# Test Report

| | | |
|---|---|---|
| Applicant | : | ASUSTeK COMPUTER INC. |
| Applicant Address | : | 1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan |
| Product Type | : | LTE module |
| Trade Name | : | FIBOCOM |
| Model Number | : | L850-GL |
| Applicable Standard | : | 47 CFR Part §2.1093 |
| Received Date | : | Jun. 10, 2021 |
| Test Period | : | Jun. 29 ~ Jul. 04, 2021 |
| Issued Date | : | Aug. 04, 2021 |

**Issued by**

Approved By : Kris Pan

(Kris Pan)

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Taiwan Accreditation Foundation accreditation number: 1330
Test Firm MRA designation number: TW0010

***Note:***

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3. The relevant information is provided by customers in this test report. According to the correctness, appropriateness or completeness of the information provided by the customer, if there is any doubt or error in the information which affects the validity of the test results, the laboratory does not take the responsibility.

# Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| 00 | Jul. 12, 2021 | Initial Issue | Nicole Chu |
| 01 | Jul. 27, 2021 | Revised 3 chapter (P.05)<br>Revised 11.3 chapter (P.62 ~ P.65)<br>Revised 11.4 chapter (P.71~ P.75)<br>Revised 11.6 chapter (P.85)<br>Revised 11.7.1 chapter (P.87~ P.91) | Nicole Chu |
| 02 | Aug. 04, 2021 | Revised 11.3 chapter (P.62 ~ P.65)<br>Revised 11.7.1 chapter (P.91)<br>Revised 11.8.2 chapter (P.95)<br>Revised Appendix B (P.116~ P.118)<br>Revised 11.7.1 chapter (P.91) | Nicole Chu |
| | | | |

# Contents

# 1. General Information

## 1.1 Reference Testing Standards

| Standard | Description | Version |
|---|---|---|
| IEC/IEEE 62209-1528 | Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Part 1528: Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 GHz) | 2020 |
| IEEE 1528 | Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques | 2013 |
| IEEE C95.1 | American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300 KHz to 100 GHz, New York | 1992 |
| 47 CFR Part §2.1093 | Radiofrequency radiation exposure evaluation: portable devices | - |
| KDB 248227 D01 | SAR guidance for IEEE 802.11 (Wi-Fi) transmitters | v02r02 |
| KDB 447498 D01 | RF exposure procedures and equipment authorization policies for mobile and portable devices | v06 |
| KDB 616217 D04 | SAR evaluation considerations for laptop, notebook and tablet computers | v01r02 |
| KDB 865664 D01 | SAR measurement requirement for 100 MHz to 6 GHz | v01r04 |
| KDB 865664 D02 | RF exposure compliance reporting and documentation considerations | v01r02 |
| KDB 941225 D05 | SAR evaluation considerations for LTE devices | v02r05 |
| KDB 941225 D05A | REL. 10 LTE SAR test guidance and KDB inquiries | v01r02 |
| KDB 941225 D06 | SAR evaluation procedures for portable devices with wireless router capabilities | v02r01 |

# 2. Test Site Environment

| Temperature (°C) | 21-23 |
|---|---|

# 3. Description of Device Under Test (DUT)

| | |
|---|---|
| Applicant | ASUSTeK COMPUTER INC.<br>1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan |
| Manufacture | ASUSTeK COMPUTER INC.<br>1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan |
| Product Type | LTE module |
| Trade Name | FIBOCOM |
| Model Number | L850-GL |
| IMEI No. | 862372048347460 |
| FCC ID | MSQL850GL |
| Class II Permissive Change | (1) This is to request a Class II permissive change for FCC ID: MSQL850GL , originally granted on 2020/12/16<br>Modification:<br>-Change #1: Additional chassis added, ASUSTeK, model number: CR1100FK, CR1100CK<br>Models differences: All models are electrically identical, different model names are for marketing purpose and the flip angle of panel, as below.<br>CR1100FK is for 360 degree；CR1100CK is for 180 degree<br><br>-Change #2: This filing also addresses co-location with WLAN, BT module FCC ID : MSQAX201D2.<br><br>-Change #3: Add two antennas which have the same antenna type as original grant, and each antenna gain is lower. |
| Host Information | Product Type: Notebook PC<br>Trade Name: ASUS<br>Model Name: CR1100FK, CR1100CK<br>All models are electrically identical, different model names are for marketing purpose and the flip angle of panel, as below.<br>CR1100FK is for 360 degree；CR1100CK is for 180 degree |

| | Operate Bands | Operate Frequency (GHz) |
|---|---|---|
| Frequency Range | WCDMA Band II | 1852.4 - 1907.6 |
| | WCDMA Band IV | 1712.4 - 1752.6 |
| | WCDMA Band V | 826.4 - 846.6 |
| | LTE Band 2 (BW 1.4, 3, 5, 10, 15, 20 MHz) | 1850.7 - 1909.3 |
| | LTE Band 4 (BW 1.4, 3, 5, 10, 15, 20 MHz) | 1710.7 - 1754.3 |
| | LTE Band 5 (BW 1.4, 3, 5, 10 MHz) | 824.7 - 848.3 |
| | LTE Band 7 (BW 5, 10, 15, 20 MHz) | 2502.5 - 2567.5 |
| | LTE Band 12 (BW 1.4, 3, 5, 10 MHz) | 699.7 - 715.3 |
| | LTE Band 13 (BW 5, 10 MHz) | 779.5 - 784.5 |
| | LTE Band 17 (BW 5, 10 MHz) | 706.5 - 713.15 |
| | LTE Band 26 (BW 1.4, 3, 5, 10, 15 MHz) | 814.7 - 848.3 |
| | LTE Band 30 (BW 5, 10 MHz) | 2307.5 - 2312.5 |
| | LTE Band 38 (BW 5, 10, 15, 20 MHz) | 2572.5 - 2617.5 |
| | LTE Band 41 (BW 5, 10, 15, 20 MHz) | 2498.5 - 2687.5 |
| | LTE Band 66 (BW 1.4, 3, 5, 10, 15, 20 MHz) | 1710.7 - 1779.3 |
| Modulations | WCDMA: RMC 12.2Kbps/HSPA+<br>LTE: QPSK/16QAM | |
| Device Category | Portable Device | |
| Application Type | Certification | |

Note:

1. The above information of DUT was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

**Antenna list：**

| Antenna Source | ANT | Manufacturer | Part No. (Vendor) | Type | Max. Gain (dBi) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Band | NB | PAD |
| 1 | Chain A | SHENZHEN SOUTH STAR TECHNOLOGY CO., LTD | N19-0866-R0A | PIFA Antenna | WCDMA Band II | -1.18 | -3.46 |
| | | | | | WCDMA Band IV | -3.41 | -5.84 |
| | | | | | WCDMA Band V | -1.45 | -2.00 |
| | | | | | LTE Band 2 | -1.18 | -3.46 |
| | | | | | LTE Band 4 | -3.41 | -5.84 |
| | | | | | LTE Band 5 | -1.45 | -2.00 |
| | | | | | LTE Band 7 | 0.67 | -4.14 |
| | | | | | LTE Band 12 | -2.25 | -2.96 |
| | | | | | LTE Band 13 | -1.66 | -3.30 |
| | | | | | LTE Band 17 | -2.25 | -2.96 |
| | | | | | LTE Band 26 | -2.18 | -2.00 |
| | | | | | LTE Band 30 | 0.04 | -0.36 |
| | | | | | LTE Band 38 | -1.85 | -6.62 |
| | | | | | LTE Band 41 | 0.67 | -4.14 |
| | | | | | LTE Band 66 | -3.41 | -5.84 |
| | Chain B | SHENZHEN SOUTH STAR TECHNOLOGY CO., LTD | N19-0866-R0A | PIFA Antenna | WCDMA Band II | -1.13 | 1.40 |
| | | | | | WCDMA Band IV | 0.45 | -1.89 |
| | | | | | WCDMA Band V | -1.93 | -3.09 |
| | | | | | LTE Band 2 | -1.13 | 1.40 |
| | | | | | LTE Band 4 | 0.45 | -1.89 |
| | | | | | LTE Band 5 | -1.93 | -3.09 |
| | | | | | LTE Band 7 | 1.87 | 0.55 |
| | | | | | LTE Band 12 | -2.13 | -3.14 |
| | | | | | LTE Band 13 | -2.33 | -3.11 |
| | | | | | LTE Band 17 | -2.13 | -4.73 |
| | | | | | LTE Band 26 | -1.93 | -2.94 |
| | | | | | LTE Band 30 | -0.58 | -0.54 |
| | | | | | LTE Band 38 | 1.43 | 0.55 |
| | | | | | LTE Band 41 | 1.87 | 0.55 |
| | | | | | LTE Band 66 | 0.77 | -1.01 |

| Antenna Source | ANT | Manufacturer | Part No. (Vendor) | Type | Max. Gain (dBi) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Band | NB | PAD |
| 2 | Chain A | AWAN | AXFMY-300003 | PIFA Antenna | WCDMA Band II | -2.18 | -5.83 |
| | | | | | WCDMA Band IV | -4.41 | -6.36 |
| | | | | | WCDMA Band V | -2.45 | -4.5 |
| | | | | | LTE Band 2 | -2.18 | -5.83 |
| | | | | | LTE Band 4 | -4.41 | -6.36 |
| | | | | | LTE Band 5 | -2.45 | -4.5 |
| | | | | | LTE Band 7 | -0.33 | -6.64 |
| | | | | | LTE Band 12 | -3.25 | -3.39 |
| | | | | | LTE Band 13 | -2.66 | -3.38 |
| | | | | | LTE Band 17 | -3.25 | -3.39 |
| | | | | | LTE Band 26 | -2.45 | -4.5 |
| | | | | | LTE Band 30 | -0.96 | -0.91 |
| | | | | | LTE Band 38 | -2.85 | -7.31 |
| | | | | | LTE Band 41 | -0.33 | -6.64 |
| | | | | | LTE Band 66 | -4.41 | -6.07 |
| | Chain B | AWAN | AXFMY-300003 | PIFA Antenna | WCDMA Band II | -2.13 | -3.37 |
| | | | | | WCDMA Band IV | -0.73 | -2.66 |
| | | | | | WCDMA Band V | -2.93 | -3.42 |
| | | | | | LTE Band 2 | -2.13 | -3.37 |
| | | | | | LTE Band 4 | -0.73 | -2.66 |
| | | | | | LTE Band 5 | -2.93 | -3.42 |
| | | | | | LTE Band 7 | 0.42 | 0.5 |
| | | | | | LTE Band 12 | -3.13 | -4.76 |
| | | | | | LTE Band 13 | -3.33 | -3.21 |
| | | | | | LTE Band 17 | -3.13 | -4.93 |
| | | | | | LTE Band 26 | -2.93 | -3.16 |
| | | | | | LTE Band 30 | -1.58 | -1.88 |
| | | | | | LTE Band 38 | 0.43 | -0.73 |
| | | | | | LTE Band 41 | 0.87 | 0.5 |
| | | | | | LTE Band 66 | -0.73 | -2.45 |

Note :
1. Antenna Source 1 (SHENZHEN SOUTH STAR TECHNOLOGY CO., LTD) gain is higher. Hence, it is regarded as the initial configuration, and then tested and recorded in this report.
2. Antenna Source 1 (SHENZHEN SOUTH STAR TECHNOLOGY CO., LTD) and Antenna Source 2 (AWAN) are the same type of antenna, only different in manufacturer.
3. The Chain A is connected to AUX port / Chain B is connected to Main port of module.

## 4. Summary of Maximum Value

| Equipment Class | Mode | Highest Reported 1g SAR (W/kg) | | | |
|---|---|---|---|---|---|
| | | Tablet/SKU1 | | Notebook/SKU2 | |
| | | Body standalone SAR $_{1g}$(W/kg) | Highest Simultaneous Transmission SAR | Body standalone SAR $_{1g}$(W/kg) | Highest Simultaneous Transmission SAR |
| Licensed | WCDMA Band II | 1.15 | 1.59 | 0.64 | 0.89 |
| | WCDMA Band IV | 0.70 | | 0.59 | |
| | WCDMA Band V | 1.10 | | 0.19 | |
| | LTE Band 2 | 0.88 | | 0.42 | |
| | LTE Band 7 | 1.16 | | 0.30 | |
| | LTE Band 12/17 | 0.83 | | 0.12 | |
| | LTE Band 13 | 1.04 | | 0.18 | |
| | LTE Band 26/5 | 0.99 | | 0.18 | |
| | LTE Band 30 | 0.72 | | 0.10 | |
| | LTE Band 41/38 | 0.89 | | 0.13 | |
| | LTE Band 66/4 | 0.65 | | 0.34 | |
| DTS | WLAN2.4GHz Ant Main | 0.33 | 1.58 | 0.07 | 0.78 |
| | WLAN2.4GHz Ant Aux | 0.72 | | 0.46 | |
| U-NII | WLAN5GHz Ant Main | 0.53 | 1.59 | 0.16 | 0.89 |
| | WLAN5GHz Ant Aux | 1.11 | | 0.74 | |
| DSS | Bluetooth Ant Aux | 0.14 | 1.58 | 0.08 | 0.89 |

Note:

1. The SAR limit (Head & Body: SAR1g 1.6 W/kg) for general population / uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.
2. This device has two kinds of SKU, SKU 1 is 360 convertible laptop computer, SKU 2 is laptop only. All circuit designs, circuit board and other related designs are electrically identical.
3. According to October 2014 TCB workshop SAR guidance for overlapping bands that support roaming using multiple frequency band indicator. This device supports LTE B5/26, B12/17, B4/66 and B38/41 Since the supported frequency span falls complerely wiinin the suppors frequency span, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore,SAR was assessed B12/26/38/66.
4. SAR testing for WCDMA V, LTE 5/12/13/17 and 26 was performed on the maximum power mode.
5. WLAN of the SAR value reference to the FCC ID MSQAX201D2 of the report no. 2107FS11. The Devices evaluated Spot Check, please see as below : 11.10 Spot Check.

# 5. Introduction

## 5.1 SAR Definition

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

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

SAR measurement can be related to the electrical field in the tissue by

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

Where：

$\sigma$ = conductivity of the tissue (S/m)

$\rho$ = mass density of the tissue (kg/m$^3$)

$E$ = RMS electric field strength (V/m)

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

## 5.2 RF Exposure Limits

**Table 1 Safety Limits for Controlled / Uncontrolled Environment Exposure**

| SAR Exposure Limit | | |
|---|---|---|
| | **General Population / Uncontrolled Exposure [1] (W/kg)** | **Occupational / Controlled Exposure [2] (W/kg)** |
| **Spatial Peak SAR [3] (head or Body)** | 1.60 | 8.00 |
| **Spatial Peak SAR [4] (Whole Body)** | 0.08 | 0.40 |
| **Spatial Peak SAR [5] (Hands / Feet / Ankle / Wrist )** | 4.00 | 20.00 |

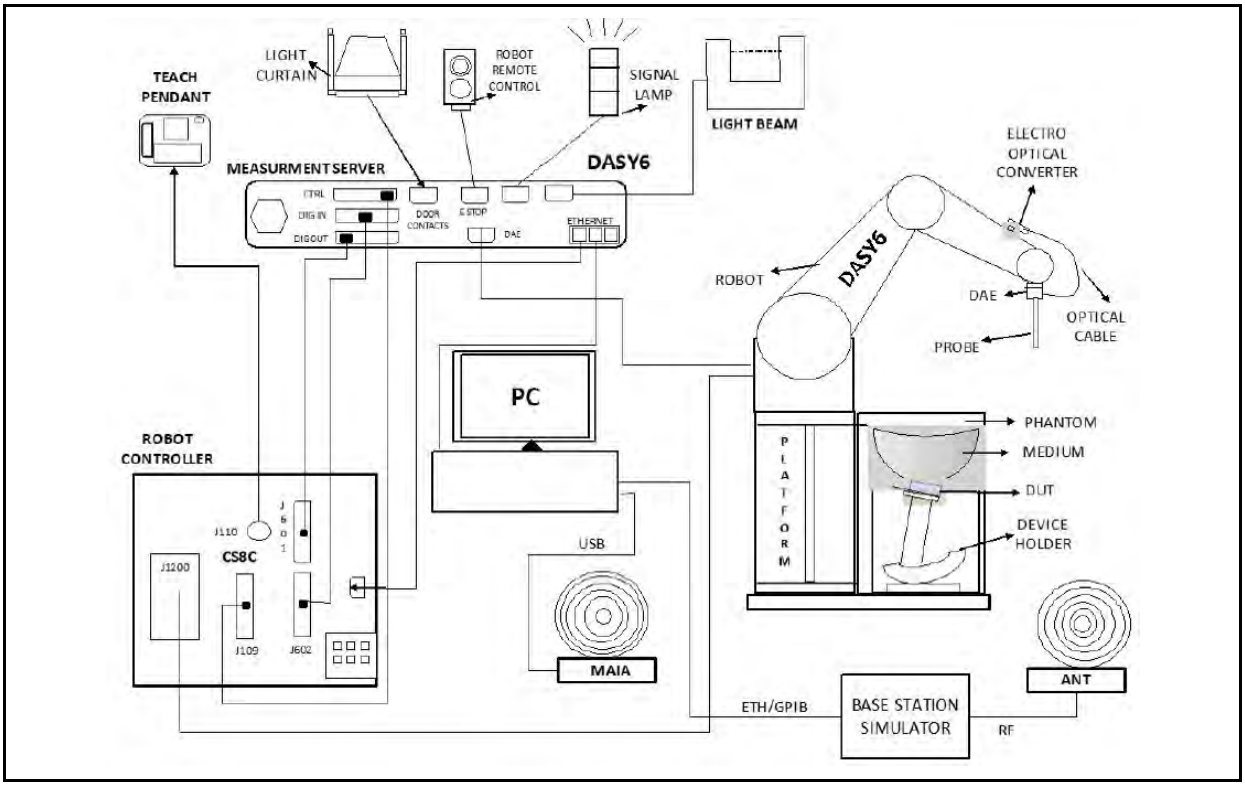
**Notes：**

1. **General Population / Uncontrolled Environments** are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.
2. **Occupational / 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).
3. The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
4. The Spatial Average value of the SAR averaged over the whole body.
5. The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

# 6. System Describtion

## 6.1 SAR Measurement System

The DASY6 system in cDASY6/DASY5 V5.2 SAR Configuration is shown below:




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

1. A standard high precision 6-axis robot (Stäubli TX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. An isotropic field probe optimized and calibrated for the targeted measurements.
3. 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.
4. 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.
5. 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.
6. The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
7. A computer running Win7/Win8/Win10 professional operating system and the cDASY6 and DASY5 V5.2 software.
8. Remote controls with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
9. The phantom, the device holder and other accessories according to the targeted measurement.
10. Tissue simulating liquid mixed according to the given recipes.
11. The validation dipole has been calibrated within and the system performance check has been successful.

**<DASY E-Field Probe System>**

The SAR measurements were conducted with the dosimetric probe (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probes is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multi-fiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting. The approach is stopped when reaching the maximum.

| | |
|---|---|
| **Construction** | Symmetrical design with triangular core<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |
| **Frequency** | 4 MHz to 10 GHz<br>Linearity: ± 0.2 dB (30 MHz to 10 GHz) |
| **Directivity** | ±0.1 dB in TSL (rotation around probe axis)<br>±0.3 dB in TSL (rotation normal to probe axis) |
| **Dimensions** | Overall length: 337 mm (Tip: 20 mm)<br>Tip diameter: 2.5 mm (Body: 12 mm)<br>Typical distance from probe tip to dipole centers: 1 mm |
| **Calibration** | ISO/IEC 17025 calibration service available |

**EX3DV4 E-Field Probe**

**Probe setup on robot**

**<Data Acquisition Electronic (DAE) System>**

| | | |
|---|---|---|
| **Model** | DAE4 |  |
| **Construction** | Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop. | |
| **Measurement Range** | -100 to +300 mV (16 bit resolution and two range settings: 4 mV, 400 mV) | |
| **Input Offset Voltage** | < 5 µV (with auto zero) | |
| **Input Bias Current** | < 50 fA | |
| **Dimensions** | 60 x 60 x 68 mm | |

**<Robot>**

| | | |
|---|---|---|
| **Positioner** | Stäubli Unimation Corp. |  |
| **Robot Model** | TX90XL | |
| **Number of Axes** | 6 | |
| **Norminal Load** | 5 kg | |
| **Reach** | 1450 mm | |
| **Repeatability** | ± 0.035 mm | |

**<Device Holder>**

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

| | |
|---|---|
|  |  |
| Device Holder 1 | Device Holder 2 |

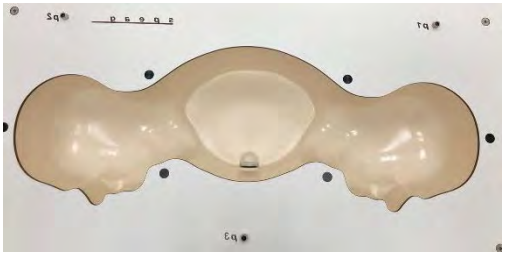
**<Oval Flat Phantom – ELI>**

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (Oval Flat) phantom defined in IEEE 1528, IEC 62209-2 and IEC/IEEE 62209-1528. It enables the dosimetric evaluation of wireless portable device usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.

| | | |
|---|---|---|
| **Shell Thickness** | 2 ±0.2 mm |  |
| **Filling Volume** | Approx. 30 liters | |
| **Dimensions** | 190×600×400 mm (H × L × W) | |

**<SAM Phantom>**

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528, IEC 62209-1 and IEC/IEEE 62209-1528. It enables the dosimetric evaluation of left and right hand phone usage as well as body-mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.

| | | |
|---|---|---|
| **Shell Thickness** | 2 ±0.2 mm |  |
| **Filling Volume** | Approx. 25 liters | |
| **Dimensions** | Length: 1000 mm<br>Width: 500 mm<br>Height: adjustable feet | |

## 6.2 Tissue Simulating Liquids (TSL)

**<Tissue Dielectric Parameters in IEEE 1528-2013 and IEC/IEEE 62209-1528>**

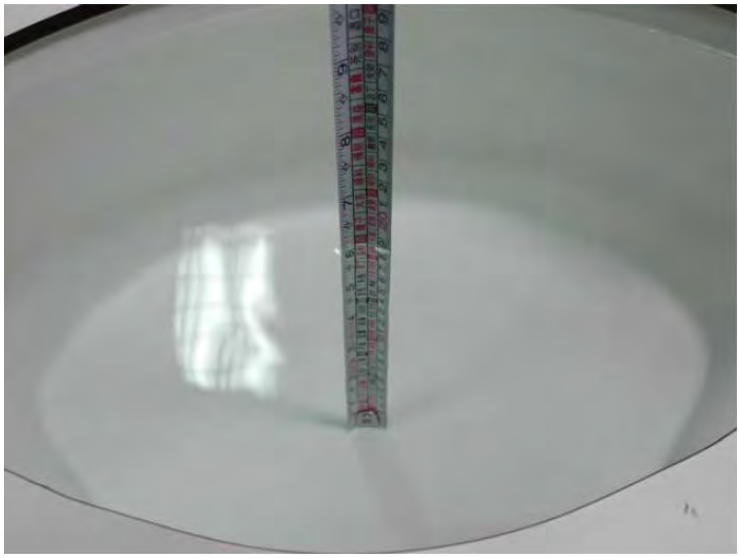
The following table incorporates the tissue dielectric parameters of head recommended by IEEE 1528-2013 and IEC/IEEE 62209-1528. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in human head. Other head and body tissue parameters that have not been specified are derived from the tissue dielectric parameters which computed by the 4-Cole-Cole equation according to the above-mentioned standards.

**Table 2 Dielectric properties of the tissue-equivalent liquid material**

| Frequency | Real part of the complex relative | Conductivity, σ |
|---|---|---|
| 30 | 55.0 | 0.75 |
| 150 | 52.3 | 0.76 |
| 300 | 45.3 | 0.87 |
| 450 | 43.5 | 0.87 |
| 750 | 41.9 | 0.89 |
| 835 | 41.5 | 0.90 |
| 900 | 41.5 | 0.97 |
| 1450 | 40.5 | 1.20 |
| 1800 | 40.0 | 1.40 |
| 1900 | 40.0 | 1.40 |
| 1950 | 40.0 | 1.40 |
| 2000 | 40.0 | 1.40 |
| 2100 | 39.8 | 1.49 |
| 2450 | 39.2 | 1.80 |
| 2600 | 39.0 | 1.98 |
| 3000 | 38.5 | 2.40 |
| 3500 | 37.9 | 2.91 |
| 4000 | 37.4 | 3.43 |
| 4500 | 36.8 | 3.94 |
| 5000 | 36.2 | 4.45 |
| 5200 | 36.0 | 4.66 |
| 5400 | 35.8 | 4.86 |
| 5600 | 35.5 | 5.07 |
| 5800 | 35.3 | 5.27 |
| 6000 | 35.1 | 5.48 |
| 6500 | 34.5 | 6.07 |
| 7000 | 33.9 | 6.65 |
| 7500 | 33.3 | 7.24 |
| 8000 | 32.7 | 7.84 |
| 8500 | 32.1 | 8.46 |
| 9000 | 31.6 | 9.08 |
| 9500 | 31.0 | 9.71 |
| 10000 | 30.4 | 10.4 |

**<Liquid Depth>**

The depth of tissue-equivalent liquid in a phantom must be ≧ 15.0 cm to ensure that the probe is immersed sufficiently in the tissue medium.



Tissue-equivalent Liquid Heigh

**<Liquid Check>**

1. The dielectric parameters of the liquids were verified prior to the SAR evaluation using a DAKS 3.5 Probe Kit.
2. The SAR testing with IEC tissue parameters as an alternative option to Head and body parameters. The head TSL were applied to body SAR tests with restrictions below:

   The mixing and matching of head TSL and body TSL for body SAR testing in a single application are not permitted. For example, testing body SAR with head TSL and then switch to Body TSL for body SAR test is not allowed. The consistency of TSL is required.

| Tissue Temp (°C) | Liquid Type | Frequency (MHz) | Cond. | Perm. | target Cond. | target Perm. | σ (Delta) (%) | εr (Delta) (%) | Limit (%) | Date |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | σ | εr | σ | εr | | | | |
| 23.2 | Head | 704 MHz | 0.85 | 43.21 | 0.89 | 42.15 | -3.68 | 2.53 | ±5 | Jun. 29, 2021 |
| 23.2 | Head | 707.5 MHz | 0.86 | 43.16 | 0.89 | 42.12 | -3.39 | 2.48 | ±5 | Jun. 29, 2021 |
| 23.2 | Head | 711 MHz | 0.86 | 43.12 | 0.89 | 42.11 | -2.91 | 2.39 | ±5 | Jun. 29, 2021 |
| 23.2 | Head | 782 MHz | 0.92 | 42.16 | 0.89 | 41.75 | 3.18 | 0.99 | ±5 | Jun. 29, 2021 |
| 23.2 | Head | 709 MHz | 0.88 | 44.00 | 0.89 | 42.12 | -0.27 | 4.46 | ±5 | Jun. 29, 2021 |
| 23.2 | Head | 710 MHz | 0.89 | 43.98 | 0.89 | 42.11 | -0.16 | 4.45 | ±5 | Jun. 29, 2021 |
| 23.2 | Head | 711 MHz | 0.89 | 43.97 | 0.89 | 42.11 | -0.05 | 4.41 | ±5 | Jun. 29, 2021 |
| 22.3 | Head | 826.4 MHz | 0.90 | 42.54 | 0.90 | 41.54 | -0.44 | 2.41 | ±5 | Jun. 30, 2021 |
| 22.3 | Head | 836.4 MHz | 0.91 | 42.40 | 0.90 | 41.50 | 0.34 | 2.17 | ±5 | Jun. 30, 2021 |

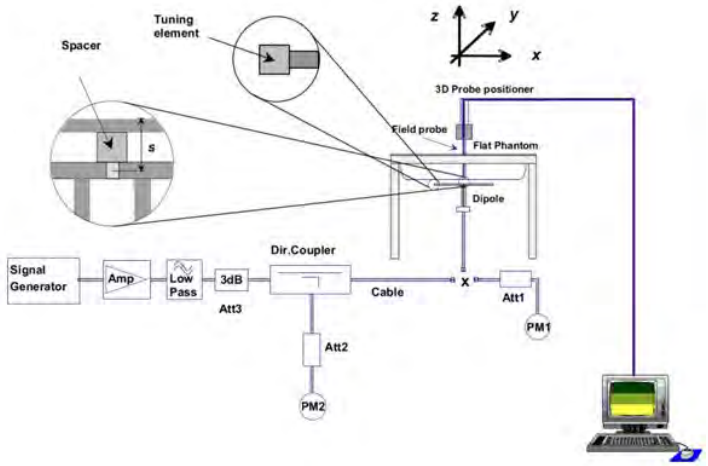
| Tissue Temp (°C) | Liquid Type | Frequency (MHz) | Cond. | Perm. | target Cond. | target Perm. | σ (Delta) (%) | εr (Delta) (%) | Limit (%) | Date |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | σ | εr | σ | εr | | | | |
| 22.3 | Head | 846.6 MHz | 0.92 | 42.26 | 0.91 | 41.50 | 0.27 | 1.82 | ±5 | Jun. 30, 2021 |
| 22.3 | Head | 829 MHz | 0.90 | 42.50 | 0.90 | 41.53 | -0.14 | 2.34 | ±5 | Jun. 30, 2021 |
| 22.3 | Head | 836.5 MHz | 0.91 | 42.40 | 0.90 | 41.50 | 0.36 | 2.16 | ±5 | Jun. 30, 2021 |
| 22.3 | Head | 844 MHz | 0.91 | 42.29 | 0.91 | 41.50 | 0.32 | 1.90 | ±5 | Jun. 30, 2021 |
| 22.3 | Head | 821.5 MHz | 0.89 | 42.61 | 0.90 | 41.57 | -0.88 | 2.50 | ±5 | Jun. 30, 2021 |
| 22.3 | Head | 831.5 MHz | 0.90 | 42.47 | 0.90 | 41.51 | 0.03 | 2.31 | ±5 | Jun. 30, 2021 |
| 22.3 | Head | 841.5 MHz | 0.91 | 42.32 | 0.91 | 41.50 | 0.37 | 1.98 | ±5 | Jun. 30, 2021 |
| 22.7 | Head | 1852.4 MHz | 1.39 | 41.37 | 1.40 | 40.00 | -0.68 | 3.43 | ±5 | Jul. 01, 2021 |
| 22.7 | Head | 1880 MHz | 1.42 | 41.28 | 1.40 | 40.00 | 1.41 | 3.19 | ±5 | Jul. 01, 2021 |
| 22.7 | Head | 1907.6 MHz | 1.44 | 41.21 | 1.40 | 40.00 | 3.21 | 3.02 | ±5 | Jul. 01, 2021 |
| 22.7 | Head | 1860 MHz | 1.40 | 41.34 | 1.40 | 40.00 | 0.02 | 3.34 | ±5 | Jul. 01, 2021 |
| 22.7 | Head | 1880 MHz | 1.42 | 41.28 | 1.40 | 40.00 | 1.41 | 3.19 | ±5 | Jul. 01, 2021 |
| 22.7 | Head | 1900 MHz | 1.44 | 41.23 | 1.40 | 40.00 | 2.70 | 3.07 | ±5 | Jul. 01, 2021 |
| 22.5 | Head | 1712.4 MHz | 1.35 | 40.79 | 1.35 | 40.13 | -0.11 | 1.65 | ±5 | Jul. 02, 2021 |
| 22.5 | Head | 1732.6 MHz | 1.36 | 40.75 | 1.36 | 40.10 | 0.23 | 1.62 | ±5 | Jul. 02, 2021 |
| 22.5 | Head | 1752.6 MHz | 1.38 | 40.69 | 1.37 | 40.07 | 0.54 | 1.54 | ±5 | Jul. 02, 2021 |
| 22.5 | Head | 1720 MHz | 1.36 | 40.78 | 1.35 | 40.11 | 0.11 | 1.67 | ±5 | Jul. 02, 2021 |
| 22.5 | Head | 1732.5 MHz | 1.36 | 40.75 | 1.36 | 40.10 | 0.23 | 1.62 | ±5 | Jul. 02, 2021 |
| 22.5 | Head | 1745 MHz | 1.37 | 40.71 | 1.37 | 40.08 | 0.41 | 1.57 | ±5 | Jul. 02, 2021 |
| 22.5 | Head | 1720 MHz | 1.35 | 40.78 | 1.35 | 40.11 | 0.04 | 1.67 | ±5 | Jul. 02, 2021 |
| 22.5 | Head | 1745 MHz | 1.37 | 40.71 | 1.37 | 40.08 | 0.41 | 1.57 | ±5 | Jul. 02, 2021 |
| 22.5 | Head | 1770 MHz | 1.40 | 40.64 | 1.38 | 40.04 | 0.91 | 1.50 | ±5 | Jul. 02, 2021 |
| 21.3 | Head | 2510 MHz | 1.87 | 39.37 | 1.86 | 39.12 | 0.49 | 0.64 | ±5 | Jul. 03, 2021 |
| 21.3 | Head | 2535 MHz | 1.91 | 39.34 | 1.89 | 39.09 | 0.75 | 0.64 | ±5 | Jul. 03, 2021 |
| 21.3 | Head | 2560 MHz | 1.93 | 39.26 | 1.92 | 39.05 | 0.80 | 0.55 | ±5 | Jul. 03, 2021 |
| 21.3 | Head | 2580 MHz | 1.96 | 39.17 | 1.94 | 39.03 | 1.06 | 0.37 | ±5 | Jul. 03, 2021 |
| 21.3 | Head | 2595 MHz | 1.98 | 39.12 | 1.95 | 39.01 | 1.49 | 0.27 | ±5 | Jul. 03, 2021 |
| 21.3 | Head | 2610 MHz | 2.00 | 39.08 | 1.97 | 38.99 | 1.68 | 0.22 | ±5 | Jul. 03, 2021 |
| 21.3 | Head | 2510 MHz | 1.87 | 39.37 | 1.86 | 39.12 | 0.49 | 0.64 | ±5 | Jul. 03, 2021 |
| 21.3 | Head | 2549.5 MHz | 1.92 | 39.31 | 1.91 | 39.07 | 0.64 | 0.62 | ±5 | Jul. 03, 2021 |
| 21.3 | Head | 2595 MHz | 1.98 | 39.12 | 1.95 | 39.01 | 1.49 | 0.27 | ±5 | Jul. 03, 2021 |
| 21.3 | Head | 2636.5 MHz | 2.04 | 38.99 | 2.00 | 38.96 | 1.75 | 0.09 | ±5 | Jul. 03, 2021 |
| 21.3 | Head | 2680 MHz | 2.09 | 38.85 | 2.05 | 38.90 | 2.04 | -0.13 | ±5 | Jul. 03, 2021 |
| 21.3 | Head | 2506 MHz | 1.87 | 39.38 | 1.86 | 39.13 | 0.41 | 0.63 | ±5 | Jul. 03, 2021 |
| 22.1 | Head | 2310 MHz | 1.64 | 40.01 | 1.68 | 39.44 | -2.33 | 1.44 | ±5 | Jul. 04, 2021 |

# 7. System Verification

## 7.1 SAR System Verification

**<Symmetric Dipoles for SAR System Verification>**

| | |
|---|---|
| Construction | Symmetrical dipole with λ/4 balun enables measurement of feed point impedance with NWA matched for use near flat phantoms filled with head simulating solutions Includes distance holder and tripod adaptor Calibration Calibrated SAR value for specified position and input power at the flat phantom in head simulating solutions. |
| Return Loss | > 20 dB at specified verification position. |
| Options | Dipoles for other frequencies or solutions and other calibration conditions are available upon request. |




System Verification Setup Diagram

Validation Kit

### 7.1.1 SAR Verification Summary

Prior to the assessment, the validation data compared to the original value provided by SPEAG should be within its specifications of ±10%. The measured SAR will be normalized to 1 W input power. The result indicates the system check can meet the variation criterion and plots can be referred to Appendix A of this report.

| Mixture Type | Frequency (MHz) | Power | Probe | Dipole | $SAR_{1\,g}$ (W/Kg) | Normalize to 1 Watt 1 g (W/Kg) | 1 W Target $SAR_{1\,g}$ (W/Kg) | $SAR_{10\,g}$ (W/Kg) | Normalize to 1 Watt 10 g (W/Kg) | 1 W Target $SAR_{10\,g}$ (W/Kg) | Difference percentage 1 g | Difference percentage 10 g | Date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Model / Serial No. | Model / Serial No. | | | | | | | | | |
| Head | 750 | 250 mW | EX3DV4-SN 3977 | D750V3 – SN1004 | 2.24 | 8.96 | 8.37 | 1.47 | 5.88 | 5.48 | 7.0% | 7.3% | Jun. 29, 2021 |
| Head | 835 | 250 mW | EX3DV4-SN 3977 | D835V2 – SN4d082 | 2.52 | 10.08 | 9.49 | 1.66 | 6.64 | 6.17 | 6.2% | 7.6% | Jun. 30, 2021 |
| Head | 1750 | 250 mW | EX3DV4-SN 3977 | D1750V2 – SN1111 | 8.29 | 33.16 | 36.40 | 4.3 | 17.2 | 19.00 | -8.9% | -9.5% | Jul. 02, 2021 |
| Head | 1900 | 250 mW | EX3DV4-SN 3977 | D1900V2 – SN5d111 | 10.7 | 42.8 | 40.10 | 5.6 | 22.4 | 20.70 | 6.7% | 8.2% | Jul. 01, 2021 |
| Head | 2300 | 250 mW | EX3DV4-SN 3977 | D2300V2 – SN1005 | 11.6 | 46.4 | 47.70 | 5.42 | 21.68 | 22.10 | -2.7% | -1.9% | Jul. 04, 2021 |
| Head | 2600 | 250 mW | EX3DV4-SN 3977 | D2600V2 – SN1007 | 15.3 | 61.2 | 57.30 | 7 | 28 | 25.90 | 6.8% | 8.1% | Jul. 03, 2021 |

# 8. Test Equipment List

## 8.1 SAR Test Equipment List

| Manufacturer | Name of Equipment | Type/Model | Serial Number | Calibration | |
|---|---|---|---|---|---|
| | | | | Cal. Date | Cal.Period |
| SPEAG | 750MHz System Validation Kit | D750V3 | 1004 | 2020/09/17 | 1 year |
| SPEAG | 835MHz System Validation Kit | D835V2 | 4d082 | 2020/09/17 | 1 year |
| SPEAG | 1750MHz System Validation Kit | D1750V2 | 1111 | 2021/04/14 | 1 year |
| SPEAG | 1900MHz System Validation Kit | D1900V2 | 5d111 | 2020/09/18 | 1 year |
| SPEAG | 2300MHz System Validation Kit | D2300V2 | 1005 | 2021/04/14 | 1 year |
| SPEAG | 2600MHz System Validation Kit | D2600V2 | 1007 | 2020/09/29 | 1 year |
| SPEAG | Dosimetric E-Field Probe | EX3DV4 | 3977 | 2020/07/29 | 1 year |
| SPEAG | Data Acquisition Electronics | DAE4 | 1253 | 2020/12/16 | 1 year |
| SPEAG | Measurement Server | SE UMS 011 BB | 1241 | NCR | |
| SPEAG | Device Holder | N/A | N/A | NCR | |
| SPEAG | Phantom | SAM V4.0 | TP-1623 | NCR | |
| SPEAG | Phantom | ELI V5.0 | 1175 | NCR | |
| SPEAG | Robot | Staubli TX90XL | F11/5G9EA1/A/01 | NCR | |
| SPEAG | Software | DASY52 V52.10 (3) | N/A | NCR | |
| SPEAG | Software | SEMCAD X V14.6.13 (7474) | N/A | NCR | |
| R&S | Wireless Communication Test Set | CMU200 | 112387 | 2021/03/17 | 1 year |
| Anritsu | Radio Communication Analyzer | MT8820C | 6201342039 | 2020/12/03 | 1 year |
| SPEAG | Network Analyzer | DAKS_VNA R140 | 0010318 | 2021/05/26 | 1 year |
| SPEAG | Dielectric Probe Kit | DAKS-3.5 | 1101 | 2021/05/26 | 1 year |
| HILA | Digital Thermometer | TM-906A | 1500033 | 2020/10/28 | 1 year |
| Anritsu | Power Sensor | MA2411B | 1126022 | 2020/09/01 | 1 year |
| Anritsu | Power Meter | ML2495A | 1135009 | 2020/09/01 | 1 year |
| Agilent | Signal Generator | E8257D | MY44320425 | 2021/02/18 | 1 year |
| Agilent | Spectrum Analyzer | N9030A | MT-112 | 2021/01/08 | 1 year |
| Agilent | Dual Directional Coupler | 778D | 50334 | NCR | |
| Woken | Dual Directional Coupler | 0100AZ20200801O | 11012409517 | NCR | |
| Mini-Circuits | Power Amplifier | EMC014225P | 980292 | NCR | |
| Mini-Circuits | Power Amplifier | EMC2830P | 980293 | NCR | |
| Aisi | Attenuator | IEAT 3dB | N/A | NCR | |

Testing Engineer: Jason Tsao / Ted Hsieh

# 9. Measurement Procedure

## 9.1 SAR Measurement Procedure

The measurement procedures are as follows:

1. The DUT is installed engineering testing software that provides continuous transmitting signal.
2. Measure output power through RF cable and power meter
3. Set scan area, grid size and other setting on the DASY software
4. Find out the largest SAR result on these testing positions of each band
5. Measure SAR results for other channels in worst SAR testing position if the 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:

1. Power reference measurement
2. Area scan
3. Zoom scan
4. Power drift measurement

### 9.1.1 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures points and step size follow as below. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution.

The measure settings are referred to KDB 865664 D01v01r04 :

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 mm ± 1 mm</td><td>½·δ·ln(2) mm ± 0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: $\Delta x_{Area}$, $\Delta y_{Area}$</td><td>≤ 2 GHz: ≤ 15 mm<br>2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm<br>4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: $\Delta x_{Area}$, $\Delta y_{Area}$</td><td>≤ 2 GHz: ≤ 8 mm<br>2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*<br>4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm<br>4 – 5 GHz: ≤ 3 mm<br>5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">Graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm<br>4 – 5 GHz: ≤ 2.5 mm<br>5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">≤ 1.5·$\Delta z_{Zoom}(n-1)$ mm</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm<br>4 – 5 GHz: ≥ 25 mm<br>5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.<br>* When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

### 9.1.2 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1 g aggregate SAR, the DUT 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.

### 9.1.3 Power Drift Monitoring

All SAR testing is under the DUT 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 DUT 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.

### 9.1.4 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1 g and 10 g, 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 1 g and 10 g 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 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

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

# 10. Measurement Uncertainty

## 10.1 SAR Measurement Uncertainty

Uncertainty Budget for frequency range 300 MHz to 3 GHz:

| Measurement uncertainty (0.3GHz ~3 GHz) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Uncertainty component** | **Tol.** | **Prob. Dist.** | **Div.** | **$C_i$ - 1g** | **$C_i$ - 10g** | **$u_i$ - 1g ( ± %)** | **$u_i$ - 10g ( ± %)** | **$v_i$** |
| **Measurement system** | | | | | | | | |
| Probe calibration | 6.1 | N | 1 | 1 | 1 | 6.1 | 6.1 | ∞ |
| Axial isotropy | 4.7 | R | 1.732 | 0.7 | 0.7 | 1.9 | 1.9 | ∞ |
| Hemispherical isotropy | 9.6 | R | 1.732 | 0.7 | 0.7 | 3.9 | 3.9 | ∞ |
| Boundary effect | 1 | R | 1.732 | 1 | 1 | 0.6 | 0.6 | ∞ |
| Linearity | 4.7 | R | 1.732 | 1 | 1 | 2.7 | 2.7 | ∞ |
| System detection limits | 0.25 | R | 1.732 | 1 | 1 | 0.1 | 0.1 | ∞ |
| Readout electronics | 0.3 | N | 1 | 1 | 1 | 0.3 | 0.3 | ∞ |
| Response time | 0.8 | R | 1.732 | 1 | 1 | 0.5 | 0.5 | ∞ |
| Integration time | 2.6 | R | 1.732 | 1 | 1 | 1.5 | 1.5 | ∞ |
| RF Ambient Noise | 3 | R | 1.732 | 1 | 1 | 1.7 | 1.7 | ∞ |
| RF Ambient Reflections | 3 | R | 1.732 | 1 | 1 | 1.7 | 1.7 | ∞ |
| Probe Positioner | 0.02 | R | 1.732 | 1 | 1 | 0 | 0 | ∞ |
| Probe Positioning | 0.4 | R | 1.732 | 1 | 1 | 0.2 | 0.2 | ∞ |
| Max. SAR evaluation | 2 | R | 1.732 | 1 | 1 | 1.2 | 1.2 | ∞ |
| **Test sample related** | | | | | | | | |
| Test sample positioning | 2.9 | N | 1 | 1 | 1 | 2.9 | 2.9 | 145 |
| Device holder uncertainty | 3.6 | N | 1 | 1 | 1 | 3.6 | 3.6 | 5 |
| SAR drift measurement | 5 | R | 1.732 | 1 | 1 | 2.9 | 2.9 | ∞ |
| **Phantom and tissue parameters** | | | | | | | | |
| Phantom shell uncertainty | 7.6 | R | 1.732 | 1 | 1 | 4.4 | 4.4 | ∞ |
| Liquid Conductivity (target) | 5 | R | 1.732 | 0.78 | 0.71 | 2.3 | 2 | ∞ |
| Liquid Conductivity (measurement) | 4.8 | R | 1.732 | 0.78 | 0.71 | 2.2 | 2 | ∞ |
| Liquid Permittivity (target) | 5 | R | 1.732 | 0.23 | 0.26 | 0.7 | 0.8 | ∞ |
| Liquid Permittivity (measurement) | 4.8 | R | 1.732 | 0.23 | 0.26 | 0.6 | 0.7 | ∞ |
| **Combined standard uncertainty** | | | | | | | | |
| - | - | RSS | - | - | - | 11.5 | 11.5 | 515 |
| **Expanded uncertainty (95% confidence interval)** | | | | | | | | |
| - | - | k =2 | - | - | - | 23.1 | 22.9 | |

Uncertainty Budget for frequency range 3 GHz to 6 GHz:

| Measurement uncertainty (3 GHz~6 GHz) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Uncertainty component** | **Tol.** | **Prob. Dist.** | **Div.** | **$C_i$ - 1g** | **$C_i$ - 10g** | **$u_i$ - 1g ( ± %)** | **$u_i$ - 10g ( ± %)** | **$v_i$** |
| **Measurement system** | | | | | | | | |
| Probe calibration | 6.7 | N | 1 | 1 | 1 | 6.7 | 6.7 | ∞ |
| Axial isotropy | 4.7 | R | 1.732 | 0.7 | 0.7 | 1.9 | 1.9 | ∞ |
| Hemispherical isotropy | 9.6 | R | 1.732 | 0.7 | 0.7 | 3.9 | 3.9 | ∞ |
| Boundary effect | 2 | R | 1.732 | 1 | 1 | 1.2 | 1.2 | ∞ |
| Linearity | 4.7 | R | 1.732 | 1 | 1 | 2.7 | 2.7 | ∞ |
| System detection limits | 0.25 | R | 1.732 | 1 | 1 | 0.1 | 0.1 | ∞ |
| Readout electronics | 0.3 | N | 1 | 1 | 1 | 0.3 | 0.3 | ∞ |
| Response time | 0 | R | 1.732 | 1 | 1 | 0 | 0 | ∞ |
| Integration time | 2.6 | R | 1.732 | 1 | 1 | 1.5 | 1.5 | ∞ |
| RF Ambient Noise | 3 | R | 1.732 | 1 | 1 | 1.7 | 1.7 | ∞ |
| RF Ambient Reflections | 3 | R | 1.732 | 1 | 1 | 1.7 | 1.7 | ∞ |
| Probe Positioner | 0.04 | R | 1.732 | 1 | 1 | 0.02 | 0.02 | ∞ |
| Probe Positioning | 0.8 | R | 1.732 | 1 | 1 | 0.5 | 0.5 | ∞ |
| Max. SAR evaluation | 4 | R | 1.732 | 1 | 1 | 2.3 | 2.3 | ∞ |
| **Test sample related** | | | | | | | | |
| Test sample positioning | 2.9 | N | 1 | 1 | 1 | 2.9 | 2.9 | 145 |
| Device holder uncertainty | 3.6 | N | 1 | 1 | 1 | 3.6 | 3.6 | 7 |
| SAR drift measurement | 5 | R | 1.732 | 1 | 1 | 2.9 | 2.9 | ∞ |
| **Phantom and tissue parameters** | | | | | | | | |
| Phantom shell uncertainty | 7.6 | R | 1.732 | 1 | 1 | 4.4 | 4.4 | ∞ |
| Liquid Conductivity (target) | 5 | R | 1.732 | 0.78 | 0.71 | 2.3 | 2 | ∞ |
| Liquid Conductivity (measurement) | 4.8 | R | 1.732 | 0.78 | 0.71 | 2.2 | 2 | ∞ |
| Liquid Permittivity (target) | 5 | R | 1.732 | 0.23 | 0.26 | 0.7 | 0.8 | ∞ |
| Liquid Permittivity (measurement) | 4.8 | R | 1.732 | 0.23 | 0.26 | 0.6 | 0.7 | ∞ |
| **Combined standard uncertainty** | | | | | | | | |
| - | - | RSS | - | - | - | 12.1 | 12.0 | 859 |
| **Expanded uncertainty (95% confidence interval)** | | | | | | | | |
| - | - | k =2 | - | - | - | 24.1 | 24.0 | - |

Uncertainty Budget for frequency range 6 GHz to 10 GHz:

| Measurement uncertainty (6 GHz~10 GHz) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Uncertainty component** | **Tol.** | **Prob. Dist.** | **Div.** | **$C_i$ - 1g** | **$C_i$ - 10g** | **$u_i$ - 1g ( ± %)** | **$u_i$ - 10g ( ± %)** | **$v_i$** |
| **Measurement system** | | | | | | | | |
| Probe calibration | 9.3 | N | 1 | 1 | 1 | 9.3 | 9.3 | ∞ |
| Axial isotropy | 4.7 | R | 1.732 | 0.7 | 0.7 | 1.9 | 1.9 | ∞ |
| Hemispherical isotropy | 9.6 | R | 1.732 | 0.7 | 0.7 | 3.9 | 3.9 | ∞ |
| Boundary effect | 2 | R | 1.732 | 1 | 1 | 1.2 | 1.2 | ∞ |
| Linearity | 4.7 | R | 1.732 | 1 | 1 | 2.7 | 2.7 | ∞ |
| System detection limits | 0.25 | R | 1.732 | 1 | 1 | 0.1 | 0.1 | ∞ |
| Readout electronics | 0.3 | N | 1 | 1 | 1 | 0.3 | 0.3 | ∞ |
| Response time | 0.8 | R | 1.732 | 1 | 1 | 0.5 | 0.5 | ∞ |
| Integration time | 2.6 | R | 1.732 | 1 | 1 | 1.5 | 1.5 | ∞ |
| RF Ambient Noise | 3 | R | 1.732 | 1 | 1 | 1.7 | 1.7 | ∞ |
| RF Ambient Reflections | 3 | R | 1.732 | 1 | 1 | 1.7 | 1.7 | ∞ |
| Probe Positioner | 0.04 | R | 1.732 | 1 | 1 | 0 | 0 | ∞ |
| Probe Positioning | 1.6 | R | 1.732 | 1 | 1 | 0.9 | 0.9 | ∞ |
| Max. SAR evaluation | 6 | R | 1.732 | 1 | 1 | 3.5 | 3.5 | ∞ |
| **Test sample related** | | | | | | | | |
| Test sample positioning | 2.9 | N | 1 | 1 | 1 | 2.9 | 2.9 | 145 |
| Device holder uncertainty | 3.6 | N | 1 | 1 | 1 | 3.6 | 3.6 | 5 |
| SAR drift measurement | 5 | R | 1.732 | 1 | 1 | 2.9 | 2.9 | ∞ |
| **Phantom and tissue parameters** | | | | | | | | |
| Phantom shell uncertainty | 6.6 | R | 1.732 | 1 | 1 | 3.3 | 3.3 | ∞ |
| Liquid Conductivity (target) | 5 | R | 1.732 | 0.78 | 0.71 | 2.3 | 2 | ∞ |
| Liquid Conductivity (measurement) | 4.8 | N | 1 | 0.78 | 0.71 | 3.7 | 3.4 | ∞ |
| Liquid Permittivity (target) | 5 | R | 1.732 | 0.23 | 0.26 | 0.7 | 0.8 | ∞ |
| Liquid Permittivity (measurement) | 4.8 | N | 1 | 0.23 | 0.26 | 1.1 | 1.2 | ∞ |
| **Combined standard uncertainty** | | | | | | | | |
| - | - | RSS | - | - | - | 14.2 | 14.1 | 1174 |
| **Expanded uncertainty (95% confidence interval)** | | | | | | | | |
| - | - | k =2 | - | - | - | 28.3 | 28.1 | - |

# 11. Measurement Evaluation

## 11.1 Positioning of the DUT in Relation to the Phantom

The following measurement procedure shall be according to RSS-102 Supplementary procedures (SPR-001):

Unless the side(s)/edge(s) of the laptop type computer (laptop mode/tablet mode) containing the built-in antenna(s) was already tested against the flat phantom.

