# ANSI/IEEE Std. C95.1-1992

**in accordance with the requirements of FCC Report and Order: ET Docket 93-62**

# FCC TEST REPORT

## For

## Rugged Tablet PC

**Trade Name: DAP**

**Model: M9020**

Issued to

**DAP Technologies LTD**
**4535 Boul. Wilfrid-Hamel,**
**Suite 100,Quebec**

Issued by

**Compliance Certification Services Inc.**
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**Issued Date: 2013/09/06**

Testing Laboratory 1309

# Revision History

| Rev. | Issue Date | Revisions | Effect Page | Revised By |
|---|---|---|---|---|
| 00 | 2013/09/06 | Initial Issue | ALL | Scott Hsu |
| 01 | 2013/9/11 | Revise Antenna Spec | 6 | Scott Hsu |
| 02 | 2013/9/26 | Revise Antenna Type | 6 | Scott Hsu |
| 03 | 2013/10/17 | Revise Highest Reported 1-g SAR of Column name, FCC Rule Parts, Simultaneous Transmission Check and Highest Reported SAR of Summary of Highest SAR Values. | 6,18,115 | Scott Hsu |

# Table Of Contents

# 1 Certificate of Compliance (SAR Evaluation)

| | |
|---|---|
| **Applicant** | DAP Technologies LTD<br>4535 Boul. Wilfrid-Hamel,Suite 100,Quebec |
| **Equipment Under Test:** | Rugged Tablet PC |
| **Trade Name:** | DAP |
| **Model Number:** | M9020 |
| **Date of Test:** | August 14 ~ September 5 , 2013 |
| **Device Category:** | PORTABLE DEVICES |
| **Exposure Category:** | GENERAL POPULATION/UNCONTROLLED EXPOSURE |

| **Applicable Standards** | |
|---|---|
| FCC | ● IEEE 1528 2003<br>● KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01<br>● KDB 447498 D01 General RF Exposure Guidance v05r01<br>● KDB 616217 D04 SAR for laptop and tablets v01r01<br>● KDB 248227 D01 SAR measurement for 802 11 a b g v01r02<br>● KDB 941225 D05 SAR for LTE Devices v02r02 |
| **Limit** | |
| 1.6 W/kg | |
| **Test Result** | |
| Pass | |

The test results in this report apply only to the tested sample of the stated device/equipment. Other similar device/equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

*Approved by:*

Alex Wu
Section Manager
Compliance Certification Services Inc.

*Tested by:*

Scott Hsu
SAR Engineer
Compliance Certification Services Inc.

# 2 DESCRIPTION OF EQUIPMENT UNDER TEST

| | | | | |
|---|---|---|---|---|
| Product | | Rugged Tablet PC | | |
| Trade Name | | DAP | | |
| Model Number | | M9020 | | |
| Transmitters | | GSM & UMTS & LTE | | |
| | | Wi-Fi & Bluetooth | | |
| Modulation Technique | | GPRS:GMSK | | |
| | | WCDMA:BPSK | | |
| | | CDMA:QPSK | | |
| | | LTE:QPSK/16QAM | | |
| | | 802.11a: Orthogonal Frequency Division Multiplexing (OFDM) | | |
| | | 802.11b: Direct Sequence Spread Spectrum(DSSS) | | |
| | | 802.11g: Orthogonal Frequency Division Multiplexing (OFDM) | | |
| | | 802.11n: Orthogonal Frequency Division Multiplexing (OFDM) | | |
| Antenna Specification | | WWAN | Brand name | Brito |
| | | | Parts Number | 397000300007 |
| | | | Type | MONOPLE |
| | | Note: The antenna specification are same between Main and Aux. | | |
| | | WLAN | Brand name | PENSON |
| | | | Parts Number | Main:39700030000E |
| | | | | Aux:39700030000F |
| | | | Type | Dipole |
| FCC Rule Parts | Band | Frequency Range | | Highest Reported 1-g SAR |
| 22 | GSM850 | 824 - 849 MHz | | 0.143 W/kg (Edge4) |
| 24 | GSM1900 | 1850 - 1910 MHz | | 1.318 W/kg (Edge4) |
| 24 | WCDMA Band II | 1850 - 1910 MHz | | 1.310 W/kg (Edge4) |
| 27 | WCDMA Band IV | 1710 - 1755 MHz | | 0.920 W/kg (Edge4) |
| 22 | WCDMA Band V | 824 - 849 MHz | | 0.107 W/kg (Edge4) |
| 22 | CDMA BC0 | 824 - 849 MHz | | 0.114 W/kg (Edge4) |
| 24 | CDMA BC1 | 1850 - 1910 MHz | | 1.447 W/kg (Edge4) |
| 24 | LTE Band 2 | 1850 - 1910 MHz | | 1.317 W/kg (Edge4) |
| 27 | LTE Band 4 | 1710 - 1755 MHz | | 0.897 W/kg (Edge4) |
| 22 | LTE Band 5 | 824 - 849 MHz | | 0.119 W/kg (Edge4) |
| 27 | LTE Band 13 | 777 - 787 MHz | | 0.061 W/kg (Rear/Bottom) |
| 27 | LTE Band 17 | 704 - 716 MHz | | 0.058 W/kg (Rear/Bottom) |
| 24 | LTE Band 25 | 1850 - 1910 MHz | | 1.347 W/kg (Edge4) |
| 15.247 | 2.4GHz | 2412 - 2462 MHz | | 0.983 W/kg (Edge1) |
| | 5.8GHz | 5725 - 5850 MHz | | 1.184W/kg (Edge2) |
| 15.407 | 5.2GHz | 5150 - 5250 MHz | | 0.504 W/kg (Rear/Bottom) |
| | 5.3GHz | 5250 - 5350 MHz | | 0.616 W/kg (Rear/Bottom) |
| | 5.5GHz | 5500 - 5700 MHz | | 0.876 W/kg (Edge2) |
| Rechargeable<br>Li-polymer<br>Battery–alternate | | Brand: DAP<br>Model: M9020-BTR<br>Rating: 7.4V 3100mAH | | |

**Remark:** The sample selected for test was prototype that approximated to production product and was provided by manufacturer

# 3 Requirements for Compliance Testing Defined

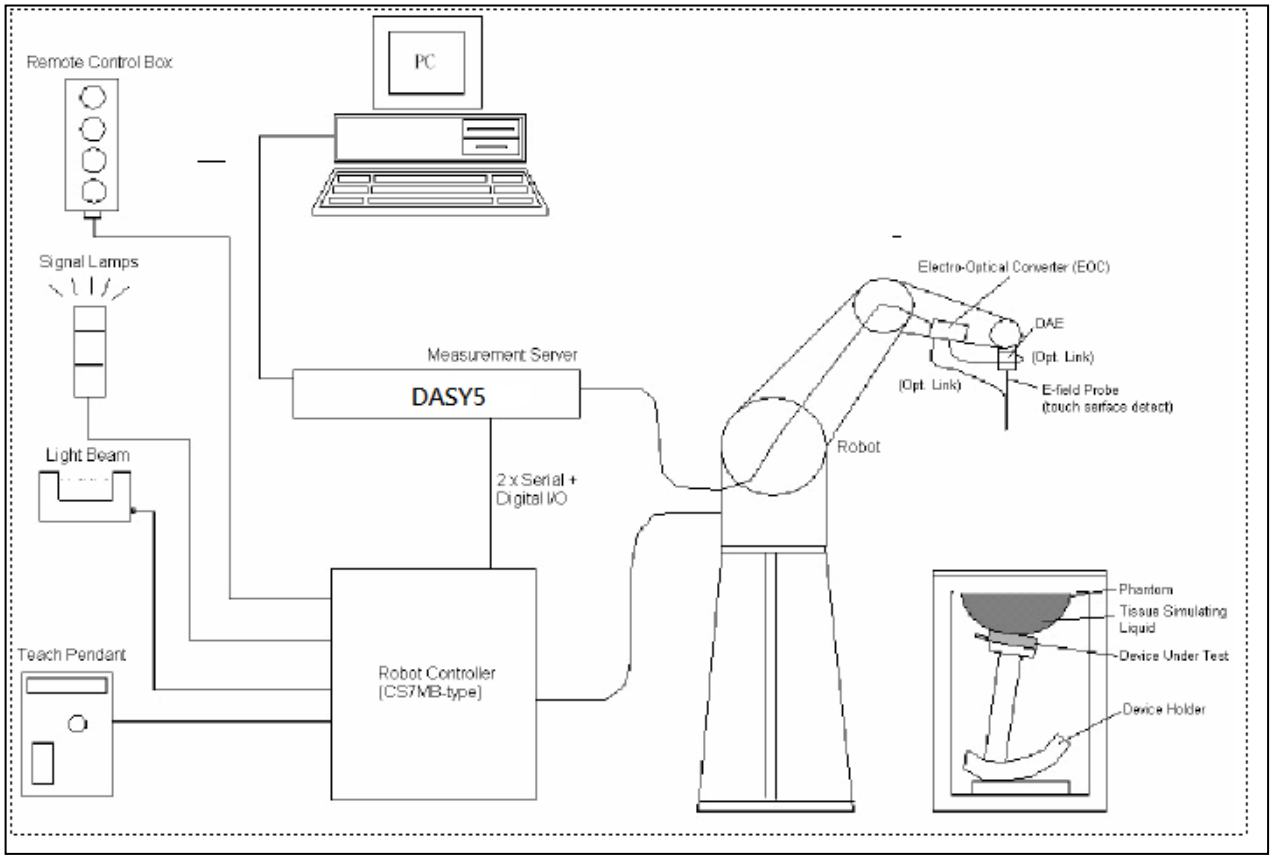
## 3.1 Requirements for Compliance Testing Defined by the FCC

The US Federal Communications Commission has released the report and order “Guidelines for Evaluating the Environmental Effects of RF Radiation", ET Docket No. 93-62 in August 1996 [1]. The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 W/kg for an uncontrolled environment and 8.0 mW/g for an occupational/controlled environment as recommended by the ANSI/IEEE standard C95.1-1992 [6].

# 4 Dosimetric Assessment System

These measurements were performed with the automated near-field scanning system DASY4/DAST5 from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9 m) which positions the probes with a positional repeatability of better than ± 0.02 mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines to the data acquisition unit. The SAR measurements were conducted with the dosimetric probe EX3DV4-SN: 3665 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the procedure with accuracy of better than ±10%. The spherical isotropy was evaluated with the procedure and found to be better than ±0.25 dB. The phantom used was the SAM Twin Phantom as described in FCC supplement C, IEEE 1528 2003.

## 4.1 Measurement System Diagram




**The DASY4/DASY5 system for performing compliance tests consists of the following items:**

- A standard high precision 6-axis robot (St¨aubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000 or Windows XP.
- DASY4/DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing validating the proper functioning of the system.

## 4.2 System Components

**DASY4/DASY5 Measurement Server**


The DASY4/DASY5 measurement server is based on a PC/104 CPU board with a 166MHz low-power Pentium, 32MB chip disk and 64MB RAM. The necessary circuits for communication with either the DAE3 electronic box as well as the 16-bit AD-converter system for optical detection and digital I/O interface are contained on the DASY4/DASY5 I/O-board, which is directly connected to the PC/104 bus of the CPU board.

The measurement server performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation.


The PC-operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with two expansion slots which are reserved for future applications. Please note that the expansion slots do not have a standardized pinout and therefore only the expansion cards provided by SPEAG can be inserted. Expansion cards from any other supplier could seriously damage the measurement server. Calibration: No calibration required.

**Data Acquisition Electronics (DAE)**


The data acquisition electronics (DAE4) consists of a highly sensitive electrometer grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock. The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection. The input impedance of the DAE4 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

**EX3DV4 Isotropic E-Field Probe for Dosimetric Measurements**

| | |
|---|---|
| **Construction:** | Symmetrical design with triangular core<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |
| **Calibration:** | Basic Broad Band Calibration in air: 10-3000 MHz.<br>Conversion Factors (CF) for HSL 900 and HSL 1800<br>CF-Calibration for other liquids and frequencies upon request. |
| **Frequency:** | 10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz) |
| **Directivity:** | ± 0.3 dB in HSL (rotation around probe axis)<br>± 0.5 dB in HSL (rotation normal to probe axis) |
| **Dynamic Range:** | 10 µW/g to > 100 mW/g; Linearity: ± 0.2 dB<br>(noise: typically < 1 µW/g) |

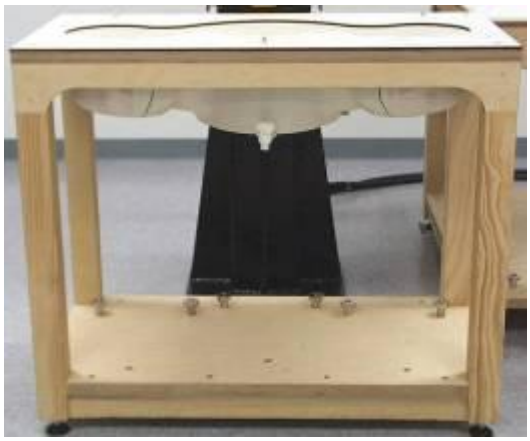
**Dimensions:** Overall length: 330 mm (Tip: 20 mm)
Tip diameter: 2.5 mm (Body: 12 mm)
Distance from probe tip to dipole centers: 1 mm

**Application:** High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

Interior of probe

### SAM Phantom (V4.0)

**Construction:** The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-2003, CENELEC 50361 and IEC 62209. 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 manually teaching three points with the robot.



**Shell Thickness:** 2 ±0.2 mm

**Filling Volume:** Approx. 25 liters

**Dimensions:** Height: 810mm; Length: 1000mm; Width: 500mm

### SAM Phantom (ELI4)

**Construction:** Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with the latest draft of the standard IEC 62209 Part II and all known tissue simulating liquids. ELI4 has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is supported by software version DASY4/DASY5 and higher and is compatible with all SPEAG dosimetric probes and dipoles

**Shell Thickness:** 2.0 ± 0.2 mm (sagging: <1%)

**Filling Volume:** Approx. 25 liters

**Dimensions:** Major ellipse axis: 600 mm

Minor axis: 400 mm 500mm

### Device Holder for SAM Twin Phantom

**Construction:** In combination with the Twin SAM Phantom V4.0 or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, and flat phantom).

### System Validation Kits for SAM Phantom (V4.0)

**Construction:** Symmetrical dipole with l/4 balun Enables measurement of feedpoint impedance with NWA Matched for use near flat phantoms filled with brain simulating solutions Includes distance holder and tripod adaptor.

**Frequency:** 850, 1800, 1900, 2450, 5200, 5300, 5500, 5800 MHz

**Return loss:** > 20 dB at specified validation position

**Power capability:** > 100 W (f < 1GHz); > 40 W (f > 1GHz)

**Dimensions:** D835V2: dipole length: 161 mm; overall height: 340 mm
D1800V2: dipole length: 72.5 mm; overall height: 300 mm
D1900V2: dipole length: 67.7 mm; overall height: 300 mm
D2450V2: dipole length: 51.5 mm; overall height: 290 mm
D5GHzV2: dipole length: 20.6 mm; overall height: 300 mm

### System Validation Kits for ELI4 phantom

**Construction:** Symmetrical dipole with l/4 balun Enables measurement of feedpoint impedance with NWA Matched for use near flat phantoms filled with brain simulating solutions Includes distance holder and tripod adaptor.

**Frequency:** 850, 1800,1900, 2450, 5200, 5300, 5500, 5800 MHz

**Return loss:** > 20 dB at specified validation position

**Power capability:** > 100 W (f < 1GHz); > 40 W (f > 1GHz)

**Dimensions:** D835V2: dipole length: 161 mm; overall height: 340 mm
D1800V2: dipole length: 72.5 mm; overall height: 300 mm
D1900V2: dipole length: 67.7 mm; overall height: 300 mm
D2450V2: dipole length: 51.5 mm; overall height: 290 mm
D5GHzV2: dipole length: 20.6 mm; overall height: 300 mm

# 5 Evaluation Procedures

**Data Evaluation**

The DASY4/DASY5 post processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

| | | |
|---|---|---|
| Probe parameters: | - Sensitivity | $Norm_i$, $a_{i0}$, $a_{i1}$, $a_{i2}$ |
| | - Conversion factor | $ConvF_i$ |
| | - Diode compression point | $dcp_i$ |
| Device parameters: | - Frequency | $f$ |
| | - Crest factor | $cf$ |
| Media parameters: | - Conductivity | $\sigma$ |
| | - Density | $\rho$ |

These parameters must be set correctly in the software. They can be found in the component documents or be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multi-meter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

| | | | |
|---|---|---|---|
| with | $V_i$ | = Compensated signal of channel i | (i = x, y, z) |
| | $U_i$ | = Input signal of channel i | (i = x, y, z) |
| | $cf$ | = Crest factor of exciting field | (DASY parameter) |
| | $dcp_i$ | = Diode compression point | (DASY parameter) |

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes: $$E_i = \sqrt{\frac{V_i}{Norm_i \bullet ConvF}}$$

H-field probes: $$H_i = \sqrt{Vi} \cdot \frac{a_{i10} + a_{i11} f + a_{i12} f^2}{f}$$

| | | | |
|---|---|---|---|
| with | $V_i$ | = Compensated signal of channel i | (i = x, y, z) |
| | $Norm_i$ | = Sensor sensitivity of channel i | (i = x, y, z) |

$\mu V/(V/m)^2$ for E0field Probes

| | |
|---|---|
| $ConvF$ | = Sensitivity enhancement in solution |
| $aij$ | = Sensor sensitivity factors for H-field probes |
| $f$ | = Carrier frequency (GHz) |
| $Ei$ | = Electric field strength of channel i in V/m |
| $Hi$ | = Magnetic field strength of channel i in A/m |

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1000}$$

with
*SAR* = local specific absorption rate in W/kg
$E_{tot}$ = total field strength in V/m
$\sigma$ = conductivity in [mho/m] or [Siemens/m]
$\rho$ = equivalent tissue density in g/cm$^3$

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid.

The power flow density is calculated assuming the excitation field as a free space field.

$$P_{pwe} = \frac{E_{tot}^2}{377} \quad \text{or} \quad P_{pwe} = H_{tot}^2 \cdot 37.7$$

with
$P_{pwe}$ = Equivalent power density of a plane wave in mW/cm$^2$
$E_{tot}$ = total electric field strength in V/m
$H_{tot}$ = total magnetic field strength in A/m

# 6 SAR Measurement Procedures

## 6.1 Normal SAR Test Procedure

- **Power Reference Measurement**

The reference and drift jobs are useful jobs for monitoring the power drift of the device under test in the batch process. Both jobs measure the field at a specified reference position, at a selectable distance from the phantom surface. The reference position can be either the selected section's grid reference point or a user point in this section. The reference job projects the selected point onto the phantom surface, orients the probe perpendicularly to the surface, and approaches the surface using the selected detection method.

- **Area Scan**

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a finer measurement around the hot spot. The sophisticated interpolation routines implemented in DASY4/DASY5 software can find the maximum locations even in relatively coarse grids. The scan area is defined by an editable grid. This grid is anchored at the grid reference point of the selected section in the phantom. When the area scan's property sheet is brought-up, the grid resolution has to less than 15 mm by 15 mm at frequency ≤2GHz; the grid resolution has to less than 12mm by 12 mm at frequency between 2GHz to 4GHz; grid resolution has to less than 10 mm by 10 mm at frequency between 4GHz to 6GHz.

According to KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r01

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

- **Zoom Scan**

Zoom scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default zoom scan measures points in accordance with the frequency can be divided into three parts. (1)The zoom scan volume was set to 5x5x7 points at frequency ≤ 2GHz. (2) The zoom scan volume was set to 7x7x7 points at frequency between 2GHz to 4GHz (3) The zoom scan volume was set to 7x7x12 points at frequency between 4GHz to 6GHz. The measures points within a cube whose base faces are centered around the maximum found in a preceding area scan job within the same procedure. If the preceding Area Scan job indicates more then one maximum, the number of Zoom Scans has to be enlarged accordingly.

According to KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r01

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: $\Delta x_{Zoom}$, $\Delta y_{Zoom}$</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 losest 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·$\Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Maximum zoom scan volume</td><td>x, y, z</td><td>≥ 30 mm</td><td colspan="2">3 – 4 GHz: ≥ 28 mm<br>4 – 5 GHz: ≥ 25 mm<br>5 – 6 GHz: ≥ 22 mm</td></tr>
</table>

- **Power Drift Measurement**

The drift job measures the field at the same location as the most recent reference job within the same procedure, and with the same settings. The drift measurement gives the field difference in dB from the reading conducted within the last reference measurement. Several drift measurements are possible for one reference measurement. This allows a user to monitor the power drift of the device under test within a batch process. In the properties of the Drift job, the user can specify a limit for the drift and have DASY4/DASY5 software stop the measurements if this limit is exceeded.

- **Z-Scan**

The Z Scan job measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. A user can anchor the grid to the current probe location. As with any other grids, the local Z-axis of the anchor location establishes the Z-axis of the grid.

# 7 Device Under Test

## 7.1 Band Interface

| | |
|---|---|
| Tx Frequency Bands | • GSM850: 824 - 849 MHz<br>• GSM1900: 1850 - 1910 MHz<br>• W-CDMA Band II: 1850 - 1910 MHz<br>• W-CDMA Band IV: 1710 - 1755 MHz<br>• W-CDMA Band V: 824 - 849 MHz<br>• CDMA BC 0: 824 – 849 MHz<br>• CDMA BC 1: 1850 – 1910 MHz<br>• CDMA BC 10: 817.9 – 823.1 MHz<br>• LTE Band 2: 1850 – 1910 MHz<br>• LTE Band 4: 1710 – 1755 MHz<br>• LTE Band 5: 824 – 849 MHz<br>• LTE Band 13: 777 – 787 MHz<br>• LTE Band 17: 704 – 716 MHz<br>• LTE Band 25: 1850 – 1915 MHz<br>• 802.11a/b/g/n: 2412 - 2462 MHz<br>5180 – 5825 MHz |
| Mode | • GSM/GPRS/EGPRS<br>• UMTS Rel 99<br>• HSDPA (Rel 5, CAT 24)<br>• HSUPA (Rel 6, CAT 7)<br>• HSPA+ (Rel 7, CAT 7)<br>• DC-HSPA+ (Rel 8, CAT 24)<br>• LTE(Rel 8, CAT3)<br>• 802.11a/b/g/n HT20/HT40 |

## 7.2 Simultaneous Transmission

| No. | Conditions | Body SAR | Hotspot |
|---|---|---|---|
| 1 | GPRS850 + WiFi 2.4GHz | ☒ | ☒ |
| 2 | GPRS1900 + WiFi 2.4GHz | ☒ | ☒ |
| 3 | WCDMA Band V + WiFi 2.4GHz | ☒ | ☒ |
| 4 | WCDMA Band II + WiFi 2.4GHz | ☒ | ☒ |
| 5 | CDMA + WiFi 2.4GHz | ☒ | ☒ |
| 6 | LTE Band 2 + WiFi 2.4GHz | ☒ | ☒ |
| 7 | LTE Band 4 + WiFi 2.4GHz | ☒ | ☒ |
| 8 | LTE Band 5 + WiFi 2.4GHz | ☒ | ☒ |
| 9 | LTE Band 13 + WiFi 2.4GHz | ☒ | ☒ |
| 10 | LTE Band 17 + WiFi 2.4GHz | ☒ | ☒ |
| 11 | LTE Band 25 + WiFi 2.4GHz | ☒ | ☒ |
| 12 | GPRS850 + WiFi 5GHz | ☒ | ☒ |
| 13 | GPRS1900 + WiFi 5GHz | ☒ | ☒ |
| 14 | WCDMA Band V + WiFi 5GHz z | ☒ | ☒ |
| 15 | WCDMA Band II + WiFi 5GHz | ☒ | ☒ |
| 16 | CDMA + WiFi 5GHz | ☒ | ☒ |
| 17 | LTE Band 2 + WiFi 5GHz | ☒ | ☒ |
| 18 | LTE Band 4 + WiFi 5GHz | ☒ | ☒ |
| 19 | LTE Band 5 + WiFi 5GHz | ☒ | ☒ |
| 20 | LTE Band 13 + WiFi 5GHz | ☒ | ☒ |
| 21 | LTE Band 17 + WiFi 5GHz | ☒ | ☒ |
| 22 | LTE Band 25 + WiFi 5GHz | ☒ | ☒ |

☑: The Product can simultaneously transmit

☒: The Product can't simultaneously transmit

# 8 Summary of Test Configurations

## 8.1 Body Test Exclusion Thresholds

The following SAR test exclusion Thresholds based on KDB 447498 D01 General RF Exposure Guidance v05r01) 4.3.1)

| Band | Test Configurations | Antenna-to-edge/surface | Power Target (dBm) | Power Tolerance (dBm) | Calculate Power (mW) | Test Exclusion Power Threshold(mW) | SAR Required |
|---|---|---|---|---|---|---|---|
| GSM850 | Edge 4 | 10.7mm | 32 | 1 | 1995.26 | 35 | Yes |
| GSM1900 | Edge 4 | 10.7mm | 29 | 1 | 1000 | 23 | Yes |
| WCDMA Band II | Edge 4 | 10.7mm | 23 | 1 | 251.18 | 24 | Yes |
| WCDMA Band V | Edge 4 | 10.7mm | 23 | 1 | 251.18 | 35 | Yes |
| CDMA(BC0) | Edge 4 | 10.7mm | 24 | 1 | 316.22 | 35 | Yes |
| CDMA(BC1) | Edge 4 | 10.7mm | 24 | 1 | 316.22 | 23 | Yes |
| LTE Band 2 | Edge 4 | 10.7mm | 23 | 1 | 251.18 | 23 | Yes |
| LTE Band 4 | Edge 4 | 10.7mm | 23 | 1 | 251.18 | 24 | Yes |
| LTE Band 5 | Edge 4 | 10.7mm | 23 | 1 | 251.18 | 35 | Yes |
| LTE Band 13 | Edge 4 | 10.7mm | 23 | 1 | 251.18 | 35 | Yes |
| LTE Band 17 | Edge 4 | 10.7mm | 23 | 1 | 251.18 | 35 | Yes |
| LTE Band 25 | Edge 4 | 10.7mm | 23 | 1 | 251.18 | 23 | Yes |
| WiFi 2.4GHz | Edge 1 | 5.7mm | 13.5 | 1.5 | 31.62 | 21 | Yes |
| WiFi 5GHz | Edge 1 | 5.7mm | 13.5 | 1.5 | 31.62 | 14 | Yes |

## 8.2 Body Exposure Conditions for WWAN for Main Antenna

| Test Configurations | Antenna-to-edge/surface | SAR Required | Note |
|---|---|---|---|
| Front | 5.8 mm | No | SAR is not required |
| Rear | 35.4 mm | Yes | SAR is required |
| Edge 1 | 24.5 mm | No | This is not the most conservative antenna-to-user distance at edge mode |
| Edge 2 | 210.4 mm | No | This is not the most conservative antenna-to-user distance at edge mode |
| Edge 3 | 90 mm | No | This is not the most conservative antenna-to-user distance at edge mode |
| Edge 4 | 10.7 mm | Yes | This is most conservative antenna-to-user distance at edge mode |

## 8.3 Body Exposure Conditions for WWAN for Aux Antenna

| Test Configurations | Antenna-to-edge/surface | SAR Required | Note |
|---|---|---|---|
| Front | 5.8 mm | No | The Antenna is used for receive only |
| Rear | 35.4 mm | No | The Antenna is used for receive only |
| Edge 1 | 24.5 mm | No | The Antenna is used for receive only |
| Edge 2 | 7.1 mm | No | The Antenna is used for receive only |
| Edge 3 | 90 mm | No | The Antenna is used for receive only |
| Edge 4 | 214 mm | No | The Antenna is used for receive only |

## 8.4 Body Exposure Conditions for Wi-Fi for Main Antenna

| Test Configurations | Antenna-to-edge/surface | SAR Required | Note |
|---|---|---|---|
| Front | 7.3 mm | No | SAR is not required |
| Rear | 32 mm | Yes | SAR is required |
| Edge 1 | 5.7 mm | Yes | This is most conservative antenna-to-user distance at edge mode |
| Edge 2 | 92.2 mm | No | This is not the most conservative antenna-to-user distance at edge mode |
| Edge 3 | 164 mm | No | This is not the most conservative antenna-to-user distance at edge mode |
| Edge 4 | 92.2 mm | No | This is not the most conservative antenna-to-user distance at edge mode |

## 8.5 Body Exposure Conditions for Wi-Fi for Aux Antenna

| Test Configurations | Antenna-to-edge/surface | SAR Required | Note |
|---|---|---|---|
| Front | 7.3 mm | No | SAR is not required |
| Rear | 32 mm | Yes | SAR is required |
| Edge 1 | 123.3mm | No | This is not the most conservative antenna-to-user distance at edge mode |
| Edge 2 | 8.7 mm | Yes | This is most conservative antenna-to-user distance at edge mode |
| Edge 3 | 32.8 mm | No | This is not the most conservative antenna-to-user distance at edge mode |
| Edge 4 | 221.1mm | No | This is not the most conservative antenna-to-user distance at edge mode |

# 9 KDB 941225 D05 SAR for LTE Devices V02

<table>
<tr><th>Item</th><th>Description</th><th>Information</th></tr>
<tr><td>1</td><td>Identify the operating frequency range of each LTE transmission band used by the device</td><td>
<table>
<tr><td colspan="2">Band 2</td></tr>
<tr><td>TX:1850 – 1910 MHz</td><td>TX:1850 – 1910 MHz</td></tr>
<tr><td colspan="2">Band 4</td></tr>
<tr><td>TX:1710 – 1755 MHz</td><td>TX:1710 – 1755 MHz</td></tr>
<tr><td colspan="2">Band 5</td></tr>
<tr><td>TX:824 – 849 MHz</td><td>TX:824 – 849 MHz</td></tr>
<tr><td colspan="2">Band 13</td></tr>
<tr><td>TX:777 – 787 MHz</td><td>TX:777 – 787 MHz</td></tr>
<tr><td colspan="2">Band 17</td></tr>
<tr><td>TX:704 – 716 MHz</td><td>TX:704 – 716 MHz</td></tr>
<tr><td colspan="2">Band 25</td></tr>
<tr><td>TX:1850 – 1915 MHz</td><td>TX:1850 – 1915 MHz</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Identify the channel bandwidths used in each LTE band; 1.4, 3, 5, 10, 15, 20 MHz etc.</td><td>
<table>
<tr><th>Band</th><th>1.4MHz</th><th>3 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15MHz</th><th>20 MHz</th></tr>
<tr><td>Band2</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Band4</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Band5</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>×</td><td>×</td></tr>
<tr><td>Band13</td><td>×</td><td>×</td><td>✓</td><td>✓</td><td>×</td><td>×</td></tr>
<tr><td>Band17</td><td>×</td><td>×</td><td>✓</td><td>✓</td><td>×</td><td>×</td></tr>
<tr><td>Band25</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Identify the high, middle and low (H, M, L) channel numbers and channel frequencies for each LTE bandwidth and frequency band</td><td>
<table>
<tr><th rowspan="2">Band 2</th><th colspan="6">Channel Bandwidth</th></tr>
<tr><th>1.4MHz</th><th>3MHz</th><th>5MHz</th><th>10MHz</th><th>15MHz</th><th>20MHz</th></tr>
<tr><td>Low</td><td>18607/ 1850.7</td><td>18615/ 1851.5</td><td>18625/ 1852.5</td><td>18650/ 1855</td><td>18675/ 1857.5</td><td>18700/ 1860</td></tr>
<tr><td>Mid</td><td>18900/1 1880</td><td>18900/1 880</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td></tr>
<tr><td>High</td><td>19192/ 1909.2</td><td>19184/ 1908.4</td><td>19175/1 907.5</td><td>19150/1 905</td><td>19125/ 1902.5</td><td>19100/ 1900</td></tr>
<tr><th rowspan="2">Band 4</th><th colspan="6">Channel Bandwidth</th></tr>
<tr><th>1.4MHz</th><th>3MHz</th><th>5MHz</th><th>10MHz</th><th>15MHz</th><th>20MHz</th></tr>
<tr><td>Low</td><td>19957/ 1710.7</td><td>19965/1 711.5</td><td>19975/1 712.5</td><td>20000/ 1715</td><td>20025/ 1717.5</td><td>20050/ 1720</td></tr>
<tr><td>Mid</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/1 732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td></tr>
<tr><td>High</td><td>20392/ 1754.2</td><td>20384/ 1753.4</td><td>20375/ 1752.5</td><td>20350/1 750</td><td>20325/ 1747.5</td><td>20300/ 1745</td></tr>
<tr><th rowspan="2">Band 5</th><th colspan="6">Channel Bandwidth</th></tr>
<tr><th>1.4MHz</th><th>3MHz</th><th>5MHz</th><th>10MHz</th><th>15MHz</th><th>20MHz</th></tr>
<tr><td>Low</td><td>20407/ 824.7</td><td>20415/ 825.5</td><td>20425/ 826.5</td><td>20450/8 29</td><td></td><td></td></tr>
<tr><td>Mid</td><td>20525/ 836.5</td><td>20525/ 836.5</td><td>20525/8 36.5</td><td>20525/ 836.5</td><td></td><td></td></tr>
<tr><td>High</td><td>20642/ 848.2</td><td>20643/ 847.4</td><td>20625/ 846.5</td><td>20600/8 44</td><td></td><td></td></tr>
</table>
</td></tr>
</table>

KDB 941225 D05 SAR for LTE Devices V02 (Continued)

<table>
<tr><th>Item</th><th>Description</th><th>Information</th></tr>
<tr><td>3</td><td>Identify the high, middle and low (H, M, L) channel numbers and channel frequencies for each LTE bandwidth and frequency band</td><td>
<table>
<tr><td rowspan="2">Band 13</td><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>1.4MHz</td><td>3MHz</td><td>5MHz</td><td>10MHz</td><td>15MHz</td><td>20MHz</td></tr>
<tr><td>Low</td><td></td><td></td><td>23205/ 779.5</td><td></td><td></td><td></td></tr>
<tr><td>Mid</td><td></td><td></td><td>23230/ 782</td><td>23230/ 782</td><td></td><td></td></tr>
<tr><td>High</td><td></td><td></td><td>23255/ 784.5</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">Band 17</td><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>1.4MHz</td><td>3MHz</td><td>5MHz</td><td>10MHz</td><td>15MHz</td><td>20MHz</td></tr>
<tr><td>Low</td><td></td><td></td><td>23755/ 706.5</td><td>23780/ 709</td><td></td><td></td></tr>
<tr><td>Mid</td><td></td><td></td><td>23790/ 710</td><td>23790/ 710</td><td></td><td></td></tr>
<tr><td>High</td><td></td><td></td><td>23825/ 713.5</td><td>23800/ 711</td><td></td><td></td></tr>
<tr><td rowspan="2">Band 25</td><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>1.4MHz</td><td>3MHz</td><td>5MHz</td><td>10MHz</td><td>15MHz</td><td>20MHz</td></tr>
<tr><td>Low</td><td>26047/ 1850.7</td><td>26055/ 1851.5</td><td>26065/ 1852.5</td><td>26090/ 1855</td><td>26115/ 1857.5</td><td>26140/ 1860</td></tr>
<tr><td>Mid</td><td>26365/ 1882.5</td><td>26365/ 1882.5</td><td>26365/ 1882.5</td><td>26365/ 1882.5</td><td>26365/1 882.5</td><td>26365/ 1882.5</td></tr>
<tr><td>High</td><td>26682/ 1914.2</td><td>26674/ 1913.4</td><td>26665/1 912.5</td><td>26640/ 1910</td><td>26615/1 907.5</td><td>26590/ 1905</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Specify the UE category and uplink modulations used</td><td>UE Category: 3<br>Uplink Modulations: QPSK, 16QAM</td></tr>
<tr><td>5</td><td>Descriptions of the LTE transmitter and antenna implementation; and also identify whether it is a standalone transmitter operating independently of other wireless transmitters in the device or sharing hardware components and/or antenna(s) with other transmitters etc</td><td>● The Main antenna is used for LTE and other wireless modes (GPRS/EGPRS/UMTS/CDMA) for both Transmit and Receive.<br>● The Main antenna is used for LTE and other wireless modes (GPRS/EGPRS/UMTS/CDMA) for Receive only.</td></tr>
<tr><td>6</td><td>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.</td><td>Data only device.<br>Exposure Conditions:<br>● Body – Rear side, Edge 1, Edge 2, Edge 3, Edge 4 of DUT at separation distance of 0 cm from the flat phantom</td></tr>
</table>

KDB 941225 D05 SAR for LTE Devices V02 (Continued)

<table>
<tr><th>Item</th><th>Description</th><th>Information</th></tr>
<tr><td>7</td><td>Identify if Maximum Power Reduction(MPR) is implemented as an optional or permanent feature, i.e., built-in by design:<br>1. MPR may be considered during SAR testing only when the maximum output power is permanently limited by the MPR implemented within the device, according to the RB (resource block) configurations specified in 3GPP/LTE standards.<br>2. Regardless of network requirements, only those RB configurations allowed (see 3GPP standards) for the channel bandwidth and modulation combinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR.<br>3. A-MPR (additional MPR) must be disabled during SAR testing.</td><td>As per 3GPP 36.101 v9.11.0 (2012-03), Release 9<br>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3<br><table><tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth ($N_{RB}$)</th><th rowspan="2">MPR (dB)</th></tr><tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr><tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr></table><br>MPR is permanently built-in by design<br>A-MPR was disabled</td></tr>
<tr><td>8</td><td>When power reduction is required for one or more LTE modes to satisfy SAR compliance for simultaneous transmission or other equipment certification and operating requirements, maximum average conducted output power measurement results for each power reduction mode applicable to the simultaneous voice/data transmission configurations for such wireless configurations and frequency bands are required.</td><td>No.</td></tr>
</table>

KDB 941225 D05 SAR for LTE Devices V02 (Continued)

| Item | Description | Information |
|---|---|---|
| 9 | Based on the design specifications and other information available to the manufacturer, through measurement and analysis during product development, when the maximum output power for different RB allocations and RB offset conditions within a channel bandwidth, modulation, or across the channels in a frequency band varies by more than 1 dB. | Refer to Section 14. |
| 10 | The maximum average conducted output power should be measured for the required test channels, for each channel bandwidth and uplink modulation, in each frequency band, using the following configurations to support the SAR test reduction and exclusion applied in the evaluation:<br>1. 100% RB allocation<br>2. 1 RB and also 50% RB allocation, offset to the upper and lower edges of each required test channel and also to the middle of the channel bandwidth | Refer to Section 14. |
| 11 | Spectrum plots should be included in SAR reports to demonstrate the tested RB allocations have been established correctly at the maximum output power conditions. | Refer to Section 14. |

