

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3954

### 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                            | 10.98   | 10.98   | 10.98   | 0.37               | 0.82                    | ± 12.0 %  |
| 835                  | 41.5                               | 0.90                            | 10.52   | 10.52   | 10.52   | 0.16               | 1.42                    | ± 12.0 %  |
| 900                  | 41.5                               | 0.97                            | 10.35   | 10.35   | 10.35   | 0.36               | 0.83                    | ± 12.0 %  |
| 1750                 | 40.1                               | 1.37                            | 8.58    | 8.58    | 8.58    | 0.31               | 0.81                    | ± 12.0 %  |
| 1900                 | 40.0                               | 1.40                            | 8.32    | 8.32    | 8.32    | 0.17               | 1.27                    | ± 12.0 %  |
| 2000                 | 40.0                               | 1.40                            | 8.23    | 8.23    | 8.23    | 0.22               | 1.11                    | ± 12.0 %  |
| 2300                 | 39.5                               | 1.67                            | 7.88    | 7.88    | 7.88    | 0.21               | 1.15                    | ± 12.0 %  |
| 2450                 | 39.2                               | 1.80                            | 7.44    | 7.44    | 7.44    | 0.30               | 0.94                    | ± 12.0 %  |
| 2600                 | 39.0                               | 1.96                            | 7.27    | 7.27    | 7.27    | 0.27               | 1.13                    | ± 12.0 %  |
| 3500                 | 37.9                               | 2.91                            | 7.10    | 7.10    | 7.10    | 0.30               | 1.20                    | ± 13.1 %  |
| 5250                 | 35.9                               | 4.71                            | 5.08    | 5.08    | 5.08    | 0.35               | 1.80                    | ± 13.1 %  |
| 5600                 | 35.5                               | 5.07                            | 4.70    | 4.70    | 4.70    | 0.40               | 1.80                    | ± 13.1 %  |
| 5750                 | 35.4                               | 5.22                            | 4.69    | 4.69    | 4.69    | 0.45               | 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. 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:3954

### 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                            | 10.54   | 10.54   | 10.54   | 0.41               | 0.80                    | ± 12.0 %  |
| 835                  | 55.2                               | 0.97                            | 10.32   | 10.32   | 10.32   | 0.24               | 1.09                    | ± 12.0 %  |
| 1750                 | 53.4                               | 1.49                            | 8.32    | 8.32    | 8.32    | 0.34               | 0.80                    | ± 12.0 %  |
| 1900                 | 53.3                               | 1.52                            | 8.01    | 8.01    | 8.01    | 0.40               | 0.80                    | ± 12.0 %  |
| 2300                 | 52.9                               | 1.81                            | 7.80    | 7.80    | 7.80    | 0.43               | 0.84                    | ± 12.0 %  |
| 2450                 | 52.7                               | 1.95                            | 7.55    | 7.55    | 7.55    | 0.47               | 0.80                    | ± 12.0 %  |
| 2600                 | 52.5                               | 2.16                            | 7.05    | 7.05    | 7.05    | 0.40               | 0.91                    | ± 12.0 %  |
| 3500                 | 51.3                               | 3.31                            | 6.75    | 6.75    | 6.75    | 0.30               | 1.20                    | ± 13.1 %  |
| 5250                 | 48.9                               | 5.36                            | 4.50    | 4.50    | 4.50    | 0.45               | 1.90                    | ± 13.1 %  |
| 5600                 | 48.5                               | 5.77                            | 3.92    | 3.92    | 3.92    | 0.50               | 1.90                    | ± 13.1 %  |
| 5750                 | 48.3                               | 5.94                            | 4.05    | 4.05    | 4.05    | 0.55               | 1.90                    | ± 13.1 %  |