Industry Canada requires SAR measurements to be performed with the side(s)/edge(s) of the display screen containing the built-in antenna(s) pointing towards the flat phantom.

1. If the integrated antenna(s) are located in the back side of the display screen, the back side shall be facing towards the flat phantom at a distance not exceeding 25 mm.
2. If the integrated antenna(s) are installed along the edge(s) of the display screen, the edge(s) shall be facing towards the flat phantom at a distance not exceeding 25 mm.

According to KDB 616217 D04:

1. When antennas are incorporated in the keyboard section of a laptop computer, SAR is required for the bottom surface of the keyboard. Provided tablet use conditions are not supported by the laptop computer, SAR tests for bystander exposure from the edges of the keyboard.
2. Some 2-in-1 tablets may operate with the display folded on top of the keyboard. Most recent tablets are designed with an interactive display that may not require a physical keyboard. Both configurations are used in similar manners and require SAR evaluation for the back surface and edges of the tablet. For keyboards that can be unfolded like a laptop, the procedures for laptop platform should also be applied.

## 11.2 SAR Testing with RF Transmitter

### 11.2.1 SAR Testing with WCDMA

**<General requirements>**

1. The default test configuration is to measure SAR with an established radio link between the handset and a communication test set using a 12.2 kbps RMC (reference measurement channel) configured in Test Loop Mode 1.
2. SAR must be measured according to these maximum output conditions and requirements in KDB Publication 447498 D01.
3. **Head SAR**:
   - SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
4. **Body-Worn Accessory SAR**:
   - SAR for body-worn accessory configurations is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
   - The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC as the primary mode.

**<Setup >**

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

- Step1: set a Test Mode 1 loop back with a 12.2 kbps Reference Measurement Channel (RMC).
- Step 2: set and send continuously up power control commands to the device.
- Step 3: measure the power at the device antenna connector using the power meter with average detector and test SAR.

### 11.2.2 SAR Testing with HSDPA / HSUPA

**<General requirements>**

1. The following procedures are applicable to HSPA (HSUPA/HSDPA) data devices operating under 3GPP Release 6. Body exposure conditions generally apply to these devices, including handsets and data modems operating in various electronic devices.
2. HSUPA operates in conjunction with WCDMA and HSDPA. SAR is initially measured in WCDMA test configurations without HSPA. The default test configuration is to establish a radio link between the DUT and a communication test set to configure a 12.2 kbps RMC (reference measurement channel) in Test Loop Mode 1.
3. SAR for HSPA is selectively measured with HS-DPCCH, EDPCCH and E-DPDCH, all enabled, along with a 12.2 kbps RMC using the highest SAR configuration in WCDMA with 12.2 kbps RMC only. An FRC is configured according to HSDPCCH Sub-test 1 using H-set 1 and QPSK. HSPA is configured according to E-DCH Subtest 5 requirements.

SAR for other HSPA sub-test configurations is also confirmed selectively according to output power, exposure conditions and E-DCH UE Category. Maximum output power is verified according to procedures in applicable versions of 3GPP TS 34.121 and SAR must be measured according to these maximum output conditions. The UE Categories for HSDPCCH and HSPA should be clearly identified in the SAR report. The following procedures are applicable only if Maximum Power Reduction (MPR) is implemented according to Cubic Metric (CM) requirements.

4. When voice transmission and head exposure conditions are applicable to a WCDMA/HSPA data device, head exposure is measured according to the 'Head SAR Measurements' procedures in the 'WCDMA Handsets' section of this document.
5. SAR for body exposure configurations are measured according to the 'Body SAR Measurements' procedures in the 'WCDMA Handsets' section of this document. In addition, body SAR is also measured for HSPA when the maximum average output of each RF channel with HSPA active is at least ¼ dB higher than that measured without HSPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is above 75% of the SAR limit.
6. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2, according to the highest body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP is applicable for head exposure, SAR is not required when the maximum output of each RF channel with HSPA is less than ¼ dB higher than that measured using 12.2 kbps RMC; otherwise, the same HSPA configuration used for body measurements should be used to test for head exposure.
7. Due to inner loop power control requirements in HSPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA should be configured according to the β values indicated below as well as other applicable procedures described in the 'WCDMA Handset' and 'Release 5 HSDPA Data Devices' sections of this document.

**<Setup >**

HSDPA should be configured according to the UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors(βc, βd), and HS-DPCCH power offset parameters (ΔACK, ΔNACK, ΔCQI) should be set according to values indicated in the Table below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

| Setup for Release 5 HSDPA | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sub-test | βc | βd | βd (SF) | βc/βd | βhs(1,2) | CM(3) (dB) | MRP(3) (dB) |
| 1 | 2/15 | 15/15 | 64 | 2/15 | 4/15 | 0.0 | 0.0 |
| 2 | 12/15(4) | 15/15(4) | 64 | 12/15(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 $\Delta_{CQI}$ = 8 ⇔ Ahs = βhs/βc = 30/15 ⇔ βhs= 30/15 *βc
2. For theHS-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 βhs = 30/15 *βc and $\Delta_{CQI}$ = 24/15 with βhs = 24/15*βc
3. CM = 1 for βc/βd =12/15, βhs/βc=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.
4. For subtest 2 the βc/βd ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 11/15 and βd = 15/15.

### 11.2.3 SAR Testing with LTE

**<FDD Setup >**

All SAR measurements for LTE were performed using the Anritsu MT8820C. A closed loop power control setting allowed the UE to transmit at the maximum output power during the SAR measurements.Configure the basestation to support LTE tests in respect to the 3GPP 36.521-1,and set ch , RB allocation number ,RB allocation offset , and send continuously Up power control commands to the device.
MPR was enabled for this device. A-MPR was disabled for all SAR test measurements.

**<TDD Setup >**

All SAR measurements for LTE were performed using the Anritsu MT8820C. A closed loop power control setting allowed the UE to transmit at the maximum output power during the SAR measurements.Configure the basestation to support LTE tests in respect to the 3GPP 36.521-1,and set ch , TDD mode , RB allocation number ,RB allocation offset , and send continuously Up power control commands to the device.
MPR was enabled for this device. A-MPR was disabled for all SAR test measurements.
For 3GPP table 4.2.1 as below, support configurations and worst-case UpPTS information into the table.

**The EUT only supports the 40 % case, which is Table 4.2.2, configuration #1 below.**

| Uplink-downlink configuration | Downlink-to-Uplink Switch-point periodicity | Subframe number | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 5ms | D | S | U | U | U | D | S | U | U | U |
| 1 | 5ms | D | S | U | U | D | D | S | U | U | D |
| 2 | 5ms | D | S | U | D | D | D | S | U | D | D |
| 3 | 10ms | D | S | U | U | U | D | D | D | D | D |
| 4 | 10ms | D | S | U | U | D | D | D | D | D | D |
| 5 | 10ms | D | S | U | D | D | D | D | D | D | D |
| 6 | 5ms | D | S | U | U | U | D | S | U | U | D |

**<Maximum power reduction (MPR) >**

Identify the LTE voice/data requirements in each operating mode and exposure condition with respect to head and body test configurations, antenna locations, handset flip-cover or slide positions, antenna diversity conditions etc.

The voice and data transmission:

- ◆ Data only device.

Identify if Maximum Power Reduction (MPR) is optional or mandatory, i.e. built-in by design:

- ◆ Maximum Power Reduction (MPR) is mandatory, i.e. built-in by design.
- ◆ A-MPR (additional MPR) must be disabled
- ◆ A-MPR was disabled during testing.

| Maximum Power Reduction (MPR) for Power Class 1, 2 and 3 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel bandwidth / Transmission bandwidth configuration (RB) | | | | | | | |
| Modulation | 1.4 MHz | 3 MHz | 5 MHz | 10 MHz | 15 MHz | 20MHz | MPR (dB) |
| 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 |
| 64 QAM | ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 2 |
| 64 QAM | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 3 |
| 256 QAM | ≥ 1 | | | | | | ≤ 5 |

### 11.2.4 SAR Testing with LTE

**<General requirements>**

1. 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.
2. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.
3. When the highest reported SAR for 1 RB and 50% RB allocation are > 0.8 W/kg, SAR is measured for the highest output power channel in 100%RB.
4. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.
5. The procedures required for 1 RB allocation are applied to measure the SAR for QPSK with 50% RB allocation.
6. For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
7. SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.
8. According to 5.3 of KDB 941225 D05, that about the test reduction for other channel bandwidth, if the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg, then SAR need to test.
9. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing; therefore, the requirement for H, M, and L channels may not fully apply.

**<FDD Setup >**

All SAR measurements for LTE were performed using the Anritsu MT8820C. A closed loop power control setting allowed the UE to transmit at the maximum output power during the SAR measurements.Configure the basestation to support LTE tests in respect to the 3GPP 36.521-1,and set ch , RB allocation number ,RB allocation offset , and send continuously Up power control commands to the device.

MPR was enabled for this device. A-MPR was disabled for all SAR test measurements.

**<TDD Setup >**

All SAR measurements for LTE were performed using the Anritsu MT8820C. A closed loop power control setting allowed the UE to transmit at the maximum output power during the SAR measurements.Configure the basestation to support LTE tests in respect to the 3GPP 36.521-1,and set ch , TDD mode , RB allocation number ,RB allocation offset , and send continuously Up power control commands to the device.

MPR was enabled for this device. A-MPR was disabled for all SAR test measurements.

For 3GPP table 4.2.1 as below, support configurations and worst-case UpPTS information into the table.

**3GPP Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).**

| Special subframe configuration | Normal cyclic prefix in downlink | | | Extended cyclic prefix in downlink | | | EUT Support Special subframe | Worst case UpPTS |
|---|---|---|---|---|---|---|---|---|
| | DwPTS | UpPTS | | DwPTS | UpPTS | | | |
| | | Normal cyclic prefix in uplink | Extended cyclic prefix in uplink | | Normal cyclic prefix in uplink | Extended cyclic prefix in uplink | | |
| 0 | 6592×Ts | 2192×Ts | 2560×Ts | 7680×Ts | 2192×Ts | 2560×Ts | □ | □ |
| 1 | 19760×Ts | | | 20480×Ts | | | □ | □ |
| 2 | 21952×Ts | | | 23040×Ts | | | □ | □ |
| 3 | 24144×Ts | | | 25600×Ts | | | ■ | □ |
| 4 | 26336×Ts | | | 7680×Ts | 4384×Ts | 5120×Ts | ■ | □ |
| 5 | 6592×Ts | 4384×Ts | 5120×Ts | 20480×Ts | | | □ | □ |
| 6 | 19760×Ts | | | 23040×Ts | | | □ | □ |
| 7 | 21952×Ts | | | 12800×Ts | | | ■ | ■ |
| 8 | 24144×Ts | | | - | - | - | □ | □ |
| 9 | 13168×Ts | | | - | - | - | □ | □ |
| Duty cycle(maximum) | | | | | | | | 43.33 % |

**The EUT only supports the 40 % case, which is Table 4.2.2, configuration #1 below.**

| Uplink-downlink configuration | Downlink-to-Uplink Switch-point periodicity | Subframe number | | | | | | | | | | Type of EUT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| 0 | 5ms | D | S | U | U | U | D | S | U | U | U | □ |
| 1 | 5ms | D | S | U | U | D | D | S | U | U | D | ■ |
| 2 | 5ms | D | S | U | D | D | D | S | U | D | D | □ |
| 3 | 10ms | D | S | U | U | U | D | D | D | D | D | □ |
| 4 | 10ms | D | S | U | U | D | D | D | D | D | D | □ |
| 5 | 10ms | D | S | U | D | D | D | D | D | D | D | □ |
| 6 | 5ms | D | S | U | U | U | D | S | U | U | D | □ |

**<Maximum power reduction (MPR) >**

Identify the LTE voice/data requirements in each operating mode and exposure condition with respect to head and body test configurations, antenna locations, handset flip-cover or slide positions, antenna diversity conditions etc.

The voice and data transmission:

- ◆ Data only device.

Identify if Maximum Power Reduction (MPR) is optional or mandatory, i.e. built-in by design:

- ◆ Maximum Power Reduction (MPR) is mandatory, i.e. built-in by design.
- ◆ A-MPR (additional MPR) must be disabled
- ◆ A-MPR was disabled during testing.

| Maximum Power Reduction (MPR) for Power Class 1, 2 and 3 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel bandwidth / Transmission bandwidth configuration (RB) | | | | | | | |
| Modulation | 1.4 MHz | 3 MHz | 5 MHz | 10 MHz | 15 MHz | 20MHz | MPR (dB) |
| 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 |
| 64 QAM | ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 2 |
| 64 QAM | > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 3 |
| 256 QAM | ≥ 1 | | | | | | ≤ 5 |

## 11.2.5 Proximity Sensor

### 11.2.5.1. Proximity Sensor Evaluation and Test

The device supports WWAN, WLAN, and Bluetooth capabilities. It is designed with a proximity sensor which can trigger/not trigger power reduction for WCDMA and LTE on Side 1 of EUT for SAR compliance. Others RF capability (WLAN and Bluetooth) have no power reduction.

### 11.2.5.2. Procedures for determining proximity sensor triggering distances

The proximity sensor triggering distance was determined per KDB 616217 for rear face and applicable edge.Summary for power verification per distance was tabulated in the below table.

Depending on how the antenna and sensor are overlapping, Since The proximity sensor which is combined with antenna in one component, the procedure for proximity sensor coverage is not required.

| Side 1(Near to Far) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gap (mm) | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| Band | on | on | on | on | on | on | off | off | off | off | off |
| WCDMA Band II | 18.50 | 18.50 | 18.50 | 18.50 | 18.50 | 18.50 | 24.50 | 24.50 | 24.50 | 24.50 | 24.50 |
| WCDMA Band IV | 18.50 | 18.50 | 18.50 | 18.50 | 18.50 | 18.50 | 24.50 | 24.50 | 24.50 | 24.50 | 24.50 |
| LTE Band 2 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 | 24.00 | 24.00 | 24.00 | 24.00 | 24.00 |
| LTE Band 4 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 | 24.00 | 24.00 | 24.00 | 24.00 | 24.00 |
| LTE Band 7 | 15.50 | 15.50 | 15.50 | 15.50 | 15.50 | 15.50 | 24.00 | 24.00 | 24.00 | 24.00 | 24.00 |
| LTE Band 30 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 | 24.00 | 24.00 | 24.00 | 24.00 | 24.00 |
| LTE Band 38 | 16.50 | 16.50 | 16.50 | 16.50 | 16.50 | 16.50 | 24.00 | 24.00 | 24.00 | 24.00 | 24.00 |
| LTE Band 41 | 16.50 | 16.50 | 16.50 | 16.50 | 16.50 | 16.50 | 24.00 | 24.00 | 24.00 | 24.00 | 24.00 |
| LTE Band 66 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 | 24.00 | 24.00 | 24.00 | 24.00 | 24.00 |

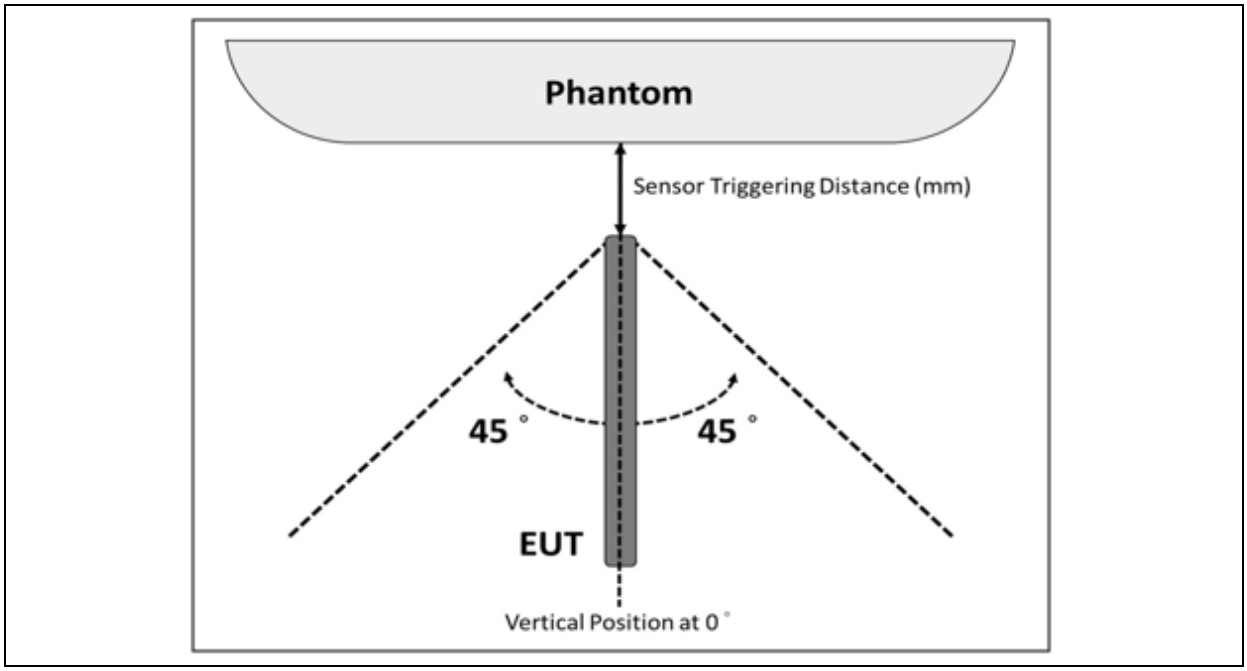
| Side 1(Far to Near) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gap (mm) | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 |
| Band | off | off | off | off | off | on | on | on | on | on | on |
| WCDMA Band II | 24.50 | 24.50 | 24.50 | 24.50 | 24.50 | 18.50 | 18.50 | 18.50 | 18.50 | 18.50 | 18.50 |
| WCDMA Band IV | 24.50 | 24.50 | 24.50 | 24.50 | 24.50 | 18.50 | 18.50 | 18.50 | 18.50 | 18.50 | 18.50 |
| LTE Band 2 | 24.00 | 24.00 | 24.00 | 24.00 | 24.00 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 |
| LTE Band 4 | 24.00 | 24.00 | 24.00 | 24.00 | 24.00 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 |
| LTE Band 7 | 24.00 | 24.00 | 24.00 | 24.00 | 24.00 | 15.50 | 15.50 | 15.50 | 15.50 | 15.50 | 15.50 |
| LTE Band 30 | 24.00 | 24.00 | 24.00 | 24.00 | 24.00 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 |
| LTE Band 38 | 24.00 | 24.00 | 24.00 | 24.00 | 24.00 | 16.50 | 16.50 | 16.50 | 16.50 | 16.50 | 16.50 |
| LTE Band 41 | 24.00 | 24.00 | 24.00 | 24.00 | 24.00 | 16.50 | 16.50 | 16.50 | 16.50 | 16.50 | 16.50 |
| LTE Band 66 | 24.00 | 24.00 | 24.00 | 24.00 | 24.00 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 |

### 11.2.5.3. Procedures for determining tablet tilt angle influences to proximity sensor triggering

The influence of table tilt angles to proximity sensor triggering is determined by positioning each tablet edge that contains a transmitting antenna, perpendicular to the flat phantom, at the smallest sensor triggering test distance determined in KDB 616217. Summary for proximity sensor tilt angle influence is shown in below table.

| WWAN Antenna _Trigger Distance Test (Side 1 of tablet) | | |
|---|---|---|
| Sensor Triggering Distance (mm) | | |
| Actual Test | Far to Near | Near to Far |
| | 20 | 21 |
| Average triggering distance | 20 | 20 |
| Sensor on distance | 20 | 20 |

| WWAN Antenna _Trigger Distance Test (Side 1 of tablet) | | | |
|---|---|---|---|
| Angle change | Sensor Triggering Distance (mm) | | |
| | Far to Near | Near to Far | Min trigger distance |
| 0 degree | 20 | 21 | 20 |
| 10 degree | Front toward to the phantom | | 20 |
| 20 degree | | | 20 |
| 30 degree | | | 20 |
| 40 degree | | | 19 |
| 45 degree | | | 18 |
| -10 degree | Back toward to the phantom | | 20 |
| -20 degree | | | 20 |
| -30 degree | | | 20 |
| -40 degree | | | 19 |
| -45 degree | | | 18 |



### 11.2.5.4. Proximity sensor triggering testing summary

The smallest power sensor triggering distance is 20 mm for DUT.

For the influence of tilt angle, test performed at the above separation distance untill proximity sensor no longer release and the output power remained in reduced mode. The smallest separation distancce for tilt angle influence is 18 mm consequently, and then subtract 1 mm for SAR measurement.

Considering SAR compliance and the conservative distance for sensor triggering, SAR test at 0 mm with power reduction for DUT and 17 mm without power reduciton for DUT, respectively.

The power reduction is determinded by proximity sensor input, and the proximity sensor function is set by manual operation with engineering testing software during SAR measurement.

### 11.3 Conducted Power Measurements

| Band | Modulation | Date Rate or Sub-test | CH | | Frequency | Avg Conducted power (dBm) | Tune up (dBm) |
|---|---|---|---|---|---|---|---|
| WCDMA II | RMC12.2K | --- | Lowest | 9262 | 1852.4 | 23.09 | 24.50 |
| | | | Middle | 9400 | 1880.0 | 23.30 | 24.50 |
| | | | Highest | 9538 | 1907.6 | 22.71 | 24.50 |
| HSDPA II | QPSK | 1 | Lowest | 9262 | 1852.4 | 22.89 | 24.50 |
| | | | Middle | 9400 | 1880.0 | 23.17 | 24.50 |
| | | | Highest | 9538 | 1907.6 | 23.05 | 24.50 |
| | | 2 | Lowest | 9262 | 1852.4 | 22.90 | 24.50 |
| | | | Middle | 9400 | 1880.0 | 23.18 | 24.50 |
| | | | Highest | 9538 | 1907.6 | 23.06 | 24.50 |
| | | 3 | Lowest | 9262 | 1852.4 | 22.40 | 24.00 |
| | | | Middle | 9400 | 1880.0 | 22.68 | 24.00 |
| | | | Highest | 9538 | 1907.6 | 22.53 | 24.00 |
| | | 4 | Lowest | 9262 | 1852.4 | 22.39 | 24.00 |
| | | | Middle | 9400 | 1880.0 | 22.68 | 24.00 |
| | | | Highest | 9538 | 1907.6 | 22.56 | 24.00 |
| HSUPA II | | 1 | Lowest | 9262 | 1852.4 | 22.90 | 24.50 |
| | | | Middle | 9400 | 1880.0 | 23.17 | 24.50 |
| | | | Highest | 9538 | 1907.6 | 23.06 | 24.50 |
| | | 2 | Lowest | 9262 | 1852.4 | 20.90 | 22.50 |
| | | | Middle | 9400 | 1880.0 | 21.18 | 22.50 |
| | | | Highest | 9538 | 1907.6 | 21.05 | 22.50 |
| | | 3 | Lowest | 9262 | 1852.4 | 21.90 | 23.50 |
| | | | Middle | 9400 | 1880.0 | 22.18 | 23.50 |
| | | | Highest | 9538 | 1907.6 | 22.06 | 23.50 |
| | | 4 | Lowest | 9262 | 1852.4 | 20.89 | 22.50 |
| | | | Middle | 9400 | 1880.0 | 21.18 | 22.50 |
| | | | Highest | 9538 | 1907.6 | 21.06 | 22.50 |
| | | 5 | Lowest | 9262 | 1852.4 | 22.88 | 24.50 |
| | | | Middle | 9400 | 1880.0 | 23.18 | 24.50 |
| | | | Highest | 9538 | 1907.6 | 23.03 | 24.50 |

| Band | Modulation | Date Rate or Sub-test | CH | | Frequency (MHz) | Avg Conducted power (dBm) | Tune up (dBm) |
|---|---|---|---|---|---|---|---|
| WCDMA IV | RMC12.2K | --- | Lowest | 1312 | 1712.4 | 22.86 | 24.50 |
| | | | Middle | 1413 | 1732.6 | 22.98 | 24.50 |
| | | | Highest | 1513 | 1752.6 | 23.39 | 24.50 |
| HSDPA IV | QPSK | 1 | Lowest | 1312 | 1712.4 | 22.66 | 24.50 |
| | | | Middle | 1413 | 1732.6 | 22.78 | 24.50 |
| | | | Highest | 1513 | 1752.6 | 22.90 | 24.50 |
| | | 2 | Lowest | 1312 | 1712.4 | 22.66 | 24.50 |
| | | | Middle | 1413 | 1732.6 | 22.78 | 24.50 |
| | | | Highest | 1513 | 1752.6 | 22.90 | 24.50 |
| | | 3 | Lowest | 1312 | 1712.4 | 22.16 | 24.00 |
| | | | Middle | 1413 | 1732.6 | 22.28 | 24.00 |
| | | | Highest | 1513 | 1752.6 | 22.33 | 24.00 |
| | | 4 | Lowest | 1312 | 1712.4 | 22.16 | 24.00 |
| | | | Middle | 1413 | 1732.6 | 22.28 | 24.00 |
| | | | Highest | 1513 | 1752.6 | 22.40 | 24.00 |
| HSUPA IV | | 1 | Lowest | 1312 | 1712.4 | 22.66 | 24.50 |
| | | | Middle | 1413 | 1732.6 | 22.78 | 24.50 |
| | | | Highest | 1513 | 1752.6 | 22.88 | 24.50 |
| | | 2 | Lowest | 1312 | 1712.4 | 20.66 | 22.50 |
| | | | Middle | 1413 | 1732.6 | 20.77 | 22.50 |
| | | | Highest | 1513 | 1752.6 | 20.90 | 22.50 |
| | | 3 | Lowest | 1312 | 1712.4 | 21.66 | 23.50 |
| | | | Middle | 1413 | 1732.6 | 21.78 | 23.50 |
| | | | Highest | 1513 | 1752.6 | 21.90 | 23.50 |
| | | 4 | Lowest | 1312 | 1712.4 | 20.59 | 22.50 |
| | | | Middle | 1413 | 1732.6 | 20.78 | 22.50 |
| | | | Highest | 1513 | 1752.6 | 20.90 | 22.50 |
| | | 5 | Lowest | 1312 | 1712.4 | 22.63 | 24.50 |
| | | | Middle | 1413 | 1732.6 | 22.78 | 24.50 |
| | | | Highest | 1513 | 1752.6 | 22.90 | 24.50 |

| Band | Modulation | Date Rate or Sub-test | CH | | Frequency (MHz) | Avg Conducted power (dBm) | Tune up (dBm) |
|---|---|---|---|---|---|---|---|
| WCDMA V | RMC12.2K | --- | Lowest | 4132 | 826.4 | 23.53 | 24.50 |
| | | | Middle | 4182 | 836.4 | 23.69 | 24.50 |
| | | | Highest | 4233 | 846.6 | 23.62 | 24.50 |
| HSDPA V | QPSK | 1 | Lowest | 4132 | 826.4 | 23.17 | 24.50 |
| | | | Middle | 4182 | 836.4 | 23.29 | 24.50 |
| | | | Highest | 4233 | 846.6 | 23.25 | 24.50 |
| | | 2 | Lowest | 4132 | 826.4 | 23.18 | 24.50 |
| | | | Middle | 41832 | 836.4 | 23.30 | 24.50 |
| | | | Highest | 4233 | 846.6 | 23.26 | 24.50 |
| | | 3 | Lowest | 4132 | 826.4 | 22.68 | 24.00 |
| | | | Middle | 4182 | 836.4 | 22.80 | 24.00 |
| | | | Highest | 4233 | 846.6 | 22.76 | 24.00 |
| | | 4 | Lowest | 4132 | 826.4 | 22.68 | 24.00 |
| | | | Middle | 4182 | 836.4 | 22.80 | 24.00 |
| | | | Highest | 4233 | 846.6 | 22.76 | 24.00 |
| HSUPA V | | 1 | Lowest | 4132 | 826.4 | 23.18 | 24.50 |
| | | | Middle | 4182 | 836.4 | 23.30 | 24.50 |
| | | | Highest | 4233 | 846.6 | 23.26 | 24.50 |
| | | 2 | Lowest | 4132 | 826.4 | 21.18 | 22.50 |
| | | | Middle | 4182 | 836.4 | 21.30 | 22.50 |
| | | | Highest | 4233 | 846.6 | 21.26 | 22.50 |
| | | 3 | Lowest | 4132 | 826.4 | 22.18 | 23.50 |
| | | | Middle | 4182 | 836.4 | 22.30 | 23.50 |
| | | | Highest | 4233 | 846.6 | 22.26 | 23.50 |
| | | 4 | Lowest | 4132 | 826.4 | 21.18 | 22.50 |
| | | | Middle | 4182 | 836.4 | 21.30 | 22.50 |
| | | | Highest | 4233 | 846.6 | 21.26 | 22.50 |
| | | 5 | Lowest | 4132 | 826.4 | 23.18 | 24.50 |
| | | | Middle | 4182 | 836.4 | 23.30 | 24.50 |
| | | | Highest | 4233 | 846.6 | 23.26 | 24.50 |

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 18607 | 18900 | 19193 | Channel | | | | |
| 1850.7 | 1880 | 1909.3 | Freq. (MHz) | | | | |
| 22.34 | 22.71 | 21.91 | 24 | QPSK | 1.4MHz | 1 | 0 |
| 22.22 | 22.67 | 22.07 | 24 | QPSK | 1.4MHz | 1 | 2 |
| 22.30 | 22.63 | 21.88 | 24 | QPSK | 1.4MHz | 1 | 5 |
| 22.29 | 22.59 | 21.99 | 24 | QPSK | 1.4MHz | 3 | 0 |
| 22.28 | 22.60 | 21.87 | 24 | QPSK | 1.4MHz | 3 | 1 |
| 22.24 | 22.59 | 22.00 | 24 | QPSK | 1.4MHz | 3 | 3 |
| 21.28 | 21.66 | 20.91 | 23 | QPSK | 1.4MHz | 6 | 0 |
| 21.22 | 22.29 | 21.52 | 23 | 16QAM | 1.4MHz | 1 | 0 |
| 21.80 | 22.27 | 21.37 | 23 | 16QAM | 1.4MHz | 1 | 2 |
| 22.18 | 21.90 | 21.09 | 23 | 16QAM | 1.4MHz | 1 | 5 |
| 21.26 | 21.80 | 20.96 | 23 | 16QAM | 1.4MHz | 3 | 0 |
| 21.47 | 21.71 | 21.04 | 23 | 16QAM | 1.4MHz | 3 | 1 |
| 21.34 | 21.74 | 21.04 | 23 | 16QAM | 1.4MHz | 3 | 3 |
| 20.37 | 20.81 | 20.05 | 22 | 16QAM | 1.4MHz | 6 | 0 |

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 18615 | 18900 | 19185 | Channel | | | | |
| 1851.5 | 1880 | 1908.5 | Freq. (MHz) | | | | |
| 22.48 | 22.63 | 22.16 | 24 | QPSK | 3MHz | 1 | 0 |
| 22.56 | 22.70 | 22.22 | 24 | QPSK | 3MHz | 1 | 7 |
| 22.47 | 22.71 | 22.18 | 24 | QPSK | 3MHz | 1 | 14 |
| 21.44 | 21.68 | 21.13 | 23 | QPSK | 3MHz | 8 | 0 |
| 21.38 | 21.67 | 21.10 | 23 | QPSK | 3MHz | 8 | 3 |
| 21.40 | 21.68 | 21.08 | 23 | QPSK | 3MHz | 8 | 7 |
| 21.44 | 21.66 | 21.16 | 23 | QPSK | 3MHz | 15 | 0 |
| 21.96 | 21.88 | 21.55 | 23 | 16QAM | 3MHz | 1 | 0 |
| 21.45 | 21.58 | 21.63 | 23 | 16QAM | 3MHz | 1 | 7 |
| 21.83 | 21.86 | 21.58 | 23 | 16QAM | 3MHz | 1 | 14 |
| 20.60 | 20.73 | 20.20 | 22 | 16QAM | 3MHz | 8 | 0 |
| 20.46 | 20.70 | 20.21 | 22 | 16QAM | 3MHz | 8 | 3 |
| 20.47 | 20.65 | 20.23 | 22 | 16QAM | 3MHz | 8 | 7 |
| 20.46 | 20.73 | 20.23 | 22 | 16QAM | 3MHz | 15 | 0 |

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| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 18625 | 18900 | 19175 | Channel | | | | |
| 1852.5 | 1880 | 1907.5 | Freq. (MHz) | | | | |
| 22.55 | 22.73 | 22.33 | 24 | QPSK | 5MHz | 1 | 0 |
| 22.46 | 22.64 | 22.27 | 24 | QPSK | 5MHz | 1 | 12 |
| 22.28 | 22.63 | 22.19 | 24 | QPSK | 5MHz | 1 | 24 |
| 21.47 | 21.72 | 21.26 | 23 | QPSK | 5MHz | 12 | 0 |
| 21.42 | 21.71 | 21.21 | 23 | QPSK | 5MHz | 12 | 6 |
| 21.37 | 21.76 | 21.14 | 23 | QPSK | 5MHz | 12 | 13 |
| 21.46 | 21.73 | 21.17 | 23 | QPSK | 5MHz | 25 | 0 |
| 22.05 | 22.04 | 21.51 | 23 | 16QAM | 5MHz | 1 | 0 |
| 21.97 | 22.29 | 21.57 | 23 | 16QAM | 5MHz | 1 | 12 |
| 21.77 | 22.26 | 21.86 | 23 | 16QAM | 5MHz | 1 | 24 |
| 20.59 | 20.75 | 20.29 | 22 | 16QAM | 5MHz | 12 | 0 |
| 20.53 | 20.80 | 20.16 | 22 | 16QAM | 5MHz | 12 | 6 |
| 20.45 | 20.79 | 20.22 | 22 | 16QAM | 5MHz | 12 | 13 |
| 20.40 | 20.77 | 20.22 | 22 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 18650 | 18900 | 19150 | Channel | | | | |
| 1855 | 1880 | 1905 | Freq. (MHz) | | | | |
| 22.44 | 22.69 | 22.21 | 24 | QPSK | 10MHz | 1 | 0 |
| 22.15 | 22.72 | 22.22 | 24 | QPSK | 10MHz | 1 | 24 |
| 22.24 | 22.60 | 22.04 | 24 | QPSK | 10MHz | 1 | 49 |
| 21.30 | 21.67 | 21.22 | 23 | QPSK | 10MHz | 25 | 0 |
| 21.17 | 21.67 | 21.17 | 23 | QPSK | 10MHz | 25 | 12 |
| 21.13 | 21.62 | 21.18 | 23 | QPSK | 10MHz | 25 | 25 |
| 21.17 | 21.65 | 21.24 | 23 | QPSK | 10MHz | 50 | 0 |
| 21.72 | 21.92 | 21.61 | 23 | 16QAM | 10MHz | 1 | 0 |
| 21.49 | 22.05 | 21.37 | 23 | 16QAM | 10MHz | 1 | 24 |
| 21.44 | 21.86 | 21.36 | 23 | 16QAM | 10MHz | 1 | 49 |
| 20.36 | 20.85 | 20.32 | 22 | 16QAM | 10MHz | 25 | 0 |
| 20.16 | 20.85 | 20.21 | 22 | 16QAM | 10MHz | 25 | 12 |
| 20.16 | 20.75 | 20.26 | 22 | 16QAM | 10MHz | 25 | 25 |
| 20.16 | 20.72 | 20.32 | 22 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 18675 | 18900 | 19125 | Channel | | | | |
| 1857.5 | 1880 | 1902.5 | Freq. (MHz) | | | | |
| 22.42 | 22.59 | 22.22 | 24 | QPSK | 15MHz | 1 | 0 |
| 22.19 | 22.71 | 22.23 | 24 | QPSK | 15MHz | 1 | 37 |
| 22.26 | 22.49 | 22.04 | 24 | QPSK | 15MHz | 1 | 74 |
| 21.23 | 21.63 | 21.14 | 23 | QPSK | 15MHz | 36 | 0 |
| 21.17 | 21.69 | 21.13 | 23 | QPSK | 15MHz | 36 | 19 |
| 21.20 | 21.62 | 21.16 | 23 | QPSK | 15MHz | 36 | 39 |
| 21.19 | 21.68 | 21.28 | 23 | QPSK | 15MHz | 75 | 0 |
| 21.87 | 21.95 | 21.34 | 23 | 16QAM | 15MHz | 1 | 0 |
| 21.51 | 21.93 | 21.42 | 23 | 16QAM | 15MHz | 1 | 37 |
| 21.62 | 21.80 | 21.39 | 23 | 16QAM | 15MHz | 1 | 74 |
| 20.25 | 20.71 | 20.18 | 22 | 16QAM | 15MHz | 36 | 0 |
| 20.12 | 20.73 | 20.26 | 22 | 16QAM | 15MHz | 36 | 19 |
| 20.32 | 20.66 | 20.22 | 22 | 16QAM | 15MHz | 36 | 39 |
| 20.15 | 20.67 | 20.33 | 22 | 16QAM | 15MHz | 75 | 0 |

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 18700 | 18900 | 19100 | Channel | | | | |
| 1860 | 1880 | 1900 | Freq. (MHz) | | | | |
| 22.61 | 22.73 | 22.63 | 24 | QPSK | 20MHz | 1 | 0 |
| 22.10 | 22.66 | 22.23 | 24 | QPSK | 20MHz | 1 | 49 |
| 22.68 | 22.55 | 22.26 | 24 | QPSK | 20MHz | 1 | 99 |
| 21.37 | 21.67 | 21.32 | 23 | QPSK | 20MHz | 50 | 0 |
| 21.29 | 21.72 | 21.24 | 23 | QPSK | 20MHz | 50 | 25 |
| 21.36 | 21.62 | 21.23 | 23 | QPSK | 20MHz | 50 | 50 |
| 21.40 | 21.85 | 21.37 | 23 | QPSK | 20MHz | 100 | 0 |
| 21.94 | 22.01 | 21.74 | 23 | 16QAM | 20MHz | 1 | 0 |
| 21.65 | 22.21 | 21.56 | 23 | 16QAM | 20MHz | 1 | 49 |
| 21.55 | 22.07 | 21.52 | 23 | 16QAM | 20MHz | 1 | 99 |
| 20.44 | 20.70 | 20.30 | 22 | 16QAM | 20MHz | 50 | 0 |
| 20.34 | 20.76 | 20.21 | 22 | 16QAM | 20MHz | 50 | 25 |
| 20.44 | 20.70 | 20.26 | 22 | 16QAM | 20MHz | 50 | 50 |
| 20.53 | 20.85 | 20.56 | 22 | 16QAM | 20MHz | 100 | 0 |

| LTE Band 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 19957 | 20175 | 20393 | Channel | | | | |
| 1710.7 | 1732.5 | 1754.3 | Freq. (MHz) | | | | |
| 22.76 | 22.62 | 23.06 | 24 | QPSK | 1.4MHz | 1 | 0 |
| 22.69 | 22.57 | 23.12 | 24 | QPSK | 1.4MHz | 1 | 2 |
| 22.63 | 22.65 | 23.19 | 24 | QPSK | 1.4MHz | 1 | 5 |
| 22.64 | 22.60 | 23.11 | 24 | QPSK | 1.4MHz | 3 | 0 |
| 22.65 | 22.62 | 23.12 | 24 | QPSK | 1.4MHz | 3 | 1 |
| 22.65 | 22.64 | 23.12 | 24 | QPSK | 1.4MHz | 3 | 3 |
| 21.64 | 21.64 | 22.12 | 23 | QPSK | 1.4MHz | 6 | 0 |
| 21.89 | 22.02 | 22.04 | 23 | 16QAM | 1.4MHz | 1 | 0 |
| 21.39 | 21.89 | 22.17 | 23 | 16QAM | 1.4MHz | 1 | 2 |
| 21.85 | 21.93 | 21.77 | 23 | 16QAM | 1.4MHz | 1 | 5 |
| 21.69 | 21.63 | 22.10 | 23 | 16QAM | 1.4MHz | 3 | 0 |
| 21.69 | 21.60 | 22.05 | 23 | 16QAM | 1.4MHz | 3 | 1 |
| 21.52 | 21.72 | 22.13 | 23 | 16QAM | 1.4MHz | 3 | 3 |
| 20.75 | 20.74 | 20.94 | 22 | 16QAM | 1.4MHz | 6 | 0 |

| LTE Band 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 19965 | 20175 | 20385 | Channel | | | | |
| 1711.5 | 1732.5 | 1753.5 | Freq. (MHz) | | | | |
| 22.73 | 22.71 | 23.17 | 24 | QPSK | 3MHz | 1 | 0 |
| 22.75 | 22.67 | 23.11 | 24 | QPSK | 3MHz | 1 | 7 |
| 22.74 | 22.60 | 23.13 | 24 | QPSK | 3MHz | 1 | 14 |
| 21.71 | 21.68 | 22.16 | 23 | QPSK | 3MHz | 8 | 0 |
| 21.70 | 21.65 | 22.16 | 23 | QPSK | 3MHz | 8 | 3 |
| 21.72 | 21.73 | 22.12 | 23 | QPSK | 3MHz | 8 | 7 |
| 21.72 | 21.75 | 22.09 | 23 | QPSK | 3MHz | 15 | 0 |
| 22.04 | 21.85 | 22.18 | 23 | 16QAM | 3MHz | 1 | 0 |
| 21.38 | 22.17 | 22.51 | 23 | 16QAM | 3MHz | 1 | 7 |
| 22.10 | 21.71 | 22.53 | 23 | 16QAM | 3MHz | 1 | 14 |
| 20.84 | 20.72 | 21.23 | 22 | 16QAM | 3MHz | 8 | 0 |
| 20.69 | 20.67 | 21.08 | 22 | 16QAM | 3MHz | 8 | 3 |
| 20.79 | 20.81 | 21.25 | 22 | 16QAM | 3MHz | 8 | 7 |
| 20.67 | 20.89 | 21.26 | 22 | 16QAM | 3MHz | 15 | 0 |

| LTE Band 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 19975 | 20175 | 20375 | Channel | | | | |
| 1712.5 | 1732.5 | 1752.5 | Freq. (MHz) | | | | |
| 22.81 | 22.91 | 23.08 | 24 | QPSK | 5MHz | 1 | 0 |
| 22.78 | 22.74 | 23.13 | 24 | QPSK | 5MHz | 1 | 12 |
| 22.84 | 22.71 | 23.15 | 24 | QPSK | 5MHz | 1 | 24 |
| 21.75 | 21.76 | 22.17 | 23 | QPSK | 5MHz | 12 | 0 |
| 21.78 | 21.72 | 22.18 | 23 | QPSK | 5MHz | 12 | 6 |
| 21.80 | 21.71 | 22.13 | 23 | QPSK | 5MHz | 12 | 13 |
| 21.77 | 21.76 | 22.10 | 23 | QPSK | 5MHz | 25 | 0 |
| 22.04 | 21.40 | 22.33 | 23 | 16QAM | 5MHz | 1 | 0 |
| 22.08 | 21.89 | 22.58 | 23 | 16QAM | 5MHz | 1 | 12 |
| 22.00 | 22.25 | 22.55 | 23 | 16QAM | 5MHz | 1 | 24 |
| 20.82 | 20.78 | 21.08 | 22 | 16QAM | 5MHz | 12 | 0 |
| 20.88 | 20.72 | 21.17 | 22 | 16QAM | 5MHz | 12 | 6 |
| 20.82 | 20.71 | 21.12 | 22 | 16QAM | 5MHz | 12 | 13 |
| 20.76 | 20.72 | 21.16 | 22 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20000 | 20175 | 20350 | Channel | | | | |
| 1715 | 1732.5 | 1750 | Freq. (MHz) | | | | |
| 22.74 | 22.61 | 23.22 | 24 | QPSK | 10MHz | 1 | 0 |
| 22.99 | 22.64 | 23.16 | 24 | QPSK | 10MHz | 1 | 24 |
| 22.82 | 22.78 | 23.06 | 24 | QPSK | 10MHz | 1 | 49 |
| 21.78 | 21.76 | 22.06 | 23 | QPSK | 10MHz | 25 | 0 |
| 21.83 | 21.67 | 22.10 | 23 | QPSK | 10MHz | 25 | 12 |
| 21.95 | 21.70 | 22.12 | 23 | QPSK | 10MHz | 25 | 25 |
| 21.87 | 21.67 | 22.07 | 23 | QPSK | 10MHz | 50 | 0 |
| 22.14 | 22.12 | 22.38 | 23 | 16QAM | 10MHz | 1 | 0 |
| 21.97 | 21.83 | 22.53 | 23 | 16QAM | 10MHz | 1 | 24 |
| 22.29 | 21.92 | 22.56 | 23 | 16QAM | 10MHz | 1 | 49 |
| 20.86 | 20.84 | 21.13 | 22 | 16QAM | 10MHz | 25 | 0 |
| 20.91 | 20.71 | 21.20 | 22 | 16QAM | 10MHz | 25 | 12 |
| 21.00 | 20.70 | 21.24 | 22 | 16QAM | 10MHz | 25 | 25 |
| 20.89 | 20.76 | 21.12 | 22 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20025 | 20175 | 20325 | Channel | | | | |
| 1717.5 | 1732.5 | 1747.5 | Freq. (MHz) | | | | |
| 22.80 | 22.82 | 22.94 | 24 | QPSK | 15MHz | 1 | 0 |
| 22.96 | 22.73 | 23.06 | 24 | QPSK | 15MHz | 1 | 37 |
| 22.76 | 22.87 | 23.20 | 24 | QPSK | 15MHz | 1 | 74 |
| 21.83 | 21.66 | 21.99 | 23 | QPSK | 15MHz | 36 | 0 |
| 21.89 | 21.61 | 21.97 | 23 | QPSK | 15MHz | 36 | 19 |
| 21.88 | 21.63 | 22.08 | 23 | QPSK | 15MHz | 36 | 39 |
| 22.02 | 21.64 | 21.97 | 23 | QPSK | 15MHz | 75 | 0 |
| 22.13 | 22.03 | 22.09 | 23 | 16QAM | 15MHz | 1 | 0 |
| 22.10 | 21.87 | 22.38 | 23 | 16QAM | 15MHz | 1 | 37 |
| 22.13 | 21.73 | 21.90 | 23 | 16QAM | 15MHz | 1 | 74 |
| 20.90 | 20.72 | 21.04 | 22 | 16QAM | 15MHz | 36 | 0 |
| 20.97 | 20.71 | 21.07 | 22 | 16QAM | 15MHz | 36 | 19 |
| 20.81 | 20.75 | 21.12 | 22 | 16QAM | 15MHz | 36 | 39 |
| 20.99 | 20.80 | 21.14 | 22 | 16QAM | 15MHz | 75 | 0 |