# 10 Measurement Uncertainty

Measurement uncertainty for 300 MHz to 3 GHz averaged over 1 gram

| Uncertainty Component | Uncertainty | Prob. | Div. | $c_{i\ (10g)}$ | Std. Unc.(1-g) | $v_{i\ or\ Veff}$ |
|---|---|---|---|---|---|---|
| Measurement System | | | | | | |
| Probe Calibration ($k$=1) | 6.00 | Normal | 1 | 1 | 6.00 | ∞ |
| Probe Isotropy | 7.60 | Rectangular | $\sqrt{3}$ | 0.7 | 3.07 | ∞ |
| Boundary Effect | 0.65 | Rectangular | $\sqrt{3}$ | 1 | 0.38 | ∞ |
| Linearity | 4.70 | Rectangular | $\sqrt{3}$ | 1 | 2.71 | ∞ |
| System Detection Limit | 1.00 | Rectangular | $\sqrt{3}$ | 1 | 0.58 | ∞ |
| Readout Electronics | 0.30 | Normal | 1 | 1 | 0.30 | ∞ |
| Response Time | 0.80 | Rectangular | $\sqrt{3}$ | 1 | 0.46 | ∞ |
| Integration Time | 2.60 | Rectangular | $\sqrt{3}$ | 1 | 1.50 | ∞ |
| RF Ambient Conditions | 3.00 | Rectangular | $\sqrt{3}$ | 1 | 1.73 | ∞ |
| RF Ambient Reflections | 3.00 | Rectangular | $\sqrt{3}$ | 1 | 1.73 | ∞ |
| Probe Positioner Mechanical Tolerance | 0.40 | Rectangular | $\sqrt{3}$ | 1 | 0.23 | ∞ |
| Probe Positioning with respect to Phantom Shell | 2.90 | Rectangular | $\sqrt{3}$ | 1 | 1.67 | ∞ |
| Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation | 2.00 | Rectangular | $\sqrt{3}$ | 1 | 1.15 | ∞ |
| **Test sample Related** | | | | | | |
| Test sample Positioning | 3.70 | Normal | 1 | 1 | 3.7 | 89 |
| Device Holder Uncertainty | 3.40 | Normal | 1 | 1 | 3.4 | 5 |
| Output Power Variation - SAR drift measurement | 5.00 | Rectangular | $\sqrt{3}$ | 1 | 2.89 | ∞ |
| **Phantom and Tissue Parameters** | | | | | | |
| Phantom Uncertainty (shape and thickness tolerances) | 7.50 | Rectangular | $\sqrt{3}$ | 1 | 4.33 | ∞ |
| Liquid Conductivity - deviation from target values | 4.14 | Rectangular | $\sqrt{3}$ | 0.64 | 1.53 | ∞ |
| Liquid Conductivity - measurement uncertainty | -4.28 | Normal | 1 | 0.64 | -2.74 | 39 |
| Liquid Permittivity - deviation from target values | 3.92 | Rectangular | $\sqrt{3}$ | 0.6 | 1.36 | ∞ |
| Liquid Permittivity - measurement uncertainty | -4.29 | Normal | 1 | 0.6 | -2.57 | 39 |
| Temp. Unc. - Conductivity | 1.70 | Rectangular | $\sqrt{3}$ | 0.78 | 0.77 | ∞ |
| Temp. Unc. - Permittivity | 0.30 | Rectangular | $\sqrt{3}$ | 0.23 | 0.04 | ∞ |
| | | RSS | | | 11.72 | 611 |
| Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = | | $k$=2 | | | 23.43% | |
| Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = | | $k$=2 | | | 1.83dB | |

Measurement uncertainty for 3 to 6 GHz averaged over 1 gram

| Uncertainty Component | Uncertainty | Prob. | Div. | $c_{i\ (10g)}$ | Std. Unc.(1-g) | $v_{i\ or\ Veff}$ |
|---|---|---|---|---|---|---|
| Measurement System | | | | | | |
| Probe Calibration ($k$=1) | 6.55 | Normal | 1 | 1 | 6.55 | ∞ |
| Probe Isotropy | 7.60 | Rectangular | $\sqrt{3}$ | 0.7 | 3.07 | ∞ |
| Boundary Effect | 2.00 | Rectangular | $\sqrt{3}$ | 1 | 1.15 | ∞ |
| Linearity | 4.70 | Rectangular | $\sqrt{3}$ | 1 | 2.71 | ∞ |
| System Detection Limit | 1.00 | Rectangular | $\sqrt{3}$ | 1 | 0.58 | ∞ |
| Readout Electronics | 0.30 | Normal | 1 | 1 | 0.30 | ∞ |
| Response Time | 0.80 | Rectangular | $\sqrt{3}$ | 1 | 0.46 | ∞ |
| Integration Time | 2.60 | Rectangular | $\sqrt{3}$ | 1 | 1.50 | ∞ |
| RF Ambient Conditions | 3.00 | Rectangular | $\sqrt{3}$ | 1 | 1.73 | ∞ |
| RF Ambient Reflections | 3.00 | Rectangular | $\sqrt{3}$ | 1 | 1.73 | ∞ |
| Probe Positioner Mechanical Tolerance | 0.80 | Rectangular | $\sqrt{3}$ | 1 | 0.46 | ∞ |
| Probe Positioning with respect to Phantom Shell | 6.70 | Rectangular | $\sqrt{3}$ | 1 | 3.87 | ∞ |
| Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation | 4.00 | Rectangular | $\sqrt{3}$ | 1 | 2.31 | ∞ |
| **Test sample Related** | | | | | | |
| Test sample Positioning | 3.70 | Normal | 1 | 1 | 3.7 | 89 |
| Device Holder Uncertainty | 3.40 | Normal | 1 | 1 | 3.4 | 5 |
| Output Power Variation - SAR drift measurement | 5.00 | Rectangular | $\sqrt{3}$ | 1 | 2.89 | ∞ |
| **Phantom and Tissue Parameters** | | | | | | |
| Phantom Uncertainty (shape and thickness tolerances) | 7.90 | Rectangular | $\sqrt{3}$ | 1 | 4.56 | ∞ |
| Liquid Conductivity - deviation from target values | 5.00 | Rectangular | $\sqrt{3}$ | 0.64 | 1.85 | ∞ |
| Liquid Conductivity - measurement uncertainty | -3.88 | Normal | 1 | 0.64 | -2.48 | 39 |
| Liquid Permittivity - deviation from target values | 5.00 | Rectangular | $\sqrt{3}$ | 0.6 | 1.73 | ∞ |
| Liquid Permittivity - measurement uncertainty | -2.09 | Normal | 1 | 0.6 | -1.25 | 39 |
| Temp. Unc. - Conductivity | 1.70 | Rectangular | $\sqrt{3}$ | 0.78 | 0.77 | ∞ |
| Temp. Unc. - Permittivity | 0.30 | Rectangular | $\sqrt{3}$ | 0.23 | 0.04 | ∞ |
| | | RSS | | | 12.63 | 611 |
| Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = | | $k$=2 | | | 25.26% | |
| Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = | | $k$=2 | | | 1.96dB | |

# 11 Exposure Limit

(A). Limits for Occupational/Controlled Exposure (W/kg)

| Whole-Body | Partial-Body | Hands, Wrists, Feet and Ankles |
|---|---|---|
| 0.4 | 8.0 | 2.0 |

(B). Limits for General Population/Uncontrolled Exposure (W/kg)

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

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

**Population/Uncontrolled Environments:**

are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

**Occupational/Controlled Environments:**

are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

**NOTE**
**GENERAL POPULATION/UNCONTROLLED EXPOSURE**
**PARTIAL BODY LIMIT**
**1.6 W/kg**

# 12 Tissue Dielectric Properties

## 12.1 Test Liquid Confirmation

**Simulating Liquids Parameter Check**

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectric parameters are within the tolerances of the specified target values

The relative permittivity and conductivity of the tissue material should be within ± 5% of the values given in the table below 5% may not be easily achieved at certain frequencies.

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in IEEE 1528 2003 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in IEEE 1528 2003 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations and extrapolated according to the head parameters specified in IEEE 1528 2003

| Target Frequency (MHz) | Head | | Body | |
|---|---|---|---|---|
| | $\varepsilon_r$ | $\sigma$ (S/m) | $\varepsilon_r$ | $\sigma$ (S/m) |
| 150 | 52.3 | 0.76 | 61.9 | 0.80 |
| 300 | 45.3 | 0.87 | 58.2 | 0.92 |
| 450 | 43.5 | 0.87 | 56.7 | 0.94 |
| 835 | 41.5 | 0.90 | 55.2 | 0.97 |
| 900 | 41.5 | 0.97 | 55.0 | 1.05 |
| 915 | 41.5 | 0.98 | 55.0 | 1.06 |
| 1450 | 40.5 | 1.20 | 54.0 | 1.30 |
| 1610 | 40.3 | 1.29 | 53.8 | 1.40 |
| 1800 – 2000 | 40.0 | 1.40 | 53.3 | 1.52 |
| 2450 | 39.2 | 1.80 | 52.7 | 1.95 |
| 3000 | 38.5 | 2.40 | 52.0 | 2.73 |
| 5000 | 36.2 | 4.45 | 49.3 | 5.07 |
| 5100 | 36.1 | 4.55 | 49.1 | 5.18 |
| 5200 | 36.0 | 4.66 | 49.0 | 5.30 |
| 5300 | 35.9 | 4.76 | 48.9 | 5.42 |
| 5400 | 35.8 | 4.86 | 48.7 | 5.53 |
| 5500 | 35.6 | 4.96 | 48.6 | 5.65 |
| 5600 | 35.5 | 5.07 | 48.5 | 5.77 |
| 5700 | 35.4 | 5.17 | 48.3 | 5.88 |
| 5800 | 35.3 | 5.27 | 48.2 | 6.00 |

## 12.2 Typical Composition of Ingredients for Liquid Tissue Phantoms

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

| Ingredients (% by weight) | Frequency (MHz) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 450 | | 835 | | 915 | | 1900 | | 2450 | |
| **Tissue Type** | **Head** | **Body** | **Head** | **Body** | **Head** | **Body** | **Head** | **Body** | **Head** | **Body** |
| **Water** | 38.56 | 51.16 | 41.45 | 52.4 | 41.05 | 56.0 | 54.9 | 40.4 | 62.7 | 73.2 |
| **Salt (NaCl)** | 3.95 | 1.49 | 1.45 | 1.4 | 1.35 | 0.76 | 0.18 | 0.5 | 0.5 | 0.04 |
| **Sugar** | 56.32 | 46.78 | 56.0 | 45.0 | 56.5 | 41.76 | 0.0 | 58.0 | 0.0 | 0.0 |
| **HEC** | 0.98 | 0.52 | 1.0 | 1.0 | 1.0 | 1.21 | 0.0 | 1.0 | 0.0 | 0.0 |
| **Bactericide** | 0.19 | 0.05 | 0.1 | 0.1 | 0.1 | 0.27 | 0.0 | 0.1 | 0.0 | 0.0 |
| **Triton X-100** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36.8 | 0.0 |
| **DGBE** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 44.92 | 0.0 | 0.0 | 26.7 |
| **Dielectric Constant** | 43.42 | 58.0 | 42.54 | 56.1 | 42.0 | 56.8 | 39.9 | 54.0 | 39.8 | 52.5 |
| **Conductivity (S/m)** | 0.85 | 0.83 | 0.91 | 0.95 | 1.0 | 1.07 | 1.42 | 1.45 | 1.88 | 1.78 |

alt: 99$^{+}$% Pure Sodium Chloride  Sugar: 98$^{+}$% Pure Sucrose
Water: De-ionized, 16 MΩ$^{+}$ resistivity  HEC: Hydroxy thyl Cellulose
DGBE: 99$^{+}$% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100 (ultra-pure): Polyethylene glycol mono [4-(1, 1, 3, 3-tetramethylbutyl)phenyl]ether

**Simulating Liquids for 5 GHz, Manufactured by SPEAG**

| Ingredients | (% by weight) |
|---|---|
| Water | 78 |
| Mineral oil | 11 |
| Emulsifiers | 9 |
| Additives and Salt | 2 |

## 12.3 Simulating Liquids Parameter Check Results

| Date | Band | Freq(MHz) | Measured | | | Standard | | Δ | | Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | e' (εr) | e'' | σ | e' (εr) | σ | e' (εr) | σ | ±5 |
| 2013/8/14 | Body 900 | 824.2 | 55.27 | 21.09 | 0.97 | 55.24 | 0.97 | 0.05% | -0.35% | ±5 |
| | | 836.6 | 55.16 | 21.06 | 0.98 | 55.20 | 0.97 | -0.07% | 0.80% | ±5 |
| | | 848.8 | 55.02 | 21.03 | 0.99 | 55.16 | 0.99 | -0.25% | 0.57% | ±5 |
| 2013/8/15 | Body 1800 | 1712.4 | 52.83 | 15.21 | 1.45 | 53.53 | 1.46 | -1.31% | -1.17% | ±5 |
| | | 1732.4 | 52.58 | 15.24 | 1.47 | 53.48 | 1.48 | -1.69% | -0.69% | ±5 |
| | | 1752.6 | 52.64 | 15.35 | 1.49 | 53.43 | 1.49 | -1.47% | 0.31% | ±5 |
| 2013/8/15 | Body 1900 | 1850.2 | 51.62 | 14.19 | 1.46 | 53.30 | 1.52 | -3.15% | -4.01% | ±5 |
| | | 1880 | 51.58 | 14.24 | 1.49 | 53.30 | 1.52 | -3.22% | -2.12% | ±5 |
| | | 1909.8 | 51.39 | 14.23 | 1.51 | 53.30 | 1.52 | -3.58% | -0.66% | ±5 |
| 2013/8/16 | Body 750 | 779.5 | 53.77 | 22.97 | 0.99 | 55.42 | 0.97 | -2.98% | 3.00% | ±5 |
| | | 782 | 53.77 | 22.91 | 1.00 | 55.41 | 0.97 | -2.95% | 3.04% | ±5 |
| | | 784.5 | 53.76 | 22.85 | 1.00 | 55.40 | 0.97 | -2.95% | 3.10% | ±5 |
| 2013/8/16 | Body 900 | 826.4 | 55.78 | 21.05 | 0.97 | 55.24 | 0.97 | 0.99% | -0.31% | ±5 |
| | | 836.6 | 55.68 | 21.02 | 0.98 | 55.20 | 0.97 | 0.88% | 0.59% | ±5 |
| | | 846.6 | 55.59 | 20.99 | 0.99 | 55.17 | 0.98 | 0.76% | 0.40% | ±5 |
| 2013/8/19 | Body 1800 | 1710.2 | 53.40 | 15.22 | 1.45 | 53.54 | 1.46 | -0.26% | -1.20% | ±5 |
| | | 1747.6 | 53.34 | 15.21 | 1.48 | 53.44 | 1.49 | -0.19% | -0.69% | ±5 |
| | | 1784.8 | 53.18 | 15.29 | 1.52 | 53.34 | 1.51 | -0.31% | 0.38% | ±5 |
| 2013/8/20 | Body 1900 | 1850.2 | 51.70 | 14.15 | 1.45 | 53.30 | 1.52 | -3.01% | -4.29% | ±5 |
| | | 1880 | 51.61 | 14.21 | 1.48 | 53.30 | 1.52 | -3.18% | -2.34% | ±5 |
| | | 1909.8 | 51.46 | 14.25 | 1.51 | 53.30 | 1.52 | -3.46% | -0.52% | ±5 |
| 2013/8/29 | Body 2450 | 2412 | 50.58 | 14.18 | 1.90 | 52.75 | 1.91 | -4.11% | -0.68% | ±5 |
| | | 2437 | 50.52 | 14.30 | 1.94 | 52.72 | 1.94 | -4.16% | -0.11% | ±5 |
| | | 2442 | 50.51 | 14.31 | 1.94 | 52.71 | 1.94 | -4.17% | -0.06% | ±5 |
| | | 2462 | 50.45 | 14.38 | 1.97 | 52.68 | 1.97 | -4.24% | 0.02% | ±5 |
| | | 2472 | 50.42 | 14.42 | 1.98 | 52.67 | 1.98 | -4.28% | -0.04% | ±5 |
| 2013/8/30 | Body 5000 | 5180 | 49.07 | 17.68 | 5.09 | 49.07 | 5.25 | 0.01% | -3.13% | ±5 |
| | | 5200 | 49.07 | 17.67 | 5.10 | 49.04 | 5.28 | 0.05% | -3.28% | ±5 |
| | | 5300 | 48.94 | 17.76 | 5.23 | 48.88 | 5.41 | 0.12% | -3.33% | ±5 |
| | | 5500 | 48.69 | 17.98 | 5.49 | 48.64 | 5.62 | 0.10% | -2.29% | ±5 |
| | | 5600 | 48.50 | 18.07 | 5.62 | 48.47 | 5.76 | 0.07% | -2.38% | ±5 |
| | | 5700 | 48.37 | 18.15 | 5.75 | 48.33 | 5.88 | 0.08% | -2.24% | ±5 |
| | | 5800 | 48.25 | 18.24 | 5.88 | 48.23 | 5.97 | 0.03% | -1.55% | ±5 |
| | | 5825 | 48.25 | 18.23 | 5.90 | 48.20 | 6.00 | 0.09% | -1.66% | ±5 |
| 2013/9/2 | Body 5000 | 5180 | 49.49 | 18.07 | 5.20 | 49.07 | 5.25 | 0.86% | -1.02% | ±5 |
| | | 5200 | 49.52 | 18.07 | 5.22 | 49.04 | 5.28 | 0.97% | -1.07% | ±5 |
| | | 5300 | 49.31 | 18.15 | 5.34 | 48.88 | 5.41 | 0.88% | -1.23% | ±5 |
| | | 5500 | 49.02 | 18.32 | 5.60 | 48.64 | 5.62 | 0.78% | -0.44% | ±5 |
| | | 5600 | 48.86 | 18.44 | 5.74 | 48.47 | 5.76 | 0.80% | -0.41% | ±5 |
| | | 5700 | 48.71 | 18.57 | 5.88 | 48.33 | 5.88 | 0.79% | -0.02% | ±5 |
| | | 5800 | 48.57 | 18.69 | 6.02 | 48.23 | 5.97 | 0.70% | 0.86% | ±5 |
| | | 5825 | 48.60 | 18.68 | 6.05 | 48.20 | 6.00 | 0.84% | 0.75% | ±5 |

| Date | Band | Freq(MHz) | Measured | | | Standard | | Δ | | Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | e' (εr) | e'' | σ | e' (εr) | σ | e' (εr) | σ | ±5 |
| 2013/9/3 | Body 5000 | 5180 | **48.38** | **18.50** | **5.32** | 49.07 | 5.25 | -1.39% | 1.33% | ±5 |
| | | 5200 | **48.29** | **18.49** | **5.34** | 49.04 | 5.28 | -1.54% | 1.22% | ±5 |
| | | 5300 | **48.18** | **18.61** | **5.48** | 48.88 | 5.41 | -1.44% | 1.28% | ±5 |
| | | 5500 | **47.88** | **18.96** | **5.79** | 48.64 | 5.62 | -1.56% | 3.00% | ±5 |
| | | 5600 | **47.60** | **19.07** | **5.93** | 48.47 | 5.76 | -1.79% | 3.00% | ±5 |
| | | 5700 | **47.40** | **19.12** | **6.05** | 48.33 | 5.88 | -1.93% | 2.96% | ±5 |
| | | 5800 | **47.23** | **19.18** | **6.18** | 48.23 | 5.97 | -2.09% | 3.50% | ±5 |
| | | 5825 | **47.22** | **19.23** | **6.22** | 48.20 | 6.00 | -2.04% | 3.73% | ±5 |
| 2013/9/4 | Body 5000 | 5180 | **48.49** | **17.59** | **5.06** | 49.07 | 5.25 | -1.19% | -3.65% | ±5 |
| | | 5200 | **48.43** | **17.58** | **5.08** | 49.04 | 5.28 | -1.25% | -3.77% | ±5 |
| | | 5300 | **48.33** | **17.66** | **5.20** | 48.88 | 5.41 | -1.12% | -3.88% | ±5 |
| | | 5500 | **48.10** | **17.91** | **5.47** | 48.64 | 5.62 | -1.11% | -2.70% | ±5 |
| | | 5600 | **47.88** | **17.98** | **5.59** | 48.47 | 5.76 | -1.22% | -2.90% | ±5 |
| | | 5700 | **47.71** | **18.03** | **5.71** | 48.33 | 5.88 | -1.29% | -2.92% | ±5 |
| | | 5800 | **47.59** | **18.08** | **5.82** | 48.23 | 5.97 | -1.34% | -2.45% | ±5 |
| | | 5825 | **47.56** | **18.10** | **5.86** | 48.20 | 6.00 | -1.32% | -2.40% | ±5 |
| 2013/9/5 | Body 5000 | 5180 | **48.62** | **17.78** | **5.12** | 49.07 | 5.25 | -0.91% | -2.58% | ±5 |
| | | 5200 | **48.56** | **17.78** | **5.14** | 49.04 | 5.28 | -0.99% | -2.63% | ±5 |
| | | 5300 | **48.46** | **17.87** | **5.26** | 48.88 | 5.41 | -0.85% | -2.75% | ±5 |
| | | 5500 | **48.23** | **18.13** | **5.54** | 48.64 | 5.62 | -0.84% | -1.51% | ±5 |
| | | 5600 | **48.01** | **18.20** | **5.66** | 48.47 | 5.76 | -0.96% | -1.67% | ±5 |
| | | 5700 | **47.83** | **18.25** | **5.78** | 48.33 | 5.88 | -1.04% | -1.70% | ±5 |
| | | 5800 | **47.71** | **18.31** | **5.90** | 48.23 | 5.97 | -1.08% | -1.20% | ±5 |
| | | 5825 | **47.67** | **18.32** | **5.93** | 48.20 | 6.00 | -1.09% | -1.19% | ±5 |

# 13 System Performance Check

The system performance check is performed prior to any usage of the system in order to guarantee reproducible results. The system performance check verifies that the system operates within its specifications. The system performance check results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

**System Performance Check Measurement Conditions**

- The measurements were performed in the flat section of the SAM twin phantom filled with Body simulating liquid of the following parameters.
- The DASY4/DASY5 system with an E-field probe EX3DV4 SN:3665 was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 15 mm (below 1 GHz) and 10 mm (above 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 10mm was aligned with the dipole.
- Special 7x7x7 fine cube was chosen for cube integration (dx=dy= 5 mm, dz= 5 mm).
- Distance between probe sensors and phantom surface was set to 3.0 mm.
- The dipole input power (forward power) was 100 mW±3%.
- The results are normalized to 1 W input power.

**Reference SAR Values for System Performance Check**

The reference SAR values can be obtained from the calibration certificate of system validation dipoles

| System Dipole | Serial No. | Cal. Date | Freq. (MHz) | Target SAR Values (W/kg) | | |
|---|---|---|---|---|---|---|
| | | | | 1g/10g | Head | Body |
| D750V3 | 1020 | 10/26/2012 | 750 | 1g | 8.37 | 8.75 |
| | | | | 10g | 5.53 | 5.78 |
| D835V2 | 4d015 | 03/18/2013 | 850 | 1g | 9.61 | 9.59 |
| | | | | 10g | 6.26 | 6.31 |
| D1800V2 | 2d062 | 02/12/2013 | 1800 | 1g | 38.7 | 38.5 |
| | | | | 10g | 20.3 | 20.3 |
| D1900V2 | 5d056 | 02/13/2013 | 1900 | 1g | 40.1 | 40.4 |
| | | | | 10g | 21.0 | 21.5 |
| D2450V2 | 728 | 05/02/2012 | 2450 | 1g | 53.5 | 51.1 |
| | | | | 10g | 25.0 | 23.9 |
| D5GHzV2 | 1004 | 11/16/2012 | 5200 | 1g | 77.8 | 71.8 |
| | | | | 10g | 22.1 | 20.1 |
| D5GHzV2 | 1004 | 11/16/2012 | 5300 | 1g | 83.9 | 75.4 |
| | | | | 10g | 24.0 | 21.2 |
| D5GHzV2 | 1004 | 11/16/2012 | 5600 | 1g | 83.3 | 78.8 |
| | | | | 10g | 23.6 | 21.8 |
| D5GHzV2 | 1004 | 11/16/2012 | 5800 | 1g | 79.8 | 73.5 |
| | | | | 10g | 22.7 | 20.4 |

## 13.1 System Performance Check Results

| Date | System Dipole | | | Parameters | Target | Measured | Deviation[%] | Limited[%] |
|---|---|---|---|---|---|---|---|---|
| | Type | Serial No. | Liquid | | | | | |
| 2013/8/14 | D835V2 | 4d015 | Body | 1g SAR: | 9.59 | 9.69 | 1.04 | ± 5 |
| | | | | 10g SAR: | 6.31 | 6.42 | 1.74 | ± 5 |
| 2013/8/15 | D1800V2 | 2d062 | Body | 1g SAR: | 38.50 | 38.60 | 0.26 | ± 5 |
| | | | | 10g SAR: | 20.30 | 20.40 | 0.49 | ± 5 |
| 2013/8/15 | D1900V2 | 5d056 | Body | 1g SAR: | 40.40 | 39.90 | -1.24 | ± 5 |
| | | | | 10g SAR: | 21.50 | 21.20 | -1.40 | ± 5 |
| 2013/8/16 | D835V2 | 4d015 | Body | 1g SAR: | 9.59 | 9.57 | -0.21 | ± 5 |
| | | | | 10g SAR: | 6.31 | 6.34 | 0.48 | ± 5 |
| 2013/8/16 | D750V3 | 1020 | Body | 1g SAR: | 8.75 | 8.33 | -4.80 | ± 5 |
| | | | | 10g SAR: | 5.78 | 5.55 | -3.98 | ± 5 |
| 2013/8/19 | D1800V2 | 2d062 | Body | 1g SAR: | 38.50 | 39.10 | 1.56 | ± 5 |
| | | | | 10g SAR: | 20.30 | 20.70 | 1.97 | ± 5 |
| 2013/8/20 | D1900V2 | 5d056 | Body | 1g SAR: | 40.40 | 40.40 | 0.00 | ± 5 |
| | | | | 10g SAR: | 21.50 | 21.40 | -0.47 | ± 5 |
| 2013/8/29 | D2450V2 | 728 | Body | 1g SAR: | 51.10 | 52.20 | 2.15 | ± 5 |
| | | | | 10g SAR: | 23.90 | 24.50 | 2.51 | ± 5 |
| 2013/8/30 | D5GHzV2 (5.2GHz) | 1004 | Body | 1g SAR: | 71.80 | 74.00 | 3.06 | ± 5 |
| | | | | 10g SAR: | 20.10 | 21.00 | 4.48 | ± 5 |
| 2013/8/30 | D5GHzV2 (5.3GHz) | 1004 | Body | 1g SAR: | 75.40 | 73.00 | -3.18 | ± 5 |
| | | | | 10g SAR: | 21.20 | 20.70 | -2.36 | ± 5 |
| 2013/9/2 | D5GHzV2 (5.6GHz) | 1004 | Body | 1g SAR: | 78.80 | 77.30 | -1.90 | ± 5 |
| | | | | 10g SAR: | 21.80 | 21.70 | -0.46 | ± 5 |
| 2013/9/3 | D5GHzV2 (5.6GHz) | 1004 | Body | 1g SAR: | 78.80 | 81.10 | 2.92 | ± 5 |
| | | | | 10g SAR: | 21.80 | 22.80 | 4.59 | ± 5 |
| 2013/9/4 | D5GHzV2 (5.8GHz) | 1004 | Body | 1g SAR: | 73.50 | 72.10 | -1.90 | ± 5 |
| | | | | 10g SAR: | 20.40 | 20.40 | 0.00 | ± 5 |
| 2013/9/5 | D5GHzV2 (5.8GHz) | 1004 | Body | 1g SAR: | 73.50 | 71.10 | -3.27 | ± 5 |
| | | | | 10g SAR: | 20.40 | 20.40 | 0.00 | ± 5 |

# 14 RF Output Power Measurement

## 14.1 GSM850

**GMSK (GPRS) Mode Coding scheme : CS-1**

Target Power: 32 dBm
Tolerance: +/- 1 dBm

| Band | Slot | Channel No. | Frequency (MHz) | Average power(dBm) | Frame Avg Pwr |
|---|---|---|---|---|---|
| GPRS 850 | 1 | 128 | 824.2 | 32.1 | 23.1 |
| | | 190 | 836.6 | 32.2 | 23.1 |
| | | 251 | 848.8 | 32.1 | 23.1 |
| GPRS 850 | 2 | 128 | 824.2 | 32.0 | 26.0 |
| | | 190 | 836.6 | 32.1 | 26.0 |
| | | 251 | 848.8 | 32.1 | 26.0 |

## EGPRS850

**8PSK (EGPRS) Mode Coding scheme : MCS-5**

Target Power: 27 dBm
Tolerance: +/- 1 dBm

| Band | Slot | Channel No. | Frequency (MHz) | Average power(dBm) | Frame Avg Pwr |
|---|---|---|---|---|---|
| EGPRS 850 | 1 | 128 | 824.2 | 26.9 | 17.9 |
| | | 190 | 836.6 | 27.0 | 17.9 |
| | | 251 | 848.8 | 27.0 | 18.0 |
| EGPRS 850 | 2 | 128 | 824.2 | 26.7 | 20.7 |
| | | 190 | 836.6 | 26.8 | 20.8 |
| | | 251 | 848.8 | 26.8 | 20.8 |
| EGPRS 850 | 3 | 128 | 824.2 | 26.6 | 22.3 |
| | | 190 | 836.6 | 26.6 | 22.4 |
| | | 251 | 848.8 | 26.7 | 22.4 |
| EGPRS 850 | 4 | 128 | 824.2 | 26.4 | 23.4 |
| | | 190 | 836.6 | 26.5 | 23.5 |
| | | 251 | 848.8 | 26.5 | 23.5 |

## 14.2 GPRS1900

**GMSK (GPRS) Mode Coding scheme : CS-1**

Target Power: 29 dBm
Tolerance: +/- 1 dBm

| Band | Slot | Channel No. | Frequency (MHz) | Average power(dBm) | Frame Avg Pwr |
|---|---|---|---|---|---|
| GPRS 1900 | 1 | 512 | 1850.2 | 29.6 | 20.6 |
| | | 661 | 1880.0 | 29.4 | 20.4 |
| | | 810 | 1909.8 | 29.5 | 20.4 |
| GPRS 1900 | 2 | 512 | 1850.2 | 29.5 | 23.4 |
| | | 661 | 1880.0 | 29.5 | 23.5 |
| | | 810 | 1909.8 | 29.4 | 23.3 |

## EGPRS1900

**8PSK (EGPRS) Mode Coding scheme : MCS-5**

Target Power: 26 dBm
Tolerance: +/- 1 dBm

| Band | Slot | Channel No. | Frequency (MHz) | Average power(dBm) | Frame Avg Pwr |
|---|---|---|---|---|---|
| EGPRS 1900 | 1 | 512 | 1850.2 | 25.6 | 16.5 |
| | | 661 | 1880.0 | 25.6 | 16.5 |
| | | 810 | 1909.8 | 25.5 | 16.4 |
| EGPRS 1900 | 2 | 512 | 1850.2 | 25.5 | 19.4 |
| | | 661 | 1880.0 | 25.5 | 19.4 |
| | | 810 | 1909.8 | 25.4 | 19.4 |
| EGPRS 1900 | 3 | 512 | 1850.2 | 25.4 | 21.1 |
| | | 661 | 1880.0 | 25.3 | 21.1 |
| | | 810 | 1909.8 | 25.2 | 20.9 |
| EGPRS 1900 | 4 | 512 | 1850.2 | 25.2 | 22.2 |
| | | 661 | 1880.0 | 25.3 | 22.2 |
| | | 810 | 1909.8 | 25.1 | 22.1 |

## 14.3 WCDMA Band II

Target Power: 23 dBm
Tolerance: +/- 1 dBm

**Release 99**

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V8.5.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7) 12.2kps RMC is used for this testing. Power control set to All bits up. A summary of these settings are illustrated below:

| Mode | Subtest | Rel99 |
|---|---|---|
| WCDMA General Settings | Loopback Mode | Test Mode 1 |
| | Rel99 RMC | 12.2kbps RMC |
| | Power Control Algorithm | Algorithm2 |
| | βc/βd | 8/15 |

**Output power table**

| Band | Data Rate or Sub-test | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) |
|---|---|---|---|---|
| WCDMA Band II | --- | 9262/9662 | 1852.4 | 23.1 |
| | | 9400/9800 | 1880.0 | 23.0 |
| | | 9538/9983 | 1907.6 | 23.0 |

**HSDPA**
Target Power: 23 dBm
Tolerance: +/- 1 dBm

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

| | Mode | HSDPA | HSDPA | HSDPA | HSDPA |
|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 |
| W-CDMA General Settings | Loopback Mode | Test Mode 1 | | | |
| | Rel99 RMC | 12.2kbps RMC | | | |
| | HSDPA FRC | H-Set1 | | | |
| | Power Control Algorithm | Algorithm 2 | | | |
| | βc | 2/15 | 12/15 | 15/15 | 15/15 |
| | βd | 15/15 | 15/15 | 8/15 | 4/15 |
| | Bd (SF) | 64 | | | |
| | βc/βd | 2/15 | 12/15 | 8/15 | 4/15 |
| | βhs | 4/15 | 24/15 | 30/15 | 30/15 |
| | CM (dB) | 0 | 1 | 1.5 | 1.5 |
| HSDPA Specific Settings | $D_{ACK}$ | 8 | | | |
| | $D_{NAK}$ | 8 | | | |
| | DCQI | 8 | | | |
| | Ack-Nack repetition factor | 3 | | | |
| | CQI Feedback (Table 5.2B.4) | 4ms | | | |
| | CQI Repetition Factor (Table 5.2B.4) | 2 | | | |
| | Ahs =βhs/βc | 30/15 | | | |

**Output power table**

| Band | Data Rate or Sub-test | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) |
|---|---|---|---|---|
| HSDPA II | 1 | 9262/9662 | 1852.4 | 22.4 |
| | | 9400/9800 | 1880.0 | 22.4 |
| | | 9538/9983 | 1907.6 | 22.5 |
| | 2 | 9262/9662 | 1852.4 | 22.6 |
| | | 9400/9800 | 1880.0 | 22.6 |
| | | 9538/9983 | 1907.6 | 22.6 |
| | 3 | 9262/9662 | 1852.4 | 22.1 |
| | | 9400/9800 | 1880.0 | 22.0 |
| | | 9538/9983 | 1907.6 | 22.2 |
| | 4 | 9262/9662 | 1852.4 | 22.1 |
| | | 9400/9800 | 1880.0 | 22.2 |
| | | 9538/9983 | 1907.6 | 22.2 |

**HSPA (HSDPA & HSUPA)**

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. **A** summary of these settings are illustrated below:

| | Mode | HSPA | HSPA | HSPA | HSPA | HSPA |
|---|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 | 5 |
| W-CDMA General Settings | Loopback Mode | Test Mode 1 | | | | |
| | Rel99 RMC | 12.2kbps RMC | | | | |
| | HSDPA FRC | H-Set1 | | | | |
| | HSUPA Test | HSUPA Loopback | | | | |
| | Power Control Algorithm | Algorithm2 | | | | |
| | βc | 11/15 | 6/15 | 15/15 | 2/15 | 15/15 |
| | βd | 15/15 | 15/15 | 9/15 | 15/15 | 15/15 |
| | βec | 209/225 | 12/15 | 30/15 | 2/15 | 24/15 |
| | βc/βd | 11/15 | 6/15 | 9/15 | 2/15 | 15/15 |
| | βhs | 22/15 | 12/15 | 30/15 | 4/15 | 30/15 |
| | βed | 1309/225 | 94/75 | 47/15 | 56/75 | 134/15 |
| | CM (dB) | 1 | 3 | 2 | 3 | 1 |
| | MPR (dB) | 0 | 2 | 1 | 2 | 0 |
| HSDPA Specific Settings | DACK | 8 | | | | |
| | DNAK | 8 | | | | |
| | DCQI | 8 | | | | |
| | Ack-Nack repetition factor | 3 | | | | |
| | CQI Feedback (Table 5.2B.4) | 4ms | | | | |
| | CQI Repetition Factor (Table 5.2B.4) | 2 | | | | |
| | Ahs = βhs/βc | 30/15 | | | | |
| HSUPA Specific Settings | D E-DPCCH | 6 | 8 | 8 | 5 | 7 |
| | DHARQ | 0 | 0 | 0 | 0 | 0 |
| | AG Index | 20 | 12 | 15 | 17 | 21 |
| | ETFCI (from 34.121 Table C.11.1.3) | 75 | 67 | 92 | 71 | 81 |
| | Associated Max UL Data Rate kbps | 242.1 | 174.9 | 482.8 | 205.8 | 308.9 |
| | Reference E_TFCIs | E-TFCI 11 | | E-TFCI 11 | E-TFCI 11 | |
| | | E-TFCI PO 4 | | E-TFCI PO 4 | E-TFCI PO 4 | |
| | | E-TFCI 67 | | E-TFCI 92 | E-TFCI 67 | |
| | | E-TFCI PO 18 | | E-TFCI PO 18 | E-TFCI PO 18 | |
| | | E-TFCI 71 | | | E-TFCI 71 | |
| | | E-TFCI PO 23 | | | E-TFCI PO 23 | |
| | | E-TFCI 75 | | | E-TFCI 75 | |
| | | E-TFCI PO 26 | | | E-TFCI PO 26 | |
| | | E-TFCI 81 | | | E-TFCI 81 | |
| | | E-TFCI PO 27 | | | E-TFCI PO 27 | |

**Output power table**

| Band | Data Rate or Sub-test | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) |
|---|---|---|---|---|
| HSUPA II | 1 | 9262/9662 | 1852.4 | 22.1 |
| | | 9400/9800 | 1880.0 | 22.4 |
| | | 9538/9983 | 1907.6 | 22.4 |
| | 2 | 9262/9662 | 1852.4 | 20.6 |
| | | 9400/9800 | 1880.0 | 20.4 |
| | | 9538/9983 | 1907.6 | 20.7 |
| | 3 | 9262/9662 | 1852.4 | 21.5 |
| | | 9400/9800 | 1880.0 | 21.8 |
| | | 9538/9983 | 1907.6 | 21.4 |
| | 4 | 9262/9662 | 1852.4 | 21.3 |
| | | 9400/9800 | 1880.0 | 21.5 |
| | | 9538/9983 | 1907.6 | 21.4 |
| | 5 | 9262/9662 | 1852.4 | 22.5 |
| | | 9400/9800 | 1880.0 | 22.5 |
| | | 9538/9983 | 1907.6 | 22.5 |

## 14.4 WCDMA Band IV

Target Power: 23dBm
Tolerance: +/- 1 dBm

**Release 99**

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V8.5.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7) 12.2kps RMC is used for this testing. Power control set to All bits up. A summary of these settings are illustrated below:

| Mode | Subtest | Rel99 |
|---|---|---|
| WCDMA General Settings | Loopback Mode | Test Mode 1 |
| | Rel99 RMC | 12.2kbps RMC |
| | Power Control Algorithm | Algorithm2 |
| | βc/βd | 8/15 |

**Output power table**

| Band | Data Rate or Sub-test | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) |
|---|---|---|---|---|
| WCDMA Band V | --- | 1312/1537 | 1712.4 | 22.9 |
| | | 1413/1638 | 1732.6 | 22.8 |
| | | 1513/1738 | 1752.6 | 23.0 |

