ± 9.6 % |
| 10146 | CAF | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)    | LTE-FDD | 6.41  | ± 9.6 % |
| 10147 | CAF | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)    | LTE-FDD | 6.72  | ± 9.6 % |
| 10149 | CAE | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)      | LTE-FDD | 6.42  | ± 9.6 % |
| 10150 | CAE | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)      | LTE-FDD | 6.60  | ± 9.6 % |
| 10151 | CAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)        | LTE-TDD | 9.28  | ± 9.6 % |
| 10152 | CAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)      | LTE-TDD | 9.92  | ± 9.6 % |
| 10153 | CAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)      | LTE-TDD | 10.05 | ± 9.6 % |
| 10154 | CAG | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)        | LTE-FDD | 5.75  | ± 9.6 % |
| 10155 | CAG | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)      | LTE-FDD | 6.43  | ± 9.6 % |
| 10156 | CAG | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)         | LTE-FDD | 5.79  | ± 9.6 % |
| 10157 | CAG | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)       | LTE-FDD | 6.49  | ± 9.6 % |
| 10158 | CAG | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)      | LTE-FDD | 6.62  | ± 9.6 % |
| 10159 | CAG | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)       | LTE-FDD | 6.56  | ± 9.6 % |
| 10160 | CAE | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)        | LTE-FDD | 5.82  | ± 9.6 % |
| 10161 | CAE | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)      | LTE-FDD | 6.43  | ± 9.6 % |
| 10162 | CAE | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)      | LTE-FDD | 6.58  | ± 9.6 % |
| 10166 | CAF | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)       | LTE-FDD | 5.46  | ± 9.6 % |
| 10167 | CAF | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)     | LTE-FDD | 6.21  | ± 9.6 % |
| 10168 | CAF | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)     | LTE-FDD | 6.79  | ± 9.6 % |
| 10169 | CAE | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)          | LTE-FDD | 5.73  | ± 9.6 % |
| 10170 | CAE | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)        | LTE-FDD | 6.52  | ± 9.6 % |
| 10171 | AAE | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)        | LTE-FDD | 6.49  | ± 9.6 % |
| 10172 | CAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)          | LTE-TDD | 9.21  | ± 9.6 % |
| 10173 | CAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)        | LTE-TDD | 9.48  | ± 9.6 % |
| 10174 | CAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)        | LTE-TDD | 10.25 | ± 9.6 % |
| 10175 | CAG | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)          | LTE-FDD | 5.72  | ± 9.6 % |
| 10176 | CAG | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)        | LTE-FDD | 6.52  | ± 9.6 % |
| 10177 | CAI | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)           | LTE-FDD | 5.73  | ± 9.6 % |
| 10178 | CAG | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)         | LTE-FDD | 6.52  | ± 9.6 % |
| 10179 | CAG | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)        | LTE-FDD | 6.50  | ± 9.6 % |
| 10180 | CAG | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)         | LTE-FDD | 6.50  | ± 9.6 % |
| 10181 | CAE | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)          | LTE-FDD | 5.72  | ± 9.6 % |
| 10182 | CAE | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)        | LTE-FDD | 6.52  | ± 9.6 % |
| 10183 | AAD | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)        | LTE-FDD | 6.50  | ± 9.6 % |
| 10184 | CAE | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)           | LTE-FDD | 5.73  | ± 9.6 % |
| 10185 | CAE | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)         | LTE-FDD | 6.51  | ± 9.6 % |
| 10186 | AAE | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)         | LTE-FDD | 6.50  | ± 9.6 % |
| 10187 | CAF | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)         | LTE-FDD | 5.73  | ± 9.6 % |
| 10188 | CAF | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)       | LTE-FDD | 6.52  | ± 9.6 % |
| 10189 | AAF | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)       | LTE-FDD | 6.50  | ± 9.6 % |
| 10193 | CAC | IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)   | WLAN    | 8.09  | ± 9.6 % |
| 10194 | CAC | IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)  | WLAN    | 8.12  | ± 9.6 % |
| 10195 | CAC | IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)  | WLAN    | 8.21  | ± 9.6 % |
| 10196 | CAC | IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)        | WLAN    | 8.10  | ± 9.6 % |
| 10197 | CAC | IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)       | WLAN    | 8.13  | ± 9.6 % |
| 10198 | CAC | IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)       | WLAN    | 8.27  | ± 9.6 % |
| 10219 | CAC | IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)        | WLAN    | 8.03  | ± 9.6 % |

|       |     |                                             |          |       |         |
|-------|-----|---------------------------------------------|----------|-------|---------|
| 10220 | CAC | IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)  | WLAN     | 8.13  | ± 9.6 % |
| 10221 | CAC | IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)  | WLAN     | 8.27  | ± 9.6 % |
| 10222 | CAC | IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)      | WLAN     | 8.06  | ± 9.6 % |
| 10223 | CAC | IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)    | WLAN     | 8.48  | ± 9.6 % |
| 10224 | CAC | IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)   | WLAN     | 8.08  | ± 9.6 % |
| 10225 | CAB | UMTS-FDD (HSPA+)                            | WCDMA    | 5.97  | ± 9.6 % |
| 10226 | CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)    | LTE-TDD  | 9.49  | ± 9.6 % |
| 10227 | CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)    | LTE-TDD  | 10.26 | ± 9.6 % |
| 10228 | CAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)      | LTE-TDD  | 9.22  | ± 9.6 % |
| 10229 | CAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)      | LTE-TDD  | 9.48  | ± 9.6 % |
| 10230 | CAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)      | LTE-TDD  | 10.25 | ± 9.6 % |
| 10231 | CAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)        | LTE-TDD  | 9.19  | ± 9.6 % |
| 10232 | CAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)      | LTE-TDD  | 9.48  | ± 9.6 % |
| 10233 | CAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)      | LTE-TDD  | 10.25 | ± 9.6 % |
| 10234 | CAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)        | LTE-TDD  | 9.21  | ± 9.6 % |
| 10235 | CAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)     | LTE-TDD  | 9.48  | ± 9.6 % |
| 10236 | CAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)     | LTE-TDD  | 10.25 | ± 9.6 % |
| 10237 | CAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)       | LTE-TDD  | 9.21  | ± 9.6 % |
| 10238 | CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)     | LTE-TDD  | 9.48  | ± 9.6 % |
| 10239 | CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)     | LTE-TDD  | 10.25 | ± 9.6 % |
| 10240 | CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)       | LTE-TDD  | 9.21  | ± 9.6 % |
| 10241 | CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)  | LTE-TDD  | 9.82  | ± 9.6 % |
| 10242 | CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)  | LTE-TDD  | 9.86  | ± 9.6 % |
| 10243 | CAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)    | LTE-TDD  | 9.46  | ± 9.6 % |
| 10244 | CAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)    | LTE-TDD  | 10.06 | ± 9.6 % |
| 10245 | CAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)    | LTE-TDD  | 10.06 | ± 9.6 % |
| 10246 | CAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)      | LTE-TDD  | 9.30  | ± 9.6 % |
| 10247 | CAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)    | LTE-TDD  | 9.91  | ± 9.6 % |
| 10248 | CAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)    | LTE-TDD  | 10.09 | ± 9.6 % |
| 10249 | CAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)      | LTE-TDD  | 9.29  | ± 9.6 % |
| 10250 | CAF | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)   | LTE-TDD  | 9.81  | ± 9.6 % |
| 10251 | CAF | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)   | LTE-TDD  | 10.17 | ± 9.6 % |
| 10252 | CAF | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)     | LTE-TDD  | 9.24  | ± 9.6 % |
| 10253 | CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)   | LTE-TDD  | 9.90  | ± 9.6 % |
| 10254 | CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)   | LTE-TDD  | 10.14 | ± 9.6 % |
| 10255 | CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)     | LTE-TDD  | 9.20  | ± 9.6 % |
| 10256 | CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM) | LTE-TDD  | 9.96  | ± 9.6 % |
| 10257 | CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM) | LTE-TDD  | 10.08 | ± 9.6 % |
| 10258 | CAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)   | LTE-TDD  | 9.34  | ± 9.6 % |
| 10259 | CAC | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)   | LTE-TDD  | 9.98  | ± 9.6 % |
| 10260 | CAC | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)   | LTE-TDD  | 9.97  | ± 9.6 % |
| 10261 | CAC | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)     | LTE-TDD  | 9.24  | ± 9.6 % |
| 10262 | CAF | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)   | LTE-TDD  | 9.83  | ± 9.6 % |
| 10263 | CAF | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)   | LTE-TDD  | 10.16 | ± 9.6 % |
| 10264 | CAF | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)     | LTE-TDD  | 9.23  | ± 9.6 % |
| 10265 | CAF | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)  | LTE-TDD  | 9.92  | ± 9.6 % |
| 10266 | CAF | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)  | LTE-TDD  | 10.07 | ± 9.6 % |
| 10267 | CAF | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)    | LTE-TDD  | 9.30  | ± 9.6 % |
| 10268 | CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)  | LTE-TDD  | 10.06 | ± 9.6 % |
| 10269 | CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)  | LTE-TDD  | 10.13 | ± 9.6 % |
| 10270 | CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)    | LTE-TDD  | 9.58  | ± 9.6 % |
| 10274 | CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)   | WCDMA    | 4.87  | ± 9.6 % |
| 10275 | CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)    | WCDMA    | 3.96  | ± 9.6 % |
| 10277 | CAA | PHS (QPSK)                                  | PHS      | 11.81 | ± 9.6 % |
| 10278 | CAA | PHS (QPSK, BW 884MHz, Rolloff 0.5)          | PHS      | 11.81 | ± 9.6 % |
| 10279 | CAA | PHS (QPSK, BW 884MHz, Rolloff 0.38)         | PHS      | 12.18 | ± 9.6 % |
| 10290 | AAB | CDMA2000, RC1, SO55, Full Rate              | CDMA2000 | 3.91  | ± 9.6 % |
| 10291 | AAB | CDMA2000, RC3, SO55, Full Rate              | CDMA2000 | 3.46  | ± 9.6 % |
| 10292 | AAB | CDMA2000, RC3, SO32, Full Rate              | CDMA2000 | 3.39  | ± 9.6 % |
| 10293 | AAB | CDMA2000, RC3, SO3, Full Rate               | CDMA2000 | 3.50  | ± 9.6 % |
| 10295 | AAB | CDMA2000, RC1, SO3, 1/8th Rate 25 fr.       | CDMA2000 | 12.49 | ± 9.6 % |
| 10297 | AAD | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)     | LTE-FDD  | 5.81  | ± 9.6 % |
| 10298 | AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)      | LTE-FDD  | 5.72  | ± 9.6 % |
| 10299 | AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)    | LTE-FDD  | 6.39  | ± 9.6 % |

|       |     |                                                                                 |          |       |         |
|-------|-----|---------------------------------------------------------------------------------|----------|-------|---------|
| 10300 | AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)                                        | LTE-FDD  | 6.60  | ± 9.6 % |
| 10301 | AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)                              | WiMAX    | 12.03 | ± 9.6 % |
| 10302 | AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols)              | WiMAX    | 12.57 | ± 9.6 % |
| 10303 | AAA | IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)                             | WiMAX    | 12.52 | ± 9.6 % |
| 10304 | AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)                             | WiMAX    | 11.86 | ± 9.6 % |
| 10305 | AAA | IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)                | WiMAX    | 15.24 | ± 9.6 % |
| 10306 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)                | WiMAX    | 14.67 | ± 9.6 % |
| 10307 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)                 | WiMAX    | 14.49 | ± 9.6 % |
| 10308 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)                            | WiMAX    | 14.46 | ± 9.6 % |
| 10309 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)             | WiMAX    | 14.58 | ± 9.6 % |
| 10310 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)              | WiMAX    | 14.57 | ± 9.6 % |
| 10311 | AAD | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)                                        | LTE-FDD  | 6.06  | ± 9.6 % |
| 10313 | AAA | IDEN 1:3                                                                        | IDEN     | 10.51 | ± 9.6 % |
| 10314 | AAA | IDEN 1:6                                                                        | IDEN     | 13.48 | ± 9.6 % |
| 10315 | AAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)                       | WLAN     | 1.71  | ± 9.6 % |
| 10316 | AAB | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)                   | WLAN     | 8.36  | ± 9.6 % |
| 10317 | AAC | IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)                         | WLAN     | 8.36  | ± 9.6 % |
| 10352 | AAA | Pulse Waveform (200Hz, 10%)                                                     | Generic  | 10.00 | ± 9.6 % |
| 10353 | AAA | Pulse Waveform (200Hz, 20%)                                                     | Generic  | 6.99  | ± 9.6 % |
| 10354 | AAA | Pulse Waveform (200Hz, 40%)                                                     | Generic  | 3.98  | ± 9.6 % |
| 10355 | AAA | Pulse Waveform (200Hz, 60%)                                                     | Generic  | 2.22  | ± 9.6 % |
| 10356 | AAA | Pulse Waveform (200Hz, 80%)                                                     | Generic  | 0.97  | ± 9.6 % |
| 10387 | AAA | QPSK Waveform, 1 MHz                                                            | Generic  | 5.10  | ± 9.6 % |
| 10388 | AAA | QPSK Waveform, 10 MHz                                                           | Generic  | 5.22  | ± 9.6 % |
| 10396 | AAA | 64-QAM Waveform, 100 kHz                                                        | Generic  | 6.27  | ± 9.6 % |
| 10399 | AAA | 64-QAM Waveform, 40 MHz                                                         | Generic  | 6.27  | ± 9.6 % |
| 10400 | AAD | IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)                             | WLAN     | 8.37  | ± 9.6 % |
| 10401 | AAD | IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)                             | WLAN     | 8.60  | ± 9.6 % |
| 10402 | AAD | IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)                             | WLAN     | 8.53  | ± 9.6 % |
| 10403 | AAB | CDMA2000 (1xEV-DO, Rev. 0)                                                      | CDMA2000 | 3.76  | ± 9.6 % |
| 10404 | AAB | CDMA2000 (1xEV-DO, Rev. A)                                                      | CDMA2000 | 3.77  | ± 9.6 % |
| 10406 | AAB | CDMA2000, RC3, SO32, SCH0, Full Rate                                            | CDMA2000 | 5.22  | ± 9.6 % |
| 10410 | AAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9, Subframe Conf=4) | LTE-TDD  | 7.82  | ± 9.6 % |
| 10414 | AAA | WLAN CCDF, 64-QAM, 40MHz                                                        | Generic  | 8.54  | ± 9.6 % |
| 10415 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)                       | WLAN     | 1.54  | ± 9.6 % |
| 10416 | AAA | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)                   | WLAN     | 8.23  | ± 9.6 % |
| 10417 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)                       | WLAN     | 8.23  | ± 9.6 % |
| 10418 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preamble)   | WLAN     | 8.14  | ± 9.6 % |
| 10419 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preamble)  | WLAN     | 8.19  | ± 9.6 % |
| 10422 | AAB | IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)                                    | WLAN     | 8.32  | ± 9.6 % |
| 10423 | AAB | IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)                                 | WLAN     | 8.47  | ± 9.6 % |
| 10424 | AAB | IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)                                 | WLAN     | 8.40  | ± 9.6 % |
| 10425 | AAB | IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)                                     | WLAN     | 8.41  | ± 9.6 % |
| 10426 | AAB | IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)                                   | WLAN     | 8.45  | ± 9.6 % |
| 10427 | AAB | IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)                                  | WLAN     | 8.41  | ± 9.6 % |
| 10430 | AAD | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)                                                | LTE-FDD  | 8.28  | ± 9.6 % |
| 10431 | AAD | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)                                               | LTE-FDD  | 8.38  | ± 9.6 % |
| 10432 | AAC | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)                                               | LTE-FDD  | 8.34  | ± 9.6 % |
| 10433 | AAC | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)                                               | LTE-FDD  | 8.34  | ± 9.6 % |
| 10434 | AAA | W-CDMA (BS Test Model 1, 64 DPCH)                                               | WCDMA    | 8.60  | ± 9.6 % |
| 10435 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)                  | LTE-TDD  | 7.82  | ± 9.6 % |
| 10447 | AAD | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)                                  | LTE-FDD  | 7.56  | ± 9.6 % |
| 10448 | AAD | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)                                 | LTE-FDD  | 7.53  | ± 9.6 % |
| 10449 | AAC | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)                                 | LTE-FDD  | 7.51  | ± 9.6 % |
| 10450 | AAC | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)                                 | LTE-FDD  | 7.48  | ± 9.6 % |