| LTE Band 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20050 | 20175 | 20300 | Channel | | | | |
| 1720 | 1732.5 | 1745 | Freq. (MHz) | | | | |
| 22.82 | 22.75 | 22.99 | 24 | QPSK | 20MHz | 1 | 0 |
| 23.03 | 22.75 | 23.10 | 24 | QPSK | 20MHz | 1 | 49 |
| 22.64 | 23.17 | 23.15 | 24 | QPSK | 20MHz | 1 | 99 |
| 21.93 | 21.95 | 21.90 | 23 | QPSK | 20MHz | 50 | 0 |
| 21.89 | 22.06 | 22.01 | 23 | QPSK | 20MHz | 50 | 25 |
| 21.77 | 22.13 | 22.08 | 23 | QPSK | 20MHz | 50 | 50 |
| 22.08 | 22.27 | 22.21 | 23 | QPSK | 20MHz | 100 | 0 |
| 22.22 | 22.21 | 22.18 | 23 | 16QAM | 20MHz | 1 | 0 |
| 22.27 | 21.85 | 22.46 | 23 | 16QAM | 20MHz | 1 | 49 |
| 21.99 | 22.14 | 22.23 | 23 | 16QAM | 20MHz | 1 | 99 |
| 21.02 | 20.92 | 21.03 | 22 | 16QAM | 20MHz | 50 | 0 |
| 20.92 | 20.76 | 21.15 | 22 | 16QAM | 20MHz | 50 | 25 |
| 20.77 | 20.81 | 21.15 | 22 | 16QAM | 20MHz | 50 | 50 |
| 21.12 | 20.90 | 21.23 | 22 | 16QAM | 20MHz | 100 | 0 |

| LTE Band 5 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20407 | 20525 | 20643 | Channel | | | | |
| 824.7 | 836.5 | 848.3 | Freq. (MHz) | | | | |
| 22.28 | 22.27 | 22.51 | 24 | QPSK | 1.4MHz | 1 | 0 |
| 22.33 | 22.32 | 22.52 | 24 | QPSK | 1.4MHz | 1 | 2 |
| 22.26 | 22.27 | 22.59 | 24 | QPSK | 1.4MHz | 1 | 5 |
| 22.32 | 22.30 | 22.61 | 24 | QPSK | 1.4MHz | 3 | 0 |
| 22.33 | 22.27 | 22.55 | 24 | QPSK | 1.4MHz | 3 | 1 |
| 22.34 | 22.25 | 22.54 | 24 | QPSK | 1.4MHz | 3 | 3 |
| 21.34 | 21.27 | 21.57 | 23 | QPSK | 1.4MHz | 6 | 0 |
| 21.64 | 21.25 | 21.97 | 23 | 16QAM | 1.4MHz | 1 | 0 |
| 21.33 | 21.29 | 21.95 | 23 | 16QAM | 1.4MHz | 1 | 2 |
| 21.81 | 21.69 | 22.06 | 23 | 16QAM | 1.4MHz | 1 | 5 |
| 21.39 | 21.33 | 21.61 | 23 | 16QAM | 1.4MHz | 3 | 0 |
| 21.45 | 21.24 | 21.66 | 23 | 16QAM | 1.4MHz | 3 | 1 |
| 21.18 | 21.33 | 21.60 | 23 | 16QAM | 1.4MHz | 3 | 3 |
| 20.48 | 20.38 | 20.64 | 22 | 16QAM | 1.4MHz | 6 | 0 |

| LTE Band 5 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20415 | 20525 | 20635 | Channel | | | | |
| 825.5 | 836.5 | 847.5 | Freq. (MHz) | | | | |
| 22.55 | 22.32 | 22.42 | 24 | QPSK | 3MHz | 1 | 0 |
| 22.50 | 22.26 | 22.63 | 24 | QPSK | 3MHz | 1 | 7 |
| 22.45 | 22.40 | 22.52 | 24 | QPSK | 3MHz | 1 | 14 |
| 21.51 | 21.34 | 21.58 | 23 | QPSK | 3MHz | 8 | 0 |
| 21.47 | 21.39 | 21.60 | 23 | QPSK | 3MHz | 8 | 3 |
| 21.49 | 21.44 | 21.59 | 23 | QPSK | 3MHz | 8 | 7 |
| 21.48 | 21.36 | 21.73 | 23 | QPSK | 3MHz | 15 | 0 |
| 21.91 | 21.85 | 21.79 | 23 | 16QAM | 3MHz | 1 | 0 |
| 21.76 | 21.72 | 21.88 | 23 | 16QAM | 3MHz | 1 | 7 |
| 21.22 | 21.86 | 21.99 | 23 | 16QAM | 3MHz | 1 | 14 |
| 20.49 | 20.43 | 20.66 | 22 | 16QAM | 3MHz | 8 | 0 |
| 20.42 | 20.49 | 20.44 | 22 | 16QAM | 3MHz | 8 | 3 |
| 20.59 | 20.50 | 20.45 | 22 | 16QAM | 3MHz | 8 | 7 |
| 20.40 | 20.49 | 20.68 | 22 | 16QAM | 3MHz | 15 | 0 |

| LTE Band 5 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20425 | 20525 | 20625 | Channel | | | | |
| 826.5 | 836.5 | 846.5 | Freq. (MHz) | | | | |
| 22.49 | 22.40 | 22.47 | 24 | QPSK | 5MHz | 1 | 0 |
| 22.38 | 22.36 | 22.53 | 24 | QPSK | 5MHz | 1 | 12 |
| 22.63 | 22.40 | 22.64 | 24 | QPSK | 5MHz | 1 | 24 |
| 21.45 | 21.39 | 21.52 | 23 | QPSK | 5MHz | 12 | 0 |
| 21.44 | 21.36 | 21.52 | 23 | QPSK | 5MHz | 12 | 6 |
| 21.41 | 21.42 | 21.60 | 23 | QPSK | 5MHz | 12 | 13 |
| 21.48 | 21.43 | 21.46 | 23 | QPSK | 5MHz | 25 | 0 |
| 21.70 | 22.00 | 21.64 | 23 | 16QAM | 5MHz | 1 | 0 |
| 21.86 | 21.60 | 22.00 | 23 | 16QAM | 5MHz | 1 | 12 |
| 21.96 | 21.82 | 22.04 | 23 | 16QAM | 5MHz | 1 | 24 |
| 20.57 | 20.60 | 20.48 | 22 | 16QAM | 5MHz | 12 | 0 |
| 20.55 | 20.49 | 20.59 | 22 | 16QAM | 5MHz | 12 | 6 |
| 20.54 | 20.49 | 20.82 | 22 | 16QAM | 5MHz | 12 | 13 |
| 20.56 | 20.47 | 20.72 | 22 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 5 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20450 | 20525 | 20600 | Channel | | | | |
| 829 | 836.5 | 844 | Freq. (MHz) | | | | |
| 22.46 | 22.55 | 22.61 | 24 | QPSK | 10MHz | 1 | 0 |
| 22.43 | 22.38 | 22.55 | 24 | QPSK | 10MHz | 1 | 24 |
| 22.35 | 22.68 | 22.66 | 24 | QPSK | 10MHz | 1 | 49 |
| 21.44 | 21.56 | 21.50 | 23 | QPSK | 10MHz | 25 | 0 |
| 21.54 | 21.55 | 21.50 | 23 | QPSK | 10MHz | 25 | 12 |
| 21.45 | 21.57 | 21.52 | 23 | QPSK | 10MHz | 25 | 25 |
| 21.57 | 21.70 | 21.63 | 23 | QPSK | 10MHz | 50 | 0 |
| 21.74 | 21.68 | 21.97 | 23 | 16QAM | 10MHz | 1 | 0 |
| 22.02 | 21.97 | 21.74 | 23 | 16QAM | 10MHz | 1 | 24 |
| 21.97 | 21.39 | 22.05 | 23 | 16QAM | 10MHz | 1 | 49 |
| 20.55 | 20.42 | 20.55 | 22 | 16QAM | 10MHz | 25 | 0 |
| 20.57 | 20.53 | 20.61 | 22 | 16QAM | 10MHz | 25 | 12 |
| 20.59 | 20.49 | 20.62 | 22 | 16QAM | 10MHz | 25 | 25 |
| 20.62 | 20.42 | 20.65 | 22 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 7 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20775 | 21100 | 21425 | Channel | | | | |
| 2502.5 | 2535 | 2567.5 | Freq. (MHz) | | | | |
| 22.85 | 22.63 | 22.41 | 24 | QPSK | 5MHz | 1 | 0 |
| 22.79 | 22.62 | 22.30 | 24 | QPSK | 5MHz | 1 | 12 |
| 22.91 | 22.58 | 22.40 | 24 | QPSK | 5MHz | 1 | 24 |
| 21.86 | 21.63 | 21.43 | 23 | QPSK | 5MHz | 12 | 0 |
| 21.85 | 21.65 | 21.40 | 23 | QPSK | 5MHz | 12 | 6 |
| 21.91 | 21.66 | 21.52 | 23 | QPSK | 5MHz | 12 | 13 |
| 21.94 | 21.64 | 21.47 | 23 | QPSK | 5MHz | 25 | 0 |
| 22.48 | 22.08 | 21.36 | 23 | 16QAM | 5MHz | 1 | 0 |
| 22.06 | 21.91 | 21.63 | 23 | 16QAM | 5MHz | 1 | 12 |
| 22.31 | 22.15 | 21.98 | 23 | 16QAM | 5MHz | 1 | 24 |
| 20.92 | 20.57 | 20.39 | 22 | 16QAM | 5MHz | 12 | 0 |
| 20.87 | 20.58 | 20.43 | 22 | 16QAM | 5MHz | 12 | 6 |
| 21.03 | 20.75 | 20.54 | 22 | 16QAM | 5MHz | 12 | 13 |
| 20.86 | 20.65 | 20.49 | 22 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 7 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20800 | 21100 | 21400 | Channel | | | | |
| 2505 | 2535 | 2565 | Freq. (MHz) | | | | |
| 22.82 | 22.52 | 22.27 | 24 | QPSK | 10MHz | 1 | 0 |
| 22.83 | 22.53 | 22.54 | 24 | QPSK | 10MHz | 1 | 24 |
| 22.91 | 22.59 | 22.50 | 24 | QPSK | 10MHz | 1 | 49 |
| 21.95 | 21.64 | 21.45 | 23 | QPSK | 10MHz | 25 | 0 |
| 21.98 | 21.66 | 21.45 | 23 | QPSK | 10MHz | 25 | 12 |
| 22.01 | 21.71 | 21.45 | 23 | QPSK | 10MHz | 25 | 25 |
| 21.98 | 21.67 | 21.41 | 23 | QPSK | 10MHz | 50 | 0 |
| 22.18 | 22.04 | 21.62 | 23 | 16QAM | 10MHz | 1 | 0 |
| 22.12 | 21.83 | 21.79 | 23 | 16QAM | 10MHz | 1 | 24 |
| 22.52 | 22.00 | 21.83 | 23 | 16QAM | 10MHz | 1 | 49 |
| 20.97 | 20.66 | 20.55 | 22 | 16QAM | 10MHz | 25 | 0 |
| 20.99 | 20.70 | 20.45 | 22 | 16QAM | 10MHz | 25 | 12 |
| 21.05 | 20.79 | 20.50 | 22 | 16QAM | 10MHz | 25 | 25 |
| 20.97 | 20.69 | 20.48 | 22 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 7 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20825 | 21100 | 21375 | Channel | | | | |
| 2507.5 | 2535 | 2562.5 | Freq. (MHz) | | | | |
| 22.74 | 22.42 | 22.31 | 24 | QPSK | 15MHz | 1 | 0 |
| 22.97 | 22.54 | 22.20 | 24 | QPSK | 15MHz | 1 | 37 |
| 22.73 | 22.55 | 22.27 | 24 | QPSK | 15MHz | 1 | 74 |
| 21.88 | 21.54 | 21.37 | 23 | QPSK | 15MHz | 36 | 0 |
| 21.95 | 21.58 | 21.39 | 23 | QPSK | 15MHz | 36 | 19 |
| 21.86 | 21.53 | 21.36 | 23 | QPSK | 15MHz | 36 | 39 |
| 21.95 | 21.58 | 21.37 | 23 | QPSK | 15MHz | 75 | 0 |
| 21.92 | 21.52 | 21.49 | 23 | 16QAM | 15MHz | 1 | 0 |
| 22.00 | 21.54 | 21.47 | 23 | 16QAM | 15MHz | 1 | 37 |
| 21.92 | 21.64 | 21.73 | 23 | 16QAM | 15MHz | 1 | 74 |
| 20.96 | 20.54 | 20.39 | 22 | 16QAM | 15MHz | 36 | 0 |
| 20.94 | 20.65 | 20.46 | 22 | 16QAM | 15MHz | 36 | 19 |
| 20.92 | 20.56 | 20.44 | 22 | 16QAM | 15MHz | 36 | 39 |
| 20.94 | 20.62 | 20.47 | 22 | 16QAM | 15MHz | 75 | 0 |

| LTE Band 7 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20850 | 21100 | 21350 | Channel | | | | |
| 2510 | 2535 | 2560 | Freq. (MHz) | | | | |
| 22.77 | 22.58 | 22.42 | 24 | QPSK | 20MHz | 1 | 0 |
| 22.81 | 22.53 | 22.33 | 24 | QPSK | 20MHz | 1 | 49 |
| 22.92 | 22.58 | 22.44 | 24 | QPSK | 20MHz | 1 | 99 |
| 21.94 | 21.62 | 21.42 | 23 | QPSK | 20MHz | 50 | 0 |
| 21.92 | 21.64 | 21.39 | 23 | QPSK | 20MHz | 50 | 25 |
| 21.90 | 21.67 | 21.45 | 23 | QPSK | 20MHz | 50 | 50 |
| 22.01 | 21.76 | 21.51 | 23 | QPSK | 20MHz | 100 | 0 |
| 21.84 | 21.77 | 21.90 | 23 | 16QAM | 20MHz | 1 | 0 |
| 22.08 | 21.70 | 21.68 | 23 | 16QAM | 20MHz | 1 | 49 |
| 21.48 | 21.91 | 21.60 | 23 | 16QAM | 20MHz | 1 | 99 |
| 21.01 | 20.66 | 20.45 | 22 | 16QAM | 20MHz | 50 | 0 |
| 20.94 | 20.65 | 20.42 | 22 | 16QAM | 20MHz | 50 | 25 |
| 20.94 | 20.62 | 20.45 | 22 | 16QAM | 20MHz | 50 | 50 |
| 20.99 | 20.74 | 20.48 | 22 | 16QAM | 20MHz | 100 | 0 |

| LTE Band 12 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 23017 | 23095 | 23173 | Channel | | | | |
| 699.7 | 707.5 | 715.3 | Freq. (MHz) | | | | |
| 22.55 | 22.54 | 22.48 | 24 | QPSK | 1.4MHz | 1 | 0 |
| 22.68 | 22.48 | 22.43 | 24 | QPSK | 1.4MHz | 1 | 2 |
| 22.65 | 22.55 | 22.48 | 24 | QPSK | 1.4MHz | 1 | 5 |
| 22.58 | 22.56 | 22.40 | 24 | QPSK | 1.4MHz | 3 | 0 |
| 22.57 | 22.45 | 22.43 | 24 | QPSK | 1.4MHz | 3 | 1 |
| 22.59 | 22.55 | 22.38 | 24 | QPSK | 1.4MHz | 3 | 3 |
| 21.56 | 21.56 | 21.44 | 23 | QPSK | 1.4MHz | 6 | 0 |
| 22.03 | 21.68 | 21.85 | 23 | 16QAM | 1.4MHz | 1 | 0 |
| 21.65 | 22.05 | 21.90 | 23 | 16QAM | 1.4MHz | 1 | 2 |
| 22.36 | 22.11 | 21.77 | 23 | 16QAM | 1.4MHz | 1 | 5 |
| 21.43 | 21.52 | 21.27 | 23 | 16QAM | 1.4MHz | 3 | 0 |
| 21.61 | 21.41 | 21.44 | 23 | 16QAM | 1.4MHz | 3 | 1 |
| 21.74 | 21.56 | 21.28 | 23 | 16QAM | 1.4MHz | 3 | 3 |
| 20.69 | 20.60 | 20.44 | 22 | 16QAM | 1.4MHz | 6 | 0 |

| LTE Band 12 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 23025 | 23095 | 23165 | Channel | | | | |
| 700.5 | 707.5 | 714.5 | Freq. (MHz) | | | | |
| 22.45 | 22.64 | 22.43 | 24 | QPSK | 3MHz | 1 | 0 |
| 22.59 | 22.46 | 22.48 | 24 | QPSK | 3MHz | 1 | 7 |
| 22.59 | 22.52 | 22.37 | 24 | QPSK | 3MHz | 1 | 14 |
| 21.61 | 21.55 | 21.47 | 23 | QPSK | 3MHz | 8 | 0 |
| 21.56 | 21.54 | 21.50 | 23 | QPSK | 3MHz | 8 | 3 |
| 21.63 | 21.65 | 21.47 | 23 | QPSK | 3MHz | 8 | 7 |
| 21.63 | 21.57 | 21.40 | 23 | QPSK | 3MHz | 15 | 0 |
| 21.97 | 21.81 | 21.99 | 23 | 16QAM | 3MHz | 1 | 0 |
| 22.17 | 21.96 | 21.82 | 23 | 16QAM | 3MHz | 1 | 7 |
| 21.82 | 21.88 | 21.91 | 23 | 16QAM | 3MHz | 1 | 14 |
| 20.66 | 20.70 | 20.52 | 22 | 16QAM | 3MHz | 8 | 0 |
| 20.61 | 20.63 | 20.37 | 22 | 16QAM | 3MHz | 8 | 3 |
| 20.70 | 20.74 | 20.69 | 22 | 16QAM | 3MHz | 8 | 7 |
| 20.62 | 20.58 | 20.49 | 22 | 16QAM | 3MHz | 15 | 0 |

| LTE Band 12 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 23035 | 23095 | 23155 | Channel | | | | |
| 701.5 | 707.5 | 713.5 | Freq. (MHz) | | | | |
| 22.38 | 22.58 | 22.62 | 24 | QPSK | 5MHz | 1 | 0 |
| 22.39 | 22.49 | 22.43 | 24 | QPSK | 5MHz | 1 | 12 |
| 22.43 | 22.60 | 22.42 | 24 | QPSK | 5MHz | 1 | 24 |
| 21.51 | 21.44 | 21.54 | 23 | QPSK | 5MHz | 12 | 0 |
| 21.51 | 21.49 | 21.56 | 23 | QPSK | 5MHz | 12 | 6 |
| 21.51 | 21.59 | 21.39 | 23 | QPSK | 5MHz | 12 | 13 |
| 21.50 | 21.54 | 21.38 | 23 | QPSK | 5MHz | 25 | 0 |
| 21.88 | 22.00 | 22.03 | 23 | 16QAM | 5MHz | 1 | 0 |
| 21.99 | 21.77 | 21.93 | 23 | 16QAM | 5MHz | 1 | 12 |
| 22.11 | 22.02 | 21.67 | 23 | 16QAM | 5MHz | 1 | 24 |
| 20.63 | 20.58 | 20.54 | 22 | 16QAM | 5MHz | 12 | 0 |
| 20.65 | 20.48 | 20.54 | 22 | 16QAM | 5MHz | 12 | 6 |
| 20.54 | 20.70 | 20.57 | 22 | 16QAM | 5MHz | 12 | 13 |
| 20.58 | 20.56 | 20.37 | 22 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 12 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 23060 | 23095 | 23130 | Channel | | | | |
| 704 | 707.5 | 711 | Freq. (MHz) | | | | |
| 22.67 | 22.69 | 22.43 | 24 | QPSK | 10MHz | 1 | 0 |
| 22.49 | 22.35 | 22.62 | 24 | QPSK | 10MHz | 1 | 24 |
| 22.66 | 22.58 | 22.41 | 24 | QPSK | 10MHz | 1 | 49 |
| 21.59 | 21.53 | 21.69 | 23 | QPSK | 10MHz | 25 | 0 |
| 21.43 | 21.56 | 21.70 | 23 | QPSK | 10MHz | 25 | 12 |
| 21.58 | 21.71 | 21.60 | 23 | QPSK | 10MHz | 25 | 25 |
| 21.55 | 21.66 | 21.59 | 23 | QPSK | 10MHz | 50 | 0 |
| 21.94 | 22.10 | 21.82 | 23 | 16QAM | 10MHz | 1 | 0 |
| 22.05 | 21.88 | 21.76 | 23 | 16QAM | 10MHz | 1 | 24 |
| 21.97 | 21.88 | 21.85 | 23 | 16QAM | 10MHz | 1 | 49 |
| 20.65 | 20.66 | 20.70 | 22 | 16QAM | 10MHz | 25 | 0 |
| 20.62 | 20.65 | 20.72 | 22 | 16QAM | 10MHz | 25 | 12 |
| 20.72 | 20.85 | 20.62 | 22 | 16QAM | 10MHz | 25 | 25 |
| 20.68 | 20.75 | 20.74 | 22 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 13 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 23205 | 23230 | 23255 | Channel | | | | |
| 779.5 | 782 | 784.5 | Freq. (MHz) | | | | |
| 22.86 | 22.81 | 22.93 | 24 | QPSK | 5MHz | 1 | 0 |
| 22.94 | 22.84 | 22.85 | 24 | QPSK | 5MHz | 1 | 12 |
| 22.90 | 22.96 | 22.87 | 24 | QPSK | 5MHz | 1 | 24 |
| 21.86 | 21.87 | 22.01 | 23 | QPSK | 5MHz | 12 | 0 |
| 21.85 | 21.91 | 21.92 | 23 | QPSK | 5MHz | 12 | 6 |
| 21.87 | 21.93 | 21.93 | 23 | QPSK | 5MHz | 12 | 13 |
| 21.99 | 22.02 | 21.94 | 23 | QPSK | 5MHz | 25 | 0 |
| 21.98 | 21.93 | 22.25 | 23 | 16QAM | 5MHz | 1 | 0 |
| 22.35 | 22.25 | 22.14 | 23 | 16QAM | 5MHz | 1 | 12 |
| 22.24 | 22.35 | 22.27 | 23 | 16QAM | 5MHz | 1 | 24 |
| 21.02 | 20.89 | 20.96 | 22 | 16QAM | 5MHz | 12 | 0 |
| 20.75 | 20.79 | 20.85 | 22 | 16QAM | 5MHz | 12 | 6 |
| 20.98 | 20.87 | 21.03 | 22 | 16QAM | 5MHz | 12 | 13 |
| 20.82 | 20.96 | 21.00 | 22 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 13 | | | | | | |
|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset | |
| 23230 | Channel | | | | | |
| 782 | Freq. (MHz) | | | | | |
| 22.84 | 24 | QPSK | 10MHz | 1 | 0 | |
| 22.93 | 24 | QPSK | 10MHz | 1 | 24 | |
| 23.00 | 24 | QPSK | 10MHz | 1 | 49 | |
| 22.08 | 23 | QPSK | 10MHz | 25 | 0 | |
| 22.00 | 23 | QPSK | 10MHz | 25 | 12 | |
| 22.04 | 23 | QPSK | 10MHz | 25 | 25 | |
| 22.15 | 23 | QPSK | 10MHz | 50 | 0 | |
| 22.15 | 23 | 16QAM | 10MHz | 1 | 0 | |
| 22.17 | 23 | 16QAM | 10MHz | 1 | 24 | |
| 22.31 | 23 | 16QAM | 10MHz | 1 | 49 | |
| 21.13 | 22 | 16QAM | 10MHz | 25 | 0 | |
| 21.12 | 22 | 16QAM | 10MHz | 25 | 12 | |
| 21.11 | 22 | 16QAM | 10MHz | 25 | 25 | |
| 21.16 | 22 | 16QAM | 10MHz | 50 | 0 | |

| LTE Band 17 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 23755 | 23790 | 23825 | Channel | | | | |
| 706.5 | 710 | 713.5 | Freq. (MHz) | | | | |
| 22.50 | 22.51 | 22.63 | 24 | QPSK | 5MHz | 1 | 0 |
| 22.49 | 22.59 | 22.46 | 24 | QPSK | 5MHz | 1 | 12 |
| 22.73 | 22.72 | 22.49 | 24 | QPSK | 5MHz | 1 | 24 |
| 21.57 | 21.58 | 21.65 | 23 | QPSK | 5MHz | 12 | 0 |
| 21.57 | 21.58 | 21.58 | 23 | QPSK | 5MHz | 12 | 6 |
| 21.54 | 21.63 | 21.49 | 23 | QPSK | 5MHz | 12 | 13 |
| 21.54 | 21.74 | 21.48 | 23 | QPSK | 5MHz | 25 | 0 |
| 21.94 | 21.88 | 21.99 | 23 | 16QAM | 5MHz | 1 | 0 |
| 21.89 | 21.72 | 21.93 | 23 | 16QAM | 5MHz | 1 | 12 |
| 22.22 | 22.08 | 22.05 | 23 | 16QAM | 5MHz | 1 | 24 |
| 20.60 | 20.66 | 20.74 | 22 | 16QAM | 5MHz | 12 | 0 |
| 20.68 | 20.70 | 20.60 | 22 | 16QAM | 5MHz | 12 | 6 |
| 20.73 | 20.67 | 20.57 | 22 | 16QAM | 5MHz | 12 | 13 |
| 20.60 | 20.65 | 20.56 | 22 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 17 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 23780 | 23790 | 23800 | Channel | | | | |
| 709 | 710 | 711 | Freq. (MHz) | | | | |
| 22.47 | 22.58 | 22.50 | 24 | QPSK | 10MHz | 1 | 0 |
| 22.52 | 22.62 | 22.72 | 24 | QPSK | 10MHz | 1 | 24 |
| 22.51 | 22.80 | 22.78 | 24 | QPSK | 10MHz | 1 | 49 |
| 21.55 | 21.71 | 21.70 | 23 | QPSK | 10MHz | 25 | 0 |
| 21.68 | 21.71 | 21.70 | 23 | QPSK | 10MHz | 25 | 12 |
| 21.76 | 21.77 | 21.65 | 23 | QPSK | 10MHz | 25 | 25 |
| 21.68 | 21.81 | 21.78 | 23 | QPSK | 10MHz | 50 | 0 |
| 21.96 | 22.02 | 21.74 | 23 | 16QAM | 10MHz | 1 | 0 |
| 22.17 | 21.79 | 22.14 | 23 | 16QAM | 10MHz | 1 | 24 |
| 22.20 | 21.90 | 21.90 | 23 | 16QAM | 10MHz | 1 | 49 |
| 20.66 | 20.65 | 20.73 | 22 | 16QAM | 10MHz | 25 | 0 |
| 20.70 | 20.78 | 20.75 | 22 | 16QAM | 10MHz | 25 | 12 |
| 20.92 | 20.75 | 20.81 | 22 | 16QAM | 10MHz | 25 | 25 |
| 20.90 | 20.91 | 20.74 | 22 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 26 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 26697 | 26865 | 27033 | Channel | | | | |
| 814.7 | 831.5 | 848.3 | Freq. (MHz) | | | | |
| 22.47 | 22.57 | 22.67 | 24 | QPSK | 1.4MHz | 1 | 0 |
| 22.49 | 22.53 | 22.68 | 24 | QPSK | 1.4MHz | 1 | 2 |
| 22.57 | 22.53 | 22.66 | 24 | QPSK | 1.4MHz | 1 | 5 |
| 22.55 | 22.51 | 22.64 | 24 | QPSK | 1.4MHz | 3 | 0 |
| 22.55 | 22.48 | 22.63 | 24 | QPSK | 1.4MHz | 3 | 1 |
| 22.56 | 22.56 | 22.66 | 24 | QPSK | 1.4MHz | 3 | 3 |
| 21.57 | 21.54 | 21.62 | 23 | QPSK | 1.4MHz | 6 | 0 |
| 21.91 | 21.86 | 21.99 | 23 | 16QAM | 1.4MHz | 1 | 0 |
| 21.88 | 21.79 | 21.48 | 23 | 16QAM | 1.4MHz | 1 | 2 |
| 22.06 | 22.07 | 22.01 | 23 | 16QAM | 1.4MHz | 1 | 5 |
| 21.44 | 21.54 | 21.71 | 23 | 16QAM | 1.4MHz | 3 | 0 |
| 21.55 | 21.33 | 21.73 | 23 | 16QAM | 1.4MHz | 3 | 1 |
| 21.42 | 21.52 | 21.61 | 23 | 16QAM | 1.4MHz | 3 | 3 |
| 20.68 | 20.55 | 20.86 | 22 | 16QAM | 1.4MHz | 6 | 0 |

| LTE Band 26 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 26705 | 26865 | 27025 | Channel | | | | |
| 815.5 | 831.5 | 847.5 | Freq. (MHz) | | | | |
| 22.50 | 22.49 | 22.60 | 24 | QPSK | 3MHz | 1 | 0 |
| 22.51 | 22.52 | 22.73 | 24 | QPSK | 3MHz | 1 | 7 |
| 22.44 | 22.49 | 22.63 | 24 | QPSK | 3MHz | 1 | 14 |
| 21.54 | 21.58 | 21.62 | 23 | QPSK | 3MHz | 8 | 0 |
| 21.56 | 21.52 | 21.72 | 23 | QPSK | 3MHz | 8 | 3 |
| 21.50 | 21.51 | 21.81 | 23 | QPSK | 3MHz | 8 | 7 |
| 21.57 | 21.53 | 21.74 | 23 | QPSK | 3MHz | 15 | 0 |
| 21.54 | 22.14 | 22.01 | 23 | 16QAM | 3MHz | 1 | 0 |
| 21.78 | 21.86 | 22.13 | 23 | 16QAM | 3MHz | 1 | 7 |
| 21.83 | 21.73 | 21.41 | 23 | 16QAM | 3MHz | 1 | 14 |
| 20.68 | 20.77 | 20.84 | 22 | 16QAM | 3MHz | 8 | 0 |
| 20.61 | 20.69 | 20.85 | 22 | 16QAM | 3MHz | 8 | 3 |
| 20.60 | 20.56 | 20.75 | 22 | 16QAM | 3MHz | 8 | 7 |
| 20.57 | 20.55 | 20.87 | 22 | 16QAM | 3MHz | 15 | 0 |

| LTE Band 26 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 26715 | 26865 | 27015 | Channel | | | | |
| 816.5 | 831.5 | 846.5 | Freq. (MHz) | | | | |
| 22.52 | 22.66 | 22.55 | 24 | QPSK | 5MHz | 1 | 0 |
| 22.50 | 22.54 | 22.61 | 24 | QPSK | 5MHz | 1 | 12 |
| 22.49 | 22.57 | 22.69 | 24 | QPSK | 5MHz | 1 | 24 |
| 21.58 | 21.62 | 21.66 | 23 | QPSK | 5MHz | 12 | 0 |
| 21.51 | 21.55 | 21.64 | 23 | QPSK | 5MHz | 12 | 6 |
| 21.50 | 21.56 | 21.77 | 23 | QPSK | 5MHz | 12 | 13 |
| 21.55 | 21.56 | 21.72 | 23 | QPSK | 5MHz | 25 | 0 |
| 22.01 | 22.08 | 21.91 | 23 | 16QAM | 5MHz | 1 | 0 |
| 21.37 | 22.00 | 21.82 | 23 | 16QAM | 5MHz | 1 | 12 |
| 21.91 | 21.92 | 22.08 | 23 | 16QAM | 5MHz | 1 | 24 |
| 20.67 | 20.69 | 20.65 | 22 | 16QAM | 5MHz | 12 | 0 |
| 20.56 | 20.76 | 20.81 | 22 | 16QAM | 5MHz | 12 | 6 |
| 20.56 | 20.71 | 20.78 | 22 | 16QAM | 5MHz | 12 | 13 |
| 20.54 | 20.68 | 20.73 | 22 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 26 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 26740 | 26865 | 26990 | Channel | | | | |
| 819 | 831.5 | 844 | Freq. (MHz) | | | | |
| 22.58 | 22.58 | 22.51 | 24 | QPSK | 10MHz | 1 | 0 |
| 22.47 | 22.55 | 22.58 | 24 | QPSK | 10MHz | 1 | 24 |
| 22.54 | 22.39 | 22.73 | 24 | QPSK | 10MHz | 1 | 49 |
| 21.62 | 21.67 | 21.73 | 23 | QPSK | 10MHz | 25 | 0 |
| 21.53 | 21.58 | 21.68 | 23 | QPSK | 10MHz | 25 | 12 |
| 21.68 | 21.59 | 21.71 | 23 | QPSK | 10MHz | 25 | 25 |
| 21.55 | 21.60 | 21.75 | 23 | QPSK | 10MHz | 50 | 0 |
| 21.94 | 21.89 | 21.97 | 23 | 16QAM | 10MHz | 1 | 0 |
| 21.81 | 21.93 | 21.91 | 23 | 16QAM | 10MHz | 1 | 24 |
| 22.31 | 21.61 | 21.96 | 23 | 16QAM | 10MHz | 1 | 49 |
| 20.59 | 20.75 | 20.66 | 22 | 16QAM | 10MHz | 25 | 0 |
| 20.49 | 20.64 | 20.72 | 22 | 16QAM | 10MHz | 25 | 12 |
| 20.68 | 20.68 | 20.74 | 22 | 16QAM | 10MHz | 25 | 25 |
| 20.59 | 20.69 | 20.78 | 22 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 26 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 26765 | 26865 | 26965 | Channel | | | | |
| 821.5 | 831.5 | 841.5 | Freq. (MHz) | | | | |
| 22.35 | 22.41 | 22.44 | 24 | QPSK | 15MHz | 1 | 0 |
| 22.30 | 22.38 | 22.40 | 24 | QPSK | 15MHz | 1 | 37 |
| 22.20 | 22.61 | 22.51 | 24 | QPSK | 15MHz | 1 | 74 |
| 21.39 | 21.41 | 21.45 | 23 | QPSK | 15MHz | 36 | 0 |
| 21.34 | 21.47 | 21.44 | 23 | QPSK | 15MHz | 36 | 19 |
| 21.31 | 21.55 | 21.42 | 23 | QPSK | 15MHz | 36 | 39 |
| 21.46 | 21.61 | 21.59 | 23 | QPSK | 15MHz | 75 | 0 |
| 21.69 | 21.68 | 21.38 | 23 | 16QAM | 15MHz | 1 | 0 |
| 21.56 | 21.41 | 21.97 | 23 | 16QAM | 15MHz | 1 | 37 |
| 20.95 | 21.54 | 21.85 | 23 | 16QAM | 15MHz | 1 | 74 |
| 20.53 | 20.56 | 20.54 | 22 | 16QAM | 15MHz | 36 | 0 |
| 20.45 | 20.54 | 20.52 | 22 | 16QAM | 15MHz | 36 | 19 |
| 20.40 | 20.43 | 20.60 | 22 | 16QAM | 15MHz | 36 | 39 |
| 20.61 | 20.65 | 20.69 | 22 | 16QAM | 15MHz | 75 | 0 |

| LTE Band 30 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 27685 | 27710 | 27735 | Channel | | | | |
| 2307.5 | 2310 | 2312.5 | Freq. (MHz) | | | | |
| 22.94 | 22.86 | 22.83 | 24 | QPSK | 5MHz | 1 | 0 |
| 22.88 | 22.84 | 22.68 | 24 | QPSK | 5MHz | 1 | 12 |
| 22.82 | 22.72 | 22.82 | 24 | QPSK | 5MHz | 1 | 24 |
| 21.92 | 21.89 | 21.84 | 23 | QPSK | 5MHz | 12 | 0 |
| 21.83 | 21.84 | 21.75 | 23 | QPSK | 5MHz | 12 | 6 |
| 21.86 | 21.85 | 21.85 | 23 | QPSK | 5MHz | 12 | 13 |
| 21.92 | 21.86 | 21.77 | 23 | QPSK | 5MHz | 25 | 0 |
| 22.18 | 22.12 | 21.97 | 23 | 16QAM | 5MHz | 1 | 0 |
| 22.15 | 21.87 | 21.62 | 23 | 16QAM | 5MHz | 1 | 12 |
| 22.40 | 22.06 | 22.26 | 23 | 16QAM | 5MHz | 1 | 24 |
| 20.98 | 20.85 | 20.74 | 22 | 16QAM | 5MHz | 12 | 0 |
| 20.99 | 20.81 | 20.63 | 22 | 16QAM | 5MHz | 12 | 6 |
| 21.02 | 20.73 | 20.89 | 22 | 16QAM | 5MHz | 12 | 13 |
| 21.00 | 20.83 | 20.77 | 22 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 30 | | | | | | |
|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset | |
| 27710 | Channel | | | | | |
| 2310 | Freq. (MHz) | | | | | |
| 22.90 | 24 | QPSK | 10MHz | 1 | 0 | |
| 22.86 | 24 | QPSK | 10MHz | 1 | 24 | |
| 22.99 | 24 | QPSK | 10MHz | 1 | 49 | |
| 22.06 | 23 | QPSK | 10MHz | 25 | 0 | |
| 21.96 | 23 | QPSK | 10MHz | 25 | 12 | |
| 21.91 | 23 | QPSK | 10MHz | 25 | 25 | |
| 22.09 | 23 | QPSK | 10MHz | 50 | 0 | |
| 22.16 | 23 | 16QAM | 10MHz | 1 | 0 | |
| 22.39 | 23 | 16QAM | 10MHz | 1 | 24 | |
| 22.39 | 23 | 16QAM | 10MHz | 1 | 49 | |
| 21.12 | 22 | 16QAM | 10MHz | 25 | 0 | |
| 21.01 | 22 | 16QAM | 10MHz | 25 | 12 | |
| 20.98 | 22 | 16QAM | 10MHz | 25 | 25 | |
| 21.14 | 22 | 16QAM | 10MHz | 50 | 0 | |

| LTE Band 38 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 37775 | 38000 | 38225 | Channel | | | | |
| 2572.5 | 2595 | 2617.5 | Freq. (MHz) | | | | |
| 22.26 | 22.25 | 22.29 | 24 | QPSK | 5MHz | 1 | 0 |
| 22.24 | 22.15 | 22.23 | 24 | QPSK | 5MHz | 1 | 12 |
| 22.27 | 22.20 | 22.25 | 24 | QPSK | 5MHz | 1 | 24 |
| 21.35 | 21.29 | 21.29 | 23 | QPSK | 5MHz | 12 | 0 |
| 21.34 | 21.27 | 21.28 | 23 | QPSK | 5MHz | 12 | 6 |
| 21.34 | 21.28 | 21.28 | 23 | QPSK | 5MHz | 12 | 13 |
| 21.33 | 21.26 | 21.28 | 23 | QPSK | 5MHz | 25 | 0 |
| 21.60 | 21.48 | 21.54 | 23 | 16QAM | 5MHz | 1 | 0 |
| 21.57 | 21.45 | 21.51 | 23 | 16QAM | 5MHz | 1 | 12 |
| 21.60 | 21.48 | 21.54 | 23 | 16QAM | 5MHz | 1 | 24 |
| 20.41 | 20.33 | 20.35 | 22 | 16QAM | 5MHz | 12 | 0 |
| 20.38 | 20.34 | 20.33 | 22 | 16QAM | 5MHz | 12 | 6 |
| 20.39 | 20.35 | 20.33 | 22 | 16QAM | 5MHz | 12 | 13 |
| 20.45 | 20.37 | 20.35 | 22 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 38 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 37800 | 38000 | 38200 | Channel | | | | |
| 2575 | 2595 | 2615 | Freq. (MHz) | | | | |
| 22.10 | 22.06 | 22.11 | 24 | QPSK | 10MHz | 1 | 0 |
| 22.05 | 22.02 | 22.09 | 24 | QPSK | 10MHz | 1 | 24 |
| 22.09 | 22.05 | 22.12 | 24 | QPSK | 10MHz | 1 | 49 |
| 21.29 | 21.22 | 21.29 | 23 | QPSK | 10MHz | 25 | 0 |
| 21.29 | 21.23 | 21.28 | 23 | QPSK | 10MHz | 25 | 12 |
| 21.26 | 21.24 | 21.30 | 23 | QPSK | 10MHz | 25 | 25 |
| 21.22 | 21.17 | 21.23 | 23 | QPSK | 10MHz | 50 | 0 |
| 21.38 | 21.33 | 21.37 | 23 | 16QAM | 10MHz | 1 | 0 |
| 21.34 | 21.28 | 21.35 | 23 | 16QAM | 10MHz | 1 | 24 |
| 21.33 | 21.31 | 21.40 | 23 | 16QAM | 10MHz | 1 | 49 |
| 20.30 | 20.26 | 20.32 | 22 | 16QAM | 10MHz | 25 | 0 |
| 20.28 | 20.24 | 20.29 | 22 | 16QAM | 10MHz | 25 | 12 |
| 20.27 | 20.23 | 20.31 | 22 | 16QAM | 10MHz | 25 | 25 |
| 20.24 | 20.20 | 20.28 | 22 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 38 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 37825 | 38000 | 38175 | Channel | | | | |
| 2577.5 | 2595 | 2612.5 | Freq. (MHz) | | | | |
| 22.92 | 22.77 | 22.74 | 24 | QPSK | 15MHz | 1 | 0 |
| 22.89 | 22.74 | 22.74 | 24 | QPSK | 15MHz | 1 | 37 |
| 22.88 | 22.69 | 22.77 | 24 | QPSK | 15MHz | 1 | 74 |
| 21.90 | 21.69 | 21.69 | 23 | QPSK | 15MHz | 36 | 0 |
| 21.84 | 21.71 | 21.71 | 23 | QPSK | 15MHz | 36 | 19 |
| 21.84 | 21.71 | 21.72 | 23 | QPSK | 15MHz | 36 | 39 |
| 21.87 | 21.71 | 21.68 | 23 | QPSK | 15MHz | 75 | 0 |
| 21.88 | 21.68 | 21.65 | 23 | 16QAM | 15MHz | 1 | 0 |
| 21.75 | 21.67 | 21.67 | 23 | 16QAM | 15MHz | 1 | 37 |
| 21.76 | 21.66 | 21.70 | 23 | 16QAM | 15MHz | 1 | 74 |
| 20.98 | 20.86 | 20.79 | 22 | 16QAM | 15MHz | 36 | 0 |
| 20.96 | 20.86 | 20.80 | 22 | 16QAM | 15MHz | 36 | 19 |
| 20.96 | 20.86 | 20.81 | 22 | 16QAM | 15MHz | 36 | 39 |
| 20.87 | 20.79 | 20.76 | 22 | 16QAM | 15MHz | 75 | 0 |

| LTE Band 38 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 37850 | 38000 | 38150 | Channel | | | | |
| 2580 | 2595 | 2610 | Freq. (MHz) | | | | |
| 22.47 | 22.44 | 22.48 | 24 | QPSK | 20MHz | 1 | 0 |
| 22.42 | 22.38 | 22.40 | 24 | QPSK | 20MHz | 1 | 49 |
| 22.43 | 22.43 | 22.47 | 24 | QPSK | 20MHz | 1 | 99 |
| 21.33 | 21.29 | 21.30 | 23 | QPSK | 20MHz | 50 | 0 |
| 21.31 | 21.25 | 21.31 | 23 | QPSK | 20MHz | 50 | 25 |
| 21.30 | 21.27 | 21.34 | 23 | QPSK | 20MHz | 50 | 50 |
| 21.33 | 21.32 | 21.37 | 23 | QPSK | 20MHz | 100 | 0 |
| 21.32 | 21.26 | 21.31 | 23 | 16QAM | 20MHz | 1 | 0 |
| 21.23 | 21.21 | 21.27 | 23 | 16QAM | 20MHz | 1 | 49 |
| 21.22 | 21.24 | 21.32 | 23 | 16QAM | 20MHz | 1 | 99 |
| 20.40 | 20.38 | 20.41 | 22 | 16QAM | 20MHz | 50 | 0 |
| 20.40 | 20.35 | 20.41 | 22 | 16QAM | 20MHz | 50 | 25 |
| 20.37 | 20.38 | 20.43 | 22 | 16QAM | 20MHz | 50 | 50 |
| 20.32 | 20.31 | 20.36 | 22 | 16QAM | 20MHz | 100 | 0 |

| LTE Band 41 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 39675 | 40148 | 40620 | 41093 | 41565 | Channel | | | | |
| 2498.5 | 2545.8 | 2593 | 2640.3 | 2687.5 | Freq. (MHz) | | | | |
| 22.51 | 22.28 | 22.27 | 22.00 | 22.17 | 24 | QPSK | 5MHz | 1 | 0 |
| 22.45 | 22.17 | 22.31 | 21.99 | 22.16 | 24 | QPSK | 5MHz | 1 | 12 |
| 22.48 | 22.21 | 22.29 | 22.03 | 22.23 | 24 | QPSK | 5MHz | 1 | 24 |
| 21.58 | 21.31 | 21.28 | 21.07 | 21.25 | 23 | QPSK | 5MHz | 12 | 0 |
| 21.55 | 21.30 | 21.35 | 21.10 | 21.25 | 23 | QPSK | 5MHz | 12 | 6 |
| 21.56 | 21.29 | 21.36 | 21.05 | 21.25 | 23 | QPSK | 5MHz | 12 | 13 |
| 21.55 | 21.27 | 21.36 | 21.02 | 21.23 | 23 | QPSK | 5MHz | 25 | 0 |
| 21.71 | 21.55 | 21.55 | 21.29 | 21.45 | 23 | 16QAM | 5MHz | 1 | 0 |
| 21.66 | 21.46 | 21.59 | 21.27 | 21.45 | 23 | 16QAM | 5MHz | 1 | 12 |
| 21.70 | 21.50 | 21.61 | 21.28 | 21.53 | 23 | 16QAM | 5MHz | 1 | 24 |
| 20.64 | 20.38 | 20.40 | 20.08 | 20.30 | 22 | 16QAM | 5MHz | 12 | 0 |
| 20.62 | 20.34 | 20.45 | 20.07 | 20.29 | 22 | 16QAM | 5MHz | 12 | 6 |
| 20.63 | 20.34 | 20.46 | 20.05 | 20.30 | 22 | 16QAM | 5MHz | 12 | 13 |
| 20.67 | 20.38 | 20.48 | 20.11 | 20.28 | 22 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 41 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 39700 | 40160 | 40620 | 41080 | 41540 | Channel | | | | |
| 2501 | 2547 | 2593 | 2639 | 2685 | Freq. (MHz) | | | | |
| 22.39 | 22.19 | 22.18 | 21.97 | 22.11 | 24 | QPSK | 10MHz | 1 | 0 |
| 22.37 | 22.11 | 22.21 | 21.84 | 22.09 | 24 | QPSK | 10MHz | 1 | 24 |
| 22.37 | 22.06 | 22.26 | 21.87 | 22.17 | 24 | QPSK | 10MHz | 1 | 49 |
| 21.57 | 21.35 | 21.35 | 21.09 | 21.28 | 23 | QPSK | 10MHz | 25 | 0 |
| 21.54 | 21.28 | 21.40 | 21.07 | 21.27 | 23 | QPSK | 10MHz | 25 | 12 |
| 21.55 | 21.22 | 21.40 | 21.09 | 21.28 | 23 | QPSK | 10MHz | 25 | 25 |
| 21.54 | 21.24 | 21.35 | 21.05 | 21.23 | 23 | QPSK | 10MHz | 50 | 0 |
| 21.62 | 21.42 | 21.42 | 21.22 | 21.39 | 23 | 16QAM | 10MHz | 1 | 0 |
| 21.55 | 21.33 | 21.47 | 21.16 | 21.36 | 23 | 16QAM | 10MHz | 1 | 24 |
| 21.60 | 21.32 | 21.48 | 21.18 | 21.44 | 23 | 16QAM | 10MHz | 1 | 49 |
| 20.60 | 20.37 | 20.36 | 20.12 | 20.27 | 22 | 16QAM | 10MHz | 25 | 0 |
| 20.56 | 20.30 | 20.40 | 20.11 | 20.27 | 22 | 16QAM | 10MHz | 25 | 12 |
| 20.55 | 20.23 | 20.40 | 20.10 | 20.29 | 22 | 16QAM | 10MHz | 25 | 25 |
| 20.56 | 20.28 | 20.37 | 20.09 | 20.28 | 22 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 41 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 39725 | 40173 | 40620 | 41068 | 41515 | Channel | | | | |
| 2503.5 | 2548.3 | 2593 | 2637.8 | 2682.5 | Freq. (MHz) | | | | |
| 22.78 | 22.50 | 22.48 | 22.27 | 22.22 | 24 | QPSK | 15MHz | 1 | 0 |
| 22.72 | 22.39 | 22.46 | 22.13 | 22.27 | 24 | QPSK | 15MHz | 1 | 37 |
| 22.69 | 22.32 | 22.46 | 22.15 | 22.37 | 24 | QPSK | 15MHz | 1 | 74 |
| 21.85 | 21.62 | 21.60 | 21.39 | 21.45 | 23 | QPSK | 15MHz | 36 | 0 |
| 21.84 | 21.56 | 21.65 | 21.32 | 21.52 | 23 | QPSK | 15MHz | 36 | 19 |
| 21.83 | 21.50 | 21.65 | 21.30 | 21.52 | 23 | QPSK | 15MHz | 36 | 39 |
| 21.91 | 21.58 | 21.64 | 21.33 | 21.50 | 23 | QPSK | 15MHz | 75 | 0 |
| 21.82 | 21.65 | 21.56 | 21.40 | 21.32 | 23 | 16QAM | 15MHz | 1 | 0 |
| 21.83 | 21.55 | 21.57 | 21.29 | 21.38 | 23 | 16QAM | 15MHz | 1 | 37 |
| 21.83 | 21.49 | 21.59 | 21.23 | 21.47 | 23 | 16QAM | 15MHz | 1 | 74 |
| 21.02 | 20.76 | 20.71 | 20.48 | 20.56 | 22 | 16QAM | 15MHz | 36 | 0 |
| 20.99 | 20.71 | 20.79 | 20.41 | 20.61 | 22 | 16QAM | 15MHz | 36 | 19 |
| 20.97 | 20.63 | 20.77 | 20.38 | 20.60 | 22 | 16QAM | 15MHz | 36 | 39 |
| 20.90 | 20.62 | 20.72 | 20.32 | 20.60 | 22 | 16QAM | 15MHz | 75 | 0 |

