ANSI/IEEE Std. C95.1-2005

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

FCC TEST REPORT

For

Tablet Computer

Trade Name: Lenovo

Model: TP00064B

Issued to

COMPAL ELECTRONICS INC
No.581, Ruiguang Rd., Neihu District, Taipei City 11492, Taiwan (R.O.C)

Issued by

Compliance Certification Services Inc.
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Issued Date: 2015/05/07

Testing Laboratory
1309

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	2015/05/07	Initial Issue	ALL	Tony Liao

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1 Certificate of Compliance (SAR Evaluation)

Applicant COMPAL ELECTRONICS INC

No.581, Ruiguang Rd., Neihu District, Taipei City 11492, Taiwan (R.O.C)

Equipment Under Test: Tablet Computer

Trade Name: Lenovo

Model Number: TP00064B

Date of Test: March 31 ~ May 06, 2015

Device Category: PORTABLE DEVICES

Exposure Category: GENERAL POPULATION/UNCONTROLLED EXPOSURE

Applicable Standards	
FCC	● IEEE 1528 2013 ● KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03 ● KDB 447498 D01 General RF Exposure Guidance v05r02 ● KDB 616217 D04 SAR for laptop and tablets v01r01 ● KDB 248227 D01 SAR measurement for 802 11 a b g v01r02 ● KDB 941225 D05 SAR for LTE Devices v02r03
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:

Tony Liao
SAR Engineer
Compliance Certification Services Inc.

2 Description of Equipment Under Test

Product	Tablet Computer		
Trade Name	Lenovo		
Model Number	TP00064B		
RF Module	Sierra	Model:	EM7345
Transmitters	GSM & UMTS & LTE		
Modulation Technique	GSM:GMSK		
	WCDMA:QPSK		
	LTE:QPSK,16QAM		
Antenna Specification	Brand name	TE Connectivity	
	Parts Number	Mai:DC33001MT00	
		Aux:DC33001MT10	
	Type	Monopole	
Rechargeable Li-polymer Battery–alternate	1. Brand:LGC Model: SB10F46454 Rating:32Wh 4.2Ah 7.6V 2. Brand:Simplo Model: SB10F46455 Rating:32Wh 4.2Ah 7.6V Test is using battery No.1.		

Note:
1. The sample selected for test was prototype that representative to production product and was provided by manufacturer.

2.1 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)
GPRS850	Rear	GPRS 4slot	1.297
GPRS1900	Rear	GPRS 3slot	1.001
WCDMA Band II	Rear	12.2 Kbps	1.001
WCDMA band IV	Edge1	12.2 Kbps	1.065
WCDMA band V	Rear	12.2 Kbps	1.005
LTE band 2	Edge1	QPSK BW20	1.064
LTE band 4	Edge1	QPSK BW20	1.064
LTE band 5	Edge1	QPSK BW10	0.712
LTE band 7	Edge1	QPSK BW20	1.330
LTE band 13	Edge1	QPSK BW10	0.817
LTE band 17	Edge1	QPSK BW10	0.718

