

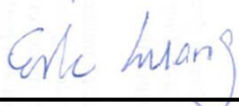
# FCC SAR Test Report

APPLICANT : Getac Technology Corporation.  
EQUIPMENT : Wireless module  
BRAND NAME : Getac  
MODEL NAME : EM7355  
FCC ID : QYLEM7355R  
STANDARD : FCC 47 CFR Part 2 (2.1093)  
ANSI/IEEE C95.1-1992  
IEEE 1528-2003

The product was installed into Tablet (Brand Name: Getac, Model Name: RX10) during test.

We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.



Reviewed by: Eric Huang / Deputy Manager



Approved by: Jones Tsai / Manager



## SPORTON INTERNATIONAL INC.

No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.)



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## Revision History

| REPORT NO.  | VERSION | DESCRIPTION             | ISSUED DATE   |
|-------------|---------|-------------------------|---------------|
| FA570164-01 | Rev. 01 | Initial issue of report | Aug. 24, 2015 |
|             |         |                         |               |
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|             |         |                         |               |

## **1. Statement of Compliance**

The maximum results of Specific Absorption Rate (SAR) found during testing for **Getac Technology Corporation., Wireless module, EM7355**, are as follows.

| Equipment Class  | Frequency Band | Highest SAR Summary   |                                         |
|------------------|----------------|-----------------------|-----------------------------------------|
|                  |                | Body 1g SAR (W/kg)    | Simultaneous Transmission 1g SAR (W/kg) |
| PCB              | GSM850         | 1.05                  | 1.59                                    |
|                  | GSM1900        | 0.98                  |                                         |
|                  | WCDMA Band V   | 1.15                  |                                         |
|                  | WCDMA Band IV  | 0.94                  |                                         |
|                  | WCDMA Band II  | 1.10                  |                                         |
|                  | CDMA 2000 BC10 | 1.19                  |                                         |
|                  | CDMA 2000 BC0  | 1.19                  |                                         |
|                  | CDMA 2000 BC1  | 1.00                  |                                         |
|                  | LTE Band 17    | 0.78                  |                                         |
|                  | LTE Band 13    | 1.00                  |                                         |
|                  | LTE Band 5     | 1.17                  |                                         |
|                  | LTE Band 4     | 0.86                  |                                         |
|                  | LTE Band 25    | 1.12                  |                                         |
| Date of Testing: |                | 2015/07/17~2015/07/21 |                                         |

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 1528-2003.

## **2. Administration Data**

| Testing Laboratory |                                                                                                                                                  |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Site          | SPORTON INTERNATIONAL INC.                                                                                                                       |
| Test Site Location | No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.)<br>TEL: +886-3-327-3456<br>FAX: +886-3-328-4978 |

| Applicant    |                                                                                                |
|--------------|------------------------------------------------------------------------------------------------|
| Company Name | Getac Technology Corporation.                                                                  |
| Address      | 5F., Building A, No. 209, Sec.1, Nangang Rd., Nangang Dist., Taipei City 11568, Taiwan, R.O.C. |

| Manufacturer |                                                 |
|--------------|-------------------------------------------------|
| Company Name | Sierra Wireless, Inc.                           |
| Address      | 13811, Wireless Way, Richmond, British Columbia |

## **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 1528-2003
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03
- FCC KDB 865664 D02 SAR Reporting v01r01
- FCC KDB 447498 D01 General RF Exposure Guidance v05r02
- FCC KDB 616217 D04 SAR for laptop and tablets v01r01
- FCC KDB 941225 D01 3G SAR Procedures v03
- FCC KDB 941225 D05 SAR for LTE Devices v02r03
- April 2015 TCB workshop notes (Overlapping LTE Bands)

## 4. Equipment Under Test (EUT)

### 4.1 General Information

| Product Feature & Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equipment Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Wireless module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Brand Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Getac                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Model Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | EM7355                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| FCC ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | QYLEM7355R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| IMEI Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 356196051008239                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| S / N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | RF5XXR0310                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Wireless Technology and Frequency Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | GSM850: 824.2 MHz ~ 848.8 MHz<br>GSM1900: 1850.2 MHz ~ 1909.8 MHz<br>WCDMA Band V: 826.4 MHz ~ 846.6 MHz<br>WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz<br>WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz<br>CDMA2000 BC0: 824.7 MHz ~ 848.31 MHz<br>CDMA 2000 BC10: 817.9 MHz ~ 823.1 MHz<br>CDMA 2000 BC1: 1851.25 MHz ~ 1908.75 MHz<br>LTE Band 17: 706.5 MHz ~ 713.5 MHz<br>LTE Band 13: 779.5 MHz ~ 784.5 MHz<br>LTE Band 5: 826.5 MHz ~ 846.5 MHz<br>LTE Band 4: 1712.5 MHz ~ 1752.5 MHz<br>LTE Band 2: 1852.5 MHz ~ 1907.5 MHz<br>LTE Band 25: 1852.5 MHz ~ 1912.5 MHz |
| Mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>· GPRS/EGPRS</li> <li>· RMC 12.2Kbps</li> <li>· HSDPA</li> <li>· HSUPA</li> <li>· DC-HSDPA</li> <li>· CDMA2000 : 1xRTT/1xEv-Do(Rev.0)/1xEv-Do(Rev.A)</li> <li>· LTE: QPSK, 16QAM</li> </ul>                                                                                                                                                                                                                                                                                                                               |
| EUT Stage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Production Unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Remark:</b> <ol style="list-style-type: none"> <li>1. The WLAN/BT module, Brand Name: Intel, Model Name: 7265NGW, FCC ID: QYL7265NG is also integrated into this host and the WLAN SAR testing results are also used perform transmission simultaneous analysis which can be referred to Sporton SAR Test Report, Report No: FA570164-02.</li> <li>2. When proximity sensor is enabled that GSM850, WCDMA B5, CDMA BC10 / BC0 / BC1, LTE B13 / B5 power reduction applied to satisfy SAR compliance.</li> </ol> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Host Information    |                                                                                                                                                                   |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Host Name           | Tablet                                                                                                                                                            |
| Brand Name          | Getac                                                                                                                                                             |
| Model Name          | RX10                                                                                                                                                              |
| Integrated Module   | Brand Name: Intel<br>Model Name: 7265NGW                                                                                                                          |
| Wireless Technology | <ul style="list-style-type: none"> <li>· 802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80</li> <li>· Bluetooth v3.0+EDR · Bluetooth v4.0-LE</li> <li>· NFC</li> </ul> |

## 4.2 Maximum Tune-up Limit

| Mode / Band             | Burst Average Power (dBm) |                   |                 |
|-------------------------|---------------------------|-------------------|-----------------|
|                         | GSM 850                   |                   | GSM 1900        |
| Output Power Status     | Full Power Mode           | Reduce Power Mode | Full Power Mode |
| GPRS (GMSK, 1 Tx slot)  | 33.50                     | 30.50             | 30.50           |
| GPRS (GMSK, 2 Tx slots) | 33.00                     | 28.00             | 30.00           |
| EDGE (8PSK, 1 Tx slot)  | 28.00                     | 28.00             | 27.00           |
| EDGE (8PSK, 2 Tx slots) | 27.00                     | 27.00             | 26.00           |
| EDGE (8PSK, 3 Tx slot)  | 27.00                     | 24.00             | 26.00           |
| EDGE (8PSK, 4 Tx slots) | 27.00                     | 24.00             | 26.00           |

| Mode / Band         | Average Power (dBm) |                   |                 |                 |
|---------------------|---------------------|-------------------|-----------------|-----------------|
|                     | WCDMA Band V        |                   | WCDMA Band II   | WCDMA Band IV   |
| Output Power Status | Full Power Mode     | Reduce Power Mode | Full Power Mode | Full Power Mode |
| RMC 12.2Kbps        | 24.00               | 22.00             | 24.00           | 24.00           |
| HSDPA Subtest-1     | 24.00               | 22.00             | 24.00           | 24.00           |
| DC-HSDPA Subtest-1  | 24.00               | 22.00             | 24.00           | 24.00           |
| HSUPA Subtest-5     | 24.00               | 22.00             | 24.00           | 24.00           |

| Mode / Band         | Average Power (dBm) |                   |                 |                   |                 |                   |
|---------------------|---------------------|-------------------|-----------------|-------------------|-----------------|-------------------|
|                     | CDMA BC10           |                   | CDMA BC0        |                   | CDMA BC1        |                   |
| Output Power Status | Full Power Mode     | Reduce Power Mode | Full Power Mode | Reduce Power Mode | Full Power Mode | Reduce Power Mode |
| 1xRTT RC1 SO55      | 25.00               | 22.00             | 25.00           | 22.00             | 25.00           | 24.00             |
| 1xRTT RC3 SO55      | 25.00               | 22.00             | 25.00           | 22.00             | 25.00           | 24.00             |
| 1xEV-DO Rev 0       | 25.00               | 22.00             | 25.00           | 22.00             | 25.00           | 24.00             |
| 1xEV-DO Rev A       | 25.00               | 22.00             | 25.00           | 22.00             | 25.00           | 24.00             |

| LTE Band 17 |          |         |                 |                     |
|-------------|----------|---------|-----------------|---------------------|
| Modulation  | BW (MHz) | RB size | Full Power Mode |                     |
|             |          |         | MPR             | Average Power (dBm) |
| 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               |

| LTE Band 13 |          |         |                 |                     |                   |                     |
|-------------|----------|---------|-----------------|---------------------|-------------------|---------------------|
| Modulation  | BW (MHz) | RB size | Full Power Mode |                     | Reduce Power Mode |                     |
|             |          |         | MPR             | Average Power (dBm) | MPR               | Average Power (dBm) |
| QPSK        | 10       | ≤ 12    | 0               | 24.00               | 0                 | 22.00               |
| QPSK        | 10       | > 12    | 1               | 23.00               | 0                 | 22.00               |
| 16QAM       | 10       | ≤ 12    | 1               | 23.00               | 0                 | 22.00               |
| 16QAM       | 10       | > 12    | 2               | 22.00               | 1                 | 21.00               |
| QPSK        | 5        | ≤ 8     | 0               | 24.00               | 0                 | 22.00               |
| QPSK        | 5        | > 8     | 1               | 23.00               | 0                 | 22.00               |
| 16QAM       | 5        | ≤ 8     | 1               | 23.00               | 0                 | 22.00               |
| 16QAM       | 5        | > 8     | 2               | 22.00               | 1                 | 21.00               |

| LTE Band 5 |          |         |                 |                     |                   |                     |
|------------|----------|---------|-----------------|---------------------|-------------------|---------------------|
| Modulation | BW (MHz) | RB size | Full Power Mode |                     | Reduce Power Mode |                     |
|            |          |         | MPR             | Average Power (dBm) | MPR               | Average Power (dBm) |
| QPSK       | 10       | ≤ 12    | 0               | 24.00               | 0                 | 22.00               |
| QPSK       | 10       | > 12    | 1               | 23.00               | 0                 | 22.00               |
| 16QAM      | 10       | ≤ 12    | 1               | 23.00               | 0                 | 22.00               |
| 16QAM      | 10       | > 12    | 2               | 22.00               | 1                 | 21.00               |
| QPSK       | 5        | ≤ 8     | 0               | 24.00               | 0                 | 22.00               |
| QPSK       | 5        | > 8     | 1               | 23.00               | 0                 | 22.00               |
| 16QAM      | 5        | ≤ 8     | 1               | 23.00               | 0                 | 22.00               |
| 16QAM      | 5        | > 8     | 2               | 22.00               | 1                 | 21.00               |

| LTE Band 4 |          |         |                 |                     |  |
|------------|----------|---------|-----------------|---------------------|--|
| Modulation | BW (MHz) | RB size | Full Power Mode |                     |  |
|            |          |         | MPR             | Average Power (dBm) |  |
| QPSK       | 20       | ≤ 18    | 0               | 24.00               |  |
| QPSK       | 20       | > 18    | 1               | 23.00               |  |
| 16QAM      | 20       | ≤ 18    | 1               | 23.00               |  |
| 16QAM      | 20       | > 18    | 2               | 22.00               |  |
| QPSK       | 15       | ≤ 16    | 0               | 24.00               |  |
| QPSK       | 15       | > 16    | 1               | 23.00               |  |
| 16QAM      | 15       | ≤ 16    | 1               | 23.00               |  |
| 16QAM      | 15       | > 16    | 2               | 22.00               |  |
| 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               |  |

| LTE Band 2 |          |         |                 |                     |
|------------|----------|---------|-----------------|---------------------|
| Modulation | BW (MHz) | RB size | Full Power Mode |                     |
|            |          |         | MPR             | Average Power (dBm) |
| QPSK       | 20       | ≤ 18    | 0               | 24.00               |
| QPSK       | 20       | > 18    | 1               | 23.00               |
| 16QAM      | 20       | ≤ 18    | 1               | 23.00               |
| 16QAM      | 20       | > 18    | 2               | 22.00               |
| QPSK       | 15       | ≤ 16    | 0               | 24.00               |
| QPSK       | 15       | > 16    | 1               | 23.00               |
| 16QAM      | 15       | ≤ 16    | 1               | 23.00               |
| 16QAM      | 15       | > 16    | 2               | 22.00               |
| 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               |

| LTE Band 25 |          |         |                 |                     |
|-------------|----------|---------|-----------------|---------------------|
| Modulation  | BW (MHz) | RB size | Full Power Mode |                     |
|             |          |         | MPR             | Average Power (dBm) |
| QPSK        | 20       | ≤ 18    | 0               | 24.00               |
| QPSK        | 20       | > 18    | 1               | 23.00               |
| 16QAM       | 20       | ≤ 18    | 1               | 23.00               |
| 16QAM       | 20       | > 18    | 2               | 22.00               |
| QPSK        | 15       | ≤ 16    | 0               | 24.00               |
| QPSK        | 15       | > 16    | 1               | 23.00               |
| 16QAM       | 15       | ≤ 16    | 1               | 23.00               |
| 16QAM       | 15       | > 16    | 2               | 22.00               |
| 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               |

### 4.3 General LTE SAR Test and Reporting Considerations

| Summarized necessary items addressed in KDB 941225 D05 v02r03  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |        |        |        |          |                                                                |  |  |  |  |  |  |  |            |                                                 |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|--------|--------|--------|----------|----------------------------------------------------------------|--|--|--|--|--|--|--|------------|-------------------------------------------------|--|--|--|--|--|----------|---------|---------|-------|--------|--------|--------|------|-----|-----|-----|------|------|------|-----|--------|-----|-----|-----|------|------|------|-----|--------|-----|-----|-----|------|------|------|-----|
| FCC ID                                                         | QYLEM7355R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |       |        |        |        |          |                                                                |  |  |  |  |  |  |  |            |                                                 |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| Equipment Name                                                 | Wireless module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |        |        |        |          |                                                                |  |  |  |  |  |  |  |            |                                                 |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| Operating Frequency Range of each LTE transmission band        | LTE Band 17: 706.5 MHz ~ 713.5 MHz<br>LTE Band 13: 779.5 MHz ~ 784.5 MHz<br>LTE Band 05: 826.5 MHz ~ 846.5 MHz<br>LTE Band 04: 1712.5 MHz ~ 1752.5 MHz<br>LTE Band 02: 1852.5 MHz ~ 1907.5 MHz<br>LTE Band 25: 1852.5 MHz ~ 1912.5 MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |       |        |        |        |          |                                                                |  |  |  |  |  |  |  |            |                                                 |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| Channel Bandwidth                                              | LTE Band 17: 5MHz, 10MHz<br>LTE Band 13: 5MHz, 10MHz<br>LTE Band 05: 5MHz, 10MHz<br>LTE Band 04: 5MHz, 10MHz, 15MHz, 20MHz<br>LTE Band 02: 5MHz, 10MHz, 15MHz, 20MHz<br>LTE Band 25: 5MHz, 10MHz, 15MHz, 20MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |       |        |        |        |          |                                                                |  |  |  |  |  |  |  |            |                                                 |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| uplink modulations used                                        | QPSK, and 16QAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |        |        |        |          |                                                                |  |  |  |  |  |  |  |            |                                                 |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| LTE Voice / Data requirements                                  | Data only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |         |       |        |        |        |          |                                                                |  |  |  |  |  |  |  |            |                                                 |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| LTE MPR permanently built-in by design                         | <table><tr><th colspan="8">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3</th></tr><tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th><th rowspan="2">MPR (dB)</th></tr><tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr><tr><td>QPSK</td><td>&gt; 5</td><td>&gt; 4</td><td>&gt; 8</td><td>&gt; 12</td><td>&gt; 16</td><td>&gt; 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>&gt; 5</td><td>&gt; 4</td><td>&gt; 8</td><td>&gt; 12</td><td>&gt; 16</td><td>&gt; 18</td><td>≤ 2</td></tr></table> |         |       |        |        |        |          | 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 |
| 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |       |        |        |        |          |                                                                |  |  |  |  |  |  |  |            |                                                 |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |
| Power reduction applied to satisfy SAR compliance              | Yes, Proximity Sensor, when operation is enabled that LTE B13 / B17 / B5 / B26 power reduction applied to satisfy SAR compliance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |       |        |        |        |          |                                                                |  |  |  |  |  |  |  |            |                                                 |  |  |  |  |  |          |         |         |       |        |        |        |      |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |        |     |     |     |      |      |      |     |

| Transmission (H, M, L) channel numbers and frequencies in each LTE band |                 |             |                  |             |                  |             |                  |             |
|-------------------------------------------------------------------------|-----------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|
| LTE Band 17                                                             |                 |             |                  |             |                  |             |                  |             |
|                                                                         | Bandwidth 5 MHz |             |                  |             | Bandwidth 10 MHz |             |                  |             |
|                                                                         | Channel #       |             | Freq.(MHz)       |             | Channel #        |             | Freq. (MHz)      |             |
| L                                                                       | 23755           |             | 706.5            |             | 23780            |             | 709              |             |
| M                                                                       | 23790           |             | 710              |             | 23790            |             | 710              |             |
| H                                                                       | 23825           |             | 713.5            |             | 23800            |             | 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 5 MHz |             |                  |             | Bandwidth 10 MHz |             |                  |             |
|                                                                         | Ch. #           |             | Freq. (MHz)      |             | Ch. #            |             | Freq. (MHz)      |             |
| L                                                                       | 20425           |             | 826.5            |             | 20450            |             | 829              |             |
| M                                                                       | 20525           |             | 836.5            |             | 20525            |             | 836.5            |             |
| H                                                                       | 20625           |             | 846.5            |             | 20600            |             | 844              |             |
| LTE Band 4                                                              |                 |             |                  |             |                  |             |                  |             |
|                                                                         | Bandwidth 5 MHz |             | Bandwidth 10 MHz |             | Bandwidth 15 MHz |             | Bandwidth 20 MHz |             |
|                                                                         | Ch. #           | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |
| L                                                                       | 19975           | 1712.5      | 20000            | 1715        | 20025            | 1717.5      | 20050            | 1720        |
| M                                                                       | 20175           | 1732.5      | 20175            | 1732.5      | 20175            | 1732.5      | 20175            | 1732.5      |
| H                                                                       | 20375           | 1752.5      | 20350            | 1750        | 20325            | 1747.5      | 20300            | 1745        |
| LTE Band 2                                                              |                 |             |                  |             |                  |             |                  |             |
|                                                                         | Bandwidth 5 MHz |             | Bandwidth 10 MHz |             | Bandwidth 15 MHz |             | Bandwidth 20 MHz |             |
|                                                                         | Ch. #           | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |
| L                                                                       | 18625           | 1852.5      | 18650            | 1855        | 18675            | 1857.5      | 18700            | 1860        |
| M                                                                       | 18900           | 1880        | 18900            | 1880        | 18900            | 1880        | 18900            | 1880        |
| H                                                                       | 19175           | 1907.5      | 19150            | 1905        | 19125            | 1902.5      | 19100            | 1900        |
| LTE Band 25                                                             |                 |             |                  |             |                  |             |                  |             |
|                                                                         | Bandwidth 5 MHz |             | Bandwidth 10 MHz |             | Bandwidth 15 MHz |             | Bandwidth 20 MHz |             |
|                                                                         | Ch. #           | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |
| L                                                                       | 26065           | 1852.5      | 26090            | 1855        | 26115            | 1857.5      | 26140            | 1860        |
| M                                                                       | 26340           | 1880        | 26340            | 1880        | 26340            | 1880        | 26340            | 1880        |
| H                                                                       | 26665           | 1912.5      | 26640            | 1910        | 26615            | 1907.5      | 26590            | 1905        |

