# FCC SAR Test Report

| | | |
|---|---|---|
| APPLICANT | : | ZTE CORPORATION |
| EQUIPMENT | : | CDMA/LTE Ufi |
| BRAND NAME | : | ZTE |
| MODEL NAME | : | MF975U |
| FCC ID | : | SRQ-MF975U |
| STANDARD | : | FCC 47 CFR Part 2 (2.1093)<br>ANSI/IEEE C95.1-1992<br>IEEE 1528-2013 |

**We, SPORTON INTERNATIONAL (XI'AN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and had been in compliance with the applicable technical standards.**

**The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (XI'AN) INC., the test report shall not be reproduced except in full.**

**Reviewed by: Eric Huang / Deputy Manager**

**Approved by: Jones Tsai / Manager**

Testing Laboratory 2804

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# Revision History

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|---|---|---|---|
| FA562405 | Rev. 01 | Initial issue of report | Aug. 14, 2015 |
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# 1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **ZTE CORPORATION, CDMA/LTE Ufi, MF975U** are as follows.

| Equipment Class | Frequency Band | Highest SAR Summary | |
|---|---|---|---|
| | | Body 1g SAR (W/kg) Gap(1cm) | Simultaneous Transmission SAR (W/kg) |
| PCB | CDMA2000 BC0 | 1.18 | 1.58 |
| | CDMA2000 BC1 | **1.45** | |
| | LTE Band 12 | 0.95 | |
| | LTE Band 13 | 1.30 | |
| | LTE Band 5 | 0.77 | |
| | LTE Band 4 | 1.44 | |
| | LTE Band 2 | 1.38 | |
| DTS | WLAN 2.4GHz Band | 0.16 | 1.50 |
| NII | WLAN 5.2GHz Band | 0.24 | 1.58 |
| | WLAN 5.8GHz Band | 0.39 | |
| Date of Testing: | | Jul. 10, 2015 ~ Aug. 07, 2015 | |

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

## 2. Administration Data

| Testing Laboratory | |
|---|---|
| Test Site | SPORTON INTERNATIONAL (XI'AN) INC. |
| Test Site Location | 1F, Building A3, No. 39 Chuangye Rd., Xi'an Hi-tech Zone, Shanxi Province, P. R. China<br>TEL: +86-029-8860-8767<br>FAX: +86-029-8860-8791 |

| Applicant | |
|---|---|
| Company Name | ZTE CORPORATION |
| Address | ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P. R. China |

| Manufacturer | |
|---|---|
| Company Name | ZTE CORPORATION |
| Address | ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P. R. China |

## 3. Guidance Standard

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r01
- FCC KDB 447498 D01 General RF Exposure Guidance v05r02
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r01
- FCC KDB 941225 D01 3G SAR Procedures v03
- FCC KDB 941225 D05 SAR for LTE Devices v02r03
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r01
- FCC KDB 941225 D06 Hotspot Mode SAR v02

# 4. Equipment Under Test (EUT)

## 4.1 General Information

| Product Feature & Specification | |
|---|---|
| Equipment Name | CDMA/LTE Ufi |
| Brand Name | ZTE |
| Model Name | MF975U |
| FCC ID | SRQ-MF975U |
| IMEI Code | 99000513900050 |
| Wireless Technology and Frequency Range | CDMA2000 BC0: 824.7 MHz ~ 848.31 MHz<br>CDMA 2000 BC1: 1851.25 MHz ~ 1908.75 MHz<br>LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz<br>LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz<br>LTE Band 5 : 824.7 MHz ~ 848.3 MHz<br>LTE Band 12: 699.7 MHz ~ 715.3 MHz<br>LTE Band 13 : 779.5 MHz ~ 784.5 MHz<br>WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz<br>WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz<br>WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz |
| Mode | · CDMA2000 : 1xRTT/1xEv-Do(Rev.0)/1xEv-Do(Rev.A)<br>· LTE: QPSK, 16QAM<br>· 802.11a/b/g/n HT20/HT40<br>· 802.11ac VHT20/VHT40/VHT80 |
| HW Version | xz3A |
| SW Version | USCC_MF975U_V1.0.0B04 |
| EUT Stage | Identical Prototype |

**Remark:**
1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. This device 2.4GHz WLAN supports Hotspot operation, and 5.2GHz/5.8GHz WLAN supports WiFi Direct (GC/GO),
3. This device has no voice function.

## 4.2 Maximum Tune-up Limit

| Mode | Average power (dBm) | |
|---|---|---|
| | CDMA2000 BC0 | CDMA2000 BC1 |
| 1xRTT RC1 SO55 | 24.50 | 24.00 |
| 1xRTT RC3 SO55 | 24.50 | 24.00 |
| 1xRTT RC3 SO32 (+ F-SCH) | 24.50 | 24.00 |
| 1xRTT RC3 SO32 (+SCH) | 24.50 | 24.00 |
| 1xEV-DO Rev 0 (RTAP 153.6kbps) | 24.50 | 24.00 |
| 1xEV-DO Rev A (RETAP 4096bits) | 24.50 | 24.00 |

| LTE Band 12 | | | | |
|---|---|---|---|---|
| Average Power (dBm) | | | | |
| Modulation | BW (MHz) | RB size | MPR | Target Power |
| QPSK | 10 | ≤ 12 | 0 | 24.00 |
| QPSK | 10 | > 12 | 1 | 23.00 |
| 16QAM | 10 | ≤ 12 | 1 | 23.00 |
| 16QAM | 10 | > 12 | 2 | 22.00 |
| QPSK | 5 | ≤ 8 | 0 | 24.00 |
| QPSK | 5 | > 8 | 1 | 23.00 |
| 16QAM | 5 | ≤ 8 | 1 | 23.00 |
| 16QAM | 5 | > 8 | 2 | 22.00 |
| QPSK | 3 | ≤ 4 | 0 | 24.00 |
| QPSK | 3 | > 4 | 1 | 23.00 |
| 16QAM | 3 | ≤ 4 | 1 | 23.00 |
| 16QAM | 3 | > 4 | 2 | 22.00 |
| QPSK | 1.4 | ≤ 5 | 0 | 24.00 |
| QPSK | 1.4 | > 5 | 1 | 23.00 |
| 16QAM | 1.4 | ≤ 5 | 1 | 23.00 |
| 16QAM | 1.4 | > 5 | 2 | 22.00 |

| LTE Band 13 | | | | |
|---|---|---|---|---|
| Average Power (dBm) | | | | |
| Modulation | BW (MHz) | RB size | MPR | Target Power |
| QPSK | 10 | ≤ 12 | 0 | 23.50 |
| QPSK | 10 | > 12 | 1 | 22.50 |
| 16QAM | 10 | ≤ 12 | 1 | 22.50 |
| 16QAM | 10 | > 12 | 2 | 21.50 |
| QPSK | 5 | ≤ 8 | 0 | 23.50 |
| QPSK | 5 | > 8 | 1 | 22.50 |
| 16QAM | 5 | ≤ 8 | 1 | 22.50 |
| 16QAM | 5 | > 8 | 2 | 21.50 |

| LTE Band 5 | | | | |
|---|---|---|---|---|
| Average Power (dBm) | | | | |
| Modulation | BW (MHz) | RB size | MPR | Target Power |
| QPSK | 10 | ≤ 12 | 0 | 23.50 |
| QPSK | 10 | > 12 | 1 | 22.50 |
| 16QAM | 10 | ≤ 12 | 1 | 22.50 |
| 16QAM | 10 | > 12 | 2 | 21.50 |
| QPSK | 5 | ≤ 8 | 0 | 23.50 |
| QPSK | 5 | > 8 | 1 | 22.50 |
| 16QAM | 5 | ≤ 8 | 1 | 22.50 |
| 16QAM | 5 | > 8 | 2 | 21.50 |
| QPSK | 3 | ≤ 4 | 0 | 23.50 |
| QPSK | 3 | > 4 | 1 | 22.50 |
| 16QAM | 3 | ≤ 4 | 1 | 22.50 |
| 16QAM | 3 | > 4 | 2 | 21.50 |
| QPSK | 1.4 | ≤ 5 | 0 | 23.50 |
| QPSK | 1.4 | > 5 | 1 | 22.50 |
| 16QAM | 1.4 | ≤ 5 | 1 | 22.50 |
| 16QAM | 1.4 | > 5 | 2 | 21.50 |

| LTE Band 4 | | | | |
|---|---|---|---|---|
| Average Power (dBm) | | | | |
| Modulation | BW (MHz) | RB size | MPR | Target Power |
| QPSK | 20 | ≤ 18 | 0 | 22.30 |
| QPSK | 20 | > 18 | 1 | 21.30 |
| 16QAM | 20 | ≤ 18 | 1 | 21.30 |
| 16QAM | 20 | > 18 | 2 | 20.30 |
| QPSK | 15 | ≤ 16 | 0 | 22.30 |
| QPSK | 15 | > 16 | 1 | 21.30 |
| 16QAM | 15 | ≤ 16 | 1 | 21.30 |
| 16QAM | 15 | > 16 | 2 | 20.30 |
| QPSK | 10 | ≤ 12 | 0 | 22.30 |
| QPSK | 10 | > 12 | 1 | 21.30 |
| 16QAM | 10 | ≤ 12 | 1 | 21.30 |
| 16QAM | 10 | > 12 | 2 | 20.30 |
| QPSK | 5 | ≤ 8 | 0 | 22.30 |
| QPSK | 5 | > 8 | 1 | 21.30 |
| 16QAM | 5 | ≤ 8 | 1 | 21.30 |
| 16QAM | 5 | > 8 | 2 | 20.30 |
| QPSK | 3 | ≤ 4 | 0 | 22.30 |
| QPSK | 3 | > 4 | 1 | 21.30 |
| 16QAM | 3 | ≤ 4 | 1 | 21.30 |
| 16QAM | 3 | > 4 | 2 | 20.30 |
| QPSK | 1.4 | ≤ 5 | 0 | 22.30 |
| QPSK | 1.4 | > 5 | 1 | 21.30 |
| 16QAM | 1.4 | ≤ 5 | 1 | 21.30 |
| 16QAM | 1.4 | > 5 | 2 | 20.30 |

| LTE Band 2 | | | | |
|---|---|---|---|---|
| Average Power (dBm) | | | | |
| Modulation | BW (MHz) | RB size | MPR | Target Power |
| QPSK | 20 | ≤ 18 | 0 | 23.50 |
| QPSK | 20 | > 18 | 1 | 22.50 |
| 16QAM | 20 | ≤ 18 | 1 | 22.50 |
| 16QAM | 20 | > 18 | 2 | 21.50 |
| QPSK | 15 | ≤ 16 | 0 | 23.50 |
| QPSK | 15 | > 16 | 1 | 22.50 |
| 16QAM | 15 | ≤ 16 | 1 | 22.50 |
| 16QAM | 15 | > 16 | 2 | 21.50 |
| QPSK | 10 | ≤ 12 | 0 | 23.50 |
| QPSK | 10 | > 12 | 1 | 22.50 |
| 16QAM | 10 | ≤ 12 | 1 | 22.50 |
| 16QAM | 10 | > 12 | 2 | 21.50 |
| QPSK | 5 | ≤ 8 | 0 | 23.50 |
| QPSK | 5 | > 8 | 1 | 22.50 |
| 16QAM | 5 | ≤ 8 | 1 | 22.50 |
| 16QAM | 5 | > 8 | 2 | 21.50 |
| QPSK | 3 | ≤ 4 | 0 | 23.50 |
| QPSK | 3 | > 4 | 1 | 22.50 |
| 16QAM | 3 | ≤ 4 | 1 | 22.50 |
| 16QAM | 3 | > 4 | 2 | 21.50 |
| QPSK | 1.4 | ≤ 5 | 0 | 23.50 |
| QPSK | 1.4 | > 5 | 1 | 22.50 |
| 16QAM | 1.4 | ≤ 5 | 1 | 22.50 |
| 16QAM | 1.4 | > 5 | 2 | 21.50 |

| Mode | | | | Maximum Average Power (dBm) |
|---|---|---|---|---|
| 2.4GHz | 802.11b | Chain Port 0 | | 15.50 |
| | | Chain Port 1 | | 15.50 |
| | 802.11g | Chain Port 0 | | 13.50 |
| | | Chain Port 1 | | 13.50 |
| | 802.11n HT20 | Chain Port 0 | | 12.00 |
| | | Chain Port 1 | | 12.00 |
| | | Chain Port 0+1 | | 12.00 |
| | 802.11n HT40 | Chain Port 0 | | 11.50 |
| | | Chain Port 1 | | 12.00 |
| | | Chain Port 0+1 | | 12.00 |
| 5.2GHz | 802.11a | Chain Port 0 | | 10.00 |
| | | Chain Port 1 | | 10.00 |
| | 802.11n HT20 | Chain Port 0 | | 10.00 |
| | | Chain Port 1 | | 10.00 |
| | | Chain Port 0+1 | | 10.50 |
| | 802.11n HT40 | Chain Port 0 | | 10.00 |
| | | Chain Port 1 | | 10.00 |
| | | Chain Port 0+1 | | 10.00 |
| | 802.11ac-VHT20 | Chain Port 0 | | 10.00 |
| | | Chain Port 1 | | 10.00 |
| | | Chain Port 0+1 | | 10.00 |
| | 802.11ac-VHT40 | Chain Port 0 | | 10.00 |
| | | Chain Port 1 | | 9.00 |
| | | Chain Port 0+1 | | 10.00 |
| | 802.11ac-VHT80 | Chain Port 0 | | 9.00 |
| | | Chain Port 1 | | 9.00 |
| | | Chain Port 0+1 | | 9.00 |
| 5.8GHz | 802.11a | Chain Port 0 | | 10.00 |
| | | Chain Port 1 | | 10.50 |
| | 802.11n HT20 | Chain Port 0 | | 10.00 |
| | | Chain Port 1 | | 10.00 |
| | | Chain Port 0+1 | CH 149 | 11.00 |
| | | | CH 157 | 11.00 |
| | | | CH 165 | 10.50 |
| | 802.11n HT40 | Chain Port 0 | | 10.00 |
| | | Chain Port 1 | | 10.00 |
| | | Chain Port 0+1 | | 10.00 |
| | 802.11ac-VHT20 | Chain Port 0 | | 10.50 |
| | | Chain Port 1 | | 10.00 |
| | | Chain Port 0+1 | | 10.50 |
| | 802.11ac-VHT40 | Chain Port 0 | | 10.00 |
| | | Chain Port 1 | | 10.00 |
| | | Chain Port 0+1 | | 10.00 |
| | 802.11ac-VHT80 | Chain Port 0 | | 9.00 |
| | | Chain Port 1 | | 9.00 |
| | | Chain Port 0+1 | | 9.00 |

## 4.3 General LTE SAR Test and Reporting Considerations

| Summarized necessary items addressed in KDB 941225 D05 v02r03 | |
|---|---|
| FCC ID | SRQ-MF975U |
| Equipment Name | CDMA/LTE Ufi |
| Operating Frequency Range of each LTE transmission band | LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz<br>LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz<br>LTE Band 5 : 824.7 MHz ~ 848.3 MHz<br>LTE Band 12: 699.7 MHz ~ 715.3 MHz<br>LTE Band 13 : 779.5 MHz ~ 784.5 MHz |
| Channel Bandwidth | LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz<br>LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz<br>LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz<br>LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz<br>LTE Band 13: 5MHz, 10MHz |
| uplink modulations used | QPSK, and 16QAM |
| LTE Voice / Data requirements | Data only |
| LTE MPR permanently built-in by design | Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3 |

| Modulation | Channel bandwidth / Transmission bandwidth (RB) | | | | | | MPR (dB) |
|---|---|---|---|---|---|---|---|
| | 1.4 MHz | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz | |
| QPSK | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 1 |
| 16 QAM | ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 1 |
| 16 QAM | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 2 |

| | |
|---|---|
| LTE A-MPR | In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI) |
| Spectrum plots for RB configuration | A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report. |
| LTE Carrier Aggregation Combinations | Inter-Band possible combinations as below page and the detail power verification please referred to page35. |
| LTE Carrier Aggregation Additional Information | This device does not support full CA features on 3GPP Release 10. Is supports a maximum of 2 carriers in the downlink only. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. Due to carrier capability, only the combinations listed above are supported. The following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA. |

| LTE Carrier Aggregation Combinations | | | | | |
|---|---|---|---|---|---|
| Inter-Band Combinations | | | | | |
| (PCC) B4 | (SCC) B12 | (PCC) B2 | (SCC) B12 | (PCC) B12 | (SCC) B2 |
| 20M+10M | | 20M+10M | | 10M+20M | |
| 20M+5M | | 20M+5M | | 10M+15M | |
| 15M+10M | | 15M+10M | | 10M+10M | |
| 15M+5M | | 15M+5M | | 10M+5M | |
| 10M+10M | | 10M+10M | | 5M+20M | |
| 10M+5M | | 10M+5M | | 5M+15M | |
| 5M+10M | | 5M+10M | | 5M+10M | |
| 5M+5M | | 5M+5M | | 5M+5M | |

**Transmission (H, M, L) channel numbers and frequencies in each LTE band**

LTE Band 12

| | Bandwidth 1.4 MHz | | Bandwidth 3 MHz | | Bandwidth 5 MHz | | Bandwidth 10 MHz | |
|---|---|---|---|---|---|---|---|---|
| | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) |
| L | 23017 | 699.7 | 23025 | 700.5 | 23035 | 701.5 | 23060 | 704 |
| M | 23095 | 707.5 | 23095 | 707.5 | 23095 | 707.5 | 23095 | 707.5 |
| H | 23173 | 715.3 | 23165 | 714.5 | 23155 | 713.5 | 23130 | 711 |

LTE Band 13

| | Bandwidth 5 MHz | | Bandwidth 10 MHz | |
|---|---|---|---|---|
| | Channel # | Freq.(MHz) | Channel # | Freq.(MHz) |
| L | 23205 | 779.5 | 23230 | 782 |
| M | 23230 | 782 | | |
| H | 23255 | 784.5 | | |

LTE Band 5

| | Bandwidth 1.4 MHz | | Bandwidth 3 MHz | | Bandwidth 5 MHz | | Bandwidth 10 MHz | |
|---|---|---|---|---|---|---|---|---|
| | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) |
| L | 20407 | 824.7 | 20415 | 825.5 | 20425 | 826.5 | 20450 | 829 |
| M | 20525 | 836.5 | 20525 | 836.5 | 20525 | 836.5 | 20525 | 836.5 |
| H | 20643 | 848.3 | 20635 | 847.5 | 20625 | 846.5 | 20600 | 844 |

LTE Band 4

| | Bandwidth 1.4 MHz | | Bandwidth 3 MHz | | Bandwidth 5 MHz | | Bandwidth 10 MHz | | Bandwidth 15 MHz | | Bandwidth 20 MHz | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) |
| L | 19957 | 1710.7 | 19965 | 1711.5 | 19975 | 1712.5 | 20000 | 1715 | 20025 | 1717.5 | 20050 | 1720 |
| M | 20175 | 1732.5 | 20175 | 1732.5 | 20175 | 1732.5 | 20175 | 1732.5 | 20175 | 1732.5 | 20175 | 1732.5 |
| H | 20393 | 1754.3 | 20385 | 1753.5 | 20375 | 1752.5 | 20350 | 1750 | 20325 | 1747.5 | 20300 | 1745 |

LTE Band 2

| | Bandwidth 1.4 MHz | | Bandwidth 3 MHz | | Bandwidth 5 MHz | | Bandwidth 10 MHz | | Bandwidth 15 MHz | | Bandwidth 20 MHz | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) | Ch. # | Freq. (MHz) |
| L | 18607 | 1850.7 | 18615 | 1851.5 | 18625 | 1852.5 | 18650 | 1855 | 18675 | 1857.5 | 18700 | 1860 |
| M | 18900 | 1880 | 18900 | 1880 | 18900 | 1880 | 18900 | 1880 | 18900 | 1880 | 18900 | 1880 |
| H | 19193 | 1909.3 | 19185 | 1908.5 | 19175 | 1907.5 | 19150 | 1905 | 19125 | 1902.5 | 19100 | 1900 |

# 5. RF Exposure Limits

## 5.1 Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

## 5.2 Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

**Limits for Occupational/Controlled Exposure (W/kg)**

| Whole-Body | Partial-Body | Hands, Wrists, Feet and Ankles |
|---|---|---|
| 0.4 | 8.0 | 20.0 |

**Limits for General Population/Uncontrolled Exposure (W/kg)**

| Whole-Body | Partial-Body | Hands, Wrists, Feet and Ankles |
|---|---|---|
| 0.08 | 1.6 | 4.0 |

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

# 6. Specific Absorption Rate (SAR)

## 6.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

## 6.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$\mathbf{SAR} = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\mathbf{dm}}\right) = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\boldsymbol{\rho}\mathbf{dv}}\right)$$

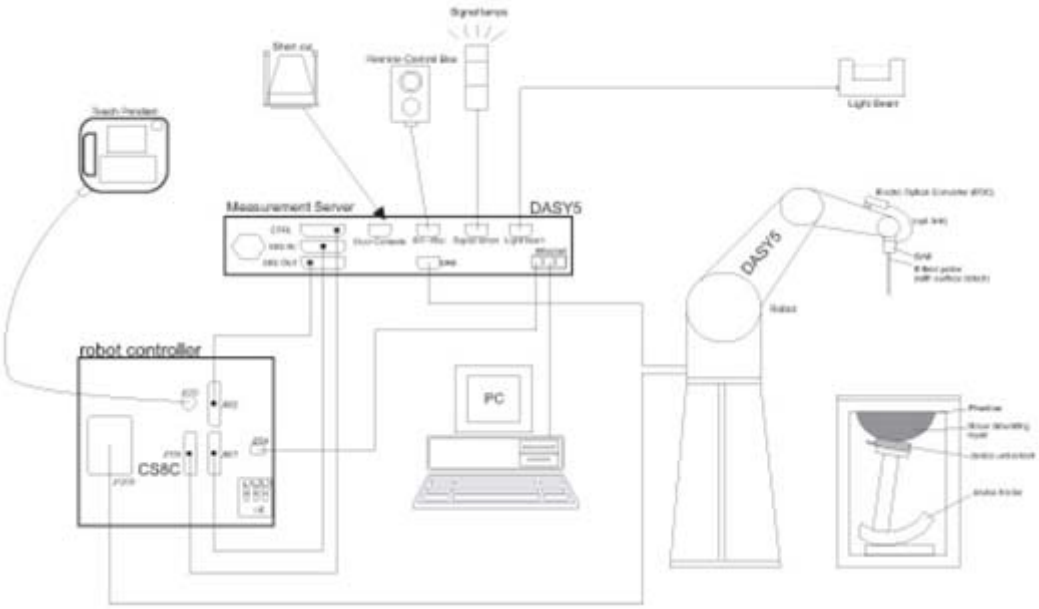
SAR is expressed in units of Watts per kilogram (W/kg)

$$\mathbf{SAR} = \frac{\boldsymbol{\sigma}|\mathbf{E}|^{\mathbf{2}}}{\boldsymbol{\rho}}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

# 7. System Description and Setup

**The DASY system used for performing compliance tests consists of the following items:**




- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

# 8. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
(b) Read the WWAN RF power level from the base station simulator.
(c) For WLANT power measurement, use engineering software to configure EUT WLAN continuously transmission, at maximum RF power in each supported wireless interface and frequency band
(d) Connect EUT RF port through RF cable to the power meter, and measure WLAN output power

<SAR measurement>

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix D demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

## 8.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

## 8.2 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

## 8.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0 is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r03 SAR measurement 100 MHz to 6 GHz.

| | ≤ 3 GHz | > 3 GHz |
|---|---|---|
| Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface | 5 ± 1 mm | ½·δ·ln(2) ± 0.5 mm |
| Maximum probe angle from probe axis to phantom surface normal at the measurement location | 30° ± 1° | 20° ± 1° |
| Maximum area scan spatial resolution: $\Delta x_{Area}$, $\Delta y_{Area}$ | ≤ 2 GHz: ≤ 15 mm<br>2 – 3 GHz: ≤ 12 mm | 3 – 4 GHz: ≤ 12 mm<br>4 – 6 GHz: ≤ 10 mm |
| | When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device. | |

## 8.4 Zoom Scan

Zoom scans are used assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube shoes base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r03 SAR measurement 100 MHz to 6 GHz.

| | | | ≤ 3 GHz | > 3 GHz |
|---|---|---|---|---|
| Maximum zoom scan spatial resolution: $\Delta x_{Zoom}$, $\Delta y_{Zoom}$ | | | ≤ 2 GHz: ≤ 8 mm<br>2 – 3 GHz: ≤ 5 mm* | 3 – 4 GHz: ≤ 5 mm*<br>4 – 6 GHz: ≤ 4 mm* |
| Maximum zoom scan spatial resolution, normal to phantom surface | uniform grid: $\Delta z_{Zoom}(n)$ | | ≤ 5 mm | 3 – 4 GHz: ≤ 4 mm<br>4 – 5 GHz: ≤ 3 mm<br>5 – 6 GHz: ≤ 2 mm |
| | graded grid | $\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface | ≤ 4 mm | 3 – 4 GHz: ≤ 3 mm<br>4 – 5 GHz: ≤ 2.5 mm<br>5 – 6 GHz: ≤ 2 mm |
| | | $\Delta z_{Zoom}(n>1)$: between subsequent points | $\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$ | |
| Minimum zoom scan volume | x, y, z | | ≥ 30 mm | 3 – 4 GHz: ≥ 28 mm<br>4 – 5 GHz: ≥ 25 mm<br>5 – 6 GHz: ≥ 22 mm |

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

## 8.5 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

## 8.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

# 9. Test Equipment List

| Manufacturer | Name of Equipment | Type/Model | Serial Number | Calibration | |
|---|---|---|---|---|---|
| | | | | Last Cal. | Due Date |
| SPEAG | 750MHz System Validation Kit | D750V3 | 1065 | Nov. 19, 2014 | Nov. 18, 2015 |
| SPEAG | 835MHz System Validation Kit | D835V2 | 4d091 | Nov. 21, 2014 | Nov. 20, 2015 |
| SPEAG | 1750MHz System Validation Kit | D1750V2 | 1069 | Nov. 21, 2014 | Nov. 20, 2015 |
| SPEAG | 1900MHz System Validation Kit | D1900V2 | 5d118 | Nov. 21, 2014 | Nov. 20, 2015 |
| SPEAG | 2450MHz System Validation Kit | D2450V2 | 840 | Nov. 19, 2014 | Nov. 18, 2015 |
| SPEAG | 5000MHz System Validation Kit | D5GHzV2 | 1113 | Nov. 24, 2014 | Nov. 23, 2015 |
| SPEAG | Data Acquisition Electronics | DAE4 | 1358 | Apr. 28, 2015 | Apr. 27, 2016 |
| SPEAG | Data Acquisition Electronics | DAE4 | 1210 | May 21, 2015 | May 20, 2016 |
| SPEAG | Dosimetric E-Field Probe | EX3DV4 | 3911 | Oct. 02, 2014 | Oct. 01, 2015 |
| SPEAG | Dosimetric E-Field Probe | EX3DV4 | 3857 | May 28, 2015 | May 27, 2016 |
| SPEAG | SAM Twin Phantom | QD 000 P40 CD | TP-1753 | NCR | NCR |
| SPEAG | SAM Twin Phantom | QD 000 P40 CD | TP-1754 | NCR | NCR |
| SPEAG | SAM Twin Phantom | QD 000 P40 CB | TP-1477 | NCR | NCR |
| SPEAG | Phone Positioner | N/A | N/A | NCR | NCR |
| Agilent | Wireless Communication Test Set | E5515C | MY52102600 | Dec. 09, 2014 | Dec. 08, 2015 |
| Anritsu | Radio communication analyzer | MT8820C | 6201091028 | Dec. 09, 2014 | Dec. 08, 2015 |
| Agilent | ENA Series Network Analyzer | E5071C | MY46317418 | Dec. 09, 2014 | Dec. 08, 2015 |
| Agilent | Dielectric Probe Kit | 85070E | MY44300751 | NCR | NCR |
| Anritsu | Power Senor | MA2411B | 0917070 | Jan. 23, 2015 | Jan. 22, 2016 |
| Anritsu | Power Meter | ML2495A | 1005002 | Jan. 23, 2015 | Jan. 22, 2016 |
| Anritsu | Power Sensor | MA2411B | 1207253 | Jan. 28, 2015 | Jan. 27, 2016 |
| Anritsu | Power Meter | ML2495A | 1218010 | Jan. 28, 2015 | Jan. 27, 2016 |
| R&S | Signal Generator | SMBV100A | 258305 | Jan. 23, 2015 | Jan. 22, 2016 |
| mini-circuits | Amplifier | ZVE-3W-83+ | 162601250 | NCR | NCR |
| Agilent | Dual Directional Coupler | 778D | 50422 | Note1 | |
| Woken | Attenuator 1 | WK0602-XX | N/A | Note1 | |
| PE | Attenuator 2 | PE7005-10 | N/A | Note1 | |
| PE | Attenuator 3 | PE7005- 3 | N/A | Note1 | |
| AR | Power Amplifier | 5S1G4M2 | 0328767 | Note1 | |
| Mini-Circuits | Power Amplifier | ZVE-3W | 162601250 | Note1 | |
| Mini-Circuits | Power Amplifier | ZHL-42W+ | 13440021344 | Note1 | |

**General Note:**

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.