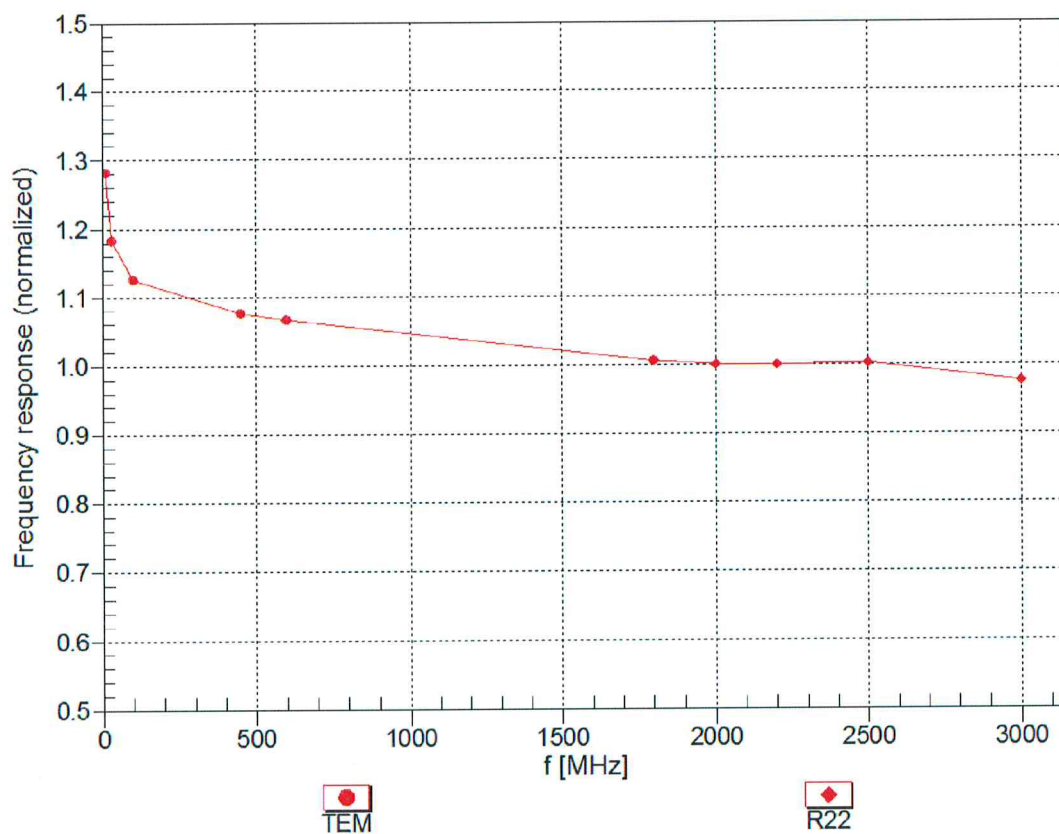
<sup>C</sup> Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. 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

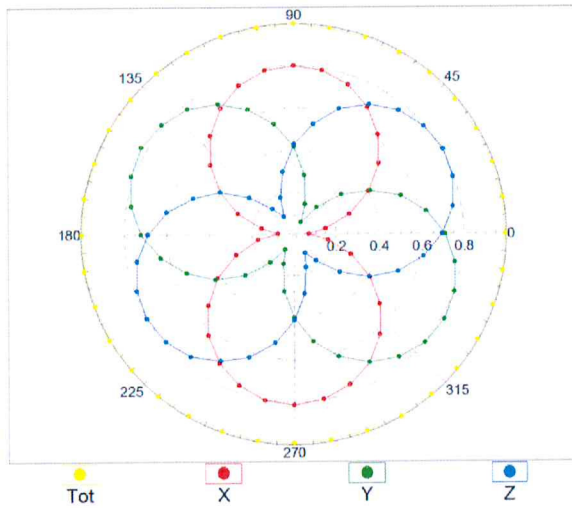
(TEM-Cell:ifi110 EXX, Waveguide: R22)