**Proximity sensor power reduction**

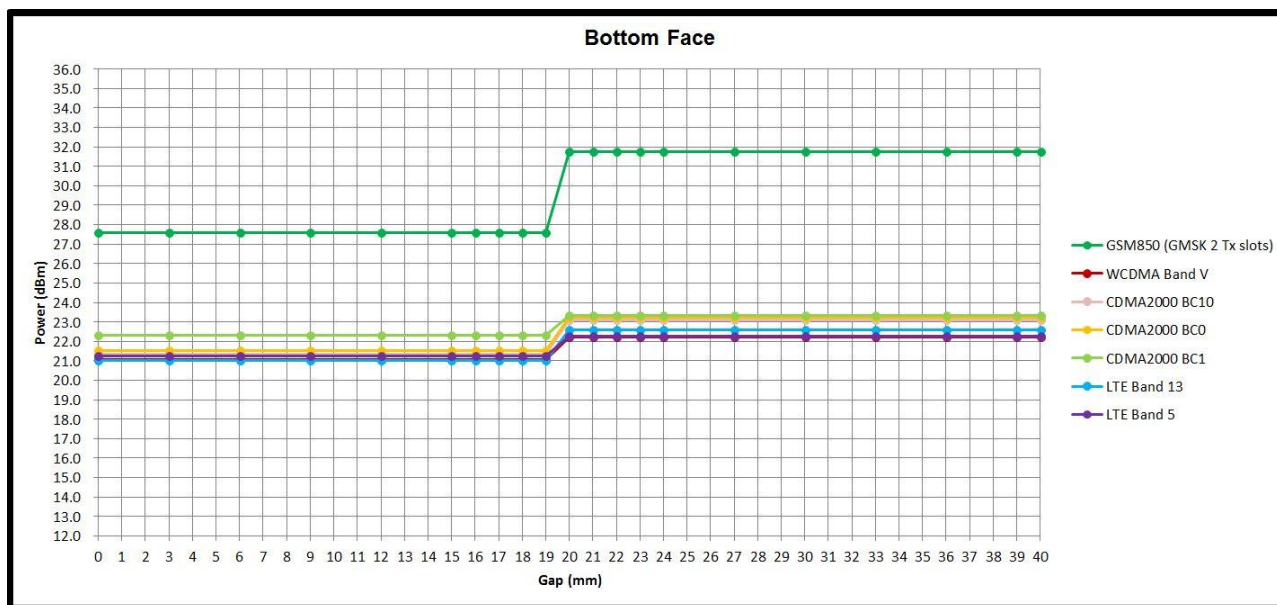
| Exposure Position /<br>wireless mode | Bottom Face <sup>(1)</sup> | Edge 1 | Edge 2 | Edge 3 | Edge 4 |
|--------------------------------------|----------------------------|--------|--------|--------|--------|
| GSM850 GPRS (GMSK 1 Tx slot) - CS1   | 3.0 dB                     | 0dB    | 0dB    | 0dB    | 0dB    |
| GSM850 GPRS (GMSK 2 Tx slot) - CS1   | 5.0 dB                     |        |        |        |        |
| GSM850 EDGE (8PSK 1 Tx slot) - MCS5  | 0.0 dB                     |        |        |        |        |
| GSM850 EDGE (8PSK 2 Tx slot) - MCS5  | 0.0 dB                     |        |        |        |        |
| GSM850 EDGE (8PSK 3 Tx slot) - MCS5  | 3.0 dB                     |        |        |        |        |
| GSM850 EDGE (8PSK 4 Tx slot) - MCS5  | 3.0 dB                     |        |        |        |        |
| WCDMA Band V                         | 2.0 dB                     |        |        |        |        |
| CDMA2000 BC10                        | 3.0 dB                     |        |        |        |        |
| CDMA2000 BC0                         | 3.0 dB                     |        |        |        |        |
| CDMA2000 BC1                         | 1.0 dB                     |        |        |        |        |
| LTE Band 13                          | 2.0 dB                     |        |        |        |        |
| LTE Band 5                           | 2.0 dB                     |        |        |        |        |

**Remark:**

- <sup>(1)</sup>: Reduced maximum limit applied by activation of proximity sensor.
- Tests were performed in accordance with KDB 616217 D04 section 6.1, 6.2, 6.3, 6.4 and 6.5 and compliant results are shown and described in exhibit "P-Sensor operational description"
- For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance was performed:
  - Bottom Face: [10 mm](#)

**Power Measurement during Sensor Trigger distance testing**

| Band/Mode               | Ch #  | Measured power reduction (dBm) |                   | Reduction Levels |
|-------------------------|-------|--------------------------------|-------------------|------------------|
|                         |       | w/o power back-off             | w/ power back-off | (dB)             |
| GSM850 (GMSK 2 Tx slot) | 128   | 31.76                          | 27.60             | 4.16             |
| WCDMA Band V            | 4132  | 22.23                          | 21.08             | 1.15             |
| EVDO BC10               | 580   | 23.09                          | 21.35             | 1.74             |
| EVDO BC0                | 384   | 23.23                          | 21.54             | 1.69             |
| EVDO BC1                | 1175  | 23.33                          | 23.30             | 1.03             |
| LTE Band 13t            | 23230 | 22.60                          | 21.01             | 1.59             |
| LTE Band 5              | 20600 | 22.27                          | 21.27             | 1.00             |



## **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:

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

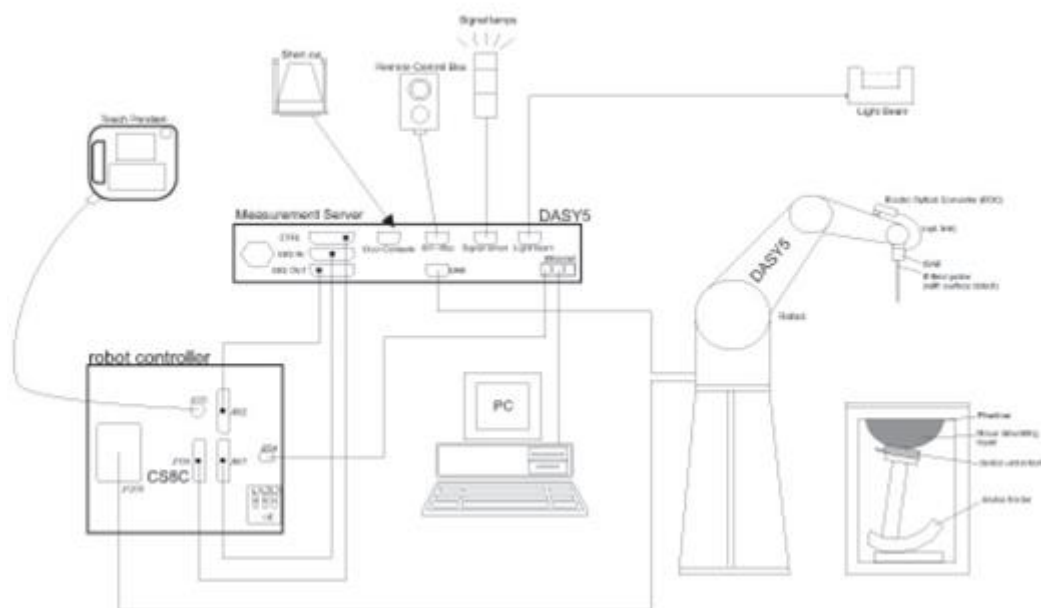
SAR is expressed in units of Watts per kilogram (W/kg)

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

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 WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT 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/BT output power

### <SAR measurement>

- (a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT 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 from 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.

|                                                                                                        | $\leq 3$ GHz                                                                                                                                                                                                                                                           | $> 3$ GHz                                              |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface | $5 \pm 1$ mm                                                                                                                                                                                                                                                           | $\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm     |
| Maximum probe angle from probe axis to phantom surface normal at the measurement location              | $30^\circ \pm 1^\circ$                                                                                                                                                                                                                                                 | $20^\circ \pm 1^\circ$                                 |
| Maximum area scan spatial resolution: $\Delta x_{Area}$ , $\Delta y_{Area}$                            | $\leq 2$ GHz: $\leq 15$ mm<br>$2 - 3$ GHz: $\leq 12$ mm                                                                                                                                                                                                                | $3 - 4$ GHz: $\leq 12$ mm<br>$4 - 6$ GHz: $\leq 10$ 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 $\leq$ 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 to 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 whose 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.

|                                                                                                                                                                                                                                                                                                             |                                           |                                                                                             | $\leq 3$ GHz                                         | $> 3$ GHz                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------|
| Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$                                                                                                                                                                                                                      |                                           |                                                                                             | $\leq 2$ GHz: $\leq 8$ mm<br>2 – 3 GHz: $\leq 5$ mm* | 3 – 4 GHz: $\leq 5$ mm*<br>4 – 6 GHz: $\leq 4$ mm*                            |
| Maximum zoom scan spatial resolution, normal to phantom surface                                                                                                                                                                                                                                             | uniform grid: $\Delta z_{\text{Zoom}}(n)$ |                                                                                             | $\leq 5$ mm                                          | 3 – 4 GHz: $\leq 4$ mm<br>4 – 5 GHz: $\leq 3$ mm<br>5 – 6 GHz: $\leq 2$ mm    |
|                                                                                                                                                                                                                                                                                                             | graded grid                               | $\Delta z_{\text{Zoom}}(1)$ : between 1 <sup>st</sup> two points closest to phantom surface | $\leq 4$ mm                                          | 3 – 4 GHz: $\leq 3$ mm<br>4 – 5 GHz: $\leq 2.5$ mm<br>5 – 6 GHz: $\leq 2$ mm  |
|                                                                                                                                                                                                                                                                                                             |                                           | $\Delta z_{\text{Zoom}}(n>1)$ : between subsequent points                                   | $\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$         |                                                                               |
| Minimum zoom scan volume                                                                                                                                                                                                                                                                                    | x, y, z                                   |                                                                                             | $\geq 30$ mm                                         | 3 – 4 GHz: $\geq 28$ mm<br>4 – 5 GHz: $\geq 25$ mm<br>5 – 6 GHz: $\geq 22$ mm |
| Note: $\delta$ 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 <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is $\leq 1.4$ W/kg, $\leq 8$ mm, $\leq 7$ mm and $\leq 5$ 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 to 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     | 1012          | May. 28, 2015 | May. 27, 2016 |
| SPEAG         | 835MHz System Validation Kit    | D835V2     | 499           | Mar. 20, 2015 | Mar. 19, 2016 |
| SPEAG         | 1750MHz System Validation Kit   | D1750V2    | 1068          | Nov. 14, 2014 | Nov. 13, 2015 |
| SPEAG         | 1900MHz System Validation Kit   | D1900V2    | 5d041         | Mar. 24, 2015 | Mar. 23, 2016 |
| SPEAG         | Data Acquisition Electronics    | DAE4       | 778           | Aug. 21, 2014 | Aug. 20, 2015 |
| SPEAG         | Data Acquisition Electronics    | DAE4       | 1399          | Nov. 13, 2014 | Nov. 12, 2015 |
| SPEAG         | Dosimetric E-Field Probe        | ES3DV3     | 3270          | Sep. 26, 2014 | Sep. 25, 2015 |
| SPEAG         | Dosimetric E-Field Probe        | EX3DV4     | 3955          | Nov. 21, 2014 | Nov. 20, 2015 |
| Wisewind      | Thermometer                     | ETP-101    | TM560         | Oct. 21, 2014 | Oct. 20, 2015 |
| WonDer        | Thermometer                     | WD-5015    | TM685         | Oct. 21, 2014 | Oct. 20, 2015 |
| Anritsu       | Radio Communication Analyzer    | MT8820C    | 6201074414    | Feb. 06, 2015 | Feb. 05, 2016 |
| Agilent       | Wireless Communication Test Set | E5515C     | MY50266977    | May. 14, 2015 | May. 13, 2016 |
| SPEAG         | Device Holder                   | N/A        | N/A           | N/A           | N/A           |
| Agilent       | Signal Generator                | N5181A     | MY50145381    | Dec. 11, 2014 | Dec. 10, 2015 |
| R&S           | Signal Generator                | MG3710A    | 6201502524    | May. 25, 2015 | May. 24, 2016 |
| Agilent       | ENA Network Analyzer            | E5071C     | MY46316648    | Feb. 11, 2015 | Feb. 10, 2016 |
| SPEAG         | Dielectric Probe Kit            | DAK-3.5    | 1138          | Nov. 18, 2014 | Nov. 17, 2015 |
| Anritsu       | Power Meter                     | ML2495A    | 1419002       | May. 13, 2015 | May. 12, 2016 |
| Anritsu       | Power Sensor                    | MA2411B    | 1339124       | May. 13, 2015 | May. 12, 2016 |
| Anritsu       | Power Meter                     | ML2495A    | 1349001       | Dec. 03, 2014 | Dec. 02, 2015 |
| Anritsu       | Power Sensor                    | MA2411B    | 1306099       | Dec. 03, 2014 | Dec. 02, 2015 |
| Anritsu       | Spectrum Analyzer               | MS2830A    | 6201396378    | Jun. 17, 2015 | Jun. 16, 2016 |
| Agilent       | Dual Directional Coupler        | 778D       | 50422         | Note 1        |               |
| Woken         | Attenuator 1                    | WK0602-XX  | N/A           | Note 1        |               |
| PE            | Attenuator 2                    | PE7005-10  | N/A           | Note 1        |               |
| PE            | Attenuator 3                    | PE7005- 3  | N/A           | Note 1        |               |
| AR            | Power Amplifier                 | 5S1G4M2    | 0328767       | Note 1        |               |
| Mini-Circuits | Power Amplifier                 | ZVE-3W     | 162601250     | Note 1        |               |

### 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 ( $\sigma$ ) | Permittivity ( $\epsilon_r$ ) |
|------------------|-----------|-----------|---------------|----------|---------------|----------|---------------------------|-------------------------------|
| For Head         |           |           |               |          |               |          |                           |                               |
| 750              | 41.1      | 57.0      | 0.2           | 1.4      | 0.2           | 0        | 0.89                      | 41.9                          |
| 835              | 40.3      | 57.9      | 0.2           | 1.4      | 0.2           | 0        | 0.90                      | 41.5                          |
| 900              | 40.3      | 57.9      | 0.2           | 1.4      | 0.2           | 0        | 0.97                      | 41.5                          |
| 1800, 1900, 2000 | 55.2      | 0         | 0             | 0.3      | 0             | 44.5     | 1.40                      | 40.0                          |
| 2450             | 55.0      | 0         | 0             | 0        | 0             | 45.0     | 1.80                      | 39.2                          |
| 2600             | 54.8      | 0         | 0             | 0.1      | 0             | 45.1     | 1.96                      | 39.0                          |
| 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                          |
| 900              | 50.8      | 48.2      | 0             | 0.9      | 0.1           | 0        | 1.05                      | 55.0                          |
| 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                          |
| 2600             | 68.1      | 0         | 0             | 0.1      | 0             | 31.8     | 2.16                      | 52.5                          |

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. (°C) | Conductivity ( $\sigma$ ) | Permittivity ( $\epsilon_r$ ) | Conductivity Target ( $\sigma$ ) | Permittivity Target ( $\epsilon_r$ ) | Delta ( $\sigma$ ) (%) | Delta ( $\epsilon_r$ ) (%) | Limit (%) | Date      |
|-----------------|-------------|-------------------|---------------------------|-------------------------------|----------------------------------|--------------------------------------|------------------------|----------------------------|-----------|-----------|
| 750             | MSL         | 22.4              | 0.964                     | 57.237                        | 0.96                             | 55.50                                | 0.42                   | 3.13                       | ±5        | 2015/7/20 |
| 835             | MSL         | 22.5              | 0.978                     | 53.298                        | 0.97                             | 55.20                                | 0.82                   | -3.45                      | ±5        | 2015/7/18 |
| 835             | MSL         | 22.4              | 0.983                     | 56.088                        | 0.97                             | 55.20                                | 1.34                   | 1.61                       | ±5        | 2015/7/20 |
| 835             | MSL         | 22.6              | 0.967                     | 55.596                        | 0.97                             | 55.20                                | -0.31                  | 0.72                       | ±5        | 2015/7/21 |
| 1750            | MSL         | 22.5              | 1.517                     | 52.252                        | 1.49                             | 53.40                                | 1.81                   | -2.15                      | ±5        | 2015/7/17 |
| 1900            | MSL         | 22.5              | 1.569                     | 51.569                        | 1.52                             | 53.30                                | 3.22                   | -3.25                      | ±5        | 2015/7/17 |

## 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 1g SAR (W/kg) | Targeted 1g SAR (W/kg) | Normalized 1g SAR (W/kg) | Deviation (%) |
|-----------|-----------------|-------------|------------------|---------------|-----------------|-------------|------------------------|------------------------|--------------------------|---------------|
| 2015/7/20 | 750             | MSL         | 250              | D750V3-1012   | ES3DV3 - SN3270 | DAE4 Sn778  | 2.14                   | 8.61                   | 8.56                     | -0.58         |
| 2015/7/18 | 835             | MSL         | 250              | D835V2-499    | ES3DV3 - SN3270 | DAE4 Sn778  | 2.46                   | 9.30                   | 9.84                     | 5.81          |
| 2015/7/20 | 835             | MSL         | 250              | D835V2-499    | ES3DV3 - SN3270 | DAE4 Sn778  | 2.43                   | 9.30                   | 9.72                     | 4.52          |
| 2015/7/21 | 835             | MSL         | 250              | D835V2-499    | EX3DV4 - SN3955 | DAE4 Sn1399 | 2.42                   | 9.30                   | 9.68                     | 4.09          |
| 2015/7/17 | 1750            | MSL         | 250              | D1750V2-1068  | ES3DV3 - SN3270 | DAE4 Sn778  | 9.15                   | 38.00                  | 36.60                    | -3.68         |
| 2015/7/17 | 1900            | MSL         | 250              | D1900V2-5d041 | ES3DV3 - SN3270 | DAE4 Sn778  | 10.20                  | 39.80                  | 40.80                    | 2.51          |

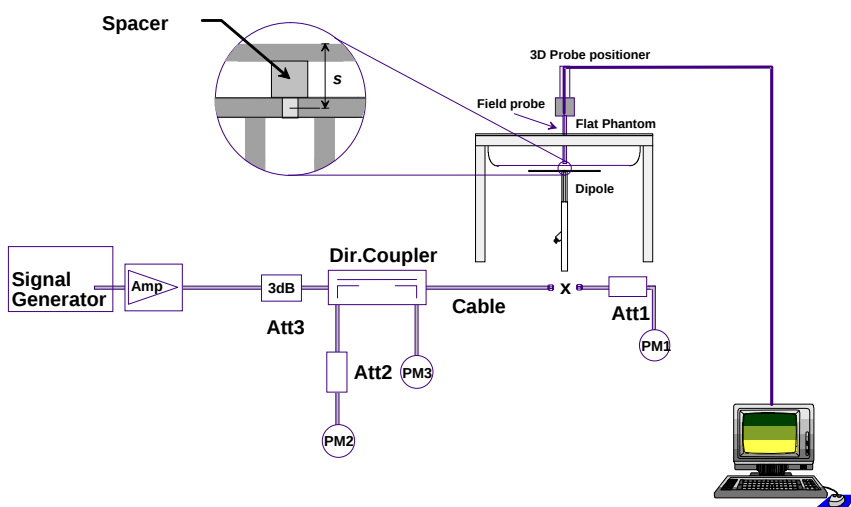


Fig 8.3.1 System Performance Check Setup



Fig 8.3.2 Setup Photo

## 11. RF Exposure Positions

### 11.1 SAR Testing for Tablet

This device can be used also in full sized tablet exposure conditions, due to its size. Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR exclusion threshold in KDB 447498 D01v05r02 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

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

### <GSM Conducted Power>

#### General Note:

1. Per KDB 447498 D01v05r02, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03, for Body SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance, for modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested, therefore, the GPRS 2Tx slots modes was selected when EUT operating without power back-off, the GPRS 2Tx slots modes was selected when EUT operating with power back-off, according to the highest source-based time-averaged output power.