**HSDPA**
Target Power: 23dBm
Tolerance: +/- 1 dBm

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

| | Mode | HSDPA | HSDPA | HSDPA | HSDPA |
|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 |
| W-CDMA General Settings | Loopback Mode | Test Mode 1 | | | |
| | Rel99 RMC | 12.2kbps RMC | | | |
| | HSDPA FRC | H-Set1 | | | |
| | Power Control Algorithm | Algorithm 2 | | | |
| | βc | 2/15 | 12/15 | 15/15 | 15/15 |
| | βd | 15/15 | 15/15 | 8/15 | 4/15 |
| | Bd (SF) | 64 | | | |
| | βc/βd | 2/15 | 12/15 | 8/15 | 4/15 |
| | βhs | 4/15 | 24/15 | 30/15 | 30/15 |
| | CM (dB) | 0 | 1 | 1.5 | 1.5 |
| HSDPA Specific Settings | $D_{ACK}$ | 8 | | | |
| | $D_{NAK}$ | 8 | | | |
| | DCQI | 8 | | | |
| | Ack-Nack repetition factor | 3 | | | |
| | CQI Feedback (Table 5.2B.4) | 4ms | | | |
| | CQI Repetition Factor (Table 5.2B.4) | 2 | | | |
| | Ahs =βhs/βc | 30/15 | | | |

**Output power table**

| Band | Data Rate or Sub-test | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) |
|---|---|---|---|---|
| HSDPA IV | 1 | 1312/1537 | 1712.4 | 22.7 |
| | | 1413/1638 | 1732.6 | 22.6 |
| | | 1513/1738 | 1752.6 | 22.7 |
| | 2 | 1312/1537 | 1712.4 | 22.8 |
| | | 1413/1638 | 1732.6 | 22.7 |
| | | 1513/1738 | 1752.6 | 22.7 |
| | 3 | 1312/1537 | 1712.4 | 22.2 |
| | | 1413/1638 | 1732.6 | 22.1 |
| | | 1513/1738 | 1752.6 | 22.1 |
| | 4 | 1312/1537 | 1712.4 | 21.9 |
| | | 1413/1638 | 1732.6 | 22.0 |
| | | 1513/1738 | 1752.6 | 22.2 |

**HSPA (HSDPA & HSUPA)**

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. **A** summary of these settings are illustrated below:

| | Mode | HSPA | HSPA | HSPA | HSPA | HSPA |
|---|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 | 5 |
| W-CDMA General Settings | Loopback Mode | Test Mode 1 | | | | |
| | Rel99 RMC | 12.2kbps RMC | | | | |
| | HSDPA FRC | H-Set1 | | | | |
| | HSUPA Test | HSUPA Loopback | | | | |
| | Power Control Algorithm | Algorithm2 | | | | |
| | βc | 11/15 | 6/15 | 15/15 | 2/15 | 15/15 |
| | βd | 15/15 | 15/15 | 9/15 | 15/15 | 15/15 |
| | βec | 209/225 | 12/15 | 30/15 | 2/15 | 24/15 |
| | βc/βd | 11/15 | 6/15 | 9/15 | 2/15 | 15/15 |
| | βhs | 22/15 | 12/15 | 30/15 | 4/15 | 30/15 |
| | βed | 1309/225 | 94/75 | 47/15 | 56/75 | 134/15 |
| | CM (dB) | 1 | 3 | 2 | 3 | 1 |
| | MPR (dB) | 0 | 2 | 1 | 2 | 0 |
| HSDPA Specific Settings | DACK | 8 | | | | |
| | DNAK | 8 | | | | |
| | DCQI | 8 | | | | |
| | Ack-Nack repetition factor | 3 | | | | |
| | CQI Feedback (Table 5.2B.4) | 4ms | | | | |
| | CQI Repetition Factor (Table 5.2B.4) | 2 | | | | |
| | Ahs = βhs/βc | 30/15 | | | | |
| HSUPA Specific Settings | D E-DPCCH | 6 | 8 | 8 | 5 | 7 |
| | DHARQ | 0 | 0 | 0 | 0 | 0 |
| | AG Index | 20 | 12 | 15 | 17 | 21 |
| | ETFCI (from 34.121 Table C.11.1.3) | 75 | 67 | 92 | 71 | 81 |
| | Associated Max UL Data Rate kbps | 242.1 | 174.9 | 482.8 | 205.8 | 308.9 |
| | Reference E_TFCIs | E-TFCI 11 | | E-TFCI 11 | E-TFCI 11 | |
| | | E-TFCI PO 4 | | E-TFCI PO 4 | E-TFCI PO 4 | |
| | | E-TFCI 67 | | E-TFCI 92 | E-TFCI 67 | |
| | | E-TFCI PO 18 | | E-TFCI PO 18 | E-TFCI PO 18 | |
| | | E-TFCI 71 | | | E-TFCI 71 | |
| | | E-TFCI PO 23 | | | E-TFCI PO 23 | |
| | | E-TFCI 75 | | | E-TFCI 75 | |
| | | E-TFCI PO 26 | | | E-TFCI PO 26 | |
| | | E-TFCI 81 | | | E-TFCI 81 | |
| | | E-TFCI PO 27 | | | E-TFCI PO 27 | |

**Output power table**

| Band | Data Rate or Sub-test | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) |
|---|---|---|---|---|
| HSUPA IV | 1 | 1312/1537 | 1712.4 | 22.1 |
| | | 1413/1638 | 1732.6 | 22.4 |
| | | 1513/1738 | 1752.6 | 22.3 |
| | 2 | 1312/1537 | 1712.4 | 20.5 |
| | | 1413/1638 | 1732.6 | 20.6 |
| | | 1513/1738 | 1752.6 | 20.3 |
| | 3 | 1312/1537 | 1712.4 | 21.7 |
| | | 1413/1638 | 1732.6 | 21.3 |
| | | 1513/1738 | 1752.6 | 21.7 |
| | 4 | 1312/1537 | 1712.4 | 21.6 |
| | | 1413/1638 | 1732.6 | 21.3 |
| | | 1513/1738 | 1752.6 | 21.5 |
| | 5 | 1312/1537 | 1712.4 | 22.3 |
| | | 1413/1638 | 1732.6 | 22.4 |
| | | 1513/1738 | 1752.6 | 22.6 |

## 14.5 WCDMA Band V

Target Power: 23dBm
Tolerance: +/- 1 dBm

**Release 99**

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V8.5.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7) 12.2kps RMC is used for this testing. Power control set to All bits up. A summary of these settings are illustrated below:

| Mode | Subtest | Rel99 |
|---|---|---|
| WCDMA General Settings | Loopback Mode | Test Mode 1 |
| | Rel99 RMC | 12.2kbps RMC |
| | Power Control Algorithm | Algorithm2 |
| | βc/βd | 8/15 |

**Output power table**

| Band | Data Rate or Sub-test | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) |
|---|---|---|---|---|
| WCDMA Band V | --- | 4132/4157 | 826.4 | 22.8 |
| | | 4182/4407 | 836.4 | 22.8 |
| | | 4233/4458 | 846.6 | 22.9 |

**HSDPA**
Target Power: 23dBm
Tolerance: +/- 1 dBm

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

| | Mode | HSDPA | HSDPA | HSDPA | HSDPA |
|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 |
| W-CDMA General Settings | Loopback Mode | Test Mode 1 | | | |
| | Rel99 RMC | 12.2kbps RMC | | | |
| | HSDPA FRC | H-Set1 | | | |
| | Power Control Algorithm | Algorithm 2 | | | |
| | βc | 2/15 | 12/15 | 15/15 | 15/15 |
| | βd | 15/15 | 15/15 | 8/15 | 4/15 |
| | Bd (SF) | 64 | | | |
| | βc/βd | 2/15 | 12/15 | 8/15 | 4/15 |
| | βhs | 4/15 | 24/15 | 30/15 | 30/15 |
| | CM (dB) | 0 | 1 | 1.5 | 1.5 |
| HSDPA Specific Settings | $D_{ACK}$ | 8 | | | |
| | $D_{NAK}$ | 8 | | | |
| | DCQI | 8 | | | |
| | Ack-Nack repetition factor | 3 | | | |
| | CQI Feedback (Table 5.2B.4) | 4ms | | | |
| | CQI Repetition Factor (Table 5.2B.4) | 2 | | | |
| | Ahs =βhs/βc | 30/15 | | | |

**Output power table**

| Band | Data Rate or Sub-test | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) |
|---|---|---|---|---|
| HSDPA V | 1 | 4132/4157 | 826.4 | 22.3 |
| | | 4182/4407 | 836.4 | 22.2 |
| | | 4233/4458 | 846.6 | 22.2 |
| | 2 | 4132/4157 | 826.4 | 22.3 |
| | | 4182/4407 | 836.4 | 22.2 |
| | | 4233/4458 | 846.6 | 22.2 |
| | 3 | 4132/4157 | 826.4 | 21.8 |
| | | 4182/4407 | 836.4 | 21.7 |
| | | 4233/4458 | 846.6 | 21.8 |
| | 4 | 4132/4157 | 826.4 | 21.8 |
| | | 4182/4407 | 836.4 | 21.7 |
| | | 4233/4458 | 846.6 | 21.7 |

**HSPA (HSDPA & HSUPA)**

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. **A** summary of these settings are illustrated below:

| | Mode | HSPA | HSPA | HSPA | HSPA | HSPA |
|---|---|---|---|---|---|---|
| | Subtest | 1 | 2 | 3 | 4 | 5 |
| W-CDMA General Settings | Loopback Mode | Test Mode 1 | | | | |
| | Rel99 RMC | 12.2kbps RMC | | | | |
| | HSDPA FRC | H-Set1 | | | | |
| | HSUPA Test | HSUPA Loopback | | | | |
| | Power Control Algorithm | Algorithm2 | | | | |
| | βc | 11/15 | 6/15 | 15/15 | 2/15 | 15/15 |
| | βd | 15/15 | 15/15 | 9/15 | 15/15 | 15/15 |
| | βec | 209/225 | 12/15 | 30/15 | 2/15 | 24/15 |
| | βc/βd | 11/15 | 6/15 | 9/15 | 2/15 | 15/15 |
| | βhs | 22/15 | 12/15 | 30/15 | 4/15 | 30/15 |
| | βed | 1309/225 | 94/75 | 47/15 | 56/75 | 134/15 |
| | CM (dB) | 1 | 3 | 2 | 3 | 1 |
| | MPR (dB) | 0 | 2 | 1 | 2 | 0 |
| HSDPA Specific Settings | DACK | 8 | | | | |
| | DNAK | 8 | | | | |
| | DCQI | 8 | | | | |
| | Ack-Nack repetition factor | 3 | | | | |
| | CQI Feedback (Table 5.2B.4) | 4ms | | | | |
| | CQI Repetition Factor (Table 5.2B.4) | 2 | | | | |
| | Ahs = βhs/βc | 30/15 | | | | |
| HSUPA Specific Settings | D E-DPCCH | 6 | 8 | 8 | 5 | 7 |
| | DHARQ | 0 | 0 | 0 | 0 | 0 |
| | AG Index | 20 | 12 | 15 | 17 | 21 |
| | ETFCI (from 34.121 Table C.11.1.3) | 75 | 67 | 92 | 71 | 81 |
| | Associated Max UL Data Rate kbps | 242.1 | 174.9 | 482.8 | 205.8 | 308.9 |
| | Reference E_TFCIs | E-TFCI 11 | | E-TFCI 11 | E-TFCI 11 | |
| | | E-TFCI PO 4 | | E-TFCI PO 4 | E-TFCI PO 4 | |
| | | E-TFCI 67 | | E-TFCI 92 | E-TFCI 67 | |
| | | E-TFCI PO 18 | | E-TFCI PO 18 | E-TFCI PO 18 | |
| | | E-TFCI 71 | | | E-TFCI 71 | |
| | | E-TFCI PO 23 | | | E-TFCI PO 23 | |
| | | E-TFCI 75 | | | E-TFCI 75 | |
| | | E-TFCI PO 26 | | | E-TFCI PO 26 | |
| | | E-TFCI 81 | | | E-TFCI 81 | |
| | | E-TFCI PO 27 | | | E-TFCI PO 27 | |

**Output power table**

| Band | Data Rate or Sub-test | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) |
|---|---|---|---|---|
| HSUPA V | 1 | 4132/4157 | 826.4 | 22.1 |
| | | 4182/4407 | 836.4 | 22.2 |
| | | 4233/4458 | 846.6 | 22.2 |
| | 2 | 4132/4157 | 826.4 | 20.5 |
| | | 4182/4407 | 836.4 | 20.1 |
| | | 4233/4458 | 846.6 | 20.1 |
| | 3 | 4132/4157 | 826.4 | 21.3 |
| | | 4182/4407 | 836.4 | 21.0 |
| | | 4233/4458 | 846.6 | 21.1 |
| | 4 | 4132/4157 | 826.4 | 21.5 |
| | | 4182/4407 | 836.4 | 21.1 |
| | | 4233/4458 | 846.6 | 21.2 |
| | 5 | 4132/4157 | 826.4 | 22.5 |
| | | 4182/4407 | 836.4 | 22.2 |
| | | 4233/4458 | 846.6 | 22.3 |

## 14.6 CDMA BC0

**1xRTT**

Target Power: 24dBm
Tolerance: +/- 1 dBm

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

| Application | Rev, License |
|---|---|
| CDMA2000 Mobile Test | B.13.08, L |

- Call Setup > Shift & Preset
- Cell Info > Cell Parameters > System ID (SID) > 387 for BC0
  > Network ID (NID) > 65535
- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > Please see following table or details
- FCH Service Option (SO) Setup > Please see following table or details
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps
  > R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Rvs Power Ctrl > Active bits
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

**Output power table**

| Band | Mode | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) |
|---|---|---|---|---|
| BC0 | RC1 SO55 (Loopback) | 1013 | 824.70 | 24.2 |
| | | 384 | 836.52 | 24.4 |
| | | 777 | 848.31 | 24.0 |
| | RC3 SO55 (Loopback) | 1013 | 824.70 | 24.1 |
| | | 384 | 836.52 | 24.3 |
| | | 777 | 848.31 | 23.7 |
| | RC3 SO32 ((+F-SCH)) | 1013 | 824.70 | 24.1 |
| | | 384 | 836.52 | 24.3 |
| | | 777 | 848.31 | 23.9 |

## 14.7 CDMA BC 1

**1xRTT**

Target Power: 24dBm、23.5dBm(channel:1175)
Tolerance: +/- 1 dBm

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

| Application | Rev, License |
|---|---|
| CDMA2000 Mobile Test | B.13.08, L |

- Call Setup > Shift & Preset
- Cell Info > Cell Parameters > System ID (SID) > 387 for BC1
  > Network ID (NID) > 65535
- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > Please see following table or details
- FCH Service Option (SO) Setup > Please see following table or details
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps
  > R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Rvs Power Ctrl > Active bits
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

**Output power table**

| Band | Mode | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) |
|---|---|---|---|---|
| BC1 | RC1 SO55 (Loopback) | 25 | 1851.25 | 24.7 |
| | | 600 | 1880.00 | 24.7 |
| | | 1175 | 1908.75 | 24.5 |
| | RC3 SO55 (Loopback) | 25 | 1851.25 | 24.4 |
| | | 600 | 1880.00 | 24.1 |
| | | 1175 | 1908.75 | 24.2 |
| | RC3 SO32 ((+F-SCH)) | 25 | 1851.25 | 24.4 |
| | | 600 | 1880.00 | 23.9 |
| | | 1175 | 1908.75 | 24.2 |

## 14.8 LTE Transmit Power

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 1dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3**

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

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

**Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)**

| Network Signalling value | Requirements (sub-clause) | E-UTRA Band | Channel bandwidth (MHz) | Resources Blocks ($N_{RB}$) | A-MPR (dB) |
|---|---|---|---|---|---|
| NS_01 | 6.6.2.1.1 | Table 5.5-1 | 1.4, 3, 5, 10, 15, 20 | Table 5.6-1 | NA |
| NS_03 | 6.6.2.2.1 | 2, 4,10, 23, 25, 35, 36 | 3 | >5 | ≤ 1 |
| | | | 5 | >6 | ≤ 1 |
| | | | 10 | >6 | ≤ 1 |
| | | | 15 | >8 | ≤ 1 |
| | | | 20 | >10 | ≤ 1 |
| NS_04 | 6.6.2.2.2 | 41 | 5 | >6 | ≤ 1 |
| | | | 10, 15, 20 | See Table 6.2.4-4 | |
| NS_05 | 6.6.3.3.1 | 1 | 10,15,20 | ≥ 50 | ≤ 1 |
| NS_06 | 6.6.2.2.3 | 12, 13, 14, 17 | 1.4, 3, 5, 10 | Table 5.6-1 | n/a |
| NS_07 | 6.6.2.2.3<br>6.6.3.3.2 | 13 | 10 | Table 6.2.4-2 | Table 6.2.4-2 |
| NS_08 | 6.6.3.3.3 | 19 | 10, 15 | > 44 | ≤ 3 |
| NS_09 | 6.6.3.3.4 | 21 | 10, 15 | > 40 | ≤ 1 |
| | | | | > 55 | ≤ 2 |
| NS_10 | | 20 | 15, 20 | Table 6.2.4-3 | Table 6.2.4-3 |
| NS_11 | 6.6.2.2.1 | 23[1] | 1.4, 3, 5, 10 | Table 6.2.4-5 | Table 6.2.4-5 |
| .. | | | | | |
| NS_32 | - | - | - | - | - |
| Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region. | | | | | |

## 14.9 LTE Band 2

**Output power table**

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 2 | 20 | 18700 | 1860.0 | QPSK | 1 | 0 | 0 | 23.0 |
| | | | | | 1 | 49 | 0 | 23.1 |
| | | | | | 1 | 99 | 0 | 22.8 |
| | | | | | 50 | 0 | 1 | 22.4 |
| | | | | | 50 | 24 | 1 | 22.3 |
| | | | | | 50 | 49 | 1 | 22.3 |
| | | | | | 100 | 0 | 1 | 22.3 |
| | | | | 16QAM | 1 | 0 | 1 | 22.2 |
| | | | | | 1 | 49 | 1 | 22.1 |
| | | | | | 1 | 99 | 1 | 22.1 |
| | | | | | 50 | 0 | 2 | 21.1 |
| | | | | | 50 | 24 | 2 | 21.2 |
| | | | | | 50 | 49 | 2 | 21.0 |
| | | | | | 100 | 0 | 2 | 21.1 |
| | | 18900 | 1880.0 | QPSK | 1 | 0 | 0 | 23.1 |
| | | | | | 1 | 49 | 0 | 22.9 |
| | | | | | 1 | 99 | 0 | 22.7 |
| | | | | | 50 | 0 | 1 | 22.6 |
| | | | | | 50 | 24 | 1 | 22.4 |
| | | | | | 50 | 49 | 1 | 22.3 |
| | | | | | 100 | 0 | 1 | 22.2 |
| | | | | 16QAM | 1 | 0 | 1 | 22.2 |
| | | | | | 1 | 49 | 1 | 22.2 |
| | | | | | 1 | 99 | 1 | 22.3 |
| | | | | | 50 | 0 | 2 | 21.6 |
| | | | | | 50 | 24 | 2 | 21.2 |
| | | | | | 50 | 49 | 2 | 21.1 |
| | | | | | 100 | 0 | 2 | 21.1 |
| | | 19100 | 1900.0 | QPSK | 1 | 0 | 0 | 22.9 |
| | | | | | 1 | 49 | 0 | 23.1 |
| | | | | | 1 | 99 | 0 | 23.1 |
| | | | | | 50 | 0 | 1 | 22.4 |
| | | | | | 50 | 24 | 1 | 22.3 |
| | | | | | 50 | 49 | 1 | 22.3 |
| | | | | | 100 | 0 | 1 | 22.1 |
| | | | | 16QAM | 1 | 0 | 1 | 22.1 |
| | | | | | 1 | 49 | 1 | 22.2 |
| | | | | | 1 | 99 | 1 | 22.3 |
| | | | | | 50 | 0 | 2 | 21.1 |
| | | | | | 50 | 24 | 2 | 21.1 |
| | | | | | 50 | 49 | 2 | 21.1 |
| | | | | | 100 | 0 | 2 | 21.0 |

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 2 | 15 | 18675 | 1857.5 | QPSK | 1 | 0 | 0 | 23.0 |
| | | | | | 1 | 37 | 0 | 23.1 |
| | | | | | 1 | 74 | 0 | 23.0 |
| | | | | | 36 | 0 | 1 | 22.1 |
| | | | | | 36 | 18 | 1 | 22.4 |
| | | | | | 36 | 35 | 1 | 22.3 |
| | | | | | 75 | 0 | 1 | 22.1 |
| | | | | 16QAM | 1 | 0 | 1 | 22.1 |
| | | | | | 1 | 37 | 1 | 22.3 |
| | | | | | 1 | 74 | 1 | 22.1 |
| | | | | | 36 | 0 | 2 | 21.1 |
| | | | | | 36 | 18 | 2 | 21.1 |
| | | | | | 36 | 35 | 2 | 21.2 |
| | | | | | 75 | 0 | 2 | 21.1 |
| | | 18900 | 1880.0 | QPSK | 1 | 0 | 0 | 23.4 |
| | | | | | 1 | 37 | 0 | 22.9 |
| | | | | | 1 | 74 | 0 | 22.8 |
| | | | | | 36 | 0 | 1 | 22.6 |
| | | | | | 36 | 18 | 1 | 22.5 |
| | | | | | 36 | 35 | 1 | 22.5 |
| | | | | | 75 | 0 | 1 | 22.4 |
| | | | | 16QAM | 1 | 0 | 1 | 22.7 |
| | | | | | 1 | 37 | 1 | 22.6 |
| | | | | | 1 | 74 | 1 | 22.5 |
| | | | | | 36 | 0 | 2 | 21.5 |
| | | | | | 36 | 18 | 2 | 21.5 |
| | | | | | 36 | 35 | 2 | 21.5 |
| | | | | | 75 | 0 | 2 | 21.4 |
| | | 19125 | 1902.5 | QPSK | 1 | 0 | 0 | 22.9 |
| | | | | | 1 | 37 | 0 | 23.2 |
| | | | | | 1 | 74 | 0 | 23.2 |
| | | | | | 36 | 0 | 1 | 22.1 |
| | | | | | 36 | 18 | 1 | 22.0 |
| | | | | | 36 | 35 | 1 | 22.0 |
| | | | | | 75 | 0 | 1 | 22.1 |
| | | | | 16QAM | 1 | 0 | 1 | 22.0 |
| | | | | | 1 | 37 | 1 | 22.4 |
| | | | | | 1 | 74 | 1 | 22.4 |
| | | | | | 36 | 0 | 2 | 21.1 |
| | | | | | 36 | 18 | 2 | 21.0 |
| | | | | | 36 | 35 | 2 | 21.1 |
| | | | | | 75 | 0 | 2 | 21.0 |

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 2 | 10 | 18650 | 1855.0 | QPSK | 1 | 0 | 0 | 23.0 |
| | | | | | 1 | 24 | 0 | 23.1 |
| | | | | | 1 | 49 | 0 | 23.1 |
| | | | | | 25 | 0 | 1 | 22.1 |
| | | | | | 25 | 12 | 1 | 22.0 |
| | | | | | 25 | 24 | 1 | 22.1 |
| | | | | | 50 | 0 | 1 | 22.0 |
| | | | | 16QAM | 1 | 0 | 1 | 22.0 |
| | | | | | 1 | 24 | 1 | 22.2 |
| | | | | | 1 | 49 | 1 | 22.2 |
| | | | | | 25 | 0 | 2 | 21.2 |
| | | | | | 25 | 12 | 2 | 21.1 |
| | | | | | 25 | 24 | 2 | 21.1 |
| | | | | | 50 | 0 | 2 | 21.0 |
| | | 18900 | 1880.0 | QPSK | 1 | 0 | 0 | 23.5 |
| | | | | | 1 | 24 | 0 | 23.4 |
| | | | | | 1 | 49 | 0 | 23.4 |
| | | | | | 25 | 0 | 1 | 22.8 |
| | | | | | 25 | 12 | 1 | 22.8 |
| | | | | | 25 | 24 | 1 | 22.7 |
| | | | | | 50 | 0 | 1 | 22.7 |
| | | | | 16QAM | 1 | 0 | 1 | 22.8 |
| | | | | | 1 | 24 | 1 | 22.8 |
| | | | | | 1 | 49 | 1 | 22.7 |
| | | | | | 25 | 0 | 2 | 21.8 |
| | | | | | 25 | 12 | 2 | 21.9 |
| | | | | | 25 | 24 | 2 | 21.8 |
| | | | | | 50 | 0 | 2 | 21.7 |
| | | 19150 | 1905.0 | QPSK | 1 | 0 | 0 | 23.0 |
| | | | | | 1 | 24 | 0 | 23.1 |
| | | | | | 1 | 49 | 0 | 23.2 |
| | | | | | 25 | 0 | 1 | 22.1 |
| | | | | | 25 | 12 | 1 | 22.0 |
| | | | | | 25 | 24 | 1 | 22.0 |
| | | | | | 50 | 0 | 1 | 22.0 |
| | | | | 16QAM | 1 | 0 | 1 | 22.1 |
| | | | | | 1 | 24 | 1 | 22.2 |
| | | | | | 1 | 49 | 1 | 22.2 |
| | | | | | 25 | 0 | 2 | 21.0 |
| | | | | | 25 | 12 | 2 | 21.1 |
| | | | | | 25 | 24 | 2 | 21.1 |
| | | | | | 50 | 0 | 2 | 21.1 |

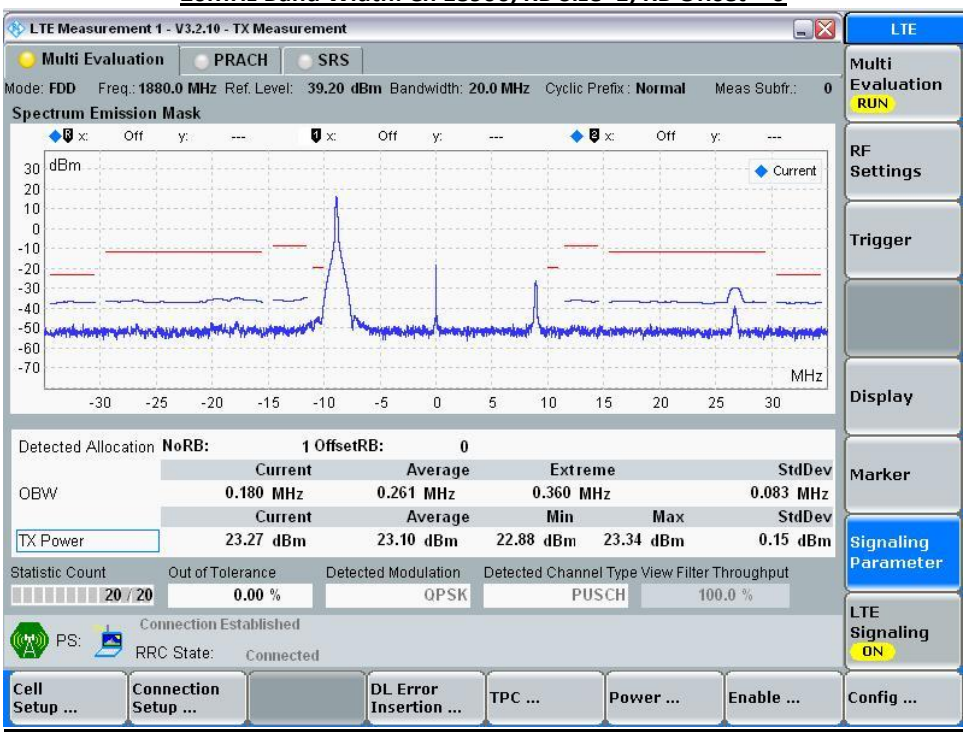
| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 2 | 5 | 18625 | 1852.5 | QPSK | 1 | 0 | 0 | 23.1 |
| | | | | | 1 | 12 | 0 | 23.2 |
| | | | | | 1 | 24 | 0 | 23.1 |
| | | | | | 12 | 0 | 1 | 22.1 |
| | | | | | 12 | 6 | 1 | 22.1 |
| | | | | | 12 | 11 | 1 | 22.2 |
| | | | | | 25 | 0 | 1 | 22.1 |
| | | | | 16QAM | 1 | 0 | 1 | 22.2 |
| | | | | | 1 | 12 | 1 | 22.3 |
| | | | | | 1 | 24 | 1 | 22.2 |
| | | | | | 12 | 0 | 2 | 21.3 |
| | | | | | 12 | 6 | 2 | 21.3 |
| | | | | | 12 | 11 | 2 | 21.3 |
| | | | | | 25 | 0 | 2 | 21.2 |
| | | 18900 | 1880.0 | QPSK | 1 | 0 | 0 | 23.6 |
| | | | | | 1 | 12 | 0 | 23.1 |
| | | | | | 1 | 24 | 0 | 22.9 |
| | | | | | 12 | 0 | 1 | 22.8 |
| | | | | | 12 | 6 | 1 | 22.7 |
| | | | | | 12 | 11 | 1 | 22.7 |
| | | | | | 25 | 0 | 1 | 22.6 |
| | | | | 16QAM | 1 | 0 | 1 | 22.7 |
| | | | | | 1 | 12 | 1 | 22.3 |
| | | | | | 1 | 24 | 1 | 22.1 |
| | | | | | 12 | 0 | 2 | 21.7 |
| | | | | | 12 | 6 | 2 | 21.7 |
| | | | | | 12 | 11 | 2 | 21.6 |
| | | | | | 25 | 0 | 2 | 21.6 |
| | | 19175 | 1907.5 | QPSK | 1 | 0 | 0 | 23.1 |
| | | | | | 1 | 12 | 0 | 23.1 |
| | | | | | 1 | 24 | 0 | 23.2 |
| | | | | | 12 | 0 | 1 | 22.2 |
| | | | | | 12 | 6 | 1 | 22.2 |
| | | | | | 12 | 11 | 1 | 22.2 |
| | | | | | 25 | 0 | 1 | 22.1 |
| | | | | 16QAM | 1 | 0 | 1 | 22.0 |
| | | | | | 1 | 12 | 1 | 22.4 |
| | | | | | 1 | 24 | 1 | 22.3 |
| | | | | | 12 | 0 | 2 | 21.2 |
| | | | | | 12 | 6 | 2 | 21.2 |
| | | | | | 12 | 11 | 2 | 21.2 |
| | | | | | 25 | 0 | 2 | 21.1 |

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 2 | 3 | 18615 | 1851.5 | QPSK | 1 | 0 | 0 | 23.0 |
| | | | | | 1 | 7 | 0 | 23.1 |
| | | | | | 1 | 14 | 0 | 23.0 |
| | | | | | 8 | 0 | 1 | 22.1 |
| | | | | | 8 | 4 | 1 | 22.0 |
| | | | | | 8 | 7 | 1 | 22.1 |
| | | | | | 15 | 0 | 1 | 22.0 |
| | | | | 16QAM | 1 | 0 | 1 | 22.1 |
| | | | | | 1 | 7 | 1 | 22.2 |
| | | | | | 1 | 14 | 1 | 22.1 |
| | | | | | 8 | 0 | 2 | 21.1 |
| | | | | | 8 | 4 | 2 | 21.1 |
| | | | | | 8 | 7 | 2 | 21.1 |
| | | | | | 15 | 0 | 2 | 21.1 |
| | | 18900 | 1880.0 | QPSK | 1 | 0 | 0 | 23.2 |
| | | | | | 1 | 7 | 0 | 23.1 |
| | | | | | 1 | 14 | 0 | 22.9 |
| | | | | | 8 | 0 | 1 | 22.5 |
| | | | | | 8 | 4 | 1 | 22.4 |
| | | | | | 8 | 7 | 1 | 22.4 |
| | | | | | 15 | 0 | 1 | 22.3 |
| | | | | 16QAM | 1 | 0 | 1 | 22.3 |
| | | | | | 1 | 7 | 1 | 22.3 |
| | | | | | 1 | 14 | 1 | 22.2 |
| | | | | | 8 | 0 | 2 | 21.2 |
| | | | | | 8 | 4 | 2 | 21.4 |
| | | | | | 8 | 7 | 2 | 21.3 |
| | | | | | 15 | 0 | 2 | 21.3 |
| | | 19184 | 1908.4 | QPSK | 1 | 0 | 0 | 23.1 |
| | | | | | 1 | 7 | 0 | 23.2 |
| | | | | | 1 | 14 | 0 | 23.2 |
| | | | | | 8 | 0 | 1 | 22.1 |
| | | | | | 8 | 4 | 1 | 22.2 |
| | | | | | 8 | 7 | 1 | 22.3 |
| | | | | | 15 | 0 | 1 | 22.2 |
| | | | | 16QAM | 1 | 0 | 1 | 22.2 |
| | | | | | 1 | 7 | 1 | 22.3 |
| | | | | | 1 | 14 | 1 | 22.3 |
| | | | | | 8 | 0 | 2 | 21.2 |
| | | | | | 8 | 4 | 2 | 21.2 |
| | | | | | 8 | 7 | 2 | 21.3 |
| | | | | | 15 | 0 | 2 | 21.2 |

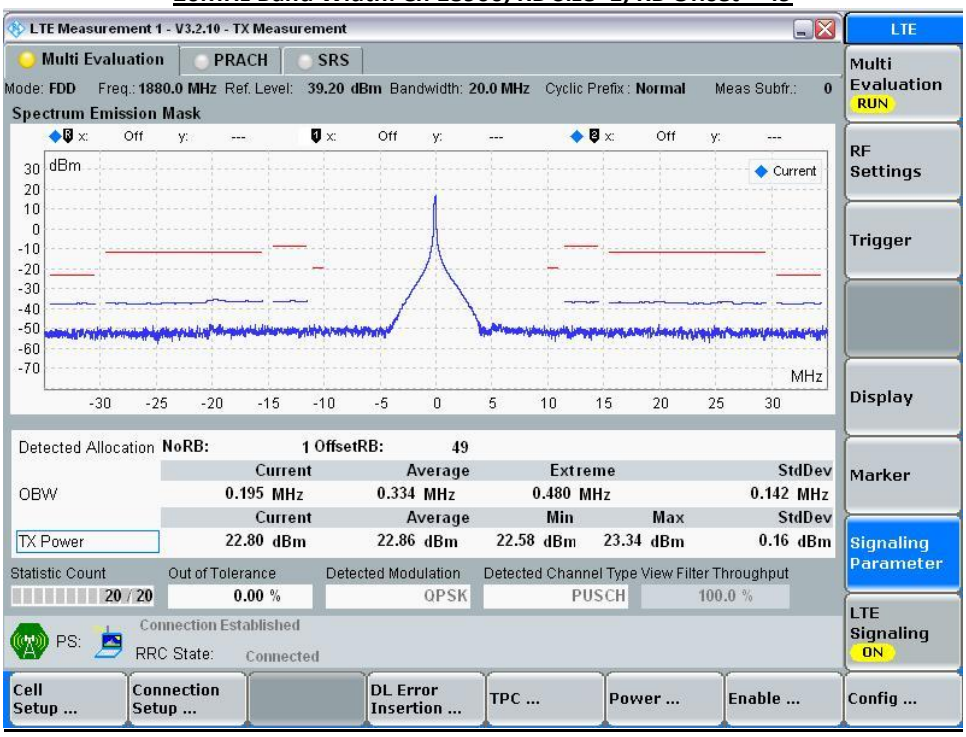
| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 2 | 1.4 | 18607 | 1850.7 | QPSK | 1 | 0 | 0 | 22.7 |
| | | | | | 1 | 2 | 0 | 22.7 |
| | | | | | 1 | 5 | 0 | 22.8 |
| | | | | | 3 | 0 | 1 | 22.7 |
| | | | | | 3 | 1 | 1 | 22.7 |
| | | | | | 3 | 2 | 1 | 22.7 |
| | | | | | 6 | 0 | 1 | 21.7 |
| | | | | 16QAM | 1 | 0 | 1 | 21.9 |
| | | | | | 1 | 2 | 1 | 21.8 |
| | | | | | 1 | 5 | 1 | 21.8 |
| | | | | | 3 | 0 | 2 | 21.8 |
| | | | | | 3 | 1 | 2 | 21.7 |
| | | | | | 3 | 2 | 2 | 21.7 |
| | | | | | 6 | 0 | 2 | 20.8 |
| | | 18900 | 1880.0 | QPSK | 1 | 0 | 0 | 22.7 |
| | | | | | 1 | 2 | 0 | 22.7 |
| | | | | | 1 | 5 | 0 | 22.8 |
| | | | | | 3 | 0 | 1 | 22.7 |
| | | | | | 3 | 1 | 1 | 22.6 |
| | | | | | 3 | 2 | 1 | 22.6 |
| | | | | | 6 | 0 | 1 | 21.7 |
| | | | | 16QAM | 1 | 0 | 1 | 21.9 |
| | | | | | 1 | 2 | 1 | 21.8 |
| | | | | | 1 | 5 | 1 | 21.9 |
| | | | | | 3 | 0 | 2 | 21.7 |
| | | | | | 3 | 1 | 2 | 21.7 |
| | | | | | 3 | 2 | 2 | 21.7 |
| | | | | | 6 | 0 | 2 | 20.7 |
| | | 19192 | 1909.2 | QPSK | 1 | 0 | 0 | 22.9 |
| | | | | | 1 | 2 | 0 | 23.0 |
| | | | | | 1 | 5 | 0 | 23.1 |
| | | | | | 3 | 0 | 1 | 22.8 |
| | | | | | 3 | 1 | 1 | 22.9 |
| | | | | | 3 | 2 | 1 | 22.9 |
| | | | | | 6 | 0 | 1 | 22.0 |
| | | | | 16QAM | 1 | 0 | 1 | 21.9 |
| | | | | | 1 | 2 | 1 | 22.0 |
| | | | | | 1 | 5 | 1 | 22.0 |
| | | | | | 3 | 0 | 2 | 21.8 |
| | | | | | 3 | 1 | 2 | 21.8 |
| | | | | | 3 | 2 | 2 | 21.8 |
| | | | | | 6 | 0 | 2 | 21.0 |