3 Requirements for Compliance Testing Defined

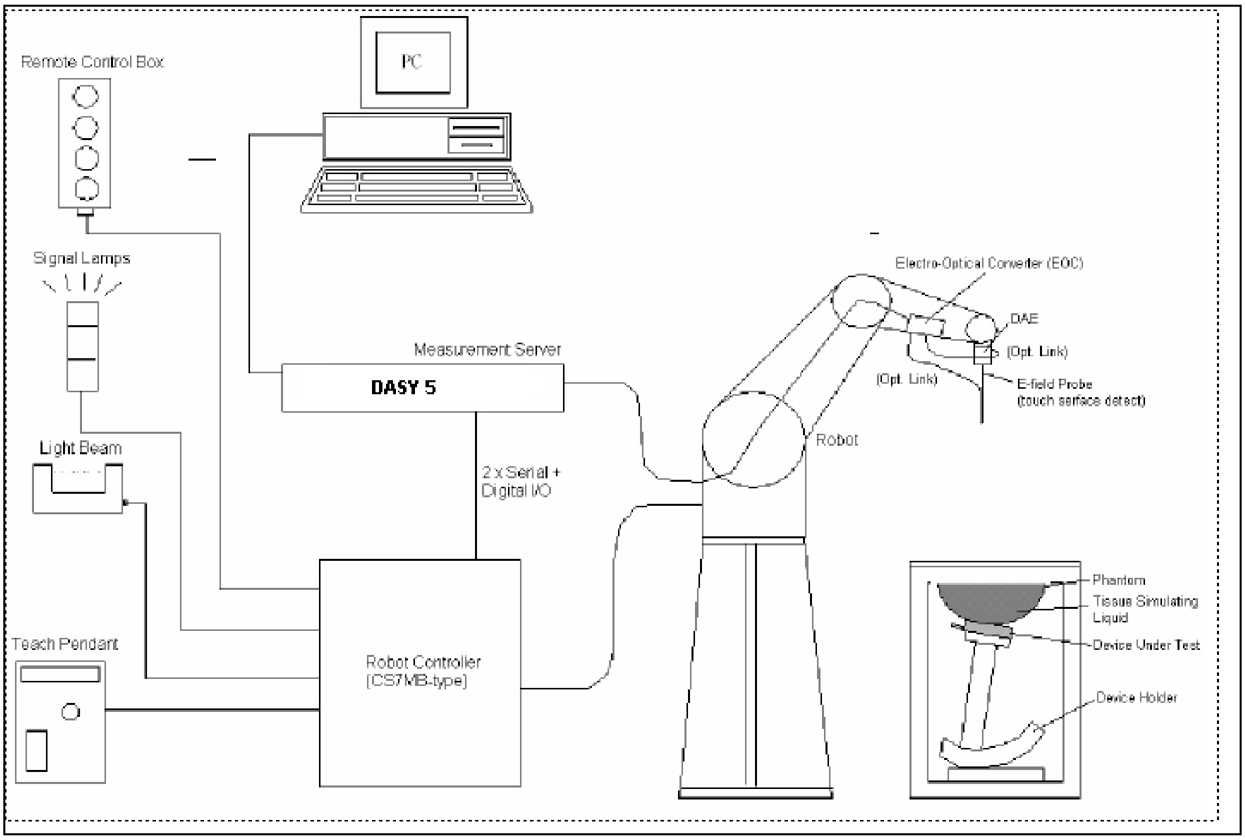
3.1 Requirements for Compliance Testing Defined by the FCC

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 C95.1-2005 [6].

4 Dosimetric Assessment System

These measurements were performed with the automated near-field scanning system DASY5 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 2013.

4.1 Measurement System Diagram



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

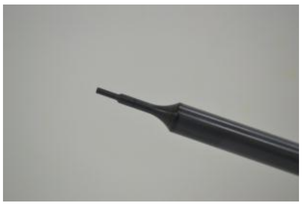
- A standard high precision 6-axis robot (St¨aubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. 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

<table>
<tr><th colspan="2">DASY4/DASY5 Measurement Server</th></tr>
<tr><td>
</td><td>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.</td></tr>
<tr><td>
</td><td>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.</td></tr>
</table>

<table>
<tr><th colspan="2">Data Acquisition Electronics (DAE)</th></tr>
<tr><td></td><td>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.</td></tr>
</table>

EX3DV4 Isotropic E-Field Probe for Dosimetric Measurements



Construction: Symmetrical design with triangular core
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g., DGBE)

Calibration: Basic Broad Band Calibration in air: 10-3000 MHz.
Conversion Factors (CF) for HSL 900 and HSL 1800
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)
± 0.5 dB in HSL (rotation normal to probe axis)

Dynamic Range: 10 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
(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%.