| LTE Band 41 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 39750 | 40185 | 40620 | 41055 | 41490 | Channel | | | | |
| 2506 | 2549.5 | 2593 | 2636.5 | 2680 | Freq. (MHz) | | | | |
| 22.77 | 22.73 | 22.70 | 22.54 | 22.58 | 24 | QPSK | 20MHz | 1 | 0 |
| 22.79 | 22.52 | 22.70 | 22.37 | 22.47 | 24 | QPSK | 20MHz | 1 | 49 |
| 22.86 | 22.55 | 22.80 | 22.41 | 22.56 | 24 | QPSK | 20MHz | 1 | 99 |
| 21.89 | 21.56 | 21.53 | 21.35 | 21.41 | 23 | QPSK | 20MHz | 50 | 0 |
| 21.79 | 21.42 | 21.59 | 21.28 | 21.45 | 23 | QPSK | 20MHz | 50 | 25 |
| 21.77 | 21.44 | 21.58 | 21.30 | 21.42 | 23 | QPSK | 20MHz | 50 | 50 |
| 21.84 | 21.45 | 21.65 | 21.29 | 21.58 | 23 | QPSK | 20MHz | 100 | 0 |
| 21.57 | 21.46 | 21.36 | 21.21 | 21.19 | 23 | 16QAM | 20MHz | 1 | 0 |
| 21.51 | 21.21 | 21.34 | 21.03 | 21.10 | 23 | 16QAM | 20MHz | 1 | 49 |
| 21.64 | 21.23 | 21.46 | 21.07 | 21.22 | 23 | 16QAM | 20MHz | 1 | 99 |
| 20.74 | 20.48 | 20.50 | 20.27 | 20.33 | 22 | 16QAM | 20MHz | 50 | 0 |
| 20.70 | 20.35 | 20.57 | 20.19 | 20.34 | 22 | 16QAM | 20MHz | 50 | 25 |
| 20.70 | 20.34 | 20.50 | 20.19 | 20.39 | 22 | 16QAM | 20MHz | 50 | 50 |
| 20.67 | 20.27 | 20.50 | 20.13 | 20.36 | 22 | 16QAM | 20MHz | 100 | 0 |

| LTE Band 66 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset | |
| 131979 | 132322 | 132665 | Channel | | | | | |
| 1710.7 | 1745 | 1779.3 | Freq. (MHz) | | | | | |
| 22.44 | 22.51 | 22.44 | 24 | QPSK | 1.4MHz | 1 | 0 | |
| 22.42 | 22.44 | 22.41 | 24 | QPSK | 1.4MHz | 1 | 2 | |
| 22.45 | 22.50 | 22.45 | 24 | QPSK | 1.4MHz | 1 | 5 | |
| 22.45 | 22.47 | 22.46 | 24 | QPSK | 1.4MHz | 3 | 0 | |
| 22.45 | 22.44 | 22.44 | 24 | QPSK | 1.4MHz | 3 | 1 | |
| 22.46 | 22.46 | 22.45 | 24 | QPSK | 1.4MHz | 3 | 3 | |
| 21.49 | 21.45 | 21.47 | 23 | QPSK | 1.4MHz | 6 | 0 | |
| 22.09 | 21.87 | 21.70 | 23 | 16QAM | 1.4MHz | 1 | 0 | |
| 21.24 | 21.80 | 21.97 | 23 | 16QAM | 1.4MHz | 1 | 2 | |
| 22.15 | 21.70 | 21.83 | 23 | 16QAM | 1.4MHz | 1 | 5 | |
| 21.67 | 21.48 | 21.65 | 23 | 16QAM | 1.4MHz | 3 | 0 | |
| 21.30 | 21.38 | 21.29 | 23 | 16QAM | 1.4MHz | 3 | 1 | |
| 21.35 | 21.51 | 21.63 | 23 | 16QAM | 1.4MHz | 3 | 3 | |
| 20.59 | 20.62 | 20.59 | 22 | 16QAM | 1.4MHz | 6 | 0 | |

| LTE Band 66 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 131987 | 132322 | 132657 | Channel | | | | |
| 1711.5 | 1745 | 1778.5 | Freq. (MHz) | | | | |
| 22.44 | 22.49 | 22.54 | 24 | QPSK | 3MHz | 1 | 0 |
| 22.45 | 22.52 | 22.46 | 24 | QPSK | 3MHz | 1 | 7 |
| 22.42 | 22.53 | 22.47 | 24 | QPSK | 3MHz | 1 | 14 |
| 21.50 | 21.53 | 21.50 | 23 | QPSK | 3MHz | 8 | 0 |
| 21.42 | 21.50 | 21.50 | 23 | QPSK | 3MHz | 8 | 3 |
| 21.48 | 21.57 | 21.57 | 23 | QPSK | 3MHz | 8 | 7 |
| 21.46 | 21.51 | 21.52 | 23 | QPSK | 3MHz | 15 | 0 |
| 21.62 | 21.51 | 21.35 | 23 | 16QAM | 3MHz | 1 | 0 |
| 21.62 | 21.83 | 21.41 | 23 | 16QAM | 3MHz | 1 | 7 |
| 21.90 | 21.97 | 21.84 | 23 | 16QAM | 3MHz | 1 | 14 |
| 20.50 | 20.58 | 20.67 | 22 | 16QAM | 3MHz | 8 | 0 |
| 20.49 | 20.63 | 20.67 | 22 | 16QAM | 3MHz | 8 | 3 |
| 20.69 | 20.79 | 20.60 | 22 | 16QAM | 3MHz | 8 | 7 |
| 20.55 | 20.57 | 20.59 | 22 | 16QAM | 3MHz | 15 | 0 |

| LTE Band 66 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 131997 | 132322 | 132647 | Channel | | | | |
| 1712.5 | 1745 | 1777.5 | Freq. (MHz) | | | | |
| 22.75 | 22.73 | 22.92 | 24 | QPSK | 5MHz | 1 | 0 |
| 22.58 | 22.69 | 22.52 | 24 | QPSK | 5MHz | 1 | 12 |
| 23.04 | 22.65 | 22.70 | 24 | QPSK | 5MHz | 1 | 24 |
| 21.76 | 21.76 | 21.71 | 23 | QPSK | 5MHz | 12 | 0 |
| 21.73 | 21.71 | 21.62 | 23 | QPSK | 5MHz | 12 | 6 |
| 21.74 | 21.79 | 21.74 | 23 | QPSK | 5MHz | 12 | 13 |
| 21.70 | 21.68 | 21.70 | 23 | QPSK | 5MHz | 25 | 0 |
| 21.84 | 22.01 | 21.79 | 23 | 16QAM | 5MHz | 1 | 0 |
| 22.04 | 21.94 | 21.76 | 23 | 16QAM | 5MHz | 1 | 12 |
| 22.28 | 21.55 | 22.02 | 23 | 16QAM | 5MHz | 1 | 24 |
| 20.72 | 20.64 | 20.80 | 22 | 16QAM | 5MHz | 12 | 0 |
| 20.84 | 20.68 | 20.65 | 22 | 16QAM | 5MHz | 12 | 6 |
| 20.87 | 20.80 | 20.82 | 22 | 16QAM | 5MHz | 12 | 13 |
| 20.70 | 20.55 | 20.69 | 22 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 66 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 132022 | 132322 | 132622 | Channel | | | | |
| 1715 | 1745 | 1775 | Freq. (MHz) | | | | |
| 22.85 | 22.79 | 22.81 | 24 | QPSK | 10MHz | 1 | 0 |
| 22.79 | 22.74 | 22.75 | 24 | QPSK | 10MHz | 1 | 24 |
| 22.88 | 22.74 | 22.91 | 24 | QPSK | 10MHz | 1 | 49 |
| 21.94 | 21.91 | 21.89 | 23 | QPSK | 10MHz | 25 | 0 |
| 21.89 | 21.83 | 21.75 | 23 | QPSK | 10MHz | 25 | 12 |
| 21.82 | 21.71 | 21.79 | 23 | QPSK | 10MHz | 25 | 25 |
| 21.98 | 21.95 | 21.90 | 23 | QPSK | 10MHz | 50 | 0 |
| 22.31 | 22.23 | 21.91 | 23 | 16QAM | 10MHz | 1 | 0 |
| 22.37 | 22.01 | 21.72 | 23 | 16QAM | 10MHz | 1 | 24 |
| 22.22 | 22.14 | 22.18 | 23 | 16QAM | 10MHz | 1 | 49 |
| 20.90 | 20.93 | 20.90 | 22 | 16QAM | 10MHz | 25 | 0 |
| 20.89 | 20.87 | 20.87 | 22 | 16QAM | 10MHz | 25 | 12 |
| 20.88 | 20.72 | 20.86 | 22 | 16QAM | 10MHz | 25 | 25 |
| 21.02 | 20.99 | 20.92 | 22 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 66 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 132047 | 132322 | 132597 | Channel | | | | |
| 1717.5 | 1745 | 1772.5 | Freq. (MHz) | | | | |
| 22.50 | 22.60 | 22.60 | 24 | QPSK | 15MHz | 1 | 0 |
| 22.36 | 22.32 | 22.46 | 24 | QPSK | 15MHz | 1 | 37 |
| 22.52 | 22.44 | 22.71 | 24 | QPSK | 15MHz | 1 | 74 |
| 21.57 | 21.54 | 21.60 | 23 | QPSK | 15MHz | 36 | 0 |
| 21.48 | 21.43 | 21.52 | 23 | QPSK | 15MHz | 36 | 19 |
| 21.49 | 21.51 | 21.53 | 23 | QPSK | 15MHz | 36 | 39 |
| 21.62 | 21.58 | 21.57 | 23 | QPSK | 15MHz | 75 | 0 |
| 21.88 | 21.80 | 21.94 | 23 | 16QAM | 15MHz | 1 | 0 |
| 21.57 | 21.88 | 21.75 | 23 | 16QAM | 15MHz | 1 | 37 |
| 21.66 | 21.68 | 21.91 | 23 | 16QAM | 15MHz | 1 | 74 |
| 20.63 | 20.65 | 20.66 | 22 | 16QAM | 15MHz | 36 | 0 |
| 20.49 | 20.58 | 20.59 | 22 | 16QAM | 15MHz | 36 | 19 |
| 20.56 | 20.60 | 20.61 | 22 | 16QAM | 15MHz | 36 | 39 |
| 20.60 | 20.66 | 20.65 | 22 | 16QAM | 15MHz | 75 | 0 |

| LTE Band 66 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 132072 | 132322 | 132572 | Channel | | | | |
| 1720 | 1745 | 1770 | Freq. (MHz) | | | | |
| 22.65 | 22.65 | 22.65 | 24 | QPSK | 20MHz | 1 | 0 |
| 22.63 | 22.64 | 22.66 | 24 | QPSK | 20MHz | 1 | 49 |
| 23.01 | 22.69 | 22.71 | 24 | QPSK | 20MHz | 1 | 99 |
| 21.77 | 21.72 | 21.70 | 23 | QPSK | 20MHz | 50 | 0 |
| 21.75 | 21.71 | 21.69 | 23 | QPSK | 20MHz | 50 | 25 |
| 21.78 | 21.69 | 21.70 | 23 | QPSK | 20MHz | 50 | 50 |
| 21.84 | 21.82 | 21.79 | 23 | QPSK | 20MHz | 100 | 0 |
| 21.84 | 21.66 | 22.04 | 23 | 16QAM | 20MHz | 1 | 0 |
| 21.81 | 21.92 | 21.25 | 23 | 16QAM | 20MHz | 1 | 49 |
| 21.93 | 21.88 | 21.97 | 23 | 16QAM | 20MHz | 1 | 99 |
| 20.85 | 20.79 | 20.78 | 22 | 16QAM | 20MHz | 50 | 0 |
| 20.75 | 20.78 | 20.74 | 22 | 16QAM | 20MHz | 50 | 25 |
| 20.77 | 20.82 | 20.67 | 22 | 16QAM | 20MHz | 50 | 50 |
| 20.87 | 20.88 | 20.84 | 22 | 16QAM | 20MHz | 100 | 0 |

### 11.4 Power Reduction

| Band | Modulation | Date Rate or Sub-test | CH | | Frequency | Avg Conducted power (dBm) | Tune up (dBm) |
|---|---|---|---|---|---|---|---|
| WCDMA II | RMC12.2K | --- | Lowest | 9262 | 1852.4 | 18.19 | 18.50 |
| | | | Middle | 9400 | 1880.0 | 18.29 | 18.50 |
| | | | Highest | 9538 | 1907.6 | 18.27 | 18.50 |
| HSDPA II | QPSK | 1 | Lowest | 9262 | 1852.4 | 16.52 | 17.00 |
| | | | Middle | 9400 | 1880.0 | 16.70 | 17.00 |
| | | | Highest | 9538 | 1907.6 | 16.56 | 17.00 |
| | | 2 | Lowest | 9262 | 1852.4 | 16.45 | 17.00 |
| | | | Middle | 9400 | 1880.0 | 16.75 | 17.00 |
| | | | Highest | 9538 | 1907.6 | 16.59 | 17.00 |
| | | 3 | Lowest | 9262 | 1852.4 | 16.01 | 16.50 |
| | | | Middle | 9400 | 1880.0 | 16.21 | 16.50 |
| | | | Highest | 9538 | 1907.6 | 16.01 | 16.50 |
| | | 4 | Lowest | 9262 | 1852.4 | 15.94 | 16.50 |
| | | | Middle | 9400 | 1880.0 | 16.16 | 16.50 |
| | | | Highest | 9538 | 1907.6 | 16.07 | 16.50 |
| HSUPA II | | 1 | Lowest | 9262 | 1852.4 | 16.53 | 17.00 |
| | | | Middle | 9400 | 1880.0 | 16.69 | 17.00 |
| | | | Highest | 9538 | 1907.6 | 16.59 | 17.00 |
| | | 2 | Lowest | 9262 | 1852.4 | 14.50 | 15.00 |
| | | | Middle | 9400 | 1880.0 | 14.69 | 15.00 |
| | | | Highest | 9538 | 1907.6 | 14.51 | 15.00 |
| | | 3 | Lowest | 9262 | 1852.4 | 15.47 | 16.00 |
| | | | Middle | 9400 | 1880.0 | 15.71 | 16.00 |
| | | | Highest | 9538 | 1907.6 | 15.53 | 16.00 |
| | | 4 | Lowest | 9262 | 1852.4 | 14.47 | 15.00 |
| | | | Middle | 9400 | 1880.0 | 14.72 | 15.00 |
| | | | Highest | 9538 | 1907.6 | 14.56 | 15.00 |
| | | 5 | Lowest | 9262 | 1852.4 | 16.46 | 17.00 |
| | | | Middle | 9400 | 1880.0 | 16.67 | 17.00 |
| | | | Highest | 9538 | 1907.6 | 16.55 | 17.00 |

| Band | Modulation | Date Rate or Sub-test | CH | | Frequency (MHz) | Avg Conducted power (dBm) | Tune up (dBm) |
|---|---|---|---|---|---|---|---|
| WCDMA IV | RMC12.2K | --- | Lowest | 1312 | 1712.4 | 17.98 | 18.50 |
| | | | Middle | 1413 | 1732.6 | 18.06 | 18.50 |
| | | | Highest | 1513 | 1752.6 | 18.11 | 18.50 |
| HSDPA IV | QPSK | 1 | Lowest | 1312 | 1712.4 | 16.37 | 17.00 |
| | | | Middle | 1413 | 1732.6 | 16.61 | 17.00 |
| | | | Highest | 1513 | 1752.6 | 16.54 | 17.00 |
| | | 2 | Lowest | 1312 | 1712.4 | 16.39 | 17.00 |
| | | | Middle | 1413 | 1732.6 | 16.69 | 17.00 |
| | | | Highest | 1513 | 1752.6 | 16.52 | 17.00 |
| | | 3 | Lowest | 1312 | 1712.4 | 15.91 | 16.50 |
| | | | Middle | 1413 | 1732.6 | 16.15 | 16.50 |
| | | | Highest | 1513 | 1752.6 | 16.05 | 16.50 |
| | | 4 | Lowest | 1312 | 1712.4 | 15.94 | 16.50 |
| | | | Middle | 1413 | 1732.6 | 16.14 | 16.50 |
| | | | Highest | 1513 | 1752.6 | 16.07 | 16.50 |
| HSUPA IV | | 1 | Lowest | 1312 | 1712.4 | 16.35 | 17.00 |
| | | | Middle | 1413 | 1732.6 | 16.67 | 17.00 |
| | | | Highest | 1513 | 1752.6 | 16.57 | 17.00 |
| | | 2 | Lowest | 1312 | 1712.4 | 14.40 | 15.00 |
| | | | Middle | 1413 | 1732.6 | 14.60 | 15.00 |
| | | | Highest | 1513 | 1752.6 | 14.54 | 15.00 |
| | | 3 | Lowest | 1312 | 1712.4 | 15.37 | 16.00 |
| | | | Middle | 1413 | 1732.6 | 15.66 | 16.00 |
| | | | Highest | 1513 | 1752.6 | 15.56 | 16.00 |
| | | 4 | Lowest | 1312 | 1712.4 | 14.41 | 15.00 |
| | | | Middle | 1413 | 1732.6 | 14.66 | 15.00 |
| | | | Highest | 1513 | 1752.6 | 14.59 | 15.00 |
| | | 5 | Lowest | 1312 | 1712.4 | 16.37 | 17.00 |
| | | | Middle | 1413 | 1732.6 | 16.65 | 17.00 |
| | | | Highest | 1513 | 1752.6 | 16.62 | 17.00 |

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 18607 | 18900 | 19193 | Channel | | | | |
| 1850.7 | 1880 | 1909.3 | Freq. (MHz) | | | | |
| 16.96 | 16.98 | 17.03 | 18 | QPSK | 1.4MHz | 1 | 0 |
| 16.97 | 17.03 | 16.98 | 18 | QPSK | 1.4MHz | 1 | 2 |
| 16.93 | 17.04 | 16.95 | 18 | QPSK | 1.4MHz | 1 | 5 |
| 16.91 | 17.10 | 16.98 | 18 | QPSK | 1.4MHz | 3 | 0 |
| 16.94 | 17.08 | 16.95 | 18 | QPSK | 1.4MHz | 3 | 1 |
| 16.95 | 16.96 | 16.96 | 18 | QPSK | 1.4MHz | 3 | 3 |
| 16.99 | 17.02 | 17.00 | 18 | QPSK | 1.4MHz | 6 | 0 |
| 16.93 | 17.53 | 17.33 | 18 | 16QAM | 1.4MHz | 1 | 0 |
| 16.90 | 17.35 | 16.59 | 18 | 16QAM | 1.4MHz | 1 | 2 |
| 17.17 | 17.45 | 17.15 | 18 | 16QAM | 1.4MHz | 1 | 5 |
| 16.92 | 17.28 | 16.91 | 18 | 16QAM | 1.4MHz | 3 | 0 |
| 17.10 | 16.84 | 16.92 | 18 | 16QAM | 1.4MHz | 3 | 1 |
| 17.07 | 17.22 | 17.04 | 18 | 16QAM | 1.4MHz | 3 | 3 |
| 16.93 | 17.09 | 17.07 | 18 | 16QAM | 1.4MHz | 6 | 0 |

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 18615 | 18900 | 19185 | Channel | | | | |
| 1851.5 | 1880 | 1908.5 | Freq. (MHz) | | | | |
| 16.78 | 17.01 | 16.82 | 18 | QPSK | 3MHz | 1 | 0 |
| 16.81 | 16.83 | 16.83 | 18 | QPSK | 3MHz | 1 | 7 |
| 16.61 | 16.96 | 16.78 | 18 | QPSK | 3MHz | 1 | 14 |
| 16.80 | 17.06 | 16.88 | 18 | QPSK | 3MHz | 8 | 0 |
| 16.81 | 17.10 | 16.85 | 18 | QPSK | 3MHz | 8 | 3 |
| 16.79 | 17.04 | 16.84 | 18 | QPSK | 3MHz | 8 | 7 |
| 16.83 | 17.01 | 16.85 | 18 | QPSK | 3MHz | 15 | 0 |
| 16.99 | 17.53 | 16.92 | 18 | 16QAM | 3MHz | 1 | 0 |
| 17.13 | 17.12 | 17.06 | 18 | 16QAM | 3MHz | 1 | 7 |
| 17.18 | 17.52 | 16.39 | 18 | 16QAM | 3MHz | 1 | 14 |
| 16.81 | 17.06 | 16.88 | 18 | 16QAM | 3MHz | 8 | 0 |
| 16.94 | 17.06 | 16.84 | 18 | 16QAM | 3MHz | 8 | 3 |
| 16.77 | 16.96 | 16.84 | 18 | 16QAM | 3MHz | 8 | 7 |
| 16.82 | 17.08 | 16.89 | 18 | 16QAM | 3MHz | 15 | 0 |

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 18625 | 18900 | 19175 | Channel | | | | |
| 1852.5 | 1880 | 1907.5 | Freq. (MHz) | | | | |
| 16.80 | 17.03 | 16.85 | 18 | QPSK | 5MHz | 1 | 0 |
| 16.84 | 16.91 | 16.79 | 18 | QPSK | 5MHz | 1 | 12 |
| 16.73 | 16.81 | 16.92 | 18 | QPSK | 5MHz | 1 | 24 |
| 16.84 | 17.01 | 16.90 | 18 | QPSK | 5MHz | 12 | 0 |
| 16.81 | 17.04 | 16.96 | 18 | QPSK | 5MHz | 12 | 6 |
| 16.67 | 16.99 | 16.93 | 18 | QPSK | 5MHz | 12 | 13 |
| 16.82 | 16.99 | 16.95 | 18 | QPSK | 5MHz | 25 | 0 |
| 17.44 | 16.56 | 17.13 | 18 | 16QAM | 5MHz | 1 | 0 |
| 17.06 | 17.37 | 17.08 | 18 | 16QAM | 5MHz | 1 | 12 |
| 16.30 | 17.17 | 17.43 | 18 | 16QAM | 5MHz | 1 | 24 |
| 16.95 | 17.18 | 16.98 | 18 | 16QAM | 5MHz | 12 | 0 |
| 16.77 | 17.18 | 16.95 | 18 | 16QAM | 5MHz | 12 | 6 |
| 16.77 | 17.02 | 16.95 | 18 | 16QAM | 5MHz | 12 | 13 |
| 16.82 | 17.13 | 16.95 | 18 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 18650 | 18900 | 19150 | Channel | | | | |
| 1855 | 1880 | 1905 | Freq. (MHz) | | | | |
| 16.90 | 17.14 | 16.65 | 18 | QPSK | 10MHz | 1 | 0 |
| 16.63 | 17.19 | 16.82 | 18 | QPSK | 10MHz | 1 | 24 |
| 16.67 | 16.99 | 17.04 | 18 | QPSK | 10MHz | 1 | 49 |
| 16.99 | 17.13 | 16.86 | 18 | QPSK | 10MHz | 25 | 0 |
| 16.84 | 17.12 | 16.87 | 18 | QPSK | 10MHz | 25 | 12 |
| 16.80 | 17.03 | 17.02 | 18 | QPSK | 10MHz | 25 | 25 |
| 16.83 | 17.05 | 16.93 | 18 | QPSK | 10MHz | 50 | 0 |
| 16.93 | 17.32 | 16.82 | 18 | 16QAM | 10MHz | 1 | 0 |
| 16.73 | 17.05 | 16.76 | 18 | 16QAM | 10MHz | 1 | 24 |
| 16.79 | 16.92 | 16.93 | 18 | 16QAM | 10MHz | 1 | 49 |
| 16.94 | 17.20 | 16.95 | 18 | 16QAM | 10MHz | 25 | 0 |
| 16.81 | 17.09 | 16.93 | 18 | 16QAM | 10MHz | 25 | 12 |
| 16.74 | 17.10 | 17.04 | 18 | 16QAM | 10MHz | 25 | 25 |
| 16.81 | 17.11 | 16.94 | 18 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 18675 | 18900 | 19125 | Channel | | | | |
| 1857.5 | 1880 | 1902.5 | Freq. (MHz) | | | | |
| 16.79 | 17.03 | 16.52 | 18 | QPSK | 15MHz | 1 | 0 |
| 16.52 | 16.91 | 16.67 | 18 | QPSK | 15MHz | 1 | 37 |
| 16.66 | 16.84 | 16.85 | 18 | QPSK | 15MHz | 1 | 74 |
| 16.72 | 16.99 | 16.66 | 18 | QPSK | 15MHz | 36 | 0 |
| 16.66 | 17.04 | 16.83 | 18 | QPSK | 15MHz | 36 | 19 |
| 16.63 | 16.92 | 16.90 | 18 | QPSK | 15MHz | 36 | 39 |
| 16.65 | 16.97 | 16.92 | 18 | QPSK | 15MHz | 75 | 0 |
| 16.50 | 17.02 | 17.10 | 18 | 16QAM | 15MHz | 1 | 0 |
| 16.72 | 17.36 | 17.18 | 18 | 16QAM | 15MHz | 1 | 37 |
| 16.62 | 17.11 | 16.98 | 18 | 16QAM | 15MHz | 1 | 74 |
| 16.73 | 17.02 | 16.71 | 18 | 16QAM | 15MHz | 36 | 0 |
| 16.60 | 17.07 | 16.88 | 18 | 16QAM | 15MHz | 36 | 19 |
| 16.65 | 16.91 | 16.93 | 18 | 16QAM | 15MHz | 36 | 39 |
| 16.63 | 16.98 | 16.90 | 18 | 16QAM | 15MHz | 75 | 0 |

| LTE Band 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 18700 | 18900 | 19100 | Channel | | | | |
| 1860 | 1880 | 1900 | Freq. (MHz) | | | | |
| 17.01 | 17.63 | 17.21 | 18 | QPSK | 20MHz | 1 | 0 |
| 16.57 | 16.99 | 16.73 | 18 | QPSK | 20MHz | 1 | 49 |
| 16.81 | 16.89 | 16.95 | 18 | QPSK | 20MHz | 1 | 99 |
| 16.99 | 17.55 | 16.96 | 18 | QPSK | 20MHz | 50 | 0 |
| 17.18 | 17.46 | 17.25 | 18 | QPSK | 20MHz | 50 | 25 |
| 16.76 | 17.09 | 17.45 | 18 | QPSK | 20MHz | 50 | 50 |
| 16.88 | 17.25 | 17.08 | 18 | QPSK | 20MHz | 100 | 0 |
| 17.22 | 17.12 | 17.01 | 18 | 16QAM | 20MHz | 1 | 0 |
| 17.22 | 17.24 | 16.75 | 18 | 16QAM | 20MHz | 1 | 49 |
| 17.14 | 17.24 | 17.04 | 18 | 16QAM | 20MHz | 1 | 99 |
| 16.81 | 17.09 | 16.80 | 18 | 16QAM | 20MHz | 50 | 0 |
| 16.69 | 17.06 | 16.82 | 18 | 16QAM | 20MHz | 50 | 25 |
| 16.85 | 17.00 | 16.91 | 18 | 16QAM | 20MHz | 50 | 50 |
| 16.89 | 17.23 | 17.01 | 18 | 16QAM | 20MHz | 100 | 0 |

| LTE Band 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 19957 | 20175 | 20393 | Channel | | | | |
| 1710.7 | 1732.5 | 1754.3 | Freq. (MHz) | | | | |
| 16.79 | 16.83 | 17.04 | 18 | QPSK | 1.4MHz | 1 | 0 |
| 16.75 | 16.78 | 16.95 | 18 | QPSK | 1.4MHz | 1 | 2 |
| 16.68 | 16.71 | 17.01 | 18 | QPSK | 1.4MHz | 1 | 5 |
| 16.71 | 16.76 | 17.01 | 18 | QPSK | 1.4MHz | 3 | 0 |
| 16.71 | 16.75 | 16.98 | 18 | QPSK | 1.4MHz | 3 | 1 |
| 16.72 | 16.77 | 17.03 | 18 | QPSK | 1.4MHz | 3 | 3 |
| 16.75 | 16.78 | 17.04 | 18 | QPSK | 1.4MHz | 6 | 0 |
| 16.96 | 17.41 | 17.41 | 18 | 16QAM | 1.4MHz | 1 | 0 |
| 17.13 | 17.03 | 17.25 | 18 | 16QAM | 1.4MHz | 1 | 2 |
| 17.15 | 17.29 | 17.42 | 18 | 16QAM | 1.4MHz | 1 | 5 |
| 16.91 | 16.84 | 17.26 | 18 | 16QAM | 1.4MHz | 3 | 0 |
| 16.94 | 16.96 | 17.15 | 18 | 16QAM | 1.4MHz | 3 | 1 |
| 16.85 | 16.95 | 17.27 | 18 | 16QAM | 1.4MHz | 3 | 3 |
| 16.65 | 16.68 | 17.00 | 18 | 16QAM | 1.4MHz | 6 | 0 |

| LTE Band 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 19965 | 20175 | 20385 | Channel | | | | |
| 1711.5 | 1732.5 | 1753.5 | Freq. (MHz) | | | | |
| 16.68 | 16.77 | 17.04 | 18 | QPSK | 3MHz | 1 | 0 |
| 16.62 | 16.72 | 16.99 | 18 | QPSK | 3MHz | 1 | 7 |
| 16.78 | 16.61 | 16.89 | 18 | QPSK | 3MHz | 1 | 14 |
| 16.74 | 16.72 | 17.04 | 18 | QPSK | 3MHz | 8 | 0 |
| 16.69 | 16.75 | 16.96 | 18 | QPSK | 3MHz | 8 | 3 |
| 16.80 | 16.69 | 17.04 | 18 | QPSK | 3MHz | 8 | 7 |
| 16.72 | 16.75 | 17.02 | 18 | QPSK | 3MHz | 15 | 0 |
| 16.73 | 16.98 | 17.23 | 18 | 16QAM | 3MHz | 1 | 0 |
| 16.88 | 17.33 | 17.06 | 18 | 16QAM | 3MHz | 1 | 7 |
| 16.54 | 16.82 | 17.26 | 18 | 16QAM | 3MHz | 1 | 14 |
| 16.74 | 16.82 | 17.16 | 18 | 16QAM | 3MHz | 8 | 0 |
| 16.84 | 16.74 | 17.07 | 18 | 16QAM | 3MHz | 8 | 3 |
| 16.75 | 16.88 | 16.91 | 18 | 16QAM | 3MHz | 8 | 7 |
| 16.79 | 16.72 | 17.01 | 18 | 16QAM | 3MHz | 15 | 0 |

| LTE Band 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 19975 | 20175 | 20375 | Channel | | | | |
| 1712.5 | 1732.5 | 1752.5 | Freq. (MHz) | | | | |
| 16.79 | 16.83 | 16.98 | 18 | QPSK | 5MHz | 1 | 0 |
| 16.78 | 16.59 | 17.00 | 18 | QPSK | 5MHz | 1 | 12 |
| 16.89 | 16.72 | 17.06 | 18 | QPSK | 5MHz | 1 | 24 |
| 16.74 | 16.79 | 16.98 | 18 | QPSK | 5MHz | 12 | 0 |
| 16.82 | 16.70 | 16.99 | 18 | QPSK | 5MHz | 12 | 6 |
| 16.84 | 16.70 | 16.97 | 18 | QPSK | 5MHz | 12 | 13 |
| 16.82 | 16.74 | 16.94 | 18 | QPSK | 5MHz | 25 | 0 |
| 16.98 | 17.31 | 17.07 | 18 | 16QAM | 5MHz | 1 | 0 |
| 16.94 | 16.26 | 17.33 | 18 | 16QAM | 5MHz | 1 | 12 |
| 16.98 | 17.05 | 16.53 | 18 | 16QAM | 5MHz | 1 | 24 |
| 16.68 | 16.85 | 16.97 | 18 | 16QAM | 5MHz | 12 | 0 |
| 16.86 | 16.75 | 17.01 | 18 | 16QAM | 5MHz | 12 | 6 |
| 16.79 | 16.64 | 16.87 | 18 | 16QAM | 5MHz | 12 | 13 |
| 16.79 | 16.69 | 16.99 | 18 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20000 | 20175 | 20350 | Channel | | | | |
| 1715 | 1732.5 | 1750 | Freq. (MHz) | | | | |
| 16.93 | 16.90 | 16.86 | 18 | QPSK | 10MHz | 1 | 0 |
| 16.91 | 16.93 | 16.99 | 18 | QPSK | 10MHz | 1 | 24 |
| 17.02 | 16.67 | 17.12 | 18 | QPSK | 10MHz | 1 | 49 |
| 16.99 | 16.93 | 16.92 | 18 | QPSK | 10MHz | 25 | 0 |
| 17.03 | 16.83 | 17.02 | 18 | QPSK | 10MHz | 25 | 12 |
| 17.09 | 16.75 | 17.09 | 18 | QPSK | 10MHz | 25 | 25 |
| 17.06 | 16.79 | 17.02 | 18 | QPSK | 10MHz | 50 | 0 |
| 16.80 | 17.25 | 17.05 | 18 | 16QAM | 10MHz | 1 | 0 |
| 17.32 | 17.02 | 17.12 | 18 | 16QAM | 10MHz | 1 | 24 |
| 16.93 | 16.82 | 17.28 | 18 | 16QAM | 10MHz | 1 | 49 |
| 16.99 | 17.00 | 16.95 | 18 | 16QAM | 10MHz | 25 | 0 |
| 17.03 | 16.77 | 17.05 | 18 | 16QAM | 10MHz | 25 | 12 |
| 17.11 | 16.82 | 17.08 | 18 | 16QAM | 10MHz | 25 | 25 |
| 17.06 | 16.86 | 16.98 | 18 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20025 | 20175 | 20325 | Channel | | | | |
| 1717.5 | 1732.5 | 1747.5 | Freq. (MHz) | | | | |
| 16.70 | 16.92 | 16.68 | 18 | QPSK | 15MHz | 1 | 0 |
| 16.95 | 16.81 | 16.77 | 18 | QPSK | 15MHz | 1 | 37 |
| 16.73 | 16.65 | 17.07 | 18 | QPSK | 15MHz | 1 | 74 |
| 16.91 | 16.89 | 16.77 | 18 | QPSK | 15MHz | 36 | 0 |
| 17.00 | 16.78 | 16.93 | 18 | QPSK | 15MHz | 36 | 19 |
| 16.98 | 16.71 | 17.06 | 18 | QPSK | 15MHz | 36 | 39 |
| 17.03 | 16.75 | 16.99 | 18 | QPSK | 15MHz | 75 | 0 |
| 16.58 | 17.29 | 17.09 | 18 | 16QAM | 15MHz | 1 | 0 |
| 16.66 | 16.90 | 16.51 | 18 | 16QAM | 15MHz | 1 | 37 |
| 17.01 | 16.63 | 17.25 | 18 | 16QAM | 15MHz | 1 | 74 |
| 17.05 | 16.92 | 16.88 | 18 | 16QAM | 15MHz | 36 | 0 |
| 17.19 | 16.83 | 17.02 | 18 | 16QAM | 15MHz | 36 | 19 |
| 17.01 | 16.77 | 17.04 | 18 | 16QAM | 15MHz | 36 | 39 |
| 17.10 | 16.84 | 16.96 | 18 | 16QAM | 15MHz | 75 | 0 |

| LTE Band 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20050 | 20175 | 20300 | Channel | | | | |
| 1720 | 1732.5 | 1745 | Freq. (MHz) | | | | |
| 16.85 | 17.55 | 16.79 | 18 | QPSK | 20MHz | 1 | 0 |
| 17.00 | 16.72 | 16.71 | 18 | QPSK | 20MHz | 1 | 49 |
| 16.86 | 16.61 | 16.98 | 18 | QPSK | 20MHz | 1 | 99 |
| 17.08 | 17.47 | 16.68 | 18 | QPSK | 20MHz | 50 | 0 |
| 17.02 | 16.76 | 16.82 | 18 | QPSK | 20MHz | 50 | 25 |
| 16.89 | 16.66 | 16.95 | 18 | QPSK | 20MHz | 50 | 50 |
| 17.18 | 16.80 | 17.03 | 18 | QPSK | 20MHz | 100 | 0 |
| 16.89 | 17.22 | 17.42 | 18 | 16QAM | 20MHz | 1 | 0 |
| 17.10 | 16.95 | 16.58 | 18 | 16QAM | 20MHz | 1 | 49 |
| 16.70 | 17.16 | 17.40 | 18 | 16QAM | 20MHz | 1 | 99 |
| 17.15 | 17.00 | 16.65 | 18 | 16QAM | 20MHz | 50 | 0 |
| 17.06 | 16.86 | 16.90 | 18 | 16QAM | 20MHz | 50 | 25 |
| 17.00 | 16.71 | 16.96 | 18 | 16QAM | 20MHz | 50 | 50 |
| 17.07 | 16.91 | 16.94 | 18 | 16QAM | 20MHz | 100 | 0 |

| LTE Band 7 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20775 | 21100 | 21425 | Channel | | | | |
| 2502.5 | 2535 | 2567.5 | Freq. (MHz) | | | | |
| 14.85 | 14.91 | 15.00 | 15.5 | QPSK | 5MHz | 1 | 0 |
| 14.92 | 14.89 | 14.96 | 15.5 | QPSK | 5MHz | 1 | 12 |
| 14.95 | 14.87 | 15.02 | 15.5 | QPSK | 5MHz | 1 | 24 |
| 14.88 | 14.87 | 15.12 | 15.5 | QPSK | 5MHz | 12 | 0 |
| 14.88 | 14.93 | 15.09 | 15.5 | QPSK | 5MHz | 12 | 6 |
| 14.85 | 14.86 | 15.13 | 15.5 | QPSK | 5MHz | 12 | 13 |
| 14.90 | 14.89 | 15.09 | 15.5 | QPSK | 5MHz | 25 | 0 |
| 14.74 | 15.19 | 15.35 | 15.5 | 16QAM | 5MHz | 1 | 0 |
| 14.93 | 14.39 | 15.38 | 15.5 | 16QAM | 5MHz | 1 | 12 |
| 15.36 | 15.29 | 15.29 | 15.5 | 16QAM | 5MHz | 1 | 24 |
| 14.78 | 14.97 | 15.04 | 15.5 | 16QAM | 5MHz | 12 | 0 |
| 14.90 | 14.83 | 15.03 | 15.5 | 16QAM | 5MHz | 12 | 6 |
| 14.94 | 14.99 | 14.97 | 15.5 | 16QAM | 5MHz | 12 | 13 |
| 14.91 | 14.97 | 15.11 | 15.5 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 7 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20800 | 21100 | 21400 | Channel | | | | |
| 2505 | 2535 | 2565 | Freq. (MHz) | | | | |
| 14.95 | 14.80 | 15.12 | 15.5 | QPSK | 10MHz | 1 | 0 |
| 14.86 | 14.82 | 15.09 | 15.5 | QPSK | 10MHz | 1 | 24 |
| 15.05 | 14.84 | 15.26 | 15.5 | QPSK | 10MHz | 1 | 49 |
| 15.00 | 15.03 | 15.14 | 15.5 | QPSK | 10MHz | 25 | 0 |
| 14.92 | 14.96 | 15.12 | 15.5 | QPSK | 10MHz | 25 | 12 |
| 14.90 | 15.01 | 15.13 | 15.5 | QPSK | 10MHz | 25 | 25 |
| 14.98 | 14.96 | 15.11 | 15.5 | QPSK | 10MHz | 50 | 0 |
| 15.15 | 15.03 | 15.28 | 15.5 | 16QAM | 10MHz | 1 | 0 |
| 15.01 | 14.76 | 15.01 | 15.5 | 16QAM | 10MHz | 1 | 24 |
| 15.01 | 15.10 | 15.37 | 15.5 | 16QAM | 10MHz | 1 | 49 |
| 14.90 | 14.83 | 15.18 | 15.5 | 16QAM | 10MHz | 25 | 0 |
| 15.01 | 14.87 | 15.17 | 15.5 | 16QAM | 10MHz | 25 | 12 |
| 14.99 | 14.93 | 15.24 | 15.5 | 16QAM | 10MHz | 25 | 25 |
| 15.00 | 14.93 | 15.18 | 15.5 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 7 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20825 | 21100 | 21375 | Channel | | | | |
| 2507.5 | 2535 | 2562.5 | Freq. (MHz) | | | | |
| 14.79 | 14.75 | 14.99 | 15.5 | QPSK | 15MHz | 1 | 0 |
| 14.85 | 14.82 | 15.06 | 15.5 | QPSK | 15MHz | 1 | 37 |
| 14.94 | 14.86 | 15.03 | 15.5 | QPSK | 15MHz | 1 | 74 |
| 14.91 | 14.82 | 15.10 | 15.5 | QPSK | 15MHz | 36 | 0 |
| 14.90 | 14.91 | 15.09 | 15.5 | QPSK | 15MHz | 36 | 19 |
| 14.94 | 14.95 | 15.10 | 15.5 | QPSK | 15MHz | 36 | 39 |
| 14.97 | 14.91 | 15.10 | 15.5 | QPSK | 15MHz | 75 | 0 |
| 14.48 | 15.13 | 15.38 | 15.5 | 16QAM | 15MHz | 1 | 0 |
| 15.31 | 14.82 | 15.05 | 15.5 | 16QAM | 15MHz | 1 | 37 |
| 15.37 | 15.03 | 15.05 | 15.5 | 16QAM | 15MHz | 1 | 74 |
| 14.91 | 14.97 | 15.10 | 15.5 | 16QAM | 15MHz | 36 | 0 |
| 14.96 | 15.01 | 15.19 | 15.5 | 16QAM | 15MHz | 36 | 19 |
| 14.97 | 14.87 | 15.15 | 15.5 | 16QAM | 15MHz | 36 | 39 |
| 15.00 | 14.92 | 15.12 | 15.5 | 16QAM | 15MHz | 75 | 0 |

| LTE Band 7 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 20850 | 21100 | 21350 | Channel | | | | |
| 2510 | 2535 | 2560 | Freq. (MHz) | | | | |
| 15.49 | 15.29 | 15.23 | 15.5 | QPSK | 20MHz | 1 | 0 |
| 14.98 | 14.86 | 15.21 | 15.5 | QPSK | 20MHz | 1 | 49 |
| 15.10 | 15.01 | 15.06 | 15.5 | QPSK | 20MHz | 1 | 99 |
| 15.49 | 15.35 | 15.20 | 15.5 | QPSK | 20MHz | 50 | 0 |
| 15.01 | 14.99 | 15.18 | 15.5 | QPSK | 20MHz | 50 | 25 |
| 15.04 | 14.91 | 15.15 | 15.5 | QPSK | 20MHz | 50 | 50 |
| 15.22 | 15.09 | 15.20 | 15.5 | QPSK | 20MHz | 100 | 0 |
| 15.02 | 14.91 | 15.19 | 15.5 | 16QAM | 20MHz | 1 | 0 |
| 15.01 | 15.23 | 15.12 | 15.5 | 16QAM | 20MHz | 1 | 49 |
| 14.93 | 14.88 | 15.12 | 15.5 | 16QAM | 20MHz | 1 | 99 |
| 14.99 | 14.89 | 15.11 | 15.5 | 16QAM | 20MHz | 50 | 0 |
| 14.98 | 14.94 | 15.12 | 15.5 | 16QAM | 20MHz | 50 | 25 |
| 15.01 | 14.90 | 15.20 | 15.5 | 16QAM | 20MHz | 50 | 50 |
| 15.20 | 15.05 | 15.14 | 15.5 | 16QAM | 20MHz | 100 | 0 |

| LTE Band 30 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 27685 | 27710 | 27735 | Channel | | | | |
| 2307.5 | 2310 | 2312.5 | Freq. (MHz) | | | | |
| 17.17 | 17.67 | 16.97 | 18 | QPSK | 5MHz | 1 | 0 |
| 16.94 | 17.11 | 16.98 | 18 | QPSK | 5MHz | 1 | 12 |
| 17.04 | 17.09 | 17.07 | 18 | QPSK | 5MHz | 1 | 24 |
| 17.15 | 17.58 | 17.17 | 18 | QPSK | 5MHz | 12 | 0 |
| 17.52 | 17.55 | 17.17 | 18 | QPSK | 5MHz | 12 | 6 |
| 17.37 | 17.39 | 17.41 | 18 | QPSK | 5MHz | 12 | 13 |
| 17.11 | 17.10 | 16.90 | 18 | QPSK | 5MHz | 25 | 0 |
| 17.09 | 17.05 | 17.10 | 18 | 16QAM | 5MHz | 1 | 0 |
| 17.09 | 17.10 | 17.04 | 18 | 16QAM | 5MHz | 1 | 12 |
| 17.11 | 17.11 | 17.05 | 18 | 16QAM | 5MHz | 1 | 24 |
| 17.04 | 17.18 | 16.98 | 18 | 16QAM | 5MHz | 12 | 0 |
| 17.16 | 17.09 | 17.04 | 18 | 16QAM | 5MHz | 12 | 6 |
| 17.02 | 17.22 | 17.07 | 18 | 16QAM | 5MHz | 12 | 13 |
| 17.04 | 16.99 | 16.95 | 18 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 30 | | | | | | |
|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset | |
| 27710 | Channel | | | | | |
| 2310 | Freq. (MHz) | | | | | |
| 17.46 | 18 | QPSK | 10MHz | 1 | 0 | |
| 17.44 | 18 | QPSK | 10MHz | 1 | 24 | |
| 17.22 | 18 | QPSK | 10MHz | 1 | 49 | |
| 17.45 | 18 | QPSK | 10MHz | 25 | 0 | |
| 17.19 | 18 | QPSK | 10MHz | 25 | 12 | |
| 17.14 | 18 | QPSK | 10MHz | 25 | 25 | |
| 17.26 | 18 | QPSK | 10MHz | 50 | 0 | |
| 17.19 | 18 | 16QAM | 10MHz | 1 | 0 | |
| 17.17 | 18 | 16QAM | 10MHz | 1 | 24 | |
| 17.34 | 18 | 16QAM | 10MHz | 1 | 49 | |
| 17.11 | 18 | 16QAM | 10MHz | 25 | 0 | |
| 17.18 | 18 | 16QAM | 10MHz | 25 | 12 | |
| 17.13 | 18 | 16QAM | 10MHz | 25 | 25 | |
| 17.21 | 18 | 16QAM | 10MHz | 50 | 0 | |

| LTE Band 38 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 37775 | 38000 | 38225 | Channel | | | | |
| 2572.5 | 2595 | 2617.5 | Freq. (MHz) | | | | |
| 15.63 | 15.56 | 15.63 | 16.5 | QPSK | 5MHz | 1 | 0 |
| 15.60 | 15.56 | 15.64 | 16.5 | QPSK | 5MHz | 1 | 12 |
| 15.61 | 15.58 | 15.64 | 16.5 | QPSK | 5MHz | 1 | 24 |
| 15.64 | 15.60 | 15.64 | 16.5 | QPSK | 5MHz | 12 | 0 |
| 15.63 | 15.56 | 15.63 | 16.5 | QPSK | 5MHz | 12 | 6 |
| 15.62 | 15.59 | 15.63 | 16.5 | QPSK | 5MHz | 12 | 13 |
| 15.62 | 15.58 | 15.64 | 16.5 | QPSK | 5MHz | 25 | 0 |
| 16.23 | 16.08 | 16.22 | 16.5 | 16QAM | 5MHz | 1 | 0 |
| 16.25 | 16.11 | 16.18 | 16.5 | 16QAM | 5MHz | 1 | 12 |
| 16.22 | 16.07 | 16.22 | 16.5 | 16QAM | 5MHz | 1 | 24 |
| 15.72 | 15.64 | 15.72 | 16.5 | 16QAM | 5MHz | 12 | 0 |
| 15.71 | 15.63 | 15.71 | 16.5 | 16QAM | 5MHz | 12 | 6 |
| 15.70 | 15.62 | 15.73 | 16.5 | 16QAM | 5MHz | 12 | 13 |
| 15.68 | 15.61 | 15.73 | 16.5 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 38 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 37800 | 38000 | 38200 | Channel | | | | |
| 2575 | 2595 | 2615 | Freq. (MHz) | | | | |
| 15.63 | 15.59 | 15.63 | 16.5 | QPSK | 10MHz | 1 | 0 |
| 15.61 | 15.55 | 15.60 | 16.5 | QPSK | 10MHz | 1 | 24 |
| 15.63 | 15.58 | 15.62 | 16.5 | QPSK | 10MHz | 1 | 49 |
| 15.65 | 15.60 | 15.65 | 16.5 | QPSK | 10MHz | 25 | 0 |
| 15.62 | 15.59 | 15.63 | 16.5 | QPSK | 10MHz | 25 | 12 |
| 15.65 | 15.61 | 15.65 | 16.5 | QPSK | 10MHz | 25 | 25 |
| 15.56 | 15.56 | 15.63 | 16.5 | QPSK | 10MHz | 50 | 0 |
| 16.35 | 16.17 | 16.20 | 16.5 | 16QAM | 10MHz | 1 | 0 |
| 16.26 | 16.16 | 16.22 | 16.5 | 16QAM | 10MHz | 1 | 24 |
| 16.24 | 16.20 | 16.30 | 16.5 | 16QAM | 10MHz | 1 | 49 |
| 15.72 | 15.69 | 15.73 | 16.5 | 16QAM | 10MHz | 25 | 0 |
| 15.71 | 15.66 | 15.73 | 16.5 | 16QAM | 10MHz | 25 | 12 |
| 15.72 | 15.66 | 15.73 | 16.5 | 16QAM | 10MHz | 25 | 25 |
| 15.64 | 15.62 | 15.65 | 16.5 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 38 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 37825 | 38000 | 38175 | Channel | | | | |
| 2577.5 | 2595 | 2612.5 | Freq. (MHz) | | | | |
| 15.64 | 15.62 | 15.64 | 16.5 | QPSK | 15MHz | 1 | 0 |
| 15.62 | 15.61 | 15.62 | 16.5 | QPSK | 15MHz | 1 | 37 |
| 15.61 | 15.58 | 15.67 | 16.5 | QPSK | 15MHz | 1 | 74 |
| 15.59 | 15.57 | 15.59 | 16.5 | QPSK | 15MHz | 36 | 0 |
| 15.58 | 15.58 | 15.61 | 16.5 | QPSK | 15MHz | 36 | 19 |
| 15.56 | 15.57 | 15.60 | 16.5 | QPSK | 15MHz | 36 | 39 |
| 15.55 | 15.53 | 15.58 | 16.5 | QPSK | 15MHz | 75 | 0 |
| 16.25 | 16.16 | 16.19 | 16.5 | 16QAM | 15MHz | 1 | 0 |
| 16.20 | 16.13 | 16.22 | 16.5 | 16QAM | 15MHz | 1 | 37 |
| 16.16 | 16.14 | 16.23 | 16.5 | 16QAM | 15MHz | 1 | 74 |
| 15.67 | 15.61 | 15.67 | 16.5 | 16QAM | 15MHz | 36 | 0 |
| 15.67 | 15.62 | 15.68 | 16.5 | 16QAM | 15MHz | 36 | 19 |
| 15.62 | 15.61 | 15.67 | 16.5 | 16QAM | 15MHz | 36 | 39 |
| 15.63 | 15.61 | 15.66 | 16.5 | 16QAM | 15MHz | 75 | 0 |