|       |     |                                                                        |          |      |         |
|-------|-----|------------------------------------------------------------------------|----------|------|---------|
| 10451 | AAA | W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)                        | WCDMA    | 7.59 | ± 9.6 % |
| 10456 | AAB | IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)                   | WLAN     | 8.63 | ± 9.6 % |
| 10457 | AAA | UMTS-FDD (DC-HSDPA)                                                    | WCDMA    | 6.62 | ± 9.6 % |
| 10458 | AAA | CDMA2000 (1xEV-DO, Rev. B, 2 carriers)                                 | CDMA2000 | 6.55 | ± 9.6 % |
| 10459 | AAA | CDMA2000 (1xEV-DO, Rev. B, 3 carriers)                                 | CDMA2000 | 8.25 | ± 9.6 % |
| 10460 | AAA | UMTS-FDD (WCDMA, AMR)                                                  | WCDMA    | 2.39 | ± 9.6 % |
| 10461 | AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 7.82 | ± 9.6 % |
| 10462 | AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.30 | ± 9.6 % |
| 10463 | AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.56 | ± 9.6 % |
| 10464 | AAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)       | LTE-TDD  | 7.82 | ± 9.6 % |
| 10465 | AAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 8.32 | ± 9.6 % |
| 10466 | AAB | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 8.57 | ± 9.6 % |
| 10467 | AAE | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)       | LTE-TDD  | 7.82 | ± 9.6 % |
| 10468 | AAE | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 8.32 | ± 9.6 % |
| 10469 | AAE | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 8.56 | ± 9.6 % |
| 10470 | AAE | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)      | LTE-TDD  | 7.82 | ± 9.6 % |
| 10471 | AAE | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.32 | ± 9.6 % |
| 10472 | AAE | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.57 | ± 9.6 % |
| 10473 | AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)      | LTE-TDD  | 7.82 | ± 9.6 % |
| 10474 | AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.32 | ± 9.6 % |
| 10475 | AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.57 | ± 9.6 % |
| 10477 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.32 | ± 9.6 % |
| 10478 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.57 | ± 9.6 % |
| 10479 | AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 7.74 | ± 9.6 % |
| 10480 | AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9) | LTE-TDD  | 8.18 | ± 9.6 % |
| 10481 | AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9) | LTE-TDD  | 8.45 | ± 9.6 % |
| 10482 | AAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 7.71 | ± 9.6 % |
| 10483 | AAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.39 | ± 9.6 % |
| 10484 | AAB | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.47 | ± 9.6 % |
| 10485 | AAE | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 7.59 | ± 9.6 % |
| 10486 | AAE | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.38 | ± 9.6 % |
| 10487 | AAE | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.60 | ± 9.6 % |
| 10488 | AAE | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 7.70 | ± 9.6 % |
| 10489 | AAE | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)  | LTE-TDD  | 8.31 | ± 9.6 % |
| 10490 | AAE | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)  | LTE-TDD  | 8.54 | ± 9.6 % |
| 10491 | AAE | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 7.74 | ± 9.6 % |

|       |     |                                                                      |         |      |         |
|-------|-----|----------------------------------------------------------------------|---------|------|---------|
| 10492 | AAE | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.41 | ± 9.6 % |
| 10493 | AAE | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.55 | ± 9.6 % |
| 10494 | AAF | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | LTE-TDD | 7.74 | ± 9.6 % |
| 10495 | AAF | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.37 | ± 9.6 % |
| 10496 | AAF | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.54 | ± 9.6 % |
| 10497 | AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 7.67 | ± 9.6 % |
| 10498 | AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.40 | ± 9.6 % |
| 10499 | AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.68 | ± 9.6 % |
| 10500 | AAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | LTE-TDD | 7.67 | ± 9.6 % |
| 10501 | AAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.44 | ± 9.6 % |
| 10502 | AAB | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.52 | ± 9.6 % |
| 10503 | AAE | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | LTE-TDD | 7.72 | ± 9.6 % |
| 10504 | AAE | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.31 | ± 9.6 % |
| 10505 | AAE | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.54 | ± 9.6 % |
| 10506 | AAE | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)    | LTE-TDD | 7.74 | ± 9.6 % |
| 10507 | AAE | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.36 | ± 9.6 % |
| 10508 | AAE | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.55 | ± 9.6 % |
| 10509 | AAE | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)    | LTE-TDD | 7.99 | ± 9.6 % |
| 10510 | AAE | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.49 | ± 9.6 % |
| 10511 | AAE | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.51 | ± 9.6 % |
| 10512 | AAF | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)    | LTE-TDD | 7.74 | ± 9.6 % |
| 10513 | AAF | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.42 | ± 9.6 % |
| 10514 | AAF | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.45 | ± 9.6 % |
| 10515 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)            | WLAN    | 1.58 | ± 9.6 % |
| 10516 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)          | WLAN    | 1.57 | ± 9.6 % |
| 10517 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)           | WLAN    | 1.58 | ± 9.6 % |
| 10518 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)            | WLAN    | 8.23 | ± 9.6 % |
| 10519 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)           | WLAN    | 8.39 | ± 9.6 % |
| 10520 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)           | WLAN    | 8.12 | ± 9.6 % |
| 10521 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)           | WLAN    | 7.97 | ± 9.6 % |
| 10522 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)           | WLAN    | 8.45 | ± 9.6 % |
| 10523 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)           | WLAN    | 8.08 | ± 9.6 % |
| 10524 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)           | WLAN    | 8.27 | ± 9.6 % |
| 10525 | AAB | IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)                    | WLAN    | 8.36 | ± 9.6 % |
| 10526 | AAB | IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)                    | WLAN    | 8.42 | ± 9.6 % |
| 10527 | AAB | IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)                    | WLAN    | 8.21 | ± 9.6 % |
| 10528 | AAB | IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)                    | WLAN    | 8.36 | ± 9.6 % |
| 10529 | AAB | IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)                    | WLAN    | 8.36 | ± 9.6 % |
| 10531 | AAB | IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)                    | WLAN    | 8.43 | ± 9.6 % |
| 10532 | AAB | IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)                    | WLAN    | 8.29 | ± 9.6 % |
| 10533 | AAB | IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)                    | WLAN    | 8.38 | ± 9.6 % |
| 10534 | AAB | IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)                    | WLAN    | 8.45 | ± 9.6 % |

|       |     |                                                                 |      |      |         |
|-------|-----|-----------------------------------------------------------------|------|------|---------|
| 10535 | AAB | IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)               | WLAN | 8.45 | ± 9.6 % |
| 10536 | AAB | IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)               | WLAN | 8.32 | ± 9.6 % |
| 10537 | AAB | IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)               | WLAN | 8.44 | ± 9.6 % |
| 10538 | AAB | IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)               | WLAN | 8.54 | ± 9.6 % |
| 10540 | AAB | IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)               | WLAN | 8.39 | ± 9.6 % |
| 10541 | AAB | IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)               | WLAN | 8.46 | ± 9.6 % |
| 10542 | AAB | IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)               | WLAN | 8.65 | ± 9.6 % |
| 10543 | AAB | IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)               | WLAN | 8.65 | ± 9.6 % |
| 10544 | AAB | IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)               | WLAN | 8.47 | ± 9.6 % |
| 10545 | AAB | IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)               | WLAN | 8.55 | ± 9.6 % |
| 10546 | AAB | IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)               | WLAN | 8.35 | ± 9.6 % |
| 10547 | AAB | IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)               | WLAN | 8.49 | ± 9.6 % |
| 10548 | AAB | IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)               | WLAN | 8.37 | ± 9.6 % |
| 10550 | AAB | IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)               | WLAN | 8.38 | ± 9.6 % |
| 10551 | AAB | IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)               | WLAN | 8.50 | ± 9.6 % |
| 10552 | AAB | IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)               | WLAN | 8.42 | ± 9.6 % |
| 10553 | AAB | IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)               | WLAN | 8.45 | ± 9.6 % |
| 10554 | AAC | IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)              | WLAN | 8.48 | ± 9.6 % |
| 10555 | AAC | IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)              | WLAN | 8.47 | ± 9.6 % |
| 10556 | AAC | IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)              | WLAN | 8.50 | ± 9.6 % |
| 10557 | AAC | IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)              | WLAN | 8.52 | ± 9.6 % |
| 10558 | AAC | IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)              | WLAN | 8.61 | ± 9.6 % |
| 10560 | AAC | IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle)              | WLAN | 8.73 | ± 9.6 % |
| 10561 | AAC | IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)              | WLAN | 8.56 | ± 9.6 % |
| 10562 | AAC | IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)              | WLAN | 8.69 | ± 9.6 % |
| 10563 | AAC | IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)              | WLAN | 8.77 | ± 9.6 % |
| 10564 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)  | WLAN | 8.25 | ± 9.6 % |
| 10565 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle) | WLAN | 8.45 | ± 9.6 % |
| 10566 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle) | WLAN | 8.13 | ± 9.6 % |
| 10567 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle) | WLAN | 8.00 | ± 9.6 % |
| 10568 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle) | WLAN | 8.37 | ± 9.6 % |
| 10569 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle) | WLAN | 8.10 | ± 9.6 % |
| 10570 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle) | WLAN | 8.30 | ± 9.6 % |
| 10571 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)       | WLAN | 1.99 | ± 9.6 % |
| 10572 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)       | WLAN | 1.99 | ± 9.6 % |
| 10573 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)     | WLAN | 1.98 | ± 9.6 % |
| 10574 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)      | WLAN | 1.98 | ± 9.6 % |
| 10575 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)  | WLAN | 8.59 | ± 9.6 % |
| 10576 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)  | WLAN | 8.60 | ± 9.6 % |
| 10577 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle) | WLAN | 8.70 | ± 9.6 % |
| 10578 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle) | WLAN | 8.49 | ± 9.6 % |
| 10579 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle) | WLAN | 8.36 | ± 9.6 % |
| 10580 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle) | WLAN | 8.76 | ± 9.6 % |
| 10581 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle) | WLAN | 8.35 | ± 9.6 % |
| 10582 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) | WLAN | 8.67 | ± 9.6 % |
| 10583 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)       | WLAN | 8.59 | ± 9.6 % |
| 10584 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)       | WLAN | 8.60 | ± 9.6 % |
| 10585 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)      | WLAN | 8.70 | ± 9.6 % |
| 10586 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)      | WLAN | 8.49 | ± 9.6 % |
| 10587 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)      | WLAN | 8.36 | ± 9.6 % |

|       |     |                                                            |          |       |         |
|-------|-----|------------------------------------------------------------|----------|-------|---------|
| 10588 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle) | WLAN     | 8.76  | ± 9.6 % |
| 10589 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle) | WLAN     | 8.35  | ± 9.6 % |
| 10590 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle) | WLAN     | 8.67  | ± 9.6 % |
| 10591 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)      | WLAN     | 8.63  | ± 9.6 % |
| 10592 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)      | WLAN     | 8.79  | ± 9.6 % |
| 10593 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)      | WLAN     | 8.64  | ± 9.6 % |
| 10594 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)      | WLAN     | 8.74  | ± 9.6 % |
| 10595 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)      | WLAN     | 8.74  | ± 9.6 % |
| 10596 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)      | WLAN     | 8.71  | ± 9.6 % |
| 10597 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)      | WLAN     | 8.72  | ± 9.6 % |
| 10598 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)      | WLAN     | 8.50  | ± 9.6 % |
| 10599 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)      | WLAN     | 8.79  | ± 9.6 % |
| 10600 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)      | WLAN     | 8.88  | ± 9.6 % |
| 10601 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)      | WLAN     | 8.82  | ± 9.6 % |
| 10602 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)      | WLAN     | 8.94  | ± 9.6 % |
| 10603 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)      | WLAN     | 9.03  | ± 9.6 % |
| 10604 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)      | WLAN     | 8.76  | ± 9.6 % |
| 10605 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)      | WLAN     | 8.97  | ± 9.6 % |
| 10606 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)      | WLAN     | 8.82  | ± 9.6 % |
| 10607 | AAB | IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)          | WLAN     | 8.64  | ± 9.6 % |
| 10608 | AAB | IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)          | WLAN     | 8.77  | ± 9.6 % |
| 10609 | AAB | IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)          | WLAN     | 8.57  | ± 9.6 % |
| 10610 | AAB | IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)          | WLAN     | 8.78  | ± 9.6 % |
| 10611 | AAB | IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)          | WLAN     | 8.70  | ± 9.6 % |
| 10612 | AAB | IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)          | WLAN     | 8.77  | ± 9.6 % |
| 10613 | AAB | IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)          | WLAN     | 8.94  | ± 9.6 % |
| 10614 | AAB | IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)          | WLAN     | 8.59  | ± 9.6 % |
| 10615 | AAB | IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)          | WLAN     | 8.82  | ± 9.6 % |
| 10616 | AAB | IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)          | WLAN     | 8.82  | ± 9.6 % |
| 10617 | AAB | IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)          | WLAN     | 8.81  | ± 9.6 % |
| 10618 | AAB | IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)          | WLAN     | 8.58  | ± 9.6 % |
| 10619 | AAB | IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)          | WLAN     | 8.86  | ± 9.6 % |
| 10620 | AAB | IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)          | WLAN     | 8.87  | ± 9.6 % |
| 10621 | AAB | IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)          | WLAN     | 8.77  | ± 9.6 % |
| 10622 | AAB | IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)          | WLAN     | 8.68  | ± 9.6 % |
| 10623 | AAB | IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)          | WLAN     | 8.82  | ± 9.6 % |
| 10624 | AAB | IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)          | WLAN     | 8.96  | ± 9.6 % |
| 10625 | AAB | IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)          | WLAN     | 8.96  | ± 9.6 % |
| 10626 | AAB | IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)          | WLAN     | 8.83  | ± 9.6 % |
| 10627 | AAB | IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)          | WLAN     | 8.88  | ± 9.6 % |
| 10628 | AAB | IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)          | WLAN     | 8.71  | ± 9.6 % |
| 10629 | AAB | IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)          | WLAN     | 8.85  | ± 9.6 % |
| 10630 | AAB | IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)          | WLAN     | 8.72  | ± 9.6 % |
| 10631 | AAB | IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)          | WLAN     | 8.81  | ± 9.6 % |
| 10632 | AAB | IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)          | WLAN     | 8.74  | ± 9.6 % |
| 10633 | AAB | IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)          | WLAN     | 8.83  | ± 9.6 % |
| 10634 | AAB | IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)          | WLAN     | 8.80  | ± 9.6 % |
| 10635 | AAB | IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)          | WLAN     | 8.81  | ± 9.6 % |
| 10636 | AAC | IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle)         | WLAN     | 8.83  | ± 9.6 % |
| 10637 | AAC | IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)         | WLAN     | 8.79  | ± 9.6 % |
| 10638 | AAC | IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle)         | WLAN     | 8.86  | ± 9.6 % |
| 10639 | AAC | IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)         | WLAN     | 8.85  | ± 9.6 % |
| 10640 | AAC | IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)         | WLAN     | 8.98  | ± 9.6 % |
| 10641 | AAC | IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)         | WLAN     | 9.06  | ± 9.6 % |
| 10642 | AAC | IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)         | WLAN     | 9.06  | ± 9.6 % |
| 10643 | AAC | IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)         | WLAN     | 8.89  | ± 9.6 % |
| 10644 | AAC | IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)         | WLAN     | 9.05  | ± 9.6 % |
| 10645 | AAC | IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)         | WLAN     | 9.11  | ± 9.6 % |
| 10646 | AAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)      | LTE-TDD  | 11.96 | ± 9.6 % |
| 10647 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)     | LTE-TDD  | 11.96 | ± 9.6 % |
| 10648 | AAA | CDMA2000 (1x Advanced)                                     | CDMA2000 | 3.45  | ± 9.6 % |
| 10652 | AAD | LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)             | LTE-TDD  | 6.91  | ± 9.6 % |
| 10653 | AAD | LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)            | LTE-TDD  | 7.42  | ± 9.6 % |
| 10654 | AAD | LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)            | LTE-TDD  | 6.96  | ± 9.6 % |

|       |     |                                                 |           |       |         |
|-------|-----|-------------------------------------------------|-----------|-------|---------|
| 10655 | AAE | LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%) | LTE-TDD   | 7.21  | ± 9.6 % |
| 10658 | AAA | Pulse Waveform (200Hz, 10%)                     | Test      | 10.00 | ± 9.6 % |
| 10659 | AAA | Pulse Waveform (200Hz, 20%)                     | Test      | 6.99  | ± 9.6 % |
| 10660 | AAA | Pulse Waveform (200Hz, 40%)                     | Test      | 3.98  | ± 9.6 % |
| 10661 | AAA | Pulse Waveform (200Hz, 60%)                     | Test      | 2.22  | ± 9.6 % |
| 10662 | AAA | Pulse Waveform (200Hz, 80%)                     | Test      | 0.97  | ± 9.6 % |
| 10670 | AAA | Bluetooth Low Energy                            | Bluetooth | 2.19  | ± 9.6 % |