#### Full Power Mode

| Band GSM850             | Burst Average Power (dBm) |       |       | Tune-up<br>Limit<br>(dBm) | Frame-Average Power (dBm) |       |       | Tune-up<br>Limit<br>(dBm) |
|-------------------------|---------------------------|-------|-------|---------------------------|---------------------------|-------|-------|---------------------------|
| TX Channel              | 128                       | 189   | 251   |                           | 128                       | 189   | 251   |                           |
| Frequency (MHz)         | 824.2                     | 836.4 | 848.8 |                           | 824.2                     | 836.4 | 848.8 |                           |
| GPRS (GMSK, 1 Tx slot)  | 31.89                     | 31.86 | 31.79 | 33.50                     | 22.89                     | 22.86 | 22.79 | 24.50                     |
| GPRS (GMSK, 2 Tx slots) | 31.76                     | 31.73 | 31.67 | 33.00                     | 25.76                     | 25.73 | 25.67 | 27.00                     |
| EDGE (8PSK, 1 Tx slot)  | 26.47                     | 26.45 | 26.43 | 28.00                     | 17.47                     | 17.45 | 17.43 | 19.00                     |
| EDGE (8PSK, 2 Tx slots) | 26.34                     | 26.29 | 26.37 | 27.00                     | 20.34                     | 20.29 | 20.37 | 21.00                     |
| EDGE (8PSK, 3 Tx slots) | 26.18                     | 26.14 | 26.17 | 27.00                     | 21.92                     | 21.88 | 21.91 | 22.74                     |
| EDGE (8PSK, 4 Tx slots) | 25.97                     | 25.92 | 25.96 | 27.00                     | 22.97                     | 22.92 | 22.96 | 24.00                     |

| Band GSM1900            | Burst Average Power (dBm) |       |        | Tune-up<br>Limit<br>(dBm) | Frame-Average Power (dBm) |       |        | Tune-up<br>Limit<br>(dBm) |
|-------------------------|---------------------------|-------|--------|---------------------------|---------------------------|-------|--------|---------------------------|
| TX Channel              | 512                       | 661   | 810    |                           | 512                       | 661   | 810    |                           |
| Frequency (MHz)         | 1850.2                    | 1880  | 1909.8 |                           | 1850.2                    | 1880  | 1909.8 |                           |
| GPRS (GMSK, 1 Tx slot)  | 28.89                     | 28.99 | 28.77  | 30.50                     | 19.89                     | 19.99 | 19.77  | 21.50                     |
| GPRS (GMSK, 2 Tx slots) | 28.77                     | 28.88 | 28.74  | 30.00                     | 22.77                     | 22.88 | 22.74  | 24.00                     |
| EDGE (8PSK, 1 Tx slot)  | 25.00                     | 25.07 | 25.09  | 27.00                     | 16.00                     | 16.07 | 16.09  | 18.00                     |
| EDGE (8PSK, 2 Tx slots) | 24.89                     | 24.95 | 24.93  | 26.00                     | 18.89                     | 18.95 | 18.93  | 20.00                     |
| EDGE (8PSK, 3 Tx slots) | 24.79                     | 24.85 | 24.85  | 26.00                     | 20.53                     | 20.59 | 20.59  | 21.74                     |
| EDGE (8PSK, 4 Tx slots) | 24.71                     | 24.77 | 24.77  | 26.00                     | 21.71                     | 21.77 | 21.77  | 23.00                     |

#### Reduced Power Mode

| Band GSM850             | Burst Average Power (dBm) |       |       | Tune-up<br>Limit<br>(dBm) | Frame-Average Power (dBm) |       |       | Tune-up<br>Limit<br>(dBm) |
|-------------------------|---------------------------|-------|-------|---------------------------|---------------------------|-------|-------|---------------------------|
| TX Channel              | 128                       | 189   | 251   |                           | 128                       | 189   | 251   |                           |
| Frequency (MHz)         | 824.2                     | 836.4 | 848.8 |                           | 824.2                     | 836.4 | 848.8 |                           |
| GPRS (GMSK, 1 Tx slot)  | 29.49                     | 29.46 | 29.42 | 30.50                     | 20.49                     | 20.46 | 20.42 | 21.50                     |
| GPRS (GMSK, 2 Tx slots) | 27.60                     | 27.52 | 27.55 | 28.00                     | 21.60                     | 21.52 | 21.55 | 22.00                     |
| EDGE (8PSK, 1 Tx slot)  | 26.47                     | 26.45 | 26.43 | 28.00                     | 17.47                     | 17.45 | 17.43 | 19.00                     |
| EDGE (8PSK, 2 Tx slots) | 26.34                     | 26.29 | 26.37 | 27.00                     | 20.34                     | 20.29 | 20.37 | 21.00                     |
| EDGE (8PSK, 3 Tx slots) | 23.85                     | 23.80 | 23.76 | 24.00                     | 19.59                     | 19.54 | 19.50 | 19.74                     |
| EDGE (8PSK, 4 Tx slots) | 23.61                     | 23.67 | 23.73 | 24.00                     | 20.61                     | 20.67 | 20.73 | 21.00                     |

**<WCDMA Conducted Power>**

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

**HSDPA Setup Configuration:**

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
  - i. Set Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters were set according to each
  - ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
  - iii. Set RMC 12.2Kbps + HSDPA mode.
  - iv. Set Cell Power = -86 dBm
  - v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
  - vi. Select HSDPA Uplink Parameters
  - vii. Set Delta ACK, Delta NACK and Delta CQI = 8
  - viii. Set Ack-Nack Repetition Factor to 3
  - ix. Set CQI Feedback Cycle (k) to 4 ms
  - x. Set CQI Repetition Factor to 2
  - xi. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

**Table C.10.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH**

| Sub-test | $\beta_c$         | $\beta_d$         | $\beta_d$<br>(SF) | $\beta_c/\beta_d$ | $\beta_{hs}$<br>(Note 1,<br>Note 2) | CM (dB)<br>(Note 3) | MPR (dB)<br>(Note 3) |
|----------|-------------------|-------------------|-------------------|-------------------|-------------------------------------|---------------------|----------------------|
| 1        | 2/15              | 15/15             | 64                | 2/15              | 4/15                                | 0.0                 | 0.0                  |
| 2        | 12/15<br>(Note 4) | 15/15<br>(Note 4) | 64                | 12/15<br>(Note 4) | 24/15                               | 1.0                 | 0.0                  |
| 3        | 15/15             | 8/15              | 64                | 15/8              | 30/15                               | 1.5                 | 0.5                  |
| 4        | 15/15             | 4/15              | 64                | 15/4              | 30/15                               | 1.5                 | 0.5                  |

Note 1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ .

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA,  $\Delta_{ACK}$  and  $\Delta_{NACK} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ , and  $\Delta_{CQI} = 24/15$  with  $\beta_{hs} = 24/15 * \beta_c$ .

Note 3: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$ .

**Setup Configuration**

**HSUPA Setup Configuration:**

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting \* :
  - i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
  - ii. Set the Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
  - iii. Set Cell Power = -86 dBm
  - iv. Set Channel Type = 12.2k + HSPA
  - v. Set UE Target Power
  - vi. Power Ctrl Mode= Alternating bits
  - vii. Set and observe the E-TFCI
  - viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
- d. The transmitted maximum output power was recorded.

**Table C.11.1.3:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH**

| Sub-test | $\beta_c$         | $\beta_d$         | $\beta_d$ (SF) | $\beta_c/\beta_d$ | $\beta_{HS}$ (Note 1) | $\beta_{ec}$ | $\beta_{ed}$ (Note 5)<br>(Note 6)              | $\beta_{ed}$ (SF) | $\beta_{ed}$ (Codes) | CM (dB)<br>(Note 2) | MPR (dB)<br>(Note 2) | AG Index<br>(Note 6) | E-TFCI |
|----------|-------------------|-------------------|----------------|-------------------|-----------------------|--------------|------------------------------------------------|-------------------|----------------------|---------------------|----------------------|----------------------|--------|
| 1        | 11/15<br>(Note 3) | 15/15<br>(Note 3) | 64             | 11/15<br>(Note 3) | 22/15                 | 209/25       | 1309/225                                       | 4                 | 1                    | 1.0                 | 0.0                  | 20                   | 75     |
| 2        | 6/15              | 15/15             | 64             | 6/15              | 12/15                 | 12/15        | 94/75                                          | 4                 | 1                    | 3.0                 | 2.0                  | 12                   | 67     |
| 3        | 15/15             | 9/15              | 64             | 15/9              | 30/15                 | 30/15        | $\beta_{ed1}$ : 47/15<br>$\beta_{ed2}$ : 47/15 | 4<br>4            | 2                    | 2.0                 | 1.0                  | 15                   | 92     |
| 4        | 2/15              | 15/15             | 64             | 2/15              | 4/15                  | 2/15         | 56/75                                          | 4                 | 1                    | 3.0                 | 2.0                  | 17                   | 71     |
| 5        | 15/15<br>(Note 4) | 15/15<br>(Note 4) | 64             | 15/15<br>(Note 4) | 30/15                 | 24/15        | 134/15                                         | 4                 | 1                    | 1.0                 | 0.0                  | 21                   | 81     |

Note 1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ .

Note 2: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the  $\beta_c/\beta_d$  ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 10/15$  and  $\beta_d = 15/15$ .

Note 4: For subtest 5 the  $\beta_c/\beta_d$  ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 14/15$  and  $\beta_d = 15/15$ .

Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 6:  $\beta_{ed}$  can not be set directly, it is set by Absolute Grant Value.

**Setup Configuration**

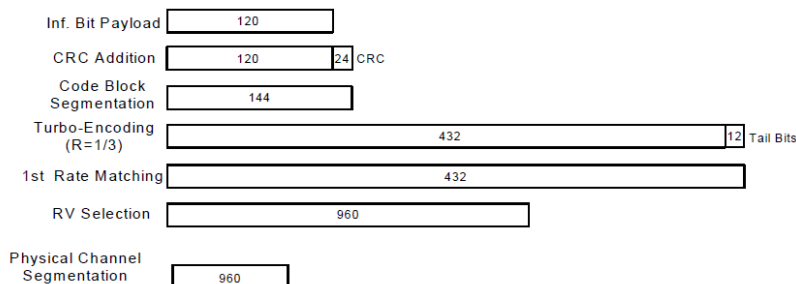
**DC-HSDPA 3GPP release 8 Setup Configuration:**

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
  - i. Set RMC 12.2Kbps + HSDPA mode.
  - ii. Set Cell Power = -25 dBm
  - iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
  - iv. Select HSDPA Uplink Parameters
  - v. Set Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
    - a). Subtest 1:  $\beta_c/\beta_d=2/15$
    - b). Subtest 2:  $\beta_c/\beta_d=12/15$
    - c). Subtest 3:  $\beta_c/\beta_d=15/8$
    - d). Subtest 4:  $\beta_c/\beta_d=15/4$
  - vi. Set Delta ACK, Delta NACK and Delta CQI = 8
  - vii. Set Ack-Nack Repetition Factor to 3
  - viii. Set CQI Feedback Cycle (k) to 4 ms
  - ix. Set CQI Repetition Factor to 2
  - x. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification. A summary of these settings are illustrated below:

**C.8.1.12 Fixed Reference Channel Definition H-Set 12**
**Table C.8.1.12: Fixed Reference Channel H-Set 12**

| Parameter                                                                                                                                              | Unit      | Value |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|
| Nominal Avg. Inf. Bit Rate                                                                                                                             | kbps      | 60    |
| Inter-TTI Distance                                                                                                                                     | TTI's     | 1     |
| Number of HARQ Processes                                                                                                                               | Processes | 6     |
| Information Bit Payload ( $N_{INF}$ )                                                                                                                  | Bits      | 120   |
| Number Code Blocks                                                                                                                                     | Blocks    | 1     |
| Binary Channel Bits Per TTI                                                                                                                            | Bits      | 960   |
| Total Available SML's in UE                                                                                                                            | SML's     | 19200 |
| Number of SML's per HARQ Proc.                                                                                                                         | SML's     | 3200  |
| Coding Rate                                                                                                                                            |           | 0.15  |
| Number of Physical Channel Codes                                                                                                                       | Codes     | 1     |
| Modulation                                                                                                                                             |           | QPSK  |
| Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.               |           |       |
| Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used. |           |       |


**Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)**
**Setup Configuration**



**<WCDMA Conducted Power>**

**General Note:**

1. Per KDB 941225 D01v03, for Body exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03, RMC 12.2kbps setting is used to evaluate SAR. If the maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is  $\leq \frac{1}{4}$  dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

**Full Power Mode**

| Band            |             |                    | WCDMA V |       |       | WCDMA II |       |        | WCDMA IV |        |        |
|-----------------|-------------|--------------------|---------|-------|-------|----------|-------|--------|----------|--------|--------|
| TX Channel      |             |                    | 4132    | 4182  | 4233  | 9262     | 9400  | 9538   | 1312     | 1413   | 1513   |
| Rx Channel      |             |                    | 4357    | 4407  | 4458  | 9662     | 9800  | 9938   | 1537     | 1638   | 1738   |
| Frequency (MHz) |             |                    | 826.4   | 836.4 | 846.6 | 1852.4   | 1880  | 1907.6 | 1712.4   | 1732.6 | 1752.6 |
| MPR (dB)        | 3GPP Rel 99 | RMC 12.2Kbps       | 22.23   | 22.15 | 22.18 | 22.75    | 22.48 | 22.54  | 22.37    | 22.35  | 22.44  |
| 0               | 3GPP Rel 6  | HSDPA Subtest-1    | 22.00   | 22.07 | 22.10 | 22.44    | 22.39 | 22.35  | 22.33    | 22.30  | 22.30  |
| 0               | 3GPP Rel 6  | HSDPA Subtest-2    | 22.02   | 22.05 | 22.06 | 22.41    | 22.38 | 22.33  | 22.31    | 22.28  | 22.27  |
| 0.5             | 3GPP Rel 6  | HSDPA Subtest-3    | 21.52   | 21.63 | 21.65 | 22.02    | 21.94 | 21.91  | 21.94    | 21.91  | 21.90  |
| 0.5             | 3GPP Rel 6  | HSDPA Subtest-4    | 21.50   | 21.57 | 21.64 | 22.00    | 21.94 | 21.90  | 21.92    | 21.89  | 21.90  |
| 0               | 3GPP Rel 8  | DC-HSDPA Subtest-1 | 22.00   | 22.06 | 22.09 | 22.43    | 22.38 | 22.34  | 22.32    | 22.30  | 22.29  |
| 0               | 3GPP Rel 8  | DC-HSDPA Subtest-2 | 22.00   | 22.05 | 22.06 | 22.00    | 22.38 | 22.32  | 22.30    | 22.28  | 22.28  |
| 0.5             | 3GPP Rel 8  | DC-HSDPA Subtest-3 | 21.51   | 21.62 | 21.63 | 22.01    | 21.93 | 21.90  | 21.93    | 21.90  | 21.90  |
| 0.5             | 3GPP Rel 8  | DC-HSDPA Subtest-4 | 21.50   | 21.55 | 21.63 | 22.01    | 21.92 | 21.90  | 21.92    | 21.90  | 21.96  |
| 0               | 3GPP Rel 6  | HSUPA Subtest-1    | 22.07   | 22.04 | 22.05 | 22.01    | 22.00 | 22.00  | 22.08    | 22.03  | 22.06  |
| 2               | 3GPP Rel 6  | HSUPA Subtest-2    | 20.71   | 20.79 | 20.87 | 20.51    | 20.74 | 20.88  | 20.29    | 20.28  | 20.32  |
| 1               | 3GPP Rel 6  | HSUPA Subtest-3    | 21.04   | 21.02 | 21.11 | 21.02    | 21.17 | 21.18  | 21.17    | 21.15  | 21.28  |
| 2               | 3GPP Rel 6  | HSUPA Subtest-4    | 20.75   | 20.82 | 20.91 | 20.63    | 20.62 | 20.94  | 20.34    | 20.39  | 20.33  |
| 0               | 3GPP Rel 6  | HSUPA Subtest-5    | 22.20   | 22.13 | 22.15 | 22.02    | 22.14 | 22.10  | 22.10    | 22.13  | 22.13  |

**Reduced Power Mode**

| Band            |             |                    | WCDMA V |       |       |
|-----------------|-------------|--------------------|---------|-------|-------|
| TX Channel      |             |                    | 4132    | 4182  | 4233  |
| Rx Channel      |             |                    | 4357    | 4407  | 4458  |
| Frequency (MHz) |             |                    | 826.4   | 836.4 | 846.6 |
| MPR (dB)        | 3GPP Rel 99 | RMC 12.2Kbps       | 21.08   | 21.03 | 21.06 |
| 0               | 3GPP Rel 6  | HSDPA Subtest-1    | 20.85   | 20.95 | 20.98 |
| 0               | 3GPP Rel 6  | HSDPA Subtest-2    | 20.87   | 20.93 | 20.94 |
| 0.5             | 3GPP Rel 6  | HSDPA Subtest-3    | 20.37   | 20.51 | 20.53 |
| 0.5             | 3GPP Rel 6  | HSDPA Subtest-4    | 20.35   | 20.45 | 20.52 |
| 0               | 3GPP Rel 8  | DC-HSDPA Subtest-1 | 20.85   | 20.94 | 20.97 |
| 0               | 3GPP Rel 8  | DC-HSDPA Subtest-2 | 20.85   | 20.93 | 20.94 |
| 0.5             | 3GPP Rel 8  | DC-HSDPA Subtest-3 | 20.36   | 20.50 | 20.51 |
| 0.5             | 3GPP Rel 8  | DC-HSDPA Subtest-4 | 20.35   | 20.43 | 20.51 |
| 0               | 3GPP Rel 6  | HSUPA Subtest-1    | 20.92   | 20.92 | 20.93 |
| 2               | 3GPP Rel 6  | HSUPA Subtest-2    | 19.56   | 19.67 | 19.75 |
| 1               | 3GPP Rel 6  | HSUPA Subtest-3    | 19.89   | 19.90 | 19.99 |
| 2               | 3GPP Rel 6  | HSUPA Subtest-4    | 19.60   | 19.70 | 19.79 |
| 0               | 3GPP Rel 6  | HSUPA Subtest-5    | 21.05   | 21.01 | 21.03 |

### <CDMA2000 Conducted Power>

#### General Note:

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

#### Full Power Mode

| Band                  | CDMA2000 BC10 |       |       | CDMA2000 BC0 |        |        | CDMA2000 BC1 |       |         |
|-----------------------|---------------|-------|-------|--------------|--------|--------|--------------|-------|---------|
| TX Channel            | 476           | 580   | 684   | 1013         | 384    | 777    | 25           | 600   | 1175    |
| Frequency (MHz)       | 817.9         | 820.5 | 823.1 | 824.7        | 836.52 | 848.31 | 1851.25      | 1880  | 1908.75 |
| 1xRTT RC1 SO55        | 23.10         | 23.00 | 23.05 | 23.08        | 23.24  | 23.03  | 23.31        | 23.40 | 23.45   |
| 1xRTT RC3 SO55        | 23.11         | 23.01 | 23.07 | 23.09        | 23.26  | 23.07  | 23.34        | 23.42 | 23.49   |
| 1xEVDO RTAP 153.6Kbps | 23.05         | 23.09 | 23.04 | 23.02        | 23.23  | 23.03  | 23.14        | 23.19 | 23.33   |
| 1xEVDO RETAP 4096Bits | 23.03         | 23.08 | 23.02 | 23.06        | 23.24  | 23.06  | 23.18        | 23.20 | 23.28   |

#### Reduced Power Mode

| Band                  | CDMA2000 BC10 |       |       | CDMA2000 BC0 |        |        | CDMA2000 BC1 |       |         |
|-----------------------|---------------|-------|-------|--------------|--------|--------|--------------|-------|---------|
| TX Channel            | 476           | 580   | 684   | 1013         | 384    | 777    | 25           | 600   | 1175    |
| Frequency (MHz)       | 817.9         | 820.5 | 823.1 | 824.7        | 836.52 | 848.31 | 1851.25      | 1880  | 1908.75 |
| 1xRTT RC1 SO55        | 21.22         | 21.42 | 21.35 | 21.35        | 21.37  | 21.25  | 22.25        | 22.14 | 22.23   |
| 1xRTT RC3 SO55        | 21.15         | 21.38 | 21.25 | 21.12        | 21.41  | 21.09  | 22.22        | 22.10 | 22.30   |
| 1xEVDO RTAP 153.6Kbps | 21.29         | 21.35 | 21.08 | 21.49        | 21.54  | 21.42  | 22.28        | 22.15 | 22.30   |
| 1xEVDO RETAP 4096Bits | 21.28         | 21.37 | 21.11 | 21.32        | 21.45  | 21.37  | 22.25        | 22.14 | 22.28   |

### <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  $\leq 0.8$  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  $\frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  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  $\frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r03, smaller bandwidth SAR testing is not required.

### Full RF Power Mode

#### <LTE Band 17>

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 23780                    | 23790                       | 23800                     |                        |             |
| Frequency (MHz) |            |         |           | 709                      | 710                         | 711                       |                        |             |
| 10              | QPSK       | 1       | 0         | 22.56                    | 22.60                       | 22.48                     |                        |             |
| 10              | QPSK       | 1       | 24        | 22.32                    | 22.33                       | 22.36                     | 24                     | 0           |
| 10              | QPSK       | 1       | 49        | 22.39                    | 22.31                       | 22.22                     |                        |             |
| 10              | QPSK       | 25      | 0         | 21.46                    | 21.53                       | 21.48                     |                        |             |
| 10              | QPSK       | 25      | 12        | 21.51                    | 21.50                       | 21.45                     | 23                     | 1           |
| 10              | QPSK       | 25      | 24        | 21.52                    | 21.40                       | 21.30                     |                        |             |
| 10              | QPSK       | 50      | 0         | 21.27                    | 21.37                       | 21.36                     |                        |             |
| 10              | 16QAM      | 1       | 0         | 21.22                    | 21.31                       | 21.39                     | 23                     | 1           |
| 10              | 16QAM      | 1       | 24        | 21.58                    | 21.64                       | 21.55                     |                        |             |
| 10              | 16QAM      | 1       | 49        | 21.35                    | 21.31                       | 21.11                     |                        |             |
| 10              | 16QAM      | 25      | 0         | 20.40                    | 20.39                       | 20.45                     | 22                     | 2           |
| 10              | 16QAM      | 25      | 12        | 20.50                    | 20.45                       | 20.45                     |                        |             |
| 10              | 16QAM      | 25      | 24        | 20.46                    | 20.42                       | 20.29                     |                        |             |
| 10              | 16QAM      | 50      | 0         | 20.22                    | 20.24                       | 20.27                     |                        |             |
| Channel         |            |         |           | 23755                    | 23790                       | 23825                     |                        |             |
| Frequency (MHz) |            |         |           | 706.5                    | 710                         | 713.5                     |                        |             |
| 5               | QPSK       | 1       | 0         | 22.19                    | 22.45                       | 22.44                     |                        |             |
| 5               | QPSK       | 1       | 12        | 22.44                    | 22.49                       | 22.42                     | 24                     | 0           |
| 5               | QPSK       | 1       | 24        | 22.57                    | 22.39                       | 22.12                     |                        |             |
| 5               | QPSK       | 12      | 0         | 21.34                    | 21.60                       | 21.35                     |                        |             |
| 5               | QPSK       | 12      | 6         | 21.42                    | 21.64                       | 21.47                     | 23                     | 1           |
| 5               | QPSK       | 12      | 11        | 21.58                    | 21.44                       | 21.29                     |                        |             |
| 5               | QPSK       | 25      | 0         | 21.39                    | 21.55                       | 21.37                     |                        |             |
| 5               | 16QAM      | 1       | 0         | 21.15                    | 21.44                       | 21.42                     | 23                     | 1           |
| 5               | 16QAM      | 1       | 12        | 21.41                    | 21.47                       | 21.36                     |                        |             |
| 5               | 16QAM      | 1       | 24        | 21.56                    | 21.41                       | 21.03                     |                        |             |
| 5               | 16QAM      | 12      | 0         | 20.34                    | 20.54                       | 20.40                     | 22                     | 2           |
| 5               | 16QAM      | 12      | 6         | 20.45                    | 20.59                       | 20.39                     |                        |             |
| 5               | 16QAM      | 12      | 11        | 20.52                    | 20.49                       | 20.24                     |                        |             |
| 5               | 16QAM      | 25      | 0         | 20.41                    | 20.49                       | 20.27                     |                        |             |