### 14.9.1 Spectrum Plots for the Test RB allocations

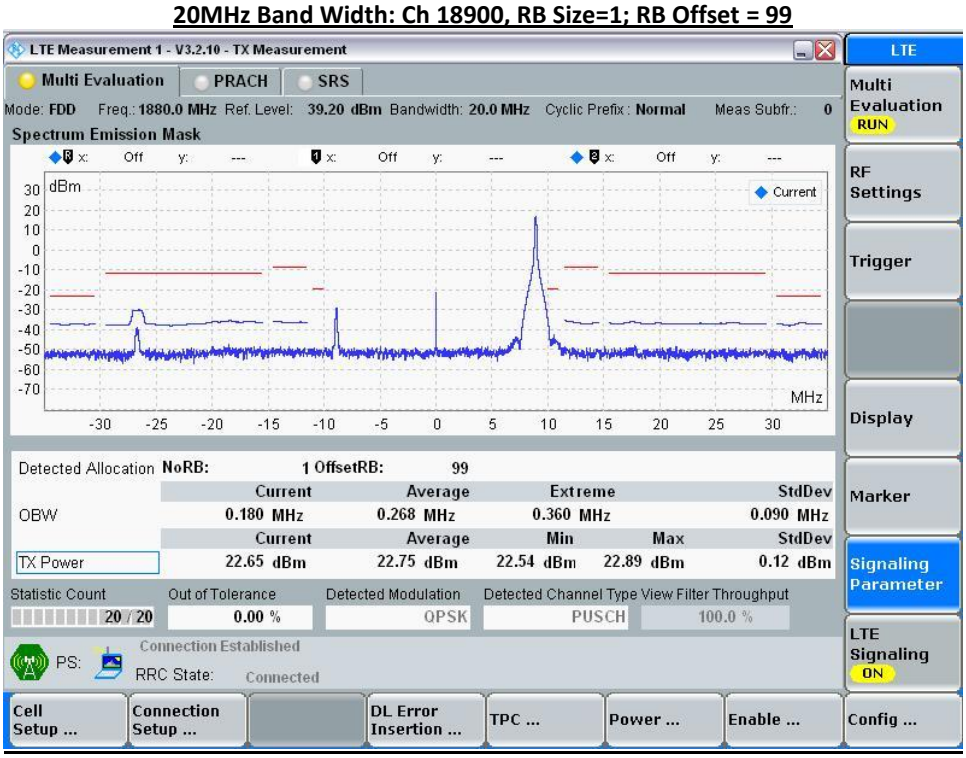
**20MHz Band Width: Ch 18900, RB Size=1; RB Offset = 0**



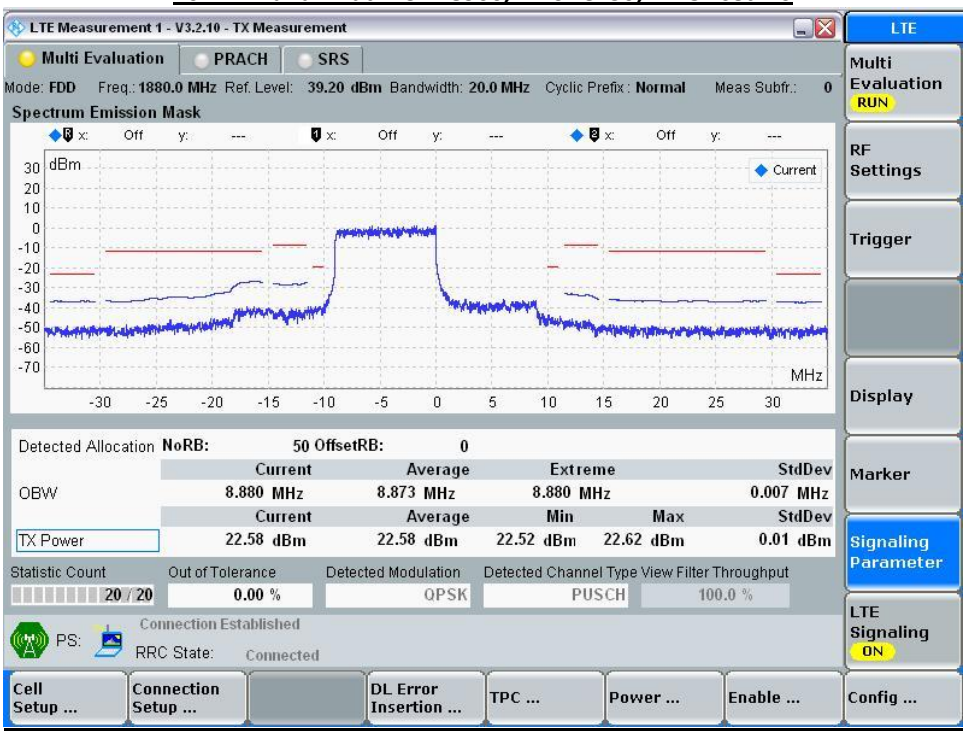

**20MHz Band Width: Ch 18900, RB Size=1; RB Offset = 49**



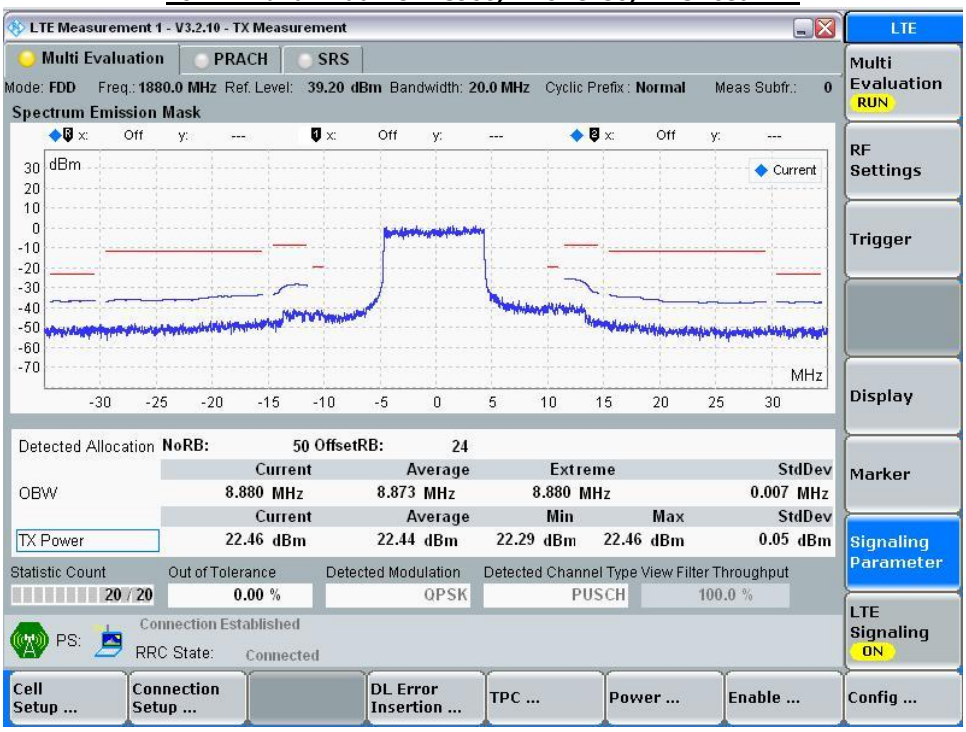
**20MHz Band Width: Ch 18900, RB Size=1; RB Offset = 99**



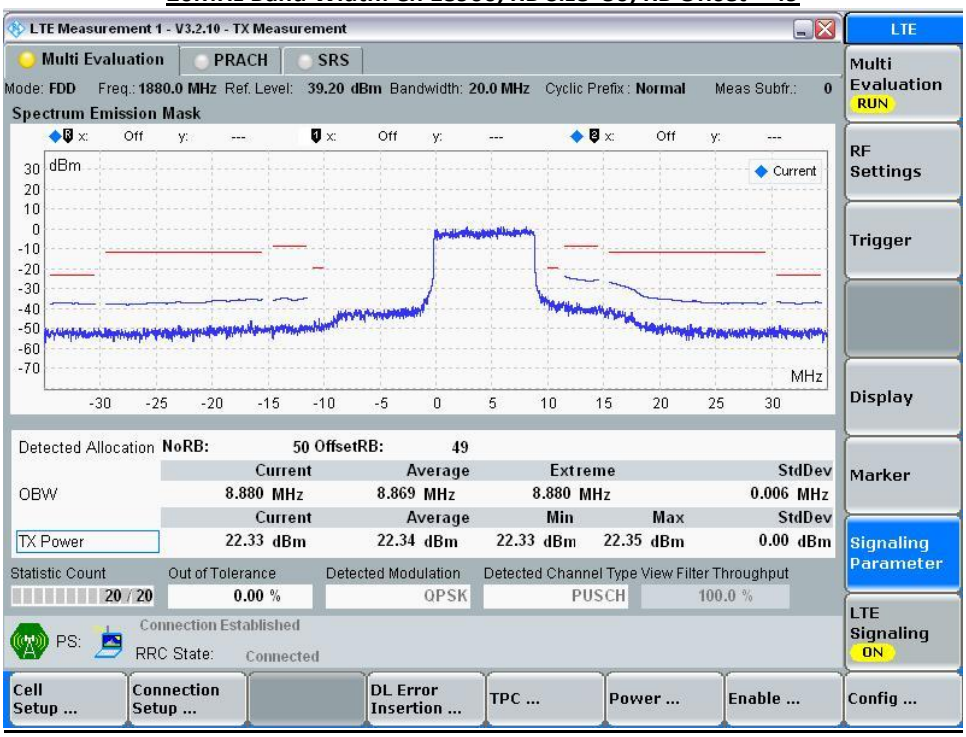

**20MHz Band Width: Ch 18900, RB Size=50; RB Offset = 0**



**20MHz Band Width: Ch 18900, RB Size=50; RB Offset = 24**




**20MHz Band Width: Ch 18900, RB Size=50; RB Offset = 49**



**20MHz Band Width: Ch 18900, RB Size=100; RB Offset = 0**

## 14.10 LTE Band 4

**Output power table**

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 4 | 20 | 20050 | 1720.0 | QPSK | 1 | 0 | 0 | 23.7 |
| | | | | | 1 | 49 | 0 | 23.5 |
| | | | | | 1 | 99 | 0 | 23.6 |
| | | | | | 50 | 0 | 1 | 23.0 |
| | | | | | 50 | 24 | 1 | 22.7 |
| | | | | | 50 | 49 | 1 | 22.7 |
| | | | | | 100 | 0 | 1 | 22.7 |
| | | | | 16QAM | 1 | 0 | 1 | 22.7 |
| | | | | | 1 | 49 | 1 | 22.8 |
| | | | | | 1 | 99 | 1 | 22.7 |
| | | | | | 50 | 0 | 2 | 21.8 |
| | | | | | 50 | 24 | 2 | 21.7 |
| | | | | | 50 | 49 | 2 | 21.7 |
| | | | | | 100 | 0 | 2 | 21.7 |
| | | 20175 | 1732.5 | QPSK | 1 | 0 | 0 | 23.8 |
| | | | | | 1 | 49 | 0 | 23.8 |
| | | | | | 1 | 99 | 0 | 23.8 |
| | | | | | 50 | 0 | 1 | 22.9 |
| | | | | | 50 | 24 | 1 | 22.9 |
| | | | | | 50 | 49 | 1 | 22.9 |
| | | | | | 100 | 0 | 1 | 23.1 |
| | | | | 16QAM | 1 | 0 | 1 | 23.0 |
| | | | | | 1 | 49 | 1 | 23.0 |
| | | | | | 1 | 99 | 1 | 22.8 |
| | | | | | 50 | 0 | 2 | 21.9 |
| | | | | | 50 | 24 | 2 | 21.9 |
| | | | | | 50 | 49 | 2 | 21.9 |
| | | | | | 100 | 0 | 2 | 21.8 |
| | | 20300 | 1745.0 | QPSK | 1 | 0 | 0 | 23.9 |
| | | | | | 1 | 49 | 0 | 23.8 |
| | | | | | 1 | 99 | 0 | 23.5 |
| | | | | | 50 | 0 | 1 | 22.9 |
| | | | | | 50 | 24 | 1 | 22.9 |
| | | | | | 50 | 49 | 1 | 22.9 |
| | | | | | 100 | 0 | 1 | 23.0 |
| | | | | 16QAM | 1 | 0 | 1 | 22.8 |
| | | | | | 1 | 49 | 1 | 22.8 |
| | | | | | 1 | 99 | 1 | 22.4 |
| | | | | | 50 | 0 | 2 | 22.0 |
| | | | | | 50 | 24 | 2 | 21.9 |
| | | | | | 50 | 49 | 2 | 21.9 |
| | | | | | 100 | 0 | 2 | 22.0 |

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 4 | 15 | 20025 | 1717.5 | QPSK | 1 | 0 | 0 | 23.4 |
| | | | | | 1 | 37 | 0 | 23.6 |
| | | | | | 1 | 74 | 0 | 23.4 |
| | | | | | 36 | 0 | 1 | 22.5 |
| | | | | | 36 | 18 | 1 | 22.6 |
| | | | | | 36 | 35 | 1 | 22.5 |
| | | | | | 75 | 0 | 1 | 22.5 |
| | | | | 16QAM | 1 | 0 | 1 | 22.6 |
| | | | | | 1 | 37 | 1 | 22.5 |
| | | | | | 1 | 74 | 1 | 22.5 |
| | | | | | 36 | 0 | 2 | 21.5 |
| | | | | | 36 | 18 | 2 | 21.6 |
| | | | | | 36 | 35 | 2 | 21.5 |
| | | | | | 75 | 0 | 2 | 21.5 |
| | | 20175 | 1732.5 | QPSK | 1 | 0 | 0 | 23.7 |
| | | | | | 1 | 37 | 0 | 23.8 |
| | | | | | 1 | 74 | 0 | 23.7 |
| | | | | | 36 | 0 | 1 | 22.7 |
| | | | | | 36 | 18 | 1 | 22.7 |
| | | | | | 36 | 35 | 1 | 22.7 |
| | | | | | 75 | 0 | 1 | 22.7 |
| | | | | 16QAM | 1 | 0 | 1 | 22.6 |
| | | | | | 1 | 37 | 1 | 22.7 |
| | | | | | 1 | 74 | 1 | 22.8 |
| | | | | | 36 | 0 | 2 | 21.8 |
| | | | | | 36 | 18 | 2 | 21.7 |
| | | | | | 36 | 35 | 2 | 21.7 |
| | | | | | 75 | 0 | 2 | 21.7 |
| | | 20325 | 1747.5 | QPSK | 1 | 0 | 0 | 23.8 |
| | | | | | 1 | 37 | 0 | 23.7 |
| | | | | | 1 | 74 | 0 | 23.6 |
| | | | | | 36 | 0 | 1 | 22.9 |
| | | | | | 36 | 18 | 1 | 22.8 |
| | | | | | 36 | 35 | 1 | 22.8 |
| | | | | | 75 | 0 | 1 | 22.8 |
| | | | | 16QAM | 1 | 0 | 1 | 22.9 |
| | | | | | 1 | 37 | 1 | 23.9 |
| | | | | | 1 | 74 | 1 | 22.8 |
| | | | | | 36 | 0 | 2 | 21.9 |
| | | | | | 36 | 18 | 2 | 21.8 |
| | | | | | 36 | 35 | 2 | 21.8 |
| | | | | | 75 | 0 | 2 | 21.8 |

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 4 | 10 | 20000 | 1715.0 | QPSK | 1 | 0 | 0 | 23.4 |
| | | | | | 1 | 24 | 0 | 23.5 |
| | | | | | 1 | 49 | 0 | 23.5 |
| | | | | | 25 | 0 | 1 | 22.5 |
| | | | | | 25 | 12 | 1 | 22.5 |
| | | | | | 25 | 24 | 1 | 22.5 |
| | | | | | 50 | 0 | 1 | 22.4 |
| | | | | 16QAM | 1 | 0 | 1 | 22.6 |
| | | | | | 1 | 24 | 1 | 22.6 |
| | | | | | 1 | 49 | 1 | 22.5 |
| | | | | | 25 | 0 | 2 | 21.5 |
| | | | | | 25 | 12 | 2 | 21.5 |
| | | | | | 25 | 24 | 2 | 21.5 |
| | | | | | 50 | 0 | 2 | 21.4 |
| | | 20175 | 1732.5 | QPSK | 1 | 0 | 0 | 23.6 |
| | | | | | 1 | 24 | 0 | 23.7 |
| | | | | | 1 | 49 | 0 | 23.6 |
| | | | | | 25 | 0 | 1 | 22.7 |
| | | | | | 25 | 12 | 1 | 22.7 |
| | | | | | 25 | 24 | 1 | 22.6 |
| | | | | | 50 | 0 | 1 | 22.6 |
| | | | | 16QAM | 1 | 0 | 1 | 22.8 |
| | | | | | 1 | 24 | 1 | 22.8 |
| | | | | | 1 | 49 | 1 | 22.8 |
| | | | | | 25 | 0 | 2 | 21.6 |
| | | | | | 25 | 12 | 2 | 21.7 |
| | | | | | 25 | 24 | 2 | 21.7 |
| | | | | | 50 | 0 | 2 | 21.6 |
| | | 20350 | 1750.0 | QPSK | 1 | 0 | 0 | 23.6 |
| | | | | | 1 | 24 | 0 | 23.7 |
| | | | | | 1 | 49 | 0 | 23.5 |
| | | | | | 25 | 0 | 1 | 22.7 |
| | | | | | 25 | 12 | 1 | 22.7 |
| | | | | | 25 | 24 | 1 | 22.7 |
| | | | | | 50 | 0 | 1 | 22.7 |
| | | | | 16QAM | 1 | 0 | 1 | 22.9 |
| | | | | | 1 | 24 | 1 | 22.8 |
| | | | | | 1 | 49 | 1 | 22.6 |
| | | | | | 25 | 0 | 2 | 21.7 |
| | | | | | 25 | 12 | 2 | 21.7 |
| | | | | | 25 | 24 | 2 | 21.8 |
| | | | | | 50 | 0 | 2 | 21.7 |

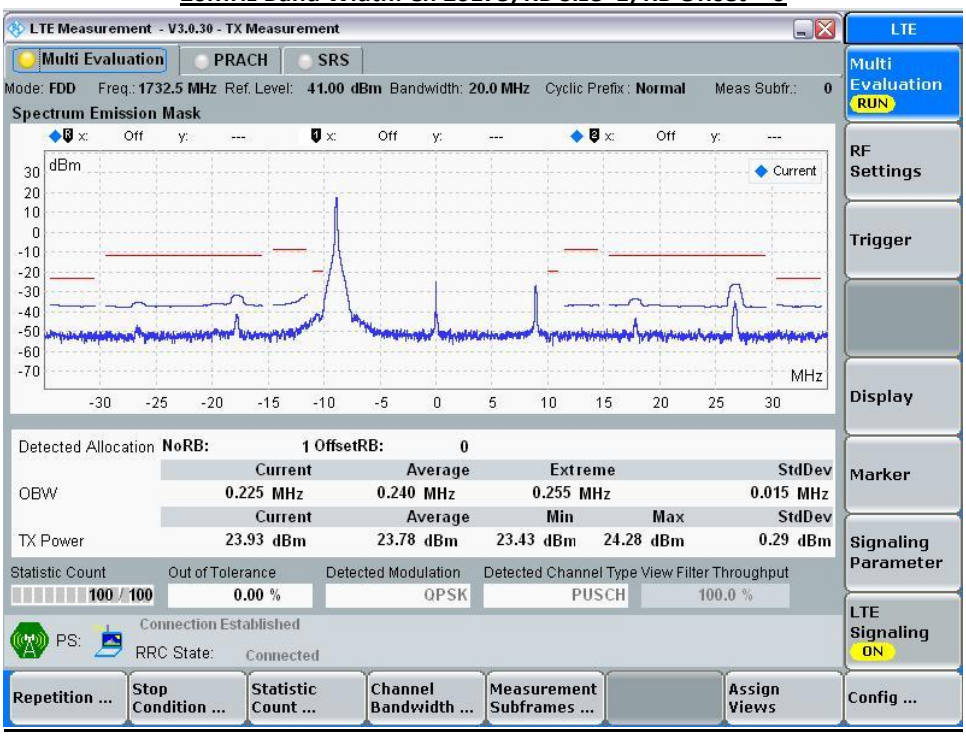
| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 4 | 5 | 19975 | 1712.5 | QPSK | 1 | 0 | 0 | 23.6 |
| | | | | | 1 | 12 | 0 | 23.6 |
| | | | | | 1 | 24 | 0 | 23.6 |
| | | | | | 12 | 0 | 1 | 22.6 |
| | | | | | 12 | 6 | 1 | 22.6 |
| | | | | | 12 | 11 | 1 | 22.7 |
| | | | | | 25 | 0 | 1 | 22.6 |
| | | | | 16QAM | 1 | 0 | 1 | 22.7 |
| | | | | | 1 | 12 | 1 | 22.7 |
| | | | | | 1 | 24 | 1 | 22.7 |
| | | | | | 12 | 0 | 2 | 21.6 |
| | | | | | 12 | 6 | 2 | 22.6 |
| | | | | | 12 | 11 | 2 | 22.6 |
| | | | | | 25 | 0 | 2 | 22.6 |
| | | 20175 | 1732.5 | QPSK | 1 | 0 | 0 | 23.6 |
| | | | | | 1 | 12 | 0 | 23.7 |
| | | | | | 1 | 24 | 0 | 23.7 |
| | | | | | 12 | 0 | 1 | 22.7 |
| | | | | | 12 | 6 | 1 | 22.7 |
| | | | | | 12 | 11 | 1 | 22.6 |
| | | | | | 25 | 0 | 1 | 22.6 |
| | | | | 16QAM | 1 | 0 | 1 | 22.7 |
| | | | | | 1 | 12 | 1 | 22.7 |
| | | | | | 1 | 24 | 1 | 22.8 |
| | | | | | 12 | 0 | 2 | 21.8 |
| | | | | | 12 | 6 | 2 | 21.8 |
| | | | | | 12 | 11 | 2 | 21.8 |
| | | | | | 25 | 0 | 2 | 21.7 |
| | | 20375 | 1752.5 | QPSK | 1 | 0 | 0 | 23.7 |
| | | | | | 1 | 12 | 0 | 23.8 |
| | | | | | 1 | 24 | 0 | 23.6 |
| | | | | | 12 | 0 | 1 | 22.8 |
| | | | | | 12 | 6 | 1 | 22.9 |
| | | | | | 12 | 11 | 1 | 22.8 |
| | | | | | 25 | 0 | 1 | 22.7 |
| | | | | 16QAM | 1 | 0 | 1 | 22.8 |
| | | | | | 1 | 12 | 1 | 22.8 |
| | | | | | 1 | 24 | 1 | 22.7 |
| | | | | | 12 | 0 | 2 | 21.7 |
| | | | | | 12 | 6 | 2 | 21.7 |
| | | | | | 12 | 11 | 2 | 21.7 |
| | | | | | 25 | 0 | 2 | 21.7 |

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 4 | 3 | 19965 | 1711.5 | QPSK | 1 | 0 | 0 | 23.6 |
| | | | | | 1 | 7 | 0 | 23.6 |
| | | | | | 1 | 14 | 0 | 23.6 |
| | | | | | 8 | 0 | 1 | 22.7 |
| | | | | | 8 | 4 | 1 | 22.7 |
| | | | | | 8 | 7 | 1 | 22.7 |
| | | | | | 15 | 0 | 1 | 22.6 |
| | | | | 16QAM | 1 | 0 | 1 | 22.6 |
| | | | | | 1 | 7 | 1 | 22.8 |
| | | | | | 1 | 14 | 1 | 22.7 |
| | | | | | 8 | 0 | 2 | 21.8 |
| | | | | | 8 | 4 | 2 | 21.7 |
| | | | | | 8 | 7 | 2 | 21.6 |
| | | | | | 15 | 0 | 2 | 21.6 |
| | | 20175 | 1732.5 | QPSK | 1 | 0 | 0 | 23.6 |
| | | | | | 1 | 7 | 0 | 23.8 |
| | | | | | 1 | 14 | 0 | 23.8 |
| | | | | | 8 | 0 | 1 | 22.8 |
| | | | | | 8 | 4 | 1 | 22.8 |
| | | | | | 8 | 7 | 1 | 22.8 |
| | | | | | 15 | 0 | 1 | 22.7 |
| | | | | 16QAM | 1 | 0 | 1 | 22.7 |
| | | | | | 1 | 7 | 1 | 22.8 |
| | | | | | 1 | 14 | 1 | 22.8 |
| | | | | | 8 | 0 | 2 | 21.7 |
| | | | | | 8 | 4 | 2 | 21.7 |
| | | | | | 8 | 7 | 2 | 21.8 |
| | | | | | 15 | 0 | 2 | 21.8 |
| | | 20384 | 1753.4 | QPSK | 1 | 0 | 0 | 23.7 |
| | | | | | 1 | 7 | 0 | 23.7 |
| | | | | | 1 | 14 | 0 | 23.7 |
| | | | | | 8 | 0 | 1 | 22.8 |
| | | | | | 8 | 4 | 1 | 22.8 |
| | | | | | 8 | 7 | 1 | 22.8 |
| | | | | | 15 | 0 | 1 | 22.7 |
| | | | | 16QAM | 1 | 0 | 1 | 22.6 |
| | | | | | 1 | 7 | 1 | 22.6 |
| | | | | | 1 | 14 | 1 | 22.5 |
| | | | | | 8 | 0 | 2 | 21.8 |
| | | | | | 8 | 4 | 2 | 21.7 |
| | | | | | 8 | 7 | 2 | 21.8 |
| | | | | | 15 | 0 | 2 | 21.8 |

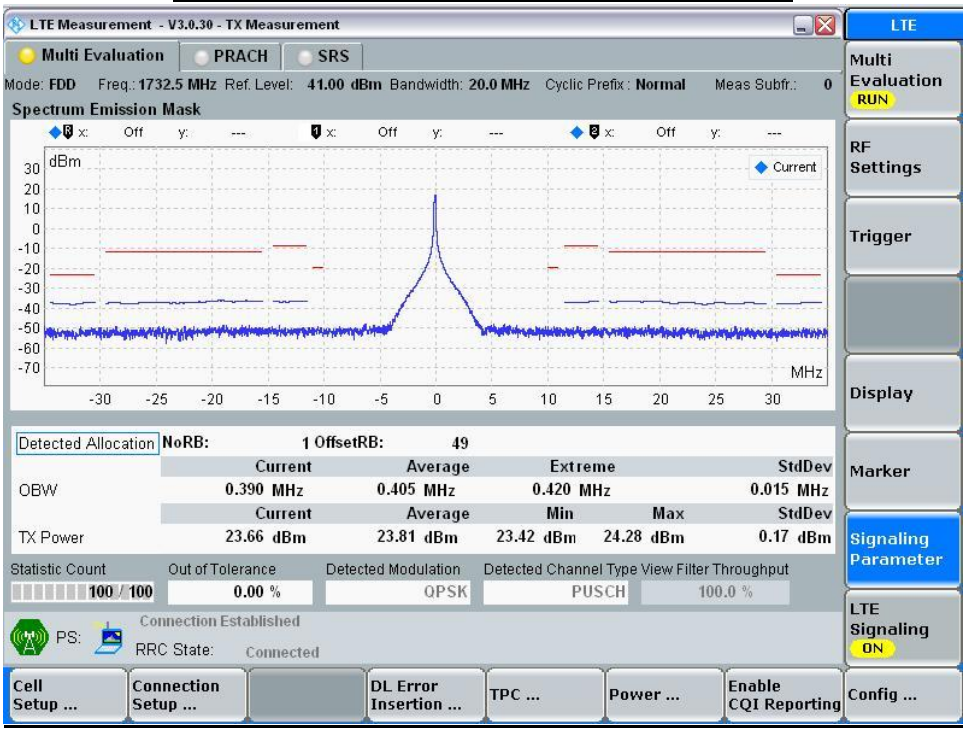
| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 4 | 1.4 | 19957 | 1710.7 | QPSK | 1 | 0 | 0 | 23.5 |
| | | | | | 1 | 2 | 0 | 23.5 |
| | | | | | 1 | 5 | 0 | 23.5 |
| | | | | | 3 | 0 | 1 | 23.3 |
| | | | | | 3 | 1 | 1 | 23.3 |
| | | | | | 3 | 2 | 1 | 23.4 |
| | | | | | 6 | 0 | 1 | 22.5 |
| | | | | 16QAM | 1 | 0 | 1 | 22.6 |
| | | | | | 1 | 2 | 1 | 22.6 |
| | | | | | 1 | 5 | 1 | 22.7 |
| | | | | | 3 | 0 | 2 | 22.4 |
| | | | | | 3 | 1 | 2 | 22.2 |
| | | | | | 3 | 2 | 2 | 22.4 |
| | | | | | 6 | 0 | 2 | 21.6 |
| | | 20175 | 1732.5 | QPSK | 1 | 0 | 0 | 23.6 |
| | | | | | 1 | 2 | 0 | 23.6 |
| | | | | | 1 | 5 | 0 | 23.7 |
| | | | | | 3 | 0 | 1 | 23.3 |
| | | | | | 3 | 1 | 1 | 23.4 |
| | | | | | 3 | 2 | 1 | 23.4 |
| | | | | | 6 | 0 | 1 | 22.7 |
| | | | | 16QAM | 1 | 0 | 1 | 22.8 |
| | | | | | 1 | 2 | 1 | 22.8 |
| | | | | | 1 | 5 | 1 | 22.7 |
| | | | | | 3 | 0 | 2 | 22.3 |
| | | | | | 3 | 1 | 2 | 22.4 |
| | | | | | 3 | 2 | 2 | 22.4 |
| | | | | | 6 | 0 | 2 | 21.9 |
| | | 20392 | 1754.2 | QPSK | 1 | 0 | 0 | 23.5 |
| | | | | | 1 | 2 | 0 | 23.4 |
| | | | | | 1 | 5 | 0 | 23.4 |
| | | | | | 3 | 0 | 1 | 23.3 |
| | | | | | 3 | 1 | 1 | 23.3 |
| | | | | | 3 | 2 | 1 | 23.3 |
| | | | | | 6 | 0 | 1 | 22.6 |
| | | | | 16QAM | 1 | 0 | 1 | 22.5 |
| | | | | | 1 | 2 | 1 | 22.5 |
| | | | | | 1 | 5 | 1 | 22.5 |
| | | | | | 3 | 0 | 2 | 22.4 |
| | | | | | 3 | 1 | 2 | 22.4 |
| | | | | | 3 | 2 | 2 | 22.2 |
| | | | | | 6 | 0 | 2 | 21.6 |

### 14.10.1 Spectrum Plots for the Test RB allocations

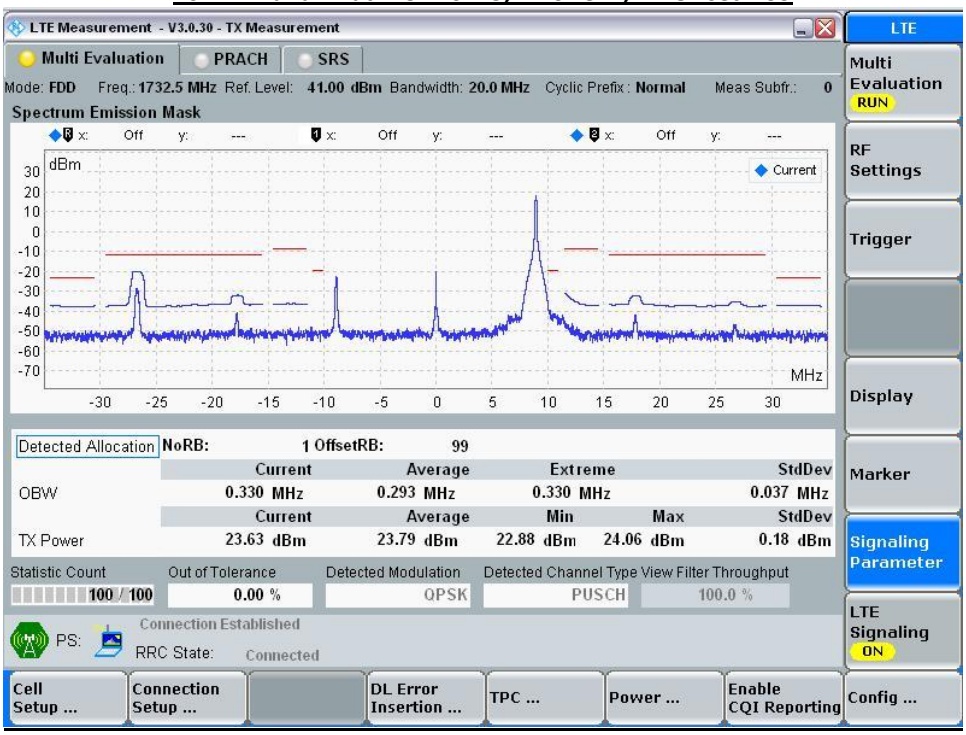
**20MHz Band Width: Ch 20175, RB Size=1; RB Offset = 0**



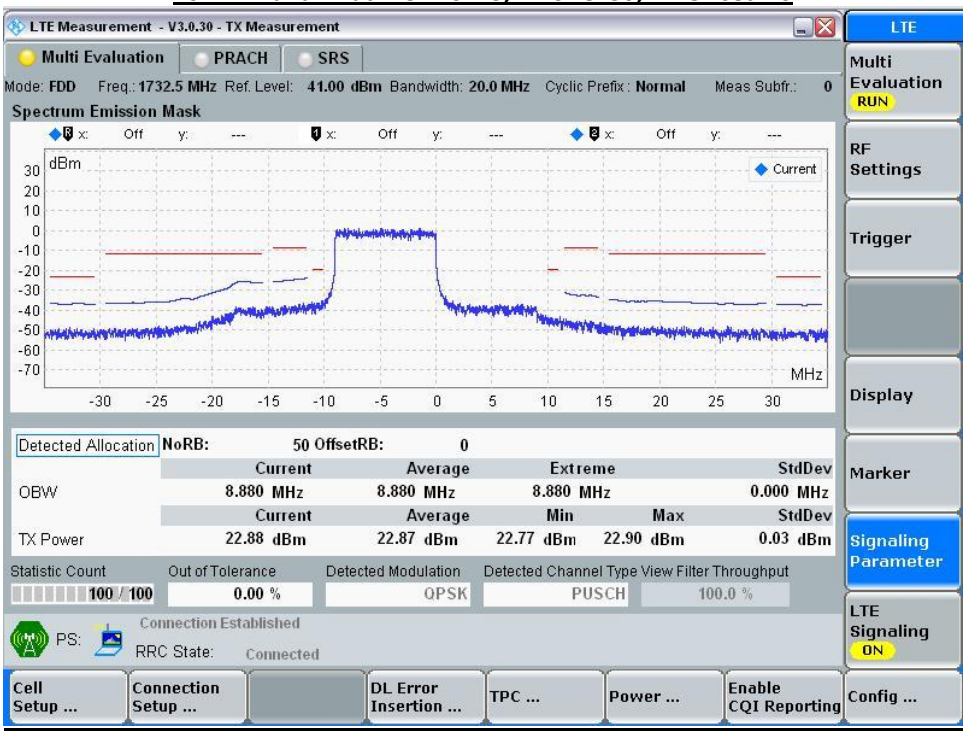

**20MHz Band Width: Ch 20175, RB Size=1; RB Offset = 49**



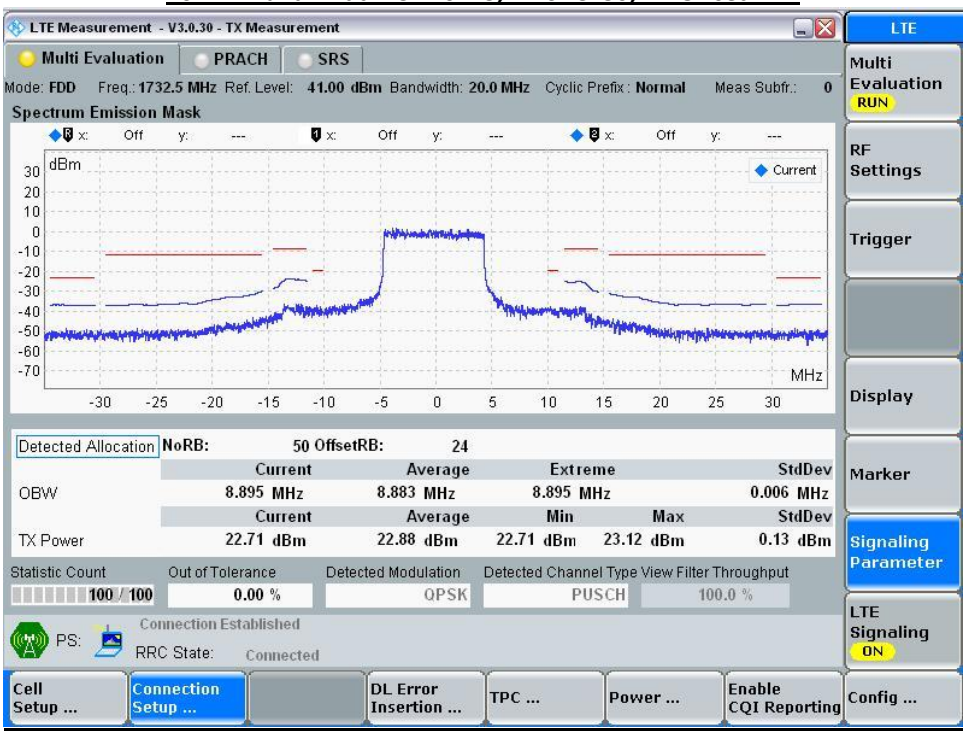
**20MHz Band Width: Ch 20175, RB Size=1; RB Offset = 99**