<sup>E</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

The Swiss Accreditation Service is one of the signatories to the EA  
 Multilateral Agreement for the recognition of calibration certificates

Client **PC Test**

Certificate No: **EX3-7420\_Nov19**

## CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:7420**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-14.v5, QA CAL-23.v5, QA CAL-25.v7**  
**Calibration procedure for dosimetric E-field probes**

Calibration date: **November 21, 2019**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^\circ\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID               | Cal Date (Certificate No.)        | Scheduled Calibration  |
|----------------------------|------------------|-----------------------------------|------------------------|
| Power meter NRP            | SN: 104778       | 03-Apr-19 (No. 217-02892/02893)   | Apr-20                 |
| Power sensor NRP-Z91       | SN: 103244       | 03-Apr-19 (No. 217-02892)         | Apr-20                 |
| Power sensor NRP-Z91       | SN: 103245       | 03-Apr-19 (No. 217-02893)         | Apr-20                 |
| Reference 20 dB Attenuator | SN: S5277 (20x)  | 04-Apr-19 (No. 217-02894)         | Apr-20                 |
| DAE4                       | SN: 660          | 07-Oct-19 (No. DAE4-660_Oct19)    | Oct-20                 |
| Reference Probe ES3DV2     | SN: 3013         | 31-Dec-18 (No. ES3-3013_Dec18)    | Dec-19                 |
| Secondary Standards        | ID               | Check Date (in house)             | Scheduled Check        |
| Power meter E4419B         | SN: GB41293874   | 06-Apr-16 (in house check Jun-18) | In house check: Jun-20 |
| Power sensor E4412A        | SN: MY41498087   | 06-Apr-16 (in house check Jun-18) | In house check: Jun-20 |
| Power sensor E4412A        | SN: 000110210    | 06-Apr-16 (in house check Jun-18) | In house check: Jun-20 |
| RF generator HP 8648C      | SN: US3642U01700 | 04-Aug-99 (in house check Jun-18) | In house check: Jun-20 |
| Network Analyzer E8358A    | SN: US41080477   | 31-Mar-14 (in house check Oct-19) | In house check: Oct-20 |

|                                                                                                                 |                        |                                   |                           |
|-----------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|---------------------------|
| Calibrated by:                                                                                                  | Name<br>Jeton Kastrati | Function<br>Laboratory Technician | Signature<br>             |
| Approved by:                                                                                                    | Katja Pokovic          | Technical Manager                 |                           |
| This calibration certificate shall not be reproduced except in full without written approval of the laboratory. |                        |                                   | Issued: November 25, 2019 |



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Accreditation No.: **SCS 0108**

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 Multilateral Agreement for the recognition of calibration certificates

## Glossary:

|                          |                                                                                                                                                         |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| TSL                      | tissue simulating liquid                                                                                                                                |
| NORM <sub>x,y,z</sub>    | sensitivity in free space                                                                                                                               |
| ConvF                    | sensitivity in TSL / NORM <sub>x,y,z</sub>                                                                                                              |
| DCP                      | diode compression point                                                                                                                                 |
| CF                       | crest factor (1/duty_cycle) of the RF signal                                                                                                            |
| A, B, C, D               | modulation dependent linearization parameters                                                                                                           |
| Polarization $\varphi$   | $\varphi$ rotation around probe axis                                                                                                                    |
| Polarization $\vartheta$ | $\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center),<br>i.e., $\vartheta = 0$ is normal to probe axis |
| Connector Angle          | information used in DASY system to align probe sensor X to the robot coordinate system                                                                  |

## Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the  $E^2$ -field uncertainty inside TSL (see below ConvF).
- NORM(f)<sub>x,y,z</sub>** = NORM<sub>x,y,z</sub> \* frequency\_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; D<sub>x,y,z</sub>; VR<sub>x,y,z</sub>**: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  MHz) and inside waveguide using analytical field distributions based on power measurements for  $f > 800$  MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> \* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$  MHz to  $\pm 100$  MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM<sub>x</sub> (no uncertainty required).

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:7420

## Basic Calibration Parameters

|                                                           | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|-----------------------------------------------------------|----------|----------|----------|-----------|
| Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup> | 0.50     | 0.54     | 0.60     | ± 10.1 %  |
| DCP (mV) <sup>B</sup>                                     | 97.3     | 99.6     | 94.7     |           |

## Calibration Results for Modulation Response

| UID       | Communication System Name   |   | A<br>dB | B<br>dB $\sqrt{\mu\text{V}}$ | C     | D<br>dB | VR<br>mV | Max<br>dev. | Max<br>Unc <sup>E</sup><br>(k=2) |
|-----------|-----------------------------|---|---------|------------------------------|-------|---------|----------|-------------|----------------------------------|
| 0         | CW                          | X | 0.00    | 0.00                         | 1.00  | 0.00    | 162.4    | ± 3.5 %     | ± 4.7 %                          |
|           |                             | Y | 0.00    | 0.00                         | 1.00  |         | 177.4    |             |                                  |
|           |                             | Z | 0.00    | 0.00                         | 1.00  |         | 171.4    |             |                                  |
| 10352-AAA | Pulse Waveform (200Hz, 10%) | X | 4.31    | 71.65                        | 13.39 | 10.00   | 60.0     | ± 3.1 %     | ± 9.6 %                          |
|           |                             | Y | 15.00   | 85.05                        | 17.43 |         | 60.0     |             |                                  |
|           |                             | Z | 15.00   | 87.48                        | 19.56 |         | 60.0     |             |                                  |
| 10353-AAA | Pulse Waveform (200Hz, 20%) | X | 6.47    | 77.45                        | 14.14 | 6.99    | 80.0     | ± 2.2 %     | ± 9.6 %                          |
|           |                             | Y | 15.00   | 86.69                        | 17.05 |         | 80.0     |             |                                  |
|           |                             | Z | 15.00   | 90.07                        | 19.30 |         | 80.0     |             |                                  |
| 10354-AAA | Pulse Waveform (200Hz, 40%) | X | 8.47    | 80.44                        | 13.43 | 3.98    | 95.0     | ± 1.5 %     | ± 9.6 %                          |
|           |                             | Y | 15.00   | 91.13                        | 17.86 |         | 95.0     |             |                                  |
|           |                             | Z | 15.00   | 95.07                        | 19.75 |         | 95.0     |             |                                  |
| 10355-AAA | Pulse Waveform (200Hz, 60%) | X | 0.55    | 63.78                        | 6.77  | 2.22    | 120.0    | ± 1.5 %     | ± 9.6 %                          |
|           |                             | Y | 15.00   | 98.96                        | 20.26 |         | 120.0    |             |                                  |
|           |                             | Z | 15.00   | 82.91                        | 12.31 |         | 120.0    |             |                                  |
| 10387-AAA | QPSK Waveform, 1 MHz        | X | 0.53    | 60.00                        | 6.91  | 0.00    | 150.0    | ± 5.4 %     | ± 9.6 %                          |
|           |                             | Y | 0.62    | 61.35                        | 8.24  |         | 150.0    |             |                                  |
|           |                             | Z | 7.72    | 252.62                       | 33.06 |         | 150.0    |             |                                  |
| 10388-AAA | QPSK Waveform, 10 MHz       | X | 1.93    | 66.24                        | 14.75 | 0.00    | 150.0    | ± 1.3 %     | ± 9.6 %                          |
|           |                             | Y | 2.36    | 69.64                        | 16.75 |         | 150.0    |             |                                  |
|           |                             | Z | 2.14    | 69.79                        | 16.96 |         | 150.0    |             |                                  |
| 10396-AAA | 64-QAM Waveform, 100 kHz    | X | 2.52    | 67.79                        | 17.44 | 3.01    | 150.0    | ± 6.2 %     | ± 9.6 %                          |
|           |                             | Y | 2.86    | 71.03                        | 19.25 |         | 150.0    |             |                                  |
|           |                             | Z | 1.53    | 63.83                        | 16.48 |         | 150.0    |             |                                  |
| 10399-AAA | 64-QAM Waveform, 40 MHz     | X | 3.31    | 66.27                        | 15.31 | 0.00    | 150.0    | ± 2.3 %     | ± 9.6 %                          |
|           |                             | Y | 3.60    | 67.83                        | 16.29 |         | 150.0    |             |                                  |
|           |                             | Z | 3.40    | 67.44                        | 16.34 |         | 150.0    |             |                                  |
| 10414-AAA | WLAN CCDF, 64-QAM, 40MHz    | X | 4.65    | 65.13                        | 15.28 | 0.00    | 150.0    | ± 4.6 %     | ± 9.6 %                          |
|           |                             | Y | 4.72    | 65.49                        | 15.59 |         | 150.0    |             |                                  |
|           |                             | Z | 4.60    | 65.93                        | 16.07 |         | 150.0    |             |                                  |

Note: For details on UID parameters see Appendix

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

<sup>A</sup> The uncertainties of Norm X,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).

<sup>B</sup> Numerical linearization parameter: uncertainty not required.

<sup>E</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:7420

### Sensor Model Parameters

|   | C1<br>fF | C2<br>fF | $\alpha$<br>$V^{-1}$ | T1<br>$ms.V^{-2}$ | T2<br>$ms.V^{-1}$ | T3<br>ms | T4<br>$V^{-2}$ | T5<br>$V^{-1}$ | T6   |
|---|----------|----------|----------------------|-------------------|-------------------|----------|----------------|----------------|------|
| X | 38.9     | 297.10   | 36.87                | 6.46              | 0.34              | 5.03     | 0.00           | 0.43           | 1.01 |
| Y | 38.6     | 290.39   | 36.12                | 8.72              | 0.00              | 5.04     | 1.08           | 0.21           | 1.01 |
| Z | 25.9     | 209.27   | 41.14                | 5.69              | 0.45              | 5.10     | 0.00           | 0.00           | 1.00 |

### Other Probe Parameters

|                                               |            |
|-----------------------------------------------|------------|
| Sensor Arrangement                            | Triangular |
| Connector Angle (°)                           | 76         |
| Mechanical Surface Detection Mode             | enabled    |
| Optical Surface Detection Mode                | disabled   |
| Probe Overall Length                          | 337 mm     |
| Probe Body Diameter                           | 10 mm      |
| Tip Length                                    | 9 mm       |
| Tip Diameter                                  | 2.5 mm     |
| Probe Tip to Sensor X Calibration Point       | 1 mm       |
| Probe Tip to Sensor Y Calibration Point       | 1 mm       |
| Probe Tip to Sensor Z Calibration Point       | 1 mm       |
| Recommended Measurement Distance from Surface | 1.4 mm     |

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:7420

### Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth (mm) <sup>G</sup> | Unc (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-----------|
| 750                  | 41.9                               | 0.89                            | 10.00   | 10.00   | 10.00   | 0.49               | 0.85                    | ± 12.0 %  |
| 835                  | 41.5                               | 0.90                            | 9.71    | 9.71    | 9.71    | 0.53               | 0.80                    | ± 12.0 %  |
| 1750                 | 40.1                               | 1.37                            | 8.39    | 8.39    | 8.39    | 0.45               | 0.87                    | ± 12.0 %  |
| 1900                 | 40.0                               | 1.40                            | 8.00    | 8.00    | 8.00    | 0.39               | 0.87                    | ± 12.0 %  |
| 2300                 | 39.5                               | 1.67                            | 7.74    | 7.74    | 7.74    | 0.34               | 0.90                    | ± 12.0 %  |
| 2450                 | 39.2                               | 1.80                            | 7.47    | 7.47    | 7.47    | 0.30               | 0.90                    | ± 12.0 %  |
| 2600                 | 39.0                               | 1.96                            | 7.28    | 7.28    | 7.28    | 0.46               | 0.85                    | ± 12.0 %  |
| 5250                 | 35.9                               | 4.71                            | 5.18    | 5.18    | 5.18    | 0.40               | 1.80                    | ± 13.1 %  |
| 5600                 | 35.5                               | 5.07                            | 4.63    | 4.63    | 4.63    | 0.40               | 1.80                    | ± 13.1 %  |
| 5750                 | 35.4                               | 5.22                            | 4.84    | 4.84    | 4.84    | 0.40               | 1.80                    | ± 13.1 %  |

<sup>C</sup> Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:7420

### Calibration Parameter Determined in Body Tissue Simulating Media

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity (S/m) <sup>F</sup> | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unc (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-----------|
| 750                  | 55.5                               | 0.96                            | 9.66    | 9.66    | 9.66    | 0.45               | 0.90                    | ± 12.0 %  |
| 835                  | 55.2                               | 0.97                            | 9.58    | 9.58    | 9.58    | 0.49               | 0.80                    | ± 12.0 %  |
| 1750                 | 53.4                               | 1.49                            | 8.01    | 8.01    | 8.01    | 0.36               | 0.87                    | ± 12.0 %  |
| 1900                 | 53.3                               | 1.52                            | 7.64    | 7.64    | 7.64    | 0.40               | 0.87                    | ± 12.0 %  |
| 2300                 | 52.9                               | 1.81                            | 7.59    | 7.59    | 7.59    | 0.47               | 0.86                    | ± 12.0 %  |
| 2450                 | 52.7                               | 1.95                            | 7.49    | 7.49    | 7.49    | 0.36               | 0.90                    | ± 12.0 %  |
| 2600                 | 52.5                               | 2.16                            | 7.30    | 7.30    | 7.30    | 0.26               | 0.90                    | ± 12.0 %  |
| 5250                 | 48.9                               | 5.36                            | 4.80    | 4.80    | 4.80    | 0.50               | 1.90                    | ± 13.1 %  |
| 5600                 | 48.5                               | 5.77                            | 4.10    | 4.10    | 4.10    | 0.50               | 1.90                    | ± 13.1 %  |
| 5750                 | 48.3                               | 5.94                            | 4.28    | 4.28    | 4.28    | 0.50               | 1.90                    | ± 13.1 %  |

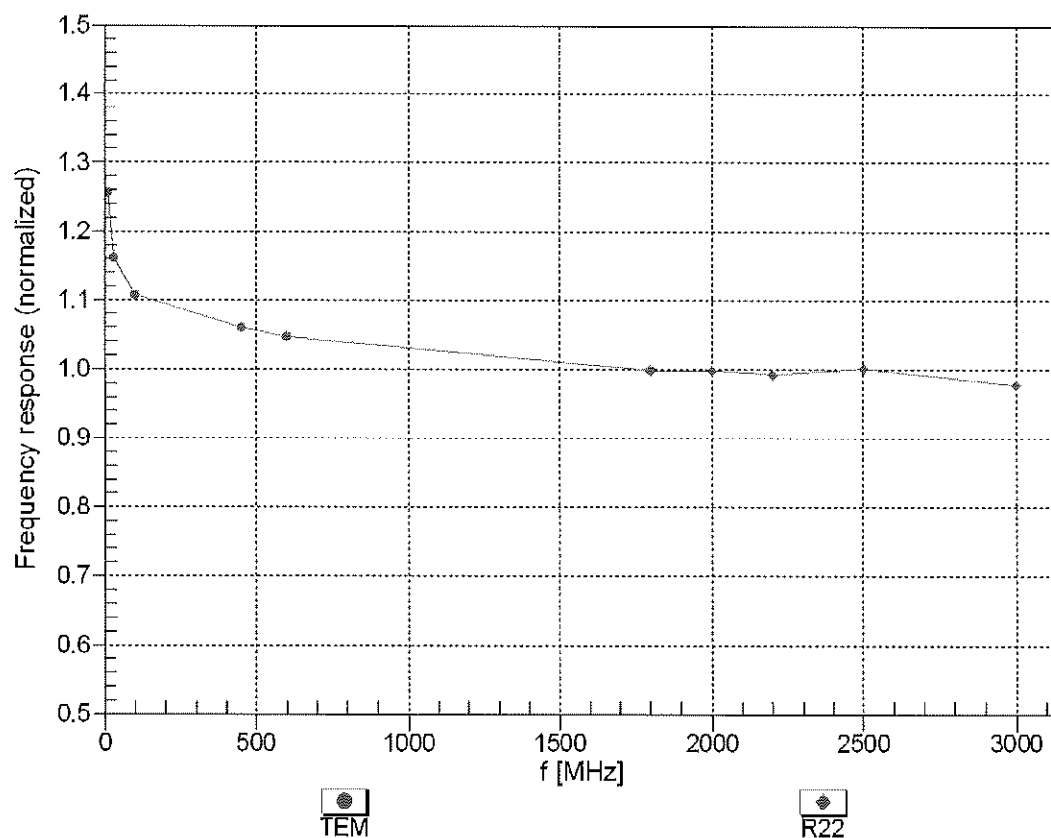
<sup>C</sup> Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