**<LTE Band 13>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power<br>Low<br>Ch. / Freq. | Power<br>Middle<br>Ch. / Freq. | Power<br>High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|-----------------------------|--------------------------------|------------------------------|------------------------|-------------|
| Channel         |            |         |           | 23230                       |                                |                              |                        |             |
| Frequency (MHz) |            |         |           | 782                         |                                |                              |                        |             |
| 10              | QPSK       | 1       | 0         | 22.60                       |                                |                              | 24                     | 0           |
| 10              | QPSK       | 1       | 24        | 22.30                       |                                |                              |                        |             |
| 10              | QPSK       | 1       | 49        | 22.49                       |                                |                              |                        |             |
| 10              | QPSK       | 25      | 0         | 21.37                       |                                |                              | 23                     | 1           |
| 10              | QPSK       | 25      | 12        | 21.32                       |                                |                              |                        |             |
| 10              | QPSK       | 25      | 24        | 21.37                       |                                |                              |                        |             |
| 10              | QPSK       | 50      | 0         | 21.28                       |                                |                              |                        |             |
| 10              | 16QAM      | 1       | 0         | 21.60                       |                                |                              | 23                     | 1           |
| 10              | 16QAM      | 1       | 24        | 21.48                       |                                |                              |                        |             |
| 10              | 16QAM      | 1       | 49        | 21.39                       |                                |                              |                        |             |
| 10              | 16QAM      | 25      | 0         | 20.21                       |                                |                              |                        |             |
| 10              | 16QAM      | 25      | 12        | 20.42                       |                                |                              | 22                     | 2           |
| 10              | 16QAM      | 25      | 24        | 20.32                       |                                |                              |                        |             |
| 10              | 16QAM      | 50      | 0         | 20.23                       |                                |                              |                        |             |
| Channel         |            |         |           | 23205                       | 23230                          | 23255                        | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 779.5                       | 782                            | 784.5                        |                        |             |
| 5               | QPSK       | 1       | 0         | 22.48                       | 22.16                          | 22.57                        | 24                     | 0           |
| 5               | QPSK       | 1       | 12        | 22.23                       | 22.49                          | 22.51                        |                        |             |
| 5               | QPSK       | 1       | 24        | 22.21                       | 22.34                          | 22.38                        |                        |             |
| 5               | QPSK       | 12      | 0         | 21.23                       | 21.40                          | 21.48                        | 23                     | 1           |
| 5               | QPSK       | 12      | 6         | 21.27                       | 21.50                          | 21.57                        |                        |             |
| 5               | QPSK       | 12      | 11        | 21.33                       | 21.47                          | 21.39                        |                        |             |
| 5               | QPSK       | 25      | 0         | 21.24                       | 21.35                          | 21.39                        |                        |             |
| 5               | 16QAM      | 1       | 0         | 21.54                       | 21.16                          | 21.65                        | 23                     | 1           |
| 5               | 16QAM      | 1       | 12        | 21.23                       | 21.56                          | 21.50                        |                        |             |
| 5               | 16QAM      | 1       | 24        | 21.37                       | 21.40                          | 21.39                        |                        |             |
| 5               | 16QAM      | 12      | 0         | 20.28                       | 20.51                          | 20.52                        | 22                     | 2           |
| 5               | 16QAM      | 12      | 6         | 20.27                       | 20.48                          | 20.49                        |                        |             |
| 5               | 16QAM      | 12      | 11        | 20.41                       | 20.46                          | 20.53                        |                        |             |
| 5               | 16QAM      | 25      | 0         | 20.23                       | 20.43                          | 20.43                        |                        |             |

**<LTE Band 5>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 20450                    | 20525                       | 20600                     |                        |             |
| Frequency (MHz) |            |         |           | 829                      | 836.5                       | 844                       |                        |             |
| 10              | QPSK       | 1       | 0         | 22.25                    | 22.24                       | 22.27                     | 24                     | 0           |
| 10              | QPSK       | 1       | 24        | 22.11                    | 22.19                       | 22.16                     |                        |             |
| 10              | QPSK       | 1       | 49        | 22.05                    | 22.16                       | 22.18                     |                        |             |
| 10              | QPSK       | 25      | 0         | 21.22                    | 21.15                       | 21.25                     | 23                     | 1           |
| 10              | QPSK       | 25      | 12        | 21.24                    | 21.24                       | 21.16                     |                        |             |
| 10              | QPSK       | 25      | 24        | 21.17                    | 21.01                       | 21.22                     |                        |             |
| 10              | QPSK       | 50      | 0         | 21.16                    | 21.20                       | 21.21                     | 23                     | 1           |
| 10              | 16QAM      | 1       | 0         | 21.06                    | 21.23                       | 21.34                     |                        |             |
| 10              | 16QAM      | 1       | 24        | 21.15                    | 21.23                       | 21.31                     |                        |             |
| 10              | 16QAM      | 1       | 49        | 21.09                    | 21.16                       | 21.20                     | 22                     | 2           |
| 10              | 16QAM      | 25      | 0         | 20.20                    | 20.21                       | 20.18                     |                        |             |
| 10              | 16QAM      | 25      | 12        | 20.10                    | 20.21                       | 20.17                     |                        |             |
| 10              | 16QAM      | 25      | 24        | 20.05                    | 20.06                       | 20.18                     | 22                     | 2           |
| 10              | 16QAM      | 50      | 0         | 20.04                    | 20.08                       | 20.09                     |                        |             |
| Channel         |            |         |           | 20425                    | 20525                       | 20625                     |                        |             |
| Frequency (MHz) |            |         |           | 826.5                    | 836.5                       | 846.5                     |                        |             |
| 5               | QPSK       | 1       | 0         | 22.13                    | 22.08                       | 22.01                     | 24                     | 0           |
| 5               | QPSK       | 1       | 12        | 22.18                    | 22.02                       | 22.24                     |                        |             |
| 5               | QPSK       | 1       | 24        | 22.12                    | 22.01                       | 22.21                     |                        |             |
| 5               | QPSK       | 12      | 0         | 21.29                    | 21.14                       | 21.26                     | 23                     | 1           |
| 5               | QPSK       | 12      | 6         | 21.25                    | 21.27                       | 21.27                     |                        |             |
| 5               | QPSK       | 12      | 11        | 21.27                    | 21.06                       | 21.33                     |                        |             |
| 5               | QPSK       | 25      | 0         | 21.13                    | 21.21                       | 21.20                     | 23                     | 1           |
| 5               | 16QAM      | 1       | 0         | 21.21                    | 21.17                       | 21.17                     |                        |             |
| 5               | 16QAM      | 1       | 12        | 21.15                    | 21.06                       | 21.32                     |                        |             |
| 5               | 16QAM      | 1       | 24        | 21.16                    | 21.07                       | 21.12                     | 22                     | 2           |
| 5               | 16QAM      | 12      | 0         | 20.19                    | 20.16                       | 20.32                     |                        |             |
| 5               | 16QAM      | 12      | 6         | 20.21                    | 20.20                       | 20.30                     |                        |             |
| 5               | 16QAM      | 12      | 11        | 20.28                    | 20.10                       | 20.23                     | 22                     | 2           |
| 5               | 16QAM      | 25      | 0         | 20.04                    | 20.17                       | 20.21                     |                        |             |

**<LTE Band 4>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 20050                    | 20175                       | 20300                     |                        |             |
| Frequency (MHz) |            |         |           | 1720                     | 1732.5                      | 1745                      |                        |             |
| 20              | QPSK       | 1       | 0         | 22.46                    | 22.44                       | 22.50                     | 24                     | 0           |
| 20              | QPSK       | 1       | 49        | 22.44                    | 22.35                       | 22.36                     |                        |             |
| 20              | QPSK       | 1       | 99        | 22.43                    | 22.39                       | 22.31                     |                        |             |
| 20              | QPSK       | 50      | 0         | 21.14                    | 21.24                       | 21.31                     | 23                     | 1           |
| 20              | QPSK       | 50      | 24        | 21.19                    | 21.16                       | 21.14                     |                        |             |
| 20              | QPSK       | 50      | 49        | 21.12                    | 21.29                       | 21.16                     |                        |             |
| 20              | QPSK       | 100     | 0         | 21.13                    | 21.11                       | 21.19                     | 23                     | 1           |
| 20              | 16QAM      | 1       | 0         | 21.48                    | 21.53                       | 21.53                     |                        |             |
| 20              | 16QAM      | 1       | 49        | 21.49                    | 21.54                       | 21.44                     |                        |             |
| 20              | 16QAM      | 1       | 99        | 21.52                    | 21.49                       | 21.39                     | 22                     | 2           |
| 20              | 16QAM      | 50      | 0         | 20.17                    | 20.23                       | 20.19                     |                        |             |
| 20              | 16QAM      | 50      | 24        | 20.18                    | 20.22                       | 20.22                     |                        |             |
| 20              | 16QAM      | 50      | 49        | 20.13                    | 20.22                       | 20.21                     | 22                     | 2           |
| 20              | 16QAM      | 100     | 0         | 20.18                    | 20.17                       | 20.15                     |                        |             |
| Channel         |            |         |           | 20025                    | 20175                       | 20325                     |                        |             |
| Frequency (MHz) |            |         |           | 1717.5                   | 1732.5                      | 1747.5                    |                        |             |
| 15              | QPSK       | 1       | 0         | 22.43                    | 22.40                       | 22.44                     | 24                     | 0           |
| 15              | QPSK       | 1       | 37        | 22.41                    | 22.39                       | 22.48                     |                        |             |
| 15              | QPSK       | 1       | 74        | 22.26                    | 22.38                       | 22.20                     |                        |             |
| 15              | QPSK       | 36      | 0         | 21.19                    | 21.27                       | 21.13                     | 23                     | 1           |
| 15              | QPSK       | 36      | 18        | 21.22                    | 21.27                       | 21.29                     |                        |             |
| 15              | QPSK       | 36      | 37        | 21.24                    | 21.17                       | 21.18                     |                        |             |
| 15              | QPSK       | 75      | 0         | 21.22                    | 21.32                       | 21.11                     | 23                     | 1           |
| 15              | 16QAM      | 1       | 0         | 21.37                    | 21.51                       | 21.39                     |                        |             |
| 15              | 16QAM      | 1       | 37        | 21.42                    | 21.51                       | 21.42                     |                        |             |
| 15              | 16QAM      | 1       | 74        | 21.31                    | 21.49                       | 21.23                     | 22                     | 2           |
| 15              | 16QAM      | 36      | 0         | 20.13                    | 20.38                       | 20.17                     |                        |             |
| 15              | 16QAM      | 36      | 18        | 20.14                    | 20.27                       | 20.28                     |                        |             |
| 15              | 16QAM      | 36      | 37        | 20.12                    | 20.23                       | 20.29                     | 22                     | 2           |
| 15              | 16QAM      | 75      | 0         | 20.14                    | 20.19                       | 20.14                     |                        |             |
| Channel         |            |         |           | 20000                    | 20175                       | 20350                     |                        |             |
| Frequency (MHz) |            |         |           | 1715                     | 1732.5                      | 1750                      |                        |             |
| 10              | QPSK       | 1       | 0         | 22.47                    | 22.45                       | 22.42                     | 24                     | 0           |
| 10              | QPSK       | 1       | 24        | 22.39                    | 22.42                       | 22.41                     |                        |             |
| 10              | QPSK       | 1       | 49        | 22.45                    | 22.37                       | 22.27                     |                        |             |
| 10              | QPSK       | 25      | 0         | 21.30                    | 21.52                       | 21.30                     | 23                     | 1           |
| 10              | QPSK       | 25      | 12        | 21.25                    | 21.35                       | 21.34                     |                        |             |
| 10              | QPSK       | 25      | 24        | 21.17                    | 21.34                       | 21.35                     |                        |             |
| 10              | QPSK       | 50      | 0         | 21.12                    | 21.30                       | 21.11                     | 23                     | 1           |
| 10              | 16QAM      | 1       | 0         | 21.50                    | 21.69                       | 21.44                     |                        |             |
| 10              | 16QAM      | 1       | 24        | 21.42                    | 21.37                       | 21.37                     |                        |             |
| 10              | 16QAM      | 1       | 49        | 21.42                    | 21.42                       | 21.35                     | 22                     | 2           |
| 10              | 16QAM      | 25      | 0         | 20.29                    | 20.36                       | 20.34                     |                        |             |
| 10              | 16QAM      | 25      | 12        | 20.34                    | 20.30                       | 20.38                     |                        |             |
| 10              | 16QAM      | 25      | 24        | 20.26                    | 20.27                       | 20.38                     | 22                     | 2           |
| 10              | 16QAM      | 50      | 0         | 20.27                    | 20.25                       | 20.21                     |                        |             |



| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 19975                    | 20175                       | 20375                     | 24                     | 0           |
| Frequency (MHz) |            |         |           | 1712.5                   | 1732.5                      | 1752.5                    |                        |             |
| 5               | QPSK       | 1       | 0         | 22.40                    | 22.43                       | 22.38                     |                        |             |
| 5               | QPSK       | 1       | 12        | 22.36                    | 22.42                       | 22.44                     | 23                     | 1           |
| 5               | QPSK       | 1       | 24        | 22.36                    | 22.48                       | 22.29                     |                        |             |
| 5               | QPSK       | 12      | 0         | 21.42                    | 21.56                       | 21.45                     |                        |             |
| 5               | QPSK       | 12      | 6         | 21.41                    | 21.47                       | 21.44                     |                        |             |
| 5               | QPSK       | 12      | 11        | 21.30                    | 21.44                       | 21.31                     |                        |             |
| 5               | QPSK       | 25      | 0         | 21.22                    | 21.46                       | 21.27                     | 23                     | 1           |
| 5               | 16QAM      | 1       | 0         | 21.41                    | 21.47                       | 21.47                     |                        |             |
| 5               | 16QAM      | 1       | 12        | 21.43                    | 21.47                       | 21.39                     |                        |             |
| 5               | 16QAM      | 1       | 24        | 21.44                    | 21.51                       | 21.36                     | 22                     | 2           |
| 5               | 16QAM      | 12      | 0         | 20.33                    | 20.67                       | 20.37                     |                        |             |
| 5               | 16QAM      | 12      | 6         | 20.38                    | 20.44                       | 20.54                     |                        |             |
| 5               | 16QAM      | 12      | 11        | 20.27                    | 20.36                       | 20.44                     |                        |             |
| 5               | 16QAM      | 25      | 0         | 20.21                    | 20.40                       | 20.34                     |                        |             |



**<LTE Band 2>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 18700                    | 18900                       | 19100                     |                        |             |
| Frequency (MHz) |            |         |           | 1860                     | 1880                        | 1900                      |                        |             |
| 20              | QPSK       | 1       | 0         | 22.54                    | 22.57                       | 22.62                     | 24                     | 0           |
| 20              | QPSK       | 1       | 49        | 22.48                    | 22.49                       | 22.49                     |                        |             |
| 20              | QPSK       | 1       | 99        | 22.41                    | 22.37                       | 22.43                     |                        |             |
| 20              | QPSK       | 50      | 0         | 21.26                    | 21.23                       | 21.29                     | 23                     | 1           |
| 20              | QPSK       | 50      | 24        | 21.23                    | 21.22                       | 21.28                     |                        |             |
| 20              | QPSK       | 50      | 49        | 21.27                    | 21.27                       | 21.26                     |                        |             |
| 20              | QPSK       | 100     | 0         | 21.38                    | 21.33                       | 21.39                     |                        |             |
| 20              | 16QAM      | 1       | 0         | 21.52                    | 21.69                       | 21.53                     | 23                     | 1           |
| 20              | 16QAM      | 1       | 49        | 21.51                    | 21.64                       | 21.54                     |                        |             |
| 20              | 16QAM      | 1       | 99        | 21.55                    | 21.53                       | 21.65                     |                        |             |
| 20              | 16QAM      | 50      | 0         | 20.41                    | 20.33                       | 20.22                     | 22                     | 2           |
| 20              | 16QAM      | 50      | 24        | 20.19                    | 20.26                       | 20.28                     |                        |             |
| 20              | 16QAM      | 50      | 49        | 20.26                    | 20.20                       | 20.27                     |                        |             |
| 20              | 16QAM      | 100     | 0         | 20.28                    | 20.31                       | 20.23                     |                        |             |
| Channel         |            |         |           | 18675                    | 18900                       | 19125                     |                        |             |
| Frequency (MHz) |            |         |           | 1857.5                   | 1880                        | 1902.5                    |                        |             |
| 15              | QPSK       | 1       | 0         | 22.52                    | 22.45                       | 22.47                     | 24                     | 0           |
| 15              | QPSK       | 1       | 37        | 22.61                    | 22.51                       | 22.56                     |                        |             |
| 15              | QPSK       | 1       | 74        | 22.38                    | 22.46                       | 22.55                     |                        |             |
| 15              | QPSK       | 36      | 0         | 21.45                    | 21.45                       | 21.29                     | 23                     | 1           |
| 15              | QPSK       | 36      | 18        | 21.24                    | 21.38                       | 21.39                     |                        |             |
| 15              | QPSK       | 36      | 37        | 21.31                    | 21.22                       | 21.37                     |                        |             |
| 15              | QPSK       | 75      | 0         | 21.29                    | 21.37                       | 21.35                     |                        |             |
| 15              | 16QAM      | 1       | 0         | 21.49                    | 21.52                       | 21.51                     | 23                     | 1           |
| 15              | 16QAM      | 1       | 37        | 21.54                    | 21.52                       | 21.57                     |                        |             |
| 15              | 16QAM      | 1       | 74        | 21.45                    | 21.57                       | 21.69                     |                        |             |
| 15              | 16QAM      | 36      | 0         | 20.42                    | 20.32                       | 20.34                     | 22                     | 2           |
| 15              | 16QAM      | 36      | 18        | 20.33                    | 20.23                       | 20.38                     |                        |             |
| 15              | 16QAM      | 36      | 37        | 20.35                    | 20.41                       | 20.40                     |                        |             |
| 15              | 16QAM      | 75      | 0         | 20.30                    | 20.25                       | 20.33                     |                        |             |
| Channel         |            |         |           | 18650                    | 18900                       | 19150                     |                        |             |
| Frequency (MHz) |            |         |           | 1855                     | 1880                        | 1905                      |                        |             |
| 10              | QPSK       | 1       | 0         | 22.48                    | 22.51                       | 22.45                     | 24                     | 0           |
| 10              | QPSK       | 1       | 24        | 22.41                    | 22.57                       | 22.50                     |                        |             |
| 10              | QPSK       | 1       | 49        | 22.44                    | 22.45                       | 22.52                     |                        |             |
| 10              | QPSK       | 25      | 0         | 21.47                    | 21.52                       | 21.48                     | 23                     | 1           |
| 10              | QPSK       | 25      | 12        | 21.51                    | 21.42                       | 21.45                     |                        |             |
| 10              | QPSK       | 25      | 24        | 21.35                    | 21.48                       | 21.52                     |                        |             |
| 10              | QPSK       | 50      | 0         | 21.27                    | 21.35                       | 21.38                     |                        |             |
| 10              | 16QAM      | 1       | 0         | 21.27                    | 21.54                       | 21.54                     | 23                     | 1           |
| 10              | 16QAM      | 1       | 24        | 21.26                    | 21.61                       | 21.58                     |                        |             |
| 10              | 16QAM      | 1       | 49        | 21.27                    | 21.66                       | 21.70                     |                        |             |
| 10              | 16QAM      | 25      | 0         | 20.86                    | 20.52                       | 20.50                     | 22                     | 2           |
| 10              | 16QAM      | 25      | 12        | 20.60                    | 20.34                       | 20.48                     |                        |             |
| 10              | 16QAM      | 25      | 24        | 20.44                    | 20.35                       | 20.50                     |                        |             |
| 10              | 16QAM      | 50      | 0         | 20.25                    | 20.35                       | 20.33                     |                        |             |



| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 18625                    | 18900                       | 19175                     | 24                     | 0           |
| Frequency (MHz) |            |         |           | 1852.5                   | 1880                        | 1907.5                    |                        |             |
| 5               | QPSK       | 1       | 0         | 22.49                    | 22.48                       | 22.55                     |                        |             |
| 5               | QPSK       | 1       | 12        | 22.31                    | 22.50                       | 22.58                     | 23                     | 1           |
| 5               | QPSK       | 1       | 24        | 22.44                    | 22.57                       | 22.59                     |                        |             |
| 5               | QPSK       | 12      | 0         | 21.37                    | 21.64                       | 21.64                     |                        |             |
| 5               | QPSK       | 12      | 6         | 21.29                    | 21.53                       | 21.61                     |                        |             |
| 5               | QPSK       | 12      | 11        | 21.46                    | 21.47                       | 21.65                     |                        |             |
| 5               | QPSK       | 25      | 0         | 21.34                    | 21.45                       | 21.50                     | 23                     | 1           |
| 5               | 16QAM      | 1       | 0         | 21.40                    | 21.48                       | 21.56                     |                        |             |
| 5               | 16QAM      | 1       | 12        | 21.35                    | 21.55                       | 21.72                     |                        |             |
| 5               | 16QAM      | 1       | 24        | 21.32                    | 21.55                       | 21.75                     | 22                     | 2           |
| 5               | 16QAM      | 12      | 0         | 20.48                    | 20.64                       | 20.61                     |                        |             |
| 5               | 16QAM      | 12      | 6         | 20.29                    | 20.55                       | 20.59                     |                        |             |
| 5               | 16QAM      | 12      | 11        | 20.50                    | 20.63                       | 20.74                     |                        |             |
| 5               | 16QAM      | 25      | 0         | 20.18                    | 20.41                       | 20.48                     |                        |             |