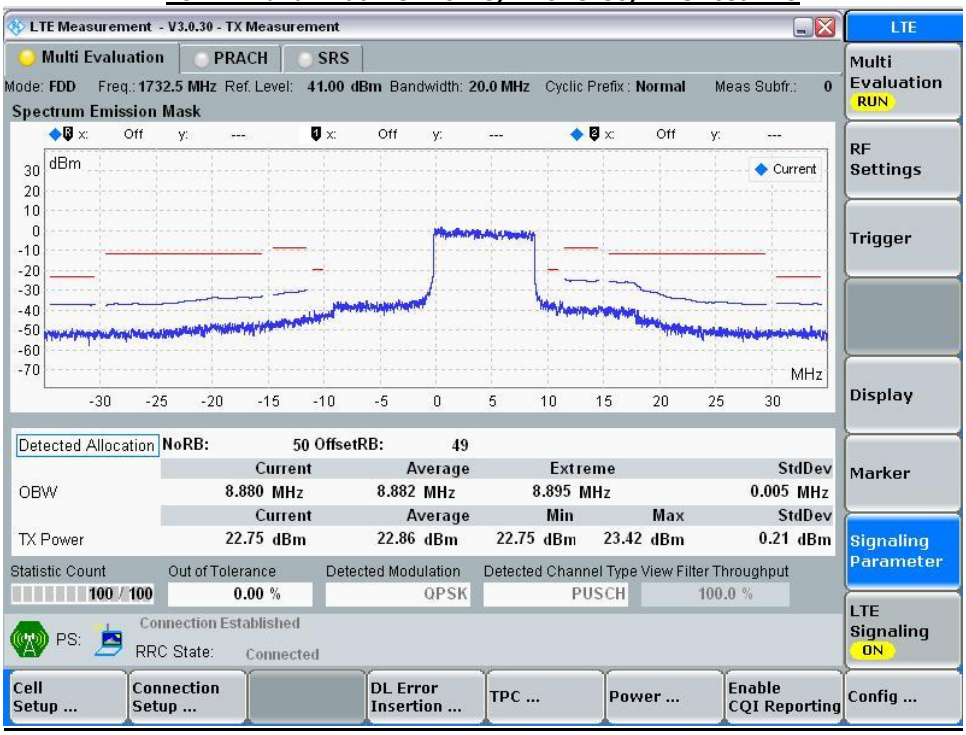

**20MHz Band Width: Ch 20175, RB Size=50; RB Offset = 0**



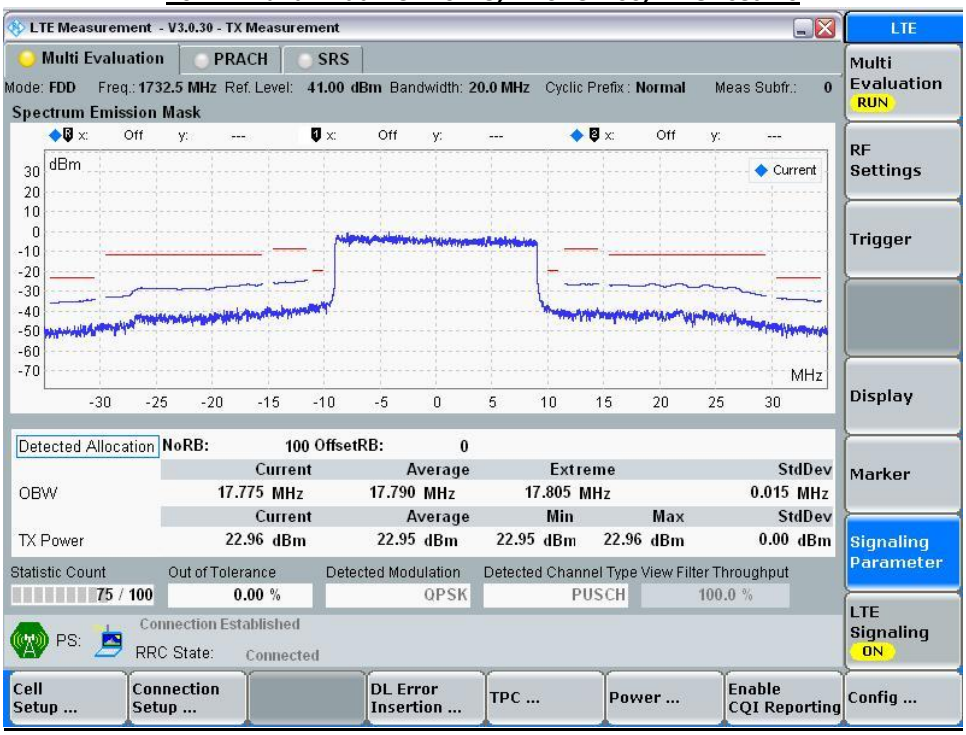
**20MHz Band Width: Ch 20175, RB Size=50; RB Offset = 24**




**20MHz Band Width: Ch 20175, RB Size=50; RB Offset = 49**



**20MHz Band Width: Ch 20175, RB Size=100; RB Offset = 0**



## 14.11 LTE Band 5

**Output power table**

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 5 | 10 | 20450 | 829.0 | QPSK | 1 | 0 | 0 | 23.5 |
| | | | | | 1 | 24 | 0 | 23.5 |
| | | | | | 1 | 49 | 0 | 23.5 |
| | | | | | 25 | 0 | 1 | 22.6 |
| | | | | | 25 | 12 | 1 | 22.6 |
| | | | | | 25 | 24 | 1 | 22.7 |
| | | | | | 50 | 0 | 1 | 22.5 |
| | | | | 16QAM | 1 | 0 | 1 | 22.7 |
| | | | | | 1 | 24 | 1 | 22.7 |
| | | | | | 1 | 49 | 1 | 22.7 |
| | | | | | 25 | 0 | 2 | 21.6 |
| | | | | | 25 | 12 | 2 | 21.6 |
| | | | | | 25 | 24 | 2 | 21.6 |
| | | | | | 50 | 0 | 2 | 21.5 |
| | | 20525 | 836.5 | QPSK | 1 | 0 | 0 | 23.4 |
| | | | | | 1 | 24 | 0 | 23.5 |
| | | | | | 1 | 49 | 0 | 23.7 |
| | | | | | 25 | 0 | 1 | 22.5 |
| | | | | | 25 | 12 | 1 | 22.5 |
| | | | | | 25 | 24 | 1 | 22.4 |
| | | | | | 50 | 0 | 1 | 22.4 |
| | | | | 16QAM | 1 | 0 | 1 | 22.6 |
| | | | | | 1 | 24 | 1 | 22.7 |
| | | | | | 1 | 49 | 1 | 22.7 |
| | | | | | 25 | 0 | 2 | 21.6 |
| | | | | | 25 | 12 | 2 | 21.5 |
| | | | | | 25 | 24 | 2 | 21.5 |
| | | | | | 50 | 0 | 2 | 21.5 |
| | | 20600 | 844.0 | QPSK | 1 | 0 | 0 | 23.4 |
| | | | | | 1 | 24 | 0 | 23.2 |
| | | | | | 1 | 49 | 0 | 23.2 |
| | | | | | 25 | 0 | 1 | 22.4 |
| | | | | | 25 | 12 | 1 | 22.4 |
| | | | | | 25 | 24 | 1 | 22.5 |
| | | | | | 50 | 0 | 1 | 22.5 |
| | | | | 16QAM | 1 | 0 | 1 | 22.5 |
| | | | | | 1 | 24 | 1 | 22.2 |
| | | | | | 1 | 49 | 1 | 22.3 |
| | | | | | 25 | 0 | 2 | 21.5 |
| | | | | | 25 | 12 | 2 | 21.5 |
| | | | | | 25 | 24 | 2 | 21.6 |
| | | | | | 50 | 0 | 2 | 21.5 |

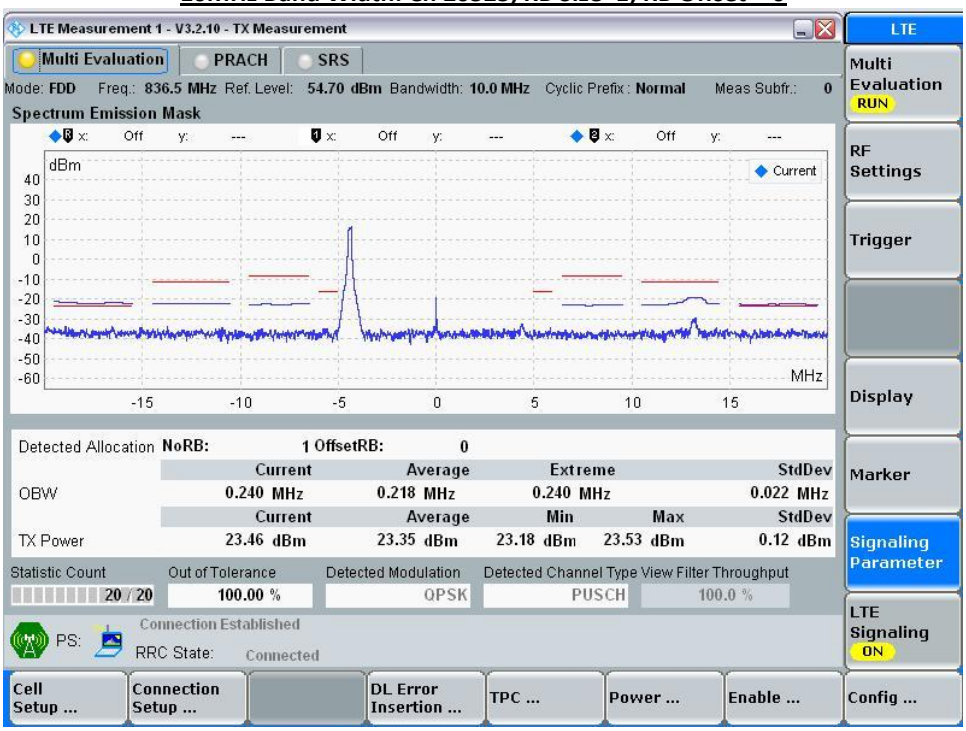
| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 5 | 5 | 20425 | 826.5 | QPSK | 1 | 0 | 0 | 23.6 |
| | | | | | 1 | 12 | 0 | 23.5 |
| | | | | | 1 | 24 | 0 | 23.4 |
| | | | | | 12 | 0 | 1 | 22.7 |
| | | | | | 12 | 6 | 1 | 22.7 |
| | | | | | 12 | 11 | 1 | 22.7 |
| | | | | | 25 | 0 | 1 | 22.6 |
| | | | | 16QAM | 1 | 0 | 1 | 22.8 |
| | | | | | 1 | 12 | 1 | 22.7 |
| | | | | | 1 | 24 | 1 | 22.7 |
| | | | | | 12 | 0 | 2 | 21.7 |
| | | | | | 12 | 6 | 2 | 21.7 |
| | | | | | 12 | 11 | 2 | 21.7 |
| | | | | | 25 | 0 | 2 | 21.7 |
| | | 20525 | 836.5 | QPSK | 1 | 0 | 0 | 23.7 |
| | | | | | 1 | 12 | 0 | 23.7 |
| | | | | | 1 | 24 | 0 | 23.6 |
| | | | | | 12 | 0 | 1 | 22.7 |
| | | | | | 12 | 6 | 1 | 22.7 |
| | | | | | 12 | 11 | 1 | 22.7 |
| | | | | | 25 | 0 | 1 | 22.7 |
| | | | | 16QAM | 1 | 0 | 1 | 22.8 |
| | | | | | 1 | 12 | 1 | 22.9 |
| | | | | | 1 | 24 | 1 | 22.7 |
| | | | | | 12 | 0 | 2 | 21.9 |
| | | | | | 12 | 6 | 2 | 21.7 |
| | | | | | 12 | 11 | 2 | 21.7 |
| | | | | | 25 | 0 | 2 | 21.7 |
| | | 20625 | 846.5 | QPSK | 1 | 0 | 0 | 23.2 |
| | | | | | 1 | 12 | 0 | 23.4 |
| | | | | | 1 | 24 | 0 | 23.3 |
| | | | | | 12 | 0 | 1 | 22.4 |
| | | | | | 12 | 6 | 1 | 22.4 |
| | | | | | 12 | 11 | 1 | 22.5 |
| | | | | | 25 | 0 | 1 | 22.4 |
| | | | | 16QAM | 1 | 0 | 1 | 22.5 |
| | | | | | 1 | 12 | 1 | 22.7 |
| | | | | | 1 | 24 | 1 | 22.6 |
| | | | | | 12 | 0 | 2 | 21.5 |
| | | | | | 12 | 6 | 2 | 21.5 |
| | | | | | 12 | 11 | 2 | 21.5 |
| | | | | | 25 | 0 | 2 | 21.5 |

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 5 | 3 | 20415 | 825.5 | QPSK | 1 | 0 | 0 | 23.6 |
| | | | | | 1 | 7 | 0 | 23.7 |
| | | | | | 1 | 14 | 0 | 23.4 |
| | | | | | 8 | 0 | 1 | 22.8 |
| | | | | | 8 | 4 | 1 | 22.7 |
| | | | | | 8 | 7 | 1 | 22.7 |
| | | | | | 15 | 0 | 1 | 22.7 |
| | | | | 16QAM | 1 | 0 | 1 | 22.8 |
| | | | | | 1 | 7 | 1 | 22.8 |
| | | | | | 1 | 14 | 1 | 22.7 |
| | | | | | 8 | 0 | 2 | 21.8 |
| | | | | | 8 | 4 | 2 | 21.7 |
| | | | | | 8 | 7 | 2 | 21.7 |
| | | | | | 15 | 0 | 2 | 21.8 |
| | | 20525 | 836.5 | QPSK | 1 | 0 | 0 | 23.6 |
| | | | | | 1 | 7 | 0 | 23.7 |
| | | | | | 1 | 14 | 0 | 23.5 |
| | | | | | 8 | 0 | 1 | 22.8 |
| | | | | | 8 | 4 | 1 | 22.7 |
| | | | | | 8 | 7 | 1 | 22.6 |
| | | | | | 15 | 0 | 1 | 22.6 |
| | | | | 16QAM | 1 | 0 | 1 | 22.8 |
| | | | | | 1 | 7 | 1 | 22.8 |
| | | | | | 1 | 14 | 1 | 22.7 |
| | | | | | 8 | 0 | 2 | 22.8 |
| | | | | | 8 | 4 | 2 | 21.6 |
| | | | | | 8 | 7 | 2 | 21.7 |
| | | | | | 15 | 0 | 2 | 21.6 |
| | | 20634 | 847.4 | QPSK | 1 | 0 | 0 | 23.3 |
| | | | | | 1 | 7 | 0 | 23.4 |
| | | | | | 1 | 14 | 0 | 23.2 |
| | | | | | 8 | 0 | 1 | 22.5 |
| | | | | | 8 | 4 | 1 | 22.5 |
| | | | | | 8 | 7 | 1 | 22.5 |
| | | | | | 15 | 0 | 1 | 22.5 |
| | | | | 16QAM | 1 | 0 | 1 | 22.5 |
| | | | | | 1 | 7 | 1 | 22.7 |
| | | | | | 1 | 14 | 1 | 22.4 |
| | | | | | 8 | 0 | 2 | 21.6 |
| | | | | | 8 | 4 | 2 | 21.5 |
| | | | | | 8 | 7 | 2 | 21.5 |
| | | | | | 15 | 0 | 2 | 21.4 |

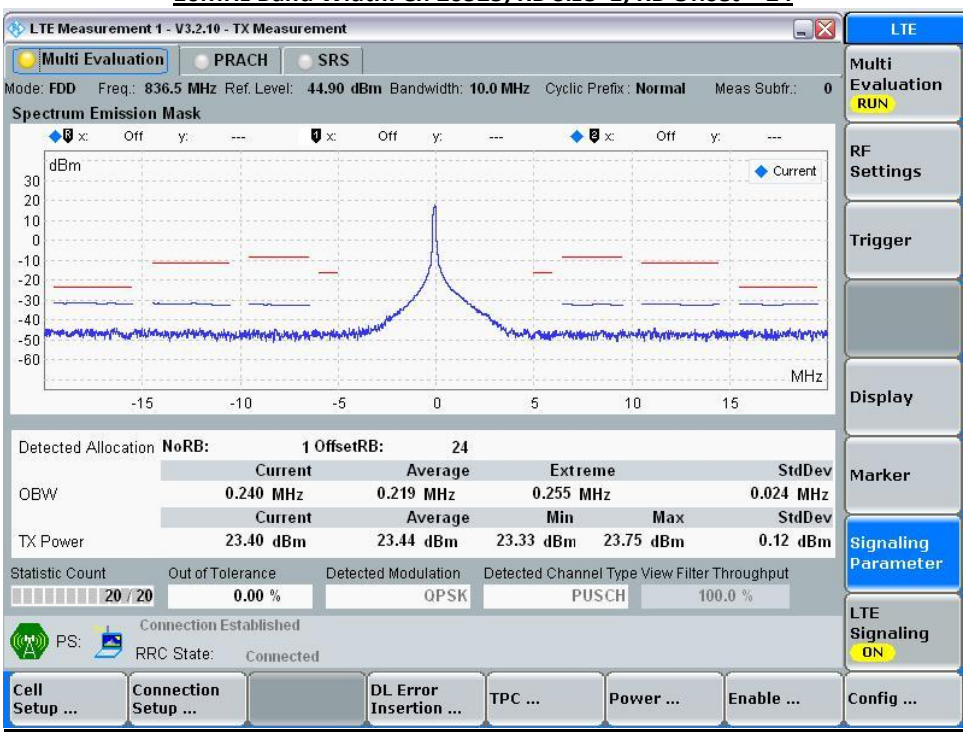
| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 5 | 1.4 | 20407 | 824.7 | QPSK | 1 | 0 | 0 | 23.5 |
| | | | | | 1 | 2 | 0 | 23.5 |
| | | | | | 1 | 5 | 0 | 23.6 |
| | | | | | 3 | 0 | 1 | 23.5 |
| | | | | | 3 | 1 | 1 | 23.5 |
| | | | | | 3 | 2 | 1 | 23.5 |
| | | | | | 6 | 0 | 1 | 22.6 |
| | | | | 16QAM | 1 | 0 | 1 | 22.8 |
| | | | | | 1 | 2 | 1 | 22.9 |
| | | | | | 1 | 5 | 1 | 22.9 |
| | | | | | 3 | 0 | 2 | 22.7 |
| | | | | | 3 | 1 | 2 | 22.6 |
| | | | | | 3 | 2 | 2 | 22.7 |
| | | | | | 6 | 0 | 2 | 21.6 |
| | | 20525 | 836.5 | QPSK | 1 | 0 | 0 | 23.4 |
| | | | | | 1 | 2 | 0 | 23.4 |
| | | | | | 1 | 5 | 0 | 23.4 |
| | | | | | 3 | 0 | 1 | 23.3 |
| | | | | | 3 | 1 | 1 | 23.3 |
| | | | | | 3 | 2 | 1 | 23.3 |
| | | | | | 6 | 0 | 1 | 22.4 |
| | | | | 16QAM | 1 | 0 | 1 | 22.6 |
| | | | | | 1 | 2 | 1 | 22.5 |
| | | | | | 1 | 5 | 1 | 22.4 |
| | | | | | 3 | 0 | 2 | 22.4 |
| | | | | | 3 | 1 | 2 | 22.4 |
| | | | | | 3 | 2 | 2 | 22.5 |
| | | | | | 6 | 0 | 2 | 21.4 |
| | | 20642 | 848.2 | QPSK | 1 | 0 | 0 | 23.2 |
| | | | | | 1 | 2 | 0 | 23.2 |
| | | | | | 1 | 5 | 0 | 23.1 |
| | | | | | 3 | 0 | 1 | 22.8 |
| | | | | | 3 | 1 | 1 | 22.8 |
| | | | | | 3 | 2 | 1 | 22.8 |
| | | | | | 6 | 0 | 1 | 22.3 |
| | | | | 16QAM | 1 | 0 | 1 | 22.3 |
| | | | | | 1 | 2 | 1 | 22.2 |
| | | | | | 1 | 5 | 1 | 22.2 |
| | | | | | 3 | 0 | 2 | 22.1 |
| | | | | | 3 | 1 | 2 | 22.1 |
| | | | | | 3 | 2 | 2 | 22.2 |
| | | | | | 6 | 0 | 2 | 22.1 |

### 14.11.1 Spectrum Plots for the Test RB allocations

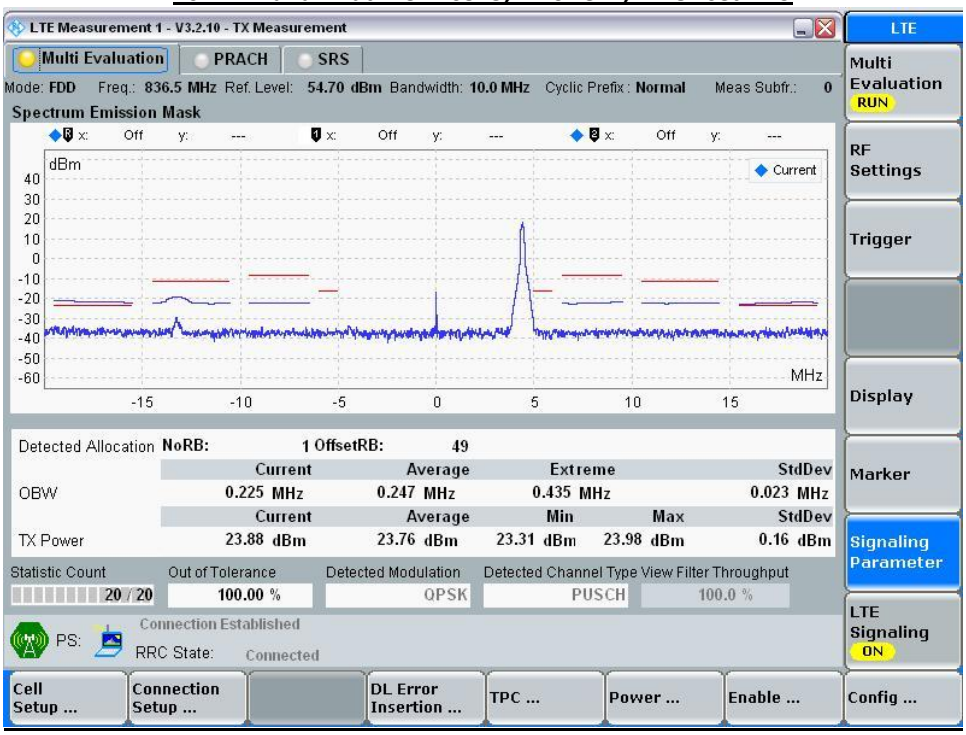
**10MHz Band Width: Ch 20525, RB Size=1; RB Offset = 0**



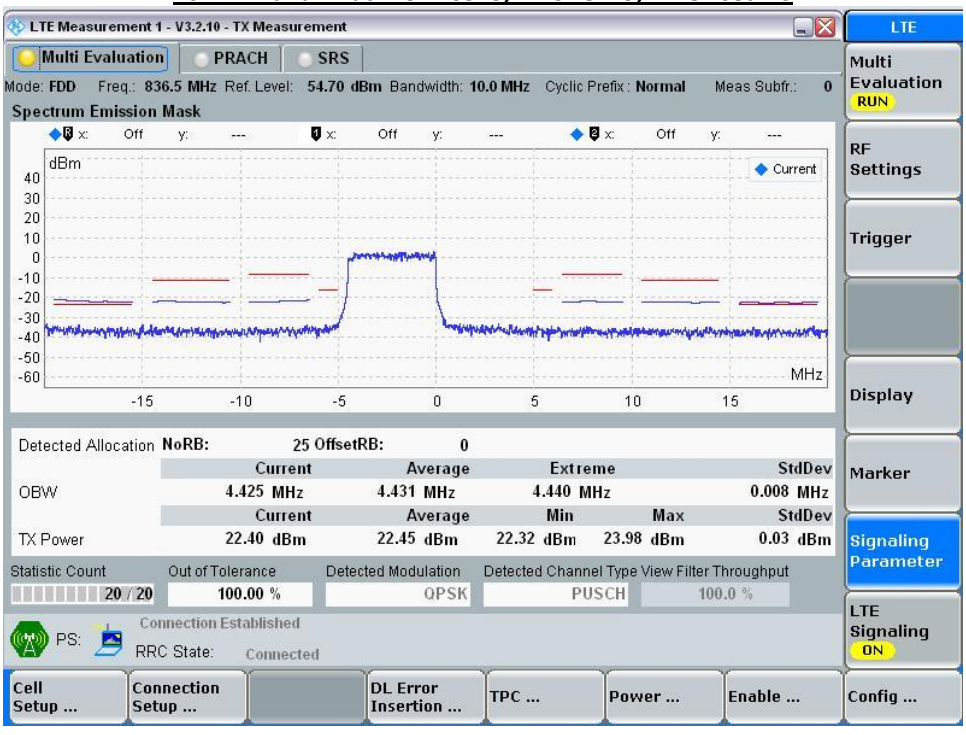

**10MHz Band Width: Ch 20525, RB Size=1; RB Offset = 24**



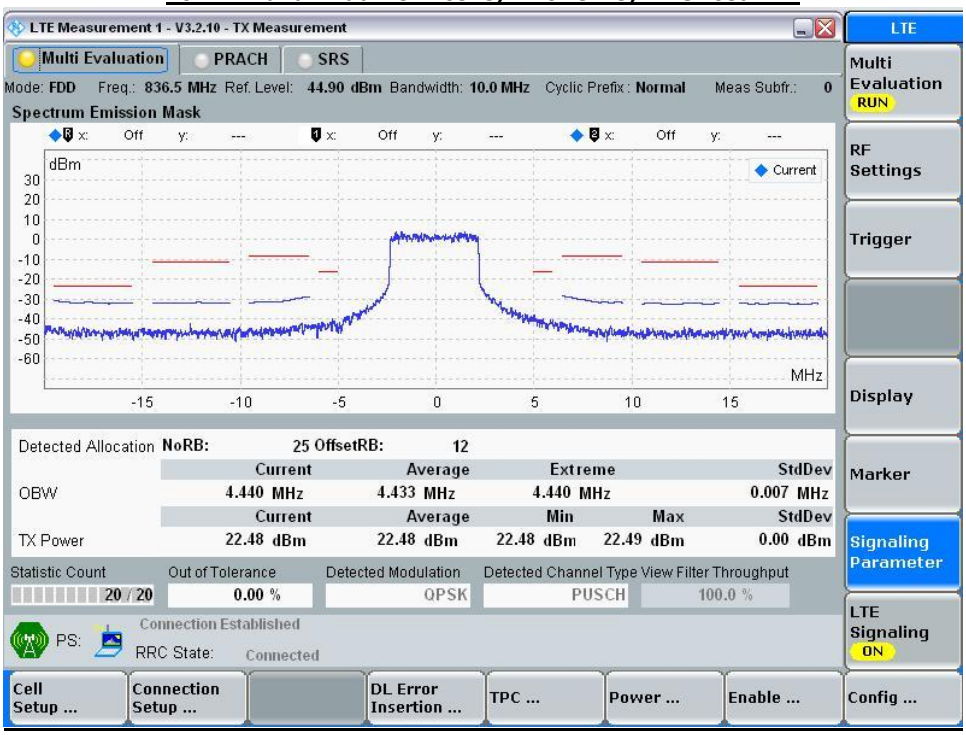
**10MHz Band Width: Ch 20525, RB Size=1; RB Offset = 49**



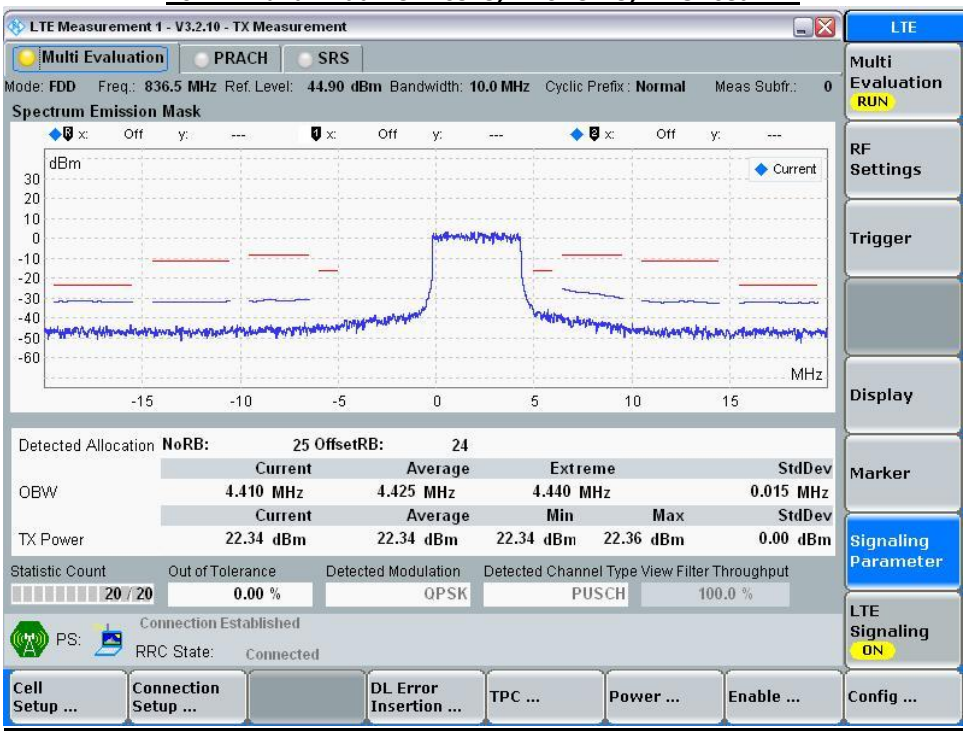

**10MHz Band Width: Ch 20525, RB Size=25; RB Offset = 0**



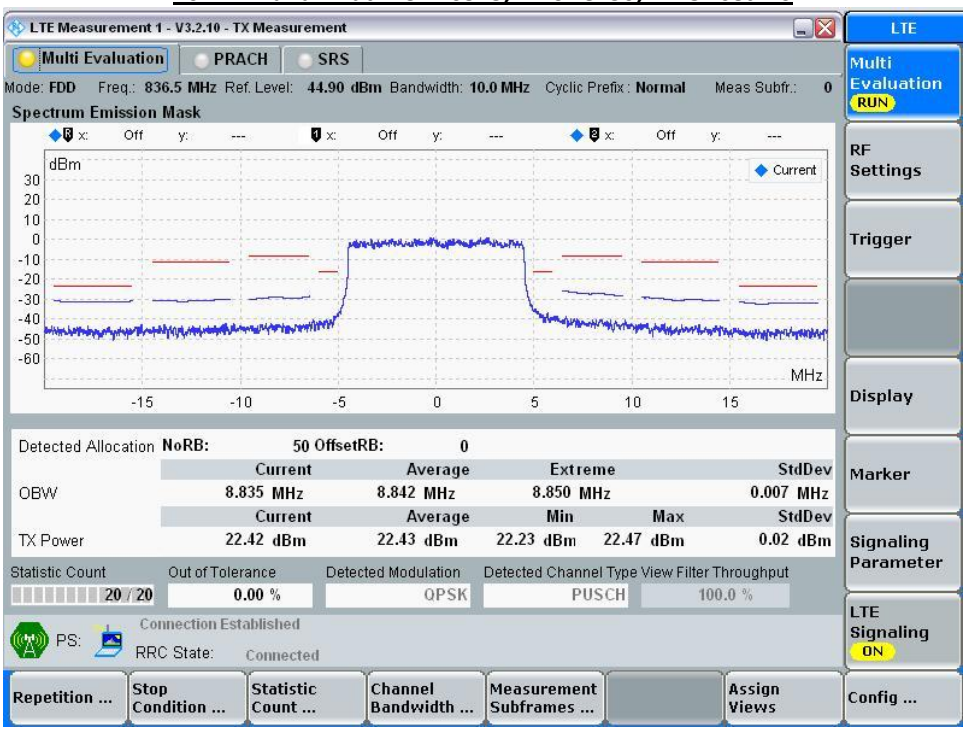
**10MHz Band Width: Ch 20525, RB Size=25; RB Offset = 12**




**10MHz Band Width: Ch 20525, RB Size=25; RB Offset = 24**



**10MHz Band Width: Ch 20525, RB Size=50; RB Offset = 0**



## 14.12 LTE Band 13

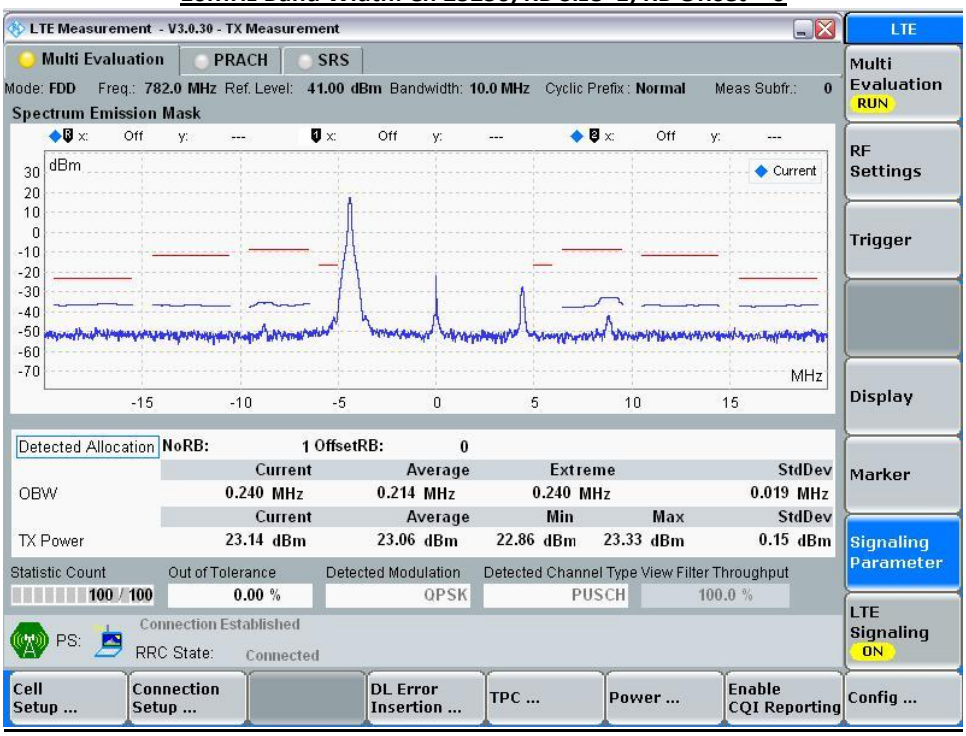
**Output power table**

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 13 | 10 | 23230 | 782.0 | QPSK | 1 | 0 | 0 | 23.1 |
| | | | | | 1 | 24 | 0 | 23.4 |
| | | | | | 1 | 49 | 0 | 23.3 |
| | | | | | 25 | 0 | 1 | 22.2 |
| | | | | | 25 | 12 | 1 | 22.5 |
| | | | | | 25 | 24 | 1 | 22.4 |
| | | | | | 50 | 0 | 1 | 22.2 |
| | | | | 16QAM | 1 | 0 | 1 | 22.3 |
| | | | | | 1 | 24 | 1 | 22.4 |
| | | | | | 1 | 49 | 1 | 22.4 |
| | | | | | 25 | 0 | 2 | 21.1 |
| | | | | | 25 | 12 | 2 | 21.4 |
| | | | | | 25 | 24 | 2 | 21.3 |
| | | | | | 50 | 0 | 2 | 21.3 |

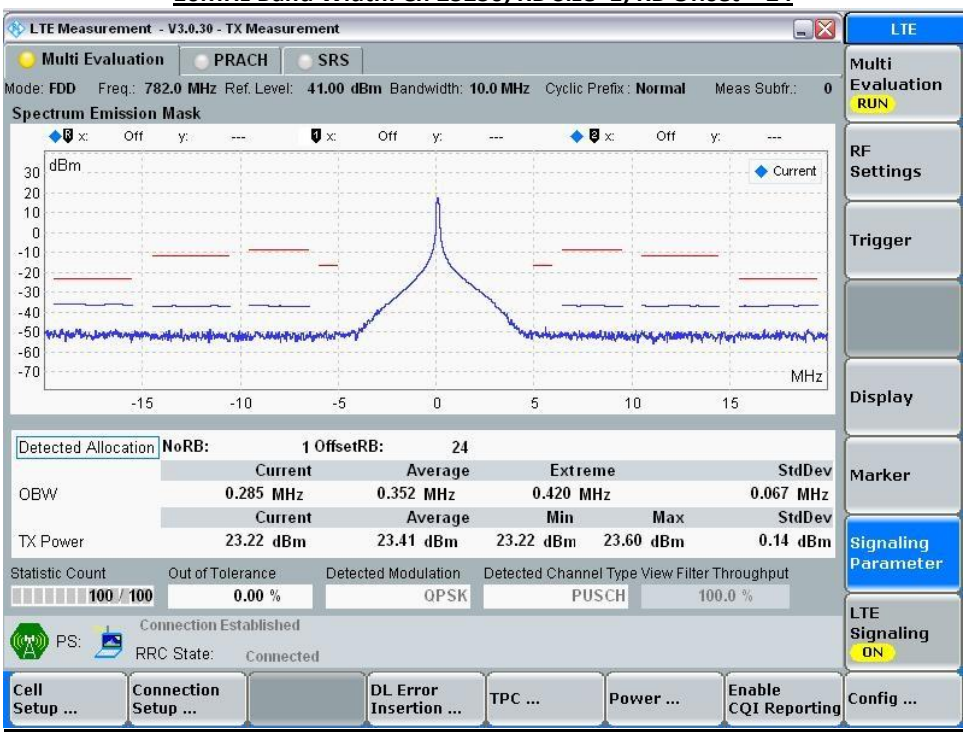
| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 13 | 5 | 23205 | 779.5 | QPSK | 1 | 0 | 0 | 23.2 |
| | | | | | 1 | 12 | 0 | 23.3 |
| | | | | | 1 | 24 | 0 | 23.4 |
| | | | | | 12 | 0 | 1 | 22.3 |
| | | | | | 12 | 6 | 1 | 22.3 |
| | | | | | 12 | 11 | 1 | 22.4 |
| | | | | | 25 | 0 | 1 | 22.3 |
| | | | | 16QAM | 1 | 0 | 1 | 22.3 |
| | | | | | 1 | 12 | 1 | 22.5 |
| | | | | | 1 | 24 | 1 | 22.4 |
| | | | | | 12 | 0 | 2 | 21.3 |
| | | | | | 12 | 6 | 2 | 21.3 |
| | | | | | 12 | 11 | 2 | 21.3 |
| | | | | | 25 | 0 | 2 | 21.3 |
| | | 23230 | 752.0 | QPSK | 1 | 0 | 0 | 23.2 |
| | | | | | 1 | 12 | 0 | 23.4 |
| | | | | | 1 | 24 | 0 | 23.4 |
| | | | | | 12 | 0 | 1 | 22.4 |
| | | | | | 12 | 6 | 1 | 22.5 |
| | | | | | 12 | 11 | 1 | 22.5 |
| | | | | | 25 | 0 | 1 | 22.3 |
| | | | | 16QAM | 1 | 0 | 1 | 22.1 |
| | | | | | 1 | 12 | 1 | 22.4 |
| | | | | | 1 | 24 | 1 | 22.5 |
| | | | | | 12 | 0 | 2 | 21.5 |
| | | | | | 12 | 6 | 2 | 21.5 |
| | | | | | 12 | 11 | 2 | 21.7 |
| | | | | | 25 | 0 | 2 | 21.5 |
| | | 23255 | 784.5 | QPSK | 1 | 0 | 0 | 23.4 |
| | | | | | 1 | 12 | 0 | 23.6 |
| | | | | | 1 | 24 | 0 | 23.2 |
| | | | | | 12 | 0 | 1 | 22.5 |
| | | | | | 12 | 6 | 1 | 22.4 |
| | | | | | 12 | 11 | 1 | 22.6 |
| | | | | | 25 | 0 | 1 | 22.5 |
| | | | | 16QAM | 1 | 0 | 1 | 22.5 |
| | | | | | 1 | 12 | 1 | 22.8 |
| | | | | | 1 | 24 | 1 | 22.3 |
| | | | | | 12 | 0 | 2 | 21.5 |
| | | | | | 12 | 6 | 2 | 21.5 |
| | | | | | 12 | 11 | 2 | 21.6 |
| | | | | | 25 | 0 | 2 | 21.5 |