# 10. System Verification

## 10.1 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

| Frequency (MHz) | Water (%) | Sugar (%) | Cellulose (%) | Salt (%) | Preventol (%) | DGBE (%) | Conductivity (σ) | Permittivity (εr) |
|---|---|---|---|---|---|---|---|---|
| For Body | | | | | | | | |
| 750 | 51.7 | 47.2 | 0 | 0.9 | 0.1 | 0 | 0.96 | 55.5 |
| 835 | 50.8 | 48.2 | 0 | 0.9 | 0.1 | 0 | 0.97 | 55.2 |
| 1750 | 70.2 | 0 | 0 | 0.4 | 0 | 29.4 | 1.49 | 53.40 |
| 1800, 1900, 2000 | 70.2 | 0 | 0 | 0.4 | 0 | 29.4 | 1.52 | 53.3 |
| 2450 | 68.6 | 0 | 0 | 0 | 0 | 31.4 | 1.95 | 52.7 |

Simulating Liquid for 5GHz, Manufactured by SPEAG

| Ingredients | (% by weight) |
|---|---|
| Water | 64~78% |
| Mineral oil | 11~18% |
| Emulsifiers | 9~15% |
| Additives and Salt | 2~3% |

**<Tissue Dielectric Parameter Check Results>**

| Frequency (MHz) | Tissue Type | Liquid Temp. (℃) | Conductivity (σ) | Permittivity ($\varepsilon_r$) | Conductivity Target (σ) | Permittivity Target ($\varepsilon_r$) | Delta (σ) (%) | Delta ($\varepsilon_r$) (%) | Limit (%) | Date |
|---|---|---|---|---|---|---|---|---|---|---|
| 750 | Body | 22.5 | 0.963 | 54.228 | 0.96 | 55.50 | 0.31 | -2.29 | ±5 | 2015.07.16 |
| 835 | Body | 22.4 | 0.994 | 54.578 | 0.97 | 55.20 | 2.47 | -1.13 | ±5 | 2015.07.15 |
| 1750 | Body | 22.5 | 1.498 | 53.247 | 1.49 | 53.40 | 0.54 | -0.29 | ±5 | 2015.07.10 |
| 1900 | Body | 22.5 | 1.527 | 55.253 | 1.52 | 53.30 | 0.46 | 3.66 | ±5 | 2015.07.10 |
| 2450 | Body | 22.6 | 1.949 | 53.894 | 1.95 | 52.70 | -0.05 | 2.27 | ±5 | 2015.08.04 |
| 5200 | Body | 22.7 | 5.162 | 48.492 | 5.30 | 49.00 | -2.60 | -1.04 | ±5 | 2015.08.07 |
| 5800 | Body | 22.7 | 5.976 | 47.158 | 6.00 | 48.20 | -0.40 | -2.16 | ±5 | 2015.08.07 |

## 10.2 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

| Date | Frequency (MHz) | Tissue Type | Input Power (mW) | Dipole S/N | Probe S/N | DAE S/N | Measured SAR (W/kg) | Targeted SAR (W/kg) | Normalized SAR (W/kg) | Deviation (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2015.07.16 | 750 | Body | 250 | 1065 | 3911 | 1358 | 2.17 | 8.64 | 8.68 | 0.46 |
| 2015.07.15 | 835 | Body | 250 | 4d091 | 3911 | 1358 | 2.51 | 9.60 | 10.04 | 4.58 |
| 2015.07.10 | 1750 | Body | 250 | 1069 | 3911 | 1358 | 9.51 | 38.10 | 38.04 | -0.16 |
| 2015.07.10 | 1900 | Body | 250 | 5d118 | 3911 | 1358 | 10.10 | 40.00 | 40.4 | 1.00 |
| 2015.08.04 | 2450 | Body | 250 | 840 | 3911 | 1358 | 12.80 | 51.00 | 51.2 | 0.39 |
| 2015.08.07 | 5200 | Body | 100 | 1113 | 3857 | 1210 | 7.01 | 74.90 | 70.1 | -6.41 |
| 2015.08.07 | 5800 | Body | 100 | 1113 | 3857 | 1210 | 7.03 | 75.40 | 70.3 | -6.76 |

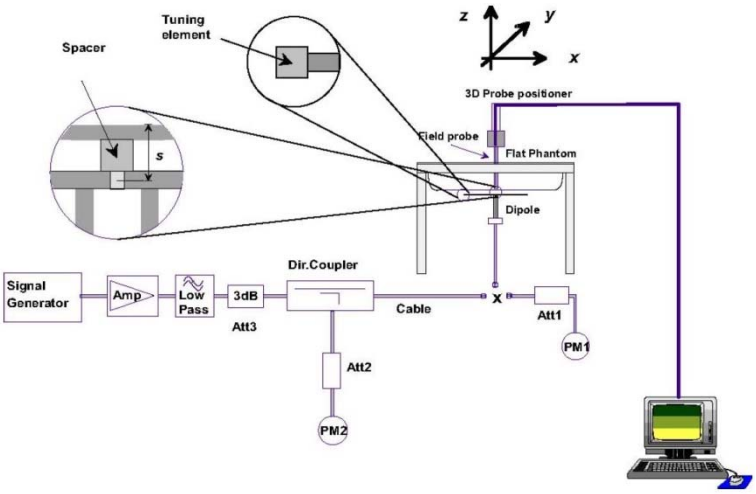



Fig 8.3.1 System Performance Check Setup

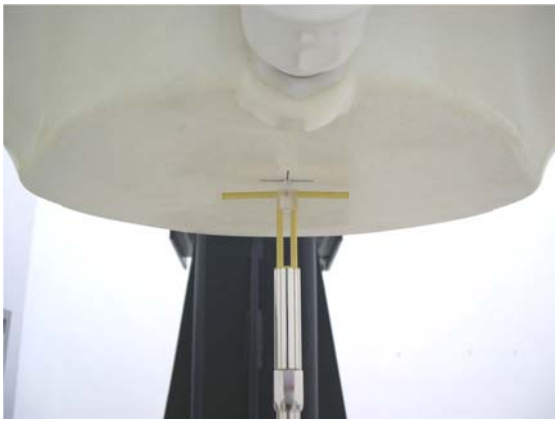


Fig 8.3.2 Setup Photo

# 11. RF Exposure Positions

## 11.1 Body Position

(a) To position the device parallel to the phantom surface with all sides and either keypad up or down.
(b) To adjust the device parallel to the flat phantom.
(c) To adjust the distance between the device and the flat phantom to 1 cm.

**<EUT Setup Photos>**

Please refer to Appendix D for the test setup photos.

# 12. Conducted RF Output Power (Unit: dBm)

**<CDMA2000 Conducted Power>**

**General Note:**

1. Per KDB 941225 D01v03, in Hotspot mode EUT is treated as data device and SAR is tested with Ev-Do Rev 0 (RTAP 153.6kbps) as the primary mode.

| Band | CDMA2000 BC0 | | | CDMA2000 BC1 | | |
|---|---|---|---|---|---|---|
| TX Channel | 1013 | 384 | 777 | 25 | 600 | 1175 |
| Frequency (MHz) | 824.7 | 836.52 | 848.31 | 1851.25 | 1880 | 1908.75 |
| 1xRTT RC1 SO55 | 24.06 | 24.18 | 24.15 | 23.63 | 23.17 | 23.27 |
| 1xRTT RC3 SO55 | 24.07 | 24.19 | 24.16 | 23.89 | 23.36 | 23.33 |
| 1xRTT RC3 SO32 (+ F-SCH) | 24.06 | 24.16 | 24.15 | 23.77 | 23.25 | 23.27 |
| 1xRTT RC3 SO32 (+SCH) | 24.12 | 24.18 | 24.17 | 23.79 | 23.23 | 23.25 |
| 1xEV-DO Rev 0 (RTAP 153.6kbps) | 24.09 | 24.15 | 24.13 | 23.84 | 23.31 | 23.29 |
| 1xEV-DO Rev A (RETAP 4096bits) | 24.03 | 24.14 | 24.12 | 23.75 | 23.19 | 23.17 |

## <LTE Conducted Power>

**General Note:**

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r03, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r03, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r03, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r03, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r03, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, smaller bandwidth SAR testing is not required.

**<LTE Band 12>**

| BW [MHz] | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune up Limit (dBm) | MPR (dB) |
|---|---|---|---|---|---|---|---|---|
| Channel | | | | 23060 | 23095 | 23130 | | |
| Frequency (MHz) | | | | 704 | 707.5 | 711 | | |
| 10 | QPSK | 1 | 0 | 22.48 | 22.67 | 22.50 | 24.00 | 0 |
| 10 | QPSK | 1 | 24 | 22.34 | 22.68 | 22.92 | | |
| 10 | QPSK | 1 | 49 | 22.64 | 22.78 | 22.93 | | |
| 10 | QPSK | 25 | 0 | 21.34 | 21.62 | 21.59 | 23.00 | 0-1 |
| 10 | QPSK | 25 | 12 | 21.33 | 21.55 | 21.65 | | |
| 10 | QPSK | 25 | 24 | 21.42 | 21.77 | 21.65 | | |
| 10 | QPSK | 50 | 0 | 21.53 | 21.68 | 21.62 | | |
| 10 | 16QAM | 1 | 0 | 21.12 | 22.23 | 22.07 | 23.00 | 0-1 |
| 10 | 16QAM | 1 | 24 | 21.55 | 21.97 | 21.86 | | |
| 10 | 16QAM | 1 | 49 | 21.91 | 21.79 | 22.31 | | |
| 10 | 16QAM | 25 | 0 | 20.36 | 20.41 | 20.63 | 22.00 | 0-2 |
| 10 | 16QAM | 25 | 12 | 20.42 | 20.55 | 20.66 | | |
| 10 | 16QAM | 25 | 24 | 20.41 | 20.72 | 20.63 | | |
| 10 | 16QAM | 50 | 0 | 20.37 | 20.55 | 20.72 | | |
| Channel | | | | 23035 | 23095 | 23155 | Tune up Limit (dBm) | MPR (dB) |
| Frequency (MHz) | | | | 701.5 | 707.5 | 713.5 | | |
| 5 | QPSK | 1 | 0 | 22.47 | 22.69 | 22.52 | 24.00 | 0 |
| 5 | QPSK | 1 | 12 | 22.11 | 22.46 | 22.97 | | |
| 5 | QPSK | 1 | 24 | 22.61 | 22.66 | 22.77 | | |
| 5 | QPSK | 12 | 0 | 21.31 | 21.58 | 21.61 | 23.00 | 0-1 |
| 5 | QPSK | 12 | 6 | 21.36 | 21.70 | 21.69 | | |
| 5 | QPSK | 12 | 11 | 21.39 | 21.74 | 21.75 | | |
| 5 | QPSK | 25 | 0 | 21.48 | 21.62 | 21.84 | | |
| 5 | 16QAM | 1 | 0 | 22.00 | 21.85 | 21.68 | 23.00 | 0-1 |
| 5 | 16QAM | 1 | 12 | 21.59 | 21.93 | 21.83 | | |
| 5 | 16QAM | 1 | 24 | 21.51 | 21.89 | 22.36 | | |
| 5 | 16QAM | 12 | 0 | 20.25 | 20.50 | 20.66 | 22.00 | 0-2 |
| 5 | 16QAM | 12 | 6 | 20.37 | 20.55 | 20.79 | | |
| 5 | 16QAM | 12 | 11 | 20.43 | 20.76 | 20.80 | | |
| 5 | 16QAM | 25 | 0 | 20.47 | 20.69 | 20.53 | | |
| Channel | | | | 23025 | 23095 | 23165 | Tune up Limit (dBm) | MPR (dB) |
| Frequency (MHz) | | | | 700.5 | 707.5 | 714.5 | | |
| 3 | QPSK | 1 | 0 | 22.36 | 22.60 | 22.50 | 24.00 | 0 |
| 3 | QPSK | 1 | 7 | 22.41 | 23.21 | 22.96 | | |
| 3 | QPSK | 1 | 14 | 22.61 | 22.64 | 22.95 | | |
| 3 | QPSK | 8 | 0 | 21.32 | 21.58 | 21.72 | 23.00 | 0-1 |
| 3 | QPSK | 8 | 4 | 21.34 | 21.67 | 21.90 | | |
| 3 | QPSK | 8 | 7 | 21.29 | 21.62 | 21.81 | | |
| 3 | QPSK | 15 | 0 | 21.29 | 21.60 | 21.85 | | |
| 3 | 16QAM | 1 | 0 | 21.35 | 21.59 | 21.76 | 23.00 | 0-1 |
| 3 | 16QAM | 1 | 7 | 21.60 | 21.95 | 22.44 | | |
| 3 | 16QAM | 1 | 14 | 21.39 | 21.68 | 22.60 | | |
| 3 | 16QAM | 8 | 0 | 20.28 | 20.60 | 20.77 | 22.00 | 0-2 |
| 3 | 16QAM | 8 | 4 | 20.38 | 20.76 | 20.83 | | |
| 3 | 16QAM | 8 | 7 | 20.10 | 20.79 | 21.03 | | |
| 3 | 16QAM | 15 | 0 | 20.41 | 20.64 | 20.84 | | |

| Channel | | | | 23017 | 23095 | 23173 | Tune up Limit (dBm) | Target MPR (dB) |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | | | | 699.7 | 707.5 | 715.3 | | |
| 1.4 | QPSK | 1 | 0 | 22.47 | 22.63 | 22.68 | 24.00 | 0 |
| 1.4 | QPSK | 1 | 2 | 22.22 | 22.71 | 23.03 | | |
| 1.4 | QPSK | 1 | 5 | 22.27 | 22.71 | 22.93 | | |
| 1.4 | QPSK | 3 | 0 | 22.40 | 22.56 | 22.95 | | |
| 1.4 | QPSK | 3 | 1 | 22.30 | 22.65 | 23.21 | | |
| 1.4 | QPSK | 3 | 2 | 22.43 | 22.77 | 22.96 | | |
| 1.4 | QPSK | 6 | 0 | 21.36 | 21.69 | 21.81 | 23.00 | 0-1 |
| 1.4 | 16QAM | 1 | 0 | 21.81 | 22.10 | 22.08 | 23.00 | 0-1 |
| 1.4 | 16QAM | 1 | 2 | 21.33 | 21.92 | 22.55 | | |
| 1.4 | 16QAM | 1 | 5 | 21.47 | 22.05 | 22.76 | | |
| 1.4 | 16QAM | 3 | 0 | 21.32 | 21.70 | 22.01 | | |
| 1.4 | 16QAM | 3 | 1 | 21.41 | 21.75 | 22.08 | | |
| 1.4 | 16QAM | 3 | 2 | 21.36 | 21.84 | 21.71 | | |
| 1.4 | 16QAM | 6 | 0 | 20.41 | 20.55 | 20.81 | 22.00 | 0-2 |

**<LTE Band 13>**

| BW [MHz] | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune up Limit (dBm) | MPR (dB) |
|---|---|---|---|---|---|---|---|---|
| Channel | | | | | 23230 | | | |
| Frequency (MHz) | | | | | 782 | | | |
| 10 | QPSK | 1 | 0 | | 22.72 | | 23.50 | 0 |
| 10 | QPSK | 1 | 24 | | 22.54 | | | |
| 10 | QPSK | 1 | 49 | | 22.43 | | | |
| 10 | QPSK | 25 | 0 | | 21.67 | | 22.50 | 0-1 |
| 10 | QPSK | 25 | 12 | | 21.52 | | | |
| 10 | QPSK | 25 | 24 | | 21.51 | | | |
| 10 | QPSK | 50 | 0 | | 21.73 | | | |
| 10 | 16QAM | 1 | 0 | | 22.14 | | 22.50 | 0-1 |
| 10 | 16QAM | 1 | 24 | | 22.05 | | | |
| 10 | 16QAM | 1 | 49 | | 21.65 | | | |
| 10 | 16QAM | 25 | 0 | | 20.61 | | 21.50 | 0-2 |
| 10 | 16QAM | 25 | 12 | | 20.58 | | | |
| 10 | 16QAM | 25 | 24 | | 20.48 | | | |
| 10 | 16QAM | 50 | 0 | | 20.72 | | | |
| Channel | | | | 23205 | 23230 | 23255 | Tune up Limit (dBm) | MPR (dB) |
| Frequency (MHz) | | | | 779.5 | 782 | 784.5 | | |
| 5 | QPSK | 1 | 0 | 22.75 | 22.55 | 22.52 | 23.50 | 0 |
| 5 | QPSK | 1 | 12 | 22.70 | 22.62 | 22.46 | | |
| 5 | QPSK | 1 | 24 | 22.39 | 22.50 | 22.57 | | |
| 5 | QPSK | 12 | 0 | 21.66 | 21.55 | 21.58 | 22.50 | 0-1 |
| 5 | QPSK | 12 | 6 | 21.68 | 21.57 | 21.63 | | |
| 5 | QPSK | 12 | 11 | 21.62 | 21.61 | 21.62 | | |
| 5 | QPSK | 25 | 0 | 21.56 | 21.49 | 21.54 | | |
| 5 | 16QAM | 1 | 0 | 22.21 | 21.75 | 22.05 | 22.50 | 0-1 |
| 5 | 16QAM | 1 | 12 | 21.85 | 21.79 | 21.93 | | |
| 5 | 16QAM | 1 | 24 | 21.89 | 22.07 | 22.01 | | |
| 5 | 16QAM | 12 | 0 | 20.79 | 20.58 | 20.72 | 21.50 | 0-2 |
| 5 | 16QAM | 12 | 6 | 20.67 | 20.62 | 20.60 | | |
| 5 | 16QAM | 12 | 11 | 20.54 | 20.51 | 20.55 | | |
| 5 | 16QAM | 25 | 0 | 20.62 | 20.66 | 20.65 | | |

**<LTE Band 5>**

| BW [MHz] | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune up Limit (dBm) | MPR (dB) |
|---|---|---|---|---|---|---|---|---|
| Channel | | | | 20450 | 20525 | 20600 | | |
| Frequency (MHz) | | | | 829 | 836.5 | 844 | | |
| 10 | QPSK | 1 | 0 | 22.60 | 22.85 | 22.88 | 23.50 | 0 |
| 10 | QPSK | 1 | 24 | 22.94 | 22.79 | 22.55 | | |
| 10 | QPSK | 1 | 49 | 22.67 | 22.67 | 22.67 | | |
| 10 | QPSK | 25 | 0 | 21.68 | 21.82 | 21.72 | 22.50 | 0-1 |
| 10 | QPSK | 25 | 12 | 21.68 | 21.63 | 21.67 | | |
| 10 | QPSK | 25 | 24 | 21.56 | 21.70 | 21.64 | | |
| 10 | QPSK | 50 | 0 | 21.63 | 21.60 | 21.68 | | |
| 10 | 16QAM | 1 | 0 | 22.41 | 22.29 | 22.12 | 22.50 | 0-1 |
| 10 | 16QAM | 1 | 24 | 21.76 | 21.61 | 21.81 | | |
| 10 | 16QAM | 1 | 49 | 21.54 | 22.13 | 21.86 | | |
| 10 | 16QAM | 25 | 0 | 20.77 | 20.74 | 20.65 | 21.50 | 0-2 |
| 10 | 16QAM | 25 | 12 | 20.75 | 20.56 | 20.64 | | |
| 10 | 16QAM | 25 | 24 | 20.57 | 20.74 | 20.50 | | |
| 10 | 16QAM | 50 | 0 | 20.68 | 20.65 | 20.60 | | |
| Channel | | | | 20425 | 20525 | 20625 | Tune up Limit (dBm) | MPR (dB) |
| Frequency (MHz) | | | | 826.5 | 836.5 | 846.5 | | |
| 5 | QPSK | 1 | 0 | 22.78 | 22.74 | 22.79 | 23.50 | 0 |
| 5 | QPSK | 1 | 12 | 22.73 | 22.45 | 22.63 | | |
| 5 | QPSK | 1 | 24 | 22.72 | 22.75 | 22.62 | | |
| 5 | QPSK | 12 | 0 | 21.71 | 21.60 | 21.57 | 22.50 | 0-1 |
| 5 | QPSK | 12 | 6 | 21.77 | 21.68 | 21.67 | | |
| 5 | QPSK | 12 | 11 | 21.70 | 21.75 | 21.62 | | |
| 5 | QPSK | 25 | 0 | 21.82 | 21.65 | 21.63 | | |
| 5 | 16QAM | 1 | 0 | 21.78 | 21.84 | 22.14 | 22.50 | 0-1 |
| 5 | 16QAM | 1 | 12 | 22.33 | 22.20 | 22.18 | | |
| 5 | 16QAM | 1 | 24 | 21.84 | 21.88 | 21.75 | | |
| 5 | 16QAM | 12 | 0 | 20.77 | 20.68 | 20.68 | 21.50 | 0-2 |
| 5 | 16QAM | 12 | 6 | 20.57 | 20.50 | 20.60 | | |
| 5 | 16QAM | 12 | 11 | 20.58 | 20.62 | 20.65 | | |
| 5 | 16QAM | 25 | 0 | 20.80 | 20.67 | 20.78 | | |
| Channel | | | | 20415 | 20525 | 20635 | Tune up Limit (dBm) | MPR (dB) |
| Frequency (MHz) | | | | 825.5 | 836.5 | 847.5 | | |
| 3 | QPSK | 1 | 0 | 22.64 | 22.80 | 22.78 | 23.50 | 0 |
| 3 | QPSK | 1 | 7 | 22.75 | 22.57 | 23.09 | | |
| 3 | QPSK | 1 | 14 | 22.62 | 22.54 | 22.89 | | |
| 3 | QPSK | 8 | 0 | 21.63 | 21.66 | 21.76 | 22.50 | 0-1 |
| 3 | QPSK | 8 | 4 | 21.56 | 21.65 | 21.71 | | |
| 3 | QPSK | 8 | 7 | 21.66 | 21.62 | 21.65 | | |
| 3 | QPSK | 15 | 0 | 21.70 | 21.65 | 21.90 | | |
| 3 | 16QAM | 1 | 0 | 21.75 | 22.06 | 21.86 | 22.50 | 0-1 |
| 3 | 16QAM | 1 | 7 | 22.45 | 21.79 | 22.41 | | |
| 3 | 16QAM | 1 | 14 | 21.77 | 21.79 | 21.76 | | |
| 3 | 16QAM | 8 | 0 | 21.05 | 20.84 | 20.74 | 21.50 | 0-2 |
| 3 | 16QAM | 8 | 4 | 20.55 | 20.75 | 20.59 | | |
| 3 | 16QAM | 8 | 7 | 21.07 | 20.91 | 20.72 | | |
| 3 | 16QAM | 15 | 0 | 20.85 | 20.84 | 20.85 | | |

| Channel | | | | 20407 | 20525 | 20643 | Tune up Limit (dBm) | Target MPR (dB) |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | | | | 824.7 | 836.5 | 848.3 | | |
| 1.4 | QPSK | 1 | 0 | 23.03 | 22.52 | 23.09 | 23.50 | 0 |
| 1.4 | QPSK | 1 | 2 | 22.63 | 22.91 | 22.82 | | |
| 1.4 | QPSK | 1 | 5 | 23.00 | 22.88 | 23.05 | | |
| 1.4 | QPSK | 3 | 0 | 22.69 | 22.52 | 22.73 | | |
| 1.4 | QPSK | 3 | 1 | 22.84 | 22.69 | 22.82 | | |
| 1.4 | QPSK | 3 | 2 | 22.85 | 22.74 | 23.00 | | |
| 1.4 | QPSK | 6 | 0 | 21.76 | 21.81 | 21.70 | 22.50 | 0-1 |
| 1.4 | 16QAM | 1 | 0 | 21.74 | 22.17 | 21.74 | 22.50 | 0-1 |
| 1.4 | 16QAM | 1 | 2 | 21.94 | 21.41 | 22.45 | | |
| 1.4 | 16QAM | 1 | 5 | 22.46 | 21.90 | 21.92 | | |
| 1.4 | 16QAM | 3 | 0 | 21.92 | 21.71 | 21.81 | | |
| 1.4 | 16QAM | 3 | 1 | 21.56 | 21.78 | 21.76 | | |
| 1.4 | 16QAM | 3 | 2 | 21.80 | 21.50 | 21.83 | | |
| 1.4 | 16QAM | 6 | 0 | 20.78 | 20.51 | 21.13 | 21.50 | 0-2 |