| LTE Band 38 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 37850 | 38000 | 38150 | Channel | | | | |
| 2580 | 2595 | 2610 | Freq. (MHz) | | | | |
| 16.46 | 16.49 | 16.31 | 16.5 | QPSK | 20MHz | 1 | 0 |
| 16.31 | 16.31 | 16.29 | 16.5 | QPSK | 20MHz | 1 | 49 |
| 16.34 | 16.31 | 16.39 | 16.5 | QPSK | 20MHz | 1 | 99 |
| 15.72 | 15.73 | 15.71 | 16.5 | QPSK | 20MHz | 50 | 0 |
| 15.70 | 15.67 | 15.69 | 16.5 | QPSK | 20MHz | 50 | 25 |
| 15.73 | 15.70 | 15.71 | 16.5 | QPSK | 20MHz | 50 | 50 |
| 15.71 | 15.67 | 15.66 | 16.5 | QPSK | 20MHz | 100 | 0 |
| 15.80 | 15.73 | 15.71 | 16.5 | 16QAM | 20MHz | 1 | 0 |
| 15.74 | 15.67 | 15.67 | 16.5 | 16QAM | 20MHz | 1 | 49 |
| 15.77 | 15.71 | 15.71 | 16.5 | 16QAM | 20MHz | 1 | 99 |
| 15.71 | 15.67 | 15.69 | 16.5 | 16QAM | 20MHz | 50 | 0 |
| 15.70 | 15.67 | 15.67 | 16.5 | 16QAM | 20MHz | 50 | 25 |
| 15.66 | 15.67 | 15.69 | 16.5 | 16QAM | 20MHz | 50 | 50 |
| 15.64 | 15.69 | 15.68 | 16.5 | 16QAM | 20MHz | 100 | 0 |

| LTE Band 41 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 39675 | 40148 | 40620 | 41093 | 41565 | Channel | | | | |
| 2498.5 | 2545.8 | 2593 | 2640.3 | 2687.5 | Freq. (MHz) | | | | |
| 15.22 | 15.21 | 15.31 | 15.57 | 15.47 | 16.5 | QPSK | 5MHz | 1 | 0 |
| 15.18 | 15.20 | 15.29 | 15.54 | 15.42 | 16.5 | QPSK | 5MHz | 1 | 12 |
| 15.22 | 15.21 | 15.31 | 15.52 | 15.55 | 16.5 | QPSK | 5MHz | 1 | 24 |
| 15.24 | 15.22 | 15.31 | 15.58 | 15.45 | 16.5 | QPSK | 5MHz | 12 | 0 |
| 15.21 | 15.21 | 15.31 | 15.58 | 15.43 | 16.5 | QPSK | 5MHz | 12 | 6 |
| 15.23 | 15.20 | 15.30 | 15.58 | 15.44 | 16.5 | QPSK | 5MHz | 12 | 13 |
| 15.23 | 15.20 | 15.31 | 15.55 | 15.47 | 16.5 | QPSK | 5MHz | 25 | 0 |
| 15.94 | 15.90 | 15.81 | 16.20 | 15.99 | 16.5 | 16QAM | 5MHz | 1 | 0 |
| 15.90 | 15.87 | 15.79 | 16.13 | 15.96 | 16.5 | 16QAM | 5MHz | 1 | 12 |
| 15.92 | 15.93 | 15.83 | 16.13 | 16.12 | 16.5 | 16QAM | 5MHz | 1 | 24 |
| 15.33 | 15.31 | 15.39 | 15.58 | 15.53 | 16.5 | 16QAM | 5MHz | 12 | 0 |
| 15.30 | 15.30 | 15.37 | 15.58 | 15.52 | 16.5 | 16QAM | 5MHz | 12 | 6 |
| 15.31 | 15.32 | 15.40 | 15.60 | 15.54 | 16.5 | 16QAM | 5MHz | 12 | 13 |
| 15.27 | 15.26 | 15.35 | 15.59 | 15.54 | 16.5 | 16QAM | 5MHz | 25 | 0 |

| LTE Band 41 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 39700 | 40160 | 40620 | 41080 | 41540 | Channel | | | | |
| 2501 | 2547 | 2593 | 2639 | 2685 | Freq. (MHz) | | | | |
| 15.22 | 15.23 | 15.30 | 15.59 | 15.45 | 16.5 | QPSK | 10MHz | 1 | 0 |
| 15.14 | 15.17 | 15.29 | 15.51 | 15.40 | 16.5 | QPSK | 10MHz | 1 | 24 |
| 15.09 | 15.25 | 15.27 | 15.46 | 15.51 | 16.5 | QPSK | 10MHz | 1 | 49 |
| 15.22 | 15.20 | 15.32 | 15.54 | 15.46 | 16.5 | QPSK | 10MHz | 25 | 0 |
| 15.22 | 15.17 | 15.25 | 15.55 | 15.44 | 16.5 | QPSK | 10MHz | 25 | 12 |
| 15.22 | 15.27 | 15.31 | 15.57 | 15.45 | 16.5 | QPSK | 10MHz | 25 | 25 |
| 15.17 | 15.15 | 15.22 | 15.50 | 15.46 | 16.5 | QPSK | 10MHz | 50 | 0 |
| 15.92 | 15.96 | 15.96 | 16.30 | 15.97 | 16.5 | 16QAM | 10MHz | 1 | 0 |
| 15.93 | 15.94 | 15.87 | 16.22 | 15.96 | 16.5 | 16QAM | 10MHz | 1 | 24 |
| 15.83 | 15.97 | 15.90 | 16.23 | 16.14 | 16.5 | 16QAM | 10MHz | 1 | 49 |
| 15.30 | 15.30 | 15.32 | 15.66 | 15.55 | 16.5 | 16QAM | 10MHz | 25 | 0 |
| 15.27 | 15.29 | 15.35 | 15.64 | 15.54 | 16.5 | 16QAM | 10MHz | 25 | 12 |
| 15.27 | 15.36 | 15.34 | 15.64 | 15.55 | 16.5 | 16QAM | 10MHz | 25 | 25 |
| 15.14 | 15.20 | 15.29 | 15.55 | 15.53 | 16.5 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 41 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 39725 | 40173 | 40620 | 41068 | 41515 | Channel | | | | |
| 2503.5 | 2548.3 | 2593 | 2637.8 | 2682.5 | Freq. (MHz) | | | | |
| 15.21 | 15.23 | 15.30 | 15.62 | 15.41 | 16.5 | QPSK | 15MHz | 1 | 0 |
| 15.17 | 15.25 | 15.28 | 15.57 | 15.48 | 16.5 | QPSK | 15MHz | 1 | 37 |
| 15.13 | 15.31 | 15.28 | 15.52 | 15.53 | 16.5 | QPSK | 15MHz | 1 | 74 |
| 15.14 | 15.18 | 15.25 | 15.55 | 15.38 | 16.5 | QPSK | 15MHz | 36 | 0 |
| 15.12 | 15.18 | 15.25 | 15.51 | 15.43 | 16.5 | QPSK | 15MHz | 36 | 19 |
| 15.08 | 15.23 | 15.27 | 15.51 | 15.42 | 16.5 | QPSK | 15MHz | 36 | 39 |
| 15.13 | 15.16 | 15.22 | 15.48 | 15.43 | 16.5 | QPSK | 15MHz | 75 | 0 |
| 15.92 | 15.96 | 15.85 | 16.25 | 15.94 | 16.5 | 16QAM | 15MHz | 1 | 0 |
| 15.84 | 15.98 | 15.81 | 16.23 | 15.96 | 16.5 | 16QAM | 15MHz | 1 | 37 |
| 15.79 | 16.00 | 15.85 | 16.19 | 16.12 | 16.5 | 16QAM | 15MHz | 1 | 74 |
| 15.21 | 15.21 | 15.30 | 15.62 | 15.45 | 16.5 | 16QAM | 15MHz | 36 | 0 |
| 15.21 | 15.26 | 15.32 | 15.57 | 15.50 | 16.5 | 16QAM | 15MHz | 36 | 19 |
| 15.15 | 15.29 | 15.32 | 15.57 | 15.47 | 16.5 | 16QAM | 15MHz | 36 | 39 |
| 15.20 | 15.24 | 15.32 | 15.59 | 15.55 | 16.5 | 16QAM | 15MHz | 75 | 0 |

| LTE Band 41 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 39750 | 40185 | 40620 | 41055 | 41490 | Channel | | | | |
| 2506 | 2549.5 | 2593 | 2636.5 | 2680 | Freq. (MHz) | | | | |
| 15.83 | 15.83 | 16.29 | 16.21 | 16.18 | 16.5 | QPSK | 20MHz | 1 | 0 |
| 15.82 | 15.79 | 16.17 | 16.16 | 16.03 | 16.5 | QPSK | 20MHz | 1 | 49 |
| 15.79 | 15.78 | 16.26 | 16.18 | 16.14 | 16.5 | QPSK | 20MHz | 1 | 99 |
| 15.81 | 15.71 | 16.12 | 16.22 | 15.76 | 16.5 | QPSK | 20MHz | 50 | 0 |
| 15.62 | 15.81 | 16.19 | 15.54 | 15.88 | 16.5 | QPSK | 20MHz | 50 | 25 |
| 15.33 | 15.82 | 15.93 | 15.53 | 15.78 | 16.5 | QPSK | 20MHz | 50 | 50 |
| 15.24 | 15.22 | 15.61 | 16.21 | 16.12 | 16.5 | QPSK | 20MHz | 100 | 0 |
| 15.21 | 15.04 | 15.62 | 15.62 | 15.60 | 16.5 | 16QAM | 20MHz | 1 | 0 |
| 15.09 | 15.08 | 15.58 | 15.51 | 15.52 | 16.5 | 16QAM | 20MHz | 1 | 49 |
| 15.10 | 15.10 | 15.70 | 15.50 | 15.60 | 16.5 | 16QAM | 20MHz | 1 | 99 |
| 15.18 | 14.95 | 15.58 | 15.57 | 15.54 | 16.5 | 16QAM | 20MHz | 50 | 0 |
| 15.07 | 14.97 | 15.60 | 15.49 | 15.57 | 16.5 | 16QAM | 20MHz | 50 | 25 |
| 15.10 | 14.98 | 15.59 | 15.50 | 15.60 | 16.5 | 16QAM | 20MHz | 50 | 50 |
| 15.15 | 14.98 | 15.60 | 15.47 | 15.61 | 16.5 | 16QAM | 20MHz | 100 | 0 |

| LTE Band 66 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 131979 | 132322 | 132665 | Channel | | | | |
| 1710.7 | 1745 | 1779.3 | Freq. (MHz) | | | | |
| 16.47 | 16.50 | 16.60 | 18 | QPSK | 1.4MHz | 1 | 0 |
| 16.43 | 16.46 | 16.66 | 18 | QPSK | 1.4MHz | 1 | 2 |
| 16.44 | 16.53 | 16.52 | 18 | QPSK | 1.4MHz | 1 | 5 |
| 16.49 | 16.48 | 16.49 | 18 | QPSK | 1.4MHz | 3 | 0 |
| 16.51 | 16.55 | 16.52 | 18 | QPSK | 1.4MHz | 3 | 1 |
| 16.53 | 16.59 | 16.54 | 18 | QPSK | 1.4MHz | 3 | 3 |
| 16.54 | 16.52 | 16.53 | 18 | QPSK | 1.4MHz | 6 | 0 |
| 16.77 | 16.55 | 16.49 | 18 | 16QAM | 1.4MHz | 1 | 0 |
| 16.73 | 16.55 | 17.01 | 18 | 16QAM | 1.4MHz | 1 | 2 |
| 16.58 | 16.92 | 17.03 | 18 | 16QAM | 1.4MHz | 1 | 5 |
| 16.57 | 16.65 | 16.77 | 18 | 16QAM | 1.4MHz | 3 | 0 |
| 16.53 | 16.58 | 16.57 | 18 | 16QAM | 1.4MHz | 3 | 1 |
| 16.45 | 16.60 | 16.48 | 18 | 16QAM | 1.4MHz | 3 | 3 |
| 16.52 | 16.67 | 16.74 | 18 | 16QAM | 1.4MHz | 6 | 0 |

| LTE Band 66 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 131987 | 132322 | 132657 | Channel | | | | |
| 1711.5 | 1745 | 1778.5 | Freq. (MHz) | | | | |
| 16.50 | 16.55 | 16.56 | 18 | QPSK | 3MHz | 1 | 0 |
| 16.62 | 16.63 | 16.56 | 18 | QPSK | 3MHz | 1 | 7 |
| 16.45 | 16.54 | 16.56 | 18 | QPSK | 3MHz | 1 | 14 |
| 16.55 | 16.57 | 16.56 | 18 | QPSK | 3MHz | 8 | 0 |
| 16.51 | 16.49 | 16.51 | 18 | QPSK | 3MHz | 8 | 3 |
| 16.53 | 16.50 | 16.53 | 18 | QPSK | 3MHz | 8 | 7 |
| 16.53 | 16.53 | 16.51 | 18 | QPSK | 3MHz | 15 | 0 |
| 16.44 | 17.14 | 16.84 | 18 | 16QAM | 3MHz | 1 | 0 |
| 16.43 | 16.55 | 16.87 | 18 | 16QAM | 3MHz | 1 | 7 |
| 16.53 | 17.04 | 16.95 | 18 | 16QAM | 3MHz | 1 | 14 |
| 16.59 | 16.51 | 16.52 | 18 | 16QAM | 3MHz | 8 | 0 |
| 16.51 | 16.69 | 16.56 | 18 | 16QAM | 3MHz | 8 | 3 |
| 16.61 | 16.51 | 16.54 | 18 | 16QAM | 3MHz | 8 | 7 |
| 16.57 | 16.62 | 16.58 | 18 | 16QAM | 3MHz | 15 | 0 |

| LTE Band 66 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 131997 | 132322 | 132647 | Channel | | | | |
| 1712.5 | 1745 | 1777.5 | Freq. (MHz) | | | | |
| 16.94 | 16.98 | 16.97 | 18 | QPSK | 5MHz | 1 | 0 |
| 16.95 | 16.91 | 16.94 | 18 | QPSK | 5MHz | 1 | 12 |
| 17.00 | 17.05 | 17.02 | 18 | QPSK | 5MHz | 1 | 24 |
| 17.05 | 17.02 | 16.95 | 18 | QPSK | 5MHz | 12 | 0 |
| 16.93 | 16.95 | 16.87 | 18 | QPSK | 5MHz | 12 | 6 |
| 16.89 | 16.96 | 16.88 | 18 | QPSK | 5MHz | 12 | 13 |
| 16.97 | 16.91 | 16.94 | 18 | QPSK | 5MHz | 25 | 0 |
| 17.52 | 17.30 | 17.08 | 18 | 16QAM | 5MHz | 1 | 0 |
| 17.45 | 17.40 | 16.91 | 18 | 16QAM | 5MHz | 1 | 12 |
| 17.59 | 17.48 | 17.46 | 18 | 16QAM | 5MHz | 1 | 24 |
| 17.03 | 16.85 | 16.97 | 18 | 16QAM | 5MHz | 12 | 0 |
| 16.96 | 16.98 | 16.96 | 18 | 16QAM | 5MHz | 12 | 6 |
| 16.99 | 16.93 | 16.95 | 18 | 16QAM | 5MHz | 12 | 13 |
| 17.00 | 16.86 | 16.83 | 18 | 16QAM | 5MHz | 25 | 0 |

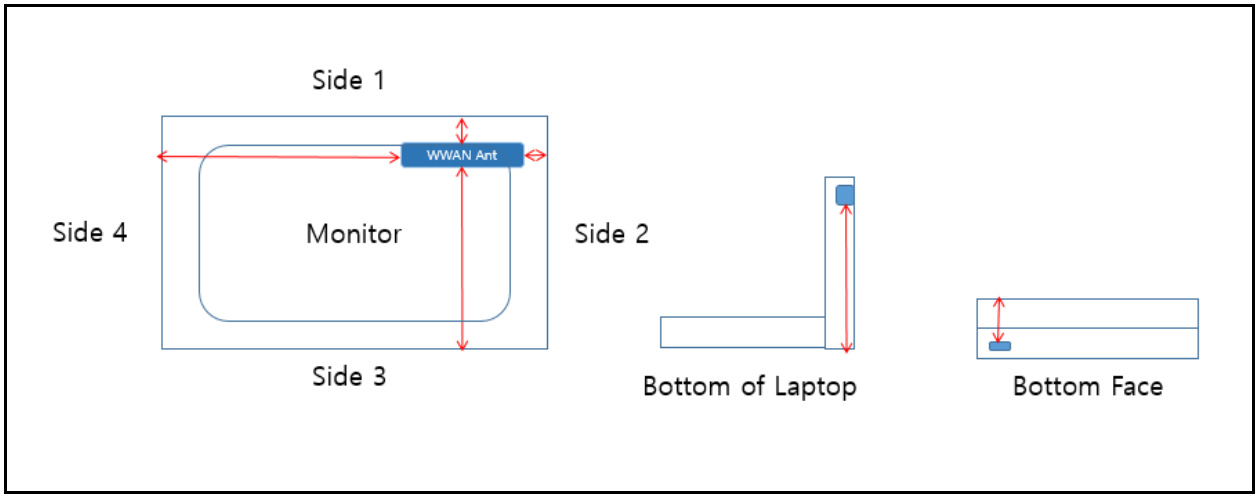
| LTE Band 66 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 132022 | 132322 | 132622 | Channel | | | | |
| 1715 | 1745 | 1775 | Freq. (MHz) | | | | |
| 17.14 | 17.07 | 17.07 | 18 | QPSK | 10MHz | 1 | 0 |
| 17.24 | 16.99 | 16.92 | 18 | QPSK | 10MHz | 1 | 24 |
| 17.10 | 17.21 | 17.13 | 18 | QPSK | 10MHz | 1 | 49 |
| 17.07 | 17.03 | 17.07 | 18 | QPSK | 10MHz | 25 | 0 |
| 17.17 | 17.10 | 17.14 | 18 | QPSK | 10MHz | 25 | 12 |
| 17.13 | 17.10 | 16.99 | 18 | QPSK | 10MHz | 25 | 25 |
| 17.10 | 17.12 | 17.08 | 18 | QPSK | 10MHz | 50 | 0 |
| 16.30 | 16.24 | 16.22 | 18 | 16QAM | 10MHz | 1 | 0 |
| 16.19 | 16.35 | 16.21 | 18 | 16QAM | 10MHz | 1 | 24 |
| 16.25 | 16.49 | 16.27 | 18 | 16QAM | 10MHz | 1 | 49 |
| 16.33 | 16.39 | 16.28 | 18 | 16QAM | 10MHz | 25 | 0 |
| 16.28 | 16.25 | 16.27 | 18 | 16QAM | 10MHz | 25 | 12 |
| 16.31 | 16.25 | 16.31 | 18 | 16QAM | 10MHz | 25 | 25 |
| 16.35 | 16.33 | 16.35 | 18 | 16QAM | 10MHz | 50 | 0 |

| LTE Band 66 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 132047 | 132322 | 132597 | Channel | | | | |
| 1717.5 | 1745 | 1772.5 | Freq. (MHz) | | | | |
| 16.59 | 16.52 | 16.59 | 18 | QPSK | 15MHz | 1 | 0 |
| 16.43 | 16.40 | 16.53 | 18 | QPSK | 15MHz | 1 | 37 |
| 16.49 | 16.59 | 16.64 | 18 | QPSK | 15MHz | 1 | 74 |
| 16.55 | 16.47 | 16.56 | 18 | QPSK | 15MHz | 36 | 0 |
| 16.56 | 16.49 | 16.53 | 18 | QPSK | 15MHz | 36 | 19 |
| 16.48 | 16.47 | 16.46 | 18 | QPSK | 15MHz | 36 | 39 |
| 16.58 | 16.61 | 16.55 | 18 | QPSK | 15MHz | 75 | 0 |
| 16.83 | 16.61 | 16.95 | 18 | 16QAM | 15MHz | 1 | 0 |
| 16.70 | 16.83 | 16.91 | 18 | 16QAM | 15MHz | 1 | 37 |
| 16.69 | 17.03 | 16.60 | 18 | 16QAM | 15MHz | 1 | 74 |
| 16.61 | 16.56 | 16.63 | 18 | 16QAM | 15MHz | 36 | 0 |
| 16.54 | 16.56 | 16.66 | 18 | 16QAM | 15MHz | 36 | 19 |
| 16.53 | 16.51 | 16.64 | 18 | 16QAM | 15MHz | 36 | 39 |
| 16.61 | 16.64 | 16.73 | 18 | 16QAM | 15MHz | 75 | 0 |

| LTE Band 66 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum Average Power (dBm) | | | Tune up (dBm) | Modulation | Bandwidth | # of Resource Blocks | Resource Block Offset |
| 132072 | 132322 | 132572 | Channel | | | | |
| 1720 | 1745 | 1770 | Freq. (MHz) | | | | |
| 17.49 | 17.68 | 17.60 | 18 | QPSK | 20MHz | 1 | 0 |
| 17.22 | 17.55 | 16.86 | 18 | QPSK | 20MHz | 1 | 49 |
| 17.11 | 17.48 | 16.68 | 18 | QPSK | 20MHz | 1 | 99 |
| 17.09 | 17.65 | 17.11 | 18 | QPSK | 20MHz | 50 | 0 |
| 17.16 | 17.04 | 17.08 | 18 | QPSK | 20MHz | 50 | 25 |
| 17.16 | 17.06 | 17.06 | 18 | QPSK | 20MHz | 50 | 50 |
| 17.09 | 17.01 | 17.19 | 18 | QPSK | 20MHz | 100 | 0 |
| 16.31 | 16.30 | 16.38 | 18 | 16QAM | 20MHz | 1 | 0 |
| 16.36 | 16.37 | 16.36 | 18 | 16QAM | 20MHz | 1 | 49 |
| 16.38 | 16.08 | 16.35 | 18 | 16QAM | 20MHz | 1 | 99 |
| 16.35 | 16.26 | 16.31 | 18 | 16QAM | 20MHz | 50 | 0 |
| 16.36 | 16.32 | 16.30 | 18 | 16QAM | 20MHz | 50 | 25 |
| 16.37 | 16.32 | 16.28 | 18 | 16QAM | 20MHz | 50 | 50 |
| 16.36 | 16.38 | 16.35 | 18 | 16QAM | 20MHz | 100 | 0 |

### 11.5 Antenna location

| Antenna | Bottom of Laptop (mm) | Bottom Face (mm) | Side 1 (mm) | Side 2 (mm) | Side 3 (mm) | Side 4 (mm) |
|---|---|---|---|---|---|---|
| WWAN | 187.23 | <5 | <5 | 26.75 | 187.23 | 183.85 |



## 11.6 SAR Test Exclusion

| Body SAR test reduction | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ant. Used | Band | Frequency | Tune-Power | | Distance of Ant. To User (mm) | | | | | | Calculated value and evaluated result (mW) | | | | | | exclusion threshold |
| | | (GHz) | (dBm) | (mW) | Bottom of laptop | Bottom face | Side1 | Side2 | Side3 | Side4 | Bottom of laptop | Bottom face | Side1 | Side2 | Side3 | Side4 | |
| WWAN Antenna | WCDMA II | 1.907 | 24.5 | 282 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 1481.0 | 77.9 | 77.9 | 14.6 | 1481.0 | 1447.0 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |
| | WCDMA IV | 1.750 | 24.5 | 282 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 1486.0 | 74.6 | 74.6 | 14.0 | 1486.0 | 1452.0 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |
| | WCDMA V | 0.846 | 24.5 | 282 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 937.1 | 51.9 | 51.9 | 9.7 | 937.1 | 918.0 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |
| | LTE 2 | 1.909 | 24 | 251 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 1481.0 | 69.4 | 69.4 | 13.0 | 1481.0 | 1447.0 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |
| | LTE 4 | 1.754 | 24 | 251 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 1486.0 | 66.5 | 66.5 | 12.4 | 1486.0 | 1452.0 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |
| | LTE 5 | 0.848 | 24 | 251 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 938.7 | 46.2 | 46.2 | 8.6 | 938.7 | 919.6 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |
| | LTE 7 | 2.567 | 24 | 251 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 1466.0 | 80.4 | 80.4 | 15.0 | 1466.0 | 1432.0 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |
| | LTE 12 | 0.715 | 24 | 251 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 831.5 | 42.5 | 42.5 | 7.9 | 831.5 | 815.4 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |
| | LTE 13 | 0.783 | 24 | 251 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 885.9 | 44.4 | 44.4 | 8.3 | 885.9 | 868.2 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |
| | LTE 17 | 0.713 | 24 | 251 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 829.9 | 42.4 | 42.4 | 7.9 | 829.9 | 813.9 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |
| | LTE 26 | 0.848 | 24 | 251 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 938.7 | 46.2 | 46.2 | 8.6 | 938.7 | 919.6 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |
| | LTE 30 | 2.310 | 24 | 251 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 1471.0 | 76.3 | 76.3 | 14.3 | 1471.0 | 1437.0 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |
| | LTE 38 | 2.618 | 24 | 251 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 1465.0 | 81.2 | 81.2 | 15.2 | 1465.0 | 1431.0 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |
| | LTE 41 | 2.688 | 24 | 251 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 1464.0 | 82.3 | 82.3 | 15.4 | 1464.0 | 1430.0 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |
| | LTE 66 | 1.779 | 24 | 251 | 187.23 | 5 | 5 | 26.75 | 187.23 | 183.85 | 1485.0 | 67.0 | 67.0 | 12.5 | 1485.0 | 1451.0 | 3 |
| | | | | | | | | | | | EXEMPT | MEASURE | MEASURE | MEASURE | EXEMPT | EXEMPT | |

Note:

1. The test reduction for distance less than 50 mm and more than 50 mm. Use the max power to make sure minimum distance by evaluated for SAR testing.
2. For 100 MHz to 6 GHz and test separation distances > 50 mm, According to KDB 447498, if the calculated Power threshold is less than the output power then SAR testing is required.
3. For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:
   According to KDB 447498, if the calculated threshold values are >3 then Body SAR and >7.5 then Limbs, SAR testing are required. Calculated Value only include number format, that means through compare output power with threshold, if the Calculated value more than 3, the SAR test should be perform. Otherwise, the SAR test could be exempt. (<50 mm)
4. The threshold $P_{th}$ (mW) described in §1.1307(b)(3)(i)(B) was also considered and compared with the calculated values from KDB447498 v06. The most conservative values compared between KDB447498 v06 method and §1.1307 method were select as the threshold in this report.
5. When an antenna qualifies for the standalone SAR test exclusion and also transmits simultaneously with other antennas, the standalone SAR value must be estimated in accordance with KDB 447498.
6. Power and distance are rounded to the nearest mW and mm before calculation.
7. The result is rounded to one decimal place for comparison.
8. The SAR test has included the exemption part in practice.

## 11.7 Test Results

### 11.7.1 SAR Test Result

| Index. | Band | Frequency | | Modulation or Sub-Test | Test Position | Spacing | SAR 1 g | Burst Avg Power (dBm) | Max tune-up (dBm) | Reported SAR 1 g | Ant | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ch. | MHz | | | (mm) | (W/Kg) | | | | | |
| | WCDMA Band II | 9400 | 1880 | RMC12.2K | Bottom of laptop | 0 | 0.01 | 23.3 | 24.5 | 0.013 | South Star | |
| | WCDMA Band II | 9400 | 1880 | RMC12.2K | Back of display screen | 25 | 0.482 | 23.3 | 24.5 | 0.635 | South Star | |
| #239 | WCDMA Band II | 9400 | 1880 | RMC12.2K | Bottom Face | 0 | 0.871 | 23.3 | 24.5 | 1.148 | South Star | |
| | WCDMA Band II | 9262 | 1852.4 | RMC12.2K | Bottom Face | 0 | 0.823 | 23.09 | 24.5 | 1.139 | South Star | |
| | WCDMA Band II | 9538 | 1907.6 | RMC12.2K | Bottom Face | 0 | 0.646 | 22.71 | 24.5 | 0.976 | South Star | |
| | WCDMA Band II | 9400 | 1880 | RMC12.2K | Side 1 | 0 | 0.812 | 18.29 | 18.5 | 0.852 | South Star | Power Reduce |
| | WCDMA Band II | 9262 | 1852.4 | RMC12.2K | Side 1 | 0 | 0.798 | 18.19 | 18.5 | 0.857 | South Star | Power Reduce |
| | WCDMA Band II | 9538 | 1907.6 | RMC12.2K | Side 1 | 0 | 0.806 | 18.27 | 18.5 | 0.850 | South Star | Power Reduce |
| #500 | WCDMA Band II | 9400 | 1880 | RMC12.2K | Side 1 | 17 | 0.901 | 23.3 | 24.5 | 1.188 | South Star | |
| | WCDMA Band II | 9400 | 1880 | RMC12.2K | Side 1 | 17 | 0.844 | 23.3 | 24.5 | 1.113 | AWAN | |
| | WCDMA Band II | 9262 | 1852.4 | RMC12.2K | Side 1 | 17 | 0.837 | 23.09 | 24.5 | 1.158 | South Star | |
| | WCDMA Band II | 9538 | 1907.6 | RMC12.2K | Side 1 | 17 | 0.463 | 22.71 | 24.5 | 0.699 | South Star | |
| | WCDMA Band II | 9400 | 1880 | RMC12.2K | Side 2 | 0 | 0.284 | 23.3 | 24.5 | 0.374 | South Star | |
| | WCDMA Band II | 9400 | 1880 | RMC12.2K | Side 3 | 0 | 0.01 | 23.3 | 24.5 | 0.013 | South Star | |
| | WCDMA Band II | 9400 | 1880 | RMC12.2K | Side 4 | 0 | 0.054 | 23.3 | 24.5 | 0.071 | South Star | |
| | | | | | | | | | | | | |
| | WCDMA Band IV | 1513 | 1752.6 | RMC12.2K | Bottom of laptop | 0 | 0.04 | 23.39 | 24.5 | 0.052 | South Star | |
| | WCDMA Band IV | 1513 | 1752.6 | RMC12.2K | Back of display screen | 25 | 0.46 | 23.39 | 24.5 | 0.594 | South Star | |
| | WCDMA Band IV | 1513 | 1752.6 | RMC12.2K | Bottom Face | 0 | 0.535 | 23.39 | 24.5 | 0.691 | South Star | |
| #249 | WCDMA Band IV | 1513 | 1752.6 | RMC12.2K | Bottom Face | 0 | 0.538 | 23.39 | 24.5 | 0.695 | AWAN | |
| | WCDMA Band IV | 1312 | 1712.4 | RMC12.2K | Bottom Face | 0 | 0.404 | 22.86 | 24.5 | 0.589 | AWAN | |
| | WCDMA Band IV | 1413 | 1732.6 | RMC12.2K | Bottom Face | 0 | 0.303 | 22.98 | 24.5 | 0.430 | AWAN | |
| | WCDMA Band IV | 1513 | 1752.6 | RMC12.2K | Side 1 | 0 | 0.541 | 18.11 | 18.5 | 0.592 | South Star | Power Reduce |
| | WCDMA Band IV | 1513 | 1752.6 | RMC12.2K | Side 1 | 17 | 0.211 | 23.39 | 24.5 | 0.272 | South Star | |
| | WCDMA Band IV | 1513 | 1752.6 | RMC12.2K | Side 2 | 0 | 0.045 | 23.39 | 24.5 | 0.058 | South Star | |
| | WCDMA Band IV | 1513 | 1752.6 | RMC12.2K | Side 3 | 0 | 0.063 | 23.39 | 24.5 | 0.081 | South Star | |
| | WCDMA Band IV | 1513 | 1752.6 | RMC12.2K | Side 4 | 0 | 0.01 | 23.39 | 24.5 | 0.013 | South Star | |
| | | | | | | | | | | | | |
| | WCDMA Band V | 4182 | 836.4 | RMC12.2K | Bottom of laptop | 0 | 0.01 | 23.69 | 24.5 | 0.012 | South Star | |
| | WCDMA Band V | 4182 | 836.4 | RMC12.2K | Back of display screen | 25 | 0.159 | 23.69 | 24.5 | 0.192 | South Star | |
| | WCDMA Band V | 4182 | 836.4 | RMC12.2K | Bottom Face | 0 | 0.268 | 23.69 | 24.5 | 0.323 | South Star | |
| | WCDMA Band V | 4182 | 836.4 | RMC12.2K | Side 1 | 0 | 0.742 | 23.69 | 24.5 | 0.894 | South Star | |
| #288 | WCDMA Band V | 4182 | 836.4 | RMC12.2K | Side 1 | 0 | 0.915 | 23.69 | 24.5 | 1.103 | AWAN | |
| | WCDMA Band V | 4132 | 826.4 | RMC12.2K | Side 1 | 0 | 0.863 | 23.53 | 24.5 | 1.079 | AWAN | |
| | WCDMA Band V | 4233 | 846.6 | RMC12.2K | Side 1 | 0 | 0.878 | 23.62 | 24.5 | 1.075 | AWAN | |
| | WCDMA Band V | 4182 | 836.4 | RMC12.2K | Side 2 | 0 | 0.101 | 23.69 | 24.5 | 0.122 | South Star | |
| | WCDMA Band V | 4182 | 836.4 | RMC12.2K | Side 3 | 0 | 0.01 | 23.69 | 24.5 | 0.012 | South Star | |
| | WCDMA Band V | 4182 | 836.4 | RMC12.2K | Side 4 | 0 | 0.01 | 23.69 | 24.5 | 0.012 | South Star | |

| Index. | Band | Frequency | | Bandwidth | Modulation | RB Size | RB Offset | Test Position | Spacing | SAR 1g | Burst Avg Power | Max tune-up | Reported SAR 1g | Antenna | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ch. | MHz | | | | | | (mm) | (W/Kg) | (dBm) | (dBm) | | | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 1 | 0 | Bottom of laptop | 0 | 0.01 | 22.73 | 24 | 0.013 | South Star | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 50 | 25 | Bottom of laptop | 0 | 0.01 | 21.72 | 23 | 0.013 | South Star | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 1 | 0 | Back of display screen | 25 | 0.308 | 22.73 | 24 | 0.413 | South Star | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 50 | 25 | Back of display screen | 25 | 0.311 | 21.72 | 23 | 0.418 | South Star | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 1 | 0 | Bottom Face | 0 | 0.511 | 22.73 | 24 | 0.685 | South Star | |
| #1006 | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 50 | 25 | Bottom Face | 0 | 0.569 | 21.72 | 23 | 0.764 | South Star | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.804 | 17.63 | 18 | 0.875 | South Star | Power Reduce |
| | LTE Band 2 | 18700 | 1860 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.703 | 17.01 | 18 | 0.883 | South Star | Power Reduce |
| | LTE Band 2 | 19100 | 1900 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.424 | 17.21 | 18 | 0.509 | South Star | Power Reduce |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 50 | 0 | Side 1 | 0 | 0.585 | 17.55 | 18 | 0.649 | South Star | Power Reduce |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 100 | 0 | Side 1 | 0 | 0.567 | 17.25 | 18 | 0.674 | South Star | Power Reduce |
| #18 | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 1 | 0 | Side 1 | 17 | 0.81 | 22.73 | 24 | 1.085 | South Star | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 1 | 0 | Side 1 | 17 | 0.689 | 22.73 | 24 | 0.923 | AWAN | |
| | LTE Band 2 | 18700 | 1860 | 20M | QPSK | 1 | 99 | Side 1 | 17 | 0.485 | 22.68 | 24 | 0.657 | South Star | |
| | LTE Band 2 | 19100 | 1900 | 20M | QPSK | 1 | 0 | Side 1 | 17 | 0.336 | 22.63 | 24 | 0.461 | South Star | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 50 | 25 | Side 1 | 17 | 0.677 | 21.72 | 23 | 0.909 | South Star | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 100 | 0 | Side 1 | 17 | 0.342 | 21.85 | 23 | 0.446 | South Star | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 1 | 0 | Side 2 | 0 | 0.19 | 22.73 | 24 | 0.255 | South Star | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 50 | 25 | Side 2 | 0 | 0.191 | 21.72 | 23 | 0.256 | South Star | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 1 | 0 | Side 3 | 0 | 0.051 | 22.73 | 24 | 0.068 | South Star | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 50 | 25 | Side 3 | 0 | 0.052 | 21.72 | 23 | 0.070 | South Star | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 1 | 0 | Side 4 | 0 | 0.01 | 22.73 | 24 | 0.013 | South Star | |
| | LTE Band 2 | 18900 | 1880 | 20M | QPSK | 50 | 25 | Side 4 | 0 | 0.01 | 21.72 | 23 | 0.013 | South Star | |
| | | | | | | | | | | | | | | | |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 1 | 99 | Bottom of laptop | 0 | 0.01 | 22.92 | 24 | 0.013 | South Star | |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 50 | 0 | Bottom of laptop | 0 | 0.01 | 21.94 | 23 | 0.013 | South Star | |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 1 | 99 | Back of display screen | 25 | 0.237 | 22.92 | 24 | 0.304 | South Star | |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 50 | 0 | Back of display screen | 25 | 0.223 | 21.94 | 23 | 0.285 | South Star | |
| #1002 | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 1 | 99 | Bottom Face | 0 | 0.602 | 22.92 | 24 | 0.772 | South Star | |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 50 | 0 | Bottom Face | 0 | 0.597 | 21.94 | 23 | 0.762 | South Star | |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 1.1 | 15.49 | 15.5 | 1.103 | South Star | Power Reduce |
| | LTE Band 7 | 21100 | 2535 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.938 | 15.29 | 15.5 | 0.984 | South Star | Power Reduce |
| | LTE Band 7 | 21350 | 2560 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.888 | 15.23 | 15.5 | 0.945 | South Star | Power Reduce |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 50 | 0 | Side 1 | 0 | 1.13 | 15.49 | 15.5 | 1.133 | South Star | Power Reduce |
| #123 | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 50 | 0 | Side 1 | 0 | 1.16 | 15.49 | 15.5 | 1.163 | AWAN | Power Reduce |
| | LTE Band 7 | 21100 | 2535 | 20M | QPSK | 50 | 0 | Side 1 | 0 | 0.893 | 15.35 | 15.5 | 0.924 | AWAN | Power Reduce |
| | LTE Band 7 | 21350 | 2560 | 20M | QPSK | 50 | 0 | Side 1 | 0 | 0.852 | 15.2 | 15.5 | 0.913 | AWAN | Power Reduce |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 100 | 0 | Side 1 | 0 | 1.052 | 15.22 | 15.5 | 1.122 | South Star | Power Reduce |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 1 | 99 | Side 1 | 17 | 0.443 | 22.92 | 24 | 0.568 | South Star | |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 50 | 0 | Side 1 | 17 | 0.359 | 21.94 | 23 | 0.458 | South Star | |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 1 | 99 | Side 2 | 0 | 0.244 | 22.92 | 24 | 0.313 | South Star | |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 50 | 0 | Side 2 | 0 | 0.229 | 21.94 | 23 | 0.292 | South Star | |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 1 | 99 | Side 3 | 0 | 0.01 | 22.92 | 24 | 0.013 | South Star | |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 50 | 0 | Side 3 | 0 | 0.01 | 21.94 | 23 | 0.013 | South Star | |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 1 | 99 | Side 4 | 0 | 0.045 | 22.92 | 24 | 0.058 | South Star | |
| | LTE Band 7 | 20850 | 2510 | 20M | QPSK | 50 | 0 | Side 4 | 0 | 0.042 | 21.94 | 23 | 0.054 | South Star | |

| Index. | Band | Frequency | | Bandwidth | Modulation | RB Size | RB Offset | Test Position | Spacing | SAR 1 g | Burst Avg Power | Max tune-up | Reported SAR 1 g | Antenna | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ch. | MHz | | | | | | (mm) | (W/Kg) | (dBm) | (dBm) | | | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 1 | 0 | Bottom of laptop | 0 | 0.01 | 22.69 | 24 | 0.014 | South Star | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 25 | 25 | Bottom of laptop | 0 | 0.01 | 21.71 | 23 | 0.013 | South Star | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 1 | 0 | Back of display screen | 25 | 0.085 | 22.69 | 24 | 0.115 | South Star | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 25 | 25 | Back of display screen | 25 | 0.072 | 21.71 | 23 | 0.097 | South Star | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 1 | 0 | Bottom Face | 0 | 0.159 | 22.69 | 24 | 0.215 | South Star | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 25 | 25 | Bottom Face | 0 | 0.137 | 21.71 | 23 | 0.184 | South Star | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 1 | 0 | Side 1 | 0 | 0.602 | 22.69 | 24 | 0.814 | South Star | |
| #79 | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 1 | 0 | Side 1 | 0 | 0.612 | 22.69 | 24 | 0.827 | AWAN | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 25 | 25 | Side 1 | 0 | 0.502 | 21.71 | 23 | 0.676 | AWAN | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 50 | 0 | Side 1 | 0 | 0.415 | 21.66 | 23 | 0.565 | AWAN | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 1 | 0 | Side 2 | 0 | 0.097 | 22.69 | 24 | 0.131 | South Star | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 25 | 25 | Side 2 | 0 | 0.085 | 21.71 | 23 | 0.114 | South Star | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 1 | 0 | Side 3 | 0 | 0.01 | 22.69 | 24 | 0.014 | South Star | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 25 | 25 | Side 3 | 0 | 0.01 | 21.71 | 23 | 0.013 | South Star | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 1 | 0 | Side 4 | 0 | 0.01 | 22.69 | 24 | 0.014 | South Star | |
| | LTE Band 12 | 23095 | 707.5 | 10M | QPSK | 25 | 25 | Side 4 | 0 | 0.01 | 21.71 | 23 | 0.013 | South Star | |
| #115 | LTE Band 17 | 23790 | 710 | 10M | QPSK | 1 | 49 | Side 1 | 0 | 0.615 | 22.8 | 24 | 0.811 | AWAN | |
| | | | | | | | | | | | | | | | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 1 | 49 | Bottom of laptop | 0 | 0.01 | 23.00 | 24 | 0.013 | South Star | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 25 | 0 | Bottom of laptop | 0 | 0.01 | 22.08 | 23 | 0.012 | South Star | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 1 | 49 | Back of display screen | 25 | 0.146 | 23.00 | 24 | 0.184 | South Star | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 25 | 0 | Back of display screen | 25 | 0.116 | 22.08 | 23 | 0.143 | South Star | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 1 | 49 | Bottom Face | 0 | 0.248 | 23.00 | 24 | 0.312 | South Star | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 25 | 0 | Bottom Face | 0 | 0.187 | 22.08 | 23 | 0.231 | South Star | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 1 | 49 | Side 1 | 0 | 0.771 | 23.00 | 24 | 0.971 | South Star | |
| #977 | LTE Band 13 | 23230 | 782 | 10M | QPSK | 1 | 49 | Side 1 | 0 | 0.822 | 23.00 | 24 | 1.035 | AWAN | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 25 | 0 | Side 1 | 0 | 0.53 | 22.08 | 23 | 0.655 | AWAN | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 50 | 0 | Side 1 | 0 | 0.256 | 22.15 | 23 | 0.311 | AWAN | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 1 | 49 | Side 2 | 0 | 0.101 | 23.00 | 24 | 0.127 | South Star | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 25 | 0 | Side 2 | 0 | 0.069 | 22.08 | 23 | 0.085 | South Star | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 1 | 49 | Side 3 | 0 | 0.01 | 23.00 | 24 | 0.013 | South Star | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 25 | 0 | Side 3 | 0 | 0.01 | 22.08 | 23 | 0.012 | South Star | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 1 | 49 | Side 4 | 0 | 0.01 | 23.00 | 24 | 0.013 | South Star | |
| | LTE Band 13 | 23230 | 782 | 10M | QPSK | 25 | 0 | Side 4 | 0 | 0.01 | 22.08 | 23 | 0.012 | South Star | |

| Index. | Band | Frequency | | Bandwidth | Modulation | RB Size | RB Offset | Test Position | Spacing | SAR 1 g | Burst Avg Power | Max tune-up | Reported SAR 1 g | Antenna | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ch. | MHz | | | | | | (mm) | (W/Kg) | (dBm) | (dBm) | | | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 1 | 74 | Bottom of laptop | 0 | 0.01 | 22.61 | 24 | 0.014 | South Star | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 36 | 39 | Bottom of laptop | 0 | 0.01 | 21.55 | 23 | 0.014 | South Star | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 1 | 74 | Back of display screen | 25 | 0.131 | 22.61 | 24 | 0.180 | South Star | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 36 | 39 | Back of display screen | 25 | 0.116 | 21.55 | 23 | 0.162 | South Star | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 1 | 74 | Bottom Face | 0 | 0.179 | 22.61 | 24 | 0.247 | South Star | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 36 | 39 | Bottom Face | 0 | 0.153 | 21.55 | 23 | 0.214 | South Star | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 1 | 74 | Side 1 | 0 | 0.541 | 22.61 | 24 | 0.745 | South Star | |
| #401 | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 1 | 74 | Side 1 | 0 | 0.721 | 22.61 | 24 | 0.993 | AWAN | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 36 | 39 | Side 1 | 0 | 0.688 | 21.55 | 23 | 0.961 | AWAN | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 75 | 0 | Side 1 | 0 | 0.693 | 21.61 | 23 | 0.954 | AWAN | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 1 | 74 | Side 2 | 0 | 0.095 | 22.61 | 24 | 0.131 | South Star | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 36 | 39 | Side 2 | 0 | 0.067 | 21.55 | 23 | 0.094 | South Star | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 1 | 74 | Side 3 | 0 | 0.01 | 22.61 | 24 | 0.014 | South Star | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 36 | 39 | Side 3 | 0 | 0.01 | 21.55 | 23 | 0.014 | South Star | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 1 | 74 | Side 4 | 0 | 0.01 | 22.61 | 24 | 0.014 | South Star | |
| | LTE Band 26 | 26865 | 831.5 | 15M | QPSK | 36 | 39 | Side 4 | 0 | 0.01 | 21.55 | 23 | 0.014 | South Star | |
| #433 | LTE Band 5 | 20525 | 836.5 | 10M | QPSK | 1 | 49 | Side 1 | 0 | 0.724 | 22.68 | 24 | 0.981 | AWAN | |
| | | | | | | | | | | | | | | | |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 1 | 49 | Bottom of laptop | 0 | 0.01 | 22.99 | 24 | 0.013 | South Star | |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 25 | 0 | Bottom of laptop | 0 | 0.01 | 22.06 | 23 | 0.012 | South Star | |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 1 | 49 | Back of display screen | 25 | 0.08 | 22.99 | 24 | 0.101 | South Star | |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 25 | 0 | Back of display screen | 25 | 0.071 | 22.06 | 23 | 0.088 | South Star | |
| #1001 | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 1 | 49 | Bottom Face | 0 | 0.569 | 22.99 | 24 | 0.718 | South Star | |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 1 | 49 | Bottom Face | 0 | 0.557 | 22.99 | 24 | 0.703 | AWAN | |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 25 | 0 | Bottom Face | 0 | 0.489 | 22.06 | 23 | 0.607 | South Star | |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 1 | 0 | Side 1 | 0 | 0.452 | 17.46 | 18 | 0.512 | South Star | Power Reduce |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 25 | 0 | Side 1 | 0 | 0.429 | 17.45 | 18 | 0.487 | South Star | Power Reduce |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 1 | 49 | Side 1 | 17 | 0.158 | 22.99 | 24 | 0.199 | South Star | |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 25 | 0 | Side 1 | 17 | 0.166 | 22.06 | 23 | 0.206 | South Star | |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 1 | 49 | Side 2 | 0 | 0.483 | 22.99 | 24 | 0.609 | South Star | |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 25 | 0 | Side 2 | 0 | 0.463 | 22.06 | 23 | 0.575 | South Star | |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 1 | 49 | Side 3 | 0 | 0.013 | 22.99 | 24 | 0.016 | South Star | |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 25 | 0 | Side 3 | 0 | 0.012 | 22.06 | 23 | 0.015 | South Star | |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 1 | 49 | Side 4 | 0 | 0.061 | 22.99 | 24 | 0.077 | South Star | |
| | LTE Band 30 | 27710 | 2310 | 10M | QPSK | 25 | 0 | Side 4 | 0 | 0.053 | 22.06 | 23 | 0.066 | South Star | |

| Index. | Band | Frequency | | Bandwidth | Modulation | RB Size | RB Offset | Test Position | Spacing | SAR 1g | Burst Avg Power | Max tune-up | Reported SAR 1g | Antenna | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ch. | MHz | | | | | | (mm) | (W/Kg) | (dBm) | (dBm) | | | |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 1 | 99 | Bottom of laptop | 0 | 0.026 | 22.86 | 24 | 0.034 | South Star | |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 50 | 0 | Bottom of laptop | 0 | 0.029 | 21.89 | 23 | 0.038 | South Star | |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 1 | 99 | Back of display screen | 25 | 0.097 | 22.86 | 24 | 0.127 | South Star | |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 50 | 0 | Back of display screen | 25 | 0.088 | 21.89 | 23 | 0.114 | South Star | |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 1 | 99 | Bottom Face | 0 | 0.243 | 22.86 | 24 | 0.318 | South Star | |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 50 | 0 | Bottom Face | 0 | 0.229 | 21.89 | 23 | 0.298 | South Star | |
| | LTE Band 41 | 40620 | 2593 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.466 | 16.29 | 16.5 | 0.492 | South Star | Power Reduce |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.569 | 15.83 | 16.5 | 0.668 | South Star | Power Reduce |
| #73 | LTE Band 41 | 40185 | 2549.5 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.76 | 15.83 | 16.5 | 0.892 | South Star | Power Reduce |
| | LTE Band 41 | 40185 | 2549.5 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.562 | 15.83 | 16.5 | 0.660 | AWAN | Power Reduce |
| | LTE Band 41 | 41055 | 2636.5 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.332 | 16.21 | 16.5 | 0.357 | South Star | Power Reduce |
| | LTE Band 41 | 41490 | 2680 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.154 | 16.18 | 16.5 | 0.167 | South Star | Power Reduce |
| | LTE Band 41 | 41055 | 2636.5 | 20M | QPSK | 50 | 0 | Side 1 | 0 | 0.297 | 16.22 | 16.5 | 0.319 | South Star | Power Reduce |
| | LTE Band 41 | 41055 | 2636.5 | 20M | QPSK | 100 | 0 | Side 1 | 0 | 0.269 | 16.21 | 16.5 | 0.289 | South Star | Power Reduce |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 1 | 99 | Side 1 | 17 | 0.152 | 22.86 | 24 | 0.199 | South Star | |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 50 | 0 | Side 1 | 17 | 0.129 | 21.89 | 23 | 0.168 | South Star | |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 1 | 99 | Side 2 | 0 | 0.05 | 22.86 | 24 | 0.065 | South Star | |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 50 | 0 | Side 2 | 0 | 0.044 | 21.89 | 23 | 0.057 | South Star | |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 1 | 99 | Side 3 | 0 | 0.012 | 22.86 | 24 | 0.016 | South Star | |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 50 | 0 | Side 3 | 0 | 0.012 | 21.89 | 23 | 0.016 | South Star | |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 1 | 99 | Side 4 | 0 | 0.044 | 22.86 | 24 | 0.058 | South Star | |
| | LTE Band 41 | 39750 | 2506 | 20M | QPSK | 50 | 0 | Side 4 | 0 | 0.038 | 21.89 | 23 | 0.049 | South Star | |
| #511 | LTE Band 38 | 38000 | 2595 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.581 | 16.49 | 16.5 | 0.586 | South Star | Power Reduce |
| | | | | | | | | | | | | | | | |
| | LTE Band 66 | 132072 | 1720 | 20M | QPSK | 1 | 99 | Bottom of laptop | 0 | 0.01 | 23.01 | 24 | 0.013 | South Star | |
| | LTE Band 66 | 132072 | 1720 | 20M | QPSK | 50 | 50 | Bottom of laptop | 0 | 0.01 | 21.78 | 23 | 0.013 | South Star | |
| | LTE Band 66 | 132072 | 1720 | 20M | QPSK | 1 | 99 | Back of display screen | 25 | 0.271 | 23.01 | 24 | 0.340 | South Star | |
| | LTE Band 66 | 132072 | 1720 | 20M | QPSK | 50 | 50 | Back of display screen | 25 | 0.249 | 21.78 | 23 | 0.330 | South Star | |
| #1003 | LTE Band 66 | 132072 | 1720 | 20M | QPSK | 1 | 99 | Bottom Face | 0 | 0.509 | 23.01 | 24 | 0.639 | South Star | |
| | LTE Band 66 | 132072 | 1720 | 20M | QPSK | 50 | 50 | Bottom Face | 0 | 0.395 | 21.78 | 23 | 0.523 | South Star | |
| #235 | LTE Band 66 | 132322 | 1745 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.602 | 17.68 | 18 | 0.648 | South Star | Power Reduce |
| | LTE Band 66 | 132322 | 1745 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.453 | 17.68 | 18 | 0.488 | AWAN | Power Reduce |
| | LTE Band 66 | 132322 | 1745 | 20M | QPSK | 50 | 0 | Side 1 | 0 | 0.589 | 17.65 | 18 | 0.638 | South Star | Power Reduce |
| | LTE Band 66 | 132072 | 1770 | 20M | QPSK | 1 | 99 | Side 1 | 17 | 0.251 | 23.01 | 24 | 0.315 | South Star | |
| | LTE Band 66 | 132072 | 1770 | 20M | QPSK | 50 | 50 | Side 1 | 17 | 0.195 | 21.78 | 23 | 0.258 | South Star | |
| | LTE Band 66 | 132072 | 1720 | 20M | QPSK | 1 | 99 | Side 2 | 0 | 0.042 | 23.01 | 24 | 0.053 | South Star | |
| | LTE Band 66 | 132072 | 1720 | 20M | QPSK | 50 | 50 | Side 2 | 0 | 0.041 | 21.78 | 23 | 0.054 | South Star | |
| | LTE Band 66 | 132072 | 1720 | 20M | QPSK | 1 | 99 | Side 3 | 0 | 0.064 | 23.01 | 24 | 0.080 | South Star | |
| | LTE Band 66 | 132072 | 1720 | 20M | QPSK | 50 | 50 | Side 3 | 0 | 0.047 | 21.78 | 23 | 0.062 | South Star | |
| | LTE Band 66 | 132072 | 1720 | 20M | QPSK | 1 | 99 | Side 4 | 0 | 0.01 | 23.01 | 24 | 0.013 | South Star | |
| | LTE Band 66 | 132072 | 1720 | 20M | QPSK | 50 | 50 | Side 4 | 0 | 0.01 | 21.78 | 23 | 0.013 | South Star | |
| #25 | LTE Band 4 | 20175 | 1732.5 | 20M | QPSK | 1 | 0 | Side 1 | 0 | 0.578 | 17.55 | 18 | 0.641 | South Star | Power Reduce |

## 11.8 Simultaneous Transmission Evaluation

### 11.8.1 Simultaneous Transmission Configurations

| Condition(s) | Band | | | | | |
|---|---|---|---|---|---|---|
| | WWAN | WLAN 2.4GHz Ant Main | WLAN 2.4GHz Ant Aux | WLAN 5GHz Ant Main | WLAN 5GHz Ant Aux | Bluetooth |
| 1 | V | V | - | - | - | - |
| 2 | V | - | V | - | - | - |
| 3 | V | V | V | - | - | - |
| 4 | V | V | - | - | - | V |
| 5 | V | - | - | V | - | - |
| 6 | V | - | - | - | V | - |
| 7 | V | - | - | V | V | - |
| 8 | V | - | - | V | - | V |
| 9 | V | - | - | V | V | V |

### 11.8.2 Simultaneous Transmission Result

When the sum of 1-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration.