## Frequency Response of E-Field

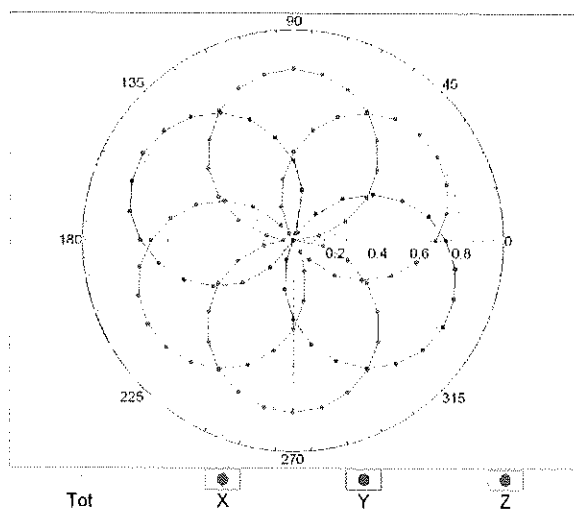
(TEM-Cell:ifi110 EXX, Waveguide: R22)



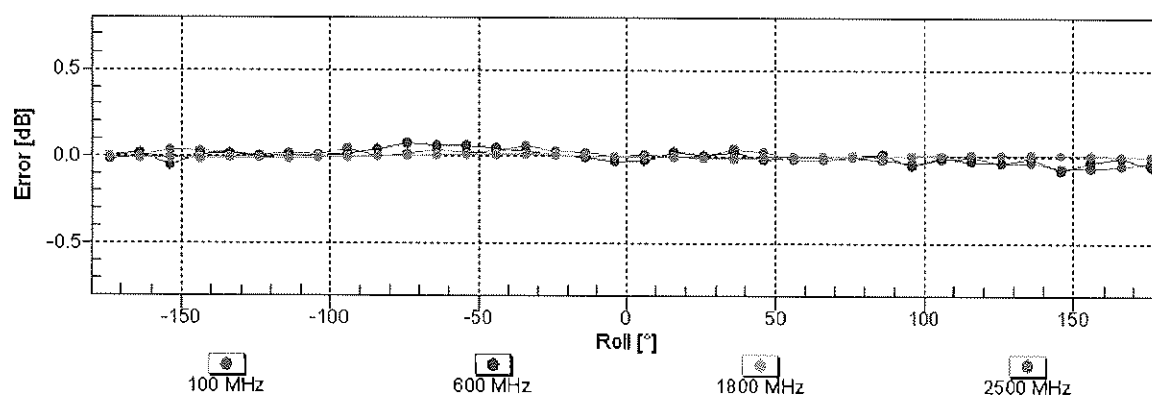
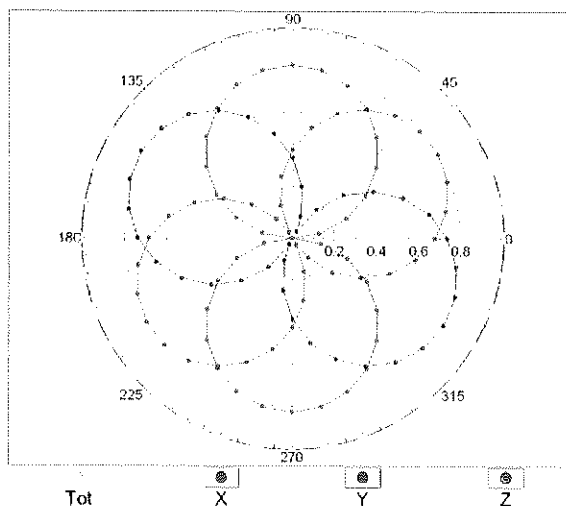
Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

## Receiving Pattern ( $\phi$ ), $\theta = 0^\circ$

f=600 MHz,TEM

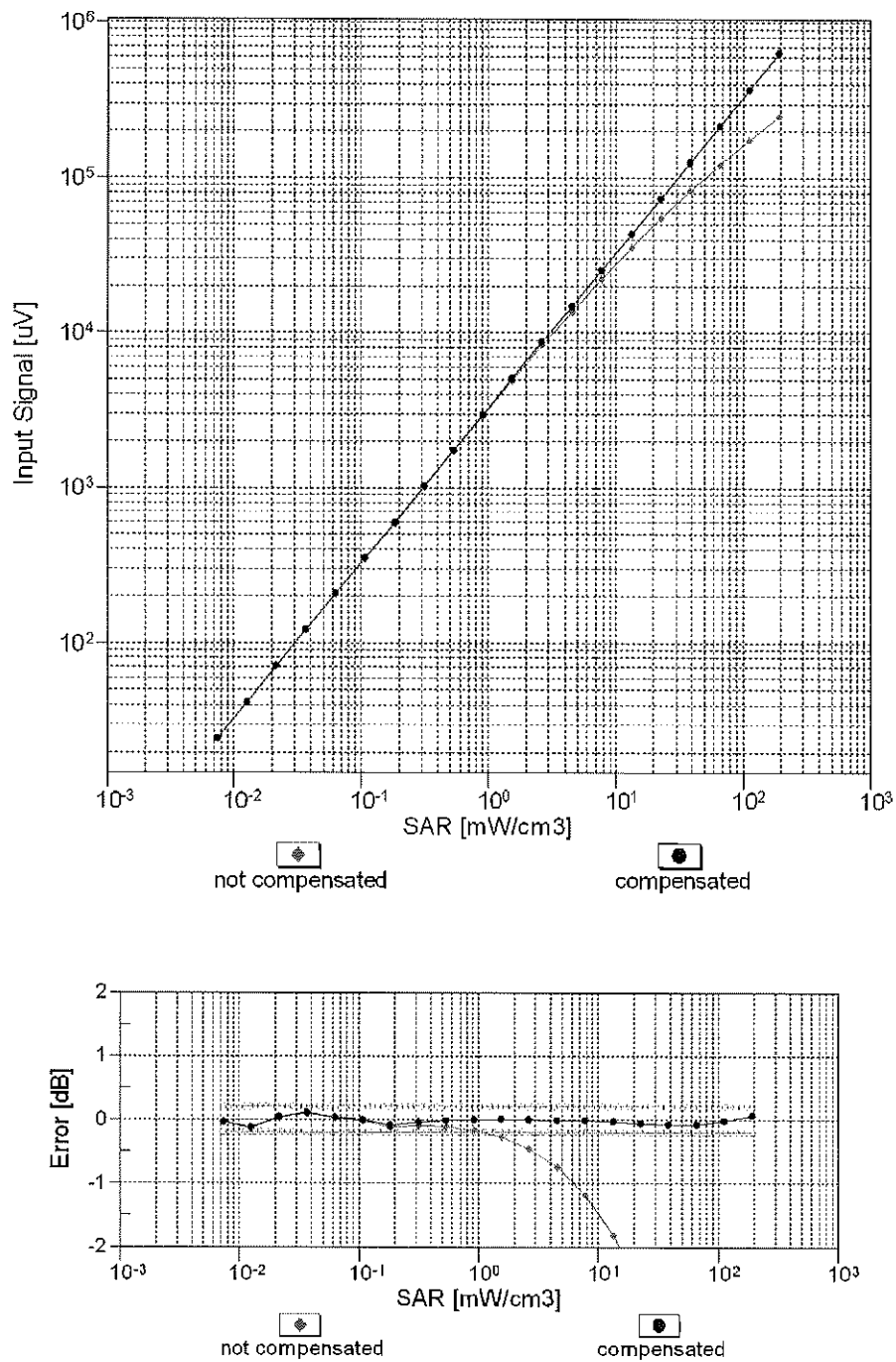


f=1800 MHz,R22



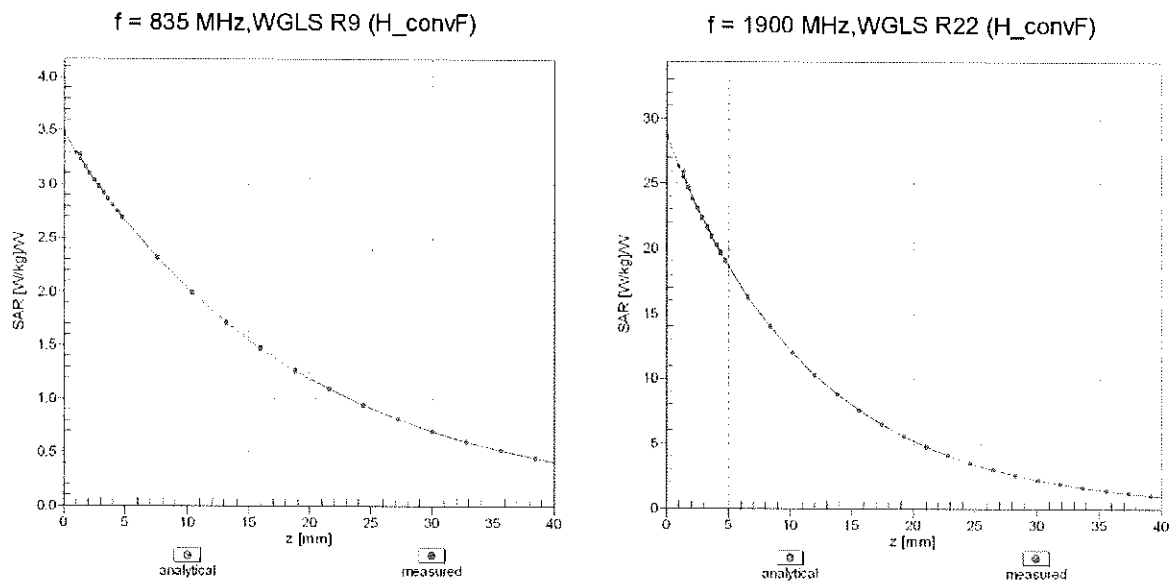
Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )

# Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell , $f_{\text{eval}} = 1900 \text{ MHz}$ )



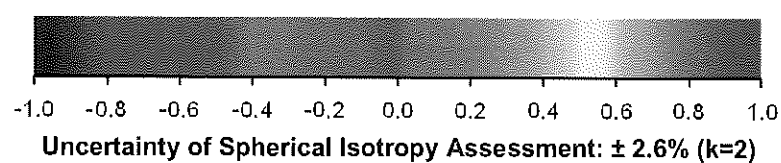
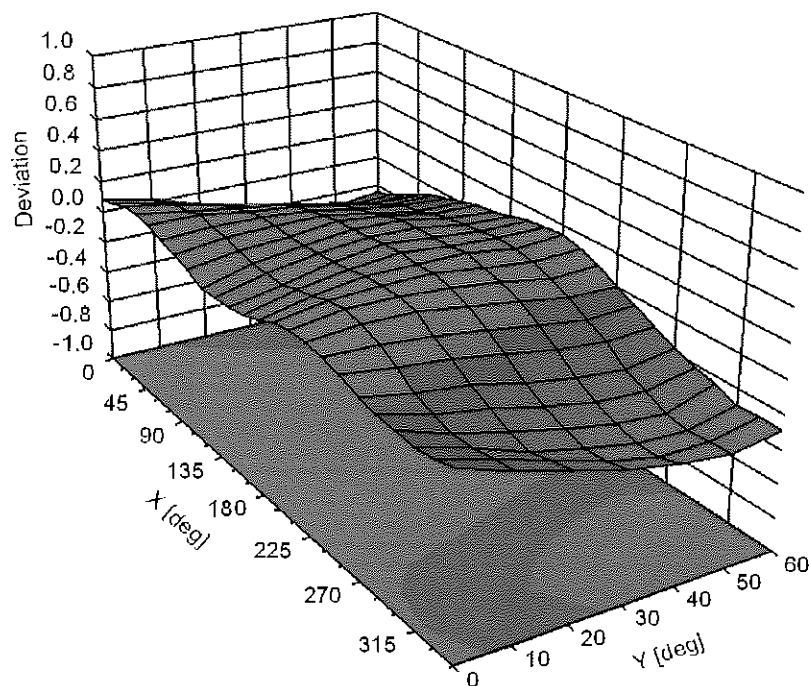
Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )

## Conversion Factor Assessment



## Deviation from Isotropy in Liquid

Error ( $\phi, \theta$ ),  $f = 900 \text{ MHz}$



## Appendix: Modulation Calibration Parameters

| UID   | Rev | Communication System Name                           | Group     | PAR (dB) | Unc <sup>E</sup> (k=2) |
|-------|-----|-----------------------------------------------------|-----------|----------|------------------------|
| 0     |     | CW                                                  | CW        | 0.00     | ± 4.7 %                |
| 10010 | CAA | SAR Validation (Square, 100ms, 10ms)                | Test      | 10.00    | ± 9.6 %                |
| 10011 | CAB | UMTS-FDD (WCDMA)                                    | WCDMA     | 2.91     | ± 9.6 %                |
| 10012 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)            | WLAN      | 1.87     | ± 9.6 %                |
| 10013 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)       | WLAN      | 9.46     | ± 9.6 %                |
| 10021 | DAC | GSM-FDD (TDMA, GMSK)                                | GSM       | 9.39     | ± 9.6 %                |
| 10023 | DAC | GPRS-FDD (TDMA, GMSK, TN 0)                         | GSM       | 9.57     | ± 9.6 %                |
| 10024 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1)                       | GSM       | 6.56     | ± 9.6 %                |
| 10025 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0)                         | GSM       | 12.62    | ± 9.6 %                |
| 10026 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1)                       | GSM       | 9.55     | ± 9.6 %                |
| 10027 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2)                     | GSM       | 4.80     | ± 9.6 %                |
| 10028 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)                   | GSM       | 3.55     | ± 9.6 %                |
| 10029 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2)                     | GSM       | 7.78     | ± 9.6 %                |
| 10030 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH1)                 | Bluetooth | 5.30     | ± 9.6 %                |
| 10031 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH3)                 | Bluetooth | 1.87     | ± 9.6 %                |
| 10032 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH5)                 | Bluetooth | 1.16     | ± 9.6 %                |
| 10033 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)           | Bluetooth | 7.74     | ± 9.6 %                |
| 10034 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)           | Bluetooth | 4.53     | ± 9.6 %                |
| 10035 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)           | Bluetooth | 3.83     | ± 9.6 %                |
| 10036 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH1)               | Bluetooth | 8.01     | ± 9.6 %                |
| 10037 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH3)               | Bluetooth | 4.77     | ± 9.6 %                |
| 10038 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH5)               | Bluetooth | 4.10     | ± 9.6 %                |
| 10039 | CAB | CDMA2000 (1xRTT, RC1)                               | CDMA2000  | 4.57     | ± 9.6 %                |
| 10042 | CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate) | AMPS      | 7.78     | ± 9.6 %                |
| 10044 | CAA | IS-91/EIA/TIA-553 FDD (FDMA, FM)                    | AMPS      | 0.00     | ± 9.6 %                |
| 10048 | CAA | DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)           | DECT      | 13.80    | ± 9.6 %                |
| 10049 | CAA | DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)         | DECT      | 10.79    | ± 9.6 %                |
| 10056 | CAA | UMTS-TDD (TD-SCDMA, 1.28 Mcps)                      | TD-SCDMA  | 11.01    | ± 9.6 %                |
| 10058 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)                   | GSM       | 6.52     | ± 9.6 %                |
| 10059 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)            | WLAN      | 2.12     | ± 9.6 %                |
| 10060 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)          | WLAN      | 2.83     | ± 9.6 %                |
| 10061 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)           | WLAN      | 3.60     | ± 9.6 %                |
| 10062 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)            | WLAN      | 8.68     | ± 9.6 %                |
| 10063 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)            | WLAN      | 8.63     | ± 9.6 %                |
| 10064 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)           | WLAN      | 9.09     | ± 9.6 %                |
| 10065 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)           | WLAN      | 9.00     | ± 9.6 %                |
| 10066 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)           | WLAN      | 9.38     | ± 9.6 %                |
| 10067 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)           | WLAN      | 10.12    | ± 9.6 %                |
| 10068 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)           | WLAN      | 10.24    | ± 9.6 %                |
| 10069 | CAC | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)           | WLAN      | 10.56    | ± 9.6 %                |
| 10071 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)       | WLAN      | 9.83     | ± 9.6 %                |
| 10072 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)      | WLAN      | 9.62     | ± 9.6 %                |
| 10073 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)      | WLAN      | 9.94     | ± 9.6 %                |
| 10074 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)      | WLAN      | 10.30    | ± 9.6 %                |
| 10075 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)      | WLAN      | 10.77    | ± 9.6 %                |
| 10076 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)      | WLAN      | 10.94    | ± 9.6 %                |
| 10077 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)      | WLAN      | 11.00    | ± 9.6 %                |
| 10081 | CAB | CDMA2000 (1xRTT, RC3)                               | CDMA2000  | 3.97     | ± 9.6 %                |
| 10082 | CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate) | AMPS      | 4.77     | ± 9.6 %                |
| 10090 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-4)                       | GSM       | 6.56     | ± 9.6 %                |
| 10097 | CAB | UMTS-FDD (HSDPA)                                    | WCDMA     | 3.98     | ± 9.6 %                |
| 10098 | CAB | UMTS-FDD (HSUPA, Subtest 2)                         | WCDMA     | 3.98     | ± 9.6 %                |
| 10099 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-4)                       | GSM       | 9.55     | ± 9.6 %                |
| 10100 | CAE | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)            | LTE-FDD   | 5.67     | ± 9.6 %                |
| 10101 | CAE | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)          | LTE-FDD   | 6.42     | ± 9.6 %                |
| 10102 | CAE | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)          | LTE-FDD   | 6.60     | ± 9.6 %                |
| 10103 | CAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)            | LTE-TDD   | 9.29     | ± 9.6 %                |
| 10104 | CAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)          | LTE-TDD   | 9.97     | ± 9.6 %                |
| 10105 | CAG | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)          | LTE-TDD   | 10.01    | ± 9.6 %                |
| 10108 | CAG | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)            | LTE-FDD   | 5.80     | ± 9.6 %                |

|       |     |                                                |         |       |         |
|-------|-----|------------------------------------------------|---------|-------|---------|
| 10109 | CAG | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)     | LTE-FDD | 6.43  | ± 9.6 % |
| 10110 | CAG | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)        | LTE-FDD | 5.75  | ± 9.6 % |
| 10111 | CAG | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)      | LTE-FDD | 6.44  | ± 9.6 % |
| 10112 | CAG | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)     | LTE-FDD | 6.59  | ± 9.6 % |
| 10113 | CAG | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)      | LTE-FDD | 6.62  | ± 9.6 % |
| 10114 | CAC | IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)  | WLAN    | 8.10  | ± 9.6 % |
| 10115 | CAC | IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)  | WLAN    | 8.46  | ± 9.6 % |
| 10116 | CAC | IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM) | WLAN    | 8.15  | ± 9.6 % |
| 10117 | CAC | IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)       | WLAN    | 8.07  | ± 9.6 % |
| 10118 | CAC | IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)       | WLAN    | 8.59  | ± 9.6 % |
| 10119 | CAC | IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)      | WLAN    | 8.13  | ± 9.6 % |
| 10140 | CAE | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)     | LTE-FDD | 6.49  | ± 9.6 % |
| 10141 | CAE | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)     | LTE-FDD | 6.53  | ± 9.6 % |
| 10142 | CAE | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)        | LTE-FDD | 5.73  | ± 9.6 % |
| 10143 | CAE | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)      | LTE-FDD | 6.35  | ± 9.6 % |
| 10144 | CAE | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)      | LTE-FDD | 6.65  | ± 9.6 % |
| 10145 | CAF | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)      | LTE-FDD | 5.76  | ± 9.6 % |
| 10146 | CAF | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)    | LTE-FDD | 6.41  | ± 9.6 % |
| 10147 | CAF | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)    | LTE-FDD | 6.72  | ± 9.6 % |
| 10149 | CAE | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)      | LTE-FDD | 6.42  | ± 9.6 % |
| 10150 | CAE | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)      | LTE-FDD | 6.60  | ± 9.6 % |
| 10151 | CAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)        | LTE-TDD | 9.28  | ± 9.6 % |
| 10152 | CAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)      | LTE-TDD | 9.92  | ± 9.6 % |
| 10153 | CAG | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)      | LTE-TDD | 10.05 | ± 9.6 % |
| 10154 | CAG | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)        | LTE-FDD | 5.75  | ± 9.6 % |
| 10155 | CAG | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)      | LTE-FDD | 6.43  | ± 9.6 % |
| 10156 | CAG | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)         | LTE-FDD | 5.79  | ± 9.6 % |
| 10157 | CAG | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)       | LTE-FDD | 6.49  | ± 9.6 % |
| 10158 | CAG | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)      | LTE-FDD | 6.62  | ± 9.6 % |
| 10159 | CAG | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)       | LTE-FDD | 6.56  | ± 9.6 % |
| 10160 | CAE | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)        | LTE-FDD | 5.82  | ± 9.6 % |
| 10161 | CAE | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)      | LTE-FDD | 6.43  | ± 9.6 % |
| 10162 | CAE | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)      | LTE-FDD | 6.58  | ± 9.6 % |
| 10166 | CAF | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)       | LTE-FDD | 5.46  | ± 9.6 % |
| 10167 | CAF | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)     | LTE-FDD | 6.21  | ± 9.6 % |
| 10168 | CAF | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)     | LTE-FDD | 6.79  | ± 9.6 % |
| 10169 | CAE | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)          | LTE-FDD | 5.73  | ± 9.6 % |
| 10170 | CAE | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)        | LTE-FDD | 6.52  | ± 9.6 % |
| 10171 | AAE | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)        | LTE-FDD | 6.49  | ± 9.6 % |
| 10172 | CAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)          | LTE-TDD | 9.21  | ± 9.6 % |
| 10173 | CAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)        | LTE-TDD | 9.48  | ± 9.6 % |
| 10174 | CAG | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)        | LTE-TDD | 10.25 | ± 9.6 % |
| 10175 | CAG | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)          | LTE-FDD | 5.72  | ± 9.6 % |
| 10176 | CAG | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)        | LTE-FDD | 6.52  | ± 9.6 % |
| 10177 | CAI | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)           | LTE-FDD | 5.73  | ± 9.6 % |
| 10178 | CAG | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)         | LTE-FDD | 6.52  | ± 9.6 % |
| 10179 | CAG | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)        | LTE-FDD | 6.50  | ± 9.6 % |
| 10180 | CAG | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)         | LTE-FDD | 6.50  | ± 9.6 % |
| 10181 | CAE | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)          | LTE-FDD | 5.72  | ± 9.6 % |
| 10182 | CAE | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)        | LTE-FDD | 6.52  | ± 9.6 % |
| 10183 | AAD | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)        | LTE-FDD | 6.50  | ± 9.6 % |
| 10184 | CAE | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)           | LTE-FDD | 5.73  | ± 9.6 % |
| 10185 | CAE | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)         | LTE-FDD | 6.51  | ± 9.6 % |
| 10186 | AAE | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)         | LTE-FDD | 6.50  | ± 9.6 % |
| 10187 | CAF | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)         | LTE-FDD | 5.73  | ± 9.6 % |
| 10188 | CAF | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)       | LTE-FDD | 6.52  | ± 9.6 % |
| 10189 | AAF | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)       | LTE-FDD | 6.50  | ± 9.6 % |
| 10193 | CAC | IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)   | WLAN    | 8.09  | ± 9.6 % |
| 10194 | CAC | IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)  | WLAN    | 8.12  | ± 9.6 % |
| 10195 | CAC | IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)  | WLAN    | 8.21  | ± 9.6 % |
| 10196 | CAC | IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)        | WLAN    | 8.10  | ± 9.6 % |
| 10197 | CAC | IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)       | WLAN    | 8.13  | ± 9.6 % |
| 10198 | CAC | IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)       | WLAN    | 8.27  | ± 9.6 % |
| 10219 | CAC | IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)        | WLAN    | 8.03  | ± 9.6 % |

|       |     |                                             |          |       |         |
|-------|-----|---------------------------------------------|----------|-------|---------|
| 10220 | CAC | IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)  | WLAN     | 8.13  | ± 9.6 % |
| 10221 | CAC | IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)  | WLAN     | 8.27  | ± 9.6 % |
| 10222 | CAC | IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)      | WLAN     | 8.06  | ± 9.6 % |
| 10223 | CAC | IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)    | WLAN     | 8.48  | ± 9.6 % |
| 10224 | CAC | IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)   | WLAN     | 8.08  | ± 9.6 % |
| 10225 | CAB | UMTS-FDD (HSPA+)                            | WCDMA    | 5.97  | ± 9.6 % |
| 10226 | CAB | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)    | LTE-TDD  | 9.49  | ± 9.6 % |
| 10227 | CAB | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)    | LTE-TDD  | 10.26 | ± 9.6 % |
| 10228 | CAB | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)      | LTE-TDD  | 9.22  | ± 9.6 % |
| 10229 | CAD | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)      | LTE-TDD  | 9.48  | ± 9.6 % |
| 10230 | CAD | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)      | LTE-TDD  | 10.25 | ± 9.6 % |
| 10231 | CAD | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)        | LTE-TDD  | 9.19  | ± 9.6 % |
| 10232 | CAG | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)      | LTE-TDD  | 9.48  | ± 9.6 % |
| 10233 | CAG | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)      | LTE-TDD  | 10.25 | ± 9.6 % |
| 10234 | CAG | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)        | LTE-TDD  | 9.21  | ± 9.6 % |
| 10235 | CAG | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)     | LTE-TDD  | 9.48  | ± 9.6 % |
| 10236 | CAG | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)     | LTE-TDD  | 10.25 | ± 9.6 % |
| 10237 | CAG | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)       | LTE-TDD  | 9.21  | ± 9.6 % |
| 10238 | CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)     | LTE-TDD  | 9.48  | ± 9.6 % |
| 10239 | CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)     | LTE-TDD  | 10.25 | ± 9.6 % |
| 10240 | CAF | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)       | LTE-TDD  | 9.21  | ± 9.6 % |
| 10241 | CAB | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)  | LTE-TDD  | 9.82  | ± 9.6 % |
| 10242 | CAB | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)  | LTE-TDD  | 9.86  | ± 9.6 % |
| 10243 | CAB | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)    | LTE-TDD  | 9.46  | ± 9.6 % |
| 10244 | CAD | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)    | LTE-TDD  | 10.06 | ± 9.6 % |
| 10245 | CAD | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)    | LTE-TDD  | 10.06 | ± 9.6 % |
| 10246 | CAD | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)      | LTE-TDD  | 9.30  | ± 9.6 % |
| 10247 | CAG | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)    | LTE-TDD  | 9.91  | ± 9.6 % |
| 10248 | CAG | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)    | LTE-TDD  | 10.09 | ± 9.6 % |
| 10249 | CAG | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)      | LTE-TDD  | 9.29  | ± 9.6 % |
| 10250 | CAG | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)   | LTE-TDD  | 9.81  | ± 9.6 % |
| 10251 | CAG | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)   | LTE-TDD  | 10.17 | ± 9.6 % |
| 10252 | CAG | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)     | LTE-TDD  | 9.24  | ± 9.6 % |
| 10253 | CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)   | LTE-TDD  | 9.90  | ± 9.6 % |
| 10254 | CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)   | LTE-TDD  | 10.14 | ± 9.6 % |
| 10255 | CAF | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)     | LTE-TDD  | 9.20  | ± 9.6 % |
| 10256 | CAB | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM) | LTE-TDD  | 9.96  | ± 9.6 % |
| 10257 | CAB | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM) | LTE-TDD  | 10.08 | ± 9.6 % |
| 10258 | CAB | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)   | LTE-TDD  | 9.34  | ± 9.6 % |
| 10259 | CAD | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)   | LTE-TDD  | 9.98  | ± 9.6 % |
| 10260 | CAD | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)   | LTE-TDD  | 9.97  | ± 9.6 % |
| 10261 | CAD | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)     | LTE-TDD  | 9.24  | ± 9.6 % |
| 10262 | CAG | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)   | LTE-TDD  | 9.83  | ± 9.6 % |
| 10263 | CAG | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)   | LTE-TDD  | 10.16 | ± 9.6 % |
| 10264 | CAG | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)     | LTE-TDD  | 9.23  | ± 9.6 % |
| 10265 | CAG | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)  | LTE-TDD  | 9.92  | ± 9.6 % |
| 10266 | CAG | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)  | LTE-TDD  | 10.07 | ± 9.6 % |
| 10267 | CAG | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)    | LTE-TDD  | 9.30  | ± 9.6 % |
| 10268 | CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)  | LTE-TDD  | 10.06 | ± 9.6 % |
| 10269 | CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)  | LTE-TDD  | 10.13 | ± 9.6 % |
| 10270 | CAF | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)    | LTE-TDD  | 9.58  | ± 9.6 % |
| 10274 | CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)   | WCDMA    | 4.87  | ± 9.6 % |
| 10275 | CAB | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)    | WCDMA    | 3.96  | ± 9.6 % |
| 10277 | CAA | PHS (QPSK)                                  | PHS      | 11.81 | ± 9.6 % |
| 10278 | CAA | PHS (QPSK, BW 884MHz, Rolloff 0.5)          | PHS      | 11.81 | ± 9.6 % |
| 10279 | CAA | PHS (QPSK, BW 884MHz, Rolloff 0.38)         | PHS      | 12.18 | ± 9.6 % |
| 10290 | AAB | CDMA2000, RC1, SO55, Full Rate              | CDMA2000 | 3.91  | ± 9.6 % |
| 10291 | AAB | CDMA2000, RC3, SO55, Full Rate              | CDMA2000 | 3.46  | ± 9.6 % |
| 10292 | AAB | CDMA2000, RC3, SO32, Full Rate              | CDMA2000 | 3.39  | ± 9.6 % |
| 10293 | AAB | CDMA2000, RC3, SO3, Full Rate               | CDMA2000 | 3.50  | ± 9.6 % |
| 10295 | AAB | CDMA2000, RC1, SO3, 1/8th Rate 25 fr.       | CDMA2000 | 12.49 | ± 9.6 % |
| 10297 | AAD | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)     | LTE-FDD  | 5.81  | ± 9.6 % |
| 10298 | AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)      | LTE-FDD  | 5.72  | ± 9.6 % |
| 10299 | AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)    | LTE-FDD  | 6.39  | ± 9.6 % |