**<LTE Band 4>**

| BW [MHz] | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune up Limit (dBm) | MPR (dB) |
|---|---|---|---|---|---|---|---|---|
| Channel | | | | 20050 | 20175 | 20300 | | |
| Frequency (MHz) | | | | 1720 | 1732.5 | 1745 | | |
| 20 | QPSK | 1 | 0 | 21.97 | 22.02 | 21.83 | 22.30 | 0 |
| 20 | QPSK | 1 | 49 | 21.27 | 21.33 | 21.25 | | |
| 20 | QPSK | 1 | 99 | 21.30 | 21.36 | 21.28 | | |
| 20 | QPSK | 50 | 0 | 20.38 | 20.39 | 20.37 | 21.30 | 0-1 |
| 20 | QPSK | 50 | 24 | 20.28 | 20.33 | 20.33 | | |
| 20 | QPSK | 50 | 49 | 20.30 | 20.38 | 20.25 | | |
| 20 | QPSK | 100 | 0 | 20.31 | 20.34 | 20.32 | | |
| 20 | 16QAM | 1 | 0 | 21.22 | 21.25 | 21.08 | 21.30 | 0-1 |
| 20 | 16QAM | 1 | 49 | 20.41 | 20.37 | 20.33 | | |
| 20 | 16QAM | 1 | 99 | 20.40 | 20.55 | 20.53 | | |
| 20 | 16QAM | 50 | 0 | 19.33 | 19.39 | 19.41 | 20.30 | 0-2 |
| 20 | 16QAM | 50 | 24 | 19.36 | 19.37 | 19.19 | | |
| 20 | 16QAM | 50 | 49 | 19.37 | 19.36 | 19.15 | | |
| 20 | 16QAM | 100 | 0 | 19.38 | 19.35 | 19.42 | | |
| Channel | | | | 20025 | 20175 | 20325 | Tune up Limit (dBm) | MPR (dB) |
| Frequency (MHz) | | | | 1717.5 | 1732.5 | 1747.5 | | |
| 15 | QPSK | 1 | 0 | 21.72 | 21.69 | 21.63 | 22.30 | 0 |
| 15 | QPSK | 1 | 37 | 21.09 | 21.09 | 20.95 | | |
| 15 | QPSK | 1 | 74 | 21.17 | 21.11 | 21.17 | | |
| 15 | QPSK | 36 | 0 | 20.27 | 20.26 | 20.35 | 21.30 | 0-1 |
| 15 | QPSK | 36 | 18 | 20.10 | 20.08 | 20.21 | | |
| 15 | QPSK | 36 | 37 | 20.04 | 20.03 | 20.09 | | |
| 15 | QPSK | 75 | 0 | 20.16 | 20.22 | 20.18 | | |
| 15 | 16QAM | 1 | 0 | 20.88 | 20.93 | 20.87 | 21.30 | 0-1 |
| 15 | 16QAM | 1 | 37 | 20.21 | 20.28 | 20.43 | | |
| 15 | 16QAM | 1 | 74 | 20.47 | 20.29 | 20.40 | | |
| 15 | 16QAM | 36 | 0 | 19.31 | 19.22 | 19.41 | 20.30 | 0-2 |
| 15 | 16QAM | 36 | 18 | 19.08 | 19.05 | 19.19 | | |
| 15 | 16QAM | 36 | 37 | 19.30 | 19.01 | 19.07 | | |
| 15 | 16QAM | 75 | 0 | 19.27 | 19.22 | 19.26 | | |
| Channel | | | | 20000 | 20175 | 20350 | Tune up Limit (dBm) | MPR (dB) |
| Frequency (MHz) | | | | 1715 | 1732.5 | 1750 | | |
| 10 | QPSK | 1 | 0 | 21.51 | 21.23 | 21.24 | 22.30 | 0 |
| 10 | QPSK | 1 | 24 | 21.22 | 20.91 | 20.92 | | |
| 10 | QPSK | 1 | 49 | 21.14 | 21.02 | 20.86 | | |
| 10 | QPSK | 25 | 0 | 20.33 | 20.10 | 20.02 | 21.30 | 0-1 |
| 10 | QPSK | 25 | 12 | 20.12 | 19.94 | 19.87 | | |
| 10 | QPSK | 25 | 24 | 20.13 | 19.91 | 19.84 | | |
| 10 | QPSK | 50 | 0 | 20.30 | 20.01 | 19.94 | | |
| 10 | 16QAM | 1 | 0 | 20.75 | 20.66 | 20.54 | 21.30 | 0-1 |
| 10 | 16QAM | 1 | 24 | 20.53 | 20.25 | 20.14 | | |
| 10 | 16QAM | 1 | 49 | 20.45 | 20.27 | 20.12 | | |
| 10 | 16QAM | 25 | 0 | 19.31 | 19.09 | 19.01 | 20.30 | 0-2 |
| 10 | 16QAM | 25 | 12 | 19.13 | 18.93 | 18.91 | | |
| 10 | 16QAM | 25 | 24 | 19.10 | 18.88 | 18.84 | | |
| 10 | 16QAM | 50 | 0 | 19.22 | 18.99 | 18.93 | | |

| Channel | | | | 19975 | 20175 | 20375 | Tune up Limit (dBm) | MPR (dB) |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | | | | 1712.5 | 1732.5 | 1752.5 | | |
| 5 | QPSK | 1 | 0 | 21.46 | 21.07 | 21.06 | 22.30 | 0 |
| 5 | QPSK | 1 | 12 | 21.34 | 20.91 | 20.69 | | |
| 5 | QPSK | 1 | 24 | 21.23 | 20.79 | 20.68 | | |
| 5 | QPSK | 12 | 0 | 20.30 | 19.93 | 19.80 | 21.30 | 0-1 |
| 5 | QPSK | 12 | 6 | 20.36 | 19.86 | 19.73 | | |
| 5 | QPSK | 12 | 11 | 20.27 | 19.87 | 19.72 | | |
| 5 | QPSK | 25 | 0 | 20.33 | 19.92 | 19.69 | | |
| 5 | 16QAM | 1 | 0 | 20.65 | 20.21 | 20.12 | 21.30 | 0-1 |
| 5 | 16QAM | 1 | 12 | 20.71 | 20.30 | 20.05 | | |
| 5 | 16QAM | 1 | 24 | 20.48 | 20.11 | 19.93 | | |
| 5 | 16QAM | 12 | 0 | 19.23 | 18.93 | 18.80 | 20.30 | 0-2 |
| 5 | 16QAM | 12 | 6 | 19.27 | 18.85 | 18.70 | | |
| 5 | 16QAM | 12 | 11 | 19.18 | 18.85 | 18.80 | | |
| 5 | 16QAM | 25 | 0 | 19.35 | 18.94 | 18.70 | | |
| Channel | | | | 19965 | 20175 | 20385 | Tune up Limit (dBm) | MPR (dB) |
| Frequency (MHz) | | | | 1711.5 | 1732.5 | 1753.5 | | |
| 3 | QPSK | 1 | 0 | 21.33 | 20.90 | 20.79 | 22.30 | 0 |
| 3 | QPSK | 1 | 7 | 21.31 | 21.37 | 21.09 | | |
| 3 | QPSK | 1 | 14 | 21.17 | 20.98 | 20.72 | | |
| 3 | QPSK | 8 | 0 | 20.29 | 19.90 | 19.75 | 21.30 | 0-1 |
| 3 | QPSK | 8 | 4 | 20.19 | 20.02 | 19.71 | | |
| 3 | QPSK | 8 | 7 | 20.20 | 19.97 | 19.63 | | |
| 3 | QPSK | 15 | 0 | 20.27 | 20.03 | 19.71 | | |
| 3 | 16QAM | 1 | 0 | 20.53 | 20.20 | 19.90 | 21.30 | 0-1 |
| 3 | 16QAM | 1 | 7 | 20.74 | 20.38 | 20.14 | | |
| 3 | 16QAM | 1 | 14 | 20.45 | 20.20 | 19.86 | | |
| 3 | 16QAM | 8 | 0 | 19.34 | 19.01 | 18.84 | 20.30 | 0-2 |
| 3 | 16QAM | 8 | 4 | 19.23 | 19.08 | 18.73 | | |
| 3 | 16QAM | 8 | 7 | 19.28 | 19.07 | 18.64 | | |
| 3 | 16QAM | 15 | 0 | 19.28 | 19.03 | 18.75 | | |
| Channel | | | | 19957 | 20175 | 20393 | Tune up Limit (dBm) | MPR (dB) |
| Frequency (MHz) | | | | 1710.7 | 1732.5 | 1754.3 | | |
| 1.4 | QPSK | 1 | 0 | 21.42 | 21.15 | 20.84 | 22.30 | 0 |
| 1.4 | QPSK | 1 | 2 | 21.37 | 21.06 | 20.87 | | |
| 1.4 | QPSK | 1 | 5 | 21.32 | 21.06 | 20.78 | | |
| 1.4 | QPSK | 3 | 0 | 21.17 | 20.91 | 20.66 | | |
| 1.4 | QPSK | 3 | 1 | 21.29 | 20.94 | 20.82 | | |
| 1.4 | QPSK | 3 | 2 | 21.29 | 21.05 | 20.81 | | |
| 1.4 | QPSK | 6 | 0 | 20.20 | 19.90 | 19.71 | 21.30 | 0-1 |
| 1.4 | 16QAM | 1 | 0 | 20.69 | 20.39 | 20.09 | 21.30 | 0-1 |
| 1.4 | 16QAM | 1 | 2 | 20.60 | 20.28 | 20.10 | | |
| 1.4 | 16QAM | 1 | 5 | 20.56 | 20.27 | 20.06 | | |
| 1.4 | 16QAM | 3 | 0 | 20.18 | 19.98 | 19.72 | | |
| 1.4 | 16QAM | 3 | 1 | 20.23 | 19.89 | 19.74 | | |
| 1.4 | 16QAM | 3 | 2 | 20.28 | 20.04 | 19.80 | | |
| 1.4 | 16QAM | 6 | 0 | 19.26 | 18.97 | 18.81 | 20.30 | 0-2 |

**<LTE Band 2>**

| BW [MHz] | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune up Limit (dBm) | MPR (dB) |
|---|---|---|---|---|---|---|---|---|
| Channel | | | | 18700 | 18900 | 19100 | | |
| Frequency (MHz) | | | | 1860 | 1880 | 1900 | | |
| 20 | QPSK | 1 | 0 | 22.98 | 23.11 | 23.10 | 23.50 | 0 |
| 20 | QPSK | 1 | 49 | 22.32 | 22.43 | 22.45 | | |
| 20 | QPSK | 1 | 99 | 22.36 | 22.44 | 22.49 | | |
| 20 | QPSK | 50 | 0 | 21.54 | 21.55 | 21.52 | 22.50 | 0-1 |
| 20 | QPSK | 50 | 24 | 21.30 | 21.42 | 21.43 | | |
| 20 | QPSK | 50 | 49 | 21.28 | 21.42 | 21.48 | | |
| 20 | QPSK | 100 | 0 | 21.38 | 21.47 | 21.41 | | |
| 20 | 16QAM | 1 | 0 | 22.28 | 22.23 | 22.42 | 22.50 | 0-1 |
| 20 | 16QAM | 1 | 49 | 21.42 | 21.42 | 21.49 | | |
| 20 | 16QAM | 1 | 99 | 21.60 | 21.61 | 21.74 | | |
| 20 | 16QAM | 50 | 0 | 20.61 | 20.54 | 20.52 | 21.50 | 0-2 |
| 20 | 16QAM | 50 | 24 | 20.34 | 20.50 | 20.43 | | |
| 20 | 16QAM | 50 | 49 | 20.33 | 20.49 | 20.46 | | |
| 20 | 16QAM | 100 | 0 | 20.41 | 20.48 | 20.41 | | |
| Channel | | | | 18675 | 18900 | 19125 | Tune up Limit (dBm) | MPR (dB) |
| Frequency (MHz) | | | | 1857.5 | 1880 | 1902.5 | | |
| 15 | QPSK | 1 | 0 | 22.74 | 22.82 | 22.81 | 23.50 | 0 |
| 15 | QPSK | 1 | 37 | 22.17 | 22.19 | 22.13 | | |
| 15 | QPSK | 1 | 74 | 22.19 | 22.21 | 22.43 | | |
| 15 | QPSK | 36 | 0 | 21.42 | 21.36 | 21.48 | 22.50 | 0-1 |
| 15 | QPSK | 36 | 18 | 21.27 | 21.38 | 21.31 | | |
| 15 | QPSK | 36 | 37 | 21.16 | 21.41 | 21.26 | | |
| 15 | QPSK | 75 | 0 | 21.25 | 21.18 | 21.37 | | |
| 15 | 16QAM | 1 | 0 | 22.08 | 22.05 | 22.09 | 22.50 | 0-1 |
| 15 | 16QAM | 1 | 37 | 21.58 | 21.27 | 21.41 | | |
| 15 | 16QAM | 1 | 74 | 21.48 | 21.50 | 21.65 | | |
| 15 | 16QAM | 36 | 0 | 20.43 | 20.34 | 20.51 | 21.50 | 0-2 |
| 15 | 16QAM | 36 | 18 | 20.26 | 20.39 | 20.28 | | |
| 15 | 16QAM | 36 | 37 | 20.14 | 20.39 | 20.24 | | |
| 15 | 16QAM | 75 | 0 | 20.32 | 20.22 | 20.39 | | |
| Channel | | | | 18650 | 18900 | 19150 | Tune up Limit (dBm) | MPR (dB) |
| Frequency (MHz) | | | | 1855 | 1880 | 1905 | | |
| 10 | QPSK | 1 | 0 | 22.61 | 22.21 | 22.10 | 23.50 | 0 |
| 10 | QPSK | 1 | 24 | 22.25 | 21.98 | 21.82 | | |
| 10 | QPSK | 1 | 49 | 22.25 | 21.82 | 22.00 | | |
| 10 | QPSK | 25 | 0 | 21.42 | 20.96 | 20.85 | 22.50 | 0-1 |
| 10 | QPSK | 25 | 12 | 21.24 | 20.92 | 20.75 | | |
| 10 | QPSK | 25 | 24 | 21.21 | 20.89 | 20.80 | | |
| 10 | QPSK | 50 | 0 | 21.28 | 20.93 | 20.79 | | |
| 10 | 16QAM | 1 | 0 | 21.93 | 21.59 | 21.39 | 22.50 | 0-1 |
| 10 | 16QAM | 1 | 24 | 21.54 | 21.28 | 21.07 | | |
| 10 | 16QAM | 1 | 49 | 21.55 | 21.10 | 21.17 | | |
| 10 | 16QAM | 25 | 0 | 20.42 | 19.99 | 19.84 | 21.50 | 0-2 |
| 10 | 16QAM | 25 | 12 | 20.23 | 19.91 | 19.75 | | |
| 10 | 16QAM | 25 | 24 | 20.25 | 19.87 | 19.82 | | |
| 10 | 16QAM | 50 | 0 | 20.29 | 19.94 | 19.79 | | |

| Channel | | | | 18625 | 18900 | 19175 | Tune up Limit (dBm) | MPR (dB) |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | | | | 1852.5 | 1880 | 1907.5 | | |
| 5 | QPSK | 1 | 0 | 22.39 | 21.98 | 21.75 | 23.50 | 0 |
| 5 | QPSK | 1 | 12 | 22.27 | 21.91 | 21.72 | | |
| 5 | QPSK | 1 | 24 | 22.33 | 21.88 | 21.70 | | |
| 5 | QPSK | 12 | 0 | 21.25 | 20.94 | 20.75 | 22.50 | 0-1 |
| 5 | QPSK | 12 | 6 | 21.32 | 20.96 | 20.75 | | |
| 5 | QPSK | 12 | 11 | 21.23 | 20.85 | 20.73 | | |
| 5 | QPSK | 25 | 0 | 21.30 | 20.91 | 20.73 | | |
| 5 | 16QAM | 1 | 0 | 21.63 | 21.34 | 21.02 | 22.50 | 0-1 |
| 5 | 16QAM | 1 | 12 | 21.66 | 21.27 | 21.16 | | |
| 5 | 16QAM | 1 | 24 | 21.58 | 21.11 | 21.03 | | |
| 5 | 16QAM | 12 | 0 | 20.25 | 19.93 | 19.74 | 21.50 | 0-2 |
| 5 | 16QAM | 12 | 6 | 20.28 | 19.92 | 19.73 | | |
| 5 | 16QAM | 12 | 11 | 20.16 | 19.82 | 19.69 | | |
| 5 | 16QAM | 25 | 0 | 20.32 | 19.93 | 19.72 | | |
| Channel | | | | 18615 | 18900 | 19185 | Tune up Limit (dBm) | MPR (dB) |
| Frequency (MHz) | | | | 1851.5 | 1880 | 1908.5 | | |
| 3 | QPSK | 1 | 0 | 22.25 | 22.04 | 21.82 | 23.50 | 0 |
| 3 | QPSK | 1 | 7 | 22.49 | 22.07 | 22.26 | | |
| 3 | QPSK | 1 | 14 | 22.35 | 22.01 | 21.77 | | |
| 3 | QPSK | 8 | 0 | 21.27 | 20.98 | 20.77 | 22.50 | 0-1 |
| 3 | QPSK | 8 | 4 | 21.28 | 20.96 | 20.79 | | |
| 3 | QPSK | 8 | 7 | 21.25 | 20.89 | 20.76 | | |
| 3 | QPSK | 15 | 0 | 21.27 | 20.92 | 20.74 | | |
| 3 | 16QAM | 1 | 0 | 21.49 | 21.23 | 20.98 | 22.50 | 0-1 |
| 3 | 16QAM | 1 | 7 | 21.75 | 21.45 | 21.19 | | |
| 3 | 16QAM | 1 | 14 | 21.52 | 21.18 | 20.97 | | |
| 3 | 16QAM | 8 | 0 | 20.37 | 20.00 | 19.82 | 21.50 | 0-2 |
| 3 | 16QAM | 8 | 4 | 20.35 | 19.98 | 19.81 | | |
| 3 | 16QAM | 8 | 7 | 20.31 | 20.00 | 19.82 | | |
| 3 | 16QAM | 15 | 0 | 20.28 | 19.95 | 19.75 | | |
| Channel | | | | 18607 | 18900 | 19193 | Tune up Limit (dBm) | MPR (dB) |
| Frequency (MHz) | | | | 1850.7 | 1880 | 1909.3 | | |
| 1.4 | QPSK | 1 | 0 | 22.32 | 21.98 | 21.83 | 23.50 | 0 |
| 1.4 | QPSK | 1 | 2 | 22.29 | 22.01 | 21.82 | | |
| 1.4 | QPSK | 1 | 5 | 22.25 | 21.95 | 21.74 | | |
| 1.4 | QPSK | 3 | 0 | 22.22 | 21.90 | 21.77 | | |
| 1.4 | QPSK | 3 | 1 | 22.29 | 21.98 | 21.88 | | |
| 1.4 | QPSK | 3 | 2 | 22.30 | 22.02 | 21.81 | | |
| 1.4 | QPSK | 6 | 0 | 21.20 | 20.93 | 20.71 | 22.50 | 0-1 |
| 1.4 | 16QAM | 1 | 0 | 21.64 | 21.34 | 21.14 | 22.50 | 0-1 |
| 1.4 | 16QAM | 1 | 2 | 21.56 | 21.35 | 21.11 | | |
| 1.4 | 16QAM | 1 | 5 | 21.68 | 21.25 | 21.15 | | |
| 1.4 | 16QAM | 3 | 0 | 21.33 | 21.01 | 20.78 | | |
| 1.4 | 16QAM | 3 | 1 | 21.33 | 20.96 | 20.78 | | |
| 1.4 | 16QAM | 3 | 2 | 21.34 | 20.99 | 20.89 | | |
| 1.4 | 16QAM | 6 | 0 | 20.35 | 20.02 | 19.79 | 21.50 | 0-2 |

## LTE Carrier Aggregation Conducted Power

**General Note:**

i. According to KDB941225 D05A v01, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.

ii. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.

iii. The device only supports downlink carrier aggregation. Uplink carrier aggregation is not supported. Power measurements were performed with two DL carriers for the Release 8 configuration that had the highest output power across all bandwidths, channels and RB configuration for each band.

iv. During the carrier aggregation conducted power measurements we have attention to throughput traffic to make sure all the power measurement is corrected.

| | PCC | | | | | | SCC | | | | Measured Power | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LTE Band | BW (MHz) | Freq. (MHz) | Channel | UL# RB | UL RB Offset | LTE Band | BW (MHz) | Freq. (MHz) | Channel | LTE Rel 10 Tx. Power (dBm) | LTE Rel 8 Tx. Power (dBm) |
| Configure | LTE Band 4 | 20M | 1720 | 20050 | 1 | 0 | LTE Band 12 | 10M | 711 | 23130 | 21.95 | 21.97 |
| | LTE Band 4 | 20M | 1732.5 | 20175 | 1 | 0 | LTE Band 12 | 10M | 711 | 23130 | 22.01 | 22.02 |
| | LTE Band 4 | 20M | 1745 | 20300 | 1 | 0 | LTE Band 12 | 10M | 711 | 23130 | 21.86 | 21.83 |
| | LTE Band 2 | 20M | 1860 | 18700 | 1 | 0 | LTE Band 12 | 10M | 711 | 23130 | 22.95 | 22.98 |
| | LTE Band 2 | 20M | 1880 | 18900 | 1 | 0 | LTE Band 12 | 10M | 711 | 23130 | 23.12 | 23.11 |
| | LTE Band 2 | 20M | 1900 | 19100 | 1 | 0 | LTE Band 12 | 10M | 711 | 23130 | 23.08 | 23.1 |
| | LTE Band 12 | 10M | 704 | 23060 | 1 | 49 | LTE Band 2 | 20M | 1880 | 18900 | 22.54 | 22.64 |
| | LTE Band 12 | 10M | 707.5 | 23095 | 1 | 49 | LTE Band 2 | 20M | 1880 | 18900 | 22.82 | 22.78 |
| | LTE Band 12 | 10M | 711 | 23130 | 1 | 49 | LTE Band 2 | 20M | 1880 | 18900 | 22.75 | 22.93 |

**<WLAN Conducted Power>**

**General Note:**

1. For WLAN SAR testing was performed on single antenna RF power in SISO mode is larger or equal to the single antenna RF power in MIMO mode, and for RF exposure assessment of MIMO mode simultaneous transmission exclusion analysis was performed with SAR test results of each antenna in SISO mode.
2. Per KDB 248227 D01v02r01, the simultaneous SAR provisions in KDB publication 447498 should be applied to determine simultaneous transmission SAR test exclusion for WiFi MIMO. If the sum of 1g single transmission chain SAR measurements is < 1.6W/kg and SAR peak to location ratio < 0.04, no additional SAR measurements for MIMO.
3. Per KDB 248227 D01v02r01, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
4. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
5. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
6. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
   a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
   b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
   c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

**<2.4GHz WLAN Antenna 0>**

| | Mode | Channel | Frequency (MHz) | Data Rate | Average power (dBm) | Duty Cycle % |
|---|---|---|---|---|---|---|
| 2.4GHz WLAN Antenna 0 | 802.11b | CH 1 | 2412 | 1Mbps | 14.18 | 100 |
| | | CH 6 | 2437 | | 14.96 | |
| | | CH 11 | 2462 | | 14.26 | |
| | 802.11g | CH 1 | 2412 | 6Mbps | 11.83 | 95.22 |
| | | CH 6 | 2437 | | 13.26 | |
| | | CH 11 | 2462 | | 12.69 | |
| | 802.11n-HT20 | CH 1 | 2412 | MCS0 | 10.36 | 95.07 |
| | | CH 6 | 2437 | | 11.60 | |
| | | CH 11 | 2462 | | 11.77 | |
| | 802.11n-HT40 | CH 3 | 2422 | MCS0 | 9.78 | 90.80 |
| | | CH 6 | 2437 | | 11.18 | |
| | | CH 9 | 2452 | | 11.15 | |