Sum of 1-g SAR of summary is shown as below:

| WWAN Band | | Exposure Position | 1 | 2 | 3 | 4 | 5 | 6 | 1+2 ∑ 1g SAR (W/kg) | 1+3 ∑ 1g SAR (W/kg) | 1+2+3 ∑ 1g SAR (W/kg) | 1+2+6 ∑ 1g SAR (W/kg) | 1+4 ∑ 1g SAR (W/kg) | 1+5 ∑ 1g SAR (W/kg) | 1+4+5 ∑ 1g SAR (W/kg) | 1+4+6 ∑ 1g SAR (W/kg) | 1+4+5+6 ∑ 1g SAR (W/kg) | SPLSR No. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | WWAN | WLAN 2.4GHz Ant Main | WLAN 2.4GHz Ant Aux | WLAN 5GHz Ant Main | WLAN 5GHz Ant Aux | Bluetooth Ant Aux | | | | | | | | | | | |
| | | | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | | | | | | | | | | | |
| WCDMA | WCDMA Band II | Bottom Face at 0mm - | 1.148 | 0.088 | 0.716 | 0.010 | 1.109 | 0.138 | 1.236 | 1.864 | 1.952 | 1.374 | 1.158 | 2.257 | 2.267 | 1.296 | 2.405 | #1 | #2 |
| | | side 1 at 0mm - | 0.857 | 0.060 | 0.128 | 0.217 | 0.426 | 0.049 | 0.917 | 0.985 | 1.045 | 0.966 | 1.074 | 1.283 | 1.500 | 1.123 | 1.549 | | |
| | | side 2 at 0mm - | 0.374 | 0.013 | 0.013 | 0.010 | 0.013 | 0.013 | 0.387 | 0.387 | 0.400 | 0.400 | 0.384 | 0.387 | 0.397 | 0.397 | 0.410 | | |
| | | side 3 at 0mm - | 0.013 | 0.079 | 0.013 | 0.010 | 0.013 | 0.013 | 0.092 | 0.026 | 0.105 | 0.105 | 0.023 | 0.026 | 0.036 | 0.036 | 0.049 | | |
| | | side 4 at 0mm - | 0.071 | 0.333 | 0.054 | 0.526 | 0.242 | 0.050 | 0.404 | 0.125 | 0.458 | 0.454 | 0.597 | 0.313 | 0.839 | 0.647 | 0.889 | | |
| | WCDMA Band IV | Bottom Face at 0mm - | 0.695 | 0.088 | 0.716 | 0.010 | 1.109 | 0.138 | 0.783 | 1.411 | 1.499 | 0.921 | 0.705 | 1.804 | 1.814 | 0.843 | 1.952 | | #3 |
| | | side 1 at 0mm - | 0.592 | 0.060 | 0.128 | 0.217 | 0.426 | 0.049 | 0.652 | 0.720 | 0.780 | 0.701 | 0.809 | 1.018 | 1.235 | 0.858 | 1.284 | | |
| | | side 2 at 0mm - | 0.058 | 0.013 | 0.013 | 0.010 | 0.013 | 0.013 | 0.071 | 0.071 | 0.084 | 0.084 | 0.068 | 0.071 | 0.081 | 0.081 | 0.094 | | |
| | | side 3 at 0mm - | 0.081 | 0.079 | 0.013 | 0.010 | 0.013 | 0.013 | 0.160 | 0.094 | 0.173 | 0.173 | 0.091 | 0.094 | 0.104 | 0.104 | 0.117 | | |
| | | side 4 at 0mm - | 0.013 | 0.333 | 0.054 | 0.526 | 0.242 | 0.050 | 0.346 | 0.067 | 0.400 | 0.396 | 0.539 | 0.255 | 0.781 | 0.589 | 0.831 | | |
| | WCDMA Band V | Bottom Face at 0mm - | 0.323 | 0.088 | 0.716 | 0.010 | 1.109 | 0.138 | 0.411 | 1.039 | 1.127 | 0.549 | 0.333 | 1.432 | 1.442 | 0.471 | 1.580 | | |
| | | side 1 at 0mm - | 1.103 | 0.060 | 0.128 | 0.217 | 0.426 | 0.049 | 1.163 | 1.231 | 1.291 | 1.212 | 1.320 | 1.529 | 1.746 | 1.369 | 1.795 | | |
| | | side 2 at 0mm - | 0.122 | 0.013 | 0.013 | 0.010 | 0.013 | 0.013 | 0.135 | 0.135 | 0.148 | 0.148 | 0.132 | 0.135 | 0.145 | 0.145 | 0.158 | | |
| | | side 3 at 0mm - | 0.012 | 0.079 | 0.013 | 0.010 | 0.013 | 0.013 | 0.091 | 0.025 | 0.104 | 0.104 | 0.022 | 0.025 | 0.035 | 0.035 | 0.048 | | |
| | | side 4 at 0mm - | 0.012 | 0.333 | 0.054 | 0.526 | 0.242 | 0.050 | 0.345 | 0.066 | 0.399 | 0.395 | 0.538 | 0.254 | 0.780 | 0.588 | 0.830 | | |

| WWAN Band | | Exposure Position | 1 | 2 | 3 | 4 | 5 | 6 | 1+2 ∑ 1g SAR (W/kg) | 1+3 ∑ 1g SAR (W/kg) | 1+2+3 ∑ 1g SAR (W/kg) | 1+2+6 ∑ 1g SAR (W/kg) | 1+4 ∑ 1g SAR (W/kg) | 1+5 ∑ 1g SAR (W/kg) | 1+4+5 ∑ 1g SAR (W/kg) | 1+4+6 ∑ 1g SAR (W/kg) | 1+4+5+6 ∑ 1g SAR (W/kg) | SPLSR No. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | WWAN | WLAN 2.4GHz Ant Main | WLAN 2.4GHz Ant Aux | WLAN 5GHz Ant Main | WLAN 5GHz Ant Aux | Bluetooth Ant Aux | | | | | | | | | | | |
| | | | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | | | | | | | | | | | |
| LTE | LTE Band 2 | Bottom Face at 0mm - | 0.764 | 0.088 | 0.716 | 0.010 | 1.109 | 0.138 | 0.852 | 1.480 | 1.568 | 0.990 | 0.774 | 1.873 | 1.883 | 0.912 | 2.021 | | #5 |
| | | side 1 at 0mm - | 0.883 | 0.060 | 0.128 | 0.217 | 0.426 | 0.049 | 0.943 | 1.011 | 1.071 | 0.992 | 1.100 | 1.309 | 1.526 | 1.149 | 1.575 | | |
| | | side 2 at 0mm - | 0.256 | 0.013 | 0.013 | 0.010 | 0.013 | 0.013 | 0.269 | 0.269 | 0.282 | 0.282 | 0.266 | 0.269 | 0.279 | 0.279 | 0.292 | | |
| | | side 3 at 0mm - | 0.070 | 0.079 | 0.013 | 0.010 | 0.013 | 0.013 | 0.149 | 0.083 | 0.162 | 0.162 | 0.080 | 0.083 | 0.093 | 0.093 | 0.106 | | |
| | | side 4 at 0mm - | 0.013 | 0.333 | 0.054 | 0.526 | 0.242 | 0.050 | 0.346 | 0.067 | 0.400 | 0.396 | 0.539 | 0.255 | 0.781 | 0.589 | 0.831 | | |
| | LTE Band 7 | Bottom Face at 0mm - | 0.772 | 0.088 | 0.716 | 0.010 | 1.109 | 0.138 | 0.860 | 1.488 | 1.576 | 0.998 | 0.782 | 1.881 | 1.891 | 0.920 | 2.029 | | #6 |
| | | side 1 at 0mm - | 1.163 | 0.060 | 0.128 | 0.217 | 0.426 | 0.049 | 1.223 | 1.291 | 1.351 | 1.272 | 1.380 | 1.589 | 1.806 | 1.429 | 1.855 | | |
| | | side 2 at 0mm - | 0.313 | 0.013 | 0.013 | 0.010 | 0.013 | 0.013 | 0.326 | 0.326 | 0.339 | 0.339 | 0.323 | 0.326 | 0.336 | 0.336 | 0.349 | | |
| | | side 3 at 0mm - | 0.013 | 0.079 | 0.013 | 0.010 | 0.013 | 0.013 | 0.092 | 0.026 | 0.105 | 0.105 | 0.023 | 0.026 | 0.036 | 0.036 | 0.049 | | |
| | | side 4 at 0mm - | 0.058 | 0.333 | 0.054 | 0.526 | 0.242 | 0.050 | 0.391 | 0.112 | 0.445 | 0.441 | 0.584 | 0.300 | 0.826 | 0.634 | 0.876 | | |
| | LTE Band 12/17 | Bottom Face at 0mm - | 0.215 | 0.088 | 0.716 | 0.010 | 1.109 | 0.138 | 0.303 | 0.931 | 1.019 | 0.441 | 0.225 | 1.324 | 1.334 | 0.363 | 1.472 | | |
| | | side 1 at 0mm - | 0.827 | 0.060 | 0.128 | 0.217 | 0.426 | 0.049 | 0.887 | 0.955 | 1.015 | 0.936 | 1.044 | 1.253 | 1.470 | 1.093 | 1.519 | | |
| | | side 2 at 0mm - | 0.131 | 0.013 | 0.013 | 0.010 | 0.013 | 0.013 | 0.144 | 0.144 | 0.157 | 0.157 | 0.141 | 0.144 | 0.154 | 0.154 | 0.167 | | |
| | | side 3 at 0mm - | 0.014 | 0.079 | 0.013 | 0.010 | 0.013 | 0.013 | 0.093 | 0.027 | 0.106 | 0.106 | 0.024 | 0.027 | 0.037 | 0.037 | 0.050 | | |
| | | side 4 at 0mm - | 0.014 | 0.333 | 0.054 | 0.526 | 0.242 | 0.050 | 0.347 | 0.068 | 0.401 | 0.397 | 0.540 | 0.256 | 0.782 | 0.590 | 0.832 | | |
| | LTE Band 13 | Bottom Face at 0mm - | 0.312 | 0.088 | 0.716 | 0.010 | 1.109 | 0.138 | 0.400 | 1.028 | 1.116 | 0.538 | 0.322 | 1.421 | 1.431 | 0.460 | 1.569 | | |
| | | side 1 at 0mm - | 1.035 | 0.060 | 0.128 | 0.217 | 0.426 | 0.049 | 1.095 | 1.163 | 1.223 | 1.144 | 1.252 | 1.461 | 1.678 | 1.301 | 1.727 | | |
| | | side 2 at 0mm - | 0.127 | 0.013 | 0.013 | 0.010 | 0.013 | 0.013 | 0.140 | 0.140 | 0.153 | 0.153 | 0.137 | 0.140 | 0.150 | 0.150 | 0.163 | | |
| | | side 3 at 0mm - | 0.013 | 0.079 | 0.013 | 0.010 | 0.013 | 0.013 | 0.092 | 0.026 | 0.105 | 0.105 | 0.023 | 0.026 | 0.036 | 0.036 | 0.049 | | |
| | | side 4 at 0mm - | 0.013 | 0.333 | 0.054 | 0.526 | 0.242 | 0.050 | 0.346 | 0.067 | 0.400 | 0.396 | 0.539 | 0.255 | 0.781 | 0.589 | 0.831 | | |
| | LTE Band 26/5 | Bottom Face at 0mm - | 0.247 | 0.088 | 0.716 | 0.010 | 1.109 | 0.138 | 0.335 | 0.963 | 1.051 | 0.473 | 0.257 | 1.356 | 1.366 | 0.395 | 1.504 | | |
| | | side 1 at 0mm - | 0.993 | 0.060 | 0.128 | 0.217 | 0.426 | 0.049 | 1.053 | 1.121 | 1.181 | 1.102 | 1.210 | 1.419 | 1.636 | 1.259 | 1.685 | | |
| | | side 2 at 0mm - | 0.131 | 0.013 | 0.013 | 0.010 | 0.013 | 0.013 | 0.144 | 0.144 | 0.157 | 0.157 | 0.141 | 0.144 | 0.154 | 0.154 | 0.167 | | |
| | | side 3 at 0mm - | 0.014 | 0.079 | 0.013 | 0.010 | 0.013 | 0.013 | 0.093 | 0.027 | 0.106 | 0.106 | 0.024 | 0.027 | 0.037 | 0.037 | 0.050 | | |
| | | side 4 at 0mm - | 0.014 | 0.333 | 0.054 | 0.526 | 0.242 | 0.050 | 0.347 | 0.068 | 0.401 | 0.397 | 0.540 | 0.256 | 0.782 | 0.590 | 0.832 | | |
| | LTE Band 30 | Bottom Face at 0mm - | 0.718 | 0.088 | 0.716 | 0.010 | 1.109 | 0.138 | 0.806 | 1.434 | 1.522 | 0.944 | 0.728 | 1.827 | 1.837 | 0.866 | 1.975 | | #9 |
| | | side 1 at 0mm - | 0.512 | 0.060 | 0.128 | 0.217 | 0.426 | 0.049 | 0.572 | 0.640 | 0.700 | 0.621 | 0.729 | 0.938 | 1.155 | 0.778 | 1.204 | | |
| | | side 2 at 0mm - | 0.609 | 0.013 | 0.013 | 0.010 | 0.013 | 0.013 | 0.622 | 0.622 | 0.635 | 0.635 | 0.619 | 0.622 | 0.632 | 0.632 | 0.645 | | |
| | | side 3 at 0mm - | 0.016 | 0.079 | 0.013 | 0.010 | 0.013 | 0.013 | 0.095 | 0.029 | 0.108 | 0.108 | 0.026 | 0.029 | 0.039 | 0.039 | 0.052 | | |
| | | side 4 at 0mm - | 0.077 | 0.333 | 0.054 | 0.526 | 0.242 | 0.050 | 0.410 | 0.131 | 0.464 | 0.460 | 0.603 | 0.319 | 0.845 | 0.653 | 0.895 | | |
| | LTE Band 41/38 | Bottom Face at 0mm - | 0.318 | 0.088 | 0.716 | 0.010 | 1.109 | 0.138 | 0.406 | 1.034 | 1.122 | 0.544 | 0.328 | 1.427 | 1.437 | 0.466 | 1.575 | | |
| | | side 1 at 0mm - | 0.892 | 0.060 | 0.128 | 0.217 | 0.426 | 0.049 | 0.952 | 1.020 | 1.080 | 1.001 | 1.109 | 1.318 | 1.535 | 1.158 | 1.584 | | |
| | | side 2 at 0mm - | 0.065 | 0.013 | 0.013 | 0.010 | 0.013 | 0.013 | 0.078 | 0.078 | 0.091 | 0.091 | 0.075 | 0.078 | 0.088 | 0.088 | 0.101 | | |
| | | side 3 at 0mm - | 0.016 | 0.079 | 0.013 | 0.010 | 0.013 | 0.013 | 0.095 | 0.029 | 0.108 | 0.108 | 0.026 | 0.029 | 0.039 | 0.039 | 0.052 | | |
| | | side 4 at 0mm - | 0.058 | 0.333 | 0.054 | 0.526 | 0.242 | 0.050 | 0.391 | 0.112 | 0.445 | 0.441 | 0.584 | 0.300 | 0.826 | 0.634 | 0.876 | | |

| WWAN Band | | Exposure Position | 1 | 2 | 3 | 4 | 5 | 6 | 1+2 Σ 1g SAR (W/kg) | 1+3 Σ 1g SAR (W/kg) | 1+2+3 Σ 1g SAR (W/kg) | 1+2+6 Σ 1g SAR (W/kg) | 1+4 Σ 1g SAR (W/kg) | 1+5 Σ 1g SAR (W/kg) | 1+4+5 Σ 1g SAR (W/kg) | 1+4+6 Σ 1g SAR (W/kg) | 1+4+5+6 Σ 1g SAR (W/kg) | SPLSR No. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | WWAN | WLAN 2.4GHz Ant Main | WLAN 2.4GHz Ant Aux | WLAN 5GHz Ant Main | WLAN 5GHz Ant Aux | Bluetooth Ant Aux | | | | | | | | | | | |
| | | | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | | | | | | | | | | | |
| LTE | LTE Band 66/4 | Bottom Face at 0mm - | 0.639 | 0.088 | 0.716 | 0.010 | 1.109 | 0.138 | 0.727 | 1.355 | 1.443 | 0.865 | 0.649 | 1.748 | 1.758 | 0.787 | 1.896 | | #11 |
| | | side 1 at 0mm - | 0.648 | 0.060 | 0.128 | 0.217 | 0.426 | 0.049 | 0.708 | 0.776 | 0.836 | 0.757 | 0.865 | 1.074 | 1.291 | 0.914 | 1.340 | | |
| | | side 2 at 0mm - | 0.054 | 0.013 | 0.013 | 0.010 | 0.013 | 0.013 | 0.067 | 0.067 | 0.080 | 0.080 | 0.064 | 0.067 | 0.077 | 0.077 | 0.090 | | |
| | | side 3 at 0mm - | 0.080 | 0.079 | 0.013 | 0.010 | 0.013 | 0.013 | 0.159 | 0.093 | 0.172 | 0.172 | 0.090 | 0.093 | 0.103 | 0.103 | 0.116 | | |
| | | side 4 at 0mm - | 0.013 | 0.333 | 0.054 | 0.526 | 0.242 | 0.050 | 0.346 | 0.067 | 0.400 | 0.396 | 0.539 | 0.255 | 0.781 | 0.589 | 0.831 | | |

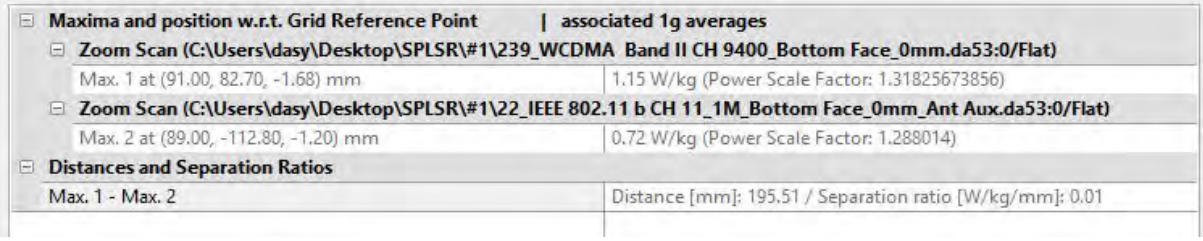
| WWAN Band | | Exposure Position | 1 | 2 | 3 | 4 | 5 | 6 | 1+2∑ 1g SAR (W/kg) | 1+3 ∑ 1g SAR (W/kg) | 1+2+3 ∑ 1g SAR (W/kg) | 1+2+6 ∑ 1g SAR (W/kg) | 1+4∑ 1g SAR (W/kg) | 1+5 ∑ 1g SAR (W/kg) | 1+4+5 ∑ 1g SAR (W/kg) | 1+4+6 ∑ 1g SAR (W/kg) | 1+4+5+6 ∑ 1g SAR (W/kg) | SPLSR No. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | WWAN | WLAN 2.4GHz Ant Main | WLAN 2.4GHz Ant Aux | WLAN 5GHz Ant Main | WLAN 5GHz Ant Aux | Bluetooth Ant Aux | | | | | | | | | | | |
| | | | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | 1g SAR (W/kg) | | | | | | | | | | | |
| WCDMA | WCDMA Band II | Bottom of laptop at 0mm - | 0.013 | 0.013 | 0.464 | 0.010 | 0.737 | 0.080 | 0.026 | 0.477 | 0.490 | 0.106 | 0.023 | 0.750 | 0.760 | 0.103 | 0.840 | | |
| | | Back of display screen at 25mm - | 0.635 | 0.068 | 0.013 | 0.159 | 0.013 | 0.080 | 0.703 | 0.648 | 0.716 | 0.783 | 0.794 | 0.648 | 0.807 | 0.874 | 0.887 | | |
| | WCDMA Band IV | Bottom of laptop at 0mm - | 0.052 | 0.013 | 0.464 | 0.010 | 0.737 | 0.080 | 0.065 | 0.516 | 0.529 | 0.145 | 0.062 | 0.789 | 0.799 | 0.142 | 0.879 | | |
| | | Back of display screen at 25mm - | 0.594 | 0.068 | 0.013 | 0.159 | 0.013 | 0.080 | 0.662 | 0.607 | 0.675 | 0.742 | 0.753 | 0.607 | 0.766 | 0.833 | 0.846 | | |
| | WCDMA Band V | Bottom of laptop at 0mm - | 0.012 | 0.013 | 0.464 | 0.010 | 0.737 | 0.080 | 0.025 | 0.476 | 0.489 | 0.105 | 0.022 | 0.749 | 0.759 | 0.102 | 0.839 | | |
| | | Back of display screen at 25mm - | 0.192 | 0.068 | 0.013 | 0.159 | 0.013 | 0.080 | 0.260 | 0.205 | 0.273 | 0.340 | 0.351 | 0.205 | 0.364 | 0.431 | 0.444 | | |
| LTE | LTE Band 2 | Bottom of laptop at 0mm - | 0.013 | 0.013 | 0.464 | 0.010 | 0.737 | 0.080 | 0.026 | 0.477 | 0.490 | 0.106 | 0.023 | 0.750 | 0.760 | 0.103 | 0.840 | | |
| | | Back of display screen at 25mm - | 0.418 | 0.068 | 0.013 | 0.159 | 0.013 | 0.080 | 0.486 | 0.431 | 0.499 | 0.566 | 0.577 | 0.431 | 0.590 | 0.657 | 0.670 | | |
| | LTE Band 7 | Bottom of laptop at 0mm - | 0.013 | 0.013 | 0.464 | 0.010 | 0.737 | 0.080 | 0.026 | 0.477 | 0.490 | 0.106 | 0.023 | 0.750 | 0.760 | 0.103 | 0.840 | | |
| | | Back of display screen at 25mm - | 0.304 | 0.068 | 0.013 | 0.159 | 0.013 | 0.080 | 0.372 | 0.317 | 0.385 | 0.452 | 0.463 | 0.317 | 0.476 | 0.543 | 0.556 | | |
| | LTE Band 12/17 | Bottom of laptop at 0mm - | 0.014 | 0.013 | 0.464 | 0.010 | 0.737 | 0.080 | 0.027 | 0.478 | 0.491 | 0.107 | 0.024 | 0.751 | 0.761 | 0.104 | 0.841 | | |
| | | Back of display screen at 25mm - | 0.115 | 0.068 | 0.013 | 0.159 | 0.013 | 0.080 | 0.183 | 0.128 | 0.196 | 0.263 | 0.274 | 0.128 | 0.287 | 0.354 | 0.367 | | |
| | LTE Band 13 | Bottom of laptop at 0mm - | 0.013 | 0.013 | 0.464 | 0.010 | 0.737 | 0.080 | 0.026 | 0.477 | 0.490 | 0.106 | 0.023 | 0.750 | 0.760 | 0.103 | 0.840 | | |
| | | Back of display screen at 25mm - | 0.184 | 0.068 | 0.013 | 0.159 | 0.013 | 0.080 | 0.252 | 0.197 | 0.265 | 0.332 | 0.343 | 0.197 | 0.356 | 0.423 | 0.436 | | |
| | LTE Band 26/5 | Bottom of laptop at 0mm - | 0.014 | 0.013 | 0.464 | 0.010 | 0.737 | 0.080 | 0.027 | 0.478 | 0.491 | 0.107 | 0.024 | 0.751 | 0.761 | 0.104 | 0.841 | | |
| | | Back of display screen at 25mm - | 0.180 | 0.068 | 0.013 | 0.159 | 0.013 | 0.080 | 0.248 | 0.193 | 0.261 | 0.328 | 0.339 | 0.193 | 0.352 | 0.419 | 0.432 | | |
| | LTE Band 30 | Bottom of laptop at 0mm - | 0.013 | 0.013 | 0.464 | 0.010 | 0.737 | 0.080 | 0.026 | 0.477 | 0.490 | 0.106 | 0.023 | 0.750 | 0.760 | 0.103 | 0.840 | | |
| | | Back of display screen at 25mm - | 0.101 | 0.068 | 0.013 | 0.159 | 0.013 | 0.080 | 0.169 | 0.114 | 0.182 | 0.249 | 0.260 | 0.114 | 0.273 | 0.340 | 0.353 | | |
| | LTE Band 41/38 | Bottom of laptop at 0mm - | 0.038 | 0.013 | 0.464 | 0.010 | 0.737 | 0.080 | 0.051 | 0.502 | 0.515 | 0.131 | 0.048 | 0.775 | 0.785 | 0.128 | 0.865 | | |
| | | Back of display screen at 25mm - | 0.127 | 0.068 | 0.013 | 0.159 | 0.013 | 0.080 | 0.195 | 0.140 | 0.208 | 0.275 | 0.286 | 0.140 | 0.299 | 0.366 | 0.379 | | |
| | LTE Band 66/4 | Bottom of laptop at 0mm - | 0.013 | 0.013 | 0.464 | 0.010 | 0.737 | 0.080 | 0.026 | 0.477 | 0.490 | 0.106 | 0.023 | 0.750 | 0.760 | 0.103 | 0.840 | | |
| | | Back of display screen at 25mm - | 0.340 | 0.068 | 0.013 | 0.159 | 0.013 | 0.080 | 0.408 | 0.353 | 0.421 | 0.488 | 0.499 | 0.353 | 0.512 | 0.579 | 0.592 | | |

### 11.8.3 SAR to peak location separation (SPLSR)

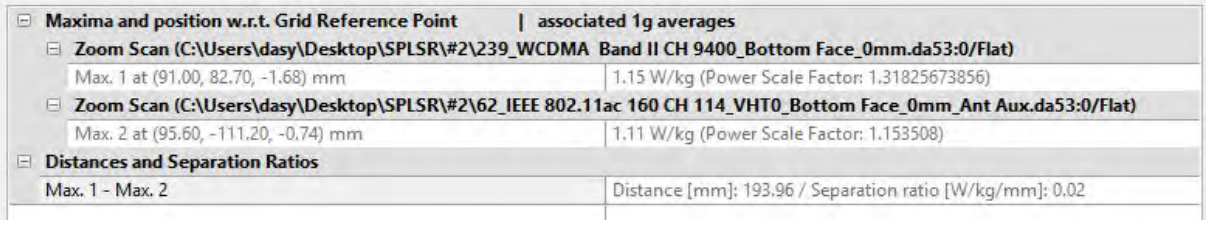
According to KDB 447498, when the sum of SAR is greater than the limit, SAR test exclusion is determined by the SAR to peak location separation ratio (SPLSR), and the simultaneously transmitting antennas must be considered one pair at a time. The ratio is determined by **(SAR1+SAR2)$^{1.5}$ / (separation distance between the peak SAR locations for the antenna pair, mm)**, round to two decimal digits, and must be ≦ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion.

If the sum of SAR is under the SAR limit, SPLSR analysis is not required.

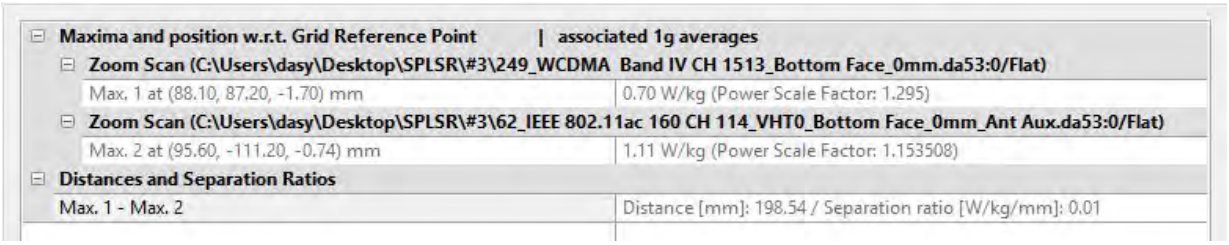
| #1_WCDMA II + 2.4GHz Aux | | | | | | |
|---|---|---|---|---|---|---|
| Antenna | Index | Frequency (GHz) | Reported SAR1g (W/Kg) | Σ Reported SAR1g (W/Kg) | Antenna pair(mm) | Peak location separation ratio |
| WCDMA II | 239 | 1.88 | 1.148 | 1.87 | 195.51 | 0.01 |
| 2.4GHz Aux | 22 | 2.462 | 0.716 | | | |



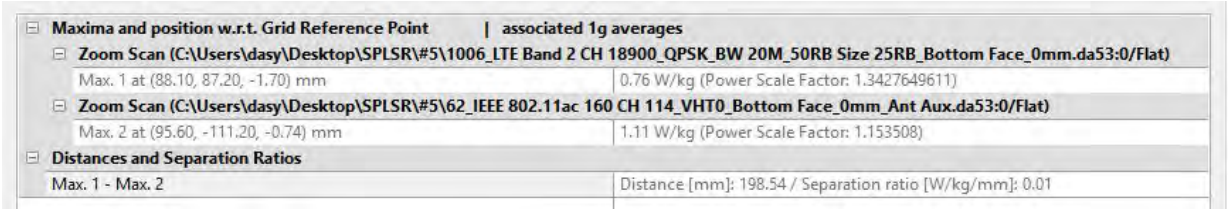

| #2_WCDMA II + 5GHz Aux | | | | | | |
|---|---|---|---|---|---|---|
| Antenna | Index | Frequency (GHz) | Reported SAR1g (W/Kg) | Σ Reported SAR1g (W/Kg) | Antenna pair(mm) | Peak location separation ratio |
| WCDMA II | 239 | 1.88 | 1.148 | 2.26 | 193.96 | 0.02 |
| 5GHz Aux | 62 | 5.57 | 1.109 | | | |



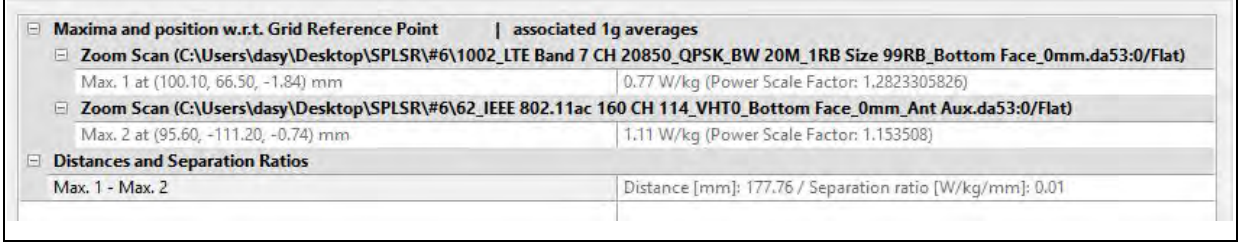
| #3_WCDMA IV + 5GHz Aux | | | | | | |
|---|---|---|---|---|---|---|
| Antenna | Index | Frequency (GHz) | Reported SAR1g (W/Kg) | Σ Reported SAR1g (W/Kg) | Antenna pair(mm) | Peak location separation ratio |
| WCDMA IV | 249 | 1.7526 | 0.695 | 1.81 | 198.54 | 0.01 |
| 5GHz Aux | 62 | 5.57 | 1.109 | | | |



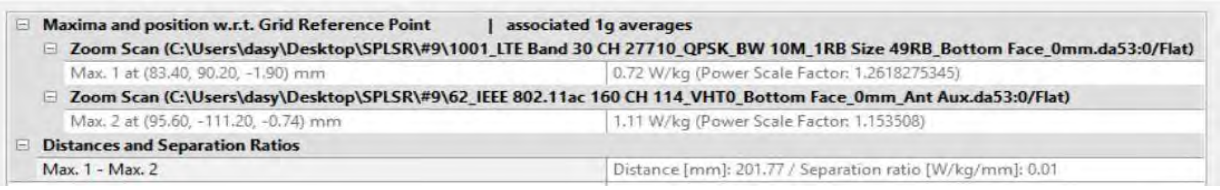

| #5_LTE Band 2 + 5GHz Aux | | | | | | |
|---|---|---|---|---|---|---|
| Antenna | Index | Frequency (GHz) | Reported SAR1g (W/Kg) | Σ Reported SAR1g (W/Kg) | Antenna pair(mm) | Peak location separation ratio |
| LTE Band 2 | 1006 | 1.18 | 0.764 | 1.87 | 198.54 | 0.01 |
| 5GHz Aux | 62 | 5.57 | 1.109 | | | |



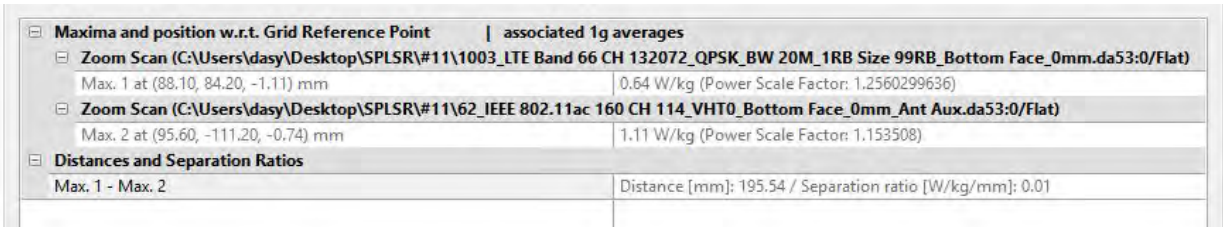

| #6_LTE Band 7 + 5GHz Aux | | | | | | |
|---|---|---|---|---|---|---|
| Antenna | Index | Frequency (GHz) | Reported SAR1g (W/Kg) | Σ Reported SAR1g (W/Kg) | Antenna pair(mm) | Peak location separation ratio |
| LTE Band 7 | 1002 | 2.51 | 0.772 | 1.88 | 177.76 | 0.01 |
| 5GHz Aux | 62 | 5.57 | 1.109 | | | |



| #9_LTE Band 30 + 5GHz Aux | | | | | | |
|---|---|---|---|---|---|---|
| Antenna | Index | Frequency (GHz) | Reported SAR1g (W/Kg) | Σ Reported SAR1g (W/Kg) | Antenna pair(mm) | Peak location separation ratio |
| LTE Band 30 | 1001 | 2.31 | 0.718 | 1.83 | 201.77 | 0.01 |
| 5GHz Aux | 62 | 5.57 | 1.109 | | | |




| #11_LTE Band 66 + 5GHz Aux | | | | | | |
|---|---|---|---|---|---|---|
| Antenna | Index | Frequency (GHz) | Reported SAR1g (W/Kg) | Σ Reported SAR1g (W/Kg) | Antenna pair(mm) | Peak location separation ratio |
| LTE Band 66 | 1003 | 1.72 | 0.639 | 1.75 | 195.54 | 0.01 |
| 5GHz Aux | 62 | 5.57 | 1.109 | | | |



## 11.9 Measurement Variability

| Band | Frequency | | Bandwidth | Modulation or Sub-Test | RB Size | RB Offset | Test Position | Spacing | Note | Original $SAR_{1g}$ | First $SAR_{1g}$ | First Ratio $SAR_{1g}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ch. | MHz | | | | | | (mm) | | (W/kg) | (W/kg) | |
| WCDMA Band II | 9400 | 1880 | --- | RMC12.2K | --- | --- | Side 1 | 17 | original #500_once | 0.901 | 0.884 | 1.89% |
| WCDMA Band V | 4182 | 836.4 | --- | RMC12.2K | --- | --- | Side 1 | 0 | original #288_once | 0.915 | 0.897 | 1.97% |
| LTE Band 7 | 20850 | 2510 | 20M | QPSK | 50 | 0 | Side 1 | 0 | original #123_once | 1.18 | 1.15 | 2.54% |
| LTE Band 13 | 23230 | 782 | 10M | QPSK | 1 | 49 | Side 1 | 0 | original #977_once | 0.822 | 0.812 | 1.22% |

According to KDB 865664 D01v01r04, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

The following procedures are applied to determine if repeated measurements are required:

1. The original highest measured Reported SAR 1-g is ＜0.80 W/kg, repeated that measurement once.

2. Perform a second repeated measurement the ratio of the largest to the smallest SAR for the original and first repeated measurements is <1.2 W/kg, or when the original or repeated measurement is ≧1.45 W/kg (~10% from the 1-g SAR limit).

## 11.10 Spot Check

| Band | Mode | Frequency | | Data Rate | Test Position | Spacing | SAR 1 g | Burst Avg Power (dBm) | Max tune-up (dBm) | Duty Cycle (%) | Reported SAR 1 g | Antenna | Note | Deviation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ch. | MHz | | | (mm) | (W/Kg) | | | | | | | |
| WLAN2.4GHz | 802.11b | 11 | 2462 | 1 Mbps | Side 4 | 0 | 0.257 | 15.92 | 17 | 99.11 | 0.333 | Ant Main | AWAN | |
| WLAN2.4GHz | 802.11b | 11 | 2462 | 1 Mbps | Side 4 | 0 | 0.237 | 15.92 | 17 | 99.11 | 0.307 | Ant Main | AWAN | -7.81% |
| | | | | | | | | | | | | | | |
| WLAN2.4GHz | 802.11b | 11 | 2462 | 1 Mbps | Bottom Face | 0 | 0.556 | 15.95 | 17 | 98.96 | 0.716 | Ant Aux | AWAN | |
| WLAN2.4GHz | 802.11b | 11 | 2462 | 1 Mbps | Bottom Face | 0 | 0.532 | 15.95 | 17 | 98.96 | 0.685 | Ant Aux | AWAN | -4.33% |
| | | | | | | | | | | | | | | |
| Bluetooth | | 78 | 2480 | 1 Mbps | Bottom Face | 0 | 0.104 | 8.37 | 8.5 | 77.60 | 0.138 | Ant Aux | AWAN | |
| Bluetooth | | 78 | 2480 | 1 Mbps | Bottom Face | 0 | 0.102 | 8.37 | 8.5 | 77.60 | 0.135 | Ant Aux | AWAN | -2.17% |
| | | | | | | | | | | | | | | |
| WLAN5GHz | 802.11ac 80 MHz | 58 | 5290 | VHT0 | Side 4 | 0 | 0.414 | 13.98 | 14 | 98.52 | 0.422 | Ant Main | AWAN | |
| WLAN5GHz | 802.11ac 80 MHz | 58 | 5290 | VHT0 | Side 4 | 0 | 0.399 | 13.98 | 14 | 98.52 | 0.407 | Ant Main | AWAN | -3.55% |
| | | | | | | | | | | | | | | |
| WLAN5GHz | 802.11ac 80 MHz | 58 | 5290 | VHT0 | Bottom Face | 0 | 0.698 | 10.96 | 12 | 98.43 | 0.901 | Ant Aux | AWAN | |
| WLAN5GHz | 802.11ac 80 MHz | 58 | 5290 | VHT0 | Bottom Face | 0 | 0.678 | 10.96 | 12 | 98.43 | 0.875 | Ant Aux | AWAN | -2.89% |
| | | | | | | | | | | | | | | |
| WLAN5GHz | 802.11ac 80 MHz | 106 | 5530 | VHT0 | Side 4 | 0 | 0.436 | 13.96 | 14 | 98.52 | 0.447 | Ant Main | AWAN | |
| WLAN5GHz | 802.11ac 80 MHz | 106 | 5530 | VHT0 | Side 4 | 0 | 0.422 | 13.96 | 14 | 98.52 | 0.432 | Ant Main | AWAN | -3.36% |
| | | | | | | | | | | | | | | |
| WLAN5GHz | 802.11ac 160 MHz | 114 | 5570 | VHT0 | Bottom Face | 0 | 0.961 | 11.46 | 12 | 98.15 | 1.109 | Ant Aux | South Star | |
| WLAN5GHz | 802.11ac 160 MHz | 114 | 5570 | VHT0 | Bottom Face | 0 | 0.936 | 11.46 | 12 | 98.15 | 1.080 | Ant Aux | South Star | -2.61% |
| | | | | | | | | | | | | | | |
| WLAN5GHz | 802.11n 40 MHz | 151 | 5755 | HT0 | Side 4 | 0 | 0.514 | 13.98 | 14 | 98.12 | 0.526 | Ant Main | AWAN | |
| WLAN5GHz | 802.11n 40 MHz | 151 | 5755 | HT0 | Side 4 | 0 | 0.501 | 13.98 | 14 | 98.12 | 0.513 | Ant Main | AWAN | -2.47% |
| | | | | | | | | | | | | | | |
| WLAN5GHz | 802.11n 40 MHz | 151 | 5755 | HT0 | Bottom Face | 0 | 0.845 | 11.47 | 12 | 98.03 | 0.974 | Ant Aux | AWAN | |
| WLAN5GHz | 802.11n 40 MHz | 151 | 5755 | HT0 | Bottom Face | 0 | 0.841 | 11.47 | 12 | 98.03 | 0.969 | Ant Aux | AWAN | -0.51% |

### 11.11 Requirements on the Uncertainty Evaluation

Decision Rule

■ Uncertainty is not included.

☐ Uncertainty is included.

The highest measured 1-g SAR is less than 1.5 W/kg and the highest measured 10-g SAR is less than 3.75 W/kg. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis described in IEEE 1528-2013 and IEC/IEEE 62209-1528 is not required.

## *12. Conclusion*

The SAR test values found for the device are below the maximum limit of 1.6 W/kg.