|       |     |                                                                                 |          |       |         |
|-------|-----|---------------------------------------------------------------------------------|----------|-------|---------|
| 10300 | AAD | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)                                        | LTE-FDD  | 6.60  | ± 9.6 % |
| 10301 | AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)                              | WiMAX    | 12.03 | ± 9.6 % |
| 10302 | AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols)              | WiMAX    | 12.57 | ± 9.6 % |
| 10303 | AAA | IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)                             | WiMAX    | 12.52 | ± 9.6 % |
| 10304 | AAA | IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)                             | WiMAX    | 11.86 | ± 9.6 % |
| 10305 | AAA | IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)                | WiMAX    | 15.24 | ± 9.6 % |
| 10306 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)                | WiMAX    | 14.67 | ± 9.6 % |
| 10307 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)                 | WiMAX    | 14.49 | ± 9.6 % |
| 10308 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)                            | WiMAX    | 14.46 | ± 9.6 % |
| 10309 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)             | WiMAX    | 14.58 | ± 9.6 % |
| 10310 | AAA | IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)              | WiMAX    | 14.57 | ± 9.6 % |
| 10311 | AAD | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)                                        | LTE-FDD  | 6.06  | ± 9.6 % |
| 10313 | AAA | IDEN 1:3                                                                        | IDEN     | 10.51 | ± 9.6 % |
| 10314 | AAA | IDEN 1:6                                                                        | IDEN     | 13.48 | ± 9.6 % |
| 10315 | AAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)                       | WLAN     | 1.71  | ± 9.6 % |
| 10316 | AAB | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)                   | WLAN     | 8.36  | ± 9.6 % |
| 10317 | AAC | IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)                         | WLAN     | 8.36  | ± 9.6 % |
| 10352 | AAA | Pulse Waveform (200Hz, 10%)                                                     | Generic  | 10.00 | ± 9.6 % |
| 10353 | AAA | Pulse Waveform (200Hz, 20%)                                                     | Generic  | 6.99  | ± 9.6 % |
| 10354 | AAA | Pulse Waveform (200Hz, 40%)                                                     | Generic  | 3.98  | ± 9.6 % |
| 10355 | AAA | Pulse Waveform (200Hz, 60%)                                                     | Generic  | 2.22  | ± 9.6 % |
| 10356 | AAA | Pulse Waveform (200Hz, 80%)                                                     | Generic  | 0.97  | ± 9.6 % |
| 10387 | AAA | QPSK Waveform, 1 MHz                                                            | Generic  | 5.10  | ± 9.6 % |
| 10388 | AAA | QPSK Waveform, 10 MHz                                                           | Generic  | 5.22  | ± 9.6 % |
| 10396 | AAA | 64-QAM Waveform, 100 kHz                                                        | Generic  | 6.27  | ± 9.6 % |
| 10399 | AAA | 64-QAM Waveform, 40 MHz                                                         | Generic  | 6.27  | ± 9.6 % |
| 10400 | AAD | IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)                             | WLAN     | 8.37  | ± 9.6 % |
| 10401 | AAD | IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)                             | WLAN     | 8.60  | ± 9.6 % |
| 10402 | AAD | IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)                             | WLAN     | 8.53  | ± 9.6 % |
| 10403 | AAB | CDMA2000 (1xEV-DO, Rev. 0)                                                      | CDMA2000 | 3.76  | ± 9.6 % |
| 10404 | AAB | CDMA2000 (1xEV-DO, Rev. A)                                                      | CDMA2000 | 3.77  | ± 9.6 % |
| 10406 | AAB | CDMA2000, RC3, SO32, SCH0, Full Rate                                            | CDMA2000 | 5.22  | ± 9.6 % |
| 10410 | AAG | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9, Subframe Conf=4) | LTE-TDD  | 7.82  | ± 9.6 % |
| 10414 | AAA | WLAN CCDF, 64-QAM, 40MHz                                                        | Generic  | 8.54  | ± 9.6 % |
| 10415 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)                       | WLAN     | 1.54  | ± 9.6 % |
| 10416 | AAA | IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)                   | WLAN     | 8.23  | ± 9.6 % |
| 10417 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)                       | WLAN     | 8.23  | ± 9.6 % |
| 10418 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preamble)   | WLAN     | 8.14  | ± 9.6 % |
| 10419 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preamble)  | WLAN     | 8.19  | ± 9.6 % |
| 10422 | AAB | IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)                                    | WLAN     | 8.32  | ± 9.6 % |
| 10423 | AAB | IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)                                 | WLAN     | 8.47  | ± 9.6 % |
| 10424 | AAB | IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)                                 | WLAN     | 8.40  | ± 9.6 % |
| 10425 | AAB | IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)                                     | WLAN     | 8.41  | ± 9.6 % |
| 10426 | AAB | IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)                                   | WLAN     | 8.45  | ± 9.6 % |
| 10427 | AAB | IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)                                  | WLAN     | 8.41  | ± 9.6 % |
| 10430 | AAD | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)                                                | LTE-FDD  | 8.28  | ± 9.6 % |
| 10431 | AAD | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)                                               | LTE-FDD  | 8.38  | ± 9.6 % |
| 10432 | AAC | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)                                               | LTE-FDD  | 8.34  | ± 9.6 % |
| 10433 | AAC | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)                                               | LTE-FDD  | 8.34  | ± 9.6 % |
| 10434 | AAA | W-CDMA (BS Test Model 1, 64 DPCH)                                               | WCDMA    | 8.60  | ± 9.6 % |
| 10435 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)                  | LTE-TDD  | 7.82  | ± 9.6 % |
| 10447 | AAD | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)                                  | LTE-FDD  | 7.56  | ± 9.6 % |
| 10448 | AAD | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)                                 | LTE-FDD  | 7.53  | ± 9.6 % |
| 10449 | AAC | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)                                 | LTE-FDD  | 7.51  | ± 9.6 % |
| 10450 | AAC | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)                                 | LTE-FDD  | 7.48  | ± 9.6 % |

|       |     |                                                                        |          |      |         |
|-------|-----|------------------------------------------------------------------------|----------|------|---------|
| 10451 | AAA | W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)                        | WCDMA    | 7.59 | ± 9.6 % |
| 10456 | AAB | IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)                   | WLAN     | 8.63 | ± 9.6 % |
| 10457 | AAA | UMTS-FDD (DC-HSDPA)                                                    | WCDMA    | 6.62 | ± 9.6 % |
| 10458 | AAA | CDMA2000 (1xEV-DO, Rev. B, 2 carriers)                                 | CDMA2000 | 6.55 | ± 9.6 % |
| 10459 | AAA | CDMA2000 (1xEV-DO, Rev. B, 3 carriers)                                 | CDMA2000 | 8.25 | ± 9.6 % |
| 10460 | AAA | UMTS-FDD (WCDMA, AMR)                                                  | WCDMA    | 2.39 | ± 9.6 % |
| 10461 | AAB | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 7.82 | ± 9.6 % |
| 10462 | AAB | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.30 | ± 9.6 % |
| 10463 | AAB | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.56 | ± 9.6 % |
| 10464 | AAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)       | LTE-TDD  | 7.82 | ± 9.6 % |
| 10465 | AAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 8.32 | ± 9.6 % |
| 10466 | AAC | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 8.57 | ± 9.6 % |
| 10467 | AAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)       | LTE-TDD  | 7.82 | ± 9.6 % |
| 10468 | AAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 8.32 | ± 9.6 % |
| 10469 | AAF | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 8.56 | ± 9.6 % |
| 10470 | AAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)      | LTE-TDD  | 7.82 | ± 9.6 % |
| 10471 | AAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.32 | ± 9.6 % |
| 10472 | AAF | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.57 | ± 9.6 % |
| 10473 | AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)      | LTE-TDD  | 7.82 | ± 9.6 % |
| 10474 | AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.32 | ± 9.6 % |
| 10475 | AAE | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.57 | ± 9.6 % |
| 10477 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.32 | ± 9.6 % |
| 10478 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 8.57 | ± 9.6 % |
| 10479 | AAB | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 7.74 | ± 9.6 % |
| 10480 | AAB | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9) | LTE-TDD  | 8.18 | ± 9.6 % |
| 10481 | AAB | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9) | LTE-TDD  | 8.45 | ± 9.6 % |
| 10482 | AAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 7.71 | ± 9.6 % |
| 10483 | AAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.39 | ± 9.6 % |
| 10484 | AAC | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.47 | ± 9.6 % |
| 10485 | AAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)     | LTE-TDD  | 7.59 | ± 9.6 % |
| 10486 | AAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.38 | ± 9.6 % |
| 10487 | AAF | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)   | LTE-TDD  | 8.60 | ± 9.6 % |
| 10488 | AAF | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 7.70 | ± 9.6 % |
| 10489 | AAF | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL<br>Subframe=2,3,4,7,8,9)  | LTE-TDD  | 8.31 | ± 9.6 % |
| 10490 | AAF | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL<br>Subframe=2,3,4,7,8,9)  | LTE-TDD  | 8.54 | ± 9.6 % |
| 10491 | AAE | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL<br>Subframe=2,3,4,7,8,9)    | LTE-TDD  | 7.74 | ± 9.6 % |

|       |     |                                                                      |         |      |         |
|-------|-----|----------------------------------------------------------------------|---------|------|---------|
| 10492 | AAE | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.41 | ± 9.6 % |
| 10493 | AAE | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.55 | ± 9.6 % |
| 10494 | AAF | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | LTE-TDD | 7.74 | ± 9.6 % |
| 10495 | AAF | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.37 | ± 9.6 % |
| 10496 | AAF | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.54 | ± 9.6 % |
| 10497 | AAB | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 7.67 | ± 9.6 % |
| 10498 | AAB | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.40 | ± 9.6 % |
| 10499 | AAB | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | LTE-TDD | 8.68 | ± 9.6 % |
| 10500 | AAC | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | LTE-TDD | 7.67 | ± 9.6 % |
| 10501 | AAC | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.44 | ± 9.6 % |
| 10502 | AAC | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.52 | ± 9.6 % |
| 10503 | AAF | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | LTE-TDD | 7.72 | ± 9.6 % |
| 10504 | AAF | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.31 | ± 9.6 % |
| 10505 | AAF | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | LTE-TDD | 8.54 | ± 9.6 % |
| 10506 | AAF | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)    | LTE-TDD | 7.74 | ± 9.6 % |
| 10507 | AAF | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.36 | ± 9.6 % |
| 10508 | AAF | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.55 | ± 9.6 % |
| 10509 | AAE | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)    | LTE-TDD | 7.99 | ± 9.6 % |
| 10510 | AAE | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.49 | ± 9.6 % |
| 10511 | AAE | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.51 | ± 9.6 % |
| 10512 | AAF | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)    | LTE-TDD | 7.74 | ± 9.6 % |
| 10513 | AAF | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.42 | ± 9.6 % |
| 10514 | AAF | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)  | LTE-TDD | 8.45 | ± 9.6 % |
| 10515 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)            | WLAN    | 1.58 | ± 9.6 % |
| 10516 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)          | WLAN    | 1.57 | ± 9.6 % |
| 10517 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)           | WLAN    | 1.58 | ± 9.6 % |
| 10518 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)            | WLAN    | 8.23 | ± 9.6 % |
| 10519 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)           | WLAN    | 8.39 | ± 9.6 % |
| 10520 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)           | WLAN    | 8.12 | ± 9.6 % |
| 10521 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)           | WLAN    | 7.97 | ± 9.6 % |
| 10522 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)           | WLAN    | 8.45 | ± 9.6 % |
| 10523 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)           | WLAN    | 8.08 | ± 9.6 % |
| 10524 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)           | WLAN    | 8.27 | ± 9.6 % |
| 10525 | AAB | IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)                    | WLAN    | 8.36 | ± 9.6 % |
| 10526 | AAB | IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)                    | WLAN    | 8.42 | ± 9.6 % |
| 10527 | AAB | IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)                    | WLAN    | 8.21 | ± 9.6 % |
| 10528 | AAB | IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)                    | WLAN    | 8.36 | ± 9.6 % |
| 10529 | AAB | IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)                    | WLAN    | 8.36 | ± 9.6 % |
| 10531 | AAB | IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)                    | WLAN    | 8.43 | ± 9.6 % |
| 10532 | AAB | IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)                    | WLAN    | 8.29 | ± 9.6 % |
| 10533 | AAB | IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)                    | WLAN    | 8.38 | ± 9.6 % |
| 10534 | AAB | IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)                    | WLAN    | 8.45 | ± 9.6 % |

|       |     |                                                                 |      |      |         |
|-------|-----|-----------------------------------------------------------------|------|------|---------|
| 10535 | AAB | IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)               | WLAN | 8.45 | ± 9.6 % |
| 10536 | AAB | IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)               | WLAN | 8.32 | ± 9.6 % |
| 10537 | AAB | IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)               | WLAN | 8.44 | ± 9.6 % |
| 10538 | AAB | IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)               | WLAN | 8.54 | ± 9.6 % |
| 10540 | AAB | IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)               | WLAN | 8.39 | ± 9.6 % |
| 10541 | AAB | IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)               | WLAN | 8.46 | ± 9.6 % |
| 10542 | AAB | IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)               | WLAN | 8.65 | ± 9.6 % |
| 10543 | AAB | IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)               | WLAN | 8.65 | ± 9.6 % |
| 10544 | AAB | IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)               | WLAN | 8.47 | ± 9.6 % |
| 10545 | AAB | IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)               | WLAN | 8.55 | ± 9.6 % |
| 10546 | AAB | IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)               | WLAN | 8.35 | ± 9.6 % |
| 10547 | AAB | IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)               | WLAN | 8.49 | ± 9.6 % |
| 10548 | AAB | IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)               | WLAN | 8.37 | ± 9.6 % |
| 10550 | AAB | IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)               | WLAN | 8.38 | ± 9.6 % |
| 10551 | AAB | IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)               | WLAN | 8.50 | ± 9.6 % |
| 10552 | AAB | IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)               | WLAN | 8.42 | ± 9.6 % |
| 10553 | AAB | IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)               | WLAN | 8.45 | ± 9.6 % |
| 10554 | AAC | IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)              | WLAN | 8.48 | ± 9.6 % |
| 10555 | AAC | IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)              | WLAN | 8.47 | ± 9.6 % |
| 10556 | AAC | IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)              | WLAN | 8.50 | ± 9.6 % |
| 10557 | AAC | IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)              | WLAN | 8.52 | ± 9.6 % |
| 10558 | AAC | IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)              | WLAN | 8.61 | ± 9.6 % |
| 10560 | AAC | IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle)              | WLAN | 8.73 | ± 9.6 % |
| 10561 | AAC | IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)              | WLAN | 8.56 | ± 9.6 % |
| 10562 | AAC | IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)              | WLAN | 8.69 | ± 9.6 % |
| 10563 | AAC | IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)              | WLAN | 8.77 | ± 9.6 % |
| 10564 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)  | WLAN | 8.25 | ± 9.6 % |
| 10565 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle) | WLAN | 8.45 | ± 9.6 % |
| 10566 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle) | WLAN | 8.13 | ± 9.6 % |
| 10567 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle) | WLAN | 8.00 | ± 9.6 % |
| 10568 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle) | WLAN | 8.37 | ± 9.6 % |
| 10569 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle) | WLAN | 8.10 | ± 9.6 % |
| 10570 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle) | WLAN | 8.30 | ± 9.6 % |
| 10571 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)       | WLAN | 1.99 | ± 9.6 % |
| 10572 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)       | WLAN | 1.99 | ± 9.6 % |
| 10573 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)     | WLAN | 1.98 | ± 9.6 % |
| 10574 | AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)      | WLAN | 1.98 | ± 9.6 % |
| 10575 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)  | WLAN | 8.59 | ± 9.6 % |
| 10576 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)  | WLAN | 8.60 | ± 9.6 % |
| 10577 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle) | WLAN | 8.70 | ± 9.6 % |
| 10578 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle) | WLAN | 8.49 | ± 9.6 % |
| 10579 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle) | WLAN | 8.36 | ± 9.6 % |
| 10580 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle) | WLAN | 8.76 | ± 9.6 % |
| 10581 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle) | WLAN | 8.35 | ± 9.6 % |
| 10582 | AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) | WLAN | 8.67 | ± 9.6 % |
| 10583 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)       | WLAN | 8.59 | ± 9.6 % |
| 10584 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)       | WLAN | 8.60 | ± 9.6 % |
| 10585 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)      | WLAN | 8.70 | ± 9.6 % |
| 10586 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)      | WLAN | 8.49 | ± 9.6 % |
| 10587 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)      | WLAN | 8.36 | ± 9.6 % |