### 14.12.1 Spectrum Plots for the Test RB allocations

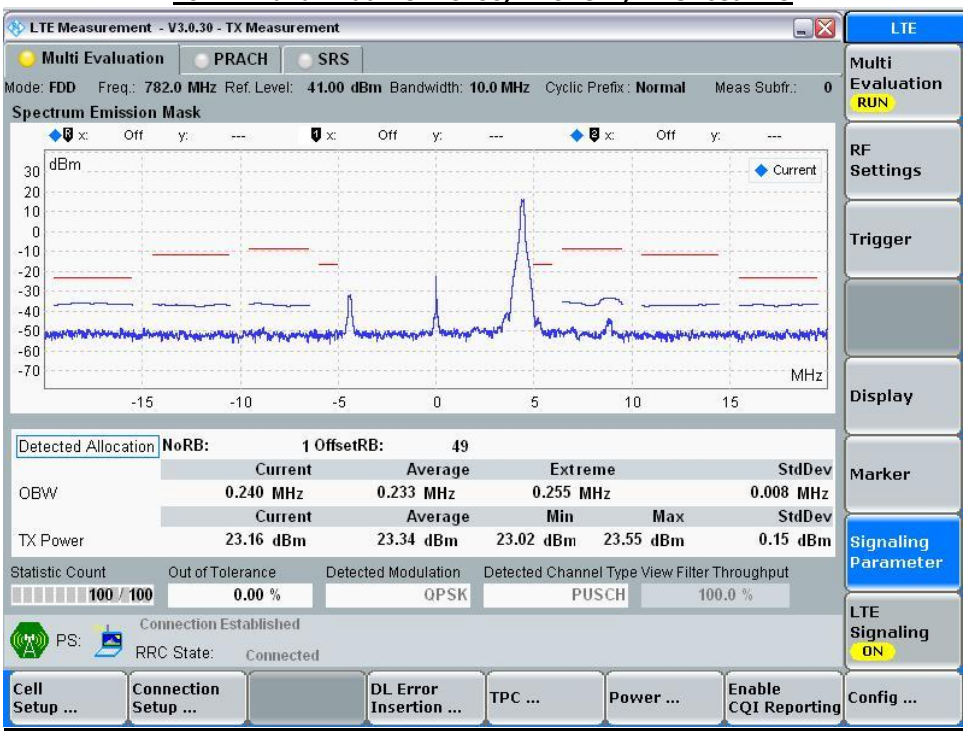
**10MHz Band Width: Ch 23230, RB Size=1; RB Offset = 0**



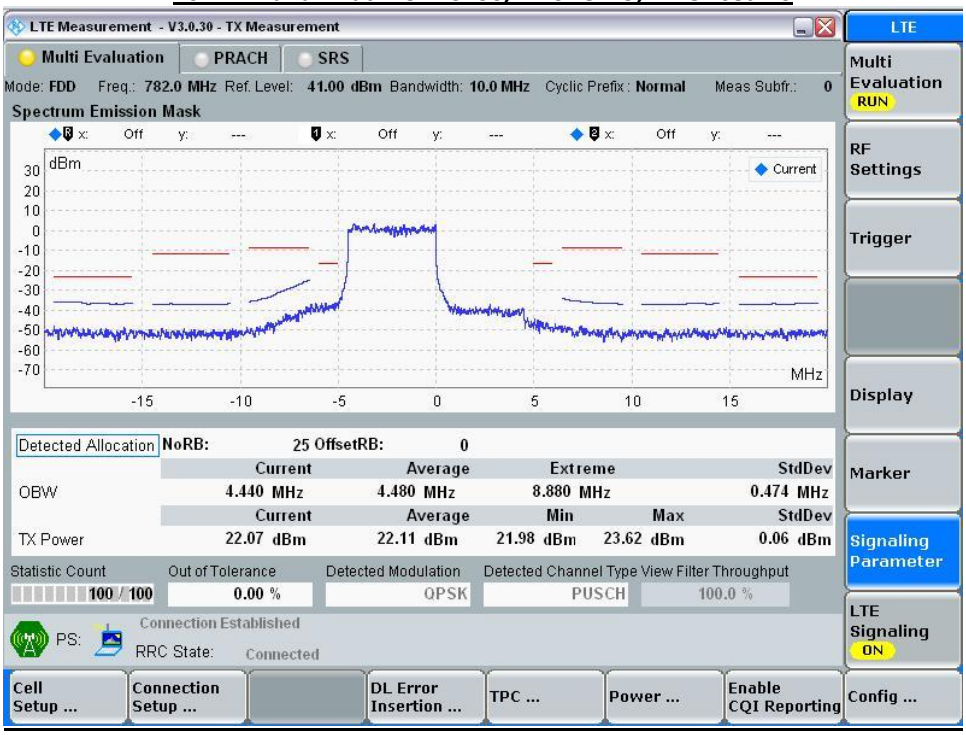

**10MHz Band Width: Ch 23230, RB Size=1; RB Offset = 24**



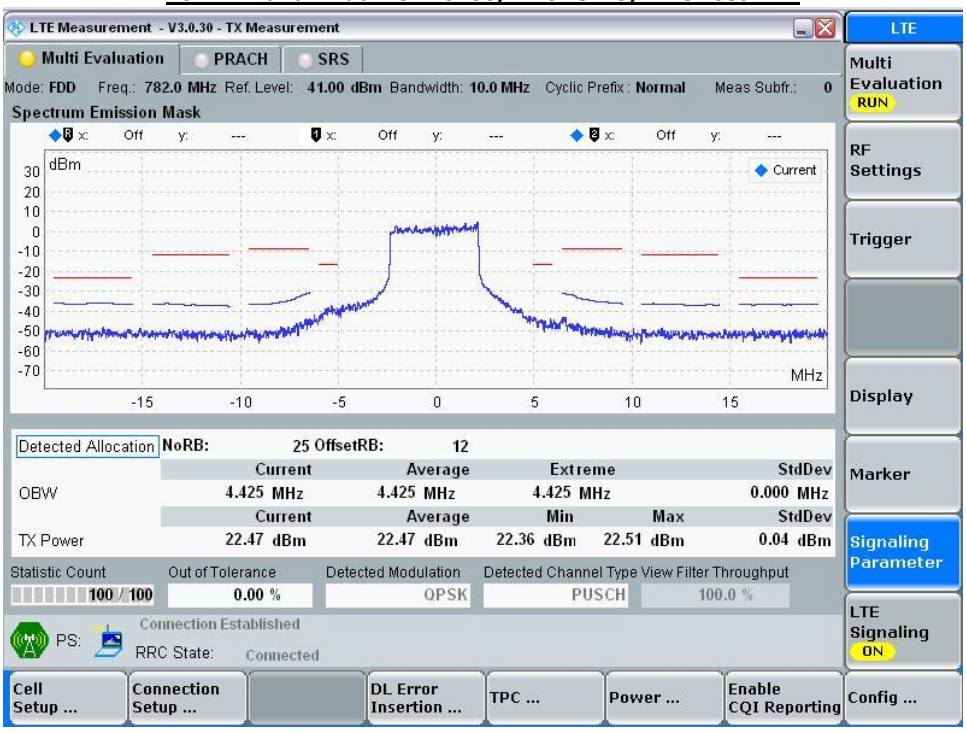
**10MHz Band Width: Ch 23230, RB Size=1; RB Offset = 49**



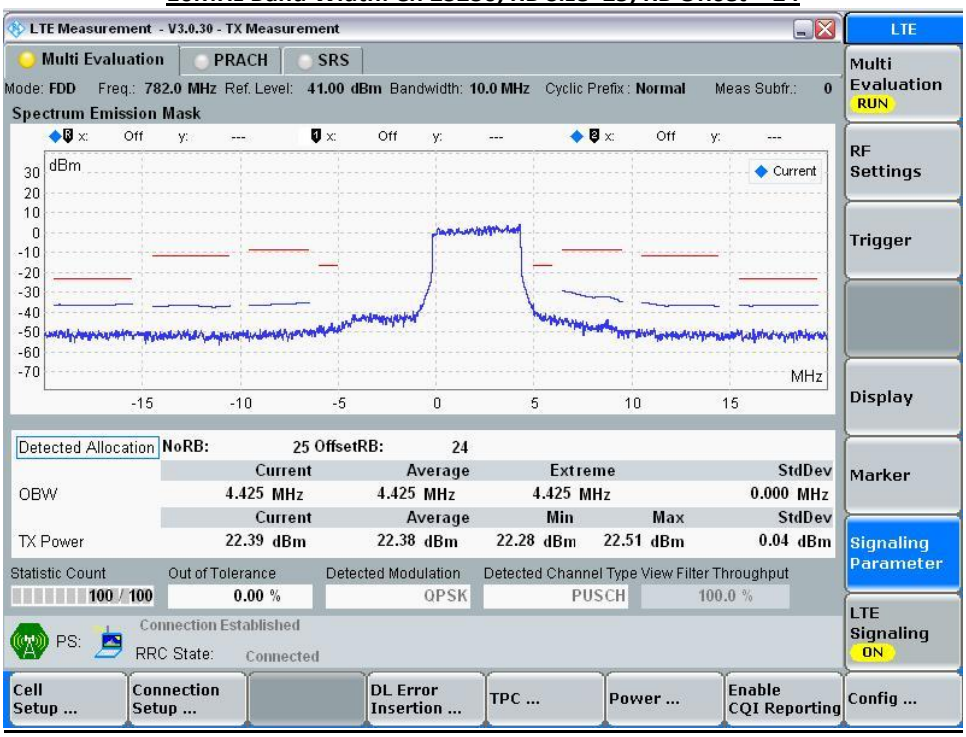

**10MHz Band Width: Ch 23230, RB Size=25; RB Offset = 0**



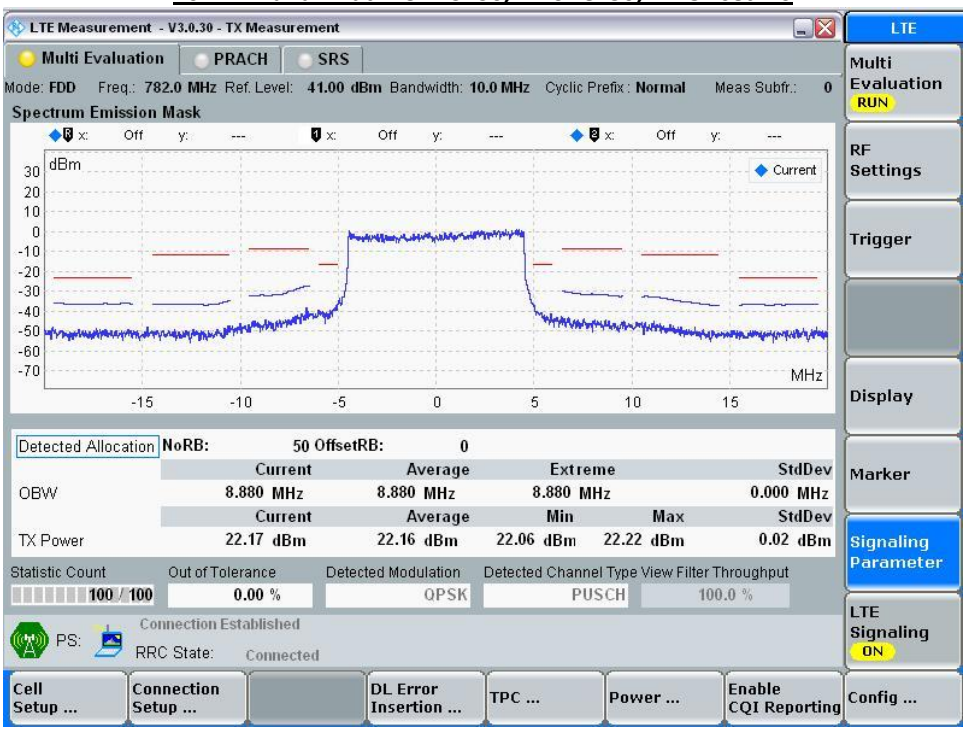
**10MHz Band Width: Ch 23230, RB Size=25; RB Offset = 12**




**10MHz Band Width: Ch 23230, RB Size=25; RB Offset = 24**



**10MHz Band Width: Ch 23230, RB Size=50; RB Offset = 0**



## 14.13 LTE Band 17

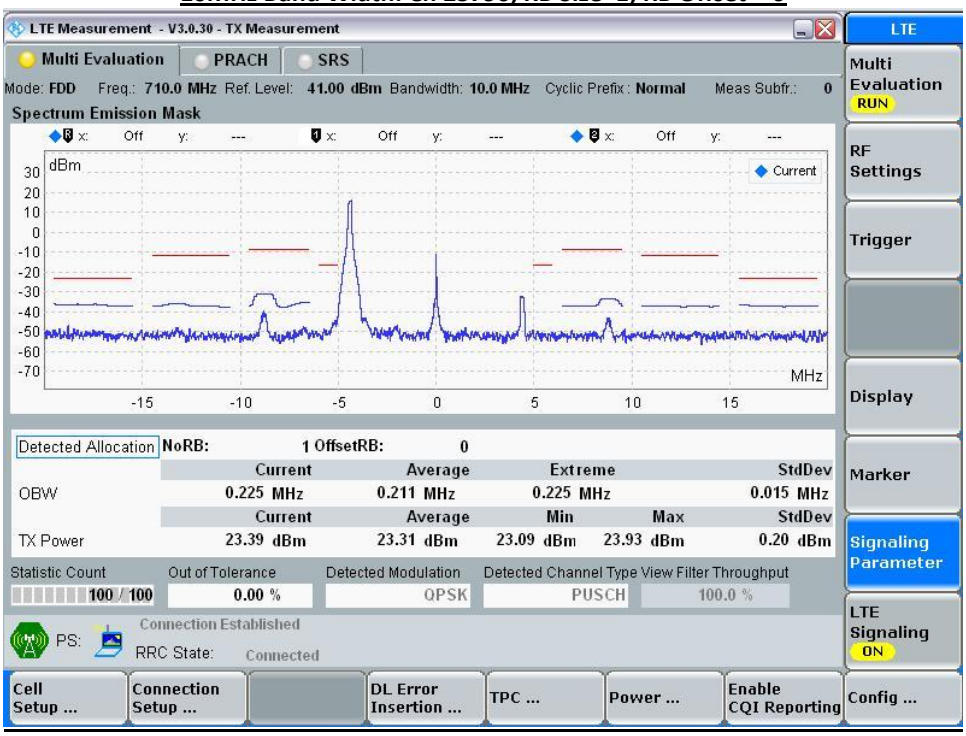
**Output power table**

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 17 | 10 | 23790 | 710.0 | QPSK | 1 | 0 | 0 | 23.3 |
| | | | | | 1 | 24 | 0 | 23.6 |
| | | | | | 1 | 49 | 0 | 22.8 |
| | | | | | 25 | 0 | 1 | 22.5 |
| | | | | | 25 | 12 | 1 | 22.4 |
| | | | | | 25 | 24 | 1 | 22.4 |
| | | | | | 50 | 0 | 1 | 22.3 |
| | | | | 16QAM | 1 | 0 | 1 | 22.3 |
| | | | | | 1 | 24 | 1 | 22.3 |
| | | | | | 1 | 49 | 1 | 22.3 |
| | | | | | 25 | 0 | 2 | 21.3 |
| | | | | | 25 | 12 | 2 | 21.4 |
| | | | | | 25 | 24 | 2 | 21.3 |
| | | | | | 50 | 0 | 2 | 21.3 |

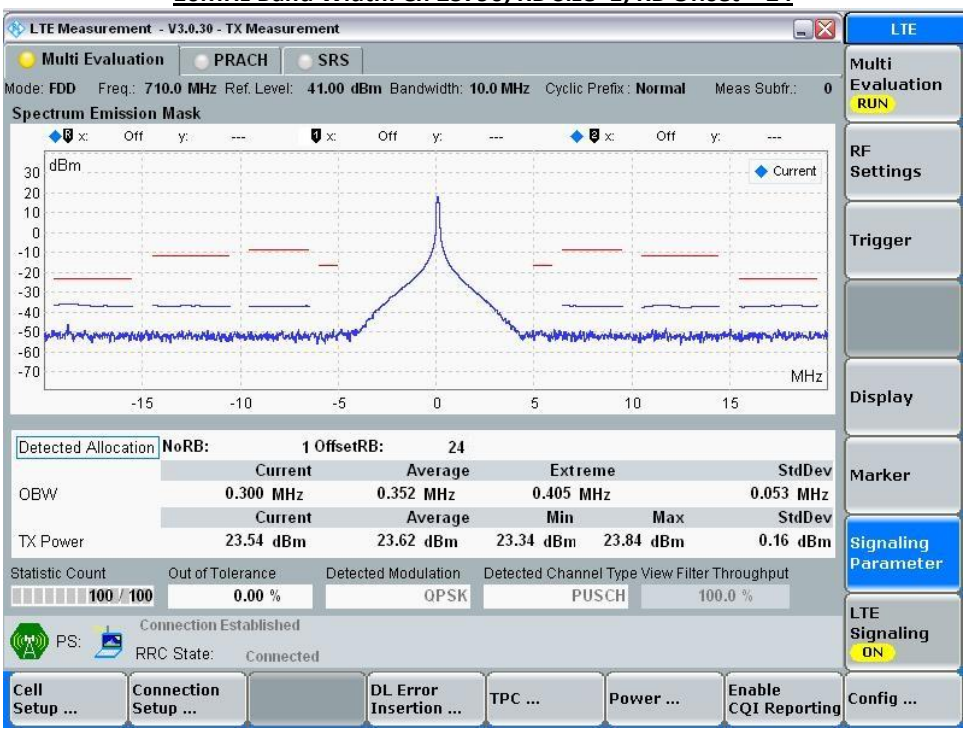
| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 17 | 5 | 23755 | 706.5 | QPSK | 1 | 0 | 0 | 23.4 |
| | | | | | 1 | 12 | 0 | 23.5 |
| | | | | | 1 | 24 | 0 | 23.3 |
| | | | | | 12 | 0 | 1 | 22.5 |
| | | | | | 12 | 6 | 1 | 22.5 |
| | | | | | 12 | 11 | 1 | 22.6 |
| | | | | | 25 | 0 | 1 | 22.4 |
| | | | | 16QAM | 1 | 0 | 1 | 22.5 |
| | | | | | 1 | 12 | 1 | 22.6 |
| | | | | | 1 | 24 | 1 | 22.5 |
| | | | | | 12 | 0 | 2 | 21.5 |
| | | | | | 12 | 6 | 2 | 21.6 |
| | | | | | 12 | 11 | 2 | 21.6 |
| | | | | | 25 | 0 | 2 | 21.5 |
| | | 23790 | 710.0 | QPSK | 1 | 0 | 0 | 23.4 |
| | | | | | 1 | 12 | 0 | 23.6 |
| | | | | | 1 | 24 | 0 | 23.0 |
| | | | | | 12 | 0 | 1 | 22.5 |
| | | | | | 12 | 6 | 1 | 22.6 |
| | | | | | 12 | 11 | 1 | 22.5 |
| | | | | | 25 | 0 | 1 | 22.6 |
| | | | | 16QAM | 1 | 0 | 1 | 22.8 |
| | | | | | 1 | 12 | 1 | 22.8 |
| | | | | | 1 | 24 | 1 | 22.4 |
| | | | | | 12 | 0 | 2 | 21.5 |
| | | | | | 12 | 6 | 2 | 21.6 |
| | | | | | 12 | 11 | 2 | 21.5 |
| | | | | | 25 | 0 | 2 | 21.4 |
| | | 23825 | 713.5 | QPSK | 1 | 0 | 0 | 23.1 |
| | | | | | 1 | 12 | 0 | 23.2 |
| | | | | | 1 | 24 | 0 | 22.9 |
| | | | | | 12 | 0 | 1 | 22.3 |
| | | | | | 12 | 6 | 1 | 22.4 |
| | | | | | 12 | 11 | 1 | 22.3 |
| | | | | | 25 | 0 | 1 | 22.2 |
| | | | | 16QAM | 1 | 0 | 1 | 22.1 |
| | | | | | 1 | 12 | 1 | 22.0 |
| | | | | | 1 | 24 | 1 | 21.9 |
| | | | | | 12 | 0 | 2 | 21.2 |
| | | | | | 12 | 6 | 2 | 21.1 |
| | | | | | 12 | 11 | 2 | 21.2 |
| | | | | | 25 | 0 | 2 | 21.1 |

### 14.13.1 Spectrum Plots for the Test RB allocations

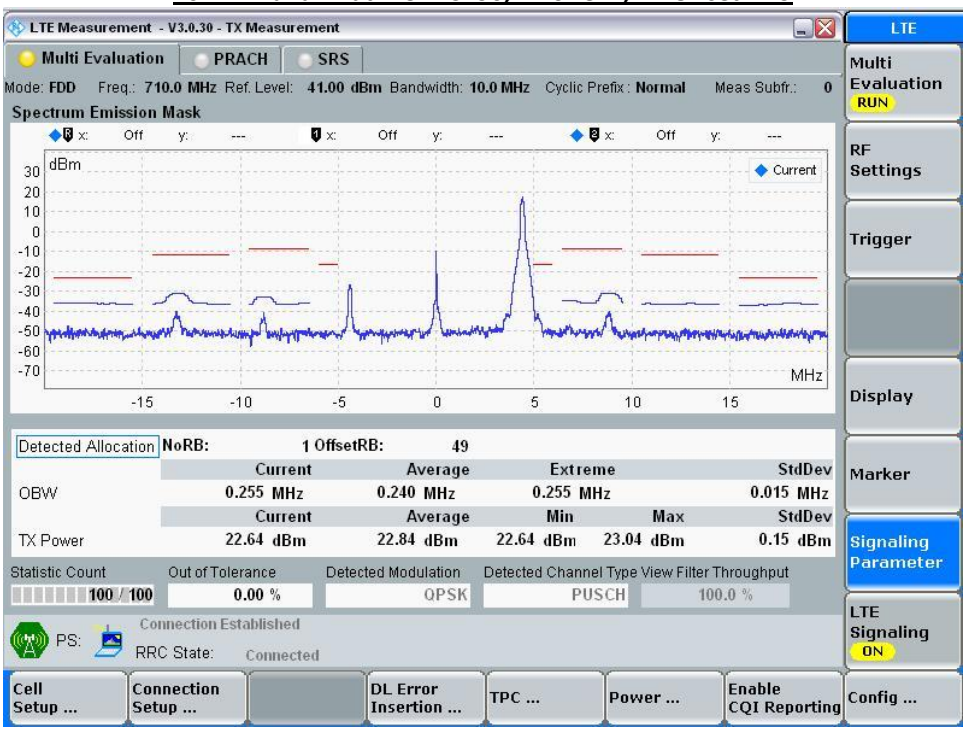
**10MHz Band Width: Ch 23790, RB Size=1; RB Offset = 0**



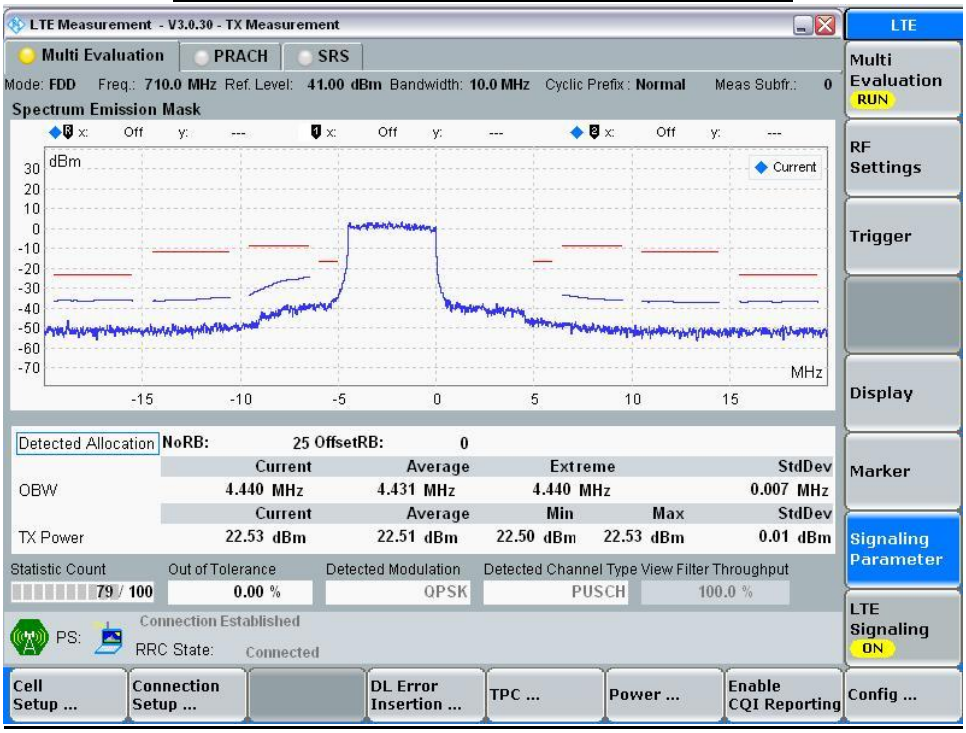

**10MHz Band Width: Ch 23790, RB Size=1; RB Offset = 24**



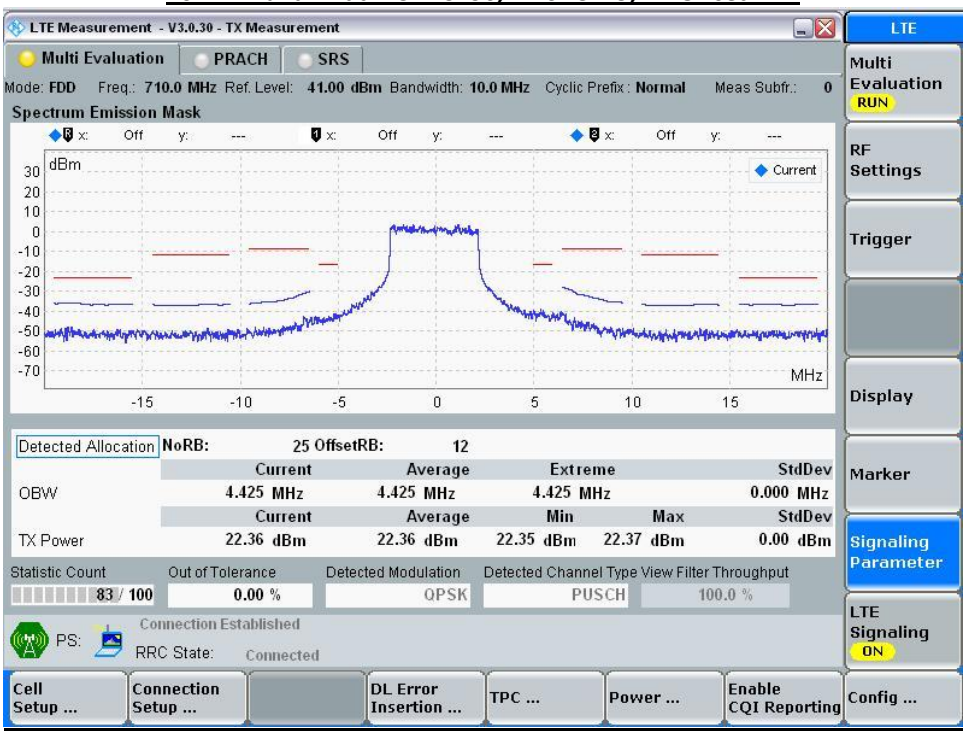
**10MHz Band Width: Ch 23790, RB Size=1; RB Offset = 49**



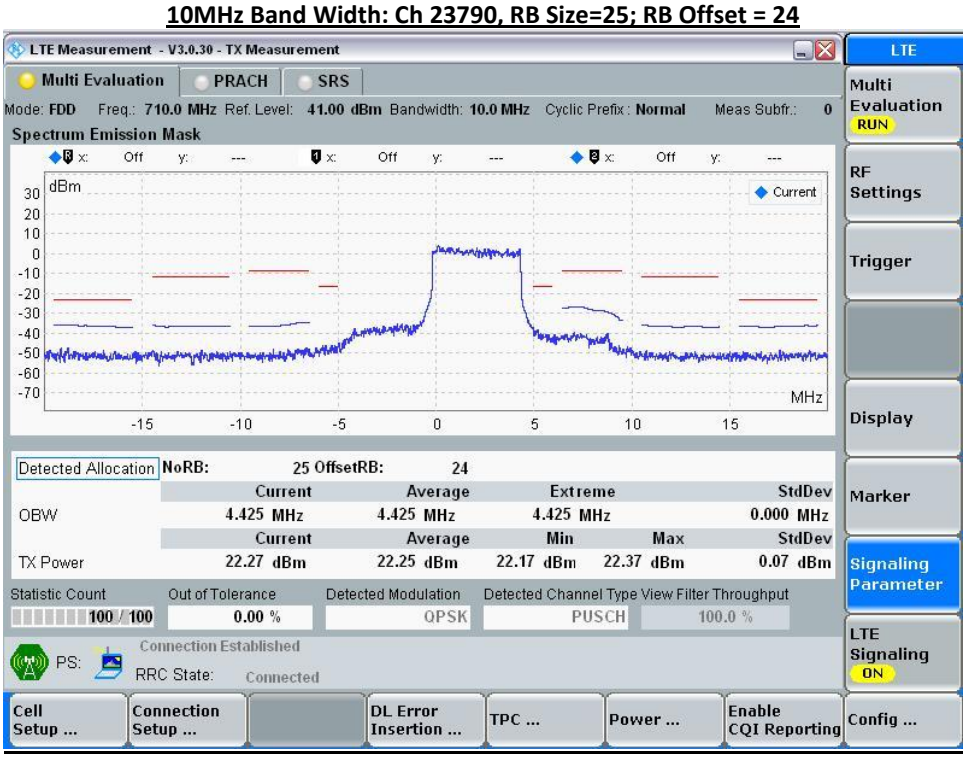

**10MHz Band Width: Ch 23790, RB Size=25; RB Offset = 0**



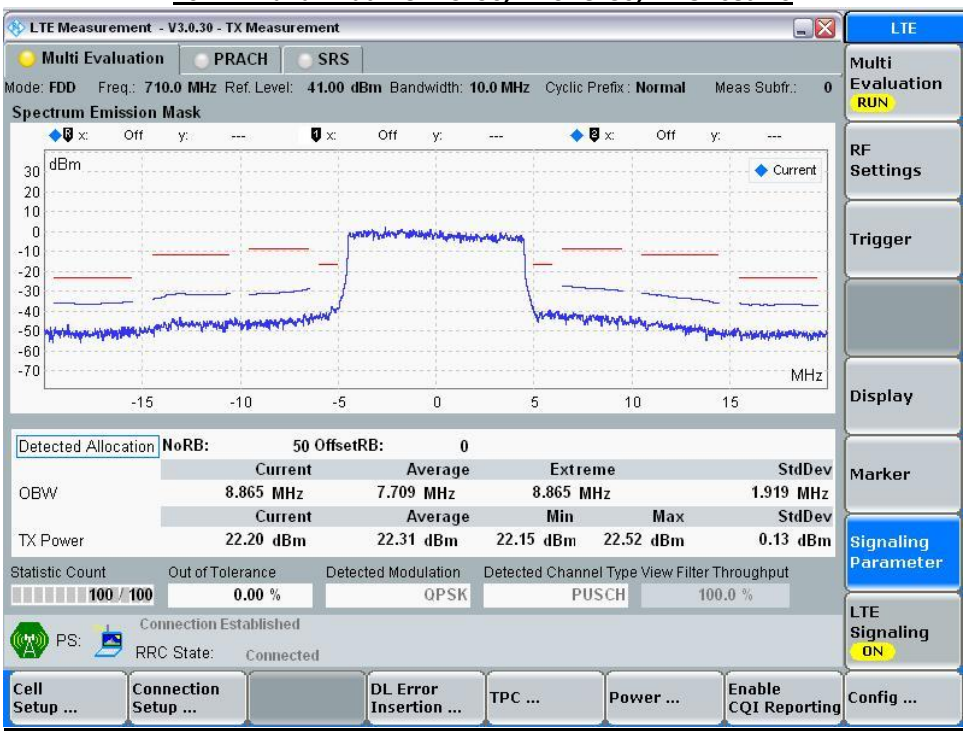
**10MHz Band Width: Ch 23790, RB Size=25; RB Offset = 12**




**10MHz Band Width: Ch 23790, RB Size=25; RB Offset = 24**



**10MHz Band Width: Ch 23790, RB Size=50; RB Offset = 0**



## 14.14 LTE Band 25

**Output power table**

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 25 | 20 | 26140 | 1860.0 | QPSK | 1 | 0 | 0 | 23.0 |
| | | | | | 1 | 49 | 0 | 23.0 |
| | | | | | 1 | 99 | 0 | 22.9 |
| | | | | | 50 | 0 | 1 | 22.3 |
| | | | | | 50 | 24 | 1 | 22.3 |
| | | | | | 50 | 49 | 1 | 22.2 |
| | | | | | 100 | 0 | 1 | 22.3 |
| | | | | 16QAM | 1 | 0 | 1 | 22.3 |
| | | | | | 1 | 49 | 1 | 22.3 |
| | | | | | 1 | 99 | 1 | 22.1 |
| | | | | | 50 | 0 | 2 | 21.2 |
| | | | | | 50 | 24 | 2 | 21.1 |
| | | | | | 50 | 49 | 2 | 21.1 |
| | | | | | 100 | 0 | 2 | 21.1 |
| | | 26365 | 1882.5 | QPSK | 1 | 0 | 0 | 23.1 |
| | | | | | 1 | 49 | 0 | 22.9 |
| | | | | | 1 | 99 | 0 | 22.7 |
| | | | | | 50 | 0 | 1 | 22.4 |
| | | | | | 50 | 24 | 1 | 22.2 |
| | | | | | 50 | 49 | 1 | 22.2 |
| | | | | | 100 | 0 | 1 | 22.2 |
| | | | | 16QAM | 1 | 0 | 1 | 22.1 |
| | | | | | 1 | 49 | 1 | 22.0 |
| | | | | | 1 | 99 | 1 | 21.5 |
| | | | | | 50 | 0 | 2 | 21.2 |
| | | | | | 50 | 24 | 2 | 21.3 |
| | | | | | 50 | 49 | 2 | 21.2 |
| | | | | | 100 | 0 | 2 | 21.3 |
| | | 26590 | 1905.0 | QPSK | 1 | 0 | 0 | 23.0 |
| | | | | | 1 | 49 | 0 | 22.9 |
| | | | | | 1 | 99 | 0 | 22.8 |
| | | | | | 50 | 0 | 1 | 22.2 |
| | | | | | 50 | 25 | 1 | 22.2 |
| | | | | | 50 | 49 | 1 | 22.2 |
| | | | | | 100 | 0 | 1 | 22.1 |
| | | | | 16QAM | 1 | 0 | 1 | 21.9 |
| | | | | | 1 | 49 | 1 | 22.1 |
| | | | | | 1 | 99 | 1 | 22.0 |
| | | | | | 50 | 0 | 2 | 21.2 |
| | | | | | 50 | 24 | 2 | 21.2 |
| | | | | | 50 | 49 | 2 | 21.2 |
| | | | | | 100 | 0 | 2 | 21.3 |

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 25 | 15 | 26115 | 1857.5 | QPSK | 1 | 0 | 0 | 22.9 |
| | | | | | 1 | 37 | 0 | 22.9 |
| | | | | | 1 | 74 | 0 | 22.8 |
| | | | | | 36 | 0 | 1 | 22.0 |
| | | | | | 36 | 18 | 1 | 22.0 |
| | | | | | 36 | 35 | 1 | 21.9 |
| | | | | | 75 | 0 | 1 | 21.9 |
| | | | | 16QAM | 1 | 0 | 1 | 22.1 |
| | | | | | 1 | 37 | 1 | 22.2 |
| | | | | | 1 | 74 | 1 | 22.0 |
| | | | | | 36 | 0 | 2 | 21.0 |
| | | | | | 36 | 18 | 2 | 21.0 |
| | | | | | 36 | 35 | 2 | 20.9 |
| | | | | | 75 | 0 | 2 | 20.9 |
| | | 26365 | 1882.5 | QPSK | 1 | 0 | 0 | 22.9 |
| | | | | | 1 | 37 | 0 | 22.9 |
| | | | | | 1 | 74 | 0 | 22.5 |
| | | | | | 36 | 0 | 1 | 22.1 |
| | | | | | 36 | 18 | 1 | 22.1 |
| | | | | | 36 | 35 | 1 | 22.1 |
| | | | | | 75 | 0 | 1 | 22.0 |
| | | | | 16QAM | 1 | 0 | 1 | 22.0 |
| | | | | | 1 | 37 | 1 | 21.9 |
| | | | | | 1 | 74 | 1 | 21.7 |
| | | | | | 36 | 0 | 2 | 21.0 |
| | | | | | 36 | 18 | 2 | 21.0 |
| | | | | | 36 | 35 | 2 | 21.0 |
| | | | | | 75 | 0 | 2 | 20.9 |
| | | 26615 | 1907.5 | QPSK | 1 | 0 | 0 | 22.7 |
| | | | | | 1 | 37 | 0 | 22.9 |
| | | | | | 1 | 74 | 0 | 22.9 |
| | | | | | 36 | 0 | 1 | 21.8 |
| | | | | | 36 | 18 | 1 | 21.9 |
| | | | | | 36 | 35 | 1 | 21.8 |
| | | | | | 75 | 0 | 1 | 21.7 |
| | | | | 16QAM | 1 | 0 | 1 | 21.9 |
| | | | | | 1 | 37 | 1 | 22.3 |
| | | | | | 1 | 74 | 1 | 22.1 |
| | | | | | 36 | 0 | 2 | 20.8 |
| | | | | | 36 | 18 | 2 | 20.8 |
| | | | | | 36 | 35 | 2 | 20.8 |
| | | | | | 75 | 0 | 2 | 20.7 |

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 25 | 10 | 26090 | 1855.0 | QPSK | 1 | 0 | 0 | 23.0 |
| | | | | | 1 | 24 | 0 | 22.9 |
| | | | | | 1 | 49 | 0 | 22.8 |
| | | | | | 25 | 0 | 1 | 22.2 |
| | | | | | 25 | 12 | 1 | 22.1 |
| | | | | | 25 | 24 | 1 | 22.1 |
| | | | | | 50 | 0 | 1 | 22.1 |
| | | | | 16QAM | 1 | 0 | 1 | 22.1 |
| | | | | | 1 | 24 | 1 | 22.0 |
| | | | | | 1 | 49 | 1 | 22.1 |
| | | | | | 25 | 0 | 2 | 21.2 |
| | | | | | 25 | 12 | 2 | 21.1 |
| | | | | | 25 | 24 | 2 | 21.0 |
| | | | | | 50 | 0 | 2 | 21.0 |
| | | 26365 | 1882.5 | QPSK | 1 | 0 | 0 | 22.9 |
| | | | | | 1 | 24 | 0 | 23.0 |
| | | | | | 1 | 49 | 0 | 22.6 |
| | | | | | 25 | 0 | 1 | 22.0 |
| | | | | | 25 | 12 | 1 | 22.1 |
| | | | | | 25 | 24 | 1 | 22.1 |
| | | | | | 50 | 0 | 1 | 22.0 |
| | | | | 16QAM | 1 | 0 | 1 | 22.0 |
| | | | | | 1 | 24 | 1 | 22.1 |
| | | | | | 1 | 49 | 1 | 21.7 |
| | | | | | 25 | 0 | 2 | 21.1 |
| | | | | | 25 | 12 | 2 | 21.2 |
| | | | | | 25 | 24 | 2 | 21.1 |
| | | | | | 50 | 0 | 2 | 21.0 |
| | | 26640 | 1910.0 | QPSK | 1 | 0 | 0 | 22.9 |
| | | | | | 1 | 24 | 0 | 22.9 |
| | | | | | 1 | 49 | 0 | 22.8 |
| | | | | | 25 | 0 | 1 | 22.0 |
| | | | | | 25 | 12 | 1 | 21.9 |
| | | | | | 25 | 24 | 1 | 22.0 |
| | | | | | 50 | 0 | 1 | 21.9 |
| | | | | 16QAM | 1 | 0 | 1 | 22.0 |
| | | | | | 1 | 24 | 1 | 22.0 |
| | | | | | 1 | 49 | 1 | 21.9 |
| | | | | | 25 | 0 | 2 | 21.1 |
| | | | | | 25 | 12 | 2 | 21.0 |
| | | | | | 25 | 24 | 2 | 21.0 |
| | | | | | 50 | 0 | 2 | 20.9 |