**<LTE Band 25>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 26140                    | 26340                       | 26590                     |                        |             |
| Frequency (MHz) |            |         |           | 1860                     | 1880                        | 1905                      |                        |             |
| 20              | QPSK       | 1       | 0         | 22.56                    | 22.49                       | 22.74                     | 24                     | 0           |
| 20              | QPSK       | 1       | 49        | 22.51                    | 22.41                       | 22.62                     |                        |             |
| 20              | QPSK       | 1       | 99        | 22.49                    | 22.49                       | 22.54                     |                        |             |
| 20              | QPSK       | 50      | 0         | 21.22                    | 21.42                       | 21.48                     | 23                     | 1           |
| 20              | QPSK       | 50      | 24        | 21.30                    | 21.27                       | 21.29                     |                        |             |
| 20              | QPSK       | 50      | 49        | 21.30                    | 21.35                       | 21.38                     |                        |             |
| 20              | QPSK       | 100     | 0         | 21.51                    | 21.41                       | 21.52                     |                        |             |
| 20              | 16QAM      | 1       | 0         | 21.59                    | 21.68                       | 21.65                     | 23                     | 1           |
| 20              | 16QAM      | 1       | 49        | 21.70                    | 21.41                       | 21.64                     |                        |             |
| 20              | 16QAM      | 1       | 99        | 21.49                    | 21.49                       | 21.58                     |                        |             |
| 20              | 16QAM      | 50      | 0         | 20.23                    | 20.28                       | 20.45                     | 22                     | 2           |
| 20              | 16QAM      | 50      | 24        | 20.30                    | 20.33                       | 20.43                     |                        |             |
| 20              | 16QAM      | 50      | 49        | 20.33                    | 20.43                       | 20.37                     |                        |             |
| 20              | 16QAM      | 100     | 0         | 20.61                    | 20.41                       | 20.49                     |                        |             |
| Channel         |            |         |           | 26115                    | 26340                       | 26615                     |                        |             |
| Frequency (MHz) |            |         |           | 1857.5                   | 1880                        | 1907.5                    |                        |             |
| 15              | QPSK       | 1       | 0         | 22.54                    | 22.51                       | 22.67                     | 24                     | 0           |
| 15              | QPSK       | 1       | 37        | 22.67                    | 22.35                       | 22.63                     |                        |             |
| 15              | QPSK       | 1       | 74        | 22.47                    | 22.41                       | 22.62                     |                        |             |
| 15              | QPSK       | 36      | 0         | 21.28                    | 21.35                       | 21.49                     | 23                     | 1           |
| 15              | QPSK       | 36      | 18        | 21.40                    | 21.27                       | 21.47                     |                        |             |
| 15              | QPSK       | 36      | 37        | 21.25                    | 21.50                       | 21.64                     |                        |             |
| 15              | QPSK       | 75      | 0         | 21.47                    | 21.31                       | 21.40                     |                        |             |
| 15              | 16QAM      | 1       | 0         | 21.54                    | 21.61                       | 21.82                     | 23                     | 1           |
| 15              | 16QAM      | 1       | 37        | 21.61                    | 21.56                       | 21.68                     |                        |             |
| 15              | 16QAM      | 1       | 74        | 21.53                    | 21.53                       | 21.78                     |                        |             |
| 15              | 16QAM      | 36      | 0         | 20.35                    | 20.49                       | 20.53                     | 22                     | 2           |
| 15              | 16QAM      | 36      | 18        | 20.40                    | 20.26                       | 20.50                     |                        |             |
| 15              | 16QAM      | 36      | 37        | 20.32                    | 20.45                       | 20.53                     |                        |             |
| 15              | 16QAM      | 75      | 0         | 20.43                    | 20.42                       | 20.49                     |                        |             |
| Channel         |            |         |           | 26090                    | 26340                       | 26640                     |                        |             |
| Frequency (MHz) |            |         |           | 1855                     | 1880                        | 1910                      |                        |             |
| 10              | QPSK       | 1       | 0         | 22.45                    | 22.58                       | 22.70                     | 24                     | 0           |
| 10              | QPSK       | 1       | 24        | 22.61                    | 22.45                       | 22.57                     |                        |             |
| 10              | QPSK       | 1       | 49        | 22.35                    | 22.53                       | 22.65                     |                        |             |
| 10              | QPSK       | 25      | 0         | 21.30                    | 21.48                       | 21.71                     | 23                     | 1           |
| 10              | QPSK       | 25      | 12        | 21.41                    | 21.28                       | 21.63                     |                        |             |
| 10              | QPSK       | 25      | 24        | 21.28                    | 21.57                       | 21.62                     |                        |             |
| 10              | QPSK       | 50      | 0         | 21.48                    | 21.37                       | 21.57                     |                        |             |
| 10              | 16QAM      | 1       | 0         | 21.42                    | 21.56                       | 21.72                     | 23                     | 1           |
| 10              | 16QAM      | 1       | 24        | 21.62                    | 21.40                       | 21.65                     |                        |             |
| 10              | 16QAM      | 1       | 49        | 21.39                    | 21.54                       | 21.75                     |                        |             |
| 10              | 16QAM      | 25      | 0         | 20.37                    | 20.51                       | 20.73                     | 22                     | 2           |
| 10              | 16QAM      | 25      | 12        | 20.54                    | 20.34                       | 20.65                     |                        |             |
| 10              | 16QAM      | 25      | 24        | 20.37                    | 20.55                       | 20.65                     |                        |             |
| 10              | 16QAM      | 50      | 0         | 20.59                    | 20.42                       | 20.53                     |                        |             |



| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 26065                    | 26340                       | 26665                     | 24                     | 0           |
| Frequency (MHz) |            |         |           | 1852.5                   | 1880                        | 1912.5                    |                        |             |
| 5               | QPSK       | 1       | 0         | 22.45                    | 22.55                       | 22.70                     |                        |             |
| 5               | QPSK       | 1       | 12        | 22.60                    | 22.43                       | 22.61                     | 23                     | 1           |
| 5               | QPSK       | 1       | 24        | 22.42                    | 22.58                       | 22.68                     |                        |             |
| 5               | QPSK       | 12      | 0         | 21.55                    | 21.62                       | 21.85                     |                        |             |
| 5               | QPSK       | 12      | 6         | 21.47                    | 21.51                       | 21.78                     |                        |             |
| 5               | QPSK       | 12      | 11        | 21.38                    | 21.76                       | 21.72                     | 23                     | 1           |
| 5               | QPSK       | 25      | 0         | 21.52                    | 21.62                       | 21.76                     |                        |             |
| 5               | 16QAM      | 1       | 0         | 21.40                    | 21.49                       | 21.70                     |                        |             |
| 5               | 16QAM      | 1       | 12        | 21.51                    | 21.58                       | 21.72                     | 23                     | 1           |
| 5               | 16QAM      | 1       | 24        | 21.36                    | 21.70                       | 21.76                     |                        |             |
| 5               | 16QAM      | 12      | 0         | 20.57                    | 20.61                       | 20.91                     | 22                     | 2           |
| 5               | 16QAM      | 12      | 6         | 20.67                    | 20.46                       | 20.77                     |                        |             |
| 5               | 16QAM      | 12      | 11        | 20.56                    | 20.73                       | 20.78                     |                        |             |
| 5               | 16QAM      | 25      | 0         | 20.47                    | 20.67                       | 20.83                     |                        |             |

### Reduced RF Power Mode

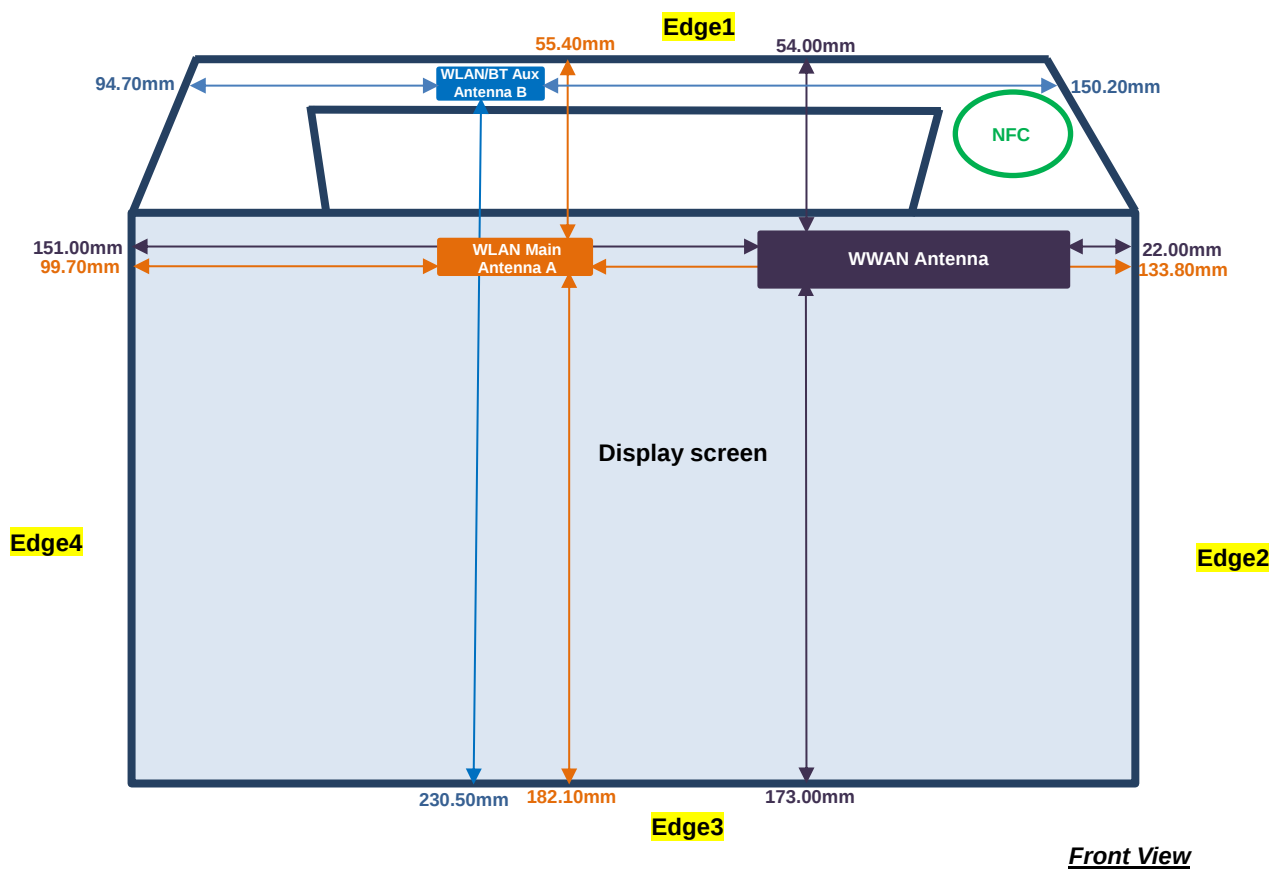
**<LTE Band 13>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power<br>Low<br>Ch. / Freq. | Power<br>Middle<br>Ch. / Freq. | Power<br>High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|-----------------------------|--------------------------------|------------------------------|------------------------|-------------|
| Channel         |            |         |           | 23230                       |                                |                              |                        |             |
| Frequency (MHz) |            |         |           | 782                         |                                |                              |                        |             |
| 10              | QPSK       | 1       | 0         | 21.01                       |                                |                              | 22                     | 0           |
| 10              | QPSK       | 1       | 24        | 20.98                       |                                |                              |                        |             |
| 10              | QPSK       | 1       | 49        | 20.89                       |                                |                              |                        |             |
| 10              | QPSK       | 25      | 0         | 20.85                       |                                |                              | 22                     | 0           |
| 10              | QPSK       | 25      | 12        | 20.76                       |                                |                              |                        |             |
| 10              | QPSK       | 25      | 24        | 20.74                       |                                |                              |                        |             |
| 10              | QPSK       | 50      | 0         | 20.58                       |                                |                              |                        |             |
| 10              | 16QAM      | 1       | 0         | 20.51                       |                                |                              | 22                     | 0           |
| 10              | 16QAM      | 1       | 24        | 20.73                       |                                |                              |                        |             |
| 10              | 16QAM      | 1       | 49        | 20.56                       |                                |                              |                        |             |
| 10              | 16QAM      | 25      | 0         | 19.98                       |                                |                              | 21                     | 1           |
| 10              | 16QAM      | 25      | 12        | 20.17                       |                                |                              |                        |             |
| 10              | 16QAM      | 25      | 24        | 20.22                       |                                |                              |                        |             |
| 10              | 16QAM      | 50      | 0         | 20.06                       |                                |                              |                        |             |
| Channel         |            |         |           | 23205                       | 23230                          | 23255                        | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 779.5                       | 782                            | 784.5                        |                        |             |
| 5               | QPSK       | 1       | 0         | 20.56                       | 20.58                          | 20.76                        | 22                     | 0           |
| 5               | QPSK       | 1       | 12        | 20.63                       | 20.74                          | 20.74                        |                        |             |
| 5               | QPSK       | 1       | 24        | 20.76                       | 20.71                          | 20.60                        |                        |             |
| 5               | QPSK       | 12      | 0         | 20.48                       | 20.59                          | 20.84                        | 22                     | 0           |
| 5               | QPSK       | 12      | 6         | 20.51                       | 20.77                          | 20.68                        |                        |             |
| 5               | QPSK       | 12      | 11        | 20.61                       | 20.76                          | 20.66                        |                        |             |
| 5               | QPSK       | 25      | 0         | 20.52                       | 20.72                          | 20.75                        | 22                     | 0           |
| 5               | 16QAM      | 1       | 0         | 20.50                       | 20.56                          | 20.76                        |                        |             |
| 5               | 16QAM      | 1       | 12        | 20.56                       | 20.72                          | 20.70                        |                        |             |
| 5               | 16QAM      | 1       | 24        | 20.70                       | 20.69                          | 20.57                        | 21                     | 1           |
| 5               | 16QAM      | 12      | 0         | 20.07                       | 20.18                          | 20.33                        |                        |             |
| 5               | 16QAM      | 12      | 6         | 20.11                       | 20.31                          | 20.31                        |                        |             |
| 5               | 16QAM      | 12      | 11        | 20.18                       | 20.28                          | 20.22                        |                        |             |
| 5               | 16QAM      | 25      | 0         | 20.00                       | 20.20                          | 20.23                        |                        |             |

**<LTE Band 5>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 20450                    | 20525                       | 20600                     |                        |             |
| Frequency (MHz) |            |         |           | 829                      | 836.5                       | 844                       |                        |             |
| 10              | QPSK       | 1       | 0         | 21.14                    | 21.22                       | 21.27                     | 22                     | 0           |
| 10              | QPSK       | 1       | 24        | 21.17                    | 21.15                       | 21.22                     |                        |             |
| 10              | QPSK       | 1       | 49        | 21.22                    | 21.19                       | 21.05                     |                        |             |
| 10              | QPSK       | 25      | 0         | 21.25                    | 21.21                       | 21.26                     | 22                     | 0           |
| 10              | QPSK       | 25      | 12        | 21.05                    | 21.04                       | 20.99                     |                        |             |
| 10              | QPSK       | 25      | 24        | 21.04                    | 21.03                       | 21.03                     |                        |             |
| 10              | QPSK       | 50      | 0         | 20.91                    | 20.92                       | 20.94                     |                        |             |
| 10              | 16QAM      | 1       | 0         | 21.09                    | 21.16                       | 21.11                     | 22                     | 0           |
| 10              | 16QAM      | 1       | 24        | 21.18                    | 21.18                       | 21.16                     |                        |             |
| 10              | 16QAM      | 1       | 49        | 21.18                    | 21.18                       | 21.00                     |                        |             |
| 10              | 16QAM      | 25      | 0         | 20.17                    | 20.12                       | 20.12                     | 21                     | 1           |
| 10              | 16QAM      | 25      | 12        | 20.12                    | 20.12                       | 20.02                     |                        |             |
| 10              | 16QAM      | 25      | 24        | 20.11                    | 20.17                       | 20.02                     |                        |             |
| 10              | 16QAM      | 50      | 0         | 19.98                    | 20.01                       | 19.91                     |                        |             |
| Channel         |            |         |           | 20425                    | 20525                       | 20625                     |                        |             |
| Frequency (MHz) |            |         |           | 826.5                    | 836.5                       | 846.5                     |                        |             |
| 5               | QPSK       | 1       | 0         | 21.02                    | 21.25                       | 21.18                     | 22                     | 0           |
| 5               | QPSK       | 1       | 12        | 21.16                    | 21.20                       | 21.13                     |                        |             |
| 5               | QPSK       | 1       | 24        | 21.17                    | 21.19                       | 21.04                     |                        |             |
| 5               | QPSK       | 12      | 0         | 20.94                    | 21.18                       | 21.12                     | 22                     | 0           |
| 5               | QPSK       | 12      | 6         | 21.14                    | 21.18                       | 21.08                     |                        |             |
| 5               | QPSK       | 12      | 11        | 21.14                    | 21.19                       | 20.98                     |                        |             |
| 5               | QPSK       | 25      | 0         | 21.01                    | 21.16                       | 20.97                     |                        |             |
| 5               | 16QAM      | 1       | 0         | 21.06                    | 21.22                       | 21.08                     | 22                     | 0           |
| 5               | 16QAM      | 1       | 12        | 21.18                    | 21.16                       | 21.01                     |                        |             |
| 5               | 16QAM      | 1       | 24        | 21.21                    | 21.19                       | 20.89                     |                        |             |
| 5               | 16QAM      | 12      | 0         | 20.23                    | 20.26                       | 20.15                     | 21                     | 1           |
| 5               | 16QAM      | 12      | 6         | 20.29                    | 20.28                       | 20.09                     |                        |             |
| 5               | 16QAM      | 12      | 11        | 20.29                    | 20.29                       | 20.00                     |                        |             |
| 5               | 16QAM      | 25      | 0         | 20.17                    | 20.12                       | 19.91                     |                        |             |

### 13. Antenna Location



**<SAR test exclusion table>**
**General Note:**

1. The below table, when the distance is < 50 mm exclusion threshold is "Ratio", when the distance is > 50 mm exclusion threshold is "mW"
2. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
3. Per KDB 447498 D01v05r02, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
4. Per KDB 447498 D01v05r02, standalone SAR test exclusion threshold is applied; If the test separation distance is < 5mm, 5mm is used to determine SAR exclusion threshold.
5. Per KDB 447498 D01v05r02, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:  

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR}$$
  - f(GHz) is the RF channel transmit frequency in GHz
  - Power and distance are rounded to the nearest mW and mm before calculation
  - The result is rounded to one decimal place for comparison
6. Per KDB 447498 D01v05r02, at 100 MHz to 6 GHz and for *test separation distances* > 50 mm, the SAR test exclusion threshold is determined according to the following
  - a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm) · (f(MHz)/150)] mW, at 100 MHz to 1500 MHz
  - b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm) · 10] mW at > 1500 MHz and ≤ 6 GHz
7. For the bottom-face that proximity sensor power reduction is applied for SAR compliance, additional SAR testing at "sensor trigger distance – 10mm" with EUT transmitting full power in normal mode was performed.

| Exposure Position | Wireless Interface      | GPRS 850 Class 10 | GPRS 1900 Class 10 | WCDMA Band V | WCDMA Band IV | WCDMA Band II | CDMA BC10 | CDMA BC0 | CDMA BC1 | LTE Band 17 | LTE Band 13 | LTE Band 5 | LTE Band 4 | LTE Band 2 | LTE Band 25 |
|-------------------|-------------------------|-------------------|--------------------|--------------|---------------|---------------|-----------|----------|----------|-------------|-------------|------------|------------|------------|-------------|
|                   | Calculated Frequency    | 848MHz            | 1909MHz            | 846MHz       | 1750MHz       | 1907MHz       | 846MHz    | 848MHz   | 1907MHz  | 713MHz      | 784MHz      | 848MHz     | 1754MHz    | 1909MHz    | 1914MHz     |
|                   | Maximum power (dBm)     | 27.               | 24                 | 24           | 24            | 24            | 25        | 25       | 25       | 24          | 24          | 24         | 24         | 24         | 24          |
|                   | Maximum rated power(mW) | 501.0             | 251.0              | 251.0        | 251.0         | 251.0         | 316.0     | 316.0    | 316.0    | 251.0       | 251.0       | 251.0      | 251.0      | 251.0      | 251.0       |
| Bottom Face       | Separation distance(mm) | 5.0               |                    |              |               |               |           |          |          |             |             |            |            |            |             |
|                   | exclusion threshold     | 92.3              | 69.4               | 46.2         | 66.4          | 69.3          | 58.1      | 58.2     | 87.3     | 42.4        | 44.5        | 46.2       | 66.5       | 69.4       | 69.5        |
|                   | Testing required?       | Yes               | Yes                | Yes          | Yes           | Yes           | Yes       | Yes      | Yes      | Yes         | Yes         | Yes        | Yes        | Yes        | Yes         |
| Edge 1            | Separation distance(mm) | 54.0              |                    |              |               |               |           |          |          |             |             |            |            |            |             |
|                   | exclusion threshold     | 186.0             | 149.0              | 186.0        | 153.0         | 149.0         | 186.0     | 186.0    | 149.0    | 197.0       | 190.0       | 186.0      | 153.0      | 149.0      | 148.0       |
|                   | Testing required?       | Yes               | Yes                | Yes          | Yes           | Yes           | Yes       | Yes      | Yes      | Yes         | Yes         | Yes        | Yes        | Yes        | Yes         |
| Edge 2            | Separation distance(mm) | 22.0              |                    |              |               |               |           |          |          |             |             |            |            |            |             |
|                   | exclusion threshold     | 21.0              | 15.8               | 10.5         | 15.1          | 15.8          | 13.2      | 13.2     | 19.8     | 9.6         | 10.1        | 10.5       | 15.1       | 15.8       | 15.8        |
|                   | Testing required?       | Yes               | Yes                | Yes          | Yes           | Yes           | Yes       | Yes      | Yes      | Yes         | Yes         | Yes        | Yes        | Yes        | Yes         |
| Edge 3            | Separation distance(mm) | 173.0             |                    |              |               |               |           |          |          |             |             |            |            |            |             |
|                   | exclusion threshold     | 858.0             | 1339.0             | 857.0        | 1343.0        | 1339.0        | 857.0     | 858.0    | 1339.0   | 762.0       | 812.0       | 858.0      | 1343.0     | 1339.0     | 1338.0      |
|                   | Testing required?       | No                | No                 | No           | No            | No            | No        | No       | No       | No          | No          | No         | No         | No         | No          |
| Edge 4            | Separation distance(mm) | 151.0             |                    |              |               |               |           |          |          |             |             |            |            |            |             |
|                   | exclusion threshold     | 734.0             | 1119.0             | 733.0        | 1123.0        | 1119.0        | 733.0     | 734.0    | 1119.0   | 658.0       | 697.0       | 734.0      | 1123.0     | 1119.0     | 1118.0      |
|                   | Testing required?       | No                | No                 | No           | No            | No            | No        | No       | No       | No          | No          | No         | No         | No         | No          |

## 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.
  - a. 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.
  - b. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)\*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:
  - $\leq 0.8$  W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\leq 100$  MHz
  - $\leq 0.6$  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
  - $\leq 0.4$  W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\geq 200$  MHz
3. For the exposure positions that proximity sensor power reduction is applied for SAR compliance, additional SAR testing with EUT transmitting full power in normal mode was performed; 10mm for bottom face.
4. Per KDB 941225 D01v03, for Body SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance, for modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested, therefore, the GPRS 2Tx slots modes was selected when EUT operating without power back-off, the GPRS 2Tx slots modes was selected when EUT operating with power back-off, according to the highest source-based time-averaged output power.
5. Per KDB 941225 D01v03, for Body exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
6. Per KDB 941225 D01v03, RMC 12.2kbps setting is used to evaluate SAR. If the maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is  $\leq 1/4$  dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.
7. Per KDB 941225 D01v03, in body SAR tested, the EUT is treated as data device and SAR is tested with Ev-Do Rev 0 (RTAP 153.6kbps) as the primary mode.
8. 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.
9. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
10. 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  $\leq 0.8$  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.
11. Per KDB 941225 D05v02r03, 16QAM output power for each RB allocation configuration is  $> \text{not } 1/2$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r03, 16QAM SAR testing is not required.
12. Per KDB 941225 D05v02r03, Smaller bandwidth output power for each RB allocation configuration is  $> \text{not } 1/2$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r03, smaller bandwidth SAR testing is not required.
13. According to April 2015 TCB workshop (Overlapping LTE Bands), for LTE B2 test exclusion, due to:
  - a. the maximum output power, including tolerance, for the smaller band must be  $\leq$  the larger band to qualify for the SAR test exclusion
  - b. the channel bandwidth and other operating parameters for the smaller band must be fully supported by the larger band
  - c. Therefore the LTE B25 SAR test result is covering LTE B2, so the LTE B2 SAR is not necessary.