# *Appendix A - System Performance Check*

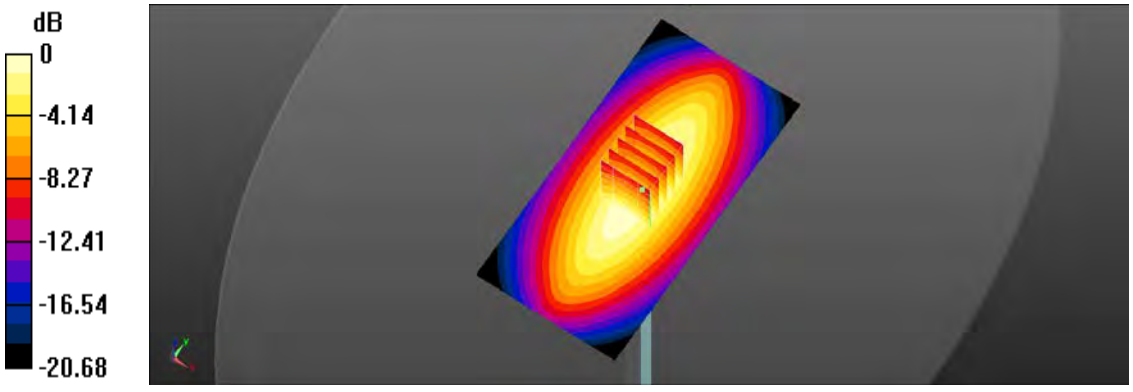
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/6/29
System Performance Check at 750MHz_Head
**DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1004**

Communication System: UID 0, CW (0); Frequency: 750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; $\sigma$ = 0.895 S/m; $\varepsilon_r$ = 42.586; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(10.32, 10.32, 10.32) @ 750 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**System Performance Check at 750MHz/Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.06 W/kg

**System Performance Check at 750MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 60.43 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.55 W/kg
**SAR(1 g) = 2.24 W/kg; SAR(10 g) = 1.47 W/kg**
Smallest distance from peaks to all points 3 dB below = 19.5 mm
Ratio of SAR at M2 to SAR at M1 = 63.4%
Maximum value of SAR (measured) = 3.07 W/kg




0 dB = 3.07 W/kg = 4.87 dBW/kg

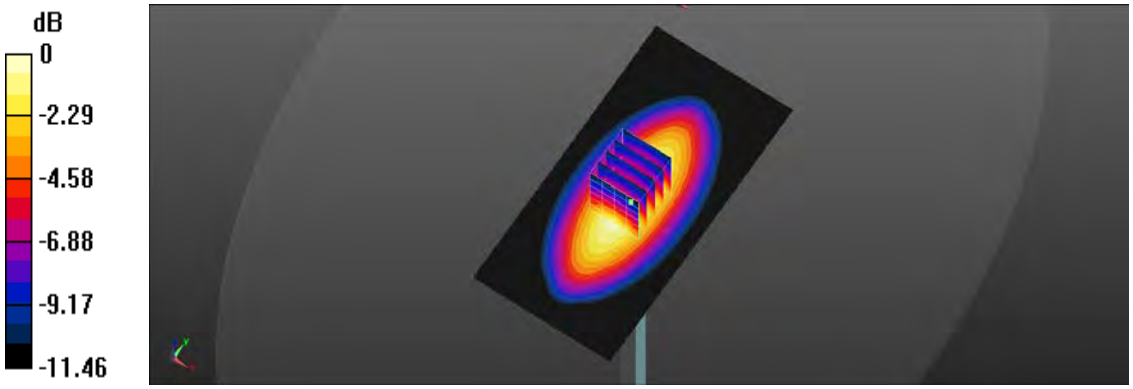
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/6/30
System Performance Check at 835MHz_Head
**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082**

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; $\sigma$ = 0.904 S/m; $\varepsilon_r$ = 42.419; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.85, 9.85, 9.85) @ 835 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**System Performance Check at 835MHz/Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.37 W/kg

**System Performance Check at 835MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 62.77 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 3.90 W/kg
**SAR(1 g) = 2.52 W/kg; SAR(10 g) = 1.66 W/kg**
Smallest distance from peaks to all points 3 dB below = 16 mm
Ratio of SAR at M2 to SAR at M1 = 65%
Maximum value of SAR (measured) = 3.40 W/kg




0 dB = 3.40 W/kg = 5.31 dBW/kg

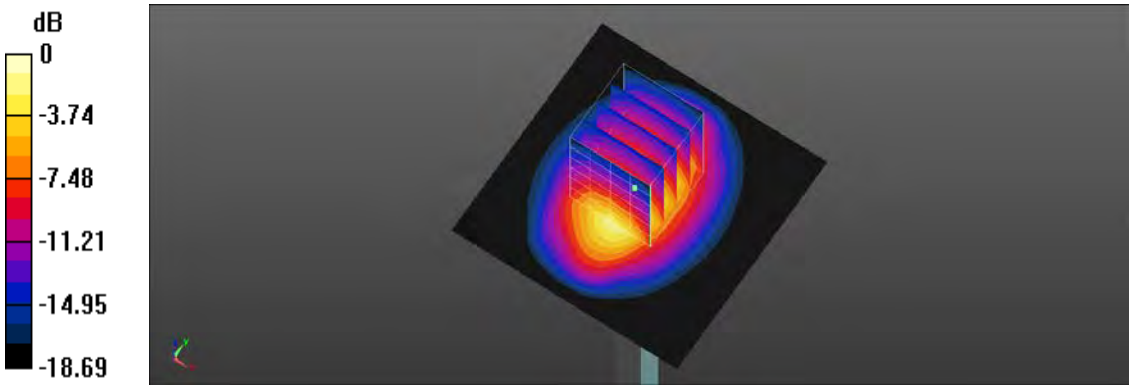
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/7/2
System Performance Check at 1750MHz_Head
**DUT: Dipole D1750V2; Type: D1750V2; Serial: D1750V2 - SN1111**

Communication System: UID 0, CW (0); Frequency: 1750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1750 MHz; $\sigma$ = 1.379 S/m; $\varepsilon_r$ = 40.693; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(8.54, 8.54, 8.54) @ 1750 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**System Performance Check at 1750MHz/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.9 W/kg

**System Performance Check at 1750MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 97.66 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 15.5 W/kg
**SAR(1 g) = 8.29 W/kg; SAR(10 g) = 4.3 W/kg**
Smallest distance from peaks to all points 3 dB below = 9.6 mm
Ratio of SAR at M2 to SAR at M1 = 53.7%
Maximum value of SAR (measured) = 12.9 W/kg




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

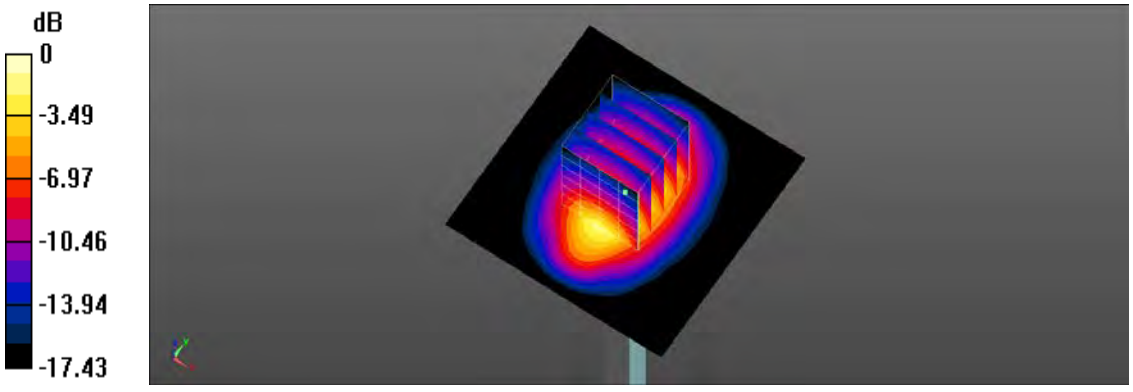
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/7/1
System Performance Check at 1900MHz_Head
**DUT: Dipole 1900 MHz D1900V2; Type: D1900V2; Serial: D1900V2 - SN:5d111**

Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; $\sigma$ = 1.438 S/m; $\varepsilon_r$ = 41.226; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(8.21, 8.21, 8.21) @ 1900 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**System Performance Check at 1900MHz/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 16.4 W/kg

**System Performance Check at 1900MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 110.7 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 19.5 W/kg
**SAR(1 g) = 10.7 W/kg; SAR(10 g) = 5.6 W/kg**
Smallest distance from peaks to all points 3 dB below = 9.6 mm
Ratio of SAR at M2 to SAR at M1 = 54.7%
Maximum value of SAR (measured) = 16.5 W/kg




0 dB = 16.5 W/kg = 12.17 dBW/kg

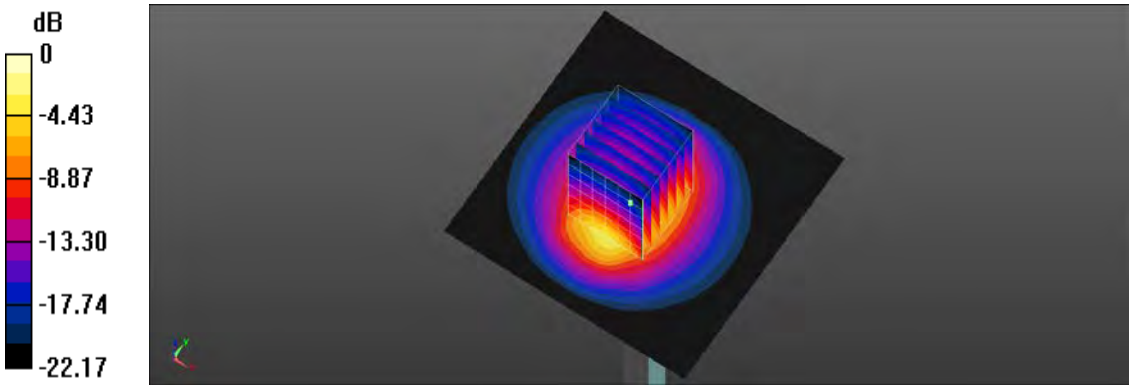
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/7/4
System Performance Check at 2300MHz_Head
**DUT: Dipole 2300 MHz; Type: D2300V2; Serial: D2300V2 - SN:1005**

Communication System: UID 0, CW (0); Frequency: 2300 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2300 MHz; $\sigma$ = 1.627 S/m; $\varepsilon_r$ = 40.062; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.88, 7.88, 7.88) @ 2300 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**System Performance Check at 2300MHz/Area Scan (81x81x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 19.4 W/kg

**System Performance Check at 2300MHz/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 106.4 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 23.9 W/kg
**SAR(1 g) = 11.6 W/kg; SAR(10 g) = 5.42 W/kg**
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 48.6%
Maximum value of SAR (measured) = 19.3 W/kg




0 dB = 19.3 W/kg = 12.86 dBW/kg

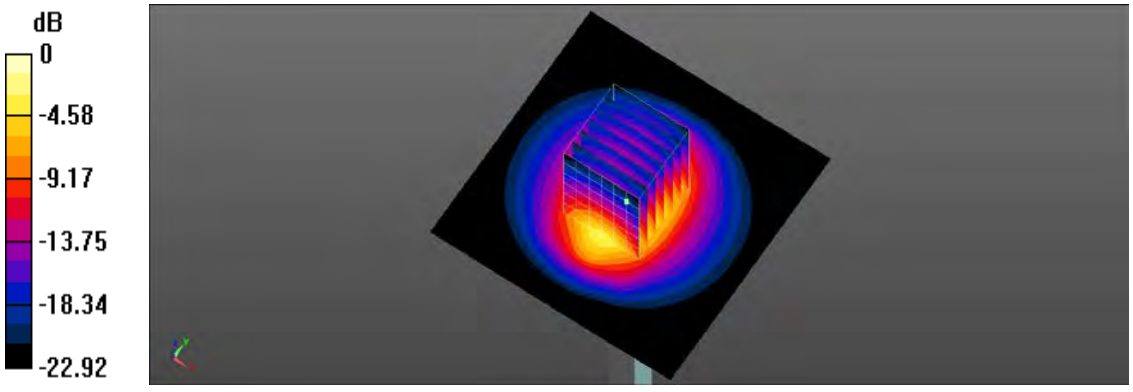
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/7/3
System Performance Check at 2600MHz_Head
**DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1007**

Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; $\sigma$ = 1.99 S/m; $\varepsilon_r$ = 39.104; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.42, 7.42, 7.42) @ 2600 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**System Performance Check at 2600MHz/Area Scan (81x81x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 26.1 W/kg

**System Performance Check at 2600MHz/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 118.6 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 32.2 W/kg
**SAR(1 g) = 15.3 W/kg; SAR(10 g) = 7 W/kg**
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 47.4%
Maximum value of SAR (measured) = 26.0 W/kg




0 dB = 26.0 W/kg = 14.15 dBW/kg

# *Appendix B - Measurement Data*

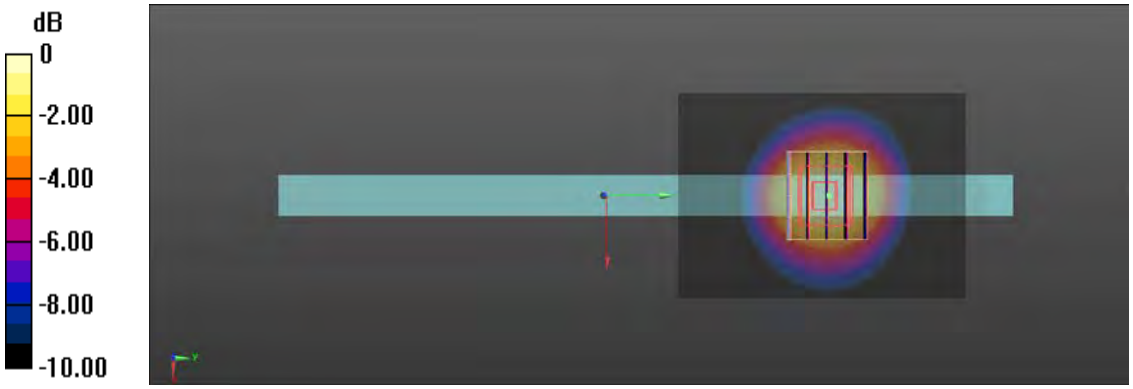
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/7/1
**500_WCDMA Band II CH 9400_Side 1_17mm**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, WCDMA Band II (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; $\sigma$ = 1.42 S/m; $\varepsilon_r$ = 41.275; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(8.21, 8.21, 8.21) @ 1880 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (51x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.30 W/kg

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.78 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.47 W/kg
**SAR(1 g) = 0.901 W/kg; SAR(10 g) = 0.542 W/kg**
Smallest distance from peaks to all points 3 dB below = 16.3 mm
Ratio of SAR at M2 to SAR at M1 = 62.1%
Maximum value of SAR (measured) = 1.26 W/kg




0 dB = 1.26 W/kg = 1.00 dBW/kg

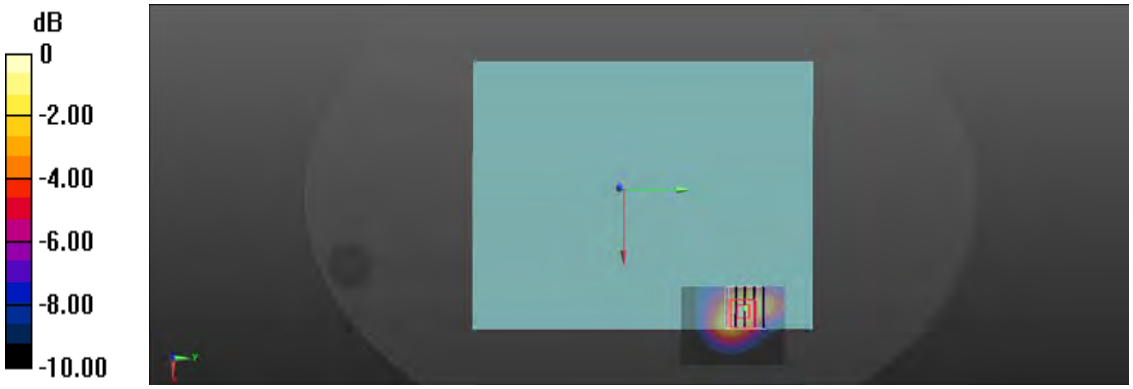
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/7/2
**249_WCDMA Band IV CH 1513_Bottom Face_0mm**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, WCDMA Band IV (0); Frequency: 1752.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1753 MHz; $\sigma$ = 1.381 S/m; $\varepsilon_r$ = 40.685; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(8.54, 8.54, 8.54) @ 1752.6 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (41x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.758 W/kg

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.93 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.921 W/kg
**SAR(1 g) = 0.538 W/kg; SAR(10 g) = 0.296 W/kg**
Smallest distance from peaks to all points 3 dB below = 9.1 mm
Ratio of SAR at M2 to SAR at M1 = 61.6%
Maximum value of SAR (measured) = 0.769 W/kg




0 dB = 0.769 W/kg = -1.14 dBW/kg

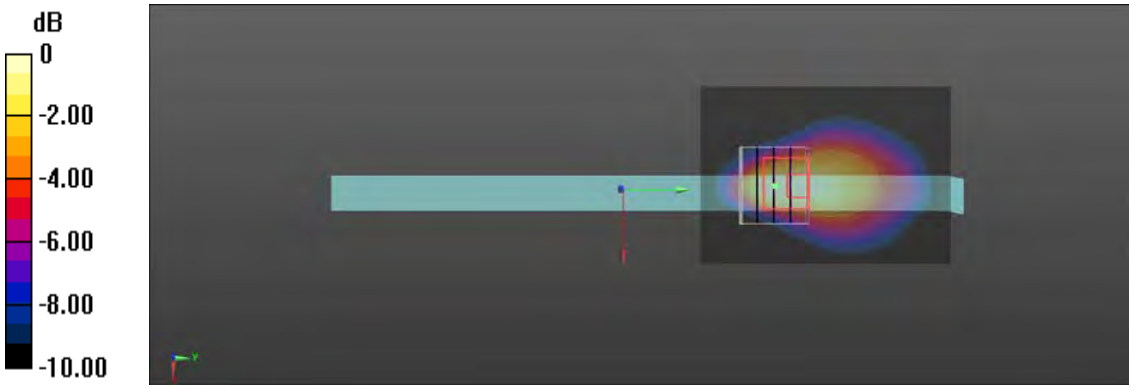
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/6/30
**288_WCDMA Band V CH 4182_Side 1_0mm**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, WCDMA Band V (0); Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium parameters used: f = 837 MHz; $\sigma$ = 0.906 S/m; $\varepsilon_r$ = 42.39; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.85, 9.85, 9.85) @ 836.4 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (51x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.65 W/kg

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 41.84 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.86 W/kg
**SAR(1 g) = 0.915 W/kg; SAR(10 g) = 0.485 W/kg**
Smallest distance from peaks to all points 3 dB below = 9.6 mm
Ratio of SAR at M2 to SAR at M1 = 47.5%
Maximum value of SAR (measured) = 1.50 W/kg




0 dB = 1.50 W/kg = 1.76 dBW/kg

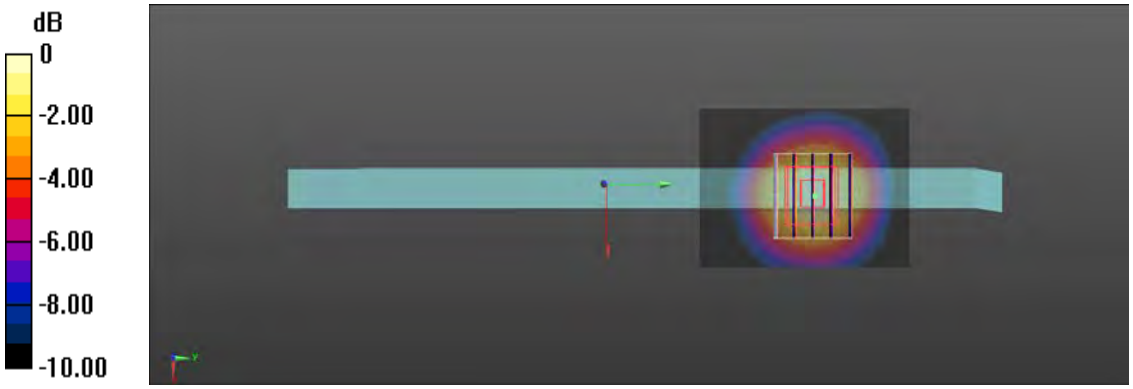
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/7/1
**18_LTE Band 2 CH 18900_QPSK_BW 20M_1RB Size 0RB_Side 1_17mm**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, Generic LTE (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; $\sigma$ = 1.42 S/m; $\varepsilon_r$ = 41.275; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(8.21, 8.21, 8.21) @ 1880 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (41x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.16 W/kg

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.208 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 1.33 W/kg
**SAR(1 g) = 0.810 W/kg; SAR(10 g) = 0.484 W/kg**
Smallest distance from peaks to all points 3 dB below = 16 mm
Ratio of SAR at M2 to SAR at M1 = 61.6%
Maximum value of SAR (measured) = 1.14 W/kg




0 dB = 1.14 W/kg = 0.57 dBW/kg

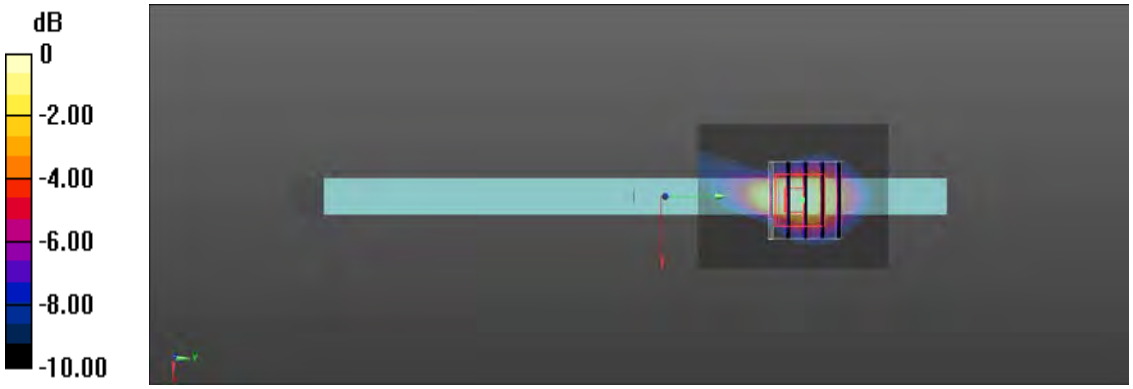
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/7/2
**25_LTE Band 4 CH 20175_QPSK_BW 20M_1RB Size 0RB_Side 1_0mm**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, Generic LTE (0); Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1732.5 MHz; $\sigma$ = 1.364 S/m; $\varepsilon_r$ = 40.748; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(8.54, 8.54, 8.54) @ 1732.5 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (41x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.977 W/kg

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.85 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 1.15 W/kg
**SAR(1 g) = 0.578 W/kg; SAR(10 g) = 0.294 W/kg**
Smallest distance from peaks to all points 3 dB below = 8 mm
Ratio of SAR at M2 to SAR at M1 = 50.8%
Maximum value of SAR (measured) = 0.936 W/kg




0 dB = 0.936 W/kg = -0.29 dBW/kg

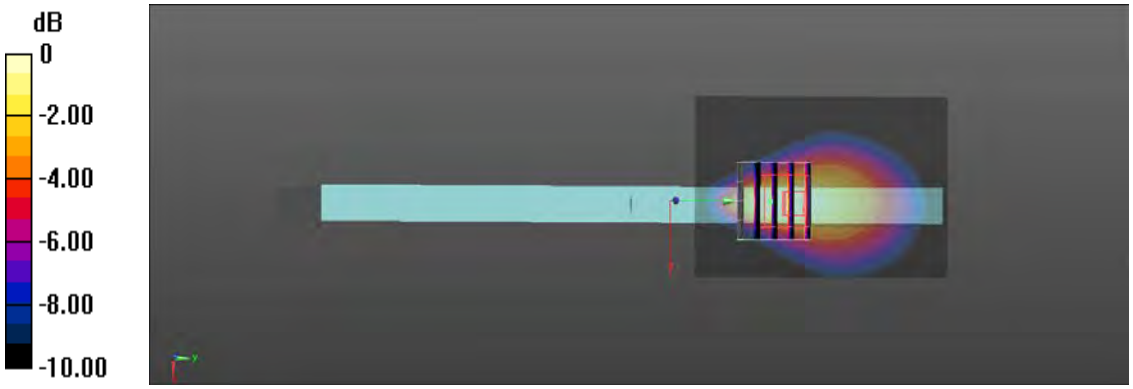
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/6/30
**433_LTE Band 5 CH 20525_QPSK_BW 10M_1RB Size 49RB_Side 1**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, Generic LTE (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.5 MHz; $\sigma$ = 0.905 S/m; $\varepsilon_r$ = 42.397; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.85, 9.85, 9.85) @ 836.5 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (51x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.37 W/kg

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 36.39 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 1.48 W/kg
**SAR(1 g) = 0.724 W/kg; SAR(10 g) = 0.378 W/kg**
Smallest distance from peaks to all points 3 dB below = 9.7 mm
Ratio of SAR at M2 to SAR at M1 = 47.3%
Maximum value of SAR (measured) = 1.17 W/kg




0 dB = 1.17 W/kg = 0.68 dBW/kg

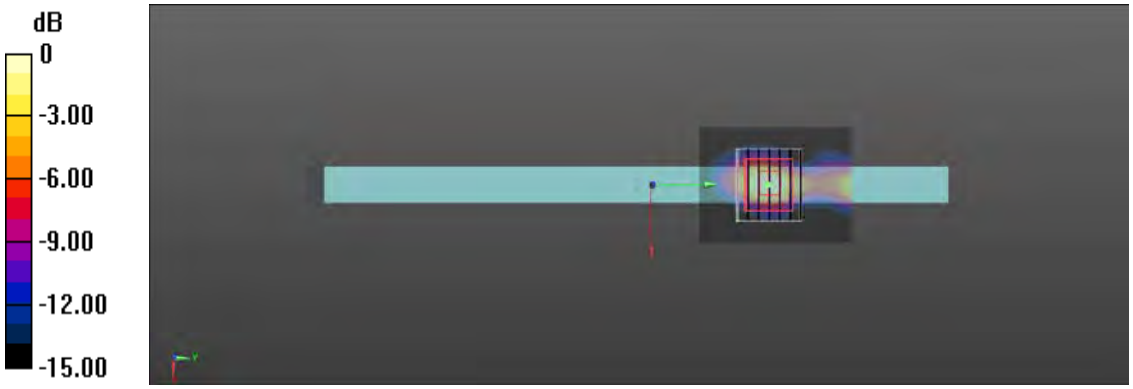
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/7/3
**123_LTE Band 7 CH 20850_QPSK_BW 20M_50RB Size 0RB_Side 1_0mm**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, Generic LTE (0); Frequency: 2510 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2510 MHz; $\sigma$ = 1.873 S/m; $\varepsilon_r$ = 39.372; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.67, 7.67, 7.67) @ 2510 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (41x61x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 2.25 W/kg

**Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 35.73 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 2.74 W/kg
**SAR(1 g) = 1.16 W/kg; SAR(10 g) = 0.444 W/kg**
Smallest distance from peaks to all points 3 dB below = 6 mm
Ratio of SAR at M2 to SAR at M1 = 46.4%
Maximum value of SAR (measured) = 2.15 W/kg




0 dB = 2.15 W/kg = 3.32 dBW/kg

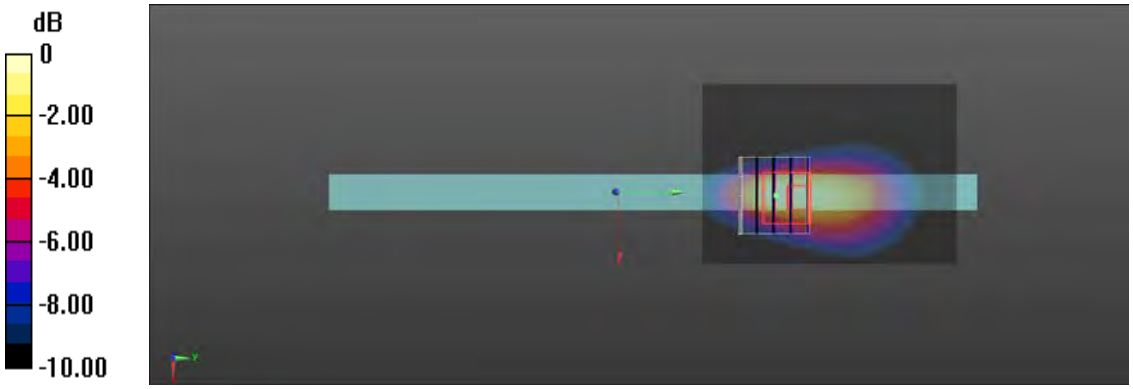
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/6/29
**79_LTE Band 12 CH 23095_QPSK_BW 10M_1RB Size 0RB_Side 1**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, Generic LTE (0); Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 707.5 MHz; $\sigma$ = 0.858 S/m; $\varepsilon_r$ = 43.163; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(10.32, 10.32, 10.32) @ 707.5 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (51x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.05 W/kg

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.02 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 1.46 W/kg
**SAR(1 g) = 0.612 W/kg; SAR(10 g) = 0.320 W/kg**
Smallest distance from peaks to all points 3 dB below = 6.4 mm
Ratio of SAR at M2 to SAR at M1 = 38.3%
Maximum value of SAR (measured) = 1.09 W/kg




0 dB = 1.09 W/kg = 0.37 dBW/kg

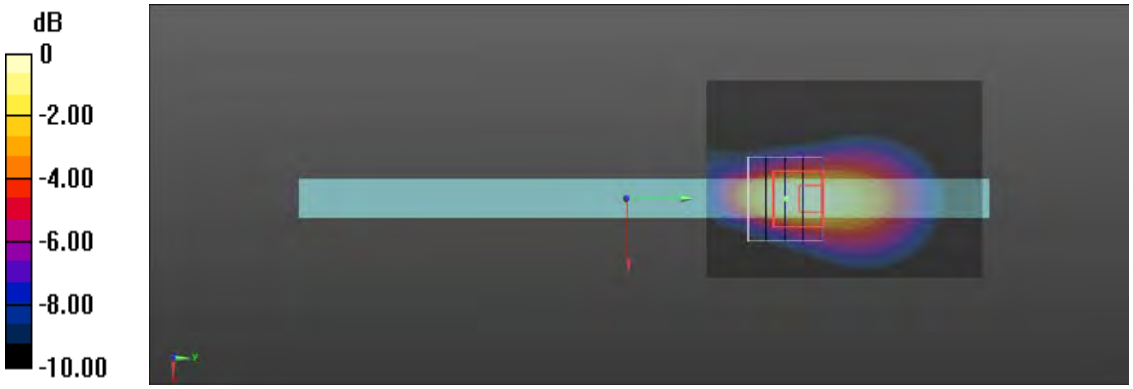
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/6/29
**977_LTE Band 13 CH 23230_QPSK_BW 10M_1RB Size 49RB_Side 1**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, Generic LTE (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used: f = 782 MHz; $\sigma$ = 0.922 S/m; $\varepsilon_r$ = 42.164; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(10.32, 10.32, 10.32) @ 782 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (51x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.53 W/kg

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 39.66 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 1.78 W/kg
**SAR(1 g) = 0.822 W/kg; SAR(10 g) = 0.433 W/kg**
Smallest distance from peaks to all points 3 dB below = 9.3 mm
Ratio of SAR at M2 to SAR at M1 = 45.6%
Maximum value of SAR (measured) = 1.41 W/kg




0 dB = 1.41 W/kg = 1.49 dBW/kg

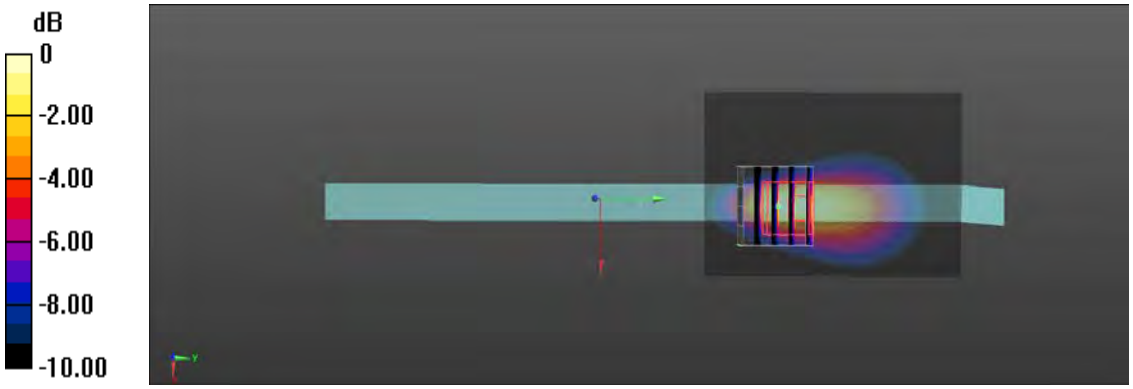
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/6/29
**115_LTE Band 17 CH 23790_QPSK_BW 10M_1RB Size 49RB_Side 1**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, Generic LTE (0); Frequency: 710 MHz;Duty Cycle: 1:1
Medium parameters used: f = 710 MHz; $\sigma$ = 0.886 S/m; $\varepsilon_r$ = 43.983; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(10.32, 10.32, 10.32) @ 710 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (51x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.10 W/kg

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.44 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.50 W/kg
**SAR(1 g) = 0.615 W/kg; SAR(10 g) = 0.314 W/kg**
Smallest distance from peaks to all points 3 dB below = 8 mm
Ratio of SAR at M2 to SAR at M1 = 43.6%
Maximum value of SAR (measured) = 1.14 W/kg




0 dB = 1.14 W/kg = 0.57 dBW/kg

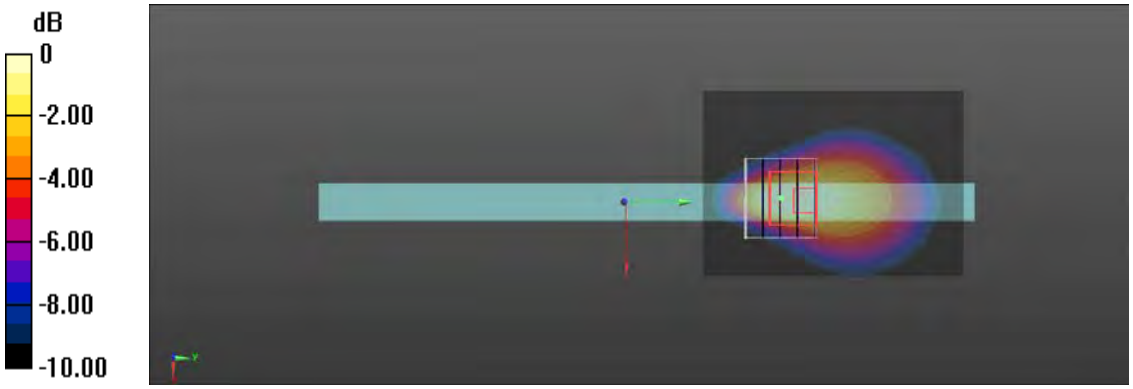
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/6/30
**401_LTE Band 26 CH 26865_QPSK_BW 15M_1RB Size 74RB_Side 1**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, Generic LTE (0); Frequency: 831.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 831.5 MHz; $\sigma$ = 0.901 S/m; $\varepsilon_r$ = 42.469; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.85, 9.85, 9.85) @ 831.5 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (51x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.36 W/kg

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.88 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.45 W/kg
**SAR(1 g) = 0.721 W/kg; SAR(10 g) = 0.380 W/kg**
Smallest distance from peaks to all points 3 dB below = 9.7 mm
Ratio of SAR at M2 to SAR at M1 = 48%
Maximum value of SAR (measured) = 1.16 W/kg




0 dB = 1.16 W/kg = 0.64 dBW/kg

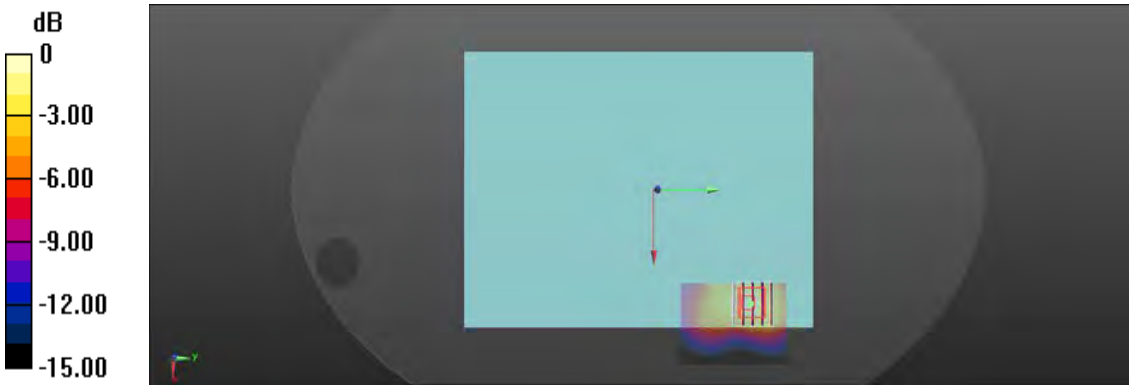
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/7/4
**1001_LTE Band 30 CH 27710_QPSK_BW 10M_1RB Size 49RB_Bottom Face_0mm**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, Generic LTE (0); Frequency: 2310 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2310 MHz; $\sigma$ = 1.637 S/m; $\varepsilon_r$ = 40.007; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.88, 7.88, 7.88) @ 2310 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (41x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.801 W/kg

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.18 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.999 W/kg
**SAR(1 g) = 0.569 W/kg; SAR(10 g) = 0.301 W/kg**
Smallest distance from peaks to all points 3 dB below = 11.3 mm
Ratio of SAR at M2 to SAR at M1 = 59.3%
Maximum value of SAR (measured) = 0.807 W/kg




0 dB = 0.807 W/kg = -0.93 dBW/kg

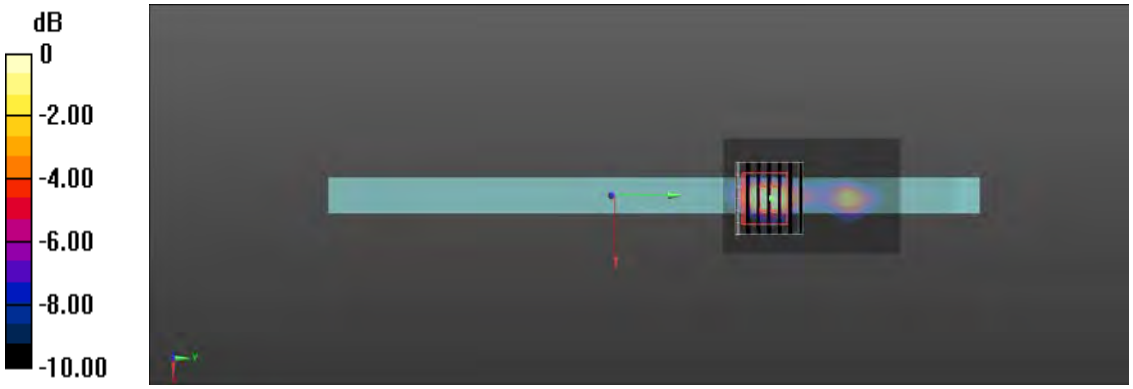
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/7/3
**511_LTE Band 38 CH 38000_QPSK_BW 20M_1RB Size 0RB_Side 1_0mm**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, Generic LTE (0); Frequency: 2595 MHz;Duty Cycle: 1:1.59
Medium parameters used (interpolated): f = 2595 MHz; $\sigma$ = 1.983 S/m; $\varepsilon_r$ = 39.12; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.42, 7.42, 7.42) @ 2595 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (41x71x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.11 W/kg

**Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.35 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.41 W/kg
**SAR(1 g) = 0.581 W/kg; SAR(10 g) = 0.212 W/kg**
Smallest distance from peaks to all points 3 dB below = 6 mm
Ratio of SAR at M2 to SAR at M1 = 44.3%
Maximum value of SAR (measured) = 1.08 W/kg




0 dB = 1.08 W/kg = 0.33 dBW/kg

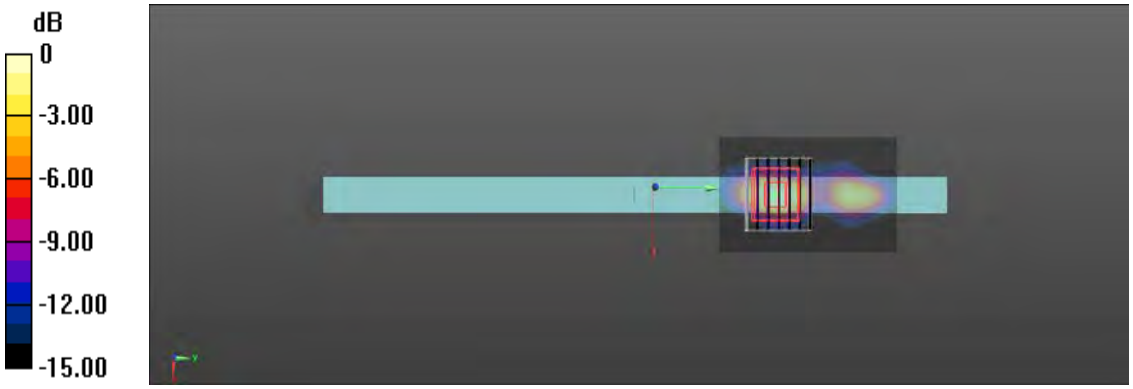
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/7/3
**73_LTE Band 41 CH 40185_QPSK_BW 20M_1RB Size 0RB_Side 1_0mm**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, Generic LTE (0); Frequency: 2549.5 MHz;Duty Cycle: 1:1.59
Medium parameters used: f = 2550 MHz; $\sigma$ = 1.92 S/m; $\varepsilon_r$ = 39.304; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.67, 7.67, 7.67) @ 2549.5 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (41x71x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.52 W/kg

**Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 28.02 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.88 W/kg
**SAR(1 g) = 0.760 W/kg; SAR(10 g) = 0.272 W/kg**
Smallest distance from peaks to all points 3 dB below = 6 mm
Ratio of SAR at M2 to SAR at M1 = 43.2%
Maximum value of SAR (measured) = 1.46 W/kg




0 dB = 1.46 W/kg = 1.64 dBW/kg

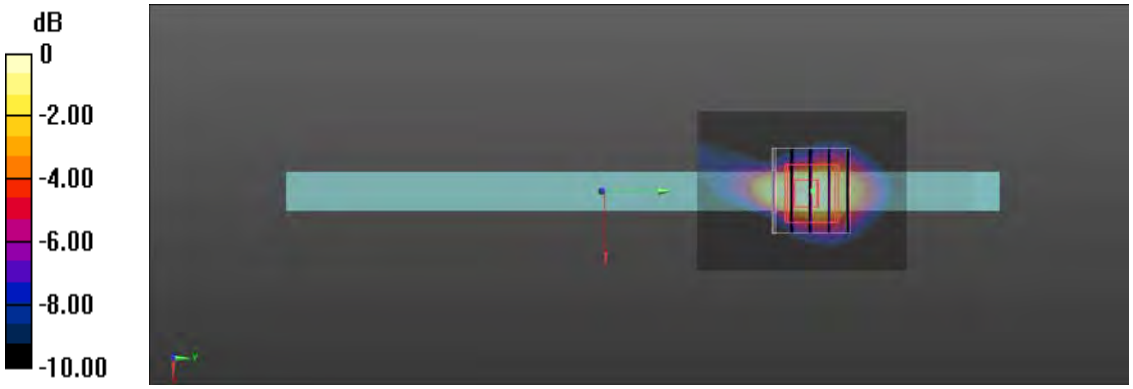
Test Laboratory: A Test Lab Techno Corp.
Date: 2021/7/2
**235_LTE Band 66 CH 132322_QPSK_BW 20M_1RB Size 0RB_Side 1_0mm**
**DUT: CR1100FK, CR1100CK; Type: Notebook PC**

Communication System: UID 0, Generic LTE (0); Frequency: 1745 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1745 MHz; $\sigma$ = 1.375 S/m; $\varepsilon_r$ = 40.708; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(8.54, 8.54, 8.54) @ 1745 MHz; Calibrated: 2020/7/29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2020/12/16
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

**Area Scan (41x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.04 W/kg

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.98 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.18 W/kg
**SAR(1 g) = 0.602 W/kg; SAR(10 g) = 0.310 W/kg**
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 50.4%
Maximum value of SAR (measured) = 0.956 W/kg




0 dB = 0.956 W/kg = -0.20 dBW/kg

# *Appendix C - Calibration*

All of the instruments Calibration information are listed below.