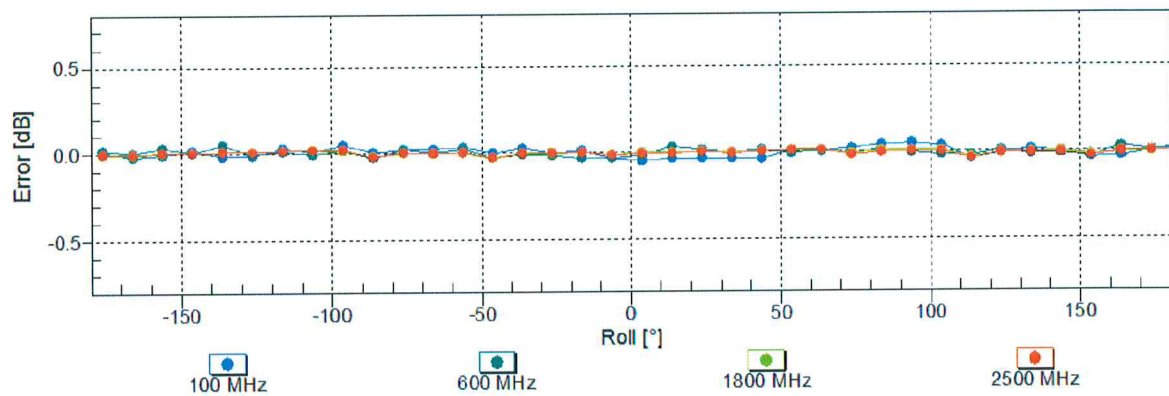
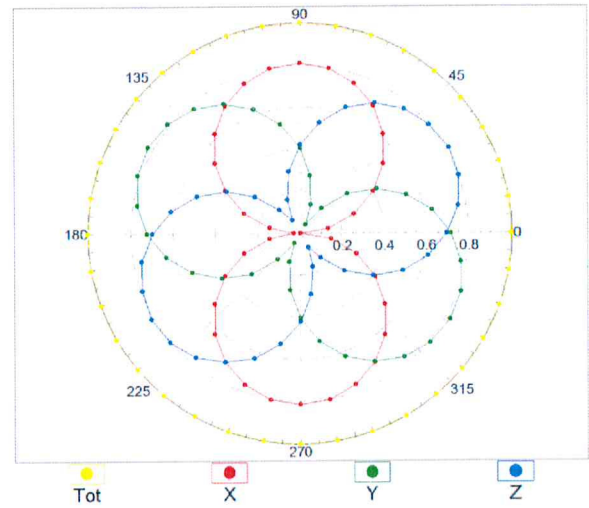
Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

## Receiving Pattern ( $\phi$ ), $\vartheta = 0^\circ$

f=600 MHz, TEM

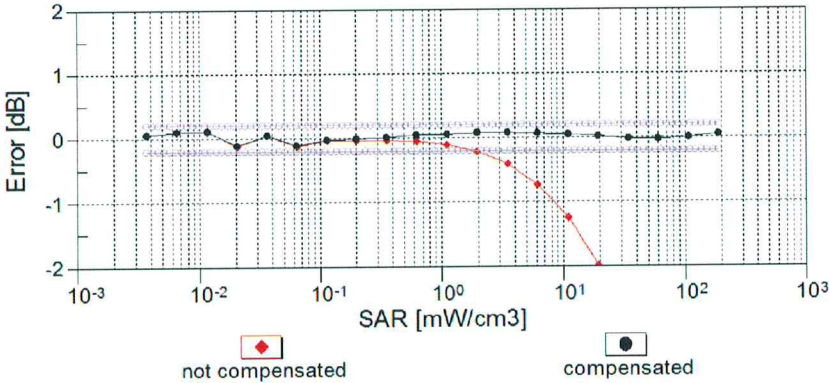
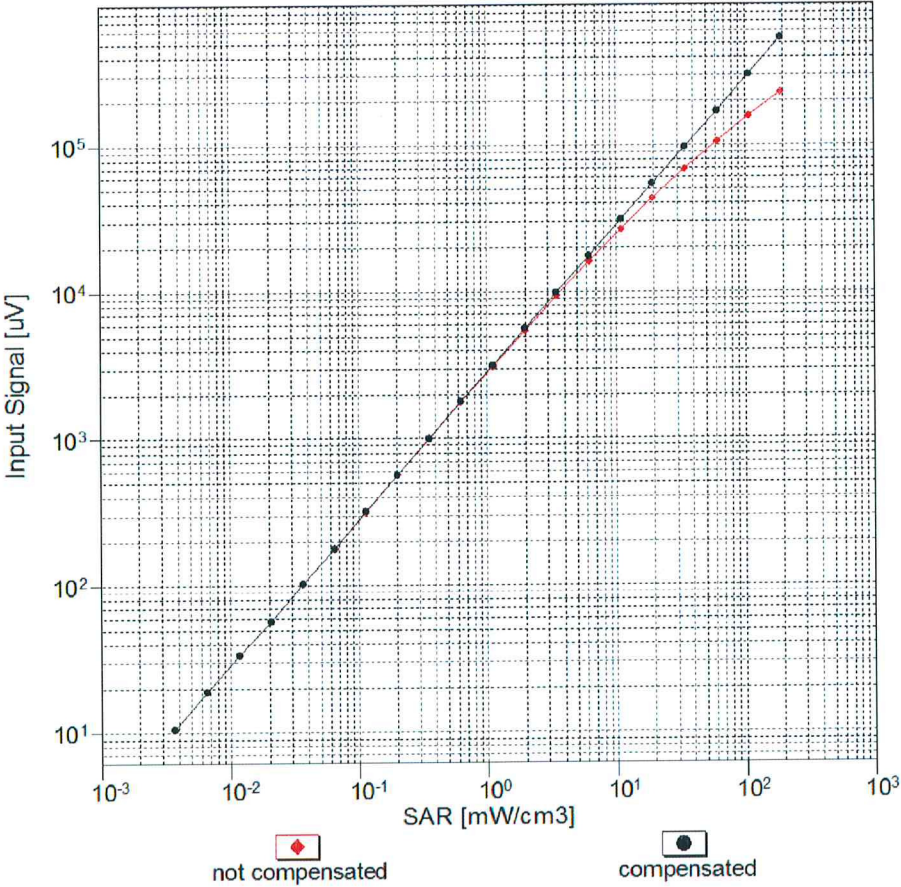