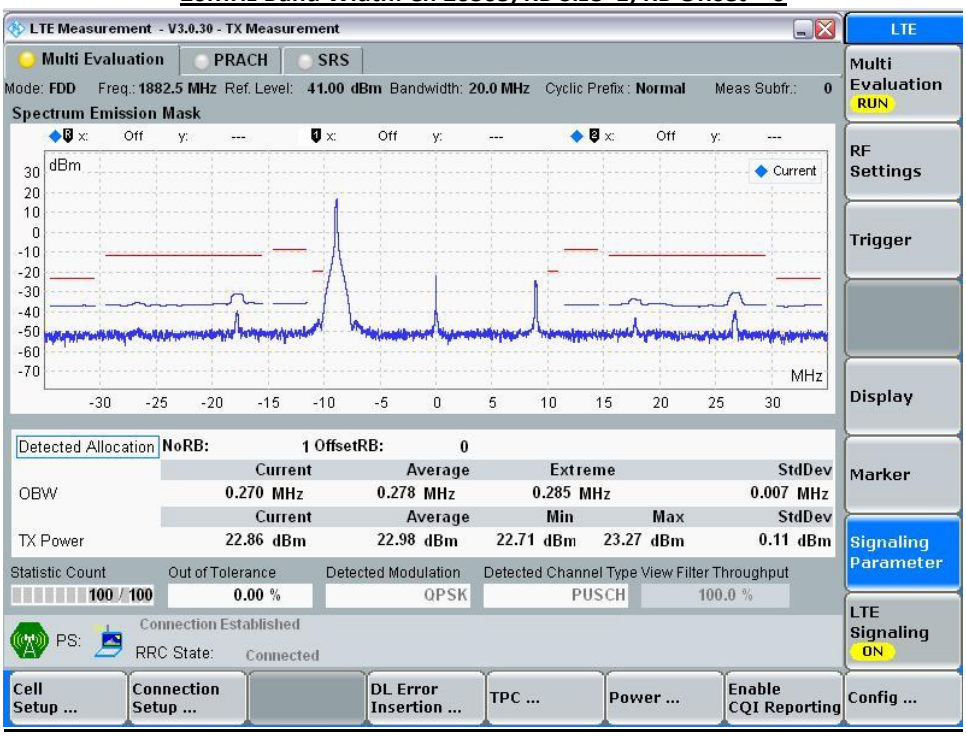
| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 25 | 5 | 26065 | 1852.5 | QPSK | 1 | 0 | 0 | 23.1 |
| | | | | | 1 | 12 | 0 | 23.1 |
| | | | | | 1 | 24 | 0 | 22.9 |
| | | | | | 12 | 0 | 1 | 22.2 |
| | | | | | 12 | 6 | 1 | 22.3 |
| | | | | | 12 | 11 | 1 | 22.2 |
| | | | | | 25 | 0 | 1 | 22.2 |
| | | | | 16QAM | 1 | 0 | 1 | 22.3 |
| | | | | | 1 | 12 | 1 | 22.4 |
| | | | | | 1 | 24 | 1 | 22.1 |
| | | | | | 12 | 0 | 2 | 21.3 |
| | | | | | 12 | 6 | 2 | 21.1 |
| | | | | | 12 | 11 | 2 | 21.2 |
| | | | | | 25 | 0 | 2 | 21.1 |
| | | 26365 | 1882.5 | QPSK | 1 | 0 | 0 | 23.0 |
| | | | | | 1 | 12 | 0 | 23.1 |
| | | | | | 1 | 24 | 0 | 22.9 |
| | | | | | 12 | 0 | 1 | 22.2 |
| | | | | | 12 | 6 | 1 | 22.1 |
| | | | | | 12 | 11 | 1 | 22.2 |
| | | | | | 25 | 0 | 1 | 22.1 |
| | | | | 16QAM | 1 | 0 | 1 | 22.1 |
| | | | | | 1 | 12 | 1 | 22.2 |
| | | | | | 1 | 24 | 1 | 22.1 |
| | | | | | 12 | 0 | 2 | 21.0 |
| | | | | | 12 | 6 | 2 | 21.1 |
| | | | | | 12 | 11 | 2 | 21.2 |
| | | | | | 25 | 0 | 2 | 21.0 |
| | | 26665 | 1912.5 | QPSK | 1 | 0 | 0 | 22.8 |
| | | | | | 1 | 12 | 0 | 22.9 |
| | | | | | 1 | 24 | 0 | 22.8 |
| | | | | | 12 | 0 | 1 | 22.9 |
| | | | | | 12 | 6 | 1 | 21.8 |
| | | | | | 12 | 11 | 1 | 22.0 |
| | | | | | 25 | 0 | 1 | 21.8 |
| | | | | 16QAM | 1 | 0 | 1 | 22.0 |
| | | | | | 1 | 12 | 1 | 22.1 |
| | | | | | 1 | 24 | 1 | 21.9 |
| | | | | | 12 | 0 | 2 | 21.0 |
| | | | | | 12 | 6 | 2 | 21.0 |
| | | | | | 12 | 11 | 2 | 21.0 |
| | | | | | 25 | 0 | 2 | 20.9 |

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 25 | 3 | 26055 | 1851.5 | QPSK | 1 | 0 | 0 | 23.2 |
| | | | | | 1 | 7 | 0 | 23.2 |
| | | | | | 1 | 14 | 0 | 23.0 |
| | | | | | 8 | 0 | 1 | 22.3 |
| | | | | | 8 | 4 | 1 | 22.3 |
| | | | | | 8 | 7 | 1 | 22.3 |
| | | | | | 15 | 0 | 1 | 22.2 |
| | | | | 16QAM | 1 | 0 | 1 | 22.4 |
| | | | | | 1 | 7 | 1 | 22.3 |
| | | | | | 1 | 14 | 1 | 22.2 |
| | | | | | 8 | 0 | 2 | 21.2 |
| | | | | | 8 | 4 | 2 | 21.3 |
| | | | | | 8 | 7 | 2 | 21.3 |
| | | | | | 15 | 0 | 2 | 21.2 |
| | | 26365 | 1882.5 | QPSK | 1 | 0 | 0 | 23.1 |
| | | | | | 1 | 7 | 0 | 23.0 |
| | | | | | 1 | 14 | 0 | 22.9 |
| | | | | | 8 | 0 | 1 | 22.3 |
| | | | | | 8 | 4 | 1 | 22.2 |
| | | | | | 8 | 7 | 1 | 22.2 |
| | | | | | 15 | 0 | 1 | 22.1 |
| | | | | 16QAM | 1 | 0 | 1 | 22.0 |
| | | | | | 1 | 7 | 1 | 22.2 |
| | | | | | 1 | 14 | 1 | 22.1 |
| | | | | | 8 | 0 | 2 | 21.1 |
| | | | | | 8 | 4 | 2 | 21.1 |
| | | | | | 8 | 7 | 2 | 21.1 |
| | | | | | 15 | 0 | 2 | 21.1 |
| | | 26675 | 1913.4 | QPSK | 1 | 0 | 0 | 22.8 |
| | | | | | 1 | 7 | 0 | 23.0 |
| | | | | | 1 | 14 | 0 | 22.7 |
| | | | | | 8 | 0 | 1 | 22.0 |
| | | | | | 8 | 4 | 1 | 22.1 |
| | | | | | 8 | 7 | 1 | 22.0 |
| | | | | | 15 | 0 | 1 | 22.0 |
| | | | | 16QAM | 1 | 0 | 1 | 22.0 |
| | | | | | 1 | 7 | 1 | 22.1 |
| | | | | | 1 | 14 | 1 | 22.0 |
| | | | | | 8 | 0 | 2 | 21.0 |
| | | | | | 8 | 4 | 2 | 21.0 |
| | | | | | 8 | 7 | 2 | 21.1 |
| | | | | | 15 | 0 | 2 | 21.0 |

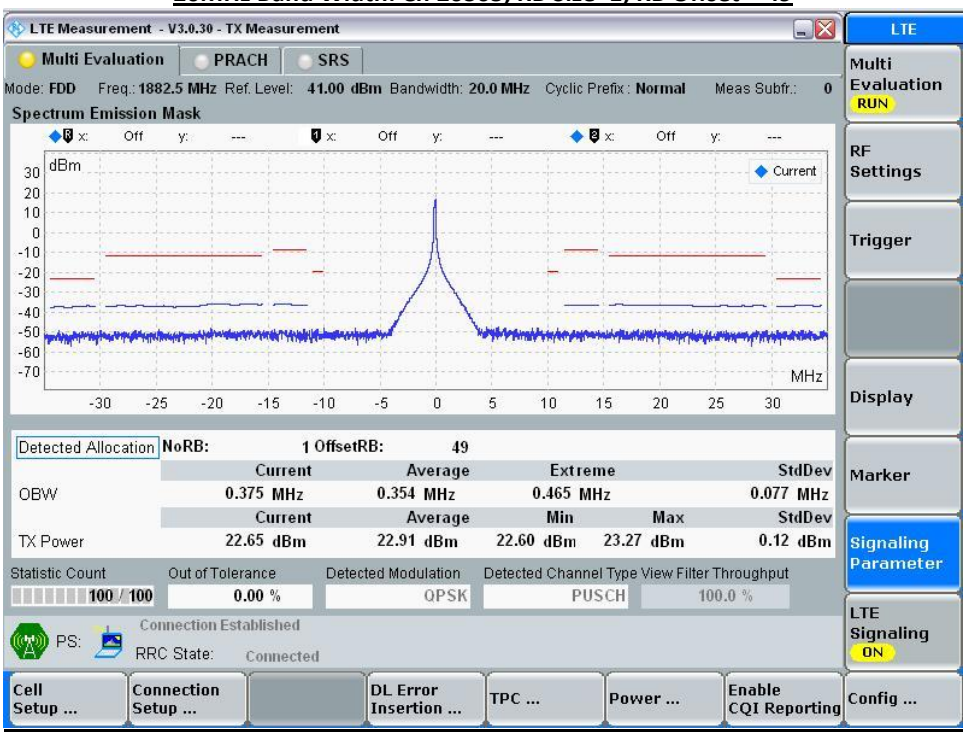
| Band | BW (MHz) | Channel | Frequency (MHz) | Mode | UL RB Allocation | UL RB Start | MPR | Average power(dBm) |
|---|---|---|---|---|---|---|---|---|
| 25 | 1.4 | 26047 | 1850.7 | QPSK | 1 | 0 | 0 | 22.9 |
| | | | | | 1 | 2 | 0 | 22.9 |
| | | | | | 1 | 5 | 0 | 22.8 |
| | | | | | 3 | 0 | 1 | 22.9 |
| | | | | | 3 | 1 | 1 | 22.9 |
| | | | | | 3 | 2 | 1 | 22.8 |
| | | | | | 6 | 0 | 1 | 21.9 |
| | | | | 16QAM | 1 | 0 | 1 | 21.9 |
| | | | | | 1 | 2 | 1 | 21.9 |
| | | | | | 1 | 5 | 1 | 21.9 |
| | | | | | 3 | 0 | 2 | 21.9 |
| | | | | | 3 | 1 | 2 | 21.9 |
| | | | | | 3 | 2 | 2 | 21.8 |
| | | | | | 6 | 0 | 2 | 21.0 |
| | | 26365 | 1882.5 | QPSK | 1 | 0 | 0 | 22.7 |
| | | | | | 1 | 2 | 0 | 22.7 |
| | | | | | 1 | 5 | 0 | 22.6 |
| | | | | | 3 | 0 | 1 | 22.6 |
| | | | | | 3 | 1 | 1 | 22.7 |
| | | | | | 3 | 2 | 1 | 22.6 |
| | | | | | 6 | 0 | 1 | 21.8 |
| | | | | 16QAM | 1 | 0 | 1 | 22.0 |
| | | | | | 1 | 2 | 1 | 21.9 |
| | | | | | 1 | 5 | 1 | 22.0 |
| | | | | | 3 | 0 | 2 | 21.9 |
| | | | | | 3 | 1 | 2 | 21.9 |
| | | | | | 3 | 2 | 2 | 21.8 |
| | | | | | 6 | 0 | 2 | 20.8 |
| | | 26682 | 1914.2 | QPSK | 1 | 0 | 0 | 22.8 |
| | | | | | 1 | 2 | 0 | 22.8 |
| | | | | | 1 | 5 | 0 | 22.7 |
| | | | | | 3 | 0 | 1 | 22.8 |
| | | | | | 3 | 1 | 1 | 22.8 |
| | | | | | 3 | 2 | 1 | 22.7 |
| | | | | | 6 | 0 | 1 | 21.8 |
| | | | | 16QAM | 1 | 0 | 1 | 22.0 |
| | | | | | 1 | 2 | 1 | 22.0 |
| | | | | | 1 | 5 | 1 | 22.0 |
| | | | | | 3 | 0 | 2 | 22.0 |
| | | | | | 3 | 1 | 2 | 22.1 |
| | | | | | 3 | 2 | 2 | 21.9 |
| | | | | | 6 | 0 | 2 | 20.8 |

### 14.14.1 Spectrum Plots for the Test RB allocations

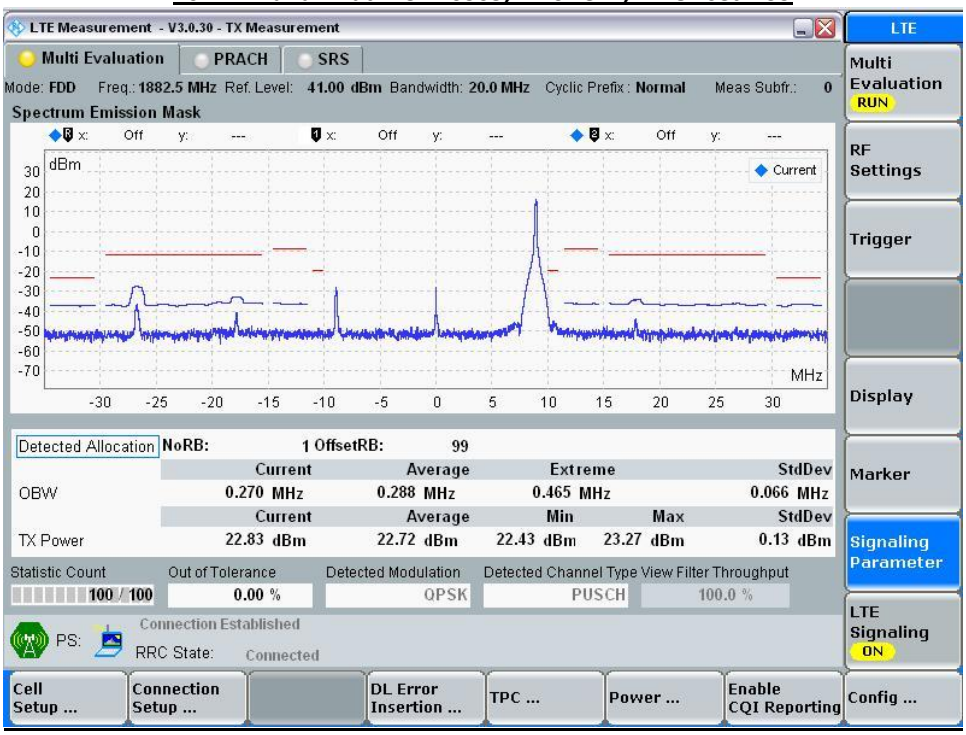
**20MHz Band Width: Ch 26365, RB Size=1; RB Offset = 0**



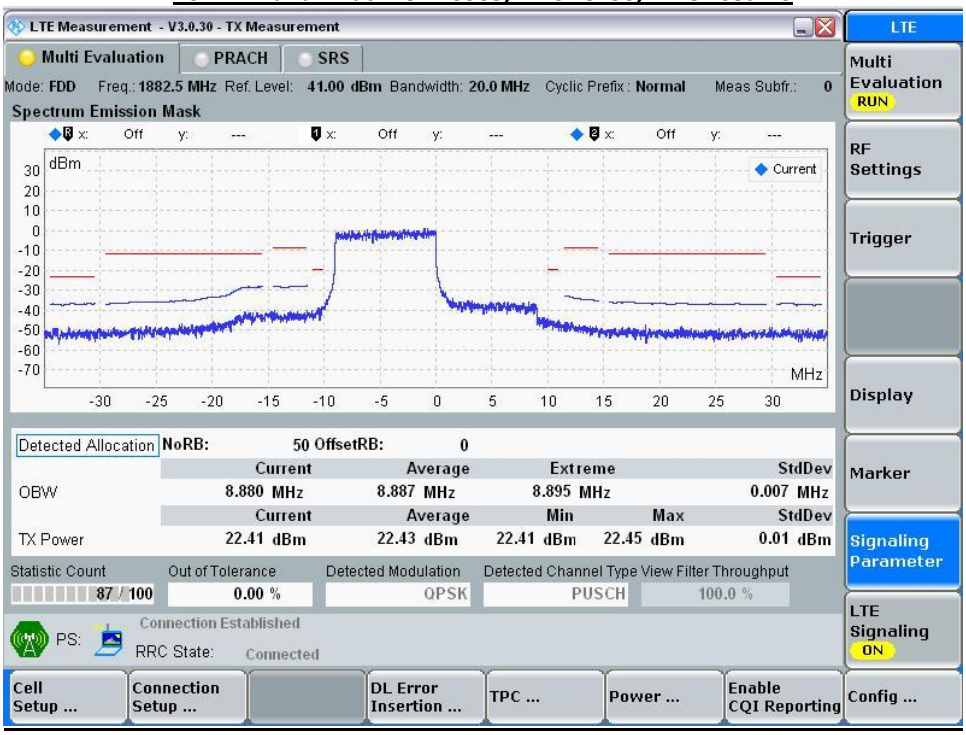

**20MHz Band Width: Ch 26365, RB Size=1; RB Offset = 49**



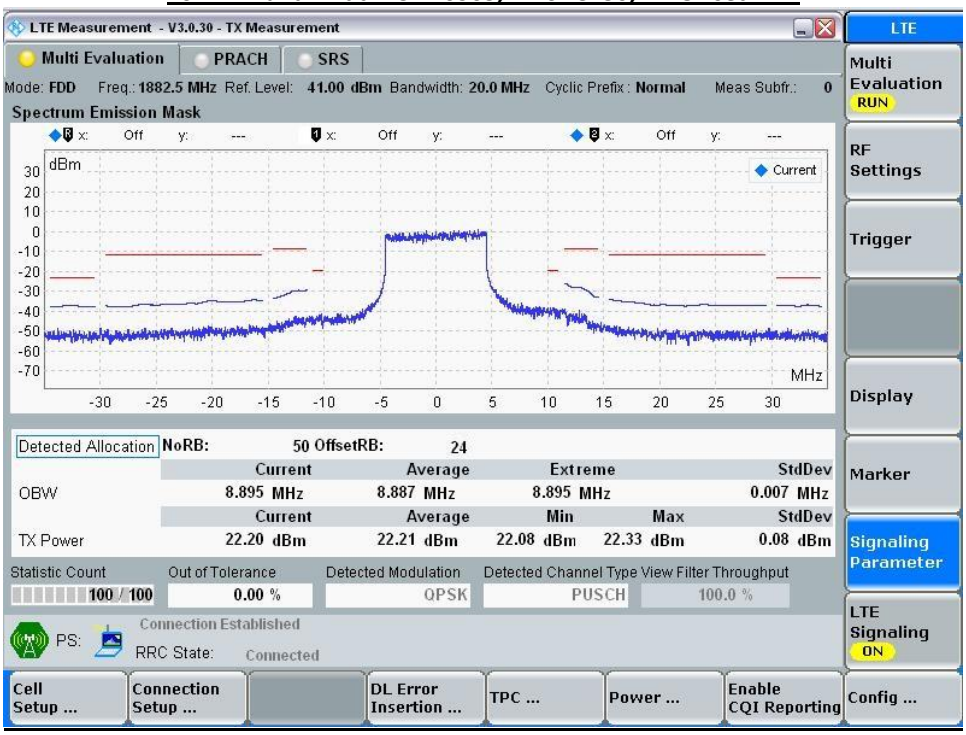
**20MHz Band Width: Ch 26365, RB Size=1; RB Offset = 99**



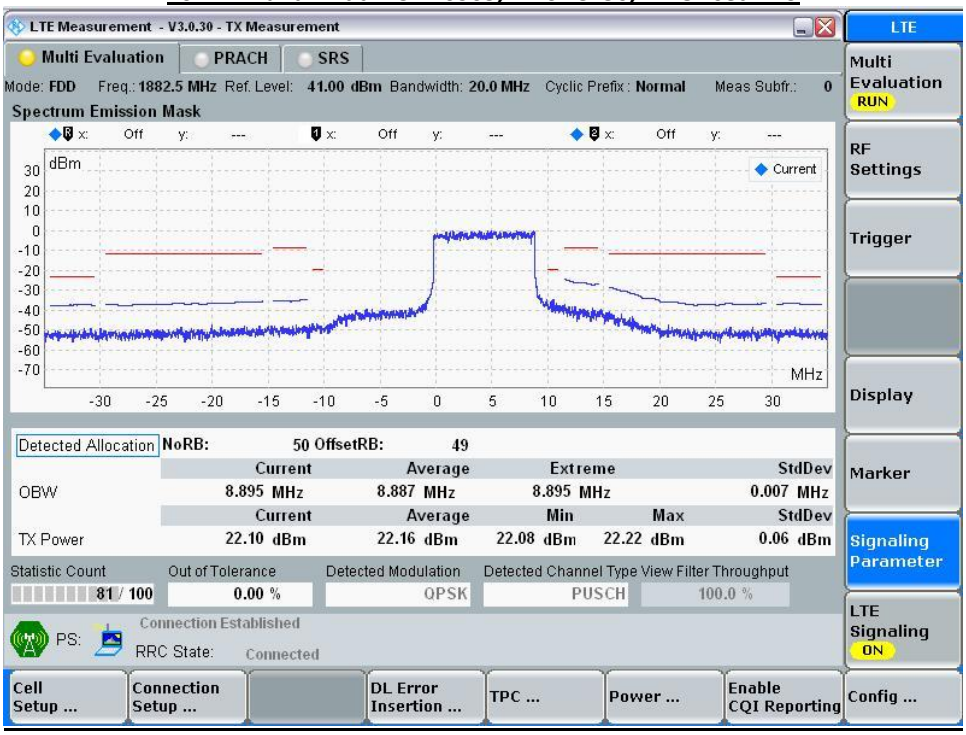

**20MHz Band Width: Ch 26365, RB Size=50, RB Offset = 0**



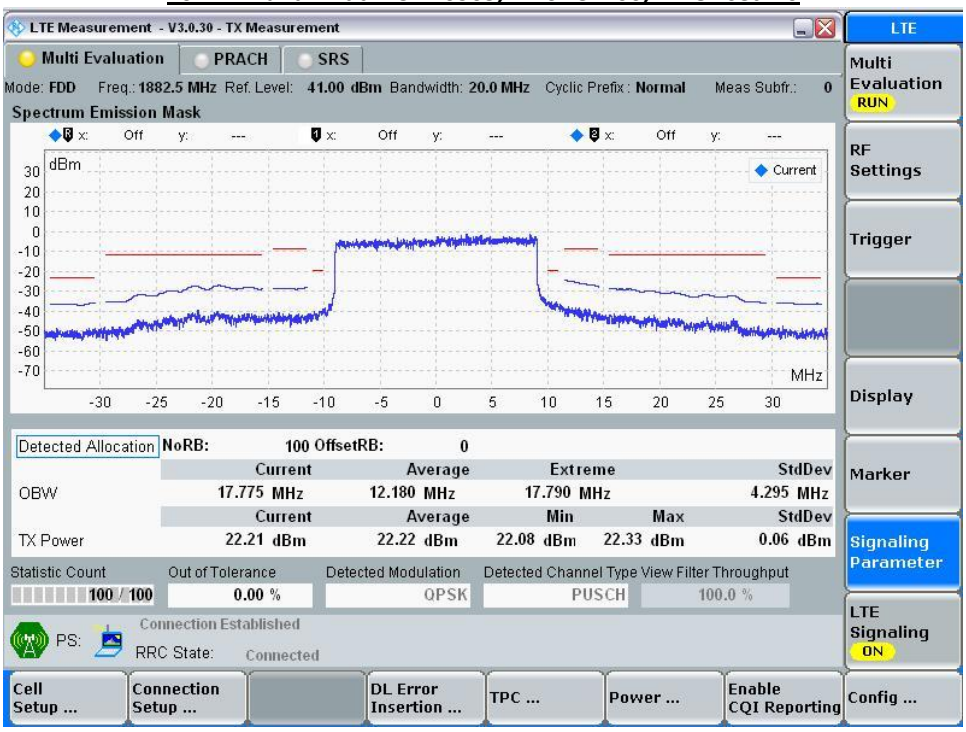
**20MHz Band Width: Ch 26365, RB Size=50, RB Offset = 24**




**20MHz Band Width: Ch 26365, RB Size=50, RB Offset = 49**



**20MHz Band Width: Ch 26365, RB Size=100, RB Offset = 0**



## 14.15 Wi-Fi (2.4 GHz Band)

Required Test Channels per KDB 248227 D01

| Mode | Band (GHz) | Freq. (MHz) | Ch # | Default Test Channels | |
|---|---|---|---|---|---|
| | | | | 802.11b | 802.11g |
| 802.11 b/g | 2.4 | 2412 | 1# | ✓ | ∇ |
| | | 2437 | 6 | ✓ | ∇ |
| | | 2462 | 11# | ✓ | ∇ |

**Notes**

✓ = "default test channels"

∇ = possible 802.11g channels with maximum average output ¼ dB the "default test channels"

# = when output power is reduced for channel 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested.

The indicated Wi-Fi target powers in the following table are absolute maximums.

**Output power table**

| Band (GHz) | Mode | Data rate (Mbps) | Ch # | Freq. (MHz) | Target Pwr (dBm) | | | Tune-up Tolerance (dBm) | Maximum Tune-up Pwr (dBm) | Avg. Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Main | Aux | Total | | | Main | Aux | Total |
| 2.4 | 802.11b | 1 | 1 | 2412 | 12.5 | | | ±1.5 | 14.0 | 13.7 | | |
| | | | 6 | 2437 | 12.5 | | | ±1.5 | 14.0 | 13.9 | | |
| | | | 11 | 2462 | 12.5 | | | ±1.5 | 14.0 | 13.9 | | |
| | 802.11g | 6 | 1 | 2412 | 12.0 | | | ±1.5 | 13.5 | 13.3 | | |
| | | | 6 | 2437 | 12.5 | | | ±1.5 | 14.0 | 13.6 | | |
| | | | 11 | 2462 | 12.0 | | | ±1.5 | 13.5 | 12.7 | | |
| | 802.11n HT20 | MCS8 | 1 | 2412 | 7.5 | 7.5 | 10.5 | ±1.5 | 12.0 | 8.8 | 8.7 | 11.8 |
| | | | 6 | 2437 | 10.5 | 10.5 | 13.5 | ±1.5 | 15.0 | 11.8 | 11.9 | 14.9 |
| | | | 11 | 2462 | 7.5 | 7.5 | 10.5 | ±1.5 | 12.0 | 9.0 | 8.9 | 12.0 |
| | 802.11n HT40 | MCS8 | 3 | 2412 | 7.0 | 7.0 | 10.0 | ±1.5 | 11.5 | 8.5 | 7.8 | 11.2 |
| | | | 6 | 2437 | 7.0 | 7.0 | 10.0 | ±1.5 | 11.5 | 8.5 | 7.9 | 11.2 |
| | | | 9 | 2462 | 5.5 | 5.5 | 8.5 | ±1.5 | 10.0 | 7.0 | 6.7 | 9.9 |

Note(s):

SAR is not required for 802.11g/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels per KDB 248227 D01

## 14.16 Wi-Fi (5 GHz Band)

Required Test Channels per KDB 248227 D01

| Mode | Band (GHz) | Freq. (MHz) | Ch # | Default Test Channels | | | |
|---|---|---|---|---|---|---|---|
| | | | | §15.247 | | UNII | |
| 802.11a | UNII | 5180 | 36 | | | ✓ | |
| | | 5200 | 40 | | | | * |
| | | 5220 | 44 | | | | * |
| | | 5240 | 48 | | | ✓ | |
| | | 5260 | 52 | | | ✓ | |
| | | 5280 | 56 | | | | * |
| | | 5300 | 60 | | | | * |
| | | 5320 | 64 | | | ✓ | |
| | | 5500 | 100 | | | | * |
| | | 5520 | 104 | | | ✓ | |
| | | 5540 | 108 | | | | * |
| | | 5560 | 112 | | | | * |
| | | 5580 | 116 | | | ✓ | |
| | | 5600 | 120 | | | | * |
| | | 5620 | 124 | | | ✓ | |
| | | 5640 | 128 | | | | * |
| | | 5660 | 132 | | | | * |
| | | 5680 | 136 | | | ✓ | |
| | | 5700 | 140 | | | | * |
| | UNII or §15.247 | 5745 | 149 | ✓ | | ✓ | |
| | | 5765 | 153 | | * | | * |
| | | 5785 | 157 | ✓ | | | * |
| | | 5805 | 161 | | * | ✓ | |
| | §15.247 | 5825 | 165 | ✓ | | | |

**Notes**

✓ = "default test channels"

* = possible 802.11a channels with maximum average output > the "default test channels"

The indicated Wi-Fi target powers in the following table are absolute maximums

**Wi-Fi 5.2GHz Band:**

| Band (GHz) | Mode | Data rate (Mbps) | Ch # | Freq. (MHz) | Target Pwr (dBm) | | | Tune-up Tolerance (dBm) | Maximum Tune-up Pwr (dBm) | Avg. Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Main | Aux | Total | | | Main | Aux | Total |
| 5.2 | 802.11a | 6 | 36 | 5180 | 9.5 | | | ± 1.5 | 11.0 | 10.8 | | |
| | | | 40 | 5200 | 9.5 | | | ± 1.5 | 11.0 | 10.7 | | |
| | | | 44 | 5220 | 9.5 | | | ± 1.5 | 11.0 | 10.6 | | |
| | | | 48 | 5240 | 9.5 | | | ± 1.5 | 11.0 | 10.7 | | |
| | 802.11n (HT20) | MCS8 | 36 | 5180 | 4.5 | 4.5 | 7.5 | ± 1.5 | 9.0 | 5.8 | 4.4 | 8.2 |
| | | | 40 | 5200 | 4.5 | 4.5 | 7.5 | ± 1.5 | 9.0 | 6.3 | 5.3 | 8.8 |
| | | | 44 | 5220 | 4.5 | 4.5 | 7.5 | ± 1.5 | 9.0 | 6.4 | 5.0 | 8.8 |
| | | | 48 | 5240 | 4.5 | 4.5 | 7.5 | ± 1.5 | 9.0 | 6.3 | 5.3 | 8.8 |
| | 802.11n (HT40) | MCS8 | 38 | 5190 | 4.5 | 4.5 | 7.5 | ± 1.5 | 9.0 | 5.8 | 5.8 | 8.8 |
| | | | 46 | 5230 | 4.5 | 4.5 | 7.5 | ± 1.5 | 9.0 | 5.8 | 5.7 | 8.8 |

Note(s):

SAR is not required for 802.11n HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a channels per KDB 248227 D01

**Wi-Fi 5.3GHz Band:**

| Band (GHz) | Mode | Data rate (Mbps) | Ch # | Freq. (MHz) | Target Pwr (dBm) | | | Tune-up Tolerance (dBm) | Maximum Tune-up Pwr (dBm) | Avg. Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Main | Aux | Total | | | Main | Aux | Total |
| 5.3 | 802.11a | 6 | 52 | 5260 | 10.5 | | | ± 1.5 | 12.0 | 11.9 | | |
| | | | 56 | 5280 | 10.5 | | | ± 1.5 | 12.0 | 12.0 | | |
| | | | 60 | 5300 | 11.5 | | | ± 1.5 | 13.0 | 12.8 | | |
| | | | 64 | 5320 | 9.5 | | | ± 1.5 | 11.0 | 11.0 | | |
| | 802.11n (HT20) | MCS8 | 52 | 5260 | 4.5 | 4.5 | 7.5 | ± 1.5 | 9.0 | 5.8 | 4.9 | 8.4 |
| | | | 56 | 5280 | 7.5 | 7.5 | 10.5 | ± 1.5 | 12.0 | 9.6 | 7.3 | 11.6 |
| | | | 60 | 5300 | 8.0 | 8.0 | 11.0 | ± 1.5 | 12.5 | 9.7 | 8.5 | 12.2 |
| | | | 64 | 5320 | 8.0 | 8.0 | 11.0 | ± 1.5 | 12.5 | 9.7 | 8.8 | 12.3 |
| | 802.11n (HT40) | MCS8 | 54 | 5270 | 4.5 | 4.5 | 7.5 | ± 1.5 | 9.0 | 6.2 | 5.8 | 9.0 |
| | | | 62 | 5310 | 6.0 | 6.0 | 9.0 | ± 1.5 | 10.5 | 8.0 | 6.4 | 10.3 |

Note(s):

SAR is not required for 802.11n HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a channels per KDB 248227 D01

**Wi-Fi 5.5GHz Band:**

| Band (GHz) | Mode | Data rate (Mbps) | Ch # | Freq. (MHz) | Target Pwr (dBm) | | | Tune-up Tolerance (dBm) | Maximum Tune-up Pwr (dBm) | Avg. Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Main | Aux | Total | | | Main | Aux | Total |
| 5.5 | 802.11a | 6 | 100 | 5500 | 12.0 | | | ± 1.5 | 13.5 | 13.2 | | |
| | | | 104 | 5520 | 11.0 | | | ± 1.5 | 12.5 | 12.2 | | |
| | | | 108 | 5540 | 11.0 | | | ± 1.5 | 12.5 | 12.2 | | |
| | | | 112 | 5560 | 11.0 | | | ± 1.5 | 12.5 | 12.1 | | |
| | | | 116 | 5580 | 11.0 | | | ± 1.5 | 12.5 | 12.1 | | |
| | | | 120 | 5600 | 11.0 | | | ± 1.5 | 12.5 | 12.2 | | |
| | | | 124 | 562 | 11.0 | | | ± 1.5 | 12.5 | 12.2 | | |
| | | | 128 | 5640 | 11.0 | | | ± 1.5 | 12.5 | 12.3 | | |
| | | | 132 | 5660 | 11.0 | | | ± 1.5 | 12.5 | 12.4 | | |
| | | | 136 | 5680 | 11.0 | | | ± 1.5 | 12.5 | 12.5 | | |
| | | | 140 | 5700 | 11.5 | | | ± 1.5 | 13.0 | 12.7 | | |
| | 802.11n (HT20) | MCS8 | 100 | 5500 | 9.0 | 9.0 | 12.0 | ± 1.5 | 13.5 | 10.7 | 9.6 | 13.2 |
| | | | 104 | 5520 | 8.5 | 8.5 | 11.5 | ± 1.5 | 13.0 | 10.5 | 9.5 | 13.0 |
| | | | 108 | 5540 | 8.5 | 8.5 | 11.5 | ± 1.5 | 13.0 | 10.6 | 9.2 | 13.0 |
| | | | 112 | 5560 | 8.5 | 8.5 | 11.5 | ± 1.5 | 13.0 | 10.3 | 9.1 | 12.8 |
| | | | 116 | 5580 | 8.5 | 8.5 | 11.5 | ± 1.5 | 13.0 | 10.3 | 8.7 | 12.6 |
| | | | 120 | 5600 | 8.5 | 8.5 | 11.5 | ± 1.5 | 13.0 | 10.6 | 9.3 | 13.0 |
| | | | 124 | 5620 | 9.5 | 9.5 | 12.5 | ± 1.5 | 14.0 | 11.8 | 9.3 | 13.7 |
| | | | 128 | 5640 | 9.5 | 9.5 | 12.5 | ± 1.5 | 14.0 | 11.5 | 9.4 | 13.6 |
| | | | 132 | 5660 | 9.5 | 9.5 | 12.5 | ± 1.5 | 14.0 | 11.3 | 9.5 | 13.5 |
| | | | 136 | 5680 | 9.5 | 9.5 | 12.5 | ± 1.5 | 14.0 | 11.2 | 9.6 | 13.5 |
| | | | 140 | 5700 | 9.5 | 9.5 | 12.5 | ± 1.5 | 14.0 | 11.6 | 9.8 | 13.8 |
| | 802.11n (HT40) | MCS8 | 102 | 5510 | 9.0 | 9.0 | 12.0 | ± 1.5 | 13.5 | 11.0 | 9.4 | 13.3 |
| | | | 118 | 5550 | 9.0 | 9.0 | 12.0 | ± 1.5 | 13.5 | 11.1 | 9.3 | 13.3 |
| | | | 134 | 5670 | 9.5 | 9.5 | 12.5 | ± 1.5 | 14.0 | 11.6 | 9.7 | 13.8 |

Note(s):

SAR is not required for 802.11n HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a channels per KDB 248227 D01

**Wi-Fi 5.8GHz Band:**

| Band (GHz) | Mode | Data rate (Mbps) | Ch # | Freq. (MHz) | Target Pwr (dBm) | | | Tune-up Tolerance (dBm) | Maximum Tune-up Pwr (dBm) | Avg. Pwr (dBm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Main | Aux | Total | | | Main | Aux | Total |
| 5.8 | 802.11a | 6 | 149 | 5745 | 12.0 | | | ± 1.5 | 13.5 | 13.2 | | |
| | | | 153 | 5765 | 12.0 | | | ± 1.5 | 13.5 | 13.5 | | |
| | | | 157 | 5785 | 12.0 | | | ± 1.5 | 13.5 | 13.2 | | |
| | | | 161 | 5805 | 12.5 | | | ± 1.5 | 14.0 | 13.9 | | |
| | | | 165 | 5825 | 12.5 | | | ± 1.5 | 14.0 | 14.0 | | |
| | 802.11n (HT20) | MCS8 | 149 | 5745 | 10.0 | 10.0 | 13.0 | ± 1.5 | 14.5 | 11.8 | 10.3 | 14.1 |
| | | | 153 | 5765 | 10.0 | 10.0 | 13.0 | ± 1.5 | 14.5 | 11.9 | 10.6 | 14.3 |
| | | | 157 | 5785 | 10.0 | 10.0 | 13.0 | ± 1.5 | 14.5 | 11.8 | 10.6 | 14.3 |
| | | | 161 | 5805 | 10.5 | 10.5 | 13.5 | ± 1.5 | 15.0 | 12.1 | 11.1 | 14.6 |
| | | | 165 | 5825 | 10.5 | 10.5 | 13.5 | ± 1.5 | 15.0 | 12.2 | 11.1 | 14.7 |
| | 802.11n (HT40) | MCS8 | 151 | 5755 | 9.5 | 9.5 | 12.5 | ± 1.5 | 14.0 | 10.6 | 10.9 | 13.8 |
| | | | 159 | 5795 | 9.5 | 9.5 | 12.5 | ± 1.5 | 14.0 | 11.2 | 9.8 | 13.6 |