|       |     |                                                            |          |       |         |
|-------|-----|------------------------------------------------------------|----------|-------|---------|
| 10588 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle) | WLAN     | 8.76  | ± 9.6 % |
| 10589 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle) | WLAN     | 8.35  | ± 9.6 % |
| 10590 | AAB | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle) | WLAN     | 8.67  | ± 9.6 % |
| 10591 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)      | WLAN     | 8.63  | ± 9.6 % |
| 10592 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)      | WLAN     | 8.79  | ± 9.6 % |
| 10593 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)      | WLAN     | 8.64  | ± 9.6 % |
| 10594 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)      | WLAN     | 8.74  | ± 9.6 % |
| 10595 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)      | WLAN     | 8.74  | ± 9.6 % |
| 10596 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)      | WLAN     | 8.71  | ± 9.6 % |
| 10597 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)      | WLAN     | 8.72  | ± 9.6 % |
| 10598 | AAB | IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)      | WLAN     | 8.50  | ± 9.6 % |
| 10599 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)      | WLAN     | 8.79  | ± 9.6 % |
| 10600 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)      | WLAN     | 8.88  | ± 9.6 % |
| 10601 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)      | WLAN     | 8.82  | ± 9.6 % |
| 10602 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)      | WLAN     | 8.94  | ± 9.6 % |
| 10603 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)      | WLAN     | 9.03  | ± 9.6 % |
| 10604 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)      | WLAN     | 8.76  | ± 9.6 % |
| 10605 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)      | WLAN     | 8.97  | ± 9.6 % |
| 10606 | AAB | IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)      | WLAN     | 8.82  | ± 9.6 % |
| 10607 | AAB | IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)          | WLAN     | 8.64  | ± 9.6 % |
| 10608 | AAB | IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)          | WLAN     | 8.77  | ± 9.6 % |
| 10609 | AAB | IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)          | WLAN     | 8.57  | ± 9.6 % |
| 10610 | AAB | IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)          | WLAN     | 8.78  | ± 9.6 % |
| 10611 | AAB | IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)          | WLAN     | 8.70  | ± 9.6 % |
| 10612 | AAB | IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)          | WLAN     | 8.77  | ± 9.6 % |
| 10613 | AAB | IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)          | WLAN     | 8.94  | ± 9.6 % |
| 10614 | AAB | IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)          | WLAN     | 8.59  | ± 9.6 % |
| 10615 | AAB | IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)          | WLAN     | 8.82  | ± 9.6 % |
| 10616 | AAB | IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)          | WLAN     | 8.82  | ± 9.6 % |
| 10617 | AAB | IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)          | WLAN     | 8.81  | ± 9.6 % |
| 10618 | AAB | IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)          | WLAN     | 8.58  | ± 9.6 % |
| 10619 | AAB | IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)          | WLAN     | 8.86  | ± 9.6 % |
| 10620 | AAB | IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)          | WLAN     | 8.87  | ± 9.6 % |
| 10621 | AAB | IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)          | WLAN     | 8.77  | ± 9.6 % |
| 10622 | AAB | IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)          | WLAN     | 8.68  | ± 9.6 % |
| 10623 | AAB | IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)          | WLAN     | 8.82  | ± 9.6 % |
| 10624 | AAB | IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)          | WLAN     | 8.96  | ± 9.6 % |
| 10625 | AAB | IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)          | WLAN     | 8.96  | ± 9.6 % |
| 10626 | AAB | IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)          | WLAN     | 8.83  | ± 9.6 % |
| 10627 | AAB | IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)          | WLAN     | 8.88  | ± 9.6 % |
| 10628 | AAB | IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)          | WLAN     | 8.71  | ± 9.6 % |
| 10629 | AAB | IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)          | WLAN     | 8.85  | ± 9.6 % |
| 10630 | AAB | IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)          | WLAN     | 8.72  | ± 9.6 % |
| 10631 | AAB | IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)          | WLAN     | 8.81  | ± 9.6 % |
| 10632 | AAB | IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)          | WLAN     | 8.74  | ± 9.6 % |
| 10633 | AAB | IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)          | WLAN     | 8.83  | ± 9.6 % |
| 10634 | AAB | IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)          | WLAN     | 8.80  | ± 9.6 % |
| 10635 | AAB | IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)          | WLAN     | 8.81  | ± 9.6 % |
| 10636 | AAC | IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle)         | WLAN     | 8.83  | ± 9.6 % |
| 10637 | AAC | IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)         | WLAN     | 8.79  | ± 9.6 % |
| 10638 | AAC | IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle)         | WLAN     | 8.86  | ± 9.6 % |
| 10639 | AAC | IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)         | WLAN     | 8.85  | ± 9.6 % |
| 10640 | AAC | IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)         | WLAN     | 8.98  | ± 9.6 % |
| 10641 | AAC | IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)         | WLAN     | 9.06  | ± 9.6 % |
| 10642 | AAC | IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)         | WLAN     | 9.06  | ± 9.6 % |
| 10643 | AAC | IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)         | WLAN     | 8.89  | ± 9.6 % |
| 10644 | AAC | IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)         | WLAN     | 9.05  | ± 9.6 % |
| 10645 | AAC | IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)         | WLAN     | 9.11  | ± 9.6 % |
| 10646 | AAG | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)      | LTE-TDD  | 11.96 | ± 9.6 % |
| 10647 | AAF | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)     | LTE-TDD  | 11.96 | ± 9.6 % |
| 10648 | AAA | CDMA2000 (1x Advanced)                                     | CDMA2000 | 3.45  | ± 9.6 % |
| 10652 | AAE | LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)             | LTE-TDD  | 6.91  | ± 9.6 % |
| 10653 | AAE | LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)            | LTE-TDD  | 7.42  | ± 9.6 % |
| 10654 | AAD | LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)            | LTE-TDD  | 6.96  | ± 9.6 % |

|       |     |                                                 |           |       |         |
|-------|-----|-------------------------------------------------|-----------|-------|---------|
| 10655 | AAE | LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%) | LTE-TDD   | 7.21  | ± 9.6 % |
| 10658 | AAA | Pulse Waveform (200Hz, 10%)                     | Test      | 10.00 | ± 9.6 % |
| 10659 | AAA | Pulse Waveform (200Hz, 20%)                     | Test      | 6.99  | ± 9.6 % |
| 10660 | AAA | Pulse Waveform (200Hz, 40%)                     | Test      | 3.98  | ± 9.6 % |
| 10661 | AAA | Pulse Waveform (200Hz, 60%)                     | Test      | 2.22  | ± 9.6 % |
| 10662 | AAA | Pulse Waveform (200Hz, 80%)                     | Test      | 0.97  | ± 9.6 % |
| 10670 | AAA | Bluetooth Low Energy                            | Bluetooth | 2.19  | ± 9.6 % |
| 10671 | AAA | IEEE 802.11ax (20MHz, MCS0, 90pc duty cycle)    | WLAN      | 9.09  | ± 9.6 % |
| 10672 | AAA | IEEE 802.11ax (20MHz, MCS1, 90pc duty cycle)    | WLAN      | 8.57  | ± 9.6 % |
| 10673 | AAA | IEEE 802.11ax (20MHz, MCS2, 90pc duty cycle)    | WLAN      | 8.78  | ± 9.6 % |
| 10674 | AAA | IEEE 802.11ax (20MHz, MCS3, 90pc duty cycle)    | WLAN      | 8.74  | ± 9.6 % |
| 10675 | AAA | IEEE 802.11ax (20MHz, MCS4, 90pc duty cycle)    | WLAN      | 8.90  | ± 9.6 % |
| 10676 | AAA | IEEE 802.11ax (20MHz, MCS5, 90pc duty cycle)    | WLAN      | 8.77  | ± 9.6 % |
| 10677 | AAA | IEEE 802.11ax (20MHz, MCS6, 90pc duty cycle)    | WLAN      | 8.73  | ± 9.6 % |
| 10678 | AAA | IEEE 802.11ax (20MHz, MCS7, 90pc duty cycle)    | WLAN      | 8.78  | ± 9.6 % |
| 10679 | AAA | IEEE 802.11ax (20MHz, MCS8, 90pc duty cycle)    | WLAN      | 8.89  | ± 9.6 % |
| 10680 | AAA | IEEE 802.11ax (20MHz, MCS9, 90pc duty cycle)    | WLAN      | 8.80  | ± 9.6 % |
| 10681 | AAA | IEEE 802.11ax (20MHz, MCS10, 90pc duty cycle)   | WLAN      | 8.62  | ± 9.6 % |
| 10682 | AAA | IEEE 802.11ax (20MHz, MCS11, 90pc duty cycle)   | WLAN      | 8.83  | ± 9.6 % |
| 10683 | AAA | IEEE 802.11ax (20MHz, MCS0, 99pc duty cycle)    | WLAN      | 8.42  | ± 9.6 % |
| 10684 | AAA | IEEE 802.11ax (20MHz, MCS1, 99pc duty cycle)    | WLAN      | 8.26  | ± 9.6 % |
| 10685 | AAA | IEEE 802.11ax (20MHz, MCS2, 99pc duty cycle)    | WLAN      | 8.33  | ± 9.6 % |
| 10686 | AAA | IEEE 802.11ax (20MHz, MCS3, 99pc duty cycle)    | WLAN      | 8.28  | ± 9.6 % |
| 10687 | AAA | IEEE 802.11ax (20MHz, MCS4, 99pc duty cycle)    | WLAN      | 8.45  | ± 9.6 % |
| 10688 | AAA | IEEE 802.11ax (20MHz, MCS5, 99pc duty cycle)    | WLAN      | 8.29  | ± 9.6 % |
| 10689 | AAA | IEEE 802.11ax (20MHz, MCS6, 99pc duty cycle)    | WLAN      | 8.55  | ± 9.6 % |
| 10690 | AAA | IEEE 802.11ax (20MHz, MCS7, 99pc duty cycle)    | WLAN      | 8.29  | ± 9.6 % |
| 10691 | AAA | IEEE 802.11ax (20MHz, MCS8, 99pc duty cycle)    | WLAN      | 8.25  | ± 9.6 % |
| 10692 | AAA | IEEE 802.11ax (20MHz, MCS9, 99pc duty cycle)    | WLAN      | 8.29  | ± 9.6 % |
| 10693 | AAA | IEEE 802.11ax (20MHz, MCS10, 99pc duty cycle)   | WLAN      | 8.25  | ± 9.6 % |
| 10694 | AAA | IEEE 802.11ax (20MHz, MCS11, 99pc duty cycle)   | WLAN      | 8.57  | ± 9.6 % |
| 10695 | AAA | IEEE 802.11ax (40MHz, MCS0, 90pc duty cycle)    | WLAN      | 8.78  | ± 9.6 % |
| 10696 | AAA | IEEE 802.11ax (40MHz, MCS1, 90pc duty cycle)    | WLAN      | 8.91  | ± 9.6 % |
| 10697 | AAA | IEEE 802.11ax (40MHz, MCS2, 90pc duty cycle)    | WLAN      | 8.61  | ± 9.6 % |
| 10698 | AAA | IEEE 802.11ax (40MHz, MCS3, 90pc duty cycle)    | WLAN      | 8.89  | ± 9.6 % |
| 10699 | AAA | IEEE 802.11ax (40MHz, MCS4, 90pc duty cycle)    | WLAN      | 8.82  | ± 9.6 % |
| 10700 | AAA | IEEE 802.11ax (40MHz, MCS5, 90pc duty cycle)    | WLAN      | 8.73  | ± 9.6 % |
| 10701 | AAA | IEEE 802.11ax (40MHz, MCS6, 90pc duty cycle)    | WLAN      | 8.86  | ± 9.6 % |
| 10702 | AAA | IEEE 802.11ax (40MHz, MCS7, 90pc duty cycle)    | WLAN      | 8.70  | ± 9.6 % |
| 10703 | AAA | IEEE 802.11ax (40MHz, MCS8, 90pc duty cycle)    | WLAN      | 8.82  | ± 9.6 % |
| 10704 | AAA | IEEE 802.11ax (40MHz, MCS9, 90pc duty cycle)    | WLAN      | 8.56  | ± 9.6 % |
| 10705 | AAA | IEEE 802.11ax (40MHz, MCS10, 90pc duty cycle)   | WLAN      | 8.69  | ± 9.6 % |
| 10706 | AAA | IEEE 802.11ax (40MHz, MCS11, 90pc duty cycle)   | WLAN      | 8.66  | ± 9.6 % |
| 10707 | AAA | IEEE 802.11ax (40MHz, MCS0, 99pc duty cycle)    | WLAN      | 8.32  | ± 9.6 % |
| 10708 | AAA | IEEE 802.11ax (40MHz, MCS1, 99pc duty cycle)    | WLAN      | 8.55  | ± 9.6 % |
| 10709 | AAA | IEEE 802.11ax (40MHz, MCS2, 99pc duty cycle)    | WLAN      | 8.33  | ± 9.6 % |
| 10710 | AAA | IEEE 802.11ax (40MHz, MCS3, 99pc duty cycle)    | WLAN      | 8.29  | ± 9.6 % |
| 10711 | AAA | IEEE 802.11ax (40MHz, MCS4, 99pc duty cycle)    | WLAN      | 8.39  | ± 9.6 % |
| 10712 | AAA | IEEE 802.11ax (40MHz, MCS5, 99pc duty cycle)    | WLAN      | 8.67  | ± 9.6 % |
| 10713 | AAA | IEEE 802.11ax (40MHz, MCS6, 99pc duty cycle)    | WLAN      | 8.33  | ± 9.6 % |
| 10714 | AAA | IEEE 802.11ax (40MHz, MCS7, 99pc duty cycle)    | WLAN      | 8.26  | ± 9.6 % |
| 10715 | AAA | IEEE 802.11ax (40MHz, MCS8, 99pc duty cycle)    | WLAN      | 8.45  | ± 9.6 % |
| 10716 | AAA | IEEE 802.11ax (40MHz, MCS9, 99pc duty cycle)    | WLAN      | 8.30  | ± 9.6 % |
| 10717 | AAA | IEEE 802.11ax (40MHz, MCS10, 99pc duty cycle)   | WLAN      | 8.48  | ± 9.6 % |
| 10718 | AAA | IEEE 802.11ax (40MHz, MCS11, 99pc duty cycle)   | WLAN      | 8.24  | ± 9.6 % |
| 10719 | AAA | IEEE 802.11ax (80MHz, MCS0, 90pc duty cycle)    | WLAN      | 8.81  | ± 9.6 % |
| 10720 | AAA | IEEE 802.11ax (80MHz, MCS1, 90pc duty cycle)    | WLAN      | 8.87  | ± 9.6 % |
| 10721 | AAA | IEEE 802.11ax (80MHz, MCS2, 90pc duty cycle)    | WLAN      | 8.76  | ± 9.6 % |
| 10722 | AAA | IEEE 802.11ax (80MHz, MCS3, 90pc duty cycle)    | WLAN      | 8.55  | ± 9.6 % |
| 10723 | AAA | IEEE 802.11ax (80MHz, MCS4, 90pc duty cycle)    | WLAN      | 8.70  | ± 9.6 % |
| 10724 | AAA | IEEE 802.11ax (80MHz, MCS5, 90pc duty cycle)    | WLAN      | 8.90  | ± 9.6 % |
| 10725 | AAA | IEEE 802.11ax (80MHz, MCS6, 90pc duty cycle)    | WLAN      | 8.74  | ± 9.6 % |
| 10726 | AAA | IEEE 802.11ax (80MHz, MCS7, 90pc duty cycle)    | WLAN      | 8.72  | ± 9.6 % |
| 10727 | AAA | IEEE 802.11ax (80MHz, MCS8, 90pc duty cycle)    | WLAN      | 8.66  | ± 9.6 % |