f=1800 MHz, R22



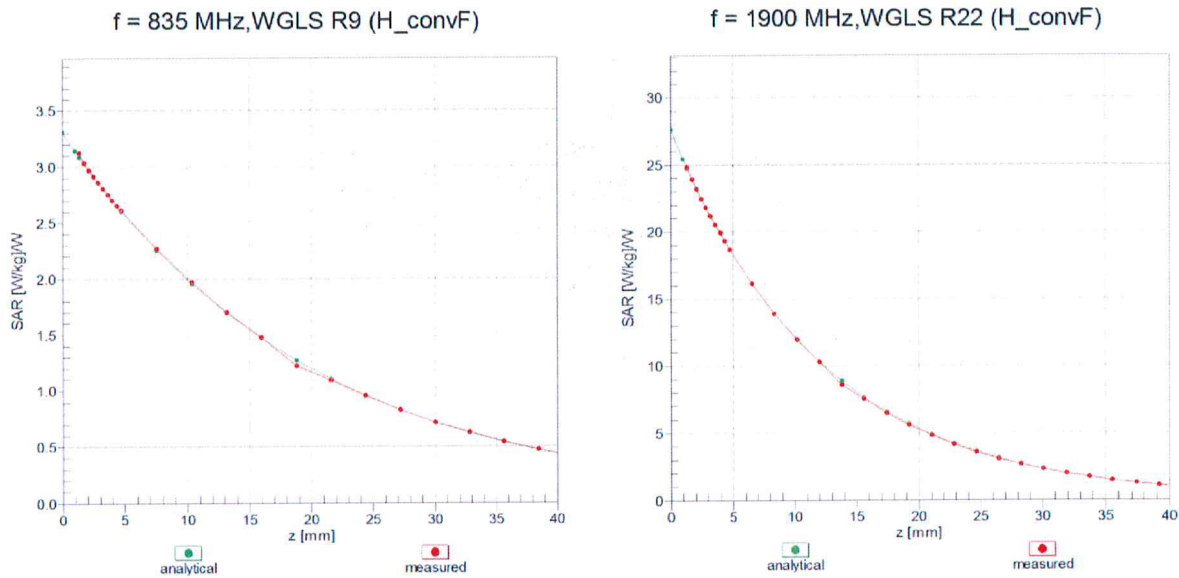
Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )

Dynamic Range f(SAR<sub>head</sub>)  
(TEM cell , f<sub>eval</sub>= 1900 MHz)