## 14.1 Body SAR

### <GSM SAR>

| Plot No. | Band    | Mode              | Test Position | Gap (mm) | Power Reduction | 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) |
|----------|---------|-------------------|---------------|----------|-----------------|-----|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
|          | GSM850  | GPRS (2 Tx slots) | Bottom Face   | 10mm     | OFF             | 128 | 824.2       | 31.76               | 33.00               | 1.330                  | 0.01             | 0.590                  | 0.785                  |
| 01       | GSM850  | GPRS (2 Tx slots) | Bottom Face   | 0mm      | ON              | 128 | 824.2       | 27.60               | 28.00               | 1.096                  | 0.04             | 0.953                  | 1.045                  |
|          | GSM850  | GPRS (2 Tx slots) | Bottom Face   | 0mm      | ON              | 189 | 836.4       | 27.52               | 28.00               | 1.117                  | 0.12             | 0.924                  | 1.032                  |
|          | GSM850  | GPRS (2 Tx slots) | Bottom Face   | 0mm      | ON              | 251 | 848.8       | 27.55               | 28.00               | 1.109                  | 0.18             | 0.941                  | 1.044                  |
|          | GSM850  | GPRS (2 Tx slots) | Edge 1        | 0mm      | OFF             | 128 | 824.2       | 31.76               | 33.00               | 1.330                  | 0.01             | 0.027                  | 0.036                  |
|          | GSM850  | GPRS (2 Tx slots) | Edge 2        | 0mm      | OFF             | 128 | 824.2       | 31.76               | 33.00               | 1.330                  | 0.14             | 0.111                  | 0.148                  |
|          | GSM1900 | GPRS (2 Tx slots) | Bottom Face   | 0mm      | OFF             | 661 | 1880        | 28.88               | 30.00               | 1.294                  | 0.03             | 0.693                  | 0.897                  |
|          | GSM1900 | GPRS (2 Tx slots) | Bottom Face   | 0mm      | OFF             | 512 | 1850.2      | 28.77               | 30.00               | 1.327                  | -0.08            | 0.690                  | 0.916                  |
| 02       | GSM1900 | GPRS (2 Tx slots) | Bottom Face   | 0mm      | OFF             | 810 | 1909.8      | 28.74               | 30.00               | 1.337                  | -0.01            | 0.732                  | 0.978                  |
|          | GSM1900 | GPRS (2 Tx slots) | Edge 1        | 0mm      | OFF             | 661 | 1880        | 28.88               | 30.00               | 1.294                  | 0.05             | 0.061                  | 0.079                  |
|          | GSM1900 | GPRS (2 Tx slots) | Edge 2        | 0mm      | OFF             | 661 | 1880        | 28.88               | 30.00               | 1.294                  | 0.05             | 0.129                  | 0.167                  |

### <WCDMA SAR>

| Plot No. | Band     | Mode         | Test Position | Gap (mm) | Power Reduction | 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) |
|----------|----------|--------------|---------------|----------|-----------------|------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
|          | WCDMA V  | RMC 12.2Kbps | Bottom Face   | 10mm     | OFF             | 4132 | 826.4       | 22.23               | 24.00               | 1.503                  | 0.13             | 0.438                  | 0.658                  |
|          | WCDMA V  | RMC 12.2Kbps | Bottom Face   | 0mm      | ON              | 4132 | 826.4       | 21.08               | 22.00               | 1.236                  | -0.12            | 0.851                  | 1.052                  |
|          | WCDMA V  | RMC 12.2Kbps | Bottom Face   | 0mm      | ON              | 4182 | 836.4       | 21.03               | 22.00               | 1.250                  | 0.05             | 0.883                  | 1.104                  |
| 03       | WCDMA V  | RMC 12.2Kbps | Bottom Face   | 0mm      | ON              | 4233 | 846.6       | 21.06               | 22.00               | 1.242                  | 0.02             | 0.924                  | 1.147                  |
|          | WCDMA V  | RMC 12.2Kbps | Edge 1        | 0mm      | OFF             | 4132 | 826.4       | 22.23               | 24.00               | 1.503                  | -0.01            | 0.024                  | 0.036                  |
|          | WCDMA V  | RMC 12.2Kbps | Edge 2        | 0mm      | OFF             | 4132 | 826.4       | 22.23               | 24.00               | 1.503                  | 0.05             | 0.099                  | 0.149                  |
| 04       | WCDMA IV | RMC 12.2Kbps | Bottom Face   | 0mm      | OFF             | 1513 | 1752.6      | 22.44               | 24.00               | 1.432                  | 0.03             | 0.655                  | 0.938                  |
|          | WCDMA IV | RMC 12.2Kbps | Bottom Face   | 0mm      | OFF             | 1312 | 1712.4      | 22.37               | 24.00               | 1.455                  | -0.05            | 0.568                  | 0.827                  |
|          | WCDMA IV | RMC 12.2Kbps | Bottom Face   | 0mm      | OFF             | 1413 | 1732.6      | 22.35               | 24.00               | 1.462                  | -0.01            | 0.585                  | 0.855                  |
|          | WCDMA IV | RMC 12.2Kbps | Edge 1        | 0mm      | OFF             | 1513 | 1752.6      | 22.44               | 24.00               | 1.432                  | 0.11             | 0.059                  | 0.084                  |
|          | WCDMA IV | RMC 12.2Kbps | Edge 2        | 0mm      | OFF             | 1513 | 1752.6      | 22.44               | 24.00               | 1.432                  | 0.05             | 0.177                  | 0.253                  |
|          | WCDMA II | RMC 12.2Kbps | Bottom Face   | 0mm      | OFF             | 9262 | 1852.4      | 22.75               | 24.00               | 1.334                  | 0.02             | 0.764                  | 1.019                  |
| 05       | WCDMA II | RMC 12.2Kbps | Bottom Face   | 0mm      | OFF             | 9400 | 1880        | 22.48               | 24.00               | 1.419                  | 0.11             | 0.775                  | 1.100                  |
|          | WCDMA II | RMC 12.2Kbps | Bottom Face   | 0mm      | OFF             | 9538 | 1907.6      | 22.54               | 24.00               | 1.400                  | -0.02            | 0.747                  | 1.045                  |
|          | WCDMA II | RMC 12.2Kbps | Edge 1        | 0mm      | OFF             | 9262 | 1852.4      | 22.75               | 24.00               | 1.334                  | 0.12             | 0.066                  | 0.088                  |
|          | WCDMA II | RMC 12.2Kbps | Edge 2        | 0mm      | OFF             | 9262 | 1852.4      | 22.75               | 24.00               | 1.334                  | -0.03            | 0.164                  | 0.219                  |



## &lt;CDMA SAR&gt;

| Plot No. | Band          | Mode           | Test Position | Gap (mm) | Power Reduction | 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 BC10 | RTAP 153.6Kbps | Bottom Face   | 10mm     | OFF             | 580  | 820.5       | 23.09               | 25.00               | 1.552                  | 0.11             | 0.431                  | 0.669                  |
| 06       | CDMA2000 BC10 | RTAP 153.6Kbps | Bottom Face   | 0mm      | ON              | 580  | 820.5       | 21.35               | 22.00               | 1.161                  | 0.17             | 1.020                  | 1.185                  |
|          | CDMA2000 BC10 | RTAP 153.6Kbps | Edge 1        | 0mm      | OFF             | 580  | 820.5       | 23.09               | 25.00               | 1.552                  | 0.19             | 0.035                  | 0.054                  |
|          | CDMA2000 BC10 | RTAP 153.6Kbps | Edge 2        | 0mm      | OFF             | 580  | 820.5       | 23.09               | 25.00               | 1.552                  | 0.11             | 0.133                  | 0.206                  |
|          | CDMA2000 BC0  | RTAP 153.6Kbps | Bottom Face   | 10mm     | OFF             | 384  | 836.52      | 23.23               | 25.00               | 1.503                  | 0.11             | 0.399                  | 0.600                  |
|          | CDMA2000 BC0  | RTAP 153.6Kbps | Bottom Face   | 0mm      | ON              | 384  | 836.52      | 21.54               | 22.00               | 1.112                  | -0.01            | 1.060                  | 1.178                  |
|          | CDMA2000 BC0  | RTAP 153.6Kbps | Bottom Face   | 0mm      | ON              | 1013 | 824.7       | 21.49               | 22.00               | 1.125                  | 0.04             | 0.990                  | 1.113                  |
| 07       | CDMA2000 BC0  | RTAP 153.6Kbps | Bottom Face   | 0mm      | ON              | 777  | 848.31      | 21.42               | 22.00               | 1.143                  | 0.01             | 1.040                  | 1.189                  |
|          | CDMA2000 BC0  | RTAP 153.6Kbps | Edge 1        | 0mm      | OFF             | 384  | 836.52      | 23.23               | 25.00               | 1.503                  | 0.12             | 0.032                  | 0.048                  |
|          | CDMA2000 BC0  | RTAP 153.6Kbps | Edge 2        | 0mm      | OFF             | 384  | 836.52      | 23.23               | 25.00               | 1.503                  | 0.06             | 0.089                  | 0.134                  |
|          | CDMA2000 BC1  | RTAP 153.6Kbps | Bottom Face   | 10mm     | OFF             | 1175 | 1908.75     | 23.33               | 25.00               | 1.469                  | 0.06             | 0.256                  | 0.376                  |
|          | CDMA2000 BC1  | RTAP 153.6Kbps | Bottom Face   | 0mm      | ON              | 1175 | 1908.75     | 22.30               | 24.00               | 1.479                  | 0.05             | 0.664                  | 0.982                  |
| 08       | CDMA2000 BC1  | RTAP 153.6Kbps | Bottom Face   | 0mm      | ON              | 25   | 1851.25     | 22.28               | 24.00               | 1.486                  | 0                | 0.676                  | 1.004                  |
|          | CDMA2000 BC1  | RTAP 153.6Kbps | Bottom Face   | 0mm      | ON              | 600  | 1880        | 22.15               | 24.00               | 1.531                  | 0.03             | 0.656                  | 1.004                  |
|          | CDMA2000 BC1  | RTAP 153.6Kbps | Edge 1        | 0mm      | OFF             | 1175 | 1908.75     | 23.33               | 25.00               | 1.469                  | 0.03             | 0.079                  | 0.116                  |
|          | CDMA2000 BC1  | RTAP 153.6Kbps | Edge 2        | 0mm      | OFF             | 1175 | 1908.75     | 23.33               | 25.00               | 1.469                  | 0.02             | 0.177                  | 0.260                  |

## &lt;LTE SAR&gt;

| Plot No. | Band        | BW (MHz) | Modulation | RB Size | RB offset | Test Position | Gap (mm) | Power Reduction | 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) |
|----------|-------------|----------|------------|---------|-----------|---------------|----------|-----------------|-------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
| 09       | LTE Band 17 | 10M      | QPSK       | 1RB     | 0Offset   | Bottom Face   | 0mm      | OFF             | 23790 | 710         | 22.60               | 24.00               | 1.380                  | -0.02            | 0.562                  | 0.776                  |
|          | LTE Band 17 | 10M      | QPSK       | 25RB    | 0Offset   | Bottom Face   | 0mm      | OFF             | 23790 | 710         | 21.53               | 23.00               | 1.403                  | 0.02             | 0.424                  | 0.595                  |
|          | LTE Band 17 | 10M      | QPSK       | 1RB     | 0Offset   | Edge 1        | 0mm      | OFF             | 23790 | 710         | 22.60               | 24.00               | 1.380                  | -0.02            | 0.017                  | 0.023                  |
|          | LTE Band 17 | 10M      | QPSK       | 25RB    | 0Offset   | Edge 1        | 0mm      | OFF             | 23790 | 710         | 21.53               | 23.00               | 1.403                  | 0.11             | 0.015                  | 0.021                  |
|          | LTE Band 17 | 10M      | QPSK       | 1RB     | 0Offset   | Edge 2        | 0mm      | OFF             | 23790 | 710         | 22.60               | 24.00               | 1.380                  | 0.07             | 0.062                  | 0.086                  |
|          | LTE Band 17 | 10M      | QPSK       | 25RB    | 0Offset   | Edge 2        | 0mm      | OFF             | 23790 | 710         | 21.53               | 23.00               | 1.403                  | 0.03             | 0.066                  | 0.093                  |
|          | LTE Band 13 | 10M      | QPSK       | 1RB     | 0Offset   | Bottom Face   | 10mm     | OFF             | 23230 | 782         | 22.60               | 24.00               | 1.380                  | -0.07            | 0.427                  | 0.589                  |
|          | LTE Band 13 | 10M      | QPSK       | 25RB    | 0Offset   | Bottom Face   | 10mm     | OFF             | 23230 | 782         | 21.37               | 23.00               | 1.455                  | -0.03            | 0.403                  | 0.587                  |
| 10       | LTE Band 13 | 10M      | QPSK       | 1RB     | 0Offset   | Bottom Face   | 0mm      | ON              | 23230 | 782         | 21.01               | 22.00               | 1.256                  | -0.02            | 0.797                  | 1.001                  |
|          | LTE Band 13 | 10M      | QPSK       | 25RB    | 0Offset   | Bottom Face   | 0mm      | ON              | 23230 | 782         | 20.85               | 22.00               | 1.303                  | -0.13            | 0.742                  | 0.967                  |
|          | LTE Band 13 | 10M      | QPSK       | 50RB    | 0Offset   | Bottom Face   | 0mm      | ON              | 23230 | 782         | 20.58               | 22.00               | 1.387                  | -0.03            | 0.713                  | 0.989                  |
|          | LTE Band 13 | 10M      | QPSK       | 1RB     | 0Offset   | Edge 1        | 0mm      | OFF             | 23230 | 782         | 22.60               | 24.00               | 1.380                  | 0.15             | 0.035                  | 0.048                  |
|          | LTE Band 13 | 10M      | QPSK       | 25RB    | 0Offset   | Edge 1        | 0mm      | OFF             | 23230 | 782         | 21.37               | 23.00               | 1.455                  | 0.05             | 0.031                  | 0.045                  |
|          | LTE Band 13 | 10M      | QPSK       | 1RB     | 0Offset   | Edge 2        | 0mm      | OFF             | 23230 | 782         | 22.60               | 24.00               | 1.380                  | 0.09             | 0.112                  | 0.155                  |
|          | LTE Band 13 | 10M      | QPSK       | 25RB    | 0Offset   | Edge 2        | 0mm      | OFF             | 23230 | 782         | 21.37               | 23.00               | 1.455                  | 0.11             | 0.090                  | 0.131                  |

| Plot No. | Band        | BW (MHz) | Modulation | RB Size | RB offset | Test Position | Gap (mm) | Power Reduction | 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      | QPSK       | 1RB     | 0Offset   | Bottom Face   | 10mm     | OFF             | 20600 | 844         | 22.27               | 24.00               | 1.489                  | 0.03             | 0.449                  | 0.669                  |
|          | LTE Band 5  | 10M      | QPSK       | 25RB    | 0Offset   | Bottom Face   | 10mm     | OFF             | 20600 | 844         | 21.25               | 23.00               | 1.496                  | -0.03            | 0.400                  | 0.598                  |
|          | LTE Band 5  | 10M      | QPSK       | 1RB     | 0Offset   | Bottom Face   | 0mm      | ON              | 20600 | 844         | 21.27               | 22.00               | 1.183                  | -0.04            | 0.943                  | 1.116                  |
|          | LTE Band 5  | 10M      | QPSK       | 1RB     | 0Offset   | Bottom Face   | 0mm      | ON              | 20450 | 829         | 21.14               | 22.00               | 1.219                  | 0.01             | 0.865                  | 1.054                  |
|          | LTE Band 5  | 10M      | QPSK       | 1RB     | 0Offset   | Bottom Face   | 0mm      | ON              | 20525 | 836.5       | 21.22               | 22.00               | 1.197                  | 0.08             | 0.943                  | 1.129                  |
|          | LTE Band 5  | 10M      | QPSK       | 25RB    | 0Offset   | Bottom Face   | 0mm      | ON              | 20600 | 844         | 21.26               | 22.00               | 1.186                  | -0.07            | 0.950                  | 1.126                  |
|          | LTE Band 5  | 10M      | QPSK       | 25RB    | 0Offset   | Bottom Face   | 0mm      | ON              | 20450 | 829         | 21.25               | 22.00               | 1.189                  | 0.07             | 0.930                  | 1.105                  |
| 11       | LTE Band 5  | 10M      | QPSK       | 25RB    | 0Offset   | Bottom Face   | 0mm      | ON              | 20525 | 836.5       | 21.21               | 22.00               | 1.199                  | -0.03            | 0.979                  | 1.174                  |
|          | LTE Band 5  | 10M      | QPSK       | 50RB    | 0Offset   | Bottom Face   | 0mm      | ON              | 20600 | 844         | 20.94               | 22.00               | 1.276                  | -0.1             | 0.905                  | 1.155                  |
|          | LTE Band 5  | 10M      | QPSK       | 1RB     | 0Offset   | Edge 1        | 0mm      | OFF             | 20600 | 844         | 22.27               | 24.00               | 1.489                  | 0.16             | 0.022                  | 0.033                  |
|          | LTE Band 5  | 10M      | QPSK       | 25RB    | 0Offset   | Edge 1        | 0mm      | OFF             | 20600 | 844         | 21.25               | 23.00               | 1.496                  | 0.12             | 0.017                  | 0.025                  |
|          | LTE Band 5  | 10M      | QPSK       | 1RB     | 0Offset   | Edge 2        | 0mm      | OFF             | 20600 | 844         | 22.27               | 24.00               | 1.489                  | -0.01            | 0.110                  | 0.164                  |
|          | LTE Band 5  | 10M      | QPSK       | 25RB    | 0Offset   | Edge 2        | 0mm      | OFF             | 20600 | 844         | 21.25               | 23.00               | 1.496                  | 0.13             | 0.088                  | 0.132                  |
| 12       | LTE Band 4  | 20M      | QPSK       | 1RB     | 0offset   | Bottom Face   | 0mm      | OFF             | 20300 | 1745        | 22.50               | 24.00               | 1.413                  | 0                | 0.606                  | 0.856                  |
|          | LTE Band 4  | 20M      | QPSK       | 1RB     | 0offset   | Bottom Face   | 0mm      | OFF             | 20050 | 1720        | 22.46               | 24.00               | 1.426                  | -0.03            | 0.548                  | 0.781                  |
|          | LTE Band 4  | 20M      | QPSK       | 1RB     | 0offset   | Bottom Face   | 0mm      | OFF             | 20175 | 1732.5      | 22.44               | 24.00               | 1.432                  | -0.06            | 0.568                  | 0.813                  |
|          | LTE Band 4  | 20M      | QPSK       | 50RB    | 0offset   | Bottom Face   | 0mm      | OFF             | 20300 | 1745        | 21.31               | 23.00               | 1.476                  | -0.07            | 0.481                  | 0.710                  |
|          | LTE Band 4  | 20M      | QPSK       | 100RB   | 0offset   | Bottom Face   | 0mm      | OFF             | 20300 | 1745        | 21.19               | 23.00               | 1.517                  | 0.01             | 0.465                  | 0.705                  |
|          | LTE Band 4  | 20M      | QPSK       | 1RB     | 0offset   | Edge 1        | 0mm      | OFF             | 20300 | 1745        | 22.50               | 24.00               | 1.413                  | 0.14             | 0.046                  | 0.065                  |
|          | LTE Band 4  | 20M      | QPSK       | 50RB    | 0offset   | Edge 1        | 0mm      | OFF             | 20300 | 1745        | 21.31               | 23.00               | 1.476                  | 0.06             | 0.037                  | 0.055                  |
|          | LTE Band 4  | 20M      | QPSK       | 1RB     | 0offset   | Edge 2        | 0mm      | OFF             | 20300 | 1745        | 22.50               | 24.00               | 1.413                  | 0.07             | 0.101                  | 0.143                  |
|          | LTE Band 4  | 20M      | QPSK       | 50RB    | 0offset   | Edge 2        | 0mm      | OFF             | 20300 | 1745        | 21.31               | 23.00               | 1.476                  | 0.03             | 0.080                  | 0.118                  |
|          | LTE Band 25 | 20M      | QPSK       | 1RB     | 0offset   | Bottom Face   | 0mm      | OFF             | 26590 | 1905        | 22.74               | 24.00               | 1.337                  | 0.01             | 0.748                  | 1.000                  |
|          | LTE Band 25 | 20M      | QPSK       | 1RB     | 0offset   | Bottom Face   | 0mm      | OFF             | 26140 | 1860        | 22.56               | 24.00               | 1.393                  | -0.04            | 0.784                  | 1.092                  |
| 13       | LTE Band 25 | 20M      | QPSK       | 1RB     | 0offset   | Bottom Face   | 0mm      | OFF             | 26340 | 1880        | 22.49               | 24.00               | 1.416                  | 0                | 0.792                  | 1.121                  |
|          | LTE Band 25 | 20M      | QPSK       | 50RB    | 0offset   | Bottom Face   | 0mm      | OFF             | 26590 | 1905        | 21.48               | 23.00               | 1.419                  | -0.14            | 0.551                  | 0.782                  |
|          | LTE Band 25 | 20M      | QPSK       | 100RB   | 0offset   | Bottom Face   | 0mm      | OFF             | 26590 | 1905        | 21.52               | 23.00               | 1.406                  | -0.02            | 0.558                  | 0.785                  |
|          | LTE Band 25 | 20M      | QPSK       | 1RB     | 0offset   | Edge 1        | 0mm      | OFF             | 26590 | 1905        | 22.74               | 24.00               | 1.337                  | 0.04             | 0.062                  | 0.083                  |
|          | LTE Band 25 | 20M      | QPSK       | 50RB    | 0offset   | Edge 1        | 0mm      | OFF             | 26590 | 1905        | 21.48               | 23.00               | 1.419                  | 0                | 0.045                  | 0.064                  |
|          | LTE Band 25 | 20M      | QPSK       | 1RB     | 0offset   | Edge 2        | 0mm      | OFF             | 26590 | 1905        | 22.74               | 24.00               | 1.337                  | 0.01             | 0.145                  | 0.194                  |
|          | LTE Band 25 | 20M      | QPSK       | 50RB    | 0offset   | Edge 2        | 0mm      | OFF             | 26590 | 1905        | 21.48               | 23.00               | 1.419                  | 0.03             | 0.116                  | 0.165                  |