**<2.4GHz WLAN Antenna 1>**

| | Mode | Channel | Frequency (MHz) | Data Rate | Average power (dBm) | Duty Cycle % |
|---|---|---|---|---|---|---|
| 2.4GHz WLAN Antenna 1 | 802.11b | CH 1 | 2412 | 1Mbps | 14.86 | 100 |
| | | CH 6 | 2437 | | 14.16 | |
| | | CH 11 | 2462 | | 14.24 | |
| | 802.11g | CH 1 | 2412 | 6Mbps | 12.28 | 95.39 |
| | | CH 6 | 2437 | | 11.99 | |
| | | CH 11 | 2462 | | 12.55 | |
| | 802.11n-HT20 | CH 1 | 2412 | MCS0 | 11.52 | 94.98 |
| | | CH 6 | 2437 | | 11.06 | |
| | | CH 11 | 2462 | | 11.48 | |
| | 802.11n-HT40 | CH 3 | 2422 | MCS0 | 11.92 | 89.94 |
| | | CH 6 | 2437 | | 11.55 | |
| | | CH 9 | 2452 | | 11.87 | |

**<2.4GHz WLAN Antenna 0+1>**

| | Mode | Channel | Frequency (MHz) | Data Rate | Average power (dBm) | Duty Cycle % |
|---|---|---|---|---|---|---|
| 2.4GHz WLAN Antenna 0+1 | 802.11n-HT20 | CH 1 | 2412 | MCS0 | 10.76 | 95.26 |
| | | CH 6 | 2437 | | 10.89 | |
| | | CH 11 | 2462 | | 11.26 | |
| | 802.11n-HT40 | CH 3 | 2422 | MCS0 | 11.19 | 89.62 |
| | | CH 6 | 2437 | | 11.87 | |
| | | CH 9 | 2452 | | 11.82 | |

**<5GHz WLAN Antenna 0>**

| | Mode | Channel | Frequency (MHz) | Data Rate | Average power (dBm) | Duty Cycle % |
|---|---|---|---|---|---|---|
| 5.2GHz WLAN Antenna 0 | 802.11a | CH 36 | 5180 | 6Mbps | 9.53 | 95.39 |
| | | CH 40 | 5200 | | 9.26 | |
| | | CH 44 | 5220 | | 9.14 | |
| | | CH 48 | 5240 | | 9.21 | |
| | 802.11n-HT20 | CH 36 | 5180 | MCS0 | 9.51 | 94.92 |
| | | CH 40 | 5200 | | 9.30 | |
| | | CH 44 | 5220 | | 9.22 | |
| | | CH 48 | 5240 | | 9.17 | |
| | 802.11n-HT40 | CH 38 | 5190 | MCS0 | 9.75 | 91.35 |
| | | CH 46 | 5230 | | 9.52 | |
| | 802.11ac-VHT20 | CH 36 | 5180 | MCS0 | 9.52 | 94.61 |
| | | CH 40 | 5200 | | 9.35 | |
| | | CH 44 | 5220 | | 9.27 | |
| | | CH 48 | 5240 | | 9.22 | |
| | 802.11ac-VHT40 | CH 38 | 5190 | MCS0 | 8.90 | 90.07 |
| | | CH 46 | 5230 | | 8.76 | |
| | 802.11ac-VHT80 | CH 42 | 5210 | MCS0 | 7.93 | 83.61 |
| 5.8GHz WLAN Antenna 0 | 802.11a | CH 149 | 5745 | MCS0 | 9.43 | 95.39 |
| | | CH 157 | 5785 | | 9.89 | |
| | | CH 165 | 5825 | | 9.59 | |
| | 802.11n-HT20 | CH 149 | 5745 | MCS0 | 9.44 | 94.92 |
| | | CH 157 | 5785 | | 9.88 | |
| | | CH 165 | 5825 | | 9.39 | |
| | 802.11n-HT40 | CH 151 | 5755 | MCS0 | 9.70 | 91.35 |
| | | CH 159 | 5795 | | 9.57 | |
| | 802.11ac-VHT20 | CH 149 | 5745 | MCS0 | 9.50 | 94.61 |
| | | CH 157 | 5785 | | 9.98 | |
| | | CH 165 | 5825 | | 9.55 | |
| | 802.11ac-VHT40 | CH 151 | 5755 | MCS0 | 8.89 | 90.07 |
| | | CH 159 | 5795 | | 8.71 | |
| | 802.11ac-VHT80 | CH 155 | 5775 | MCS0 | 8.09 | 83.51 |

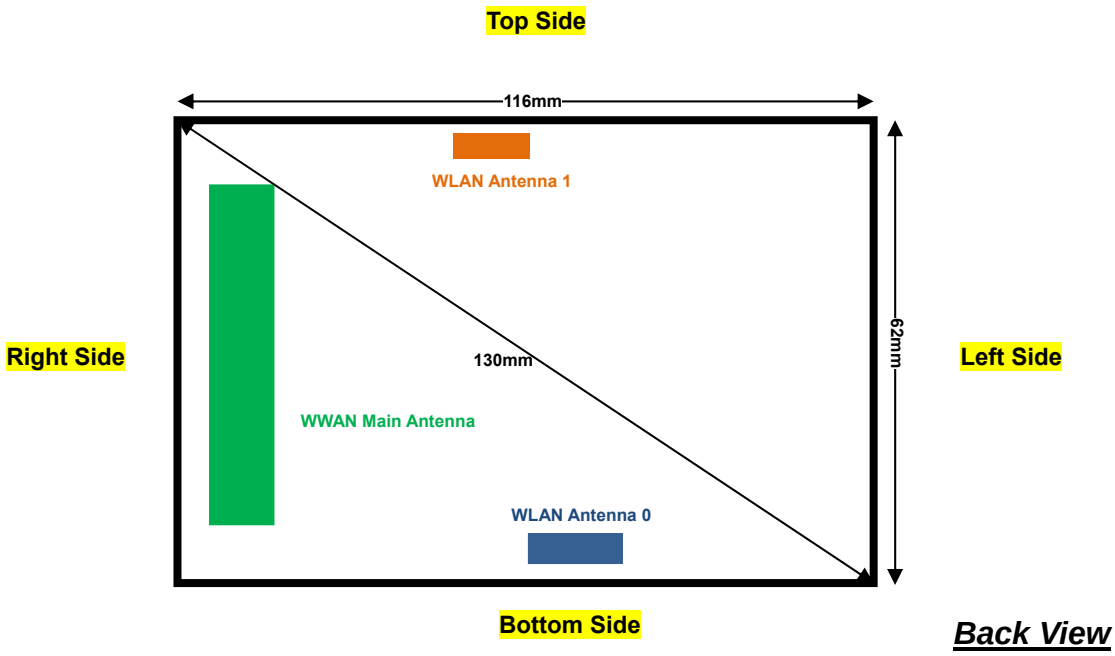
**<5GHz WLAN Antenna 1>**

| | Mode | Channel | Frequency (MHz) | Data Rate | Average power (dBm) | Duty Cycle % |
|---|---|---|---|---|---|---|
| 5.2GHz WLAN Antenna 1 | 802.11a | CH 36 | 5180 | 6Mbps | 9.54 | 95.39 |
| | | CH 40 | 5200 | | 9.43 | |
| | | CH 44 | 5220 | | 9.47 | |
| | | CH 48 | 5240 | | 9.76 | |
| | 802.11n-HT20 | CH 36 | 5180 | MCS0 | 9.44 | 95.19 |
| | | CH 40 | 5200 | | 9.34 | |
| | | CH 44 | 5220 | | 9.33 | |
| | | CH 48 | 5240 | | 9.66 | |
| | 802.11n-HT40 | CH 38 | 5190 | MCS0 | 9.76 | 90.33 |
| | | CH 46 | 5230 | | 9.92 | |
| | 802.11ac-VHT20 | CH 36 | 5180 | MCS0 | 9.61 | 94.94 |
| | | CH 40 | 5200 | | 9.27 | |
| | | CH 44 | 5220 | | 9.47 | |
| | | CH 48 | 5240 | | 9.44 | |
| | 802.11ac-VHT40 | CH 38 | 5190 | MCS0 | 8.69 | 92.03 |
| | | CH 46 | 5230 | | 8.92 | |
| | 802.11ac-VHT80 | CH 42 | 5210 | MCS0 | 8.08 | 84.03 |
| 5.8GHz WLAN Antenna 1 | 802.11a | CH 149 | 5745 | MCS0 | 9.58 | 95.39 |
| | | CH 157 | 5785 | | 9.98 | |
| | | CH 165 | 5825 | | 9.36 | |
| | 802.11n-HT20 | CH 149 | 5745 | MCS0 | 9.45 | 95.19 |
| | | CH 157 | 5785 | | 9.89 | |
| | | CH 165 | 5825 | | 9.08 | |
| | 802.11n-HT40 | CH 151 | 5755 | MCS0 | 9.95 | 90.33 |
| | | CH 159 | 5795 | | 9.74 | |
| | 802.11ac-VHT20 | CH 149 | 5745 | MCS0 | 9.50 | 94.94 |
| | | CH 157 | 5785 | | 9.87 | |
| | | CH 165 | 5825 | | 9.20 | |
| | 802.11ac-VHT40 | CH 151 | 5755 | MCS0 | 8.95 | 92.03 |
| | | CH 159 | 5795 | | 8.71 | |
| | 802.11ac-VHT80 | CH 155 | 5775 | MCS0 | 8.25 | 84.03 |

**<5GHz WLAN Antenna 0+1>**

| | Mode | Channel | Frequency (MHz) | Data Rate | Average power (dBm) | Duty Cycle % |
|---|---|---|---|---|---|---|
| 5.2GHz WLAN Antenna 0+1 | 802.11n-HT20 | CH 36 | 5180 | MCS0 | 10.00 | 94.92 |
| | | CH 40 | 5200 | | 9.93 | |
| | | CH 44 | 5220 | | 10.03 | |
| | | CH 48 | 5240 | | 9.88 | |
| | 802.11n-HT40 | CH 38 | 5190 | MCS0 | 9.47 | 91.25 |
| | | CH 46 | 5230 | | 9.74 | |
| | 802.11ac-VHT20 | CH 36 | 5180 | MCS0 | 9.16 | 95.00 |
| | | CH 40 | 5200 | | 9.17 | |
| | | CH 44 | 5220 | | 9.35 | |
| | | CH 48 | 5240 | | 9.62 | |
| | 802.11ac-VHT40 | CH 38 | 5190 | MCS0 | 8.95 | 90.86 |
| | | CH 46 | 5230 | | 8.70 | |
| | 802.11ac-VHT80 | CH 42 | 5210 | MCS0 | 7.91 | 84.29 |
| 5.8GHz WLAN Antenna 0+1 | 802.11n-HT20 | CH 149 | 5745 | MCS0 | 10.13 | 94.92 |
| | | CH 157 | 5785 | | 10.64 | |
| | | CH 165 | 5825 | | 9.99 | |
| | 802.11n-HT40 | CH 151 | 5755 | MCS0 | 9.93 | 91.25 |
| | | CH 159 | 5795 | | 9.78 | |
| | 802.11ac-VHT20 | CH 149 | 5745 | MCS0 | 9.67 | 95.00 |
| | | CH 157 | 5785 | | 10.27 | |
| | | CH 165 | 5825 | | 9.59 | |
| | 802.11ac-VHT40 | CH 151 | 5755 | MCS0 | 9.21 | 90.86 |
| | | CH 159 | 5795 | | 8.92 | |
| | 802.11ac-VHT80 | CH 155 | 5775 | MCS0 | 8.44 | 84.29 |

# 13. Antenna Location




| Distance of the Antenna to the EUT surface/edge | | | | | | |
|---|---|---|---|---|---|---|
| Antennas | Back | Front | Top Side | Bottom Side | Right Side | Left Side |
| WWAN Main | ≤ 25mm | ≤ 25mm | ≤ 25mm | ≤ 25mm | ≤ 25mm | 103mm |
| WLAN Antenna 0 | ≤ 25mm | ≤ 25mm | 56mm | ≤ 25mm | 61mm | 36mm |
| WLAN Antenna 1 | ≤ 25mm | ≤ 25mm | ≤ 25mm | 56mm | 53mm | 46mm |

| Positions for SAR tests; Hotspot mode | | | | | | |
|---|---|---|---|---|---|---|
| Antennas | Back | Front | Top Side | Bottom Side | Right Side | Left Side |
| WWAN Main | Yes | Yes | Yes | Yes | Yes | No |
| WLAN Antenna 0 | Yes | Yes | No | Yes | No | No |
| WLAN Antenna 1 | Yes | Yes | Yes | No | No | No |

**General Note:**
Referring to KDB 941225 D06 v02, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge

# 14. SAR Test Results

**General Note:**

1. Per KDB 447498 D01v05r02, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   b. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   c. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   d. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   e. For WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
2. Per KDB 447498 D01v05r02, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 941225 D01v03, in hotspot mode EUT is treated as data device and SAR is tested with Ev-Do Rev 0 (RTAP 153.6kbps) as the primary mode.
4. Per KDB 941225 D05v02r03, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
5. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
6. Per KDB 941225 D05v02r03, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
7. Per KDB 941225 D05v02r03, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, 16QAM SAR testing is not required.
8. Per KDB 941225 D05v02r03, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, smaller bandwidth SAR testing is not required.
9. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
10. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
11. For WLAN SAR testing was performed on single antenna RF power in SISO mode is larger or equal to the single antenna RF power in MIMO mode, and for RF exposure assessment of MIMO mode simultaneous transmission exclusion analysis was performed with SAR test results of each antenna in SISO mode.
12. Per KDB 248227 D01v02r01, the simultaneous SAR provisions in KDB publication 447498 should be applied to determine simultaneous transmission SAR test exclusion for WiFi MIMO. If the sum of 1g single transmission chain SAR measurements is < 1.6W/kg and SAR peak to location ratio < 0.04, no additional SAR measurements for MIMO.
13. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

## 14.1 Body SAR

**<CDMA SAR>**

| Plot No. | Band | Mode | Test Position | Gap (cm) | Ch. | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CDMA2000 BC0 | RTAP 153.6kbps | Front | 1 | 384 | 836.52 | 24.15 | 24.50 | 1.084 | 0.02 | 0.997 | 1.081 |
| | CDMA2000 BC0 | RTAP 153.6kbps | Back | 1 | 384 | 836.52 | 24.15 | 24.50 | 1.084 | 0.01 | 1.050 | 1.138 |
| | CDMA2000 BC0 | RTAP 153.6kbps | Right side | 1 | 384 | 836.52 | 24.15 | 24.50 | 1.084 | -0.05 | 0.224 | 0.243 |
| | CDMA2000 BC0 | RTAP 153.6kbps | Top side | 1 | 384 | 836.52 | 24.15 | 24.50 | 1.084 | 0.01 | 0.454 | 0.492 |
| | CDMA2000 BC0 | RTAP 153.6kbps | Bottom side | 1 | 384 | 836.52 | 24.15 | 24.50 | 1.084 | -0.1 | 0.358 | 0.388 |
| | CDMA2000 BC0 | RTAP 153.6kbps | Front | 1 | 1013 | 824.7 | 24.09 | 24.50 | 1.099 | -0.01 | 1.030 | 1.132 |
| | CDMA2000 BC0 | RTAP 153.6kbps | Front | 1 | 777 | 848.31 | 24.13 | 24.50 | 1.089 | -0.03 | 0.908 | 0.989 |
| **01** | **CDMA2000 BC0** | **RTAP 153.6kbps** | **Back** | **1** | **1013** | **824.7** | **24.09** | **24.50** | **1.099** | **0.04** | **1.070** | **1.176** |
| | CDMA2000 BC0 | RTAP 153.6kbps | Back | 1 | 777 | 848.31 | 24.13 | 24.50 | 1.089 | 0.01 | 0.939 | 1.023 |
| | CDMA2000 BC1 | RTAP 153.6kbps | Front | 1 | 25 | 1851.3 | 23.84 | 24.00 | 1.038 | 0.19 | 1.120 | 1.162 |
| | CDMA2000 BC1 | RTAP 153.6kbps | Back | 1 | 25 | 1851.3 | 23.84 | 24.00 | 1.038 | 0.15 | 1.090 | 1.131 |
| **02** | **CDMA2000 BC1** | **RTAP 153.6kbps** | **Right side** | **1** | **25** | **1851.3** | **23.84** | **24.00** | **1.038** | **-0.05** | **1.400** | **1.453** |
| | CDMA2000 BC1 | RTAP 153.6kbps | Top side | 1 | 25 | 1851.3 | 23.84 | 24.00 | 1.038 | 0.01 | 1.100 | 1.141 |
| | CDMA2000 BC1 | RTAP 153.6kbps | Bottom side | 1 | 25 | 1851.3 | 23.84 | 24.00 | 1.038 | -0.05 | 0.071 | 0.074 |
| | CDMA2000 BC1 | RTAP 153.6kbps | Front | 1 | 600 | 1880 | 23.31 | 24.00 | 1.172 | -0.07 | 0.907 | 1.063 |
| | CDMA2000 BC1 | RTAP 153.6kbps | Front | 1 | 1175 | 1908.8 | 23.29 | 24.00 | 1.178 | -0.01 | 0.934 | 1.100 |
| | CDMA2000 BC1 | RTAP 153.6kbps | Back | 1 | 600 | 1880 | 23.31 | 24.00 | 1.172 | 0.13 | 0.910 | 1.067 |
| | CDMA2000 BC1 | RTAP 153.6kbps | Back | 1 | 1175 | 1908.8 | 23.29 | 24.00 | 1.178 | 0.08 | 0.927 | 1.092 |
| | CDMA2000 BC1 | RTAP 153.6kbps | Right side | 1 | 600 | 1880 | 23.31 | 24.00 | 1.172 | -0.18 | 1.170 | 1.371 |
| | CDMA2000 BC1 | RTAP 153.6kbps | Right side | 1 | 1175 | 1908.8 | 23.29 | 24.00 | 1.178 | 0.18 | 1.100 | 1.295 |
| | CDMA2000 BC1 | RTAP 153.6kbps | Top side | 1 | 600 | 1880 | 23.31 | 24.00 | 1.172 | 0.03 | 1.060 | 1.243 |
| | CDMA2000 BC1 | RTAP 153.6kbps | Top side | 1 | 1175 | 1908.8 | 23.29 | 24.00 | 1.178 | 0.02 | 1.140 | 1.342 |

**<LTE SAR>**

| Plot No. | Band | BW (MHz) | RB Size | RB Offset | Modulation | Test Position | Gap (cm) | Ch. | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LTE Band 12 | 10M | 1 | 49 | QPSK | Front | 1 | 23130 | 711 | 22.93 | 24.00 | 1.279 | -0.01 | 0.676 | 0.865 |
| **03** | **LTE Band 12** | **10M** | **1** | **49** | **QPSK** | **Back** | **1** | **23130** | **711** | **22.93** | **24.00** | **1.279** | **0.03** | **0.741** | **0.948** |
| | LTE Band 12 | 10M | 1 | 49 | QPSK | Right side | 1 | 23130 | 711 | 22.93 | 24.00 | 1.279 | -0.02 | 0.132 | 0.169 |
| | LTE Band 12 | 10M | 1 | 49 | QPSK | Top side | 1 | 23130 | 711 | 22.93 | 24.00 | 1.279 | -0.06 | 0.275 | 0.352 |
| | LTE Band 12 | 10M | 1 | 49 | QPSK | Bottom side | 1 | 23130 | 711 | 22.93 | 24.00 | 1.279 | -0.08 | 0.241 | 0.308 |
| | LTE Band 12 | 10M | 1 | 49 | QPSK | Front | 1 | 23060 | 704 | 22.64 | 24.00 | 1.368 | 0.03 | 0.512 | 0.700 |
| | LTE Band 12 | 10M | 1 | 49 | QPSK | Front | 1 | 23095 | 707.5 | 22.78 | 24.00 | 1.324 | 0.01 | 0.555 | 0.735 |
| | LTE Band 12 | 10M | 1 | 49 | QPSK | Back | 1 | 23060 | 704 | 22.64 | 24.00 | 1.368 | -0.05 | 0.590 | 0.807 |
| | LTE Band 12 | 10M | 1 | 49 | QPSK | Back | 1 | 23095 | 707.5 | 22.78 | 24.00 | 1.324 | -0.01 | 0.616 | 0.816 |
| | LTE Band 12 | 10M | 25 | 24 | QPSK | Front | 1 | 23095 | 707.5 | 21.77 | 23.00 | 1.327 | -0.02 | 0.419 | 0.556 |
| | LTE Band 12 | 10M | 25 | 24 | QPSK | Back | 1 | 23095 | 707.5 | 21.77 | 23.00 | 1.327 | 0.01 | 0.487 | 0.646 |
| | LTE Band 12 | 10M | 25 | 24 | QPSK | Right side | 1 | 23095 | 707.5 | 21.77 | 23.00 | 1.327 | -0.16 | 0.094 | 0.125 |
| | LTE Band 12 | 10M | 25 | 24 | QPSK | Top side | 1 | 23095 | 707.5 | 21.77 | 23.00 | 1.327 | -0.05 | 0.216 | 0.287 |
| | LTE Band 12 | 10M | 25 | 24 | QPSK | Bottom side | 1 | 23095 | 707.5 | 21.77 | 23.00 | 1.327 | -0.08 | 0.175 | 0.232 |
| | LTE Band 12 | 10M | 50 | 0 | QPSK | Front | 1 | 23095 | 707.5 | 21.68 | 23.00 | 1.355 | -0.02 | 0.430 | 0.583 |
| | LTE Band 12 | 10M | 50 | 0 | QPSK | Back | 1 | 23095 | 707.5 | 21.68 | 23.00 | 1.355 | -0.02 | 0.502 | 0.680 |
| | LTE Band 13 | 10M | 1 | 0 | QPSK | Front | 1 | 23230 | 782 | 22.72 | 23.50 | 1.197 | 0.02 | 0.971 | 1.162 |
| **04** | **LTE Band 13** | **10M** | **1** | **0** | **QPSK** | **Back** | **1** | **23230** | **782** | **22.72** | **23.50** | **1.197** | **0.04** | **1.090** | **1.304** |
| | LTE Band 13 | 10M | 1 | 0 | QPSK | Right side | 1 | 23230 | 782 | 22.72 | 23.50 | 1.197 | -0.14 | 0.149 | 0.178 |
| | LTE Band 13 | 10M | 1 | 0 | QPSK | Top side | 1 | 23230 | 782 | 22.72 | 23.50 | 1.197 | -0.02 | 0.484 | 0.579 |
| | LTE Band 13 | 10M | 1 | 0 | QPSK | Bottom side | 1 | 23230 | 782 | 22.72 | 23.50 | 1.197 | 0.05 | 0.337 | 0.403 |
| | LTE Band 13 | 10M | 25 | 0 | QPSK | Front | 1 | 23230 | 782 | 21.67 | 22.50 | 1.211 | -0.04 | 0.806 | 0.976 |
| | LTE Band 13 | 10M | 25 | 0 | QPSK | Back | 1 | 23230 | 782 | 21.67 | 22.50 | 1.211 | -0.01 | 0.860 | 1.041 |
| | LTE Band 13 | 10M | 25 | 0 | QPSK | Right side | 1 | 23230 | 782 | 21.67 | 22.50 | 1.211 | -0.12 | 0.118 | 0.143 |
| | LTE Band 13 | 10M | 25 | 0 | QPSK | Top side | 1 | 23230 | 782 | 21.67 | 22.50 | 1.211 | 0.01 | 0.396 | 0.479 |
| | LTE Band 13 | 10M | 25 | 0 | QPSK | Bottom side | 1 | 23230 | 782 | 21.67 | 22.50 | 1.211 | -0.12 | 0.272 | 0.329 |
| | LTE Band 13 | 10M | 50 | 0 | QPSK | Front | 1 | 23230 | 782 | 21.73 | 22.50 | 1.194 | -0.03 | 0.771 | 0.921 |
| | LTE Band 13 | 10M | 50 | 0 | QPSK | Back | 1 | 23230 | 782 | 21.73 | 22.50 | 1.194 | 0.01 | 0.824 | 0.984 |