SAM Phantom (V4.0)

Construction: The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 2013, 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%)

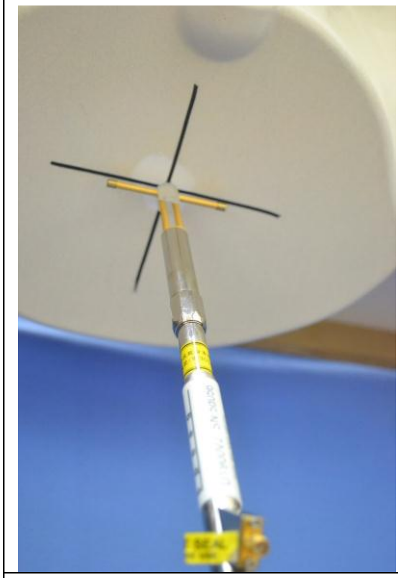
Filling Volume: Approx. 25 liters

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: 750, 835, 1800, 1900,2450 MHz

Return loss: > 20 dB at specified validation position

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

Dimensions:
D750V3: dipole length: 178 mm; overall height: 330 mm
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

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: 750, 835, 1800, 1900,2450 MHz

Return loss: > 20 dB at specified validation position

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

Dimensions:
D750V3: dipole length: 178 mm; overall height: 330 mm
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

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	σ
	- Density	ρ

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

σ = conductivity in [mho/m] or [Siemens/m]

ρ = 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 v01

<table>
<tr><th></th><th>≤ 3 GHz</th><th>> 3 GHz</th></tr>
<tr><td>Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>$\frac{1}{2} \cdot \delta \cdot \ln(2)$ ± 0.5 mm</td></tr>
<tr><td>Maximum probe abgle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td rowspan="2">Maximum area scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
</table>

- **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 v01

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm</td><td>3 – 4 GHz: ≤ 5 mm
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
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$:between 1^{st} two points losest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
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
4 – 5 GHz: ≥ 25 mm
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 Wireless Technologies

Wireless technologies	Tx Frequency Bands	Operating mode	Duty Cycle used for testing
GSM	850 1900	GPRS (GMSK) EGPRS(8PSK)	GPRS/EGPRS:1 Slot: 12.5%; 2 Slots: 25%, 3 Slots: 37.5%, 4 Slots: 50%,
	GPRS Multi-Slot Class: ☐Class 8 - ☐ Class 10 - ☐Class 12 - ☑Class 33		
WCDMA (UMTS)	Band II Band IV Band V	UMTS Rel. 99 HSDPA HSUPA	100%
LTE	Band 2 Band 4 Band 5 Band 7 Band 13 Band 17	QPSK 16QAM	100%

7.2 Maximum Tune-up Power

Tolerance (dB): ± 1		RF Output Power (dBm)	
Band	Mode	Target	Max. tune-up power
GSM850	GPRS 1 Slot	32.5	33.5
	GPRS 2 Slot	32.5	33.5
	GPRS 3 Slot	31.7	32.7
	GPRS 4 Slot	30.5	31.5
GSM1900	GPRS 1 Slot	29.5	30.5
	GPRS 2 Slot	29.5	30.5
	GPRS 3 Slot	28.7	29.7
	GPRS 4 Slot	27.5	28.5
WCDMA Band II	R99	23.5	24.5
	HSDPA	23.5	24.5
	HSUPA	23.5	24.5
WCDMA Band V	R99	23.5	24.5
	HSDPA	23.5	24.5
	HSUPA	23.5	24.5
Tolerance (dB): -1,+0.5		RF Output Power (dBm)	
LTE Band 2	QPSK	23.0	23.5
LTE Band 4	QPSK	23.0	23.5
LTE Band 5	QPSK	23.0	23.5
LTE Band 13	QPSK	23.0	23.5
LTE Band 17	QPSK	23.0	23.5
LTE Band 25	QPSK	23.0	23.5