Note(s):

SAR is not required for 802.11n HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a channels per KDB 248227 D01

# 15 SAR Measurements Results

**GSM850:**

| Mode | Slot | Test Position | Channel | Freq. (MHz) | Dist. (mm) | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Tune up limit | Measured | | | |
| GPRS 850 | 2 | Edge 4 | 128 | 824.2 | 0 | | | | | |
| | | | 190 | 836.6 | 0 | 33.0 | 32.1 | 0.115 | 0.143 | |
| | | | 251 | 848.8 | 0 | | | | | |
| | | Rear | 128 | 824.2 | 0 | | | | | |
| | | | 190 | 836.6 | 0 | 33.0 | 32.1 | 0.035 | 0.043 | |
| | | | 251 | 848.8 | 0 | | | | | |

**GSM1900:**

| Mode | Slot | Test Position | Channel | Freq. (MHz) | Dist. (mm) | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Tune up limit | Measured | | | |
| GPRS 1900 | 2 | Edge 4 | 512 | 1850.2 | 0 | 30.0 | 29.5 | 0.843 | 0.955 | 1 |
| | | | 661 | 1880.0 | 0 | 30.0 | 29.5 | 0.970 | 1.083 | |
| | | | 810 | 1909.8 | 0 | 30.0 | 29.4 | 1.140 | 1.318 | 1 |
| | | | 810 | 1909.8 | 0 | 30.0 | 29.4 | 1.140 | 1.309 | 2 |
| | | Rear | 512 | 1850.2 | 0 | | | | | |
| | | | 661 | 1880.0 | 0 | 30.0 | 29.5 | 0.141 | 0.157 | |
| | | | 810 | 1909.8 | 0 | | | | | |

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is required when the reported 1-g SAR for the mid-band or highest output power channel. ≥0.8 W/kg and transmission band ≤ 100 MHz (Per KDB 447498 D01 v05r01 section 4.3.3)
2. Repeated measurements are required only when the measured SAR is ≥0.80 W/kg. If the measured SAR values are < 1.45 W/kg with ≤20% variation, only one repeated measurement is required to reaffirm that the results are not expected to have substantial variations, which may introduce significant compliance concerns. (Per KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r01)
   - 2.1 Original SAR = 1.14 W/kg, therefore two times repeat SAR is required.
   - 2.2 Repeat SAR = 1.14 W/kg < 1.45W/kg
   - 2.3 SAR variation= 0.0% < 20%

**WCDMA Band II:**

| Mode | Test Position | Channel | Freq. (MHz) | Dist. (mm) | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Tune up limit | Measured | | | |
| Rel 99 RMC 12.2Kbps | Edge 4 | 9262 | 1852.4 | 0 | 24.0 | 23.1 | 0.896 | 1.095 | |
| | | 9400 | 1880.0 | 0 | 24.0 | 23.0 | 0.914 | 1.151 | 1 |
| | | 9538 | 1907.6 | 0 | 24.0 | 23.0 | 1.040 | 1.297 | 1 |
| | | 9538 | 1907.6 | 0 | 24.0 | 23.0 | 1.050 | 1.310 | 2 |
| | Rear | 9262 | 1852.4 | 0 | 24.0 | 23.1 | 0.123 | 0.150 | |
| | | 9400 | 1880.0 | 0 | | | | | |
| | | 9538 | 1907.6 | 0 | | | | | |

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is required when the reported 1-g SAR for the mid-band or highest output power channel. ≥0.8 W/kg and transmission band ≤ 100 MHz (Per KDB 447498 D01 v05r01 section 4.3.3)
2. Repeated measurements are required only when the measured SAR is ≥0.80 W/kg. If the measured SAR values are < 1.45 W/kg with ≤20% variation, only one repeated measurement is required to reaffirm that the results are not expected to have substantial variations, which may introduce significant compliance concerns. (Per KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r01)
   2.1 Original SAR = 1.04 W/kg, therefore two times repeat SAR is required.
   2.2 Repeat SAR = 1.05 W/kg < 1.45W/kg
   2.3 SAR variation= 0.95% < 20%

**WCDMA Band IV:**

| Mode | Test Position | Channel | Freq. (MHz) | Dist. (mm) | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Tune up limit | Measured | | | |
| Rel 99 RMC 12.2Kbps | Edge 4 | 1312 | 1712.4 | 0 | | | | | |
| | | 1413 | 1732.6 | 0 | | | | | |
| | | 1513 | 1752.6 | 0 | 24.0 | 23.0 | 0.724 | 0.920 | |
| | Rear | 1312 | 1712.4 | 0 | | | | | |
| | | 1413 | 1732.6 | 0 | | | | | |
| | | 1513 | 1752.6 | 0 | 24.0 | 23.0 | 0.107 | 0.136 | |

**WCDMA Band V:**

| Mode | Test Position | Channel | Freq. (MHz) | Dist. (mm) | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Tune up limit | Measured | | | |
| Rel 99 RMC 12.2Kbps | Edge 4 | 4132 | 826.4 | 0 | | | | | |
| | | 4183 | 836.6 | 0 | | | | | |
| | | 4233 | 846.6 | 0 | 24.0 | 22.9 | 0.083 | 0.107 | |
| | Rear | 4132 | 826.4 | 0 | | | | | |
| | | 4183 | 836.6 | 0 | | | | | |
| | | 4233 | 846.6 | 0 | 24.0 | 22.9 | 0.042 | 0.054 | |

**CDMA BC0:**

| Mode | Test Position | Channel | Freq. (MHz) | Dist. (mm) | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Tune up limit | Measured | | | |
| CDMA BC0 | Edge 4 | 1013 | 824.7 | 0 | | | | | |
| | | 384 | 836.5 | 0 | 25.0 | 24.4 | 0.098 | 0.114 | |
| | | 777 | 848.3 | 0 | | | | | |
| | Rear | 1013 | 824.7 | 0 | | | | | |
| | | 384 | 836.5 | 0 | 25.0 | 24.4 | 0.046 | 0.053 | |
| | | 777 | 848.3 | 0 | | | | | |

**CDMA BC1:**

| Mode | Test Position | Channel | Freq. (MHz) | Dist. (mm) | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Tune up limit | Measured | | | |
| CDMA BC1 | Edge 4 | 25 | 1851.3 | 0 | 25.0 | 24.7 | 1.350 | 1.447 | |
| | | 25 | 1851.3 | 0 | 25.0 | 24.7 | 1.310 | 1.404 | 2 |
| | | 600 | 1880.0 | 0 | 25.0 | 24.7 | 1.350 | 1.447 | 1 |
| | | 1175 | 1908.8 | 0 | 24.5 | 24.5 | 1.270 | 1.264 | 1 |
| | Rear | 25 | 1851.3 | 0 | 25.0 | 24.7 | 0.164 | 0.176 | |
| | | 600 | 1880.0 | 0 | | | | | |
| | | 1175 | 1908.8 | 0 | | | | | |

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is required when the reported 1-g SAR for the mid-band or highest output power channel. ≥0.8 W/kg and transmission band ≤ 100 MHz (Per KDB 447498 D01 v05r01 section 4.3.3)
2. Repeated measurements are required only when the measured SAR is ≥0.80 W/kg. If the measured SAR values are < 1.45 W/kg with ≤20% variation, only one repeated measurement is required to reaffirm that the results are not expected to have substantial variations, which may introduce significant compliance concerns. (Per KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r01)
   2.1 Original SAR = 1.35 W/kg, therefore two times repeat SAR is required.
   2.2 Repeat SAR = 1.31 W/kg < 1.45W/kg
   2.3 SAR variation= 3.0 % < 20%

**LTE Band 2 (20MHz Bandwidth):**

| Mode | Test Position | Channel | Freq. (MHz) | Dist. (mm) | UL RB Allocation | UL RB Start | MPR | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Tune up limit | Measured | | | |
| QPSK | Edge4 | 18900 | 1880.0 | 0 | 1 | 0 | 0 | 24.0 | 23.1 | 1.070 | 1.316 | |
| | | 18700 | 1860.0 | 0 | 1 | 0 | 0 | 24.0 | 23.0 | 1.010 | 1.272 | 1 |
| | | 19100 | 1900.0 | 0 | 1 | 0 | 0 | 24.0 | 22.9 | 1.020 | 1.314 | 1 |
| | | 18900 | 1880.0 | 0 | 50 | 0 | 1 | 24.0 | 22.6 | 0.918 | 1.267 | |
| | | 18700 | 1860.0 | 0 | 50 | 0 | 1 | 24.0 | 22.4 | 0.784 | 1.133 | 1 |
| | | 19100 | 1900.0 | 0 | 50 | 0 | 1 | 24.0 | 22.4 | 0.834 | 1.205 | 1 |
| | | 18900 | 1880.0 | 0 | 100 | 0 | 1 | 24.0 | 22.2 | 0.870 | 1.317 | 2 |
| | | 18700 | 1860.0 | 0 | 100 | 0 | 1 | 24.0 | 22.3 | 0.796 | 1.177 | 2 |
| | | 19100 | 1900.0 | 0 | 100 | 0 | 1 | 24.0 | 22.1 | 0.835 | 1.293 | 2 |
| | | 18900 | 1880.0 | 0 | 1 | 0 | 0 | 24.0 | 23.1 | 1.070 | 1.316 | 3 |
| QPSK | Rear | 18900 | 1880.0 | 0 | 1 | 0 | 0 | 24.0 | 23.1 | 0.125 | 0.154 | |
| | | 18900 | 1880.0 | 0 | 50 | 0 | 1 | 24.0 | 22.6 | 0.115 | 0.159 | |

Note(s):

1. 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. (Per KDB 941225 D05 v02r02 section 5.2.1)
2. The highest reported SAR for 1 RB and 50% RB allocation are ≥ 0.8 W/kg, SAR is required of 100% RB. (Per KDB 941225 D05 v02r02 section 5.2.3)
3. Repeated measurements are required only when the measured SAR is ≥0.80 W/kg. If the measured SAR values are < 1.45 W/kg with ≤20% variation, only one repeated measurement is required to reaffirm that the results are not expected to have substantial variations, which may introduce significant compliance concerns. (Per KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r01)
   3.1 Original SAR = 1.07 W/kg, therefore two times repeat SAR is required.
   3.2 Repeat SAR = 1.07 W/kg < 1.45W/kg
   3.3 SAR variation= 0.0 % < 20%

**LTE Band 4 (20MHz Bandwidth):**

| Mode | Test Position | Channel | Freq. (MHz) | Dist. (mm) | UL RB Allocation | UL RB Start | MPR | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Tune up limit | Measured | | | |
| QPSK | Edge4 | 20300 | 1745.0 | 0 | 1 | 0 | 0 | 24.0 | 23.9 | 0.860 | 0.880 | |
| | | 20050 | 1720.0 | 0 | 1 | 0 | 0 | 24.0 | 23.7 | 0.769 | 0.824 | 1 |
| | | 20175 | 1732.5 | 0 | 1 | 0 | 0 | 24.0 | 23.8 | 0.816 | 0.854 | 1 |
| | | 20050 | 1720.0 | 0 | 50 | 0 | 1 | 24.0 | 23.0 | 0.601 | 0.757 | |
| | | 20175 | 1732.5 | 0 | 50 | 0 | 1 | 24.0 | 22.9 | 0.643 | 0.828 | 1 |
| | | 20300 | 1745.5 | 0 | 50 | 0 | 1 | 24.0 | 22.9 | 0.680 | 0.876 | 1 |
| | | 20300 | 1745.0 | 0 | 100 | 0 | 1 | 24.0 | 23.0 | 0.668 | 0.841 | 2 |
| | | 20050 | 1720.0 | 0 | 100 | 0 | 1 | 24.0 | 22.7 | 0.620 | 0.836 | 2 |
| | | 20175 | 1732.5 | 0 | 100 | 0 | 1 | 24.0 | 23.1 | 0.657 | 0.808 | 2 |
| | | 20300 | 1745.0 | 0 | 1 | 0 | 0 | 24.0 | 23.9 | 0.877 | 0.897 | 3 |
| QPSK | Rear | 20300 | 1745.0 | 0 | 1 | 0 | 0 | 24.0 | 23.9 | 0.092 | 0.094 | |
| | | 20050 | 1720.0 | 0 | 50 | 0 | 1 | 24.0 | 22.6 | 0.086 | 0.119 | |

Note(s):

1. 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. (Per KDB 941225 D05 v02r02 section 5.2.1)
2. The highest reported SAR for 1 RB and 50% RB allocation are ≥ 0.8 W/kg, SAR is required of 100% RB. (Per KDB 941225 D05 v02r02 section 5.2.3)
3. Repeated measurements are required only when the measured SAR is ≥0.80 W/kg. If the measured SAR values are < 1.45 W/kg with ≤20% variation, only one repeated measurement is required to reaffirm that the results are not expected to have substantial variations, which may introduce significant compliance concerns. (Per KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r01)
   3.1 Original SAR = 0.860 W/kg, therefore two times repeat SAR is required.
   3.2 Repeat SAR = 0.877 W/kg < 1.45W/kg
   3.3 SAR variation= 1.9 % < 20%

**LTE Band 5 (10MHz Bandwidth):**

| Mode | Test Position | Channel | Freq. (MHz) | Dist. (mm) | UL RB Allocation | UL RB Start | MPR | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Tune up limit | Measured | | | |
| QPSK | Edge4 | 20525 | 836.5 | 0 | 1 | 49 | 0 | 24.0 | 23.7 | 0.099 | 0.106 | |
| | | 20450 | 829.0 | 0 | 25 | 24 | 1 | 24.0 | 22.6 | 0.086 | 0.119 | |
| QPSK | Rear | 20525 | 836.5 | 0 | 1 | 49 | 0 | 24.0 | 23.7 | 0.052 | 0.056 | |
| | | 20450 | 829.0 | 0 | 25 | 24 | 1 | 24.0 | 22.6 | 0.045 | 0.062 | |

**LTE Band 13 (10MHz Bandwidth):**

| Mode | Test Position | Channel | Freq. (MHz) | Dist. (mm) | UL RB Allocation | UL RB Start | MPR | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Tune up limit | Measured | | | |
| QPSK | Edge4 | 23230 | 782.0 | 0 | 1 | 24 | 0 | 24.0 | 23.4 | 0.050 | 0.057 | |
| | | 23230 | 782.0 | 0 | 25 | 12 | 1 | 24.0 | 22.5 | 0.042 | 0.059 | |
| QPSK | Rear | 23230 | 782.0 | 0 | 1 | 24 | 0 | 24.0 | 23.4 | 0.053 | 0.061 | |
| | | 23230 | 782.0 | 0 | 25 | 12 | 1 | 24.0 | 22.5 | 0.037 | 0.052 | |

**LTE Band 17 (10MHz Bandwidth):**

| Mode | Test Position | Channel | Freq. (MHz) | Dist. (mm) | UL RB Allocation | UL RB Start | MPR | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Tune up limit | Measured | | | |
| QPSK | Edge4 | 23790 | 710.0 | 0 | 1 | 24 | 0 | 24.0 | 23.6 | 0.043 | 0.047 | |
| | | 23790 | 710.0 | 0 | 25 | 0 | 1 | 24.0 | 22.5 | 0.034 | 0.048 | |
| QPSK | Rear | 23790 | 710.0 | 0 | 1 | 24 | 0 | 24.0 | 23.6 | 0.053 | 0.058 | |
| | | 23790 | 710.0 | 0 | 25 | 0 | 1 | 24.0 | 22.5 | 0.035 | 0.049 | |

**LTE Band 25 (20MHz Bandwidth):**

| Mode | Test Position | Channel | Freq. (MHz) | Dist. (mm) | UL RB Allocation | UL RB Start | MPR | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Tune up limit | Measured | | | |
| QPSK | Edge4 | 26365 | 1882.5 | 0 | 1 | 0 | 0 | 24.0 | 23.1 | 1.030 | 1.267 | |
| | | 26140 | 1860.0 | 0 | 1 | 0 | 0 | 24.0 | 23.0 | 1.000 | 1.259 | 1 |
| | | 26590 | 1905.0 | 0 | 1 | 0 | 0 | 24.0 | 23.0 | 1.040 | 1.309 | 1 |
| | | 26365 | 1882.5 | 0 | 50 | 0 | 1 | 24.0 | 22.4 | 0.793 | 1.146 | |
| | | 26140 | 1860.0 | 0 | 50 | 0 | 1 | 24.0 | 22.3 | 0.755 | 1.117 | 1 |
| | | 26590 | 1905.0 | 0 | 50 | 0 | 1 | 24.0 | 22.2 | 0.813 | 1.231 | 1 |
| | | 26365 | 1882.5 | 0 | 100 | 0 | 2 | 24.0 | 22.2 | 0.800 | 1.211 | 2 |
| | | 26140 | 1860.0 | 0 | 100 | 0 | 2 | 24.0 | 22.3 | 0.764 | 1.130 | 2 |
| | | 26590 | 1905.0 | 0 | 100 | 0 | 2 | 24.0 | 22.1 | 0.828 | 1.282 | 2 |
| | | 26590 | 1905.0 | 0 | 1 | 0 | 0 | 24.0 | 23.0 | 1.070 | 1.347 | 3 |
| QPSK | Rear | 26365 | 1882.5 | 0 | 1 | 0 | 0 | 24.0 | 23.1 | 0.117 | 0.144 | |
| | | 26365 | 1882.5 | 0 | 50 | 0 | 1 | 23.0 | 21.9 | 0.100 | 0.129 | |

Note(s):

1. 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. (Per KDB 941225 D05 v02r02 section 5.2.1)
2. The highest reported SAR for 1 RB and 50% RB allocation are ≥ 0.8 W/kg, SAR is required of 100% RB. (Per KDB 941225 D05 v02r02 section 5.2.3)
3. Repeated measurements are required only when the measured SAR is ≥0.80 W/kg. If the measured SAR values are < 1.45 W/kg with ≤20% variation, only one repeated measurement is required to reaffirm that the results are not expected to have substantial variations, which may introduce significant compliance concerns. (Per KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r01)
   3.1 Original SAR = 1.04 W/kg, therefore two times repeat SAR is required.
   3.2 Repeat SAR = 1.07 W/kg < 1.45W/kg
   3.3 SAR variation= 2.8 % < 20%

**Wi-Fi (2.4GHz Band):**

| Band | Mode | Test Position | Channel | Freq. (MHz) | Chain | Dist. (mm) | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Tune up limit | Measured | | | |
| 2.4GHz | 802.11b | Edge 1 | 1 | 2412 | 0 | 0 | 14.0 | 13.7 | 0.818 | 0.877 | 1 |
| | | | 6 | 2437 | 0 | 0 | 14.0 | 13.9 | 0.922 | 0.943 | |
| | | | 11 | 2462 | 0 | 0 | 14.0 | 13.9 | 0.961 | 0.983 | 1 |
| | | | 11 | 2462 | 0 | 0 | 14.0 | 13.9 | 0.952 | 0.974 | 2 |
| | | Rear | 6 | 2437 | 0 | 0 | 14.0 | 13.9 | 0.088 | 0.090 | |
| | 802.11n HT20 | Edge 1 | 6 | 2437 | 0 | 0 | 15.0 | 14.9 | 0.572 | 0.585 | |
| | | Edge 2 | 6 | 2437 | 1 | 0 | 15.0 | 14.9 | 0.240 | 0.246 | |
| | | Rear | 6 | 2437 | 0+1 | 0 | 15.0 | 14.9 | 0.034 | 0.035 | |

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is required when the reported 1-g SAR for the mid-band or highest output power channel. ≥ 0.8 W/kg and transmission band ≤ 100 MHz (Per KDB 447498 D01 v05r01 section 4.3.3)
2. Repeated measurements are required only when the measured SAR is ≥0.80 W/kg. If the measured SAR values are < 1.45 W/kg with ≤20% variation, only one repeated measurement is required to reaffirm that the results are not expected to have substantial variations, which may introduce significant compliance concerns. (Per KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r01)
   - 2.1 Original SAR = 0.961 W/kg, therefore two times repeat SAR is required.
   - 2.2 Repeat SAR = 0.952W/kg < 1.45W/kg
   - 2.3 SAR variation= 0.9% < 20%

**Wi-Fi (5.2GHz Band):**

| Band | Mode | Test Position | Channel | Freq. (MHz) | Chain | Dist. (mm) | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Tune up limit | Measured | | | |
| 5.2GHz | 802.11a | Edge1 | 36 | 5180 | 0 | 0 | 11.0 | 10.8 | 0.234 | 0.245 | |
| | | | 48 | 5240 | 0 | 0 | 11.0 | 10.7 | 0.298 | 0.319 | |
| | | Rear | 36 | 5180 | 0 | 0 | 11.0 | 10.8 | 0.415 | 0.435 | |
| | | | 48 | 5240 | 0 | 0 | 11.0 | 10.7 | 0.470 | 0.504 | |

**Wi-Fi (5.3GHz Band):**

| Band | Mode | Test Position | Channel | Freq. (MHz) | Chain | Dist. (mm) | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Tune up limit | Measured | | | |
| 5.3GHz | 802.11a | Edge1 | 56 | 5280 | 0 | 0 | 12.0 | 12.0 | 0.548 | 0.548 | |
| | | | 60 | 5300 | 0 | 0 | 13.0 | 12.8 | 0.588 | 0.616 | |
| | | Rear | 56 | 5280 | 0 | 0 | 12.0 | 12.0 | 0.383 | 0.383 | |
| | | | 60 | 5300 | 0 | 0 | 13.0 | 12.8 | 0.356 | 0.373 | |

**Wi-Fi (5.5GHz Band):**

| Band | Mode | Test Position | Channel | Freq. (MHz) | Chain | Dist. (mm) | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Tune up limit | Measured | | | |
| 5.5GHz | 802.11a | Edge1 | 100 | 5500 | 0 | 0 | 13.5 | 13.2 | 0.688 | 0.737 | |
| | | | 120 | 5600 | 0 | 0 | 12.5 | 12.2 | 0.532 | 0.570 | |
| | | | 128 | 5640 | 0 | 0 | 12.5 | 12.3 | 0.487 | 0.510 | |
| | | | 140 | 5700 | 0 | 0 | 13.0 | 12.7 | 0.429 | 0.460 | |
| | | Rear | 100 | 5500 | 0 | 0 | 13.5 | 13.2 | 0.473 | 0.507 | |
| | | | 120 | 5600 | 0 | 0 | 12.5 | 12.2 | 0.481 | 0.515 | |
| | | | 128 | 5640 | 0 | 0 | 12.5 | 12.3 | 0.497 | 0.520 | |
| | | | 140 | 5700 | 0 | 0 | 13.0 | 12.7 | 0.364 | 0.390 | |
| | 802.11n HT20 | Edge1 | 100 | 5500 | 0+1 | 0 | 13.5 | 13.2 | 0.779 | 0.835 | |
| | | | 120 | 5600 | 0+1 | 0 | 13.0 | 13.0 | 0.477 | 0.477 | |
| | | | 124 | 5620 | 0+1 | 0 | 14.0 | 13.7 | 0.480 | 0.514 | |
| | | | 140 | 5700 | 0+1 | 0 | 14.0 | 13.8 | 0.425 | 0.445 | |
| | | Edge2 | 100 | 5500 | 0+1 | 0 | 13.5 | 13.2 | 0.774 | 0.829 | |
| | | | 120 | 5600 | 0+1 | 0 | 13.0 | 13.0 | 0.732 | 0.732 | |
| | | | 124 | 5620 | 0+1 | 0 | 14.0 | 13.7 | 0.781 | 0.837 | |
| | | | 140 | 5700 | 0+1 | 0 | 14.0 | 13.8 | 0.836 | 0.875 | |
| | | | 140 | 5700 | 0+1 | 0 | 14.0 | 13.8 | 0.837 | 0.876 | 1 |
| | | Rear | 100 | 5500 | 0+1 | 0 | 13.5 | 13.2 | 0.615 | 0.659 | |
| | | | 120 | 5600 | 0+1 | 0 | 13.0 | 13.0 | 0.525 | 0.525 | |
| | | | 124 | 5620 | 0+1 | 0 | 14.0 | 13.7 | 0.511 | 0.548 | |
| | | | 140 | 5700 | 0+1 | 0 | 14.0 | 13.8 | 0.524 | 0.549 | |

Note(s):

1 Repeated measurements are required only when the measured SAR is ≥0.80 W/kg. If the measured SAR values are < 1.45 W/kg with ≤20% variation, only one repeated measurement is required to reaffirm that the results are not expected to have substantial variations, which may introduce significant compliance concerns. (Per KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r01)

1.1 Original SAR = 0.836 W/kg, therefore two times repeat SAR is required.

1.2 Repeat SAR = 0.837W/kg < 1.45W/kg

1.3 SAR variation= 0.1% < 20%

**Wi-Fi (5.8GHz Band):**

| Band | Mode | Test Position | Channel | Freq. (MHz) | Chain | Dist. (mm) | Power (dBm) | | Measured 1g SAR (W/kg) | Reported SAR(W/kg) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Tune up limit | Measured | | | |
| 5.8GHz | 802.11a | Edge1 | 153 | 5765 | 0 | 0 | 13.5 | 13.5 | 0.611 | 0.611 | |
| | | | 161 | 5805 | 0 | 0 | 14.0 | 13.9 | 0.725 | 0.742 | |
| | | | 165 | 5825 | 0 | 0 | 14.0 | 14.0 | 0.778 | 0.778 | |
| | | Rear | 153 | 5765 | 0 | 0 | 13.5 | 13.5 | 0.394 | 0.394 | |
| | | | 161 | 5805 | 0 | 0 | 14.0 | 13.9 | 0.507 | 0.519 | |
| | | | 165 | 5825 | 0 | 0 | 14.0 | 14.0 | 0.482 | 0.482 | |
| | 802.11n HT20 | Edge1 | 153 | 5765 | 0+1 | 0 | 14.5 | 14.3 | 0.534 | 0.559 | |
| | | | 161 | 5805 | 0+1 | 0 | 15.0 | 14.6 | 0.449 | 0.492 | |
| | | | 165 | 5825 | 0+1 | 0 | 15.0 | 14.7 | 0.527 | 0.565 | |
| | | Edge2 | 153 | 5765 | 0+1 | 0 | 14.5 | 14.3 | 0.953 | 0.998 | |
| | | | 161 | 5805 | 0+1 | 0 | 15.0 | 14.6 | 1.020 | 1.118 | |
| | | | 165 | 5825 | 0+1 | 0 | 15.0 | 14.7 | 0.955 | 1.023 | |
| | | | 161 | 5805 | 0+1 | 0 | 15.0 | 14.6 | 1.080 | 1.184 | 1 |
| | | Rear | 153 | 5765 | 0+1 | 0 | 14.5 | 14.3 | 0.545 | 0.571 | |
| | | | 161 | 5805 | 0+1 | 0 | 15.0 | 14.6 | 0.461 | 0.505 | |
| | | | 165 | 5825 | 0+1 | 0 | 15.0 | 14.7 | 0.545 | 0.584 | |

Note(s):

1 Repeated measurements are required only when the measured SAR is ≥0.80 W/kg. If the measured SAR values are < 1.45 W/kg with ≤20% variation, only one repeated measurement is required to reaffirm that the results are not expected to have substantial variations, which may introduce significant compliance concerns. (Per KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r01)1.1 Original SAR = 1.02 W/kg, therefore two times repeat SAR is required.

1.2 Repeat SAR = 1.08 W/kg < 1.45W/kg

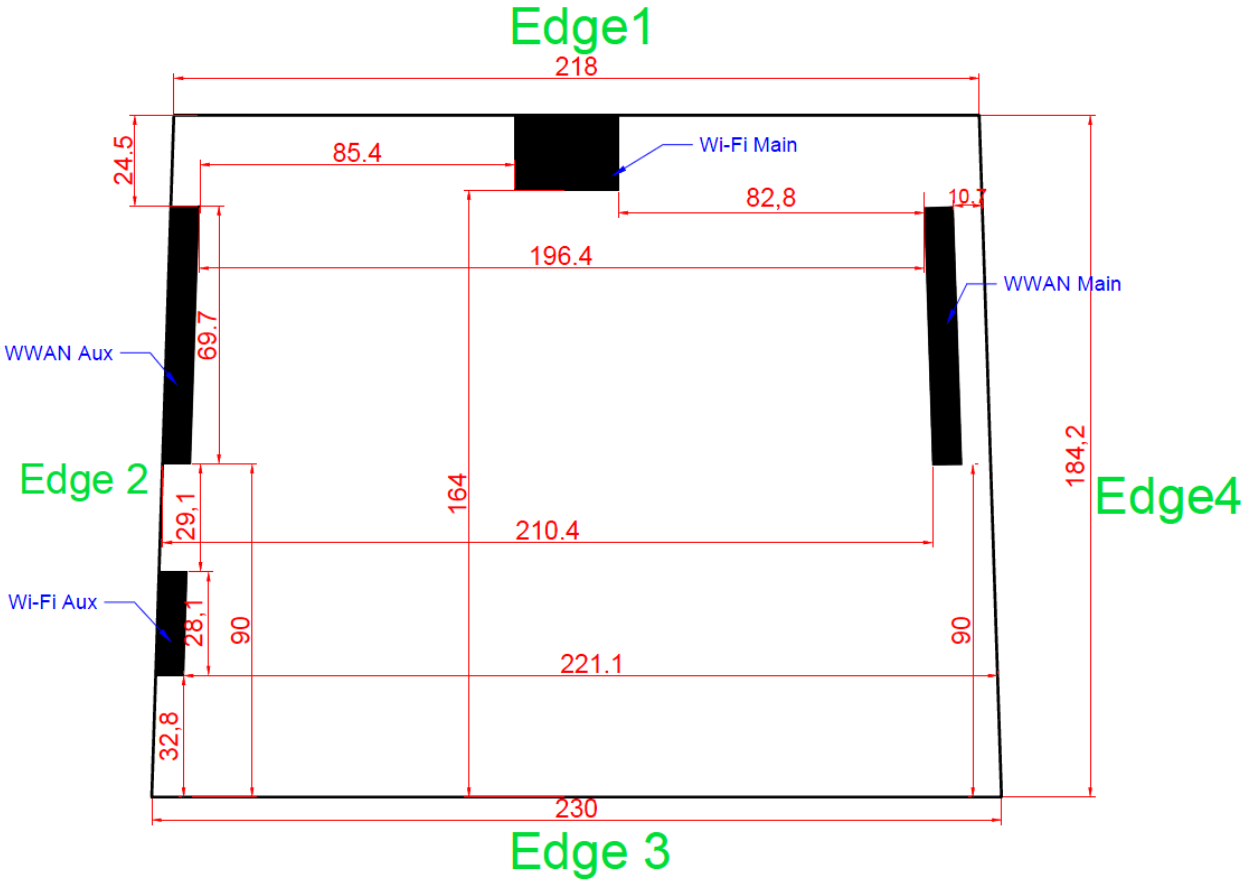
1.3 SAR variation= 5.5% < 20%

## 15.1 Summary of Highest SAR Values

Results for highest reported SAR values for each frequency band and mode

| Technology/Band | Test configuration | Mode | Highest Reported 1g-SAR (W/kg) |
|---|---|---|---|
| GSM850 | Edge4 | GPRS 2slot | 0.143 |
| GSM1900 | Edge4 | GPRS 2slot | 1.318 |
| W-CDMA (UMTS) Band II | Edge4 | 12.2 Kbps | 1.310 |
| WCDMA (UMTS) band IV | Edge4 | 12.2 Kbps | 0.920 |
| WCDMA (UMTS) band V | Edge4 | 12.2 Kbps | 0.107 |
| CDMA BC0 | Edge4 | RC1 SO55 | 0.114 |
| CDMA BC1 | Edge4 | RC1 SO55 | 1.447 |
| LTE band 2 | Edge4 | QPSK BW20 | 1.317 |
| LTE band 4 | Edge4 | QPSK BW20 | 0.897 |
| LTE band 5 | Edge4 | QPSK BW10 | 0.119 |
| LTE band 13 | Rear | QPSK BW10 | 0.061 |
| LTE band 17 | Rear | QPSK BW10 | 0.058 |
| LTE band 25 | Edge4 | QPSK BW20 | 1.347 |
| WiFi 2.4 GHz | Edge1 | 802.11b | 0.983 |
| WiFi 5.2 GHz | Rear | 802.11a | 0.504 |
| WiFi 5.3 GHz | Edge1 | 802.11a | 0.616 |
| WiFi 5.5 GHz | Edge2 | 802.11n HT20 | 0.876 |
| WiFi 5.8 GHz | Edge2 | 802.11n HT20 | 1.184 |

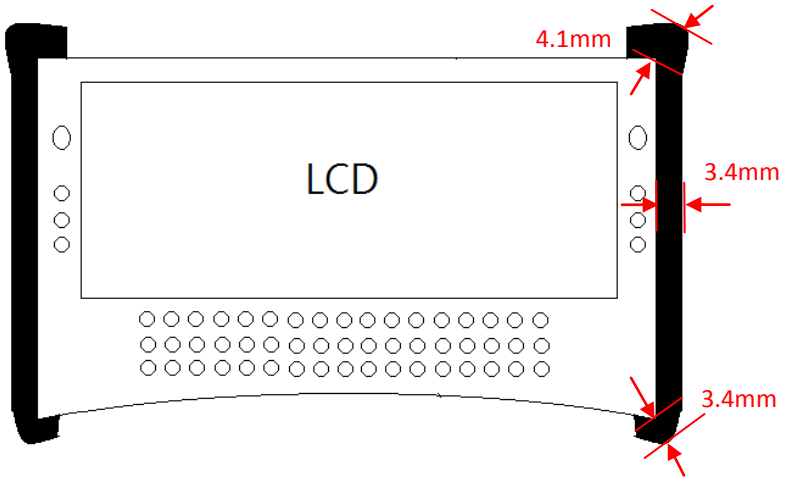
# 16 Antenna Locations & Separation Distances

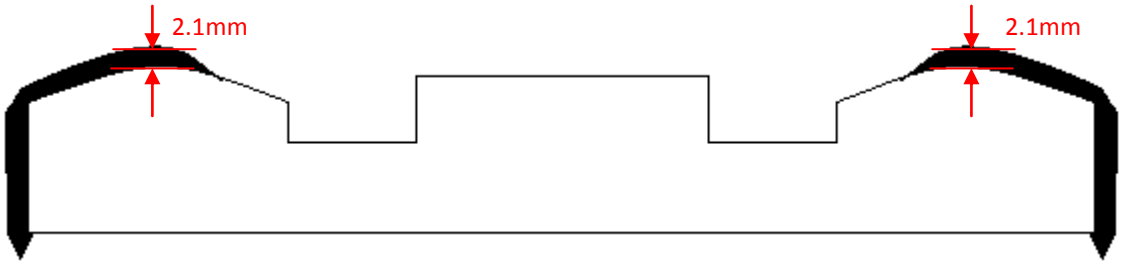



Unit: mm

# 17 Schematic of Bumpers

According to KDB 616217 )4.1), the bumpers thickness is less than 5mm. Therefore the bumpers cannot be removed for SAR tesing.



# 18 Equipment List & Calibration Status

| Name of Equipment | Manufacturer | Type/Model | Serial Number | Calibration Cycle(year) | Calibration Due |
|---|---|---|---|---|---|
| S-Parameter Network Analyzer | Agilent | E8358A | MY46213916 | 1 | 06/03/2014 |
| Electronic Probe kit | Hewlett Packard | 85070D | N/A | N/A | N/A |
| Power Meter | Anritsu | ML2495A | GB41291611 | 1 | 09/18/2013 |
| Power Sensor | Anritsu | MA2411B | MY41091956 | 1 | 09/18/2013 |
| Spectrum Analyzer | Agilent | E4446A | US42510252 | 1 | 12/09/2013 |
| Wireless Communication Test Set | Agilent | E5515C 8960 | MY48363204 | 1 | 09/12/2013 |
| Radio Communication Analyzer | Anritsu | MT8820C | 6200938900 | 1 | 05/30/2014 |
| Data Acquisition Electronics (DAE) | SPEAG | DAE4 | 877 | 1 | 03/11/2014 |
| Dosimetric E-Field Probe | SPEAG | EX3DV4 | 3665 | 1 | 05/06/2014 |
| 750 MHz System Validation Dipole | SPEAG | D750V3 | 1020 | 1 | 10/25/2013 |
| 835 MHz System Validation Dipole | SPEAG | D835V2 | 4d015 | 1 | 03/17/2014 |
| 1800 MHz System Validation Dipole | SPEAG | D1800V2 | 2d062 | 1 | 02/11/2014 |
| 1900 MHz System Validation Dipole | SPEAG | D1900V2 | 5d056 | 1 | 02/12/2014 |
| 2450 MHz System Validation Dipole | SPEAG | D2450V2 | 728 | 1 | 05/01/2014 |
| 5 GHz System Validation Dipole | SPEAG | D5GHzV2 | 1004 | 1 | 11/15/2013 |
| Robot | Staubli | RX60L | F02/5T69A1/A/01 | N/A | N/A |
| Amplifier | Mini-Circuit | ZVE-8G | 665500309 | N/A | N/A |
| Amplifier | Mini-Circuit | ZHL-1724HLN | D072602#2 | N/A | N/A |

# 19 Facilities

All measurement facilities used to collect the measurement data are located at

☐ No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang, Taoyuan Hsien, Taiwan, R.O.C.

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)

☐ No. 199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

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# 21 Attachments

| Exhibit | Content |
|---|---|
| 1 | System Performance Check Plots |
| 2 | SAR test plots for GPRS 850 |
| 3 | SAR test plots for GPRS 1900 |
| 4 | SAR test plots for WCDMA Band II |
| 5 | SAR test plots for WCDMA Band IV |
| 6 | SAR test plots for WCDMA Band V |
| 7 | SAR test plots for CDMA BC0 |
| 8 | SAR test plots for CDMA BC1 |
| 9 | SAR test plots for LTE Band 2 |
| 10 | SAR test plots for LTE Band 4 |
| 11 | SAR test plots for LTE Band 5 |
| 12 | SAR test plots for LTE Band 13 |
| 13 | SAR test plots for LTE Band 17 |
| 14 | SAR test plots for LTE Band 25 |
| 15 | SAR test plots for Wi-Fi 2.4GHz Band |
| 16 | SAR test plots for Wi-Fi 5 GHz Band |
| 17 | SAR_Probe_EX3DV4_sn3665 |
| 18 | SAR_DAE4_sn877 |
| 19 | SAR_Dipole_D750v3_sn1020 |
| 20 | SAR_Dipole_D835v2_sn4d015 |
| 21 | SAR_Dipole_D1800v2_sn2d062 |
| 22 | SAR_Dipole_D1900v2_sn5d056 |
| 23 | SAR_Dipole_D2450v2_sn728 |
| 24 | SAR_Dipole_D5GHzv2_sn1004 |
| 25 | T130724W02-SF PHOTOs |

**END OF REPORT**