| Plot No. | Band | BW (MHz) | RB Size | RB Offset | Modulation | Test Position | Gap (cm) | Ch. | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LTE Band 5 | 10M | 1 | 24 | QPSK | Front | 1 | 20450 | 829 | 22.94 | 23.50 | 1.138 | 0.01 | 0.660 | 0.751 |
| **05** | **LTE Band 5** | **10M** | **1** | **24** | **QPSK** | **Back** | **1** | **20450** | **829** | **22.94** | **23.50** | **1.138** | **0.01** | **0.674** | **0.767** |
| | LTE Band 5 | 10M | 1 | 24 | QPSK | Right side | 1 | 20450 | 829 | 22.94 | 23.50 | 1.138 | -0.09 | 0.127 | 0.144 |
| | LTE Band 5 | 10M | 1 | 24 | QPSK | Top side | 1 | 20450 | 829 | 22.94 | 23.50 | 1.138 | -0.03 | 0.323 | 0.367 |
| | LTE Band 5 | 10M | 1 | 24 | QPSK | Bottom side | 1 | 20450 | 829 | 22.94 | 23.50 | 1.138 | -0.03 | 0.246 | 0.280 |
| | LTE Band 5 | 10M | 25 | 0 | QPSK | Front | 1 | 20525 | 836.5 | 21.82 | 22.50 | 1.169 | -0.01 | 0.514 | 0.601 |
| | LTE Band 5 | 10M | 25 | 0 | QPSK | Back | 1 | 20525 | 836.5 | 21.82 | 22.50 | 1.169 | -0.09 | 0.518 | 0.606 |
| | LTE Band 5 | 10M | 25 | 0 | QPSK | Right side | 1 | 20525 | 836.5 | 21.82 | 22.50 | 1.169 | -0.07 | 0.104 | 0.122 |
| | LTE Band 5 | 10M | 25 | 0 | QPSK | Top side | 1 | 20525 | 836.5 | 21.82 | 22.50 | 1.169 | -0.04 | 0.250 | 0.292 |
| | LTE Band 5 | 10M | 25 | 0 | QPSK | Bottom side | 1 | 20525 | 836.5 | 21.82 | 22.50 | 1.169 | -0.02 | 0.196 | 0.229 |
| | LTE Band 4 | 20M | 1 | 0 | QPSK | Front | 1 | 20175 | 1732.5 | 22.02 | 22.30 | 1.067 | 0.02 | 1.140 | 1.216 |
| | LTE Band 4 | 20M | 1 | 0 | QPSK | Back | 1 | 20175 | 1732.5 | 22.02 | 22.30 | 1.067 | 0.07 | 1.040 | 1.109 |
| | LTE Band 4 | 20M | 1 | 0 | QPSK | Right side | 1 | 20175 | 1732.5 | 22.02 | 22.30 | 1.067 | -0.09 | 1.300 | 1.387 |
| | LTE Band 4 | 20M | 1 | 0 | QPSK | Top side | 1 | 20175 | 1732.5 | 22.02 | 22.30 | 1.067 | -0.06 | 0.550 | 0.587 |
| | LTE Band 4 | 20M | 1 | 0 | QPSK | Bottom side | 1 | 20175 | 1732.5 | 22.02 | 22.30 | 1.067 | -0.09 | 0.039 | 0.042 |
| | LTE Band 4 | 20M | 1 | 0 | QPSK | Front | 1 | 20050 | 1720 | 21.97 | 22.30 | 1.079 | 0.02 | 1.150 | 1.241 |
| | LTE Band 4 | 20M | 1 | 0 | QPSK | Front | 1 | 20300 | 1745 | 21.83 | 22.30 | 1.114 | 0.04 | 1.110 | 1.237 |
| | LTE Band 4 | 20M | 1 | 0 | QPSK | Back | 1 | 20050 | 1720 | 21.97 | 22.30 | 1.079 | 0.03 | 1.060 | 1.144 |
| | LTE Band 4 | 20M | 1 | 0 | QPSK | Back | 1 | 20300 | 1745 | 21.83 | 22.30 | 1.114 | 0.05 | 0.982 | 1.094 |
| | LTE Band 4 | 20M | 1 | 0 | QPSK | Right side | 1 | 20050 | 1720 | 21.97 | 22.30 | 1.079 | -0.1 | 1.290 | 1.392 |
| **06** | **LTE Band 4** | **20M** | **1** | **0** | **QPSK** | **Right side** | **1** | **20300** | **1745** | **21.83** | **22.30** | **1.114** | **-0.1** | **1.290** | **1.437** |
| | LTE Band 4 | 20M | 50 | 0 | QPSK | Front | 1 | 20175 | 1732.5 | 20.39 | 21.30 | 1.233 | 0.18 | 0.819 | 1.010 |
| | LTE Band 4 | 20M | 50 | 0 | QPSK | Back | 1 | 20175 | 1732.5 | 20.39 | 21.30 | 1.233 | 0.05 | 0.724 | 0.893 |
| | LTE Band 4 | 20M | 50 | 0 | QPSK | Right side | 1 | 20175 | 1732.5 | 20.39 | 21.30 | 1.233 | -0.1 | 0.928 | 1.144 |
| | LTE Band 4 | 20M | 50 | 0 | QPSK | Top side | 1 | 20175 | 1732.5 | 20.39 | 21.30 | 1.233 | -0.04 | 0.392 | 0.483 |
| | LTE Band 4 | 20M | 50 | 0 | QPSK | Bottom side | 1 | 20175 | 1732.5 | 20.39 | 21.30 | 1.233 | -0.06 | 0.029 | 0.036 |
| | LTE Band 4 | 20M | 50 | 0 | QPSK | Front | 1 | 20050 | 1720 | 20.38 | 21.30 | 1.236 | 0.02 | 0.836 | 1.033 |
| | LTE Band 4 | 20M | 50 | 0 | QPSK | Front | 1 | 20300 | 1745 | 20.37 | 21.30 | 1.239 | 0.17 | 0.822 | 1.018 |
| | LTE Band 4 | 20M | 50 | 0 | QPSK | Back | 1 | 20050 | 1720 | 20.38 | 21.30 | 1.236 | -0.02 | 0.738 | 0.912 |
| | LTE Band 4 | 20M | 50 | 0 | QPSK | Back | 1 | 20300 | 1745 | 20.37 | 21.30 | 1.239 | 0.03 | 0.733 | 0.908 |
| | LTE Band 4 | 20M | 50 | 0 | QPSK | Right side | 1 | 20050 | 1720 | 20.38 | 21.30 | 1.236 | -0.11 | 0.938 | 1.159 |
| | LTE Band 4 | 20M | 50 | 0 | QPSK | Right side | 1 | 20300 | 1745 | 20.37 | 21.30 | 1.239 | -0.09 | 0.959 | 1.188 |
| | LTE Band 4 | 20M | 100 | 0 | QPSK | Front | 1 | 20175 | 1732.5 | 20.34 | 21.30 | 1.247 | 0.17 | 0.807 | 1.007 |
| | LTE Band 4 | 20M | 100 | 0 | QPSK | Back | 1 | 20175 | 1732.5 | 20.34 | 21.30 | 1.247 | 0.07 | 0.705 | 0.879 |
| | LTE Band 4 | 20M | 100 | 0 | QPSK | Right side | 1 | 20175 | 1732.5 | 20.34 | 21.30 | 1.247 | -0.08 | 0.926 | 1.155 |

| Plot No. | Band | BW (MHz) | RB Size | RB Offset | Modulation | Test Position | Gap (cm) | Ch. | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LTE Band 2 | 20M | 1 | 0 | QPSK | Front | 1 | 18900 | 1880 | 23.11 | 23.50 | 1.094 | 0.1 | 0.858 | 0.939 |
| | LTE Band 2 | 20M | 1 | 0 | QPSK | Back | 1 | 18900 | 1880 | 23.11 | 23.50 | 1.094 | 0.14 | 0.924 | 1.011 |
| | LTE Band 2 | 20M | 1 | 0 | QPSK | Right side | 1 | 18900 | 1880 | 23.11 | 23.50 | 1.094 | -0.13 | 1.150 | 1.258 |
| | LTE Band 2 | 20M | 1 | 0 | QPSK | Top side | 1 | 18900 | 1880 | 23.11 | 23.50 | 1.094 | 0.1 | 0.905 | 0.990 |
| | LTE Band 2 | 20M | 1 | 0 | QPSK | Bottom side | 1 | 18900 | 1880 | 23.11 | 23.50 | 1.094 | -0.09 | 0.058 | 0.063 |
| | LTE Band 2 | 20M | 1 | 0 | QPSK | Front | 1 | 18700 | 1860 | 22.98 | 23.50 | 1.127 | 0.02 | 0.918 | 1.035 |
| | LTE Band 2 | 20M | 1 | 0 | QPSK | Front | 1 | 19100 | 1900 | 23.10 | 23.50 | 1.096 | -0.01 | 0.831 | 0.911 |
| | LTE Band 2 | 20M | 1 | 0 | QPSK | Back | 1 | 18700 | 1860 | 22.98 | 23.50 | 1.127 | 0.18 | 0.943 | 1.063 |
| | LTE Band 2 | 20M | 1 | 0 | QPSK | Back | 1 | 19100 | 1900 | 23.10 | 23.50 | 1.096 | 0.14 | 0.890 | 0.976 |
| **07** | **LTE Band 2** | **20M** | **1** | **0** | **QPSK** | **Right side** | **1** | **18700** | **1860** | **22.98** | **23.50** | **1.127** | **-0.13** | **1.220** | **1.375** |
| | LTE Band 2 | 20M | 1 | 0 | QPSK | Right side | 1 | 19100 | 1900 | 23.10 | 23.50 | 1.096 | -0.01 | 1.120 | 1.228 |
| | LTE Band 2 | 20M | 1 | 0 | QPSK | Top side | 1 | 18700 | 1860 | 22.98 | 23.50 | 1.127 | 0.13 | 0.834 | 0.940 |
| | LTE Band 2 | 20M | 1 | 0 | QPSK | Top side | 1 | 19100 | 1900 | 23.10 | 23.50 | 1.096 | 0.06 | 0.999 | 1.095 |
| | LTE Band 2 | 20M | 50 | 0 | QPSK | Front | 1 | 18900 | 1880 | 21.55 | 22.50 | 1.245 | 0.06 | 0.632 | 0.787 |
| | LTE Band 2 | 20M | 50 | 0 | QPSK | Back | 1 | 18900 | 1880 | 21.55 | 22.50 | 1.245 | 0.09 | 0.659 | 0.820 |
| | LTE Band 2 | 20M | 50 | 0 | QPSK | Right side | 1 | 18900 | 1880 | 21.55 | 22.50 | 1.245 | -0.07 | 0.845 | 1.052 |
| | LTE Band 2 | 20M | 50 | 0 | QPSK | Top side | 1 | 18900 | 1880 | 21.55 | 22.50 | 1.245 | 0.04 | 0.662 | 0.824 |
| | LTE Band 2 | 20M | 50 | 0 | QPSK | Bottom side | 1 | 18900 | 1880 | 21.55 | 22.50 | 1.245 | -0.09 | 0.041 | 0.051 |
| | LTE Band 2 | 20M | 50 | 0 | QPSK | Back | 1 | 18700 | 1860 | 21.54 | 22.50 | 1.247 | 0.11 | 0.705 | 0.879 |
| | LTE Band 2 | 20M | 50 | 0 | QPSK | Back | 1 | 19100 | 1900 | 21.52 | 22.50 | 1.253 | 0.08 | 0.598 | 0.749 |
| | LTE Band 2 | 20M | 50 | 0 | QPSK | Right side | 1 | 18700 | 1860 | 21.54 | 22.50 | 1.247 | -0.02 | 0.898 | 1.120 |
| | LTE Band 2 | 20M | 50 | 0 | QPSK | Right side | 1 | 19100 | 1900 | 21.52 | 22.50 | 1.253 | -0.13 | 0.791 | 0.991 |
| | LTE Band 2 | 20M | 50 | 0 | QPSK | Top side | 1 | 18700 | 1860 | 21.54 | 22.50 | 1.247 | 0.08 | 0.618 | 0.771 |
| | LTE Band 2 | 20M | 50 | 0 | QPSK | Top side | 1 | 19100 | 1900 | 21.52 | 22.50 | 1.253 | 0.02 | 0.713 | 0.893 |
| | LTE Band 2 | 20M | 100 | 0 | QPSK | Front | 1 | 18900 | 1880 | 21.47 | 22.50 | 1.268 | -0.01 | 0.593 | 0.752 |
| | LTE Band 2 | 20M | 100 | 0 | QPSK | Back | 1 | 18900 | 1880 | 21.47 | 22.50 | 1.268 | 0.08 | 0.614 | 0.778 |
| | LTE Band 2 | 20M | 100 | 0 | QPSK | Right side | 1 | 18900 | 1880 | 21.47 | 22.50 | 1.268 | -0.02 | 0.794 | 1.007 |
| | LTE Band 2 | 20M | 100 | 0 | QPSK | Top side | 1 | 18900 | 1880 | 21.47 | 22.50 | 1.268 | 0.05 | 0.634 | 0.804 |

**<WLAN 2.4GHz SAR>**

| Plot No. | Band | Mode | Test Position | Gap (cm) | Ant. | Ch. | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Duty Cycle % | Duty Cycle Scaling Factor | Power Drift (dB) | Area Scan Max SAR(W/kg) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | WLAN 2.4GHz | 802.11b 1Mbps | Front | 1 | Ant 0 | 6 | 2437 | 14.96 | 15.50 | 1.132 | 100 | 1.000 | | 0.128 | | |
| | WLAN 2.4GHz | 802.11b 1Mbps | Back | 1 | Ant 0 | 6 | 2437 | 14.96 | 15.50 | 1.132 | 100 | 1.000 | | 0.142 | | |
| | WLAN 2.4GHz | 802.11b 1Mbps | Bottom side | 1 | Ant 0 | 6 | 2437 | 14.96 | 15.50 | 1.132 | 100 | 1.000 | -0.07 | 0.161 | 0.117 | 0.132 |
| | WLAN 2.4GHz | 802.11b 1Mbps | Front | 1 | Ant 1 | 1 | 2412 | 14.86 | 15.50 | 1.159 | 100 | 1.000 | | 0.124 | | |
| | WLAN 2.4GHz | 802.11b 1Mbps | Back | 1 | Ant 1 | 1 | 2412 | 14.86 | 15.50 | 1.159 | 100 | 1.000 | | 0.122 | | |
| **08** | **WLAN 2.4GHz** | **802.11b 1Mbps** | **Top side** | **1** | **Ant 1** | **1** | **2412** | **14.86** | **15.50** | **1.159** | **100** | **1.000** | **-0.03** | **0.195** | **0.134** | **0.155** |
| | WLAN 2.4GHz | 802.11n HT40 MCS0 | Front | 1 | Ant 0+1 | 6 | 2437 | 11.87 | 12.00 | 1.030 | 89.62 | 1.116 | | 0.0393 | | |
| | WLAN 2.4GHz | 802.11n HT40 MCS0 | Back | 1 | Ant 0+1 | 6 | 2437 | 11.87 | 12.00 | 1.030 | 89.62 | 1.116 | | 0.0562 | | |
| | WLAN 2.4GHz | 802.11n HT40 MCS0 | Top side | 1 | Ant 0+1 | 6 | 2437 | 11.87 | 12.00 | 1.030 | 89.62 | 1.116 | | 0.0587 | | |
| | WLAN 2.4GHz | 802.11n HT40 MCS0 | Bottom side | 1 | Ant 0+1 | 6 | 2437 | 11.87 | 12.00 | 1.030 | 89.62 | 1.116 | -0.07 | 0.0589 | 0.036 | 0.041 |

**<WLAN 5GHz SAR>**

| Plot No. | Band | Mode | Test Position | Gap (cm) | Ant. | Ch. | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Duty Cycle % | Duty Cycle Scaling Factor | Power Drift (dB) | Area Scan Max SAR(W/kg) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | WLAN 5.2GHz | 802.11n HT40 MCS0 | Front | 1 | Ant 0 | 38 | 5190 | 9.75 | 10.00 | 1.059 | 91.35 | 1.095 | -0.11 | | 0.057 | 0.066 |
| | WLAN 5.2GHz | 802.11n HT40 MCS0 | Back | 1 | Ant 0 | 38 | 5190 | 9.75 | 10.00 | 1.059 | 91.35 | 1.095 | -0.09 | | 0.092 | 0.107 |
| | WLAN 5.2GHz | 802.11n HT40 MCS0 | Bottom side | 1 | Ant 0 | 38 | 5190 | 9.75 | 10.00 | 1.059 | 91.35 | 1.095 | -0.04 | | 0.122 | 0.142 |
| | WLAN 5.2GHz | 802.11n HT40 MCS0 | Front | 1 | Ant 1 | 46 | 5230 | 9.92 | 10.00 | 1.019 | 90.33 | 1.107 | | 0.105 | | |
| | WLAN 5.2GHz | 802.11n HT40 MCS0 | Back | 1 | Ant 1 | 46 | 5230 | 9.92 | 10.00 | 1.019 | 90.33 | 1.107 | | 0.207 | | |
| **09** | **WLAN 5.2GHz** | **802.11n HT40 MCS0** | **Top side** | **1** | **Ant 1** | **46** | **5230** | **9.92** | **10.00** | **1.019** | **90.33** | **1.107** | **-0.05** | **0.532** | **0.212** | **0.239** |
| | WLAN 5.2GHz | 802.11n HT20 MCS0 | Front | 1 | Ant 0+1 | 44 | 5220 | 10.03 | 10.50 | 1.114 | 94.92 | 1.054 | -0.15 | 0.036 | 0.00858 | 0.010 |
| | WLAN 5.2GHz | 802.11n HT20 MCS0 | Back | 1 | Ant 0+1 | 44 | 5220 | 10.03 | 10.50 | 1.114 | 94.92 | 1.054 | -0.12 | 0.145 | 0.015 | 0.018 |
| | WLAN 5.2GHz | 802.11n HT20 MCS0 | Top side | 1 | Ant 0+1 | 44 | 5220 | 10.03 | 10.50 | 1.114 | 94.92 | 1.054 | -0.14 | 0.356 | 0.123 | 0.144 |
| | WLAN 5.2GHz | 802.11n HT20 MCS0 | Bottom side | 1 | Ant 0+1 | 44 | 5220 | 10.03 | 10.50 | 1.114 | 94.92 | 1.054 | | 0.174 | | |
| | WLAN 5.8GHz | 802.11ac VHT20 MCS0 | Front | 1 | Ant 0 | 157 | 5785 | 9.98 | 10.50 | 1.127 | 94.61 | 1.057 | 0.01 | | 0.186 | 0.222 |
| | WLAN 5.8GHz | 802.11ac VHT20 MCS0 | Back | 1 | Ant 0 | 157 | 5785 | 9.98 | 10.50 | 1.127 | 94.61 | 1.057 | -0.15 | | 0.09 | 0.107 |
| | WLAN 5.8GHz | 802.11ac VHT20 MCS0 | Bottom side | 1 | Ant 0 | 157 | 5785 | 9.98 | 10.50 | 1.127 | 94.61 | 1.057 | -0.023 | | 0.326 | 0.388 |
| | WLAN 5.8GHz | 802.11a 6Mbps | Front | 1 | Ant 1 | 157 | 5785 | 9.98 | 10.50 | 1.127 | 95.39 | 1.048 | | 0.206 | | |
| | WLAN 5.8GHz | 802.11a 6Mbps | Back | 1 | Ant 1 | 157 | 5785 | 9.98 | 10.50 | 1.127 | 95.39 | 1.048 | | 0.203 | | |
| | WLAN 5.8GHz | 802.11a 6Mbps | Top side | 1 | Ant 1 | 157 | 5785 | 9.98 | 10.50 | 1.127 | 95.39 | 1.048 | -0.09 | 0.477 | 0.175 | 0.207 |
| | WLAN 5.8GHz | 802.11n HT20 MCS0 | Front | 1 | Ant 0+1 | 157 | 5785 | 10.64 | 11.00 | 1.086 | 94.92 | 1.054 | 0.15 | | 0.02 | 0.023 |
| | WLAN 5.8GHz | 802.11n HT20 MCS0 | Back | 1 | Ant 0+1 | 157 | 5785 | 10.64 | 11.00 | 1.086 | 94.92 | 1.054 | -0.03 | | 0.033 | 0.038 |
| | WLAN 5.8GHz | 802.11n HT20 MCS0 | Top side | 1 | Ant 0+1 | 157 | 5785 | 10.64 | 11.00 | 1.086 | 94.92 | 1.054 | -0.15 | | 0.152 | 0.174 |
| **10** | **WLAN 5.8GHz** | **802.11n HT20 MCS0** | **Bottom side** | **1** | **Ant 0+1** | **157** | **5785** | **10.64** | **11.00** | **1.086** | **94.92** | **1.054** | **-0.07** | | **0.343** | **0.393** |

## 14.2 Repeated SAR Measurement

| No. | Band | BW (MHz) | RB Size | RB Offset | Mode | Test Position | Gap (cm) | Ch. | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Ratio | Reported 1g SAR (W/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1st | CDMA2000 BC0 | - | - | - | RTAP 153.6k bps | Back | 1 | 1013 | 824.7 | 24.09 | 24.50 | 1.099 | 0.04 | 1.070 | 1 | 1.176 |
| 2nd | CDMA2000 BC0 | - | - | - | RTAP 153.6k bps | Back | 1 | 1013 | 824.7 | 24.09 | 24.50 | 1.099 | -0.03 | 1.040 | 1.028 | 1.143 |
| 1st | CDMA2000 BC1 | - | - | - | RTAP 153.6k bps | Right side | 1 | 25 | 1851.3 | 23.84 | 24.00 | 1.038 | -0.05 | 1.400 | 1 | 1.453 |
| 2nd | CDMA2000 BC1 | - | - | - | RTAP 153.6k bps | Right side | 1 | 25 | 1851.3 | 23.84 | 24.00 | 1.038 | -0.04 | 1.390 | 1.007 | 1.442 |
| 1st | LTE Band 13 | 10M | 1 | 0 | QPSK | Back | 1 | 23230 | 782 | 22.72 | 23.50 | 1.197 | 0.04 | 1.090 | 1 | 1.304 |
| 2nd | LTE Band 13 | 10M | 1 | 0 | QPSK | Back | 1 | 23230 | 782 | 22.72 | 23.50 | 1.197 | -0.01 | 1.080 | 1.009 | 1.292 |
| 1st | LTE Band 4 | 20M | 1 | 0 | QPSK | Right side | 1 | 20175 | 1732.5 | 22.02 | 22.30 | 1.067 | -0.09 | 1.300 | 1 | 1.387 |
| 2nd | LTE Band 4 | 20M | 1 | 0 | QPSK | Right side | 1 | 20175 | 1732.5 | 22.02 | 22.30 | 1.067 | -0.12 | 1.290 | 1.008 | 1.376 |

**General Note:**

1. Per KDB 865664 D01v01r03, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r03, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

# 15. Simultaneous Transmission Analysis

| NO. | Simultaneous Transmission Configurations | Body | Note |
|---|---|---|---|
| 1. | CDMA(Data) + WLAN2.4GHz SISO(data) | Yes | 2.4GHz Hotspot |
| 2. | CDMA(Data) + WLAN2.4GHz MIMO(data) | Yes | 2.4GHz Hotspot |
| 3. | CDMA(Data) + WLAN5GHz SISO(data) | Yes | WiFi Direct |
| 4. | CDMA(Data) + WLAN5GHz MIMO(data) | Yes | WiFi Direct |
| 5. | LTE (Data) + WLAN2.4GHz SISO(data) | Yes | 2.4GHz Hotspot |
| 6. | LTE (Data) + WLAN2.4GHz MIMO(data) | Yes | 2.4GHz Hotspot |
| 7. | LTE (Data) + WLAN5 GHz SISO(data) | Yes | WiFi Direct |
| 8. | LTE (Data) + WLAN5 GHz MIMO(data) | Yes | WiFi Direct |

**General Note:**

1. This device has no voice function.
2. This device 2.4GHz WLAN supports hotspot operation and 5.2GHz/5.8GHz supports WiFi Direct (GC/GO).
3. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, they will not transmit simultaneously.
4. EUT will choose either CDMA or LTE according to the network signal condition; therefore, they will not transmit simultaneously.
5. The Reported SAR summation is calculated based on the same configuration and test position.
6. Per KDB 447498 D01v05r02, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*), and the peak separation distance is determined from the square root of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$, where $(x_1, y_1, z_1)$ and $(x_2, y_2, z_2)$ are the coordinates of the extrapolated peak SAR locations in the zoom scan
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.