7.3 Simultaneous Transmission

RF Exposure Condition	Transmit Configurations
WWAN + Wi-Fi	**GPRS + Wi-Fi / BT** GPRS 850/1900 + BT (Chain 0) GPRS 850/1900 + 2.4GHz (Chain 0) GPRS 850/1900 + 2.4GHz (Chain 1) GPRS 850/1900 + 5GHz (Chain 0) + BT (Chain 0) GPRS 850/1900 + 5GHz (Chain 1) + BT (Chain 0) GPRS 850/1900 + 2.4GHz (Chain 0+ Chain 1) GPRS 850/1900 + 2.4GHz (Chain 1) + BT (Chain 0) GPRS 850/1900 + 5GHz (Chain 0+ Chain 1) + BT (Chain 0) **WCDMA + Wi-Fi / BT** WCDMA Band II/IV/V + BT (Chain 0) WCDMA Band II/IV/V + 2.4GHz (Chain 0) WCDMA Band II/IV/V + 2.4GHz (Chain 1) WCDMA Band II/IV/V + 5GHz (Chain 0) + BT (Chain 0) WCDMA Band II/IV/V + 5GHz (Chain 1) + BT (Chain 0) WCDMA Band II/IV/V + 2.4GHz (Chain 0+ Chain 1) WCDMA Band II/IV/V + 2.4GHz (Chain 1) + BT (Chain 0) WCDMA Band II/IV/V + 5GHz (Chain 0+ Chain 1) + BT (Chain 0) **LTE + Wi-Fi / BT** LTE Band 2/4/5/13/17 + BT (Chain 0) LTE Band 2/4/5/13/17 + 2.4GHz (Chain 0) LTE Band 2/4/5/13/17 + 2.4GHz (Chain 0) LTE Band 2/4/5/13/17 + 5GHz (Chain 0) + BT (Chain 0) LTE Band 2/4/5/13/17 + 5GHz (Chain 1) + BT (Chain 0) LTE Band 2/4/5/13/17 + 2.4GHz (Chain 0+ Chain 1) LTE Band 2/4/5/13/17 + 2.4GHz (Chain 1) + BT (Chain 0) LTE Band 2/4/5/13/17 + 5GHz (Chain 0+ Chain 1) + BT (Chain 0) **Wi-Fi/BT** 2.4GHz(Chain 0) 2.4GHz(Chain 1) 2.4GHz(Chain 0+ Chain 1) 2.4GHz(Chain 1) + BT (Chain 0) 5GHz(Chain 0) 5GHz(Chain 1) 5GHz(Chain 0+ Chain 1) 5GHz(Chain 0) + BT (Chain 0) 5GHz(Chain 1) + BT (Chain 0) 5GHz(Chain 0+ Chain 1) + BT (Chain 0) **BT** BT (Chain 0)

Note(s):

1. For WWAN mode only Chain 0 can be used as transmitting and Chain 1 only be used as receiving.
2. For WLAN mode can be used as transmitting/receiving on the Chain 0 and Chain 1.
3. For BT mode only Chain 0 can be used as transmitting/receiving.

8 General LTE SAR Test and Reporting Considerations

KDB 941225 D05 SAR for LTE Devices V02

Item	Description	Information						
1	Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 2	Channel Bandwidth					
			1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz
		Low	18607/1850.7	18615/1851.5	18625/1852.5	18650/1855	18675/1857.5	18700/1860
		Mid	18900/1880	18900/1880	18900/1880	18900/1880	18900/1880	18900/1880
		High	19192/1909.2	19184/1908.4	19175/1907.5	19150/1905	19125/1902.5	19100/1900
		Band 4	Channel Bandwidth					
			1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz
		Low	19957/1710.7	19965/1711.5	19975/1712.5	20000/1715	20025/1717.5	20050/1720
		Mid	20175/1732.5	20175/1732.5	20175/1732.5	20175/1732.5	20175/1732.5	20175/1732.5
		High	20392/1754.2	20384/1753.4	20375/1752.5	20350/1750	20325/1747.5	20300/1745
		Band 5	Channel Bandwidth					
			1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz
		Low	20407/824.7	20415/825.5	20425/826.5	20450/829		
		Mid	20525/836.5	20525/836.5	20525/836.5	20525/836.5		
		High	20642/848.2	20643/847.4	20625/846.5	20600/844		
		Band 7	Channel Bandwidth					
			1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz
		Low			20775/2502.5	20800/2505.5	20825/2507.5	20850/2510.0
		Mid			21100/2535.0	21100/2535.0	21100/2535.0	21100/2535.0
		High			21425/2567.5	21400/2565.0	21375/2562.5	21350/2560.0
		Band 13	Channel Bandwidth					
			1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz
		Low			23205/779.5			
		Mid			23230/782	23230/782		
		High			23255/784.5			
		Band 17	Channel Bandwidth					
			1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz
		Low			23755/706.5	23780/709		
		Mid			23790/710	23790/710		
		High			23825/713.5	23800/711		