## 14.2 Repeated SAR Measurement

| No. | Band         | Mode           | Test Position | Gap (mm) | Power Reduction | 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 153.6Kbps | Bottom Face   | 0mm      | ON              | 384 | 836.52      | 21.54               | 22.00               | 1.112                  | -0.01            | 1.060                  | -     | 1.178                  |
| 2nd | CDMA2000 BC0 | RTAP 153.6Kbps | Bottom Face   | 0mm      | ON              | 384 | 836.52      | 21.54               | 22.00               | 1.112                  | 0.05             | 1.040                  | 1.02  | 1.156                  |

### General Note:

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

## 15. Simultaneous Transmission Analysis

| NO. | Simultaneous Transmission Configurations | Tablet |
|-----|------------------------------------------|--------|
|     |                                          | Body   |
| 1.  | GPRS/EDGE(Data) + WLAN2.4GHz(data)       | Yes    |
| 2.  | WCDMA(Data) + WLAN2.4GHz(data)           | Yes    |
| 3.  | CDMA(Data) + WLAN2.4GHz(data)            | Yes    |
| 4.  | LTE(Data) + WLAN2.4GHz(data)             | Yes    |
| 5.  | GPRS/EDGE(Data) + Bluetooth(data)        | Yes    |
| 6.  | WCDMA(Data) + Bluetooth(data)            | Yes    |
| 7.  | CDMA(Data) + Bluetooth(data)             | Yes    |
| 8.  | LTE(Data) + Bluetooth(data)              | Yes    |
| 9.  | GPRS/EDGE(data) + WLAN5GHz(data)         | Yes    |
| 10. | WCDMA(data) + WLAN5GHz(data)             | Yes    |
| 11. | CDMA(data) + WLAN5 GHz(data)             | Yes    |
| 12. | LTE(data) + WLAN5GHz(data)               | Yes    |

### General Note:

- The WLAN/BT module, Brand Name: Intel, Model Name: 7265NGW, FCC ID: QYL7265NG is also integrated into this host and the WLAN SAR testing results are also used perform transmission simultaneous analysis which can be referred to Sporton SAR Test Report, Report No: FA570164-02.
- For simultaneous transmission analysis for exposure position of bottom face 10mm, WLAN SAR tested at 0mm separation is worse and the test data is used for conservative SAR summation.
- For co-location analysis:
  - For WWAN SAR testing was performed on bottom face, Edge1 and Edge2, according to KDB 447498 D01v05r02 exclusion thresholds which can be referred to page44.
  - The WLAN SAR testing was performed on bottom face and Edge1, according to KDB 447498 D01v05r02 exclusion thresholds which can be referred to Sporton FCC SAR Report, FCC ID: QYL7265NG, Report No: FA5710164-02 page30.
  - For co-location analysis was performed at the same exposure positions, which are bottom face and Edge1, where both WWAN standalone SAR and WLAN standalone SAR was assessed.
- The Scaled SAR summation is calculated based on the same configuration and test position.
- Per KDB 447498 D01v05r02, simultaneous transmission SAR is compliant if,
  - Scalar SAR summation < 1.6W/kg.
  - $SPLSR = (SAR1 + SAR2)^{1.5} / (\min. \text{ separation distance, mm})$ , and the peak separation distance is determined from the square root of  $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$ , where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
  - If  $SPLSR \leq 0.04$ , simultaneously transmission SAR measurement is not necessary.
  - Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.
  - The SPLSR calculated results please refer to section 15.2.



**15.1 Body Exposure Conditions**

| WWAN Band |               | Exposure Position   | 1                | 2                                | 3                                | 1+2<br>Summed<br>1g SAR<br>(W/kg) | 1+3<br>Summed<br>1g SAR<br>(W/kg) | SPLSR | Case No |
|-----------|---------------|---------------------|------------------|----------------------------------|----------------------------------|-----------------------------------|-----------------------------------|-------|---------|
|           |               |                     | WWAN             | 2.4GHz /<br>5.8GHz<br>WLAN Ant A | 2.4GHz /<br>5.8GHz<br>WLAN Ant B |                                   |                                   |       |         |
|           |               |                     | 1g SAR<br>(W/kg) | 1g SAR<br>(W/kg)                 | 1g SAR<br>(W/kg)                 |                                   |                                   |       |         |
| GSM       | GSM850        | Bottom Face at 10mm | 0.785            | 0.209                            | 0.428                            | 0.99                              | 1.21                              |       |         |
|           |               | Bottom Face at 0mm  | 1.045            | 0.209                            | 0.428                            | 1.25                              | 1.47                              |       |         |
|           |               | Edge 1 at 0mm       | 0.036            |                                  | 0.278                            | 0.04                              | 0.31                              |       |         |
|           |               | Edge 2 at 0mm       | 0.148            |                                  |                                  | 0.15                              | 0.15                              |       |         |
|           | GSM1900       | Bottom Face at 0mm  | 0.978            | 0.209                            | 0.428                            | 1.19                              | 1.41                              |       |         |
|           |               | Edge 1 at 0mm       | 0.079            |                                  | 0.278                            | 0.08                              | 0.36                              |       |         |
|           |               | Edge 2 at 0mm       | 0.167            |                                  |                                  | 0.17                              | 0.17                              |       |         |
| WCDMA     | WCDMA V       | Bottom Face at 10mm | 0.658            | 0.209                            | 0.428                            | 0.87                              | 1.09                              |       |         |
|           |               | Bottom Face at 0mm  | 1.147            | 0.209                            | 0.428                            | 1.36                              | 1.58                              |       |         |
|           |               | Edge 1 at 0mm       | 0.036            |                                  | 0.278                            | 0.04                              | 0.31                              |       |         |
|           |               | Edge 2 at 0mm       | 0.149            |                                  |                                  | 0.15                              | 0.15                              |       |         |
|           | WCDMA IV      | Bottom Face at 0mm  | 0.938            | 0.209                            | 0.428                            | 1.15                              | 1.37                              |       |         |
|           |               | Edge 1 at 0mm       | 0.084            |                                  | 0.278                            | 0.08                              | 0.36                              |       |         |
|           |               | Edge 2 at 0mm       | 0.253            |                                  |                                  | 0.25                              | 0.25                              |       |         |
|           | WCDMA II      | Bottom Face at 0mm  | 1.100            | 0.209                            | 0.428                            | 1.31                              | 1.53                              |       |         |
|           |               | Edge 1 at 0mm       | 0.088            |                                  | 0.278                            | 0.09                              | 0.37                              |       |         |
|           |               | Edge 2 at 0mm       | 0.219            |                                  |                                  | 0.22                              | 0.22                              |       |         |
| CDMA      | CDMA2000 BC10 | Bottom Face at 10mm | 0.669            | 0.209                            | 0.428                            | 0.88                              | 1.10                              |       |         |
|           |               | Bottom Face at 0mm  | 1.185            | 0.209                            | 0.428                            | 1.39                              | 1.61                              | 0.02  | Case 1  |
|           |               | Edge 1 at 0mm       | 0.054            |                                  | 0.278                            | 0.05                              | 0.33                              |       |         |
|           |               | Edge 2 at 0mm       | 0.206            |                                  |                                  | 0.21                              | 0.21                              |       |         |
|           | CDMA2000 BC0  | Bottom Face at 10mm | 0.600            | 0.209                            | 0.428                            | 0.81                              | 1.03                              |       |         |
|           |               | Bottom Face at 0mm  | 1.189            | 0.209                            | 0.428                            | 1.40                              | 1.62                              | 0.02  | Case 2  |
|           |               | Edge 1 at 0mm       | 0.048            |                                  | 0.278                            | 0.05                              | 0.33                              |       |         |
|           |               | Edge 2 at 0mm       | 0.134            |                                  |                                  | 0.13                              | 0.13                              |       |         |
|           | CDMA2000 BC1  | Bottom Face at 10mm | 0.376            | 0.209                            | 0.428                            | 0.59                              | 0.80                              |       |         |
|           |               | Bottom Face at 0mm  | 1.004            | 0.209                            | 0.428                            | 1.21                              | 1.43                              |       |         |
|           |               | Edge 1 at 0mm       | 0.116            |                                  | 0.278                            | 0.12                              | 0.39                              |       |         |
|           |               | Edge 2 at 0mm       | 0.260            |                                  |                                  | 0.26                              | 0.26                              |       |         |
| LTE       | LTE Band 17   | Bottom Face at 0mm  | 0.776            | 0.209                            | 0.428                            | 0.99                              | 1.20                              |       |         |
|           |               | Edge 1 at 0mm       | 0.023            |                                  | 0.278                            | 0.02                              | 0.30                              |       |         |
|           |               | Edge 2 at 0mm       | 0.093            |                                  |                                  | 0.09                              | 0.09                              |       |         |
|           | LTE Band 13   | Bottom Face at 10mm | 0.589            | 0.209                            | 0.428                            | 0.80                              | 1.02                              |       |         |
|           |               | Bottom Face at 0mm  | 1.001            | 0.209                            | 0.428                            | 1.21                              | 1.43                              |       |         |
|           |               | Edge 1 at 0mm       | 0.048            |                                  | 0.278                            | 0.05                              | 0.33                              |       |         |
|           |               | Edge 2 at 0mm       | 0.155            |                                  |                                  | 0.16                              | 0.16                              |       |         |
|           | LTE Band 5    | Bottom Face at 10mm | 0.669            | 0.209                            | 0.428                            | 0.88                              | 1.10                              |       |         |
|           |               | Bottom Face at 0mm  | 1.174            | 0.209                            | 0.428                            | 1.38                              | 1.60                              | 0.02  | Case 3  |
|           |               | Edge 1 at 0mm       | 0.033            |                                  | 0.278                            | 0.03                              | 0.31                              |       |         |
|           |               | Edge 2 at 0mm       | 0.164            |                                  |                                  | 0.16                              | 0.16                              |       |         |
|           | LTE Band 4    | Bottom Face at 0mm  | 0.856            | 0.209                            | 0.428                            | 1.07                              | 1.28                              |       |         |
|           |               | Edge 1 at 0mm       | 0.065            |                                  | 0.278                            | 0.07                              | 0.34                              |       |         |
|           |               | Edge 2 at 0mm       | 0.143            |                                  |                                  | 0.14                              | 0.14                              |       |         |
|           | LTE Band 25   | Bottom Face at 0mm  | 1.121            | 0.209                            | 0.428                            | 1.33                              | 1.55                              |       |         |
|           |               | Edge 1 at 0mm       | 0.083            |                                  | 0.278                            | 0.08                              | 0.36                              |       |         |
|           |               | Edge 2 at 0mm       | 0.194            |                                  |                                  | 0.19                              | 0.19                              |       |         |



| WWAN Band |               | Exposure Position   | 1                        | 4                                              | 1+4<br>Summed<br>1g SAR (W/kg) | SPLSR | Case No |
|-----------|---------------|---------------------|--------------------------|------------------------------------------------|--------------------------------|-------|---------|
|           |               |                     | WWAN<br>1g SAR<br>(W/kg) | 2.4GHz Bluetooth<br>Estimated<br>1g SAR (W/kg) |                                |       |         |
| GSM       | GSM850        | Bottom Face at 10mm | 0.785                    | 0.126                                          | <b>0.91</b>                    |       |         |
|           |               | Bottom Face at 0mm  | 1.045                    | 0.126                                          | <b>1.17</b>                    |       |         |
|           |               | Edge 1 at 0mm       | 0.036                    | 0.126                                          | <b>0.16</b>                    |       |         |
|           |               | Edge 2 at 0mm       | 0.148                    | 0.126                                          | <b>0.27</b>                    |       |         |
|           | GSM1900       | Bottom Face at 0mm  | 0.978                    | 0.126                                          | <b>1.10</b>                    |       |         |
|           |               | Edge 1 at 0mm       | 0.079                    | 0.126                                          | <b>0.21</b>                    |       |         |
|           |               | Edge 2 at 0mm       | 0.167                    | 0.126                                          | <b>0.29</b>                    |       |         |
| WCDMA     | WCDMA V       | Bottom Face at 10mm | 0.658                    | 0.126                                          | <b>0.78</b>                    |       |         |
|           |               | Bottom Face at 0mm  | 1.147                    | 0.126                                          | <b>1.27</b>                    |       |         |
|           |               | Edge 1 at 0mm       | 0.036                    | 0.126                                          | <b>0.16</b>                    |       |         |
|           |               | Edge 2 at 0mm       | 0.149                    | 0.126                                          | <b>0.28</b>                    |       |         |
|           | WCDMA IV      | Bottom Face at 0mm  | 0.938                    | 0.126                                          | <b>1.06</b>                    |       |         |
|           |               | Edge 1 at 0mm       | 0.084                    | 0.126                                          | <b>0.21</b>                    |       |         |
|           |               | Edge 2 at 0mm       | 0.253                    | 0.126                                          | <b>0.38</b>                    |       |         |
|           | WCDMA II      | Bottom Face at 0mm  | 1.100                    | 0.126                                          | <b>1.23</b>                    |       |         |
|           |               | Edge 1 at 0mm       | 0.088                    | 0.126                                          | <b>0.21</b>                    |       |         |
|           |               | Edge 2 at 0mm       | 0.219                    | 0.126                                          | <b>0.35</b>                    |       |         |
| CDMA      | CDMA2000 BC10 | Bottom Face at 10mm | 0.669                    | 0.126                                          | <b>0.80</b>                    |       |         |
|           |               | Bottom Face at 0mm  | 1.185                    | 0.126                                          | <b>1.31</b>                    |       |         |
|           |               | Edge 1 at 0mm       | 0.054                    | 0.126                                          | <b>0.18</b>                    |       |         |
|           |               | Edge 2 at 0mm       | 0.206                    | 0.126                                          | <b>0.33</b>                    |       |         |
|           | CDMA2000 BC0  | Bottom Face at 10mm | 0.600                    | 0.126                                          | <b>0.73</b>                    |       |         |
|           |               | Bottom Face at 0mm  | 1.189                    | 0.126                                          | <b>1.32</b>                    |       |         |
|           |               | Edge 1 at 0mm       | 0.048                    | 0.126                                          | <b>0.17</b>                    |       |         |
|           |               | Edge 2 at 0mm       | 0.134                    | 0.126                                          | <b>0.26</b>                    |       |         |
|           | CDMA2000 BC1  | Bottom Face at 10mm | 0.376                    | 0.126                                          | <b>0.50</b>                    |       |         |
|           |               | Bottom Face at 0mm  | 1.004                    | 0.126                                          | <b>1.13</b>                    |       |         |
|           |               | Edge 1 at 0mm       | 0.116                    | 0.126                                          | <b>0.24</b>                    |       |         |
|           |               | Edge 2 at 0mm       | 0.260                    | 0.126                                          | <b>0.39</b>                    |       |         |
| LTE       | LTE Band 17   | Bottom Face at 0mm  | 0.776                    | 0.126                                          | <b>0.90</b>                    |       |         |
|           |               | Edge 1 at 0mm       | 0.023                    | 0.126                                          | <b>0.15</b>                    |       |         |
|           |               | Edge 2 at 0mm       | 0.093                    | 0.126                                          | <b>0.22</b>                    |       |         |
|           | LTE Band 13   | Bottom Face at 10mm | 0.589                    | 0.126                                          | <b>0.72</b>                    |       |         |
|           |               | Bottom Face at 0mm  | 1.001                    | 0.126                                          | <b>1.13</b>                    |       |         |
|           |               | Edge 1 at 0mm       | 0.048                    | 0.126                                          | <b>0.17</b>                    |       |         |
|           |               | Edge 2 at 0mm       | 0.155                    | 0.126                                          | <b>0.28</b>                    |       |         |
|           | LTE Band 5    | Bottom Face at 10mm | 0.669                    | 0.126                                          | <b>0.80</b>                    |       |         |
|           |               | Bottom Face at 0mm  | 1.174                    | 0.126                                          | <b>1.30</b>                    |       |         |
|           |               | Edge 1 at 0mm       | 0.033                    | 0.126                                          | <b>0.16</b>                    |       |         |
|           |               | Edge 2 at 0mm       | 0.164                    | 0.126                                          | <b>0.29</b>                    |       |         |
|           | LTE Band 4    | Bottom Face at 0mm  | 0.856                    | 0.126                                          | <b>0.98</b>                    |       |         |
|           |               | Edge 1 at 0mm       | 0.065                    | 0.126                                          | <b>0.19</b>                    |       |         |
|           |               | Edge 2 at 0mm       | 0.143                    | 0.126                                          | <b>0.27</b>                    |       |         |
|           | LTE Band 25   | Bottom Face at 0mm  | 1.121                    | 0.126                                          | <b>1.25</b>                    |       |         |
|           |               | Edge 1 at 0mm       | 0.083                    | 0.126                                          | <b>0.21</b>                    |       |         |
|           |               | Edge 2 at 0mm       | 0.194                    | 0.126                                          | <b>0.32</b>                    |       |         |