## 15.1 Body Exposure Conditions

**<WWAN + WLAN 2.4GHz (Antenna 0)>**

| WWAN Band | | Exposure Position | WWAN Max. WWAN SAR (W/kg) | WLAN 2.4GHz Max. WLAN SAR (W/kg) | Summed SAR (W/kg) |
|---|---|---|---|---|---|
| CDMA2000 | BC0 | Front | 1.132 | 0.132 | 1.26 |
| | | Back | 1.176 | 0.132 | 1.31 |
| | | Right side | 0.243 | | 0.24 |
| | | Top side | 0.492 | | 0.49 |
| | | Bottom side | 0.388 | 0.132 | 0.52 |
| | BC1 | Front | 1.162 | 0.132 | 1.29 |
| | | Back | 1.131 | 0.132 | 1.26 |
| | | Right side | 1.453 | | 1.45 |
| | | Top side | 1.342 | | 1.34 |
| | | Bottom side | 0.074 | 0.132 | 0.21 |
| LTE | Band 12 | Front | 0.865 | 0.132 | 1.00 |
| | | Back | 0.948 | 0.132 | 1.08 |
| | | Right side | 0.169 | | 0.17 |
| | | Top side | 0.352 | | 0.35 |
| | | Bottom side | 0.308 | 0.132 | 0.44 |
| | Band 13 | Front | 1.162 | 0.132 | 1.29 |
| | | Back | 1.304 | 0.132 | 1.44 |
| | | Right side | 0.178 | | 0.18 |
| | | Top side | 0.579 | | 0.58 |
| | | Bottom side | 0.403 | 0.132 | 0.54 |
| | Band 5 | Front | 0.751 | 0.132 | 0.88 |
| | | Back | 0.767 | 0.132 | 0.90 |
| | | Right side | 0.144 | | 0.14 |
| | | Top side | 0.367 | | 0.37 |
| | | Bottom side | 0.280 | 0.132 | 0.41 |
| | Band 4 | Front | 1.241 | 0.132 | 1.37 |
| | | Back | 1.144 | 0.132 | 1.28 |
| | | Right side | 1.437 | | 1.44 |
| | | Top side | 0.587 | | 0.59 |
| | | Bottom side | 0.042 | 0.132 | 0.17 |
| | Band 2 | Front | 1.035 | 0.132 | 1.17 |
| | | Back | 1.063 | 0.132 | 1.20 |
| | | Right side | 1.375 | | 1.38 |
| | | Top side | 1.095 | | 1.10 |
| | | Bottom side | 0.063 | 0.132 | 0.20 |

**<WWAN + WLAN 2.4GHz (Antenna 1)>**

| WWAN Band | | Exposure Position | WWAN Max. WWAN SAR (W/kg) | WLAN 2.4GHz Max. WLAN SAR (W/kg) | Summed SAR (W/kg) |
|---|---|---|---|---|---|
| CDMA2000 | BC0 | Front | 1.132 | 0.155 | 1.29 |
| | | Back | 1.176 | 0.155 | 1.33 |
| | | Right side | 0.243 | | 0.24 |
| | | Top side | 0.492 | 0.155 | 0.65 |
| | | Bottom side | 0.388 | | 0.39 |
| | BC1 | Front | 1.162 | 0.155 | 1.32 |
| | | Back | 1.131 | 0.155 | 1.29 |
| | | Right side | 1.453 | | 1.45 |
| | | Top side | 1.342 | 0.155 | **1.50** |
| | | Bottom side | 0.074 | | 0.07 |
| LTE | Band 12 | Front | 0.865 | 0.155 | 1.02 |
| | | Back | 0.948 | 0.155 | 1.10 |
| | | Right side | 0.169 | | 0.17 |
| | | Top side | 0.352 | 0.155 | 0.51 |
| | | Bottom side | 0.308 | | 0.31 |
| | Band 13 | Front | 1.162 | 0.155 | 1.32 |
| | | Back | 1.304 | 0.155 | 1.46 |
| | | Right side | 0.178 | | 0.18 |
| | | Top side | 0.579 | 0.155 | 0.73 |
| | | Bottom side | 0.403 | | 0.40 |
| | Band 5 | Front | 0.751 | 0.155 | 0.91 |
| | | Back | 0.767 | 0.155 | 0.92 |
| | | Right side | 0.144 | | 0.14 |
| | | Top side | 0.367 | 0.155 | 0.52 |
| | | Bottom side | 0.280 | | 0.28 |
| | Band 4 | Front | 1.241 | 0.155 | 1.40 |
| | | Back | 1.144 | 0.155 | 1.30 |
| | | Right side | 1.437 | | 1.44 |
| | | Top side | 0.587 | 0.155 | 0.74 |
| | | Bottom side | 0.042 | | 0.04 |
| | Band 2 | Front | 1.035 | 0.155 | 1.19 |
| | | Back | 1.063 | 0.155 | 1.22 |
| | | Right side | 1.375 | | 1.38 |
| | | Top side | 1.095 | 0.155 | 1.25 |
| | | Bottom side | 0.063 | | 0.06 |

**<WWAN + WLAN 2.4GHz (Antenna 0+1)>**

| WWAN Band | | Exposure Position | WWAN Max. WWAN SAR (W/kg) | WLAN 2.4GHz Max. WLAN SAR (W/kg) | Summed SAR (W/kg) |
|---|---|---|---|---|---|
| CDMA2000 | BC0 | Front | 1.132 | 0.041 | 1.17 |
| | | Back | 1.176 | 0.041 | 1.22 |
| | | Right side | 0.243 | | 0.24 |
| | | Top side | 0.492 | 0.041 | 0.53 |
| | | Bottom side | 0.388 | 0.041 | 0.43 |
| | BC1 | Front | 1.162 | 0.041 | 1.20 |
| | | Back | 1.131 | 0.041 | 1.17 |
| | | Right side | 1.453 | | 1.45 |
| | | Top side | 1.342 | 0.041 | 1.38 |
| | | Bottom side | 0.074 | 0.041 | 0.12 |
| LTE | Band 12 | Front | 0.865 | 0.041 | 0.91 |
| | | Back | 0.948 | 0.041 | 0.99 |
| | | Right side | 0.169 | | 0.17 |
| | | Top side | 0.352 | 0.041 | 0.39 |
| | | Bottom side | 0.308 | 0.041 | 0.35 |
| | Band 13 | Front | 1.162 | 0.041 | 1.20 |
| | | Back | 1.304 | 0.041 | 1.35 |
| | | Right side | 0.178 | | 0.18 |
| | | Top side | 0.579 | 0.041 | 0.62 |
| | | Bottom side | 0.403 | 0.041 | 0.44 |
| | Band 5 | Front | 0.751 | 0.041 | 0.79 |
| | | Back | 0.767 | 0.041 | 0.81 |
| | | Right side | 0.144 | | 0.14 |
| | | Top side | 0.367 | 0.041 | 0.41 |
| | | Bottom side | 0.280 | 0.041 | 0.32 |
| | Band 4 | Front | 1.241 | 0.041 | 1.28 |
| | | Back | 1.144 | 0.041 | 1.19 |
| | | Right side | 1.437 | | 1.44 |
| | | Top side | 0.587 | 0.041 | 0.63 |
| | | Bottom side | 0.042 | 0.041 | 0.08 |
| | Band 2 | Front | 1.035 | 0.041 | 1.08 |
| | | Back | 1.063 | 0.041 | 1.10 |
| | | Right side | 1.375 | | 1.38 |
| | | Top side | 1.095 | 0.041 | 1.14 |
| | | Bottom side | 0.063 | 0.041 | 0.10 |

**<WWAN + WLAN 5GHz (Antenna 0)>**

| WWAN Band | | Exposure Position | WWAN Max. WWAN SAR (W/kg) | WLAN 5GHz Max. WLAN SAR (W/kg) | Summed SAR (W/kg) |
|---|---|---|---|---|---|
| CDMA2000 | BC0 | Front | 1.132 | 0.222 | 1.35 |
| | | Back | 1.176 | 0.107 | 1.28 |
| | | Right side | 0.243 | | 0.24 |
| | | Top side | 0.492 | | 0.49 |
| | | Bottom side | 0.388 | 0.388 | 0.78 |
| | BC1 | Front | 1.162 | 0.222 | 1.38 |
| | | Back | 1.131 | 0.107 | 1.24 |
| | | Right side | 1.453 | | 1.45 |
| | | Top side | 1.342 | | 1.34 |
| | | Bottom side | 0.074 | 0.388 | 0.46 |
| LTE | Band 12 | Front | 0.865 | 0.222 | 1.09 |
| | | Back | 0.948 | 0.107 | 1.06 |
| | | Right side | 0.169 | | 0.17 |
| | | Top side | 0.352 | | 0.35 |
| | | Bottom side | 0.308 | 0.388 | 0.70 |
| | Band 13 | Front | 1.162 | 0.222 | 1.38 |
| | | Back | 1.304 | 0.107 | 1.41 |
| | | Right side | 0.178 | | 0.18 |
| | | Top side | 0.579 | | 0.58 |
| | | Bottom side | 0.403 | 0.388 | 0.79 |
| | Band 5 | Front | 0.751 | 0.222 | 0.97 |
| | | Back | 0.767 | 0.107 | 0.87 |
| | | Right side | 0.144 | | 0.14 |
| | | Top side | 0.367 | | 0.37 |
| | | Bottom side | 0.28 | 0.388 | 0.67 |
| | Band 4 | Front | 1.241 | 0.222 | 1.46 |
| | | Back | 1.144 | 0.107 | 1.25 |
| | | Right side | 1.437 | | 1.44 |
| | | Top side | 0.587 | | 0.59 |
| | | Bottom side | 0.042 | 0.388 | 0.43 |
| | Band 2 | Front | 1.035 | 0.222 | 1.26 |
| | | Back | 1.063 | 0.107 | 1.17 |
| | | Right side | 1.375 | | 1.38 |
| | | Top side | 1.095 | | 1.10 |
| | | Bottom side | 0.063 | 0.388 | 0.45 |

**<WWAN + WLAN 5GHz (Antenna 1)>**

| WWAN Band | | Exposure Position | WWAN Max. WWAN SAR (W/kg) | WLAN 5GHz Max. WLAN SAR (W/kg) | Summed SAR (W/kg) |
|---|---|---|---|---|---|
| CDMA2000 | BC0 | Front | 1.132 | 0.239 | 1.37 |
| | | Back | 1.176 | 0.239 | 1.42 |
| | | Right side | 0.243 | | 0.24 |
| | | Top side | 0.492 | 0.239 | 0.73 |
| | | Bottom side | 0.388 | | 0.39 |
| | BC1 | Front | 1.162 | 0.239 | 1.40 |
| | | Back | 1.131 | 0.239 | 1.37 |
| | | Right side | 1.453 | | 1.45 |
| | | Top side | 1.342 | 0.239 | **1.58** |
| | | Bottom side | 0.074 | | 0.07 |
| LTE | Band 12 | Front | 0.865 | 0.239 | 1.10 |
| | | Back | 0.948 | 0.239 | 1.19 |
| | | Right side | 0.169 | | 0.17 |
| | | Top side | 0.352 | 0.239 | 0.59 |
| | | Bottom side | 0.308 | | 0.31 |
| | Band 13 | Front | 1.162 | 0.239 | 1.40 |
| | | Back | 1.304 | 0.239 | 1.54 |
| | | Right side | 0.178 | | 0.18 |
| | | Top side | 0.579 | 0.239 | 0.82 |
| | | Bottom side | 0.403 | | 0.40 |
| | Band 5 | Front | 0.751 | 0.239 | 0.99 |
| | | Back | 0.767 | 0.239 | 1.01 |
| | | Right side | 0.144 | | 0.14 |
| | | Top side | 0.367 | 0.239 | 0.61 |
| | | Bottom side | 0.28 | | 0.28 |
| | Band 4 | Front | 1.241 | 0.239 | 1.48 |
| | | Back | 1.144 | 0.239 | 1.38 |
| | | Right side | 1.437 | | 1.44 |
| | | Top side | 0.587 | 0.239 | 0.83 |
| | | Bottom side | 0.042 | | 0.04 |
| | Band 2 | Front | 1.035 | 0.239 | 1.27 |
| | | Back | 1.063 | 0.239 | 1.30 |
| | | Right side | 1.375 | | 1.38 |
| | | Top side | 1.095 | 0.239 | 1.33 |
| | | Bottom side | 0.063 | | 0.06 |

**<WWAN + WLAN 5GHz (Antenna 0+1)>**

| WWAN Band | | Exposure Position | WWAN Max. WWAN SAR (W/kg) | WLAN 5GHz Max. WLAN SAR (W/kg) | Summed SAR (W/kg) |
|---|---|---|---|---|---|
| CDMA2000 | BC0 | Front | 1.132 | 0.023 | 1.16 |
| | | Back | 1.176 | 0.038 | 1.21 |
| | | Right side | 0.243 | | 0.24 |
| | | Top side | 0.492 | 0.174 | 0.67 |
| | | Bottom side | 0.388 | 0.393 | 0.78 |
| | BC1 | Front | 1.162 | 0.023 | 1.19 |
| | | Back | 1.131 | 0.038 | 1.17 |
| | | Right side | 1.453 | | 1.45 |
| | | Top side | 1.342 | 0.174 | 1.52 |
| | | Bottom side | 0.074 | 0.393 | 0.47 |
| LTE | Band 12 | Front | 0.865 | 0.023 | 0.89 |
| | | Back | 0.948 | 0.038 | 0.99 |
| | | Right side | 0.169 | | 0.17 |
| | | Top side | 0.352 | 0.174 | 0.53 |
| | | Bottom side | 0.308 | 0.393 | 0.70 |
| | Band 13 | Front | 1.162 | 0.023 | 1.19 |
| | | Back | 1.304 | 0.038 | 1.34 |
| | | Right side | 0.178 | | 0.18 |
| | | Top side | 0.579 | 0.174 | 0.75 |
| | | Bottom side | 0.403 | 0.393 | 0.80 |
| | Band 5 | Front | 0.751 | 0.023 | 0.77 |
| | | Back | 0.767 | 0.038 | 0.81 |
| | | Right side | 0.144 | | 0.14 |
| | | Top side | 0.367 | 0.174 | 0.54 |
| | | Bottom side | 0.28 | 0.393 | 0.67 |
| | Band 4 | Front | 1.241 | 0.023 | 1.26 |
| | | Back | 1.144 | 0.038 | 1.18 |
| | | Right side | 1.437 | | 1.44 |
| | | Top side | 0.587 | 0.174 | 0.76 |
| | | Bottom side | 0.042 | 0.393 | 0.44 |
| | Band 2 | Front | 1.035 | 0.023 | 1.06 |
| | | Back | 1.063 | 0.038 | 1.10 |
| | | Right side | 1.375 | | 1.38 |
| | | Top side | 1.095 | 0.174 | 1.27 |
| | | Bottom side | 0.063 | 0.393 | 0.46 |

**Test Engineer：** Ken Li and Ken Li

# 16. Uncertainty Assessment

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in table below.

| Uncertainty Distributions | Normal | Rectangular | Triangular | U-Shape |
|---|---|---|---|---|
| Multi-plying Factor[(a)] | 1/k[(b)] | $1/\sqrt{3}$ | $1/\sqrt{6}$ | $1/\sqrt{2}$ |

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) $\kappa$ is the coverage factor

**Table 16.1. Standard Uncertainty for Assumed Distribution**

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

| Error Description | Uncertainty Value (±%) | Probability Distribution | Divisor | Ci (1g) | Ci (10g) | Standard Uncertainty (1g) | Standard Uncertainty (10g) |
|---|---|---|---|---|---|---|---|
| **Measurement System** | | | | | | | |
| Probe Calibration | 6.0 | Normal | 1 | 1 | 1 | ± 6.0 % | ± 6.0 % |
| Axial Isotropy | 4.7 | Rectangular | √3 | √3 | 0.7 | ± 1.9 % | ± 1.9 % |
| Hemispherical Isotropy | 9.6 | Rectangular | √3 | √3 | 0.7 | ± 3.9 % | ± 3.9 % |
| Boundary Effects | 1.0 | Rectangular | √3 | 1 | 1 | ± 0.6 % | ± 0.6 % |
| Linearity | 4.7 | Rectangular | √3 | 1 | 1 | ± 2.7 % | ± 2.7 % |
| System Detection Limits | 1.0 | Rectangular | √3 | 1 | 1 | ± 0.6 % | ± 0.6 % |
| Readout Electronics | 0.3 | Normal | 1 | 1 | 1 | ± 0.3 % | ± 0.3 % |
| Response Time | 0.8 | Rectangular | √3 | 1 | 1 | ± 0.5 % | ± 0.5 % |
| Integration Time | 2.6 | Rectangular | √3 | 1 | 1 | ± 1.5 % | ± 1.5 % |
| RF Ambient Noise | 3.0 | Rectangular | √3 | 1 | 1 | ± 1.7 % | ± 1.7 % |
| RF Ambient Reflections | 3.0 | Rectangular | √3 | 1 | 1 | ± 1.7 % | ± 1.7 % |
| Probe Positioner | 0.4 | Rectangular | √3 | 1 | 1 | ± 0.2 % | ± 0.2 % |
| Probe Positioning | 2.9 | Rectangular | √3 | 1 | 1 | ± 1.7 % | ± 1.7 % |
| Max. SAR Eval. | 1.0 | Rectangular | √3 | 1 | 1 | ± 0.6 % | ± 0.6 % |
| **Test Sample Related** | | | | | | | |
| Device Positioning | 2.9 | Normal | 1 | 1 | 1 | ± 2.9 % | ± 2.9 % |
| Device Holder | 3.6 | Normal | 1 | 1 | 1 | ± 3.6 % | ± 3.6 % |
| Power Drift | 5.0 | Rectangular | √3 | 1 | 1 | ± 2.9 % | ± 2.9 % |
| **Phantom and Setup** | | | | | | | |
| Phantom Uncertainty | 4.0 | Rectangular | √3 | 1 | 1 | ± 2.3 % | ± 2.3 % |
| Liquid Conductivity (Target) | 5.0 | Rectangular | √3 | 0.64 | 0.43 | ± 1.8 % | ± 1.2 % |
| Liquid Conductivity (Meas.) | 2.5 | Rectangular | √3 | 0.64 | 0.43 | ± 0.9 % | ± 0.6 % |
| Liquid Permittivity (Target) | 5.0 | Rectangular | √3 | 0.6 | 0.49 | ± 1.7 % | ± 1.4 % |
| Liquid Permittivity (Meas.) | 2.5 | Rectangular | √3 | 0.6 | 0.49 | ± 0.9 % | ± 0.7 % |
| **Combined Standard Uncertainty** | | | | | | ± 10.9 % | ± 10.7 % |
| **Coverage Factor for 95 %** | | | | | | K=2 | |
| **Expanded Uncertainty** | | | | | | **± 21.7 %** | **± 21.4 %** |

**Table 16.2. Uncertainty Budget for frequency range 300 MHz to 3 GHz**

| Error Description | Uncertainty Value (±%) | Probability Distribution | Divisor | Ci (1g) | Ci (10g) | Standard Uncertainty (1g) | Standard Uncertainty (10g) |
|---|---|---|---|---|---|---|---|
| **Measurement System** | | | | | | | |
| Probe Calibration | 6.55 | Normal | 1 | 1 | 1 | ± 6.55 % | ± 6.55 % |
| Axial Isotropy | 4.7 | Rectangular | √3 | 0.7 | 0.7 | ± 1.9 % | ± 1.9 % |
| Hemispherical Isotropy | 9.6 | Rectangular | √3 | 0.7 | 0.7 | ± 3.9 % | ± 3.9 % |
| Boundary Effects | 2.0 | Rectangular | √3 | 1 | 1 | ± 1.2 % | ± 1.2 % |
| Linearity | 4.7 | Rectangular | √3 | 1 | 1 | ± 2.7 % | ± 2.7 % |
| System Detection Limits | 1.0 | Rectangular | √3 | 1 | 1 | ± 0.6 % | ± 0.6 % |
| Readout Electronics | 0.3 | Normal | 1 | 1 | 1 | ± 0.3 % | ± 0.3 % |
| Response Time | 0.8 | Rectangular | √3 | 1 | 1 | ± 0.5 % | ± 0.5 % |
| Integration Time | 2.6 | Rectangular | √3 | 1 | 1 | ± 1.5 % | ± 1.5 % |
| RF Ambient Noise | 3.0 | Rectangular | √3 | 1 | 1 | ± 1.7 % | ± 1.7 % |
| RF Ambient Reflections | 3.0 | Rectangular | √3 | 1 | 1 | ± 1.7 % | ± 1.7 % |
| Probe Positioner | 0.8 | Rectangular | √3 | 1 | 1 | ± 0.5 % | ± 0.5 % |
| Probe Positioning | 6.7 | Rectangular | √3 | 1 | 1 | ± 3.9 % | ± 3.9 % |
| Max. SAR Eval. | 4.0 | Rectangular | √3 | 1 | 1 | ± 2.3 % | ± 2.3 % |
| **Test Sample Related** | | | | | | | |
| Device Positioning | 2.9 | Normal | 1 | 1 | 1 | ± 2.9 % | ± 2.9 % |
| Device Holder | 3.6 | Normal | 1 | 1 | 1 | ± 3.6 % | ± 3.6 % |
| Power Drift | 5.0 | Rectangular | √3 | 1 | 1 | ± 2.9 % | ± 2.9 % |
| **Phantom and Setup** | | | | | | | |
| Phantom Uncertainty | 4.0 | Rectangular | √3 | 1 | 1 | ± 2.3 % | ± 2.3 % |
| Liquid Conductivity (Target) | 5.0 | Rectangular | √3 | 0.64 | 0.43 | ± 1.8 % | ± 1.2 % |
| Liquid Conductivity (Meas.) | 2.5 | Rectangular | √3 | 0.64 | 0.43 | ± 0.9 % | ± 0.6 % |
| Liquid Permittivity (Target) | 5.0 | Rectangular | √3 | 0.6 | 0.49 | ± 1.7 % | ± 1.4 % |
| Liquid Permittivity (Meas.) | 2.5 | Rectangular | √3 | 0.6 | 0.49 | ± 0.9 % | ± 0.6 % |
| **Combined Standard Uncertainty** | | | | | | ± 12.0 % | ± 11.8 % |
| **Coverage Factor for 95 %** | | | | | | K=2 | |
| **Expanded Uncertainty** | | | | | | **± 24.0 %** | **± 23.7 %** |

**Table 16.3. Uncertainty Budget for frequency range 3 GHz to 6 GHz**

# 17. References


[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 248227 D01 v02r01, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Jun 2015.

[6] FCC KDB 447498 D01 v05r02, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Feb 2014

[7] FCC KDB 941225 D01 v03, “3G SAR MEAUREMENT PROCEDURES”, Oct 2014

[8] FCC KDB 941225 D05 v02r03, “SAR Evaluation Considerations for LTE Devices”, Dec 2013

[9] FCC KDB 941225 D05A v01r01, “Rel. 10 LTE SAR Test Guidance and KDB Inquiries”, Aug 2014

[10] FCC KDB 941225 D06 v02, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2014.

[11] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[12] FCC KDB 865664 D02 v01r01, “RF Exposure Compliance Reporting and Documentation Considerations” May 2013.

# Appendix A. Plots of System Performance Check

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015/7/16

**System Check_Body_750MHz_150716**

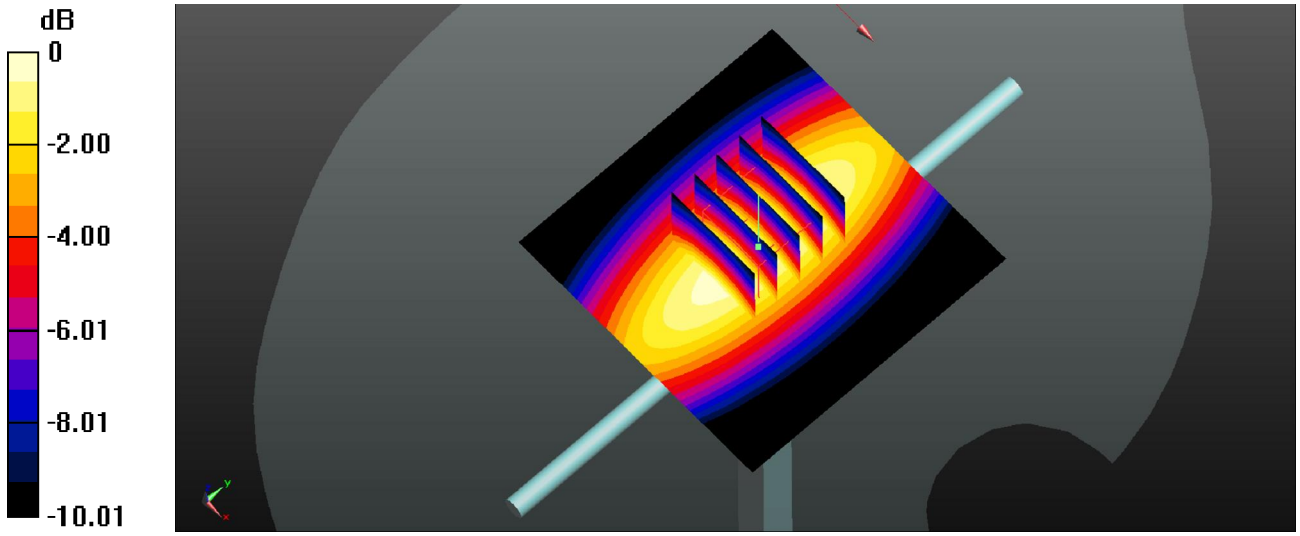
**DUT: D750V3-SN:1065**

Communication System: UID 0, CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: MSL_750_150716 Medium parameters used: f = 750 MHz; $\sigma$ = 0.963 S/m; $\varepsilon_r$ = 54.228; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.3 ℃; Liquid Temperature ：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3911; ConvF(9.61, 9.61, 9.61); Calibrated: 2014/10/2;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2015/4/28
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Pin=250mW/Area Scan (61x61x1):** Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.72 W/kg

**Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.31 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.14 W/kg
**SAR(1 g) = 2.17 W/kg; SAR(10 g) = 1.44 W/kg**
Maximum value of SAR (measured) = 2.72 W/kg




0 dB = 2.72 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015/7/15

**System Check_Body_835MHz_150715**

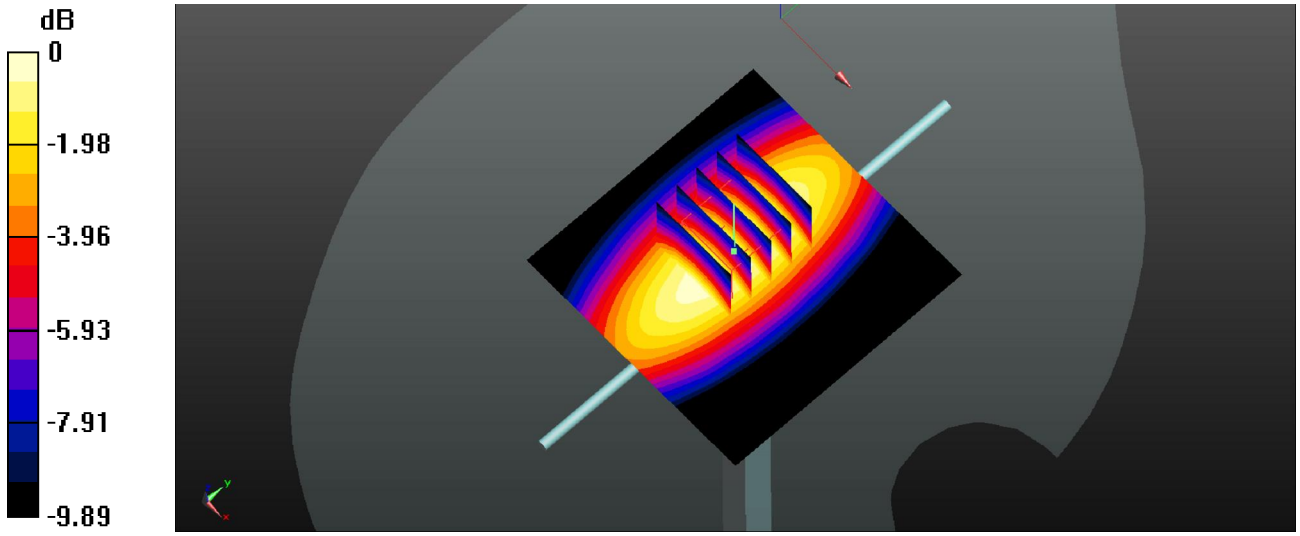
**DUT: D835V2-SN:4d091**

Communication System: UID 0, CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL_835_150715 Medium parameters used: f = 835 MHz; $\sigma$ = 0.994 S/m; $\varepsilon_r$ = 54.578; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.6 ℃; Liquid Temperature ：22.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3911; ConvF(9.66, 9.66, 9.66); Calibrated: 2014/10/2;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2015/4/28
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Pin=250mW/Area Scan (61x61x1):** Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.16 W/kg

**Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 48.80 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.65 W/kg
**SAR(1 g) = 2.51 W/kg; SAR(10 g) = 1.68 W/kg**
Maximum value of SAR (measured) = 3.14 W/kg




0 dB = 3.14 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015/7/10

**System Check_Body_1750MHz_150710**

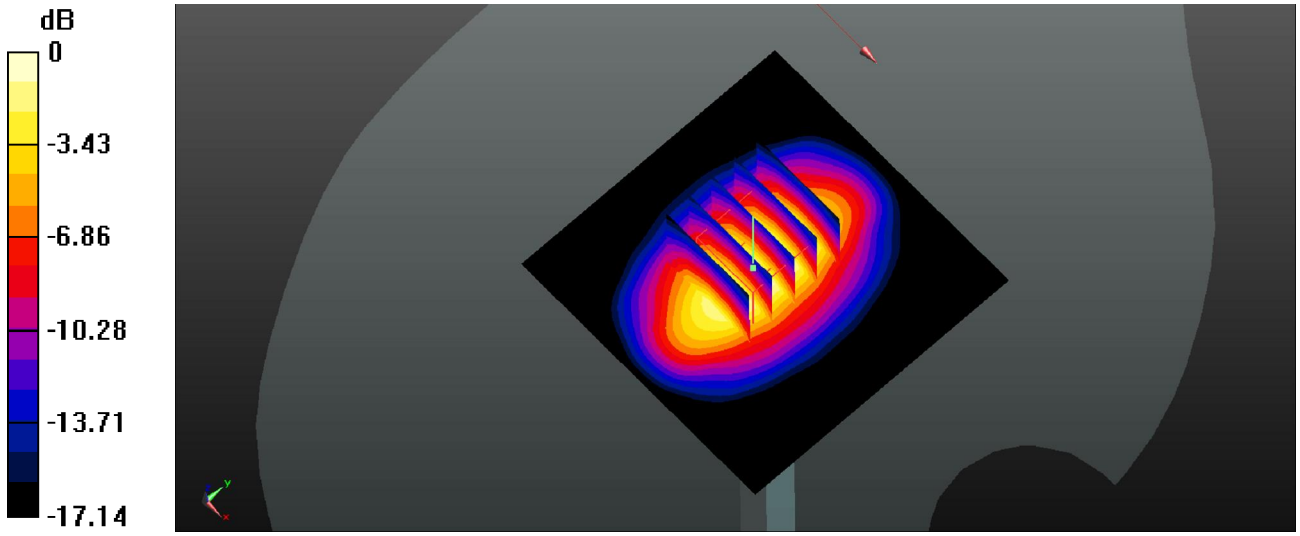
**DUT: D1750V2-SN:1069**

Communication System: UID 0, CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: MSL_1750_150710 Medium parameters used: f = 1750 MHz; $\sigma$ = 1.498 S/m; $\varepsilon_r$ = 53.247; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.4 ℃; Liquid Temperature ：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3911; ConvF(7.93, 7.93, 7.93); Calibrated: 2014/10/2;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2015/4/28
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Pin=250mW/Area Scan (61x61x1):** Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.4 W/kg

**Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 94.62 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 17.0 W/kg
**SAR(1 g) = 9.51 W/kg; SAR(10 g) = 5.03 W/kg**
Maximum value of SAR (measured) = 13.2 W/kg




0 dB = 13.2 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015/7/10

**System Check_Body_1900MHz_150710**

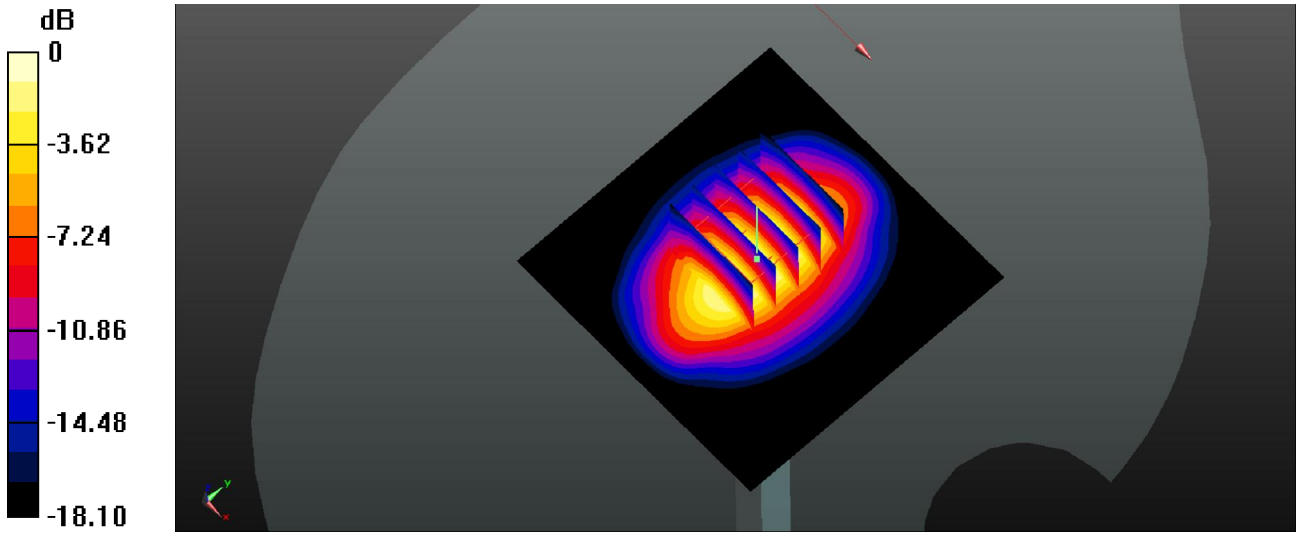
**DUT: D1900V2-SN:5d118**

Communication System: UID 0, CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL_1900_150710 Medium parameters used: f = 1900 MHz; $\sigma$ = 1.527 S/m; $\varepsilon_r$ = 55.253; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.5 ℃; Liquid Temperature ：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3911; ConvF(7.57, 7.57, 7.57); Calibrated: 2014/10/2;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2015/4/28
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Pin=250mW/Area Scan (61x61x1):** Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 14.2 W/kg

**Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 84.98 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 18.1 W/kg
**SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.24 W/kg**
Maximum value of SAR (measured) = 14.2 W/kg




0 dB = 14.2 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015/8/4

**System Check_Body_2450MHz_150804**

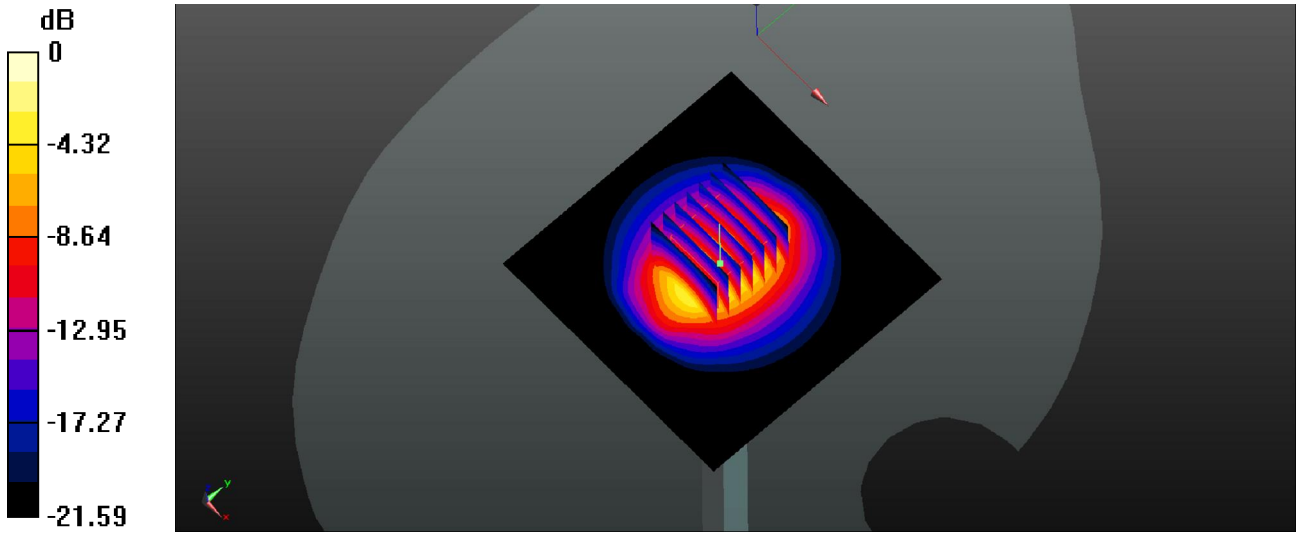
**DUT: D2450V2-SN:840**

Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: MSL_2450_150804 Medium parameters used: f = 2450 MHz; $\sigma$ = 1.949 S/m; $\varepsilon_r$ = 53.894; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.5 ℃; Liquid Temperature ：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3911; ConvF(7.18, 7.18, 7.18); Calibrated: 2014/10/2;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2015/4/28
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Pin=250mW/Area Scan (81x81x1):** Interpolated grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 19.5 W/kg

**Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.32 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 26.3 W/kg
**SAR(1 g) = 12.8 W/kg; SAR(10 g) = 5.89 W/kg**
Maximum value of SAR (measured) = 19.6 W/kg




0 dB = 19.6 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.08.07

**System Check_Body_5200MHz_150807**

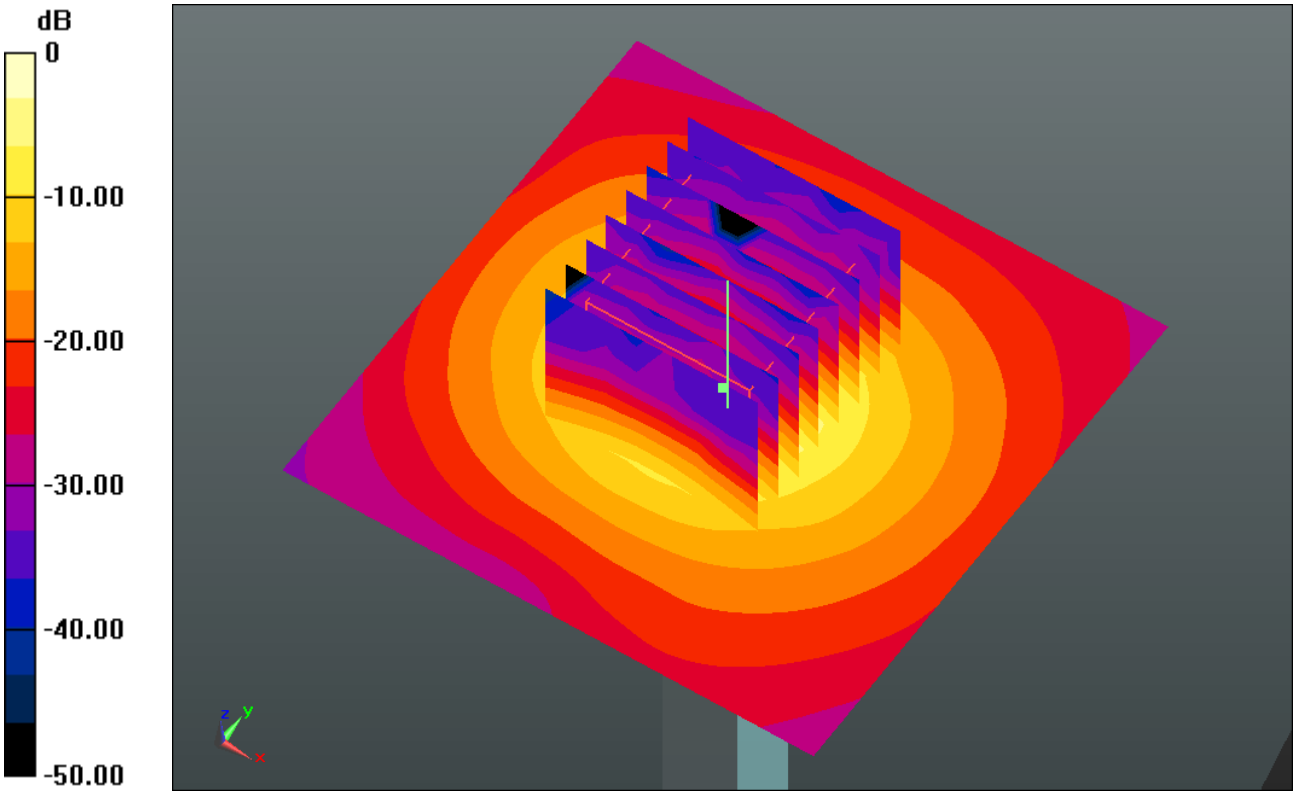
**DUT: D5GHzV2-SN:1113**

Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: MSL_5000_150807 Medium parameters used: f = 5200 MHz; $\sigma$ = 5.162 mho/m; $\varepsilon_r$ = 48.492; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.4 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.45, 4.45, 4.45); Calibrated: 2015.05.28
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2015.05.21
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

**Pin=100mW/Area Scan (71x71x1):** Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 16.392 mW/g

**Pin=100mW/Zoom Scan (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 40.630 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 28.050 W/kg
**SAR(1 g) = 7.01 mW/g; SAR(10 g) = 1.96 mW/g**
Maximum value of SAR (measured) = 16.251 mW/g




0 dB = 16.250mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.08.07

**System Check_Body_5800MHz_150807**

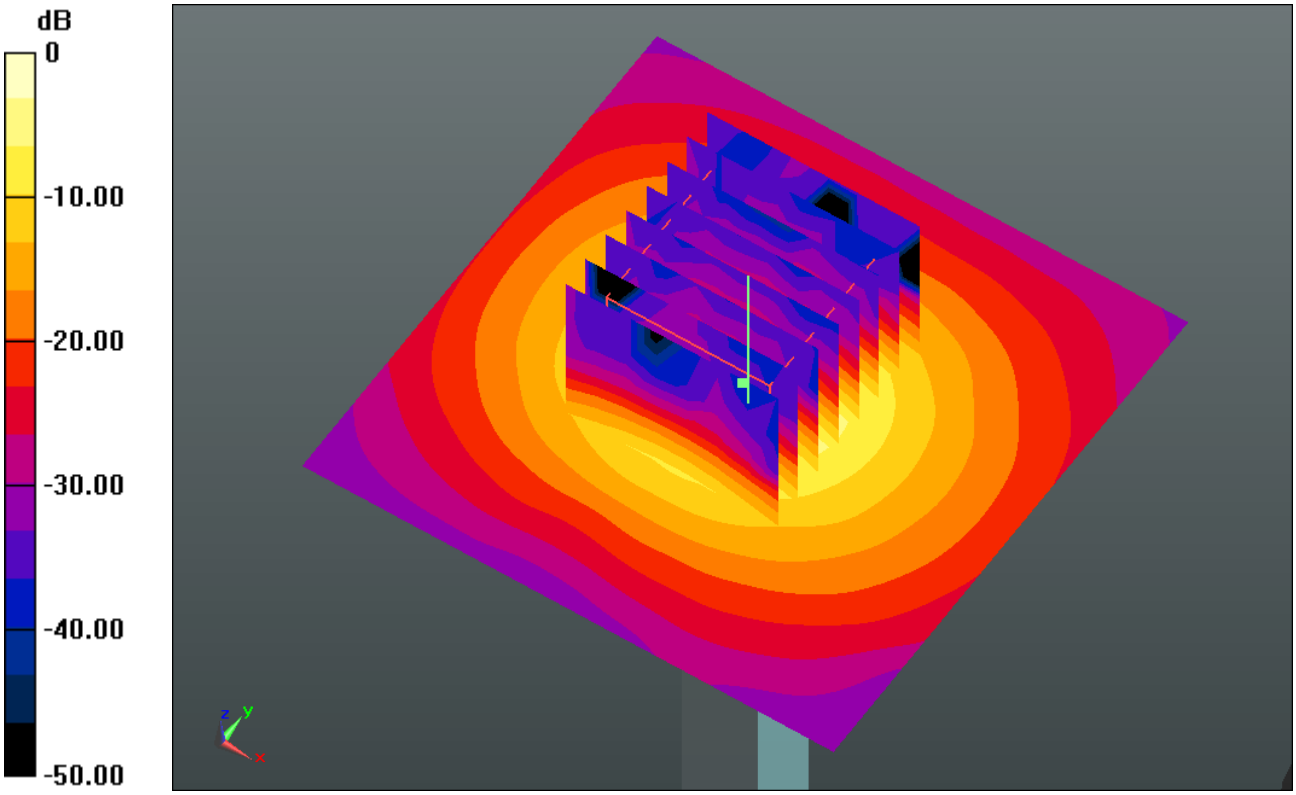
**DUT: D5GHzV2-SN:1113**

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: MSL_5000_150807 Medium parameters used: f = 5800 MHz; $\sigma$ = 5.976 mho/m; $\varepsilon_r$ = 47.158; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.4 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.16, 4.16, 4.16); Calibrated: 2015.05.28
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2015.05.21
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

**Pin=100mW/Area Scan (71x71x1):** Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 17.632 mW/g

**Pin=100mW/Zoom Scan (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 36.887 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 31.874 W/kg
**SAR(1 g) = 7.03 mW/g; SAR(10 g) = 1.95 mW/g**
Maximum value of SAR (measured) = 17.166 mW/g




0 dB = 17.170mW/g

# Appendix B. Plots of High SAR Measurement

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015/7/15

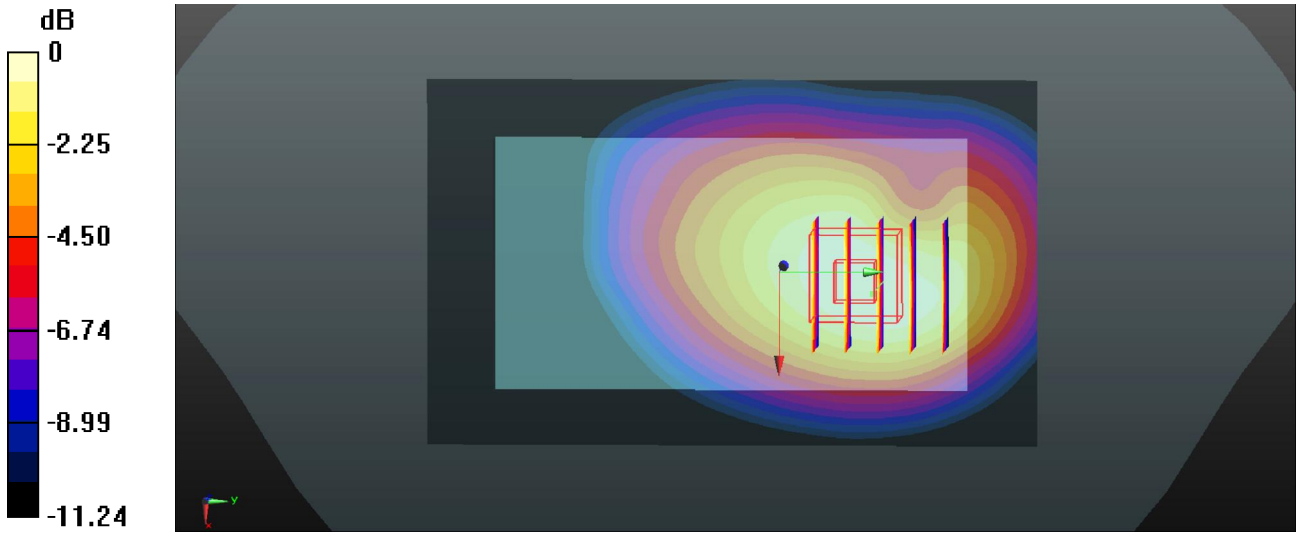
**01 CDMA2000_BC0_RTAP 153.6K_Back_1.0cm_Ch1013**

Communication System: UID 0, CDMA2000 (0); Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: MSL_835_150715 Medium parameters used: f = 824.7 MHz; $\sigma$ = 0.983 S/m; $\varepsilon_r$ = 54.696; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.6 ℃; Liquid Temperature ：22.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3911; ConvF(9.66, 9.66, 9.66); Calibrated: 2014/10/2;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2015/4/28
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Ch1013/Area Scan (61x101x1):** Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.34 W/kg

**Ch1013/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.02 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.52 W/kg
**SAR(1 g) = 1.070 W/kg; SAR(10 g) = 0.736 W/kg**
Maximum value of SAR (measured) = 1.29 W/kg




0 dB = 1.29 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015/7/10

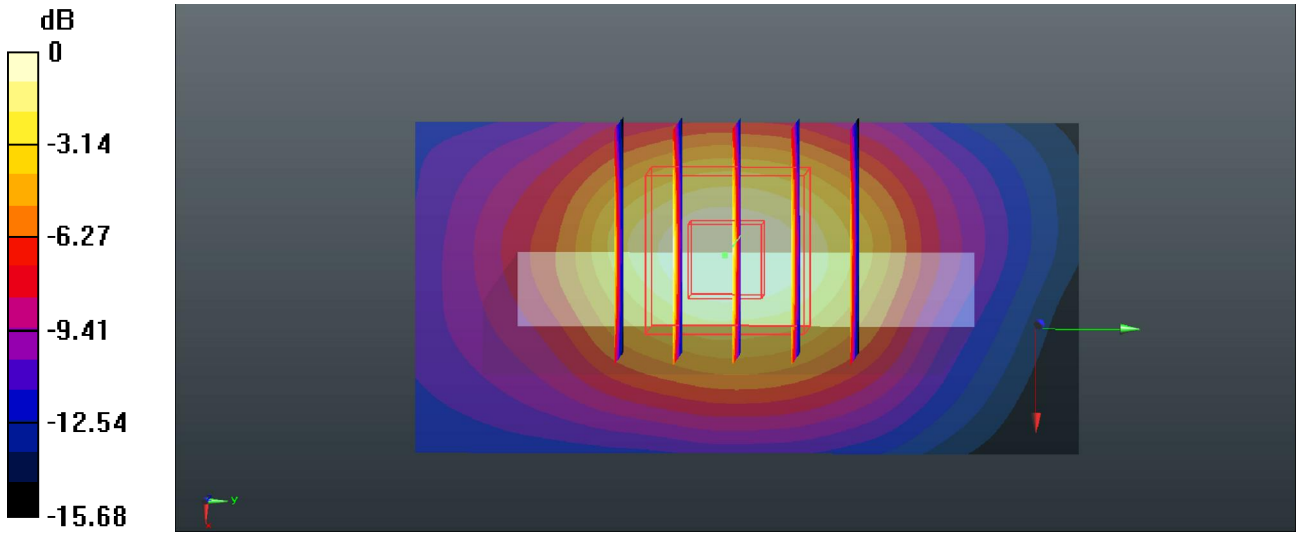
**02 CDMA2000 BC1_RTAP 153.6K_Right side_1.0cm_Ch25**

Communication System: UID 0, CDMA2000 (0); Frequency: 1851.25 MHz;Duty Cycle: 1:1
Medium: MSL_1900_150710 Medium parameters used: f = 1851.25 MHz; $\sigma$ = 1.48 S/m; $\varepsilon_r$ = 55.388; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.5 ℃; Liquid Temperature ：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3911; ConvF(7.57, 7.57, 7.57); Calibrated: 2014/10/2;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2015/4/28
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Ch25/Area Scan (31x61x1):** Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.96 W/kg

**Ch25/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.734 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 2.30 W/kg
**SAR(1 g) = 1.400 W/kg; SAR(10 g) = 0.767 W/kg**
Maximum value of SAR (measured) = 1.88 W/kg




0 dB = 1.88 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015/7/16

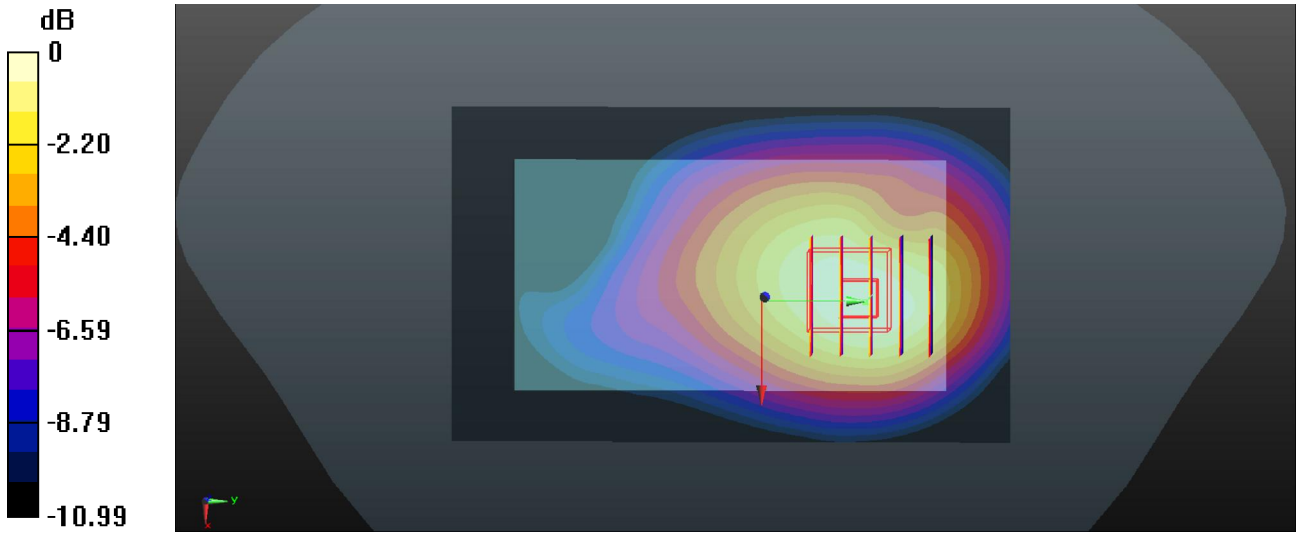
**03 LTE Band 12_QPSK_10M(1,49)_Back_1.0cm_Ch23130**