|       |     |                                                |               |      |         |
|-------|-----|------------------------------------------------|---------------|------|---------|
| 10728 | AAA | IEEE 802.11ax (80MHz, MCS9, 90pc duty cycle)   | WLAN          | 8.65 | ± 9.6 % |
| 10729 | AAA | IEEE 802.11ax (80MHz, MCS10, 90pc duty cycle)  | WLAN          | 8.64 | ± 9.6 % |
| 10730 | AAA | IEEE 802.11ax (80MHz, MCS11, 90pc duty cycle)  | WLAN          | 8.67 | ± 9.6 % |
| 10731 | AAA | IEEE 802.11ax (80MHz, MCS0, 99pc duty cycle)   | WLAN          | 8.42 | ± 9.6 % |
| 10732 | AAA | IEEE 802.11ax (80MHz, MCS1, 99pc duty cycle)   | WLAN          | 8.46 | ± 9.6 % |
| 10733 | AAA | IEEE 802.11ax (80MHz, MCS2, 99pc duty cycle)   | WLAN          | 8.40 | ± 9.6 % |
| 10734 | AAA | IEEE 802.11ax (80MHz, MCS3, 99pc duty cycle)   | WLAN          | 8.25 | ± 9.6 % |
| 10735 | AAA | IEEE 802.11ax (80MHz, MCS4, 99pc duty cycle)   | WLAN          | 8.33 | ± 9.6 % |
| 10736 | AAA | IEEE 802.11ax (80MHz, MCS5, 99pc duty cycle)   | WLAN          | 8.27 | ± 9.6 % |
| 10737 | AAA | IEEE 802.11ax (80MHz, MCS6, 99pc duty cycle)   | WLAN          | 8.36 | ± 9.6 % |
| 10738 | AAA | IEEE 802.11ax (80MHz, MCS7, 99pc duty cycle)   | WLAN          | 8.42 | ± 9.6 % |
| 10739 | AAA | IEEE 802.11ax (80MHz, MCS8, 99pc duty cycle)   | WLAN          | 8.29 | ± 9.6 % |
| 10740 | AAA | IEEE 802.11ax (80MHz, MCS9, 99pc duty cycle)   | WLAN          | 8.48 | ± 9.6 % |
| 10741 | AAA | IEEE 802.11ax (80MHz, MCS10, 99pc duty cycle)  | WLAN          | 8.40 | ± 9.6 % |
| 10742 | AAA | IEEE 802.11ax (80MHz, MCS11, 99pc duty cycle)  | WLAN          | 8.43 | ± 9.6 % |
| 10743 | AAA | IEEE 802.11ax (160MHz, MCS0, 90pc duty cycle)  | WLAN          | 8.94 | ± 9.6 % |
| 10744 | AAA | IEEE 802.11ax (160MHz, MCS1, 90pc duty cycle)  | WLAN          | 9.16 | ± 9.6 % |
| 10745 | AAA | IEEE 802.11ax (160MHz, MCS2, 90pc duty cycle)  | WLAN          | 8.93 | ± 9.6 % |
| 10746 | AAA | IEEE 802.11ax (160MHz, MCS3, 90pc duty cycle)  | WLAN          | 9.11 | ± 9.6 % |
| 10747 | AAA | IEEE 802.11ax (160MHz, MCS4, 90pc duty cycle)  | WLAN          | 9.04 | ± 9.6 % |
| 10748 | AAA | IEEE 802.11ax (160MHz, MCS5, 90pc duty cycle)  | WLAN          | 8.93 | ± 9.6 % |
| 10749 | AAA | IEEE 802.11ax (160MHz, MCS6, 90pc duty cycle)  | WLAN          | 8.90 | ± 9.6 % |
| 10750 | AAA | IEEE 802.11ax (160MHz, MCS7, 90pc duty cycle)  | WLAN          | 8.79 | ± 9.6 % |
| 10751 | AAA | IEEE 802.11ax (160MHz, MCS8, 90pc duty cycle)  | WLAN          | 8.82 | ± 9.6 % |
| 10752 | AAA | IEEE 802.11ax (160MHz, MCS9, 90pc duty cycle)  | WLAN          | 8.81 | ± 9.6 % |
| 10753 | AAA | IEEE 802.11ax (160MHz, MCS10, 90pc duty cycle) | WLAN          | 9.00 | ± 9.6 % |
| 10754 | AAA | IEEE 802.11ax (160MHz, MCS11, 90pc duty cycle) | WLAN          | 8.94 | ± 9.6 % |
| 10755 | AAA | IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle)  | WLAN          | 8.64 | ± 9.6 % |
| 10756 | AAA | IEEE 802.11ax (160MHz, MCS1, 99pc duty cycle)  | WLAN          | 8.77 | ± 9.6 % |
| 10757 | AAA | IEEE 802.11ax (160MHz, MCS2, 99pc duty cycle)  | WLAN          | 8.77 | ± 9.6 % |
| 10758 | AAA | IEEE 802.11ax (160MHz, MCS3, 99pc duty cycle)  | WLAN          | 8.69 | ± 9.6 % |
| 10759 | AAA | IEEE 802.11ax (160MHz, MCS4, 99pc duty cycle)  | WLAN          | 8.58 | ± 9.6 % |
| 10760 | AAA | IEEE 802.11ax (160MHz, MCS5, 99pc duty cycle)  | WLAN          | 8.49 | ± 9.6 % |
| 10761 | AAA | IEEE 802.11ax (160MHz, MCS6, 99pc duty cycle)  | WLAN          | 8.58 | ± 9.6 % |
| 10762 | AAA | IEEE 802.11ax (160MHz, MCS7, 99pc duty cycle)  | WLAN          | 8.49 | ± 9.6 % |
| 10763 | AAA | IEEE 802.11ax (160MHz, MCS8, 99pc duty cycle)  | WLAN          | 8.53 | ± 9.6 % |
| 10764 | AAA | IEEE 802.11ax (160MHz, MCS9, 99pc duty cycle)  | WLAN          | 8.54 | ± 9.6 % |
| 10765 | AAA | IEEE 802.11ax (160MHz, MCS10, 99pc duty cycle) | WLAN          | 8.54 | ± 9.6 % |
| 10766 | AAA | IEEE 802.11ax (160MHz, MCS11, 99pc duty cycle) | WLAN          | 8.51 | ± 9.6 % |
| 10767 | AAA | 5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)     | 5G NR FR1 TDD | 7.99 | ± 9.6 % |
| 10768 | AAA | 5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz)    | 5G NR FR1 TDD | 8.01 | ± 9.6 % |
| 10769 | AAA | 5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz)    | 5G NR FR1 TDD | 8.01 | ± 9.6 % |
| 10770 | AAA | 5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)    | 5G NR FR1 TDD | 8.02 | ± 9.6 % |
| 10771 | AAA | 5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz)    | 5G NR FR1 TDD | 8.02 | ± 9.6 % |
| 10772 | AAA | 5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)    | 5G NR FR1 TDD | 8.23 | ± 9.6 % |
| 10773 | AAA | 5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)    | 5G NR FR1 TDD | 8.03 | ± 9.6 % |
| 10774 | AAA | 5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)    | 5G NR FR1 TDD | 8.02 | ± 9.6 % |
| 10776 | AAA | 5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)  | 5G NR FR1 TDD | 8.30 | ± 9.6 % |
| 10778 | AAA | 5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)  | 5G NR FR1 TDD | 8.34 | ± 9.6 % |
| 10780 | AAA | 5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)  | 5G NR FR1 TDD | 8.38 | ± 9.6 % |
| 10781 | AAA | 5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)  | 5G NR FR1 TDD | 8.38 | ± 9.6 % |
| 10782 | AAA | 5G NR (CP-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)  | 5G NR FR1 TDD | 8.43 | ± 9.6 % |

|       |     |                                                |               |      |         |
|-------|-----|------------------------------------------------|---------------|------|---------|
| 10783 | AAA | 5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)  | 5G NR FR1 TDD | 8.31 | ± 9.6 % |
| 10784 | AAA | 5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.29 | ± 9.6 % |
| 10785 | AAA | 5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.40 | ± 9.6 % |
| 10786 | AAA | 5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.35 | ± 9.6 % |
| 10787 | AAA | 5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.44 | ± 9.6 % |
| 10788 | AAA | 5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.39 | ± 9.6 % |
| 10789 | AAA | 5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.37 | ± 9.6 % |
| 10790 | AAA | 5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz) | 5G NR FR1 TDD | 8.39 | ± 9.6 % |
| 10791 | AAA | 5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)     | 5G NR FR1 TDD | 7.83 | ± 9.6 % |
| 10792 | AAA | 5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.92 | ± 9.6 % |
| 10793 | AAA | 5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.95 | ± 9.6 % |
| 10794 | AAA | 5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.82 | ± 9.6 % |
| 10795 | AAA | 5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.84 | ± 9.6 % |
| 10796 | AAA | 5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.82 | ± 9.6 % |
| 10797 | AAA | 5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 8.01 | ± 9.6 % |
| 10798 | AAA | 5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.89 | ± 9.6 % |
| 10799 | AAA | 5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.93 | ± 9.6 % |
| 10801 | AAA | 5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.89 | ± 9.6 % |
| 10802 | AAA | 5G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 30 kHz)    | 5G NR FR1 TDD | 7.87 | ± 9.6 % |
| 10803 | AAA | 5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)   | 5G NR FR1 TDD | 7.93 | ± 9.6 % |
| 10805 | AAA | 5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 8.34 | ± 9.6 % |
| 10806 | AAA | 5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 8.37 | ± 9.6 % |
| 10809 | AAA | 5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 8.34 | ± 9.6 % |
| 10810 | AAA | 5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 8.34 | ± 9.6 % |
| 10812 | AAA | 5G NR (CP-OFDM, 50% RB, 60 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 8.35 | ± 9.6 % |
| 10817 | AAA | 5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 8.35 | ± 9.6 % |
| 10818 | AAA | 5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.34 | ± 9.6 % |
| 10819 | AAA | 5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.33 | ± 9.6 % |
| 10820 | AAA | 5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.30 | ± 9.6 % |
| 10821 | AAA | 5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.41 | ± 9.6 % |
| 10822 | AAA | 5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.41 | ± 9.6 % |
| 10823 | AAA | 5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.36 | ± 9.6 % |
| 10824 | AAA | 5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz) | 5G NR FR1 TDD | 8.39 | ± 9.6 % |

|       |     |                                                     |               |      |         |
|-------|-----|-----------------------------------------------------|---------------|------|---------|
| 10825 | AAA | 5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)      | 5G NR FR1 TDD | 8.41 | ± 9.6 % |
| 10827 | AAA | 5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)      | 5G NR FR1 TDD | 8.42 | ± 9.6 % |
| 10828 | AAA | 5G NR (CP-OFDM, 100% RB, 90 MHz, QPSK, 30 kHz)      | 5G NR FR1 TDD | 8.43 | ± 9.6 % |
| 10829 | AAA | 5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)     | 5G NR FR1 TDD | 8.40 | ± 9.6 % |
| 10830 | AAA | 5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 60 kHz)         | 5G NR FR1 TDD | 7.63 | ± 9.6 % |
| 10831 | AAA | 5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 60 kHz)         | 5G NR FR1 TDD | 7.73 | ± 9.6 % |
| 10832 | AAA | 5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 60 kHz)         | 5G NR FR1 TDD | 7.74 | ± 9.6 % |
| 10833 | AAA | 5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 60 kHz)         | 5G NR FR1 TDD | 7.70 | ± 9.6 % |
| 10834 | AAA | 5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 60 kHz)         | 5G NR FR1 TDD | 7.75 | ± 9.6 % |
| 10835 | AAA | 5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 60 kHz)         | 5G NR FR1 TDD | 7.70 | ± 9.6 % |
| 10836 | AAA | 5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 60 kHz)         | 5G NR FR1 TDD | 7.66 | ± 9.6 % |
| 10837 | AAA | 5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 60 kHz)         | 5G NR FR1 TDD | 7.68 | ± 9.6 % |
| 10839 | AAA | 5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 60 kHz)         | 5G NR FR1 TDD | 7.70 | ± 9.6 % |
| 10840 | AAA | 5G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 60 kHz)         | 5G NR FR1 TDD | 7.67 | ± 9.6 % |
| 10841 | AAA | 5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 60 kHz)        | 5G NR FR1 TDD | 7.71 | ± 9.6 % |
| 10843 | AAA | 5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 60 kHz)       | 5G NR FR1 TDD | 8.49 | ± 9.6 % |
| 10844 | AAA | 5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 60 kHz)       | 5G NR FR1 TDD | 8.34 | ± 9.6 % |
| 10846 | AAA | 5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 60 kHz)       | 5G NR FR1 TDD | 8.41 | ± 9.6 % |
| 10854 | AAA | 5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 60 kHz)      | 5G NR FR1 TDD | 8.34 | ± 9.6 % |
| 10855 | AAA | 5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 60 kHz)      | 5G NR FR1 TDD | 8.36 | ± 9.6 % |
| 10856 | AAA | 5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 60 kHz)      | 5G NR FR1 TDD | 8.37 | ± 9.6 % |
| 10857 | AAA | 5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 60 kHz)      | 5G NR FR1 TDD | 8.35 | ± 9.6 % |
| 10858 | AAA | 5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 60 kHz)      | 5G NR FR1 TDD | 8.36 | ± 9.6 % |
| 10859 | AAA | 5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 60 kHz)      | 5G NR FR1 TDD | 8.34 | ± 9.6 % |
| 10860 | AAA | 5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 60 kHz)      | 5G NR FR1 TDD | 8.41 | ± 9.6 % |
| 10861 | AAA | 5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 60 kHz)      | 5G NR FR1 TDD | 8.40 | ± 9.6 % |
| 10863 | AAA | 5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 60 kHz)      | 5G NR FR1 TDD | 8.41 | ± 9.6 % |
| 10864 | AAA | 5G NR (CP-OFDM, 100% RB, 90 MHz, QPSK, 60 kHz)      | 5G NR FR1 TDD | 8.37 | ± 9.6 % |
| 10865 | AAA | 5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 60 kHz)     | 5G NR FR1 TDD | 8.41 | ± 9.6 % |
| 10866 | AAA | 5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)     | 5G NR FR1 TDD | 5.68 | ± 9.6 % |
| 10868 | AAA | 5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)  | 5G NR FR1 TDD | 5.89 | ± 9.6 % |
| 10869 | AAA | 5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)    | 5G NR FR2 TDD | 5.75 | ± 9.6 % |
| 10870 | AAA | 5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz) | 5G NR FR2 TDD | 5.86 | ± 9.6 % |

|       |     |                                                      |               |      |         |
|-------|-----|------------------------------------------------------|---------------|------|---------|
| 10871 | AAA | 5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)    | 5G NR FR2 TDD | 5.75 | ± 9.6 % |
| 10872 | AAA | 5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz) | 5G NR FR2 TDD | 6.52 | ± 9.6 % |
| 10873 | AAA | 5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)    | 5G NR FR2 TDD | 6.61 | ± 9.6 % |
| 10874 | AAA | 5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz) | 5G NR FR2 TDD | 6.65 | ± 9.6 % |
| 10875 | AAA | 5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)        | 5G NR FR2 TDD | 7.78 | ± 9.6 % |
| 10876 | AAA | 5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)     | 5G NR FR2 TDD | 8.39 | ± 9.6 % |
| 10877 | AAA | 5G NR (CP-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)       | 5G NR FR2 TDD | 7.95 | ± 9.6 % |
| 10878 | AAA | 5G NR (CP-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)    | 5G NR FR2 TDD | 8.41 | ± 9.6 % |
| 10879 | AAA | 5G NR (CP-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)       | 5G NR FR2 TDD | 8.12 | ± 9.6 % |
| 10880 | AAA | 5G NR (CP-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz)    | 5G NR FR2 TDD | 8.38 | ± 9.6 % |
| 10881 | AAA | 5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)      | 5G NR FR2 TDD | 5.75 | ± 9.6 % |
| 10882 | AAA | 5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)   | 5G NR FR2 TDD | 5.96 | ± 9.6 % |
| 10883 | AAA | 5G NR (DFT-s-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)     | 5G NR FR2 TDD | 6.57 | ± 9.6 % |
| 10884 | AAA | 5G NR (DFT-s-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)  | 5G NR FR2 TDD | 6.53 | ± 9.6 % |
| 10885 | AAA | 5G NR (DFT-s-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)     | 5G NR FR2 TDD | 6.61 | ± 9.6 % |
| 10886 | AAA | 5G NR (DFT-s-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)  | 5G NR FR2 TDD | 6.65 | ± 9.6 % |
| 10887 | AAA | 5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)         | 5G NR FR2 TDD | 7.78 | ± 9.6 % |
| 10888 | AAA | 5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)      | 5G NR FR2 TDD | 8.35 | ± 9.6 % |
| 10889 | AAA | 5G NR (CP-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)        | 5G NR FR2 TDD | 8.02 | ± 9.6 % |
| 10890 | AAA | 5G NR (CP-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)     | 5G NR FR2 TDD | 8.40 | ± 9.6 % |
| 10891 | AAA | 5G NR (CP-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)        | 5G NR FR2 TDD | 8.13 | ± 9.6 % |
| 10892 | AAA | 5G NR (CP-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)     | 5G NR FR2 TDD | 8.41 | ± 9.6 % |

<sup>E</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.