- Dipole _ D750V3 SN: 1004
- Dipole _ D8350V2 SN: 4d082
- Dipole _ D1750V2 SN: 1111
- Dipole _ D1900V2 SN: 5d111
- Dipole _ D2300V2 SN: 1005
- Dipole _ D2600V2 SN: 1007
- Probe _ EX3DV4 SN: 3977
- DAE _ DAE4 SN: 1253

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中国认可 国际互认 校准 CALIBRATION CNAS L0570

Client ATL Certificate No: Z20-60365

# CALIBRATION CERTIFICATE

Object D750V3 - SN: 1004

Calibration Procedure(s) FF-Z11-003-01
Calibration Procedures for dipole validation kits

Calibration date: September 17, 2020

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

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power Meter NRP2 | 106276 | 12-May-20 (CTTL, No.J20X02965) | May-21 |
| Power sensor NRP6A | 101369 | 12-May-20 (CTTL, No.J20X02965) | May-21 |
| ReferenceProbe EX3DV4 | SN 3617 | 30-Jan-20(SPEAG,No.EX3-3617_Jan20) | Jan-21 |
| DAE4 | SN 771 | 10-Feb-20(CTTL-SPEAG,No.Z20-60017) | Feb-21 |
| **Secondary Standards** | **ID #** | **Cal Date(Calibrated by, Certificate No.)** | **Scheduled Calibration** |
| Signal Generator E4438C | MY49071430 | 25-Feb-20 (CTTL, No.J20X00516) | Feb-21 |
| NetworkAnalyzer E5071C | MY46110673 | 10-Feb-20 (CTTL, No.J20X00515) | Feb-21 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Zhao Jing | SAR Test Engineer | |
| Reviewed by: | Lin Hao | SAR Test Engineer | |
| Approved by: | Qi Dianyuan | SAR Project Leader | |

Issued: September 22, 2020

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**Glossary:**

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

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

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

**Additional Documentation:**

e) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

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

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

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## Measurement Conditions

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

| | | |
|---|---|---|
| **DASY Version** | DASY52 | V52.10.4 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Triple Flat Phantom 5.1C | |
| **Distance Dipole Center - TSL** | 15 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy, dz = 5 mm | |
| **Frequency** | 750 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 41.9 | 0.89 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 42.3 ± 6 % | 0.88 mho/m ± 6 % |
| **Head TSL temperature change during test** | <1.0 °C | ---- | ---- |

## SAR result with Head TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 2.07 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **8.37 W/kg ± 18.8 % (*k*=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | Condition | |
| SAR measured | 250 mW input power | 1.36 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **5.48 W/kg ± 18.7 % (*k*=2)** |

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## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 52.9Ω+ 1.70jΩ |
| Return Loss | - 29.6dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 0.900 ns |

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

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

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**DASY5 Validation Report for Head TSL** Date: 09.17.2020

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1004**

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium parameters used: f = 750 MHz; $\sigma$ = 0.88 S/m; $\varepsilon_r$ = 42.25; $\rho$ = 1000 kg/m3

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(10.07, 10.07, 10.07) @ 750 MHz; Calibrated: 2020-01-30
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2020-02-10
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

**Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.56 V/m; Power Drift = -0.01 dB

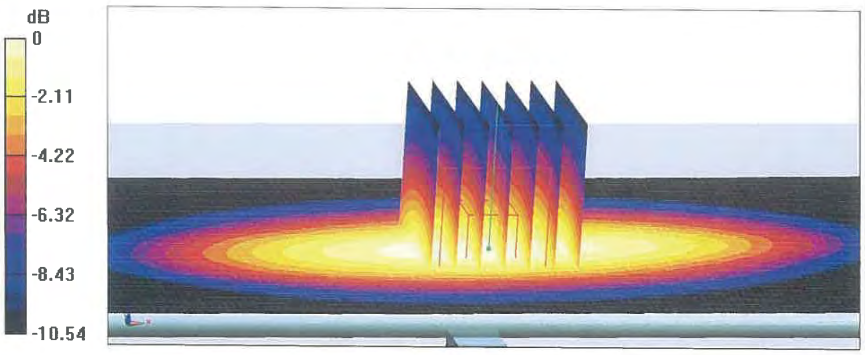
Peak SAR (extrapolated) = 3.08 W/kg

**SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.36 W/kg**

Smallest distance from peaks to all points 3 dB below = 18.9 mm

Ratio of SAR at M2 to SAR at M1 = 67%

Maximum value of SAR (measured) = 2.75 W/kg




**0 dB = 2.75 W/kg = 4.39 dBW/kg**

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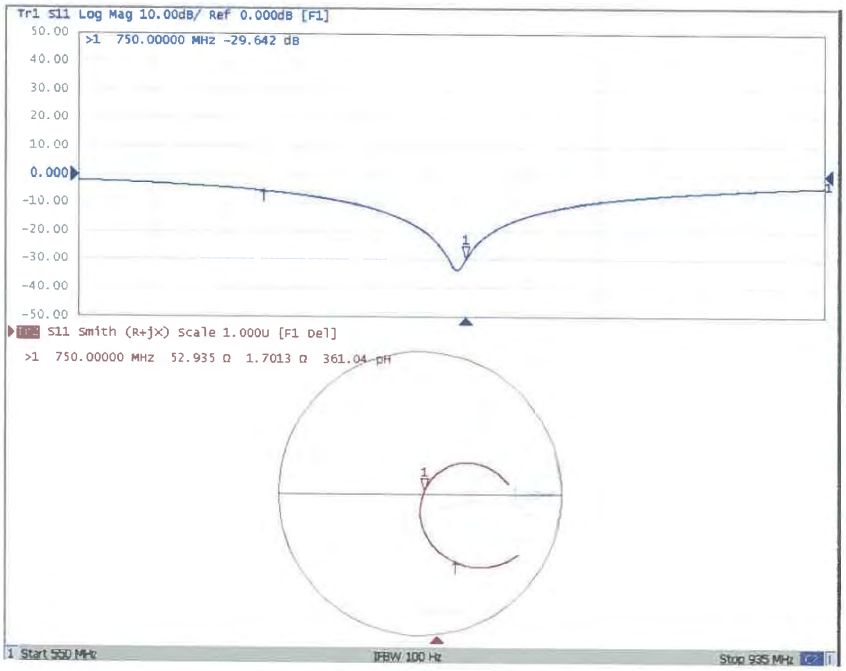
**Impedance Measurement Plot for Head TSL**



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Client ATL Certificate No: Z20-60366

# CALIBRATION CERTIFICATE

Object D835V2 - SN: 4d082

Calibration Procedure(s) FF-Z11-003-01
Calibration Procedures for dipole validation kits

Calibration date: September 17, 2020

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

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power Meter NRP2 | 106276 | 12-May-20 (CTTL, No.J20X02965) | May-21 |
| Power sensor NRP6A | 101369 | 12-May-20 (CTTL, No.J20X02965) | May-21 |
| ReferenceProbe EX3DV4 | SN 3617 | 30-Jan-20(SPEAG,No.EX3-3617_Jan20) | Jan-21 |
| DAE4 | SN 771 | 10-Feb-20(CTTL-SPEAG,No.Z20-60017) | Feb-21 |
| **Secondary Standards** | **ID #** | **Cal Date(Calibrated by, Certificate No.)** | **Scheduled Calibration** |
| Signal Generator E4438C | MY49071430 | 25-Feb-20 (CTTL, No.J20X00516) | Feb-21 |
| NetworkAnalyzer E5071C | MY46110673 | 10-Feb-20 (CTTL, No.J20X00515) | Feb-21 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Zhao Jing | SAR Test Engineer | |
| Reviewed by: | Lin Hao | SAR Test Engineer | |
| Approved by: | Qi Dianyuan | SAR Project Leader | |

Issued: September 22, 2020

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**Glossary:**

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

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

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

**Additional Documentation:**

e) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

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

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

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## Measurement Conditions

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

| | | |
|---|---|---|
| **DASY Version** | DASY52 | V52.10.4 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Triple Flat Phantom 5.1C | |
| **Distance Dipole Center - TSL** | 15 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy, dz = 5 mm | |
| **Frequency** | 835 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 41.5 | 0.90 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 40.9 ± 6 % | 0.87 mho/m ± 6 % |
| **Head TSL temperature change during test** | <1.0 °C | ---- | ---- |

## SAR result with Head TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 2.33 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **9.49 W/kg ± 18.8 % (*k*=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | Condition | |
| SAR measured | 250 mW input power | 1.52 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **6.17 W/kg ± 18.7 % (*k*=2)** |

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## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 51.8Ω- 2.36jΩ |
| Return Loss | - 30.7dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.253 ns |

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

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

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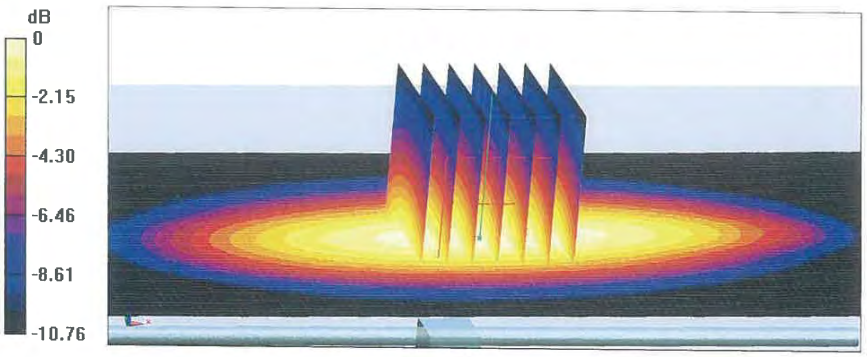
**DASY5 Validation Report for Head TSL** Date: 09.17.2020
Test Laboratory: CTTL, Beijing, China
**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d082**
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; $\sigma$ = 0.874 S/m; $\varepsilon_r$ = 40.86; $\rho$ = 1000 kg/m$^3$
Phantom section: Right Section
DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(9.66, 9.66, 9.66) @ 835 MHz; Calibrated: 2020-01-30
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2020-02-10
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

**Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.90 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 3.48 W/kg
**SAR(1 g) = 2.33 W/kg; SAR(10 g) = 1.52 W/kg**
Smallest distance from peaks to all points 3 dB below = 16.6 mm
Ratio of SAR at M2 to SAR at M1 = 66.7%
Maximum value of SAR (measured) = 3.12 W/kg




**0 dB = 3.12 W/kg = 4.94 dBW/kg**

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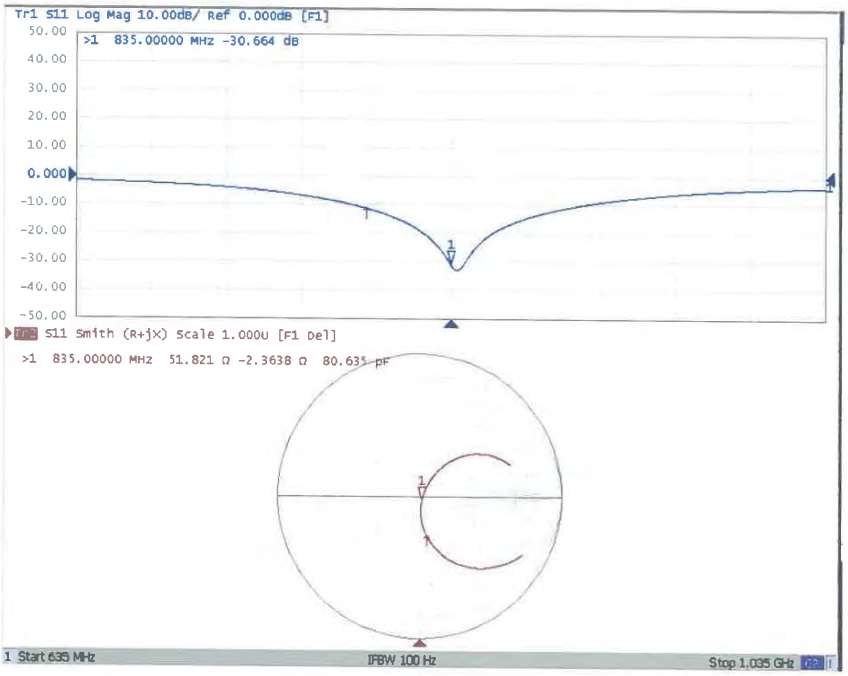
**Impedance Measurement Plot for Head TSL**



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CNAS L0570

Client **AUDEN** **Certificate No: Z21-60099**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D1750V2 - SN: 1111 |
| Calibration Procedure(s) | FF-Z11-003-01<br>Calibration Procedures for dipole validation kits |
| Calibration date: | April 14, 2021 |

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

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power Meter NRP2 | 106276 | 12-May-20 (CTTL, No.J20X02965) | May-21 |
| Power sensor NRP6A | 101369 | 12-May-20 (CTTL, No.J20X02965) | May-21 |
| ReferenceProbe EX3DV4 | SN 7307 | 29-May-20(SPEAG,No.EX3-7307_May20) | May-21 |
| DAE4 | SN 777 | 08-Jan-21(CTTL-SPEAG,No.Z21-60003) | Jan-22 |
| **Secondary Standards** | **ID #** | **Cal Date(Calibrated by, Certificate No.)** | **Scheduled Calibration** |
| Signal Generator E4438C | MY49071430 | 01-Feb-21 (CTTL, No.J21X00593) | Jan-22 |
| NetworkAnalyzer E5071C | MY46110673 | 14-Jan-21 (CTTL, No.J21X00232) | Jan-22 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Zhao Jing | SAR Test Engineer | |
| Reviewed by: | Lin Hao | SAR Test Engineer | |
| Approved by: | Qi Dianyuan | SAR Project Leader | |

Issued: April 19, 2021

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**Glossary:**

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

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

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

**Additional Documentation:**

e) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

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

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

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## Measurement Conditions

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

| | | |
|---|---|---|
| **DASY Version** | DASY52 | V52.10.4 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Triple Flat Phantom 5.1C | |
| **Distance Dipole Center - TSL** | 10 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy, dz = 5 mm | |
| **Frequency** | 1750 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 40.1 | 1.37 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 40.5 ± 6 % | 1.39 mho/m ± 6 % |
| **Head TSL temperature change during test** | <1.0 °C | --- | --- |

## SAR result with Head TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 9.16 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **36.4 W/kg ± 18.8 % (k=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | Condition | |
| SAR measured | 250 mW input power | 4.78 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **19.0 W/kg ± 18.7 % (k=2)** |

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## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 48.9Ω- 4.12jΩ |
| Return Loss | - 27.3 dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.125 ns |

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

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

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**DASY5 Validation Report for Head TSL** Date: 04.14.2021

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1111**

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1750 MHz; $\sigma$ = 1.391 S/m; $\varepsilon_r$ = 40.52; $\rho$ = 1000 kg/m$^3$

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7307; ConvF(8.64, 8.64, 8.64) @ 1750 MHz; Calibrated: 2020-05-29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 2021-01-08
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

**System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 94.69 V/m; Power Drift = -0.08 dB

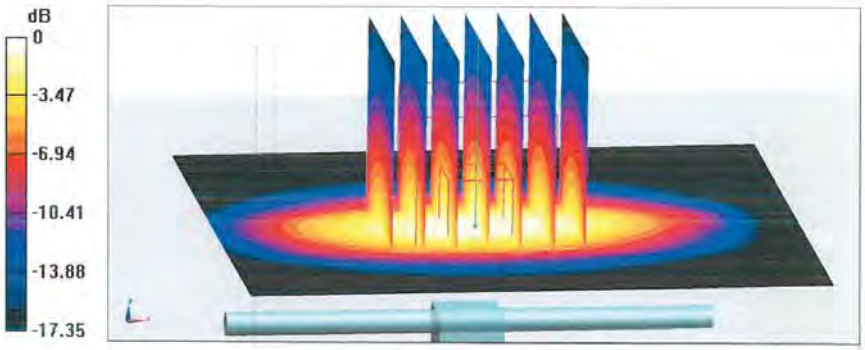
Peak SAR (extrapolated) = 17.3 W/kg

**SAR(1 g) = 9.16 W/kg; SAR(10 g) = 4.78 W/kg**

Smallest distance from peaks to all points 3 dB below = 10 mm

Ratio of SAR at M2 to SAR at M1 = 53.3%

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




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

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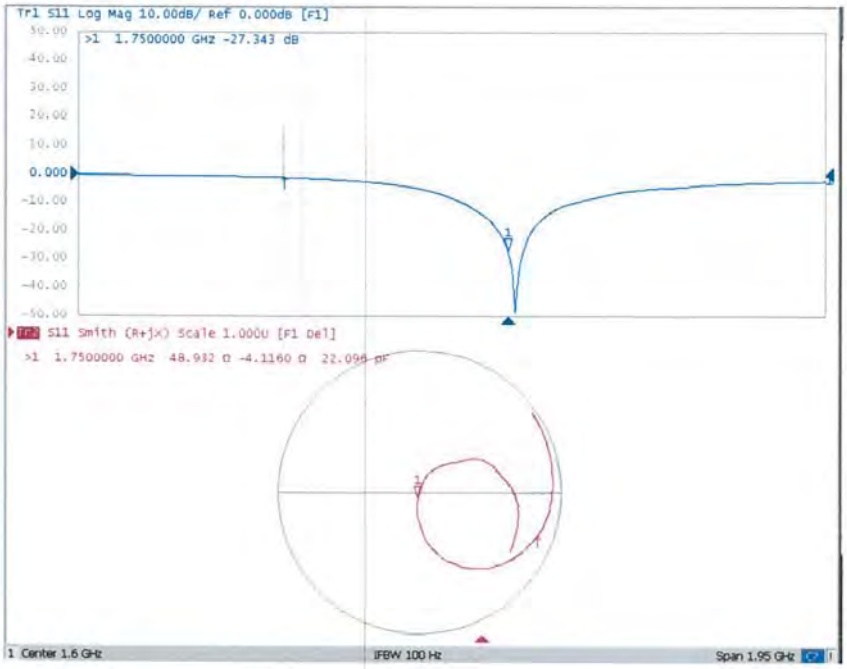
**Impedance Measurement Plot for Head TSL**



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Client ATL Certificate No: Z20-60367

# CALIBRATION CERTIFICATE

Object D1900V2 - SN: 5d111

Calibration Procedure(s) FF-Z11-003-01
Calibration Procedures for dipole validation kits

Calibration date: September 18, 2020

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

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power Meter NRP2 | 106276 | 12-May-20 (CTTL, No.J20X02965) | May-21 |
| Power sensor NRP6A | 101369 | 12-May-20 (CTTL, No.J20X02965) | May-21 |
| ReferenceProbe EX3DV4 | SN 3617 | 30-Jan-20(SPEAG,No.EX3-3617_Jan20) | Jan-21 |
| DAE4 | SN 771 | 10-Feb-20(CTTL-SPEAG,No.Z20-60017) | Feb-21 |
| Secondary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
| Signal Generator E4438C | MY49071430 | 25-Feb-20 (CTTL, No.J20X00516) | Feb-21 |
| NetworkAnalyzer E5071C | MY46110673 | 10-Feb-20 (CTTL, No.J20X00515) | Feb-21 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Zhao Jing | SAR Test Engineer | |
| Reviewed by: | Lin Hao | SAR Test Engineer | |
| Approved by: | Qi Dianyuan | SAR Project Leader | |

Issued: September 22, 2020

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**lossary:**

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

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

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

**Additional Documentation:**

e) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

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

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

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## Measurement Conditions

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

| | | |
|---|---|---|
| **DASY Version** | DASY52 | V52.10.4 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Triple Flat Phantom 5.1C | |
| **Distance Dipole Center - TSL** | 10 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy, dz = 5 mm | |
| **Frequency** | 1900 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 40.0 | 1.40 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 39.9 ± 6 % | 1.40 mho/m ± 6 % |
| **Head TSL temperature change during test** | <1.0 °C | ---- | ---- |

## SAR result with Head TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 10.0 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **40.1 W/kg ± 18.8 % (*k*=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | Condition | |
| SAR measured | 250 mW input power | 5.17 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **20.7 W/kg ± 18.7 % (*k*=2)** |

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## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 50.1Ω+ 6.43jΩ |
| Return Loss | - 23.9dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.066 ns |

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

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

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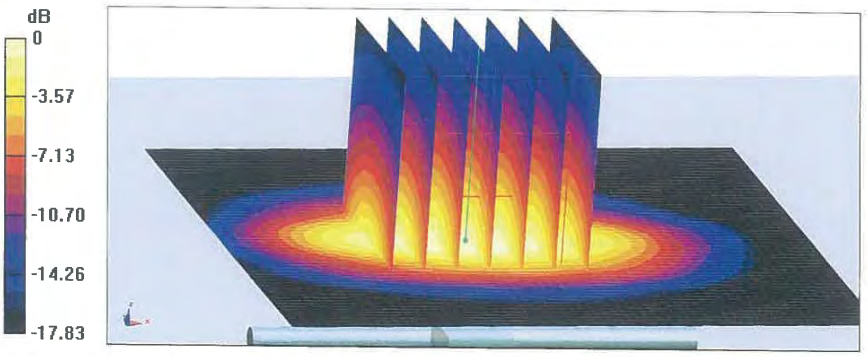
**DASY5 Validation Report for Head TSL** Date: 09.18.2020
Test Laboratory: CTTL, Beijing, China
**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d111**
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; $\sigma$ = 1.395 S/m; $\varepsilon_r$ = 39.89; $\rho$ = 1000 kg/m$^3$
Phantom section: Center Section
DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(8.14, 8.14, 8.14) @ 1900 MHz; Calibrated: 2020-01-30
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2020-02-10
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

**System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 101.0 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 19.2 W/kg
**SAR(1 g) = 10 W/kg; SAR(10 g) = 5.17 W/kg**
Smallest distance from peaks to all points 3 dB below = 9.8 mm
Ratio of SAR at M2 to SAR at M1 = 52.5%
Maximum value of SAR (measured) = 15.9 W/kg




**0 dB = 15.9 W/kg = 12.01 dBW/kg**

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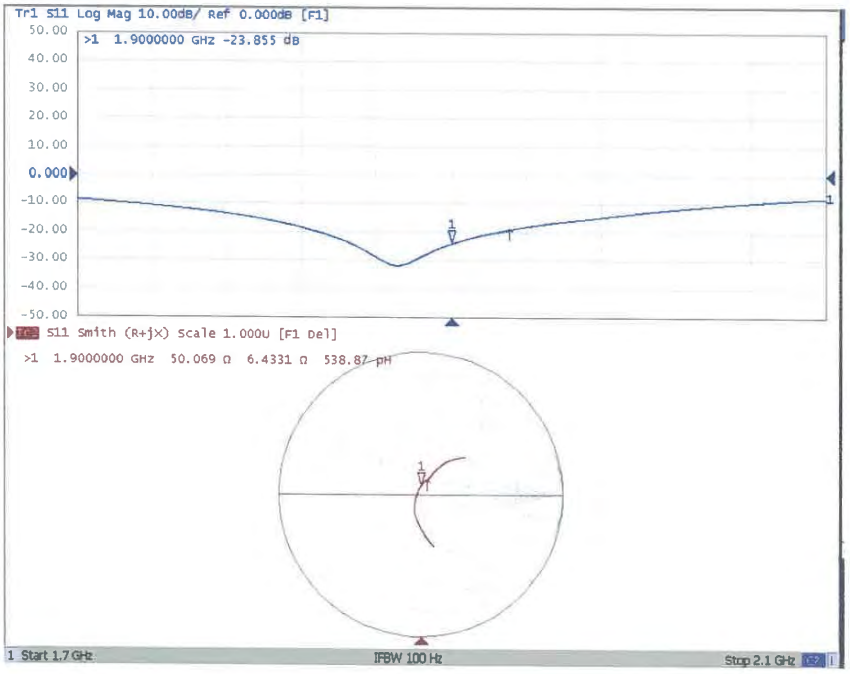
**Impedance Measurement Plot for Head TSL**



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ST-D2D_21-100

Client ATL ertificate No: Z21-60115

# CALIBRATION CERTIFICATE

Object D2300V2 - SN: 1005

Calibration Procedure(s) FF-Z11-003-01
Calibration Procedures for dipole validation kits

Calibration date: April 14, 2021

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

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power Meter NRP2 | 106276 | 12-May-20 (CTTL, No.J20X02965) | May-21 |
| Power sensor NRP6A | 101369 | 12-May-20 (CTTL, No.J20X02965) | May-21 |
| ReferenceProbe EX3DV4 | SN 7307 | 29-May-20(SPEAG,No.EX3-7307_May20) | May-21 |
| DAE4 | SN 777 | 08-Jan-21(CTTL-SPEAG,No.Z21-60003) | Jan-22 |
| **Secondary Standards** | **ID #** | **Cal Date(Calibrated by, Certificate No.)** | **Scheduled Calibration** |
| Signal Generator E4438C | MY49071430 | 01-Feb-21 (CTTL, No.J21X00593) | Jan-22 |
| NetworkAnalyzer E5071C | MY46110673 | 14-Jan-21 (CTTL, No.J21X00232) | Jan-22 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Zhao Jing | SAR Test Engineer | |
| Reviewed by: | Lin Hao | SAR Test Engineer | |
| Approved by: | Qi Dianyuan | SAR Project Leader | |

Issued: April 19, 2021

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**Glossary:**

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

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

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

**Additional Documentation:**

e) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

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

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

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## Measurement Conditions

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

| | | |
|---|---|---|
| **DASY Version** | DASY52 | V52.10.4 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Triple Flat Phantom 5.1C | |
| **Distance Dipole Center - TSL** | 10 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy, dz = 5 mm | |
| **Frequency** | 2300 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 39.5 | 1.67 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 39.9 ± 6 % | 1.64 mho/m ± 6 % |
| **Head TSL temperature change during test** | <1.0 °C | ---- | ---- |

## SAR result with Head TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 11.8 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **47.7 W/kg ± 18.8 % (*k*=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | Condition | |
| SAR measured | 250 mW input power | 5.48 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **22.1 W/kg ± 18.7 % (*k*=2)** |

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## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 46.9Ω- 1.76jΩ |
| Return Loss | - 28.7dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.058 ns |

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

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

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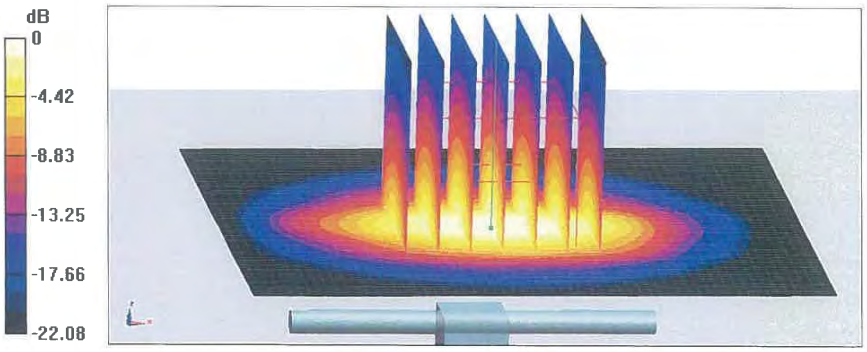
**DASY5 Validation Report for Head TSL** Date: 04.14.2021
Test Laboratory: CTTL, Beijing, China
**DUT: Dipole 2300 MHz; Type: D2300V2; Serial: D2300V2 - SN: 1005**
Communication System: UID 0, CW; Frequency: 2300 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2300 MHz; $\sigma$ = 1.643 S/m; $\varepsilon_r$ = 39.87; $\rho$ = 1000 kg/m$^3$
Phantom section: Center Section
DASY5 Configuration:

- Probe: EX3DV4 - SN7307; ConvF(8.15, 8.15, 8.15) @ 2300 MHz; Calibrated: 2020-05-29
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 2021-01-08
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

**Dipole Calibration**/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.3 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 24.8 W/kg
**SAR(1 g) = 11.8 W/kg; SAR(10 g) = 5.48 W/kg**
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 47.5%
Maximum value of SAR (measured) = 19.9 W/kg




**0 dB = 19.9 W/kg = 12.99 dBW/kg**

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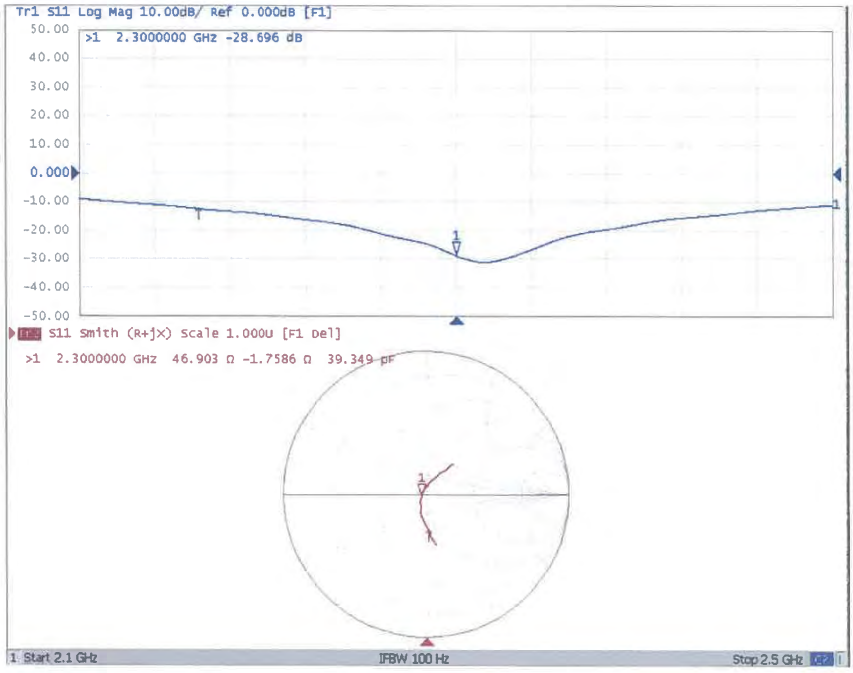
**Impedance Measurement Plot for Head TSL**



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ST-021-20-186

Client ATL Certificate No: Z20-60374

# CALIBRATION CERTIFICATE

Object D2600V2 - SN: 1007

Calibration Procedure(s) FF-Z11-003-01
Calibration Procedures for dipole validation kits

Calibration date: September 29, 2020

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

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power Meter NRP2 | 106276 | 12-May-20 (CTTL, No.J20X02965) | May-21 |
| Power sensor NRP6A | 101369 | 12-May-20 (CTTL, No.J20X02965) | May-21 |
| Reference Probe EX3DV4 | SN 3617 | 30-Jan-20(SPEAG,No.EX3-3617_Jan20) | Jan-21 |
| DAE4 | SN 771 | 10-Feb-20(CTTL-SPEAG,No.Z20-60017) | Feb-21 |
| **Secondary Standards** | **ID #** | **Cal Date(Calibrated by, Certificate No.)** | **Scheduled Calibration** |
| Signal Generator E4438C | MY49071430 | 25-Feb-20 (CTTL, No.J20X00516) | Feb-21 |
| Network Analyzer E5071C | MY46110673 | 10-Feb-20 (CTTL, No.J20X00515) | Feb-21 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Zhao Jing | SAR Test Engineer | |
| Reviewed by: | Lin Hao | SAR Test Engineer | |
| Approved by: | Qi Dianyuan | SAR Project Leader | |

Issued: October 4, 2020

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**Glossary:**

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

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

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

**Additional Documentation:**

e) DASY4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

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

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

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## Measurement Conditions

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

| | | |
|---|---|---|
| **DASY Version** | DASY52 | V52.10.4 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Triple Flat Phantom 5.1C | |
| **Distance Dipole Center - TSL** | 10 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy, dz = 5 mm | |
| **Frequency** | 2600 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 39.0 | 1.96 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 37.9 ± 6 % | 1.96 mho/m ± 6 % |
| **Head TSL temperature change during test** | <1.0 °C | ---- | ---- |

## SAR result with Head TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 14.4 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **57.3 W/kg ± 18.8 % (*k*=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | Condition | |
| SAR measured | 250 mW input power | 6.51 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **25.9 W/kg ± 18.7 % (*k*=2)** |

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## Appendix(Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 48.1Ω- 3.65jΩ |
| Return Loss | - 27.5dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.018 ns |

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

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

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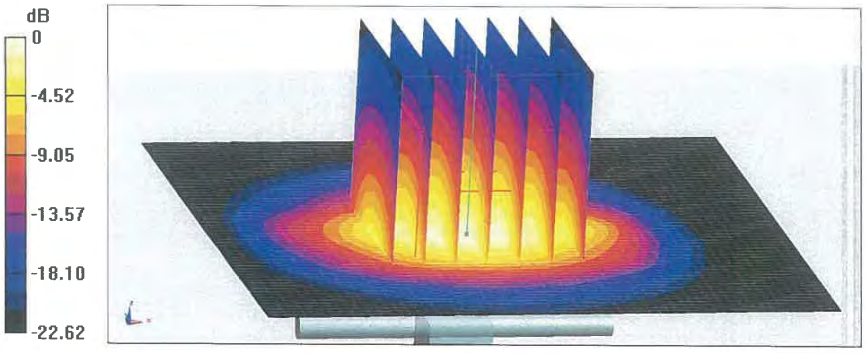
**DASY5 Validation Report for Head TSL** Date: 09.29.2020
Test Laboratory: CTTL, Beijing, China
**DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1007**
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; $\sigma$ = 1.955 S/m; $\varepsilon_r$ = 37.94; $\rho$ = 1000 kg/m$^3$
Phantom section: Center Section
DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(7.52, 7.52, 7.52) @ 2600 MHz; Calibrated: 2020-01-30
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2020-02-10
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

**Dipole Calibration**/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.3 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 30.3 W/kg
**SAR(1 g) = 14.4 W/kg; SAR(10 g) = 6.51 W/kg**
Smallest distance from peaks to all points 3 dB below = 8.5 mm
Ratio of SAR at M2 to SAR at M1 = 48.3%
Maximum value of SAR (measured) = 24.4 W/kg




**0 dB = 24.4 W/kg = 13.87 dBW/kg**

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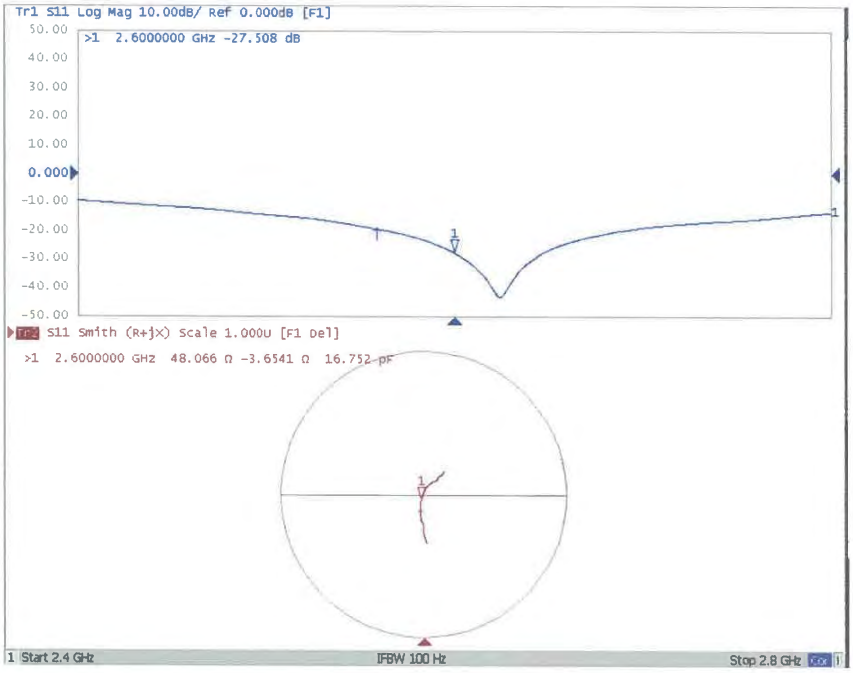
**Impedance Measurement Plot for Head TSL**



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Client ATL Certificate No: Z20-60261

# CALIBRATION CERTIFICATE

Object EX3DV4 - SN : 3977

Calibration Procedure(s) FF-Z11-004-01
Calibration Procedures for Dosimetric E-field Probes

Calibration date: July 29, 2020

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power Meter NRP2 | 101919 | 16-Jun-20(CTTL, No.J20X04344) | Jun-21 |
| Power sensor NRP-Z91 | 101547 | 16-Jun-20(CTTL, No.J20X04344) | Jun-21 |
| Power sensor NRP-Z91 | 101548 | 16-Jun-20(CTTL, No.J20X04344) | Jun-21 |
| Reference 10dBAttenuator | 18N50W-10dB | 10-Feb-20(CTTL, No.J20X00525) | Feb-22 |
| Reference 20dBAttenuator | 18N50W-20dB | 10-Feb-20(CTTL, No.J20X00526) | Feb-22 |
| Reference Probe EX3DV4 | SN 7307 | 29-May-20(SPEAG, No.EX3-7307_May20) | May-21 |
| DAE4 | SN 1556 | 4-Feb-20(SPEAG, No.DAE4-1556_Feb20) | Feb-21 |

| Secondary Standards | ID # | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| SignalGenerator MG3700A | 6201052605 | 23-Jun-20(CTTL, No.J20X04343) | Jun-21 |
| Network Analyzer E5071C | MY46110673 | 10-Feb-20(CTTL, No.J20X00515) | Feb-21 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Yu Zongying | SAR Test Engineer | |
| Reviewed by: | Lin Hao | SAR Test Engineer | |
| Approved by: | Qi Dianyuan | SAR Project Leader | |

Issued: July 31, 2020

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**Glossary:**

| | |
|---|---|
| TSL | tissue simulating liquid |
| NORMx,y,z | sensitivity in free space |
| ConvF | sensitivity in TSL / NORMx,y,z |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A,B,C,D | modulation dependent linearization parameters |
| Polarization Φ | Φ rotation around probe axis |
| Polarization θ | θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i θ=0 is normal to probe axis |
| Connector Angle | information used in DASY system to align probe sensor X to the robot coordinate system |

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

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016

c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010

d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

**Methods Applied and Interpretation of Parameters:**

- *NORMx,y,z:* Assessed for E-field polarization θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the $E^2$-field uncertainty inside TSL (see below ConvF).
- *NORM(f)x,y,z = NORMx,y,z* frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- *Ax,y,z; Bx,y,z; Cx,y,z;VRx,y,z:*A,B,C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from±50MHz to±100MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle:* The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

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# DASY/EASY – Parameters of Probe: EX3DV4 – SN:3977

## Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (*k*=2) |
|---|---|---|---|---|
| Norm(μV/(V/m)²)[A] | 0.53 | 0.58 | 0.51 | ±10.0% |
| DCP(mV)[B] | 102.4 | 102.5 | 102.6 | |

## Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB√μV | C | D dB | VR mV | Unc[E] (*k*=2) |
|---|---|---|---|---|---|---|---|---|
| 0 | CW | X | 0.0 | 0.0 | 1.0 | 0.00 | 187.4 | ±2.0% |
| | | Y | 0.0 | 0.0 | 1.0 | | 197.4 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 178.9 | |

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

[A] The uncertainties of Norm X, Y, Z do not affect the $E^2$-field uncertainty inside TSL (see Page 4).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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# DASY/EASY – Parameters of Probe: EX3DV4 – SN:3977

## Calibration Parameter Determined in Head Tissue Simulating Media

| f [MHz][C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha[G] | Depth[G] (mm) | Unct. (*k*=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 41.9 | 0.89 | 10.32 | 10.32 | 10.32 | 0.40 | 0.75 | ±12.1% |
| 835 | 41.5 | 0.90 | 9.85 | 9.85 | 9.85 | 0.19 | 1.23 | ±12.1% |
| 900 | 41.5 | 0.97 | 9.91 | 9.91 | 9.91 | 0.22 | 1.15 | ±12.1% |
| 1750 | 40.1 | 1.37 | 8.54 | 8.54 | 8.54 | 0.22 | 1.08 | ±12.1% |
| 1810 | 40.0 | 1.40 | 8.30 | 8.30 | 8.30 | 0.27 | 0.94 | ±12.1% |
| 1900 | 40.0 | 1.40 | 8.21 | 8.21 | 8.21 | 0.28 | 0.99 | ±12.1% |
| 2000 | 40.0 | 1.40 | 8.26 | 8.26 | 8.26 | 0.23 | 1.14 | ±12.1% |
| 2300 | 39.5 | 1.67 | 7.88 | 7.88 | 7.88 | 0.59 | 0.70 | ±12.1% |
| 2450 | 39.2 | 1.80 | 7.67 | 7.67 | 7.67 | 0.59 | 0.72 | ±12.1% |
| 2600 | 39.0 | 1.96 | 7.42 | 7.42 | 7.42 | 0.65 | 0.67 | ±12.1% |
| 3500 | 37.9 | 2.91 | 6.78 | 6.78 | 6.78 | 0.47 | 0.90 | ±13.3% |
| 3700 | 37.7 | 3.12 | 6.57 | 6.57 | 6.57 | 0.47 | 0.99 | ±13.3% |
| 5250 | 35.9 | 4.71 | 5.51 | 5.51 | 5.51 | 0.50 | 1.20 | ±13.3% |
| 5600 | 35.5 | 5.07 | 4.86 | 4.86 | 4.86 | 0.50 | 1.30 | ±13.3% |
| 5750 | 35.4 | 5.22 | 5.03 | 5.03 | 5.03 | 0.50 | 1.30 | ±13.3% |

[C] Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[F] At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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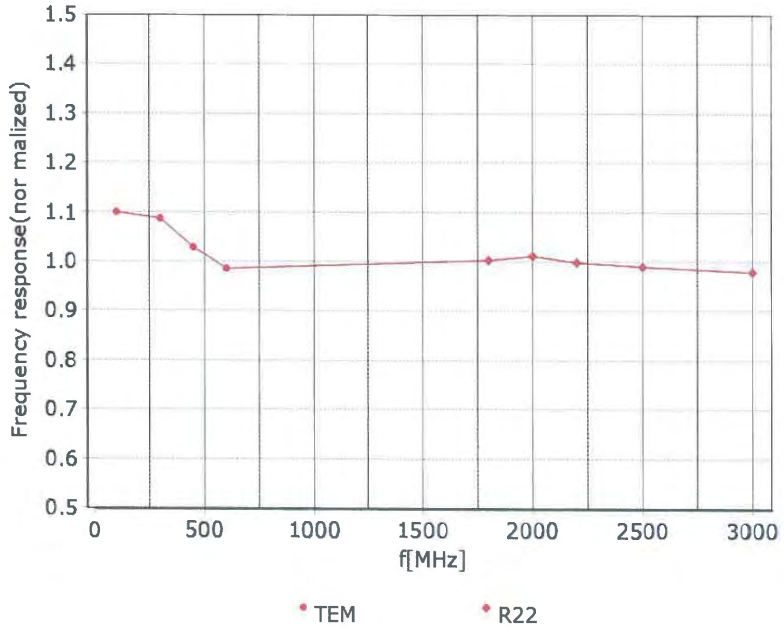
## Frequency Response of E-Field
### (TEM-Cell: ifi110 EXX, Waveguide: R22)




**Uncertainty of Frequency Response of E-field: ±7.4% (*k*=2)**

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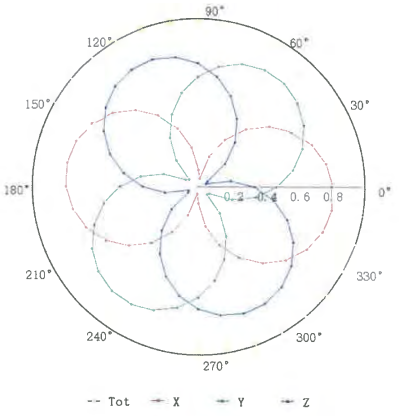
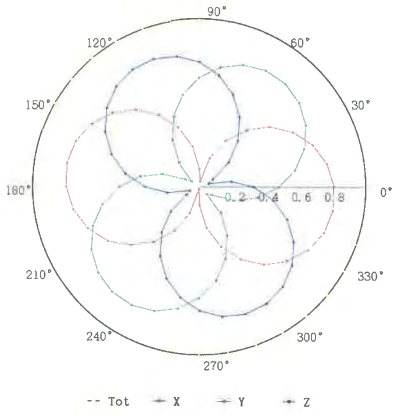
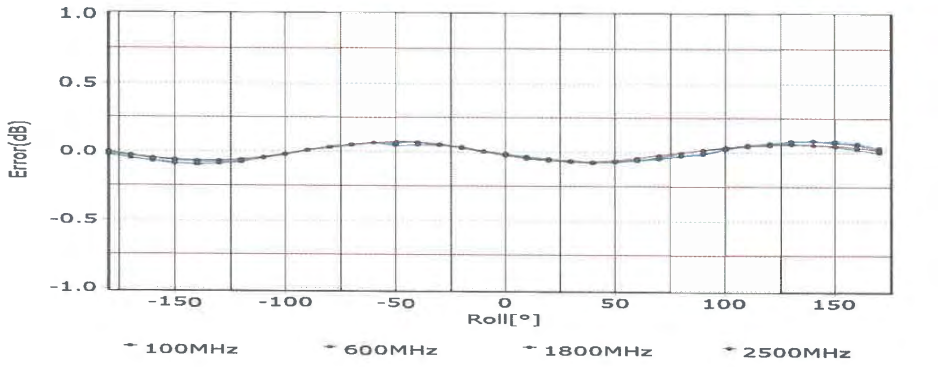
# Receiving Pattern (Φ), θ=0°

## f=600 MHz, TEM




## f=1800 MHz, R22




Uncertainty of Axial Isotropy Assessment: ±1.2% (*k*=2)

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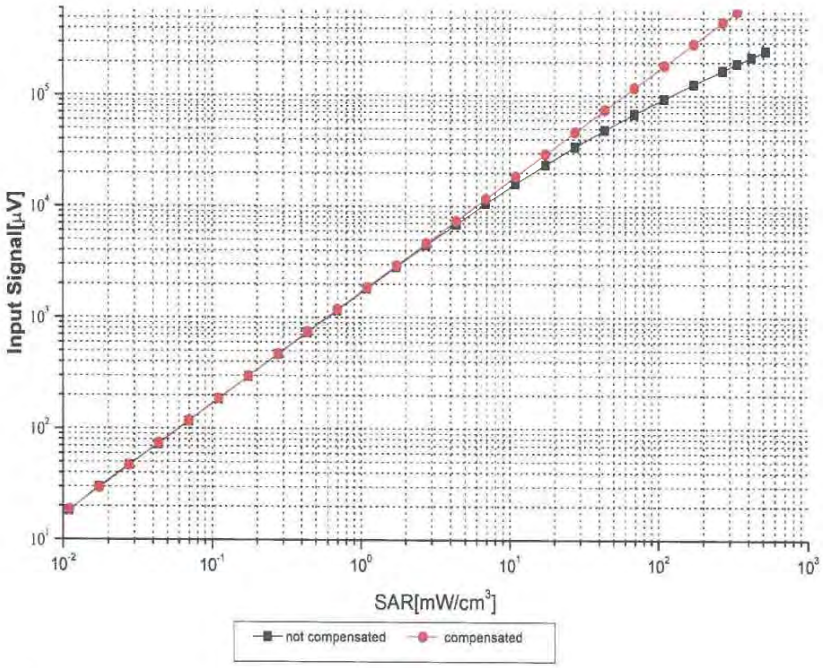
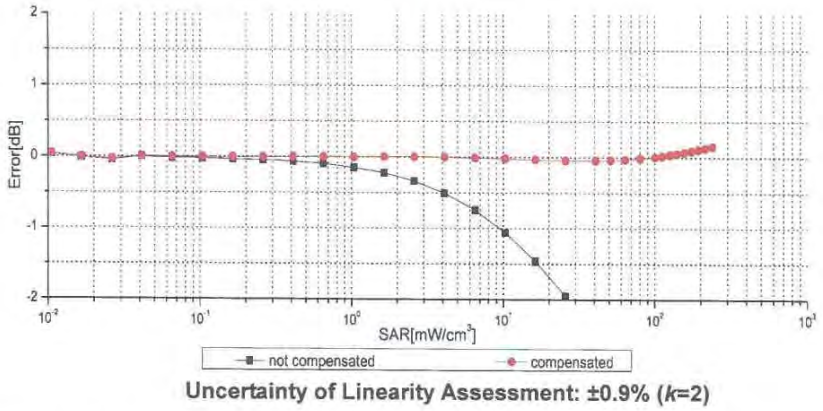
## Dynamic Range f($SAR_{head}$)
## (TEM cell, f = 900 MHz)




**Uncertainty of Linearity Assessment: ±0.9% (*k*=2)**

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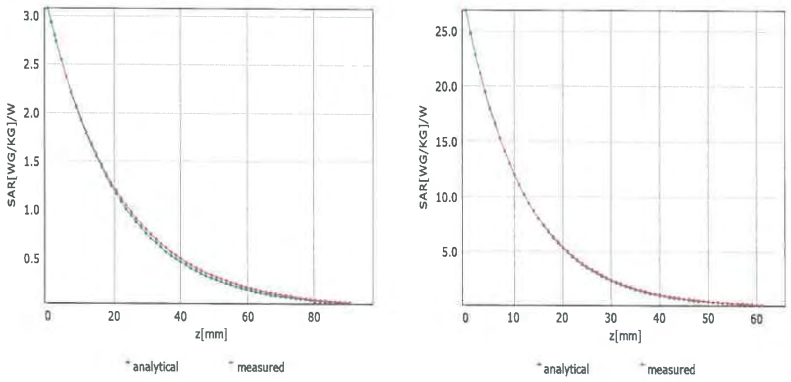
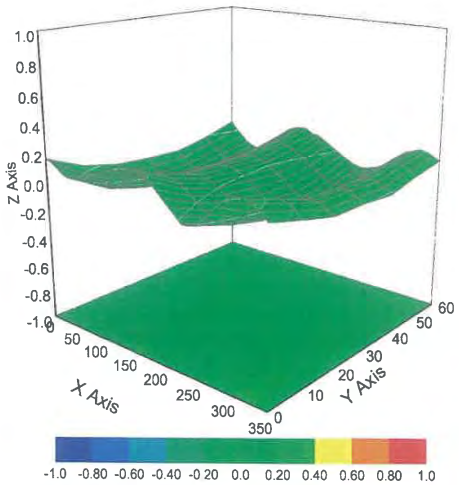
# Conversion Factor Assessment

**f=750 MHz,WGLS R9(H_convF)** **f=1750 MHz,WGLS R22(H_convF)**




# Deviation from Isotropy in Liquid




**Uncertainty of Spherical Isotropy Assessment: ±3.2% (*k*=2)**

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# DASY/EASY – Parameters of Probe: EX3DV4 – SN:3977

## Other Probe Parameters

| | |
|---|---|
| Sensor Arrangement | Triangular |
| Connector Angle (°) | 25.7 |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disable |
| Probe Overall Length | 337mm |
| Probe Body Diameter | 10mm |
| Tip Length | 10mm |
| Tip Diameter | 2.5mm |
| Probe Tip to Sensor X Calibration Point | 1mm |
| Probe Tip to Sensor Y Calibration Point | 1mm |
| Probe Tip to Sensor Z Calibration Point | 1mm |
| Recommended Measurement Distance from Surface | 1.4mm |

MR-275_21-003

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**Accreditation No.: SCS 0108**

**Client** Auden-KS **Certificate No:** DAE4-1253_Dec20

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | DAE4 - SD 000 D04 BM - SN: 1253 |
| Calibration procedure(s) | QA CAL-06.v30<br>Calibration procedure for the data acquisition electronics (DAE) |
| Calibration date: | December 16, 2020 |

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Keithley Multimeter Type 2001 | SN: 0810278 | 07-Sep-20 (No:28647) | Sep-21 |
| **Secondary Standards** | **ID #** | **Check Date (in house)** | **Scheduled Check** |
| Auto DAE Calibration Unit | SE UWS 053 AA 1001 | 09-Jan-20 (in house check) | In house check: Jan-21 |
| Calibrator Box V2.1 | SE UMS 006 AA 1002 | 09-Jan-20 (in house check) | In house check: Jan-21 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Dominique Steffen | Laboratory Technician | |
| Approved by: | Sven Kühn | Deputy Manager | i.V. |

Issued: December 16, 2020

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**Accreditation No.: SCS 0108**

## Glossary

| | |
|---|---|
| DAE | data acquisition electronics |
| Connector angle | information used in DASY system to align probe sensor X to the robot coordinate system. |

## Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

## DC Voltage Measurement

A/D - Converter Resolution nominal

| | | | | |
|---|---|---|---|---|
| High Range: | 1LSB = | 6.1μV , | full range = | -100…+300 mV |
| Low Range: | 1LSB = | 61nV , | full range = | -1…….+3mV |

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X | Y | Z |
|---|---|---|---|
| High Range | 404.356 ± 0.02% (k=2) | 404.540 ± 0.02% (k=2) | 404.466 ± 0.02% (k=2) |
| Low Range | 3.96086 ± 1.50% (k=2) | 3.98759 ± 1.50% (k=2) | 3.97759 ± 1.50% (k=2) |

## Connector Angle

| | |
|---|---|
| **Connector Angle** to be used in DASY system | 353.0 ° ± 1 ° |

## Appendix (Additional assessments outside the scope of SCS0108)

### 1. DC Voltage Linearity

| High Range | | Reading (μV) | Difference (μV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 200034.00 | 2.90 | 0.00 |
| Channel X | + Input | 20005.12 | -0.09 | -0.00 |
| Channel X | - Input | -20004.14 | 1.09 | -0.01 |
| Channel Y | + Input | 200029.40 | -2.26 | -0.00 |
| Channel Y | + Input | 20003.43 | -1.67 | -0.01 |
| Channel Y | - Input | -20005.68 | -0.28 | 0.00 |
| Channel Z | + Input | 200029.53 | -1.36 | -0.00 |
| Channel Z | + Input | 20002.84 | -2.24 | -0.01 |
| Channel Z | - Input | -20006.49 | -1.02 | 0.01 |

| Low Range | | Reading (μV) | Difference (μV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 2001.19 | -0.08 | -0.00 |
| Channel X | + Input | 201.48 | 0.23 | 0.11 |
| Channel X | - Input | -198.78 | 0.09 | -0.04 |
| Channel Y | + Input | 2001.18 | 0.04 | 0.00 |
| Channel Y | + Input | 200.43 | -0.64 | -0.32 |
| Channel Y | - Input | -199.48 | -0.55 | 0.28 |
| Channel Z | + Input | 2001.63 | 0.59 | 0.03 |
| Channel Z | + Input | 199.65 | -1.36 | -0.68 |
| Channel Z | - Input | -200.08 | -1.02 | 0.51 |

### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Common mode Input Voltage (mV) | High Range Average Reading (μV) | Low Range Average Reading (μV) |
|---|---|---|---|
| Channel X | 200 | -7.42 | -8.91 |
| | - 200 | 9.59 | 8.14 |
| Channel Y | 200 | -11.03 | -11.34 |
| | - 200 | 9.30 | 9.38 |
| Channel Z | 200 | -13.13 | -13.17 |
| | - 200 | 11.97 | 11.44 |

### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Input Voltage (mV) | Channel X (μV) | Channel Y (μV) | Channel Z (μV) |
|---|---|---|---|---|
| Channel X | 200 | - | -0.02 | -4.91 |
| Channel Y | 200 | 6.53 | - | 1.55 |
| Channel Z | 200 | 8.50 | 4.53 | - |

## 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | High Range (LSB) | Low Range (LSB) |
|---|---|---|
| Channel X | 15759 | 16091 |
| Channel Y | 16178 | 15874 |
| Channel Z | 16183 | 16058 |

## 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

| | Average (μV) | min. Offset (μV) | max. Offset (μV) | Std. Deviation (μV) |
|---|---|---|---|---|
| Channel X | 0.41 | -0.80 | 1.71 | 0.38 |
| Channel Y | -0.81 | -1.75 | -0.21 | 0.31 |
| Channel Z | -0.60 | -1.75 | 0.45 | 0.36 |

## 6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

## 7. Input Resistance (Typical values for information)

| | Zeroing (kOhm) | Measuring (MOhm) |
|---|---|---|
| Channel X | 200 | 200 |
| Channel Y | 200 | 200 |
| Channel Z | 200 | 200 |

## 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|---|---|
| Supply (+ Vcc) | +7.9 |
| Supply (- Vcc) | -7.6 |

## 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|---|---|---|---|
| Supply (+ Vcc) | +0.01 | +6 | +14 |
| Supply (- Vcc) | –0.01 | -8 | -9 |



---- END ----