Communication System: UID 0, FDD-LTE (0); Frequency: 711 MHz;Duty Cycle: 1:1
Medium: MSL_750_150716 Medium parameters used: f = 711 MHz; $\sigma$ = 0.937 S/m; $\varepsilon_r$ = 55.142; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.3 ℃; Liquid Temperature ：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3911; ConvF(9.61, 9.61, 9.61); Calibrated: 2014/10/2;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2015/4/28
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Ch23130/Area Scan (61x101x1):** Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.910 W/kg

**Ch23130/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.63 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.05 W/kg
**SAR(1 g) = 0.741 W/kg; SAR(10 g) = 0.509 W/kg**
Maximum value of SAR (measured) = 0.912 W/kg




0 dB = 0.912 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015/7/16

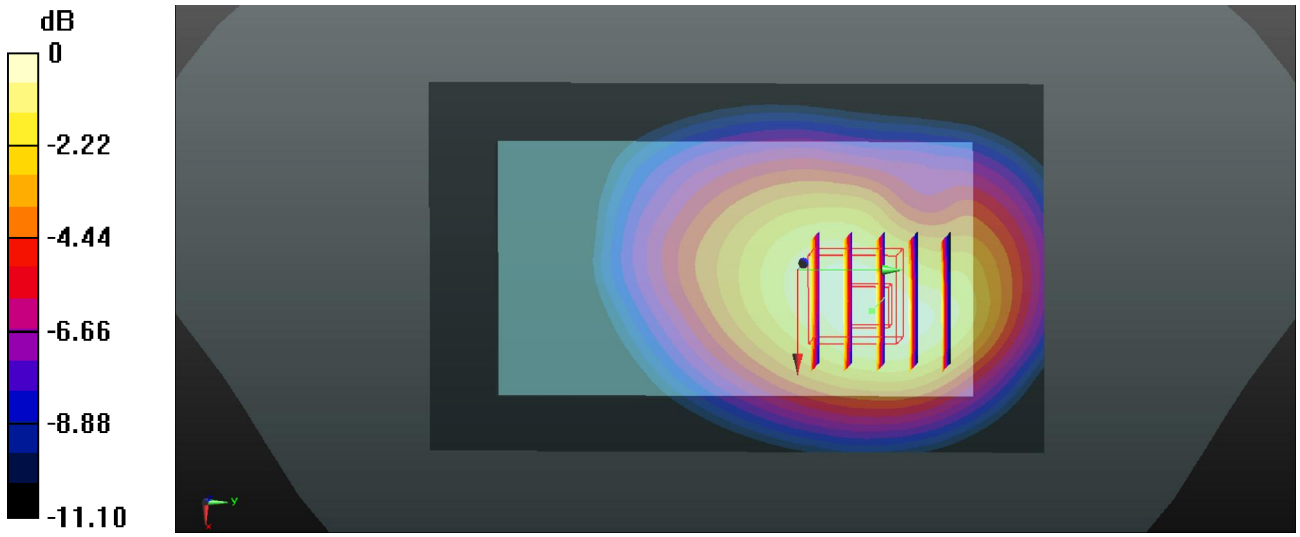
**04 LTE Band 13_QPSK_10M(1,0)_Back_1.0cm_Ch23230**

Communication System: UID 0, FDD-LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium: MSL_750_150716 Medium parameters used: f = 782 MHz; $\sigma$ = 0.988 S/m; $\varepsilon_r$ = 53.555; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.3 ℃; Liquid Temperature ：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3911; ConvF(9.61, 9.61, 9.61); Calibrated: 2014/10/2;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2015/4/28
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Ch23230/Area Scan (61x101x1):** Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.34 W/kg

**Ch23230/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.65 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.53 W/kg
**SAR(1 g) = 1.090 W/kg; SAR(10 g) = 0.748 W/kg**
Maximum value of SAR (measured) = 1.35 W/kg




0 dB = 1.35 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015/7/15

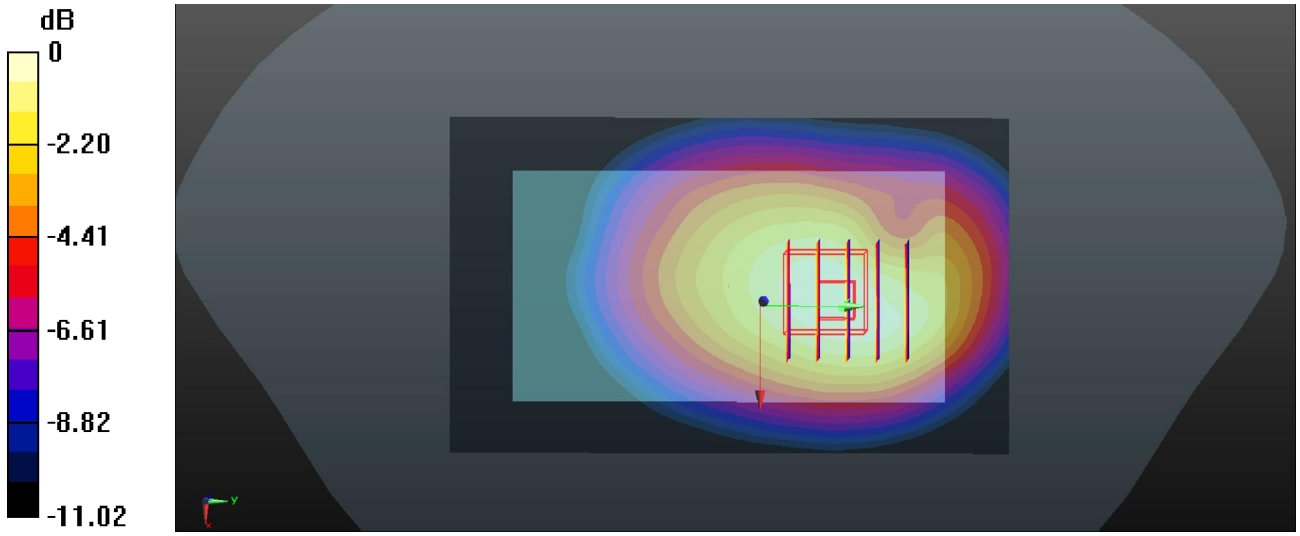
**05 LTE Band 5_QPSK_10M(1,24)_Back_1.0cm_Ch20450**

Communication System: UID 0, FDD-LTE (0); Frequency: 829 MHz;Duty Cycle: 1:1
Medium: MSL_835_150715 Medium parameters used: f = 829 MHz; $\sigma$ = 0.987 S/m; $\varepsilon_r$ = 54.649; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.6 ℃; Liquid Temperature ：22.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3911; ConvF(9.66, 9.66, 9.66); Calibrated: 2014/10/2;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2015/4/28
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Ch20450/Area Scan (61x101x1):** Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.828 W/kg

**Ch20450/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.42 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.956 W/kg
**SAR(1 g) = 0.674 W/kg; SAR(10 g) = 0.471 W/kg**
Maximum value of SAR (measured) = 0.826 W/kg




0 dB = 0.826 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015/7/10

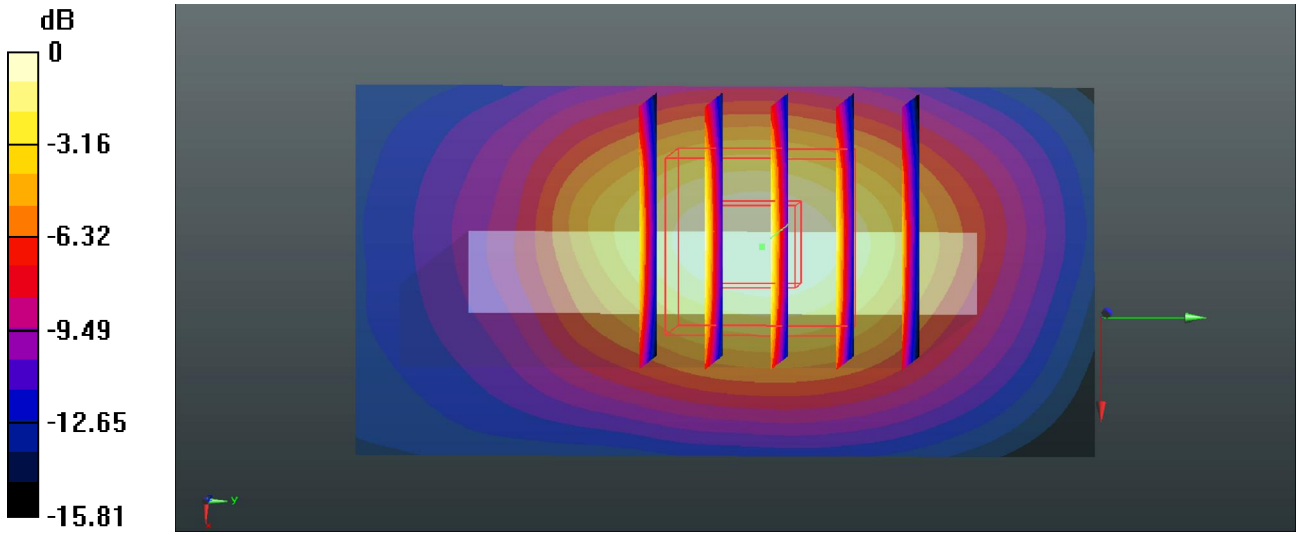
**06 LTE Band 4_QPSK_20M(1,0)_Right side_1.0cm_Ch20300**

Communication System: UID 0, FDD-LTE (0); Frequency: 1745 MHz;Duty Cycle: 1:1
Medium: MSL_1750_150710 Medium parameters used: f = 1745 MHz; $\sigma$ = 1.492 S/m; $\varepsilon_r$ = 53.228; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.4 ℃; Liquid Temperature ：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3911; ConvF(7.93, 7.93, 7.93); Calibrated: 2014/10/2;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2015/4/28
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Ch20300/Area Scan (31x61x1):** Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.87 W/kg

**Ch20300/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.57 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 2.12 W/kg
**SAR(1 g) = 1.290 W/kg; SAR(10 g) = 0.705 W/kg**
Maximum value of SAR (measured) = 1.73 W/kg




0 dB = 1.73 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015/7/10

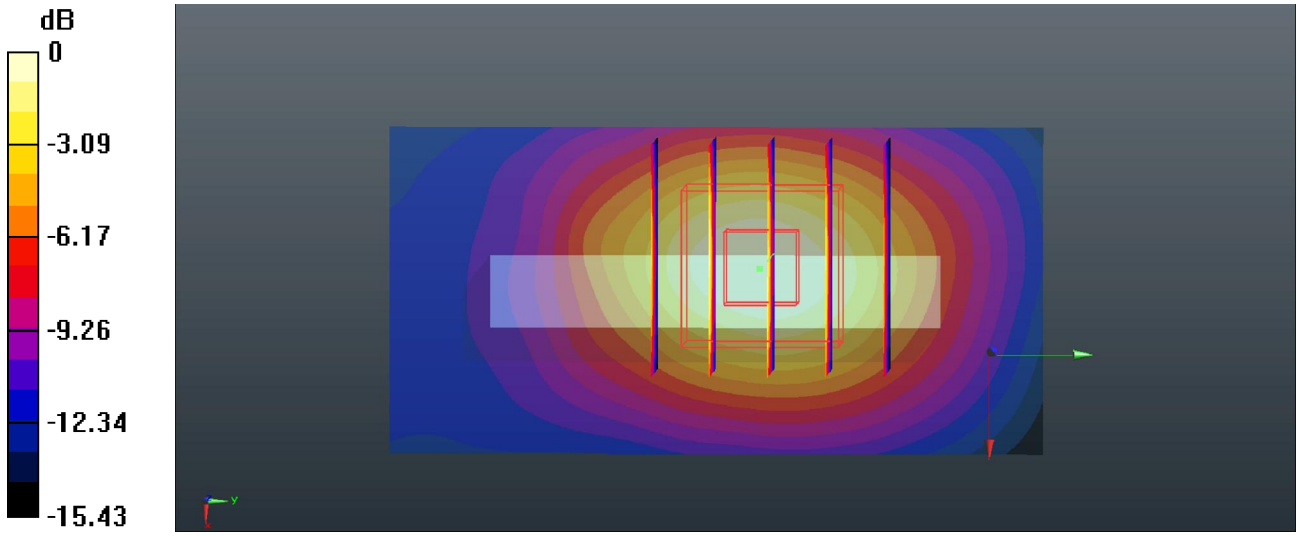
**07 LTE Band 2_QPSK_20M(1,0)_Right side_1.0cm_Ch18700**

Communication System: UID 0, FDD-LTE (0); Frequency: 1860 MHz;Duty Cycle: 1:1
Medium: MSL_1900_150710 Medium parameters used: f = 1860 MHz; $\sigma$ = 1.49 S/m; $\varepsilon_r$ = 55.39; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.5 ℃; Liquid Temperature ：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3911; ConvF(7.57, 7.57, 7.57); Calibrated: 2014/10/2;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2015/4/28
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Ch18700/Area Scan (31x61x1):** Interpolated grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.80 W/kg

**Ch18700/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.42 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.98 W/kg
**SAR(1 g) = 1.220 W/kg; SAR(10 g) = 0.676 W/kg**
Maximum value of SAR (measured) = 1.63 W/kg




0 dB = 1.63 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015/8/4

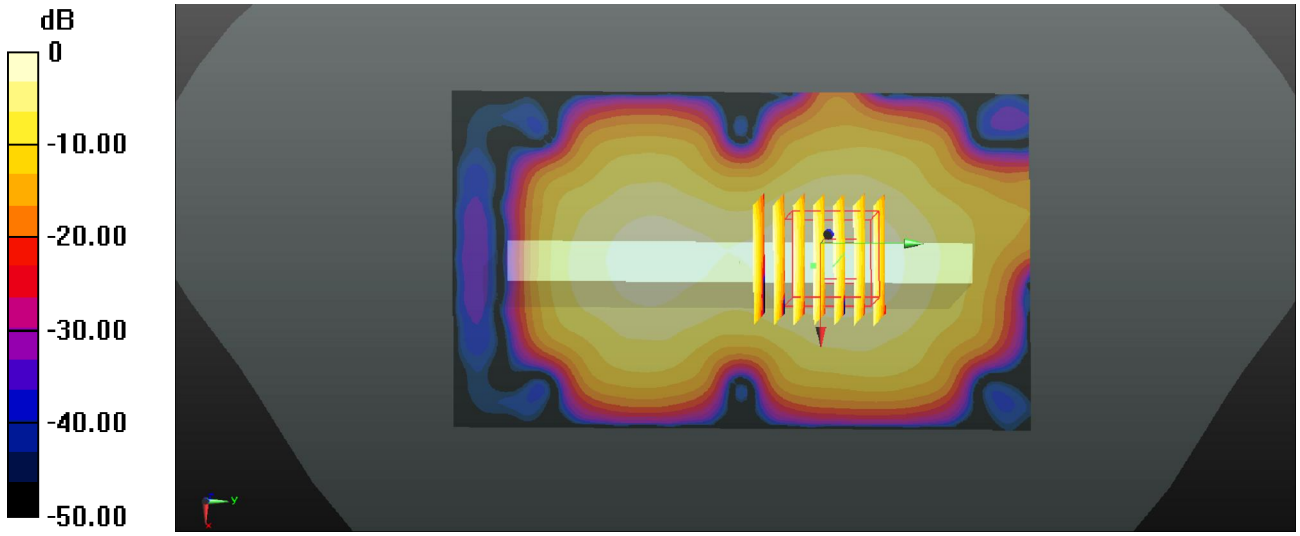
**08 WLAN 2.4G_802.11b_Top side_1.0cm_Ch1_ANT 1**

Communication System: UID 0, 802.11b (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_150804 Medium parameters used: f = 2412 MHz; $\sigma$ = 1.877 S/m; $\varepsilon_r$ = 54.002; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.5 ℃; Liquid Temperature ：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3911; ConvF(7.18, 7.18, 7.18); Calibrated: 2014/10/2;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2015/4/28
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Ch1/Area Scan (71x121x1):** Interpolated grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 0.195 W/kg

**Ch1/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.967 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.230 W/kg
**SAR(1 g) = 0.134 W/kg; SAR(10 g) = 0.073 W/kg**
Maximum value of SAR (measured) = 0.181 W/kg




0 dB = 0.181 W/kg

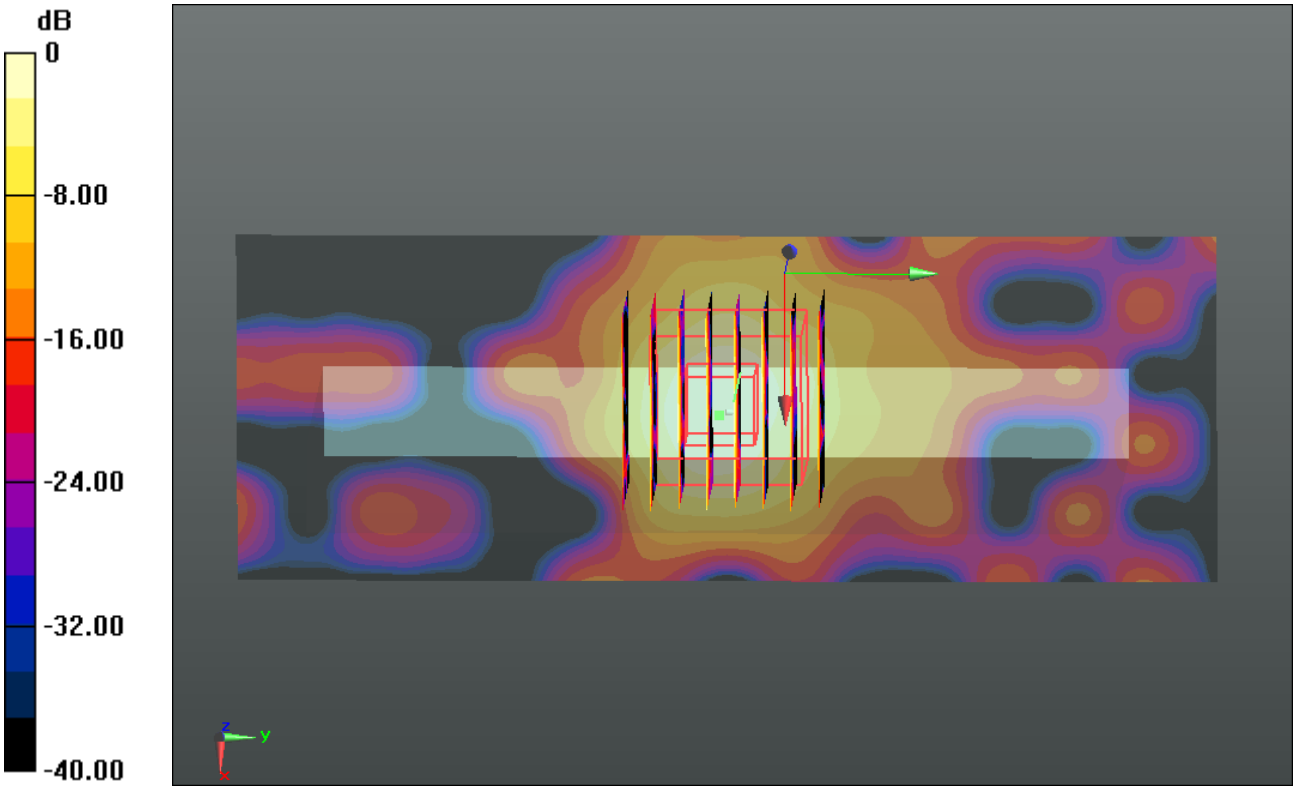
**09 WLAN 5GHz Band1_802.11n-HT40_MCS0_Top Side_1cm_Ch46_Ant.1**

Communication System: WIFI (0); Frequency: 5230 MHz;Duty Cycle: 1:1.107
Medium: MSL_5000_150807 Medium parameters used: f = 5230 MHz; $\sigma$ = 5.206 mho/m; $\varepsilon_r$ = 48.439; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.4 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.45, 4.45, 4.45); Calibrated: 2015.05.28
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2015.05.21
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

**Ch46/Area Scan (51x141x1):** Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.532 mW/g

**Ch46/Zoom Scan (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 7.057 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.857 W/kg
**SAR(1 g) = 0.212 mW/g; SAR(10 g) = 0.061 mW/g**
Maximum value of SAR (measured) = 0.535 mW/g




0 dB = 0.540mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.08.07

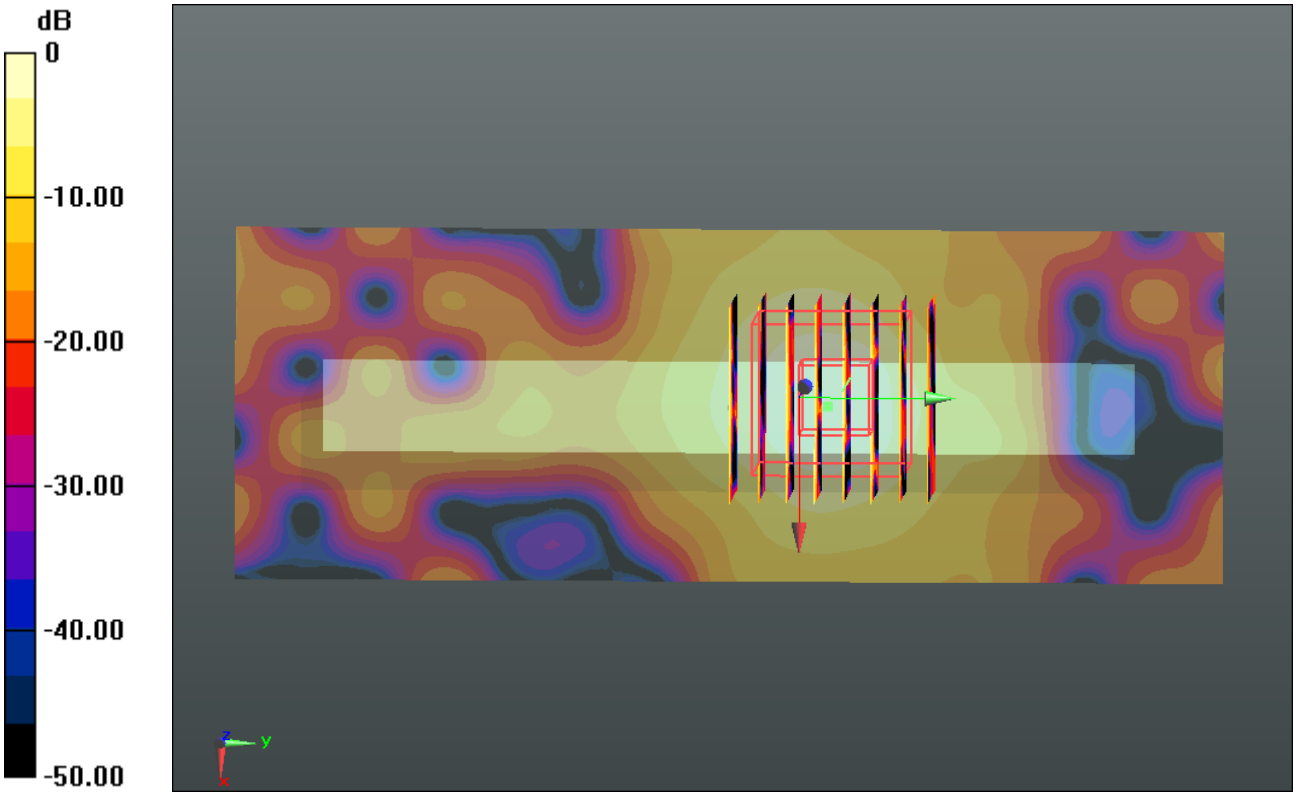
**10 WLAN 5GHz Band4_802.11ac-VHT20_MCS0_Bottom Side_1cm_Ch157_Ant.0+1**

Communication System: WIFI (0); Frequency: 5785 MHz;Duty Cycle: 1:1.054
Medium: MSL_5000_150807 Medium parameters used: f = 5785 MHz; $\sigma$ = 5.961 mho/m; $\varepsilon_r$ = 47.221; $\rho$ = 1000 kg/m$^3$
Ambient Temperature：23.4 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.16, 4.16, 4.16); Calibrated: 2015.05.28
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2015.05.21
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

**Ch157/Area Scan (51x141x1):** Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.863 mW/g

**Ch157/Zoom Scan (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 4.058 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.589 W/kg
**SAR(1 g) = 0.343 mW/g; SAR(10 g) = 0.101 mW/g**
Maximum value of SAR (measured) = 0.833 mW/g




0 dB = 0.830mW/g