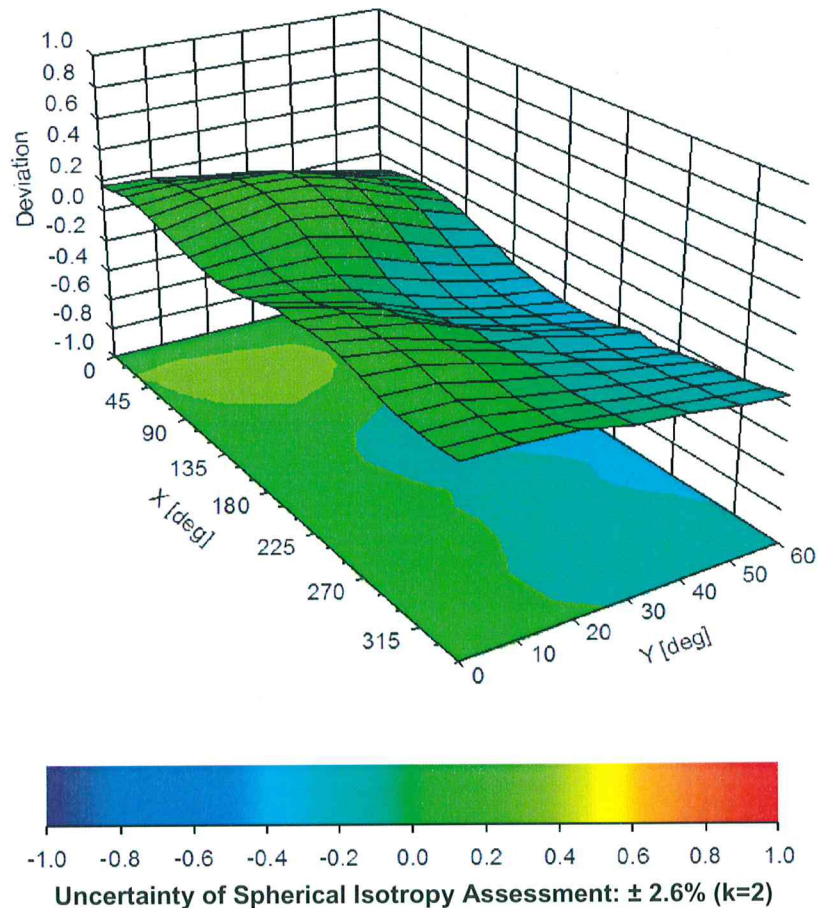


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

# Conversion Factor Assessment



## Deviation from Isotropy in Liquid Error ( $\phi$ , $\theta$ ), f = 900 MHz



## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3954

### Other Probe Parameters

|                                               |            |
|-----------------------------------------------|------------|
| Sensor Arrangement                            | Triangular |
| Connector Angle (°)                           | 73.7       |
| 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     |



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**Appendix E. Product Equality Declaration**

HMD Global Oy

Tel:

Date:

## Product Equality Declaration

We, HMD Global Oy declares on our sole responsibility for the product as below:

| Certification information |         |         |         |         |                     |
|---------------------------|---------|---------|---------|---------|---------------------|
| SKU                       | Row     | LatAm   | Row     | LatAm   | APAC                |
| Number of SIM's supported | SKU1    | SKU2    | SKU1    | SKU2    | SKU1                |
|                           | SS      | SS      | DS      | DS      | SS/DS               |
| Model Name                | TA-1020 | TA-1028 | TA-1032 | TA-1038 | TA-1020/<br>TA-1032 |

The differences between Row, Latam, APAC as below:

■ RF section

1. Antenna pattern and matching has no difference

## 2. Frequency band difference

| • Radio Functionality Matrix -Same Row indicates Signal Path is Shared among SKUs |                    |                    |                    |                    |                                                                                                                         |
|-----------------------------------------------------------------------------------|--------------------|--------------------|--------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------|
| Bands<br>/ Model                                                                  | SKU1-SS<br>TA-1020 | SKU1-DS<br>TA-1032 | SKU2-SS<br>TA-1028 | SKU2-DS<br>TA-1038 | Remark                                                                                                                  |
| GSM 850                                                                           | V                  | V                  | V                  | V                  | No difference                                                                                                           |
| GSM 900                                                                           | V                  | V                  | V                  | V                  | No difference                                                                                                           |
| GSM 1800                                                                          | V                  | V                  | V                  | V                  | No difference                                                                                                           |
| GSM 1900                                                                          | V                  | V                  | V                  | V                  | No difference                                                                                                           |
| LTE 1                                                                             | V                  | V                  | X                  | X                  | No difference                                                                                                           |
| LTE 2                                                                             | X                  | X                  | V                  | V                  | U3404 for SKU1 SMT is B40 DRX SAW;<br>U3404 for SKU2 is B2DRX SAW                                                       |
| LTE 3                                                                             | V                  | V                  | V                  | V                  | No difference                                                                                                           |
| LTE 4                                                                             | X                  | X                  | V                  | V                  | U3304 Only for W_B4 Tx/PRX;<br>LTE B4 TX/PRX                                                                            |
| LTE 5                                                                             | V                  | V                  | X                  | X                  | U3408 only for SKU1 LTE B5 DRX                                                                                          |
| LTE 7                                                                             | V                  | V                  | V                  | V                  | No difference                                                                                                           |
| LTE 8                                                                             | V                  | V                  | X                  | X                  | Z3404 only for SKU1 LTE band8 DRX                                                                                       |
| LTE 12                                                                            | X                  | X                  | V                  | V                  | U3311 SMT is different, SKU1 SMT is the<br>Duplexer of B20, SKU2 SMT is the Duplexer<br>of B12/B17.                     |
| LTE 17                                                                            | X                  | X                  | V                  | V                  | U3311 SMT is different, SKU1 SMT is the<br>Duplexer of B20, SKU2 SMT is the Duplexer<br>of B12/B17.                     |
| LTE 20                                                                            | V                  | V                  | X                  | X                  | U3311 SMT is different, SKU1 SMT is the<br>Duplexer of B20, SKU2 SMT is the Duplexer<br>of B12/B17                      |
| LTE 28                                                                            | V                  | V                  | V                  | V                  | NUL3336 SMT is different for SKU1& SKU2.                                                                                |
| LTE 38                                                                            | V                  | V                  | V                  | V                  | No difference                                                                                                           |
| LTE 40                                                                            | V                  | V                  | X                  | X                  | U3404 SKU1 SMT is the DRX SAW of LTE<br>B40, SKU2 SMT is the DRX of LTE B2;<br>U3202 is only for SKU1Tx/PRx of LTE B40. |
| WCDMA 1                                                                           | V                  | V                  | V                  | V                  | No difference                                                                                                           |
| WCDMA 2                                                                           | V                  | V                  | V                  | V                  | No difference                                                                                                           |
| WCDMA 4                                                                           | X                  | X                  | V                  | V                  | U3304 Only for W_B4 Tx/PRX;LTE B4<br>TX/PRX                                                                             |
| WCDMA 5                                                                           | V                  | V                  | V                  | V                  | No difference                                                                                                           |
| WCDMA 8                                                                           | V                  | V                  | V                  | V                  | No difference                                                                                                           |
| WLAN 2.4GHz                                                                       | V                  | V                  | V                  | V                  | No difference                                                                                                           |
| WLAN 5GHz                                                                         | V                  | V                  | V                  | V                  | No difference                                                                                                           |
| Bluetooth                                                                         | V                  | V                  | V                  | V                  | No difference                                                                                                           |
| NFC                                                                               | V                  | V                  | V                  | V                  | No difference                                                                                                           |