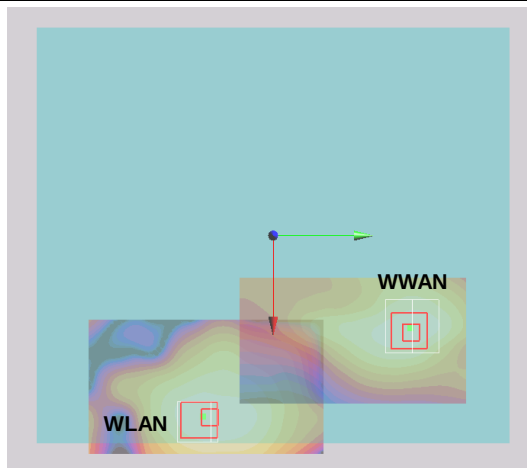
| WWAN Band |               | Exposure Position   | 1                | 5                                            | 6                                            | 1+5<br>Summed<br>1g SAR<br>(W/kg) | 1+6<br>Summed<br>1g SAR<br>(W/kg) | SPLSR | Case No |
|-----------|---------------|---------------------|------------------|----------------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|-------|---------|
|           |               |                     | WWAN             | 5.2GHz /<br>5.3GHz /<br>5.5GHz<br>WLAN Ant A | 5.2GHz /<br>5.3GHz /<br>5.5GHz<br>WLAN Ant B |                                   |                                   |       |         |
|           |               |                     | 1g SAR<br>(W/kg) | 1g SAR<br>(W/kg)                             | 1g SAR<br>(W/kg)                             |                                   |                                   |       |         |
| GSM       | GSM850        | Bottom Face at 10mm | 0.785            | 0.210                                        | 0.544                                        | 1.00                              | 1.33                              |       |         |
|           |               | Bottom Face at 0mm  | 1.045            | 0.210                                        | 0.544                                        | 1.26                              | 1.59                              |       |         |
|           |               | Edge 1 at 0mm       | 0.036            |                                              | 0.213                                        | 0.04                              | 0.25                              |       |         |
|           |               | Edge 2 at 0mm       | 0.148            |                                              |                                              | 0.15                              | 0.15                              |       |         |
|           | GSM1900       | Bottom Face at 0mm  | 0.978            | 0.210                                        | 0.544                                        | 1.19                              | 1.52                              |       |         |
|           |               | Edge 1 at 0mm       | 0.079            |                                              | 0.213                                        | 0.08                              | 0.29                              |       |         |
|           |               | Edge 2 at 0mm       | 0.167            |                                              |                                              | 0.17                              | 0.17                              |       |         |
| WCDMA     | WCDMA V       | Bottom Face at 10mm | 0.658            | 0.210                                        | 0.544                                        | 0.87                              | 1.20                              |       |         |
|           |               | Bottom Face at 0mm  | 1.147            | 0.210                                        | 0.544                                        | 1.36                              | 1.69                              | 0.02  | Case 4  |
|           |               | Edge 1 at 0mm       | 0.036            |                                              | 0.213                                        | 0.04                              | 0.25                              |       |         |
|           |               | Edge 2 at 0mm       | 0.149            |                                              |                                              | 0.15                              | 0.15                              |       |         |
|           | WCDMA IV      | Bottom Face at 0mm  | 0.938            | 0.210                                        | 0.544                                        | 1.15                              | 1.48                              |       |         |
|           |               | Edge 1 at 0mm       | 0.084            |                                              | 0.213                                        | 0.08                              | 0.30                              |       |         |
|           |               | Edge 2 at 0mm       | 0.253            |                                              |                                              | 0.25                              | 0.25                              |       |         |
|           | WCDMA II      | Bottom Face at 0mm  | 1.100            | 0.210                                        | 0.544                                        | 1.31                              | 1.64                              | 0.02  | Case 5  |
|           |               | Edge 1 at 0mm       | 0.088            |                                              | 0.213                                        | 0.09                              | 0.30                              |       |         |
|           |               | Edge 2 at 0mm       | 0.219            |                                              |                                              | 0.22                              | 0.22                              |       |         |
| CDMA      | CDMA2000 BC10 | Bottom Face at 10mm | 0.669            | 0.210                                        | 0.544                                        | 0.88                              | 1.21                              |       |         |
|           |               | Bottom Face at 0mm  | 1.185            | 0.210                                        | 0.544                                        | 1.40                              | 1.73                              | 0.02  | Case 6  |
|           |               | Edge 1 at 0mm       | 0.054            |                                              | 0.213                                        | 0.05                              | 0.27                              |       |         |
|           |               | Edge 2 at 0mm       | 0.206            |                                              |                                              | 0.21                              | 0.21                              |       |         |
|           | CDMA2000 BC0  | Bottom Face at 10mm | 0.600            | 0.210                                        | 0.544                                        | 0.81                              | 1.14                              |       |         |
|           |               | Bottom Face at 0mm  | 1.189            | 0.210                                        | 0.544                                        | 1.40                              | 1.73                              | 0.02  | Case 7  |
|           |               | Edge 1 at 0mm       | 0.048            |                                              | 0.213                                        | 0.05                              | 0.26                              |       |         |
|           |               | Edge 2 at 0mm       | 0.134            |                                              |                                              | 0.13                              | 0.13                              |       |         |
|           | CDMA2000 BC1  | Bottom Face at 10mm | 0.376            | 0.210                                        | 0.544                                        | 0.59                              | 0.92                              |       |         |
|           |               | Bottom Face at 0mm  | 1.004            | 0.210                                        | 0.544                                        | 1.21                              | 1.55                              |       |         |
|           |               | Edge 1 at 0mm       | 0.116            |                                              | 0.213                                        | 0.12                              | 0.33                              |       |         |
|           |               | Edge 2 at 0mm       | 0.260            |                                              |                                              | 0.26                              | 0.26                              |       |         |
| LTE       | LTE Band 17   | Bottom Face at 0mm  | 0.776            | 0.210                                        | 0.544                                        | 0.99                              | 1.32                              |       |         |
|           |               | Edge 1 at 0mm       | 0.023            |                                              | 0.213                                        | 0.02                              | 0.24                              |       |         |
|           |               | Edge 2 at 0mm       | 0.093            |                                              |                                              | 0.09                              | 0.09                              |       |         |
|           | LTE Band 13   | Bottom Face at 10mm | 0.589            | 0.210                                        | 0.544                                        | 0.80                              | 1.13                              |       |         |
|           |               | Bottom Face at 0mm  | 1.001            | 0.210                                        | 0.544                                        | 1.21                              | 1.55                              |       |         |
|           |               | Edge 1 at 0mm       | 0.048            |                                              | 0.213                                        | 0.05                              | 0.26                              |       |         |
|           |               | Edge 2 at 0mm       | 0.155            |                                              |                                              | 0.16                              | 0.16                              |       |         |
|           | LTE Band 5    | Bottom Face at 10mm | 0.669            | 0.210                                        | 0.544                                        | 0.88                              | 1.21                              |       |         |
|           |               | Bottom Face at 0mm  | 1.174            | 0.210                                        | 0.544                                        | 1.38                              | 1.72                              | 0.02  | Case 8  |
|           |               | Edge 1 at 0mm       | 0.033            |                                              | 0.213                                        | 0.03                              | 0.25                              |       |         |
|           |               | Edge 2 at 0mm       | 0.164            |                                              |                                              | 0.16                              | 0.16                              |       |         |
|           | LTE Band 4    | Bottom Face at 0mm  | 0.856            | 0.210                                        | 0.544                                        | 1.07                              | 1.40                              |       |         |
|           |               | Edge 1 at 0mm       | 0.065            |                                              | 0.213                                        | 0.07                              | 0.28                              |       |         |
|           |               | Edge 2 at 0mm       | 0.143            |                                              |                                              | 0.14                              | 0.14                              |       |         |
|           | LTE Band 25   | Bottom Face at 0mm  | 1.121            | 0.210                                        | 0.544                                        | 1.33                              | 1.67                              | 0.02  | Case 9  |
|           |               | Edge 1 at 0mm       | 0.083            |                                              | 0.213                                        | 0.08                              | 0.30                              |       |         |
|           |               | Edge 2 at 0mm       | 0.194            |                                              |                                              | 0.19                              | 0.19                              |       |         |

## 15.2 SPLSR Evaluation and Analysis

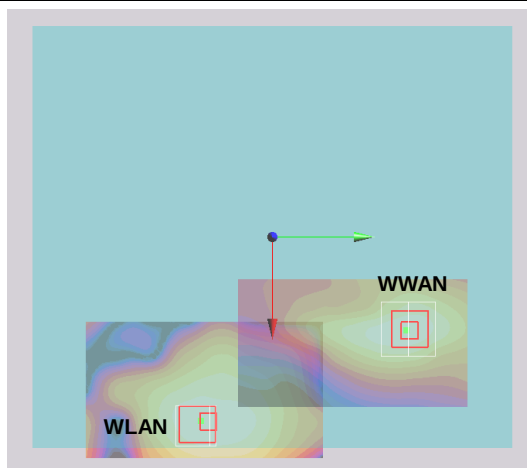
**General Note:**

1.  $SPLSR = (SAR_1 + SAR_2)^{1.5} / (\text{min. separation distance, mm})$ . If  $SPLSR \leq 0.04$ , simultaneously transmission SAR measurement is not necessary

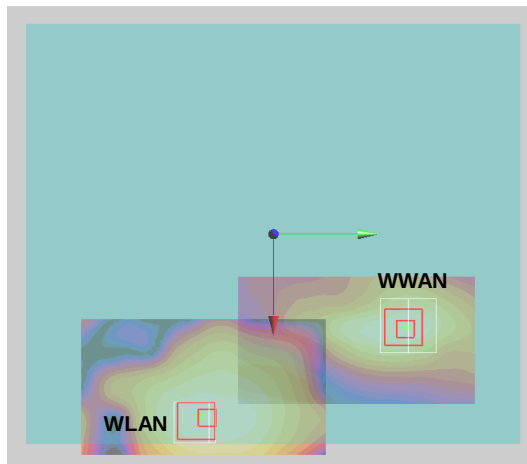
| Case 1 | Band      | Position    | SAR (W/kg) | Gap (cm) | SAR peak location (m) |        |        | 3D distance (mm) | Summed SAR (W/kg) | SPLSR Results | Simultaneous SAR |
|--------|-----------|-------------|------------|----------|-----------------------|--------|--------|------------------|-------------------|---------------|------------------|
|        | CDMA BC10 | Bottom Face | 1.185      | 0        | X                     | Y      | Z      | 131.2            | 1.61              | 0.02          | Not required     |
|        | WLAN      |             | 0.428      | 0        | 0.107                 | -0.037 | -0.185 |                  |                   |               |                  |



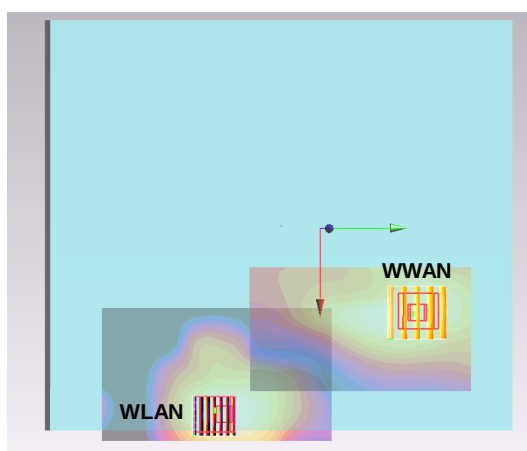
| Case 2 | Band     | Position    | SAR (W/kg) | Gap (cm) | SAR peak location (m) |        |        | 3D distance (mm) | Summed SAR (W/kg) | SPLSR Results | Simultaneous SAR |
|--------|----------|-------------|------------|----------|-----------------------|--------|--------|------------------|-------------------|---------------|------------------|
|        | CDMA BC0 | Bottom Face | 1.189      | 0        | X                     | Y      | Z      | 128.5            | 1.62              | 0.02          | Not required     |
|        | WLAN     |             | 0.428      | 0        | 0.107                 | -0.037 | -0.185 |                  |                   |               |                  |



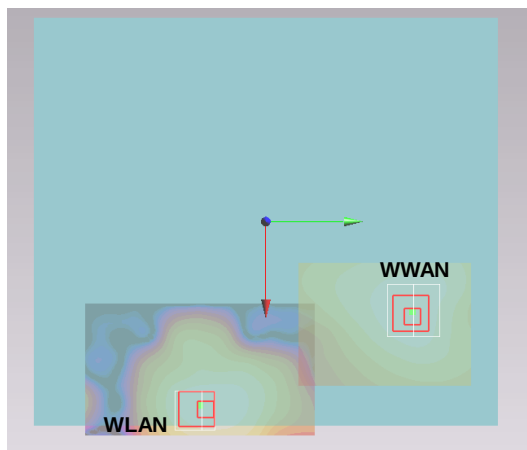
| Case 3 | Band       | Position    | SAR (W/kg) | Gap (cm) | SAR peak location (m) |        |        | 3D distance (mm) | Summed SAR (W/kg) | SPLSR Results | Simultaneous SAR |
|--------|------------|-------------|------------|----------|-----------------------|--------|--------|------------------|-------------------|---------------|------------------|
|        |            |             |            |          | X                     | Y      | Z      |                  |                   |               |                  |
|        | LTE Band 5 | Bottom Face | 1.174      | 0        | 0.054                 | 0.0815 | -0.182 | 129.8            | 1.60              | 0.02          | Not required     |
|        | WLAN       |             | 0.428      | 0        | 0.107                 | -0.037 | -0.185 |                  |                   |               |                  |



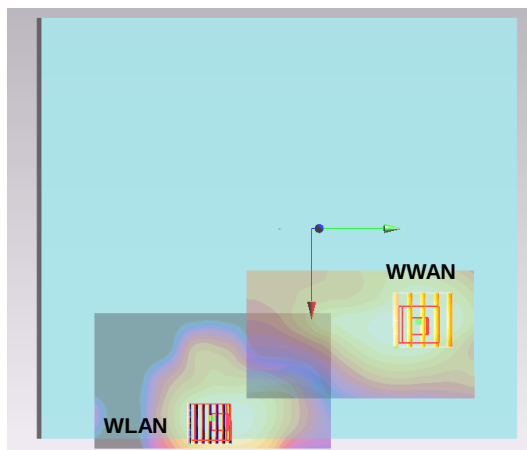
| Case 4 | Band    | Position    | SAR (W/kg) | Gap (cm) | SAR peak location (m) |        |        | 3D distance (mm) | Summed SAR (W/kg) | SPLSR Results | Simultaneous SAR |
|--------|---------|-------------|------------|----------|-----------------------|--------|--------|------------------|-------------------|---------------|------------------|
|        |         |             |            |          | X                     | Y      | Z      |                  |                   |               |                  |
|        | WCDMA V | Bottom Face | 1.147      | 0        | 0.0525                | 0.08   | -0.182 | 134.4            | 1.69              | 0.02          | Not required     |
|        | WLAN    |             | 0.544      | 0        | 0.115                 | -0.039 | -0.185 |                  |                   |               |                  |



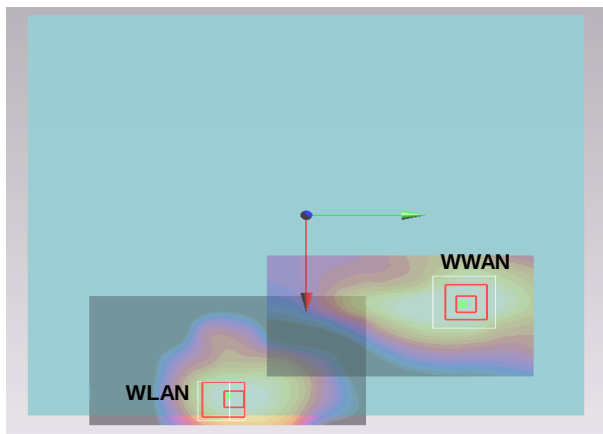
| Case 5 | Band     | Position    | SAR (W/kg) | Gap (cm) | SAR peak location (m) |        |        | 3D distance (mm) | Summed SAR (W/kg) | SPLSR Results | Simultaneous SAR |
|--------|----------|-------------|------------|----------|-----------------------|--------|--------|------------------|-------------------|---------------|------------------|
|        | WCDMA II | Bottom Face | 1.1        | 0        | X                     | Y      | Z      | 139.5            | 1.64              | 0.02          | Not required     |
|        | WLAN     |             | 0.544      | 0        | 0.115                 | -0.039 | -0.185 |                  |                   |               |                  |



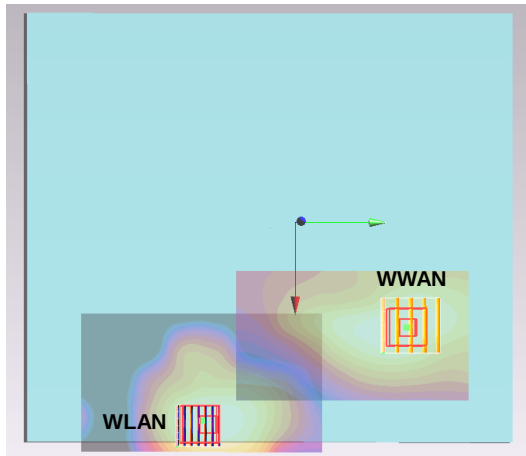
| Case 6 | Band      | Position    | SAR (W/kg) | Gap (cm) | SAR peak location (m) |        |        | 3D distance (mm) | Summed SAR (W/kg) | SPLSR Results | Simultaneous SAR |
|--------|-----------|-------------|------------|----------|-----------------------|--------|--------|------------------|-------------------|---------------|------------------|
|        | CDMA BC10 | Bottom Face | 1.185      | 0        | X                     | Y      | Z      | 136.5            | 1.73              | 0.02          | Not required     |
|        | WLAN      |             | 0.544      | 0        | 0.115                 | -0.039 | -0.185 |                  |                   |               |                  |



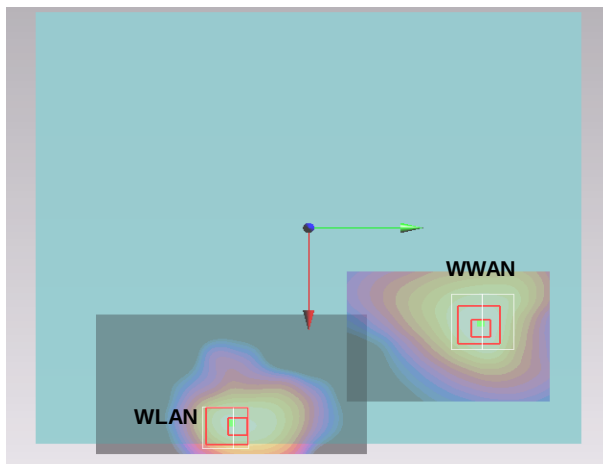
| Case 7 | Band     | Position    | SAR (W/kg) | Gap (cm) | SAR peak location (m) |        |        | 3D distance (mm) | Summed SAR (W/kg) | SPLSR Results | Simultaneous SAR |
|--------|----------|-------------|------------|----------|-----------------------|--------|--------|------------------|-------------------|---------------|------------------|
|        | CDMA BC0 | Bottom Face | 1.189      | 0        | X                     | Y      | Z      | 133.8            | 1.73              | 0.02          | Not required     |
|        | WLAN     |             | 0.544      | 0        | 0.115                 | -0.039 | -0.185 |                  |                   |               |                  |



| Case 8 | Band       | Position    | SAR (W/kg) | Gap (cm) | SAR peak location (m) |        |        | 3D distance (mm) | Summed SAR (W/kg) | SPLSR Results | Simultaneous SAR |
|--------|------------|-------------|------------|----------|-----------------------|--------|--------|------------------|-------------------|---------------|------------------|
|        | LTE Band 5 | Bottom Face | 1.174      | 0        | X                     | Y      | Z      | 132.4            | 1.72              | 0.02          | Not required     |
|        | WLAN       |             | 0.544      | 0        | 0.115                 | -0.039 | -0.185 |                  |                   |               |                  |



| Case 9 | Band        | Position    | SAR (W/kg) | Gap (cm) | SAR peak location (m) |        |        | 3D distance (mm) | Summed SAR (W/kg) | SPLSR Results | Simultaneous SAR |
|--------|-------------|-------------|------------|----------|-----------------------|--------|--------|------------------|-------------------|---------------|------------------|
|        |             |             |            |          | X                     | Y      | Z      |                  |                   |               |                  |
|        | LTE Band 25 | Bottom Face | 1.121      | 0        | 0.062                 | 0.09   | -0.18  | 139.6            | 1.67              | 0.02          | Not required     |
|        | WLAN        |             | 0.544      | 0        | 0.115                 | -0.039 | -0.185 |                  |                   |               |                  |



**Test Engineer :** Frank Wu, Vic Yang, Galen Zhang and Angelo Chang

## **16. Uncertainty Assessment**

The component of uncertainty may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainty by the statistical analysis of a series of observations is termed a Type A 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.

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

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

(b)  $k$  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) |
|--------------------------------------|------------------------|--------------------------|---------|---------|----------|---------------------------|----------------------------|
| <b>Measurement System</b>            |                        |                          |         |         |          |                           |                            |
| Probe Calibration                    | 6.0                    | Normal                   | 1       | 1       | 1        | ± 6.0 %                   | ± 6.0 %                    |
| 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                     | 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 %                    |
| <b>Test Sample Related</b>           |                        |                          |         |         |          |                           |                            |
| 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 %                    |
| <b>Phantom and Setup</b>             |                        |                          |         |         |          |                           |                            |
| 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                    | Normal                   | 1       | 0.64    | 0.43     | ± 1.6 %                   | ± 1.1 %                    |
| Liquid Permittivity (Target)         | 5.0                    | Rectangular              | √3      | 0.6     | 0.49     | ± 1.7 %                   | ± 1.4 %                    |
| Liquid Permittivity (Meas.)          | 2.5                    | Normal                   | 1       | 0.6     | 0.49     | ± 1.5 %                   | ± 1.2 %                    |
| <b>Combined Standard Uncertainty</b> |                        |                          |         |         |          | ± 11.0 %                  | ± 10.8 %                   |
| <b>Coverage Factor for 95 %</b>      |                        |                          |         |         |          | K=2                       |                            |
| <b>Expanded Uncertainty</b>          |                        |                          |         |         |          | ± 22.0 %                  | ± 21.5 %                   |

**Table 16.2. Uncertainty Budget for frequency range 300 MHz to 3 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. 1528-2003, “Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, December 2003
- [4] SPEAG DASY System Handbook
- [5] FCC KDB 447498 D01 v05r02, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Feb 2014
- [6] FCC KDB 941225 D01 v03, “3G SAR MEAUREMENT PROCEDURES”, Oct 2014
- [7] FCC KDB 941225 D05 v02r03, “SAR Evaluation Considerations for LTE Devices”, Dec 2013
- [8] FCC KDB 616217 D04 v01r01, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, May 2013
- [9] FCC KDB 865664 D01 v01r03, “SAR Measurement Requirements for 100 MHz to 6 GHz”, Feb 2014.
- [10] 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.



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## ***Appendix B. Plots of SAR Measurement***

The plots are shown as follows.



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## ***Appendix C. DASY Calibration Certificate***

The DASY calibration certificates are shown as follows.