### 3. Board difference

|                   |                     | SKU1-SS<br>TA-1020 | SKU1-DS<br>TA-1032 | SKU2-SS<br>TA-1028 | SKU2-DS<br>TA-1038 |
|-------------------|---------------------|--------------------|--------------------|--------------------|--------------------|
| WWAN              | IC<br>(MT6169)      | No difference      |                    |                    |                    |
|                   | Component<br>on PCB | No difference      |                    |                    |                    |
|                   | Antenna 1           | No difference      |                    |                    |                    |
| BT                | IC<br>(MT6625LN)    | No difference      |                    |                    |                    |
|                   |                     | No difference      |                    |                    |                    |
|                   | Component<br>on PCB | No difference      |                    |                    |                    |
|                   | Antenna             | No difference      |                    |                    |                    |
| WLAN<br>2.4GHz    | IC<br>(MT6625LN)    | No difference      |                    |                    |                    |
|                   | Component<br>on PCB | No difference      |                    |                    |                    |
|                   | Antenna             | No difference      |                    |                    |                    |
| WLAN<br>5GHz      | IC<br>(MT6625LN)    | No difference      |                    |                    |                    |
|                   | Component<br>on PCB | No difference      |                    |                    |                    |
|                   | Antenna             | No difference      |                    |                    |                    |
| NFC               | IC MT6605           | No difference      |                    |                    |                    |
|                   | Component<br>on PCB | No difference      |                    |                    |                    |
|                   | Antenna             | No difference      |                    |                    |                    |
| E-compass         | IC                  | No difference      |                    |                    |                    |
|                   | Component<br>on PCB | No difference      |                    |                    |                    |
| SAR cap<br>Sensor | IC                  | No difference      |                    |                    |                    |
|                   | Component<br>on PCB | No difference      |                    |                    |                    |

#### ■ SW section

There is no different for SW design. Only the UI will show different model name.

#### ■ Mechanical section

There is only one different for the structure of SIM Card. For hardware system design is the same.

| SKU      | SKU1-SS<br>TA-1020 | SKU1-DS<br>TA-1032 | SKU2-SS<br>TA-1028 | SKU2-DS<br>TA-1038 | Remark |
|----------|--------------------|--------------------|--------------------|--------------------|--------|
| SIM Slot | Single SIM         | Dual SIM           | Single SIM         | Dual SIM           | NA     |

Except listings above, the others are all the same.

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**Appendix F. Reference Report**

Please refer to Sporton report number FA711304-01 which is issued separately.