KDB 941225 D05 SAR for LTE Devices V02 (Continued)

Item	Description	Information
2	Descriptions of the LTE transmitter and antenna implementation;	A single antenna is used for LTE and other wireless modes (GPRS/EGPRS/UMTS) for both Transmit and Receive. A Secondary antenna is used for LTE and other wireless modes (GPRS/EGPRS/UMTS) for Receive Only.
3	Maximum power reduction (MPR)	As per 3GPP 36.101 v9.11.0 (2012-03), Release 9
4	Power Reduction	Yes
5	Spectrum plots for RB configurations	Refer to Section 11.3

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

Modulation	Channel bandwidth / Transmission bandwidth (N_{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

MPR is permanently built-in by design

A-MPR was disabled

9 Power Reduction by Proximity Sensing

A proximity sensor for power reduction is implemented in this device to address RF exposure compliance when the cellular antenna is positioned close to the user's body. The sensor's mechanical structure is designed to fit within the enclosure design used in this device and also extended around the edge and top of the antenna element in order to optimize sensitivity in these orientations. This design combines the antenna printed directly on a plastic part and proximity sensor FPC (Flexible Printed Circuit) bonded together into one piece. According to KDB 616217 D04 SAR for laptop and tablets v01r01 6)

9.1 Procedures for determining proximity sensor triggering distances

The following procedures should be applied to determine proximity sensor triggering distances for the back surface and individual edges of a tablet. Conducted power is monitored qualitatively to identify the general triggering characteristics and recorded quantitatively, versus spacing, as required by the procedures. Unless there is built-in test software that reports the triggering conditions and enables the power levels to be confirmed separately, monitoring of conducted power during the triggering tests typically requires internal access to the antenna ports inside the tablet, which may interfere with the triggering tests.

(1) The relevant transmitter should be set to operate at its normal maximum output power.

(2) The entire back surface or edge of the tablet is positioned below a flat phantom filled with the required tissue-equivalent medium, and positioned at least 20 mm further than the distance that triggers power reduction.

(3) It should be ensured that the cables required for power measurements are not interfering with the proximity sensor. Cable losses should be properly compensated to report the measured power results.

(4) The back surface or edge is moved toward the phantom in 3 mm steps until the sensor triggers.

(5) The back surface or edge is then moved back (further away) from the phantom by at least 5 mm or until maximum output power is returned to the normal maximum level.

(6) The back surface or edge is again moved toward the phantom, but in 1 mm steps, until it is at least 5 mm past the triggering point or touching the phantom. If 1 mm resolution is not suitable for the sensor triggering sensitivity, a KDB inquiry should be submitted to determine alternative test configurations.

(7) If the tablet is not touching the phantom, it is moved in 3 mm steps until it touches the phantom to confirm that the sensor remains triggered and the maximum power stays reduced.

(8) The process is then reversed by moving the tablet away from the phantom according to steps 4) to 7), to determine triggering release, until it is at least 10 mm beyond the point that triggers the return of normal maximum power.

(9) The measured output power within ± 5 mm of the triggering points, or until the tablet is touching the phantom, for movements to and from the phantom should be tabulated in the SAR report.

(10) If the sensor design and implementation allow additional variations for triggering distance tolerances, multiple samples should be tested to determine the most conservative distance required for SAR evaluation.

(11) To ensure all production units are compliant, it is generally necessary to reduce the triggering distance determined from the triggering tests by 1 mm, or more if it is necessary, and use the smallest distance for movements to and from the phantom, minus 1 mm, as the sensor triggering distance for determining the SAR measurement distance.

9.2 Procedures for determining antenna and proximity sensor coverage

The sensing regions are usually limited to areas near the sensor element. If a sensor is spatially offset from the antenna(s), it is necessary to verify sensor triggering for conditions where the antenna is next to the user but the sensor is laterally further away to ensure sensor coverage is sufficient for reducing the power to maintain compliance. The following are used to determine if additional SAR measurements may be necessary due to sensor and antenna offset. 25 These procedures do not apply and are not required for configurations where the antenna and sensor are collocated and the peak SAR location is overlapping with the sensor.

(1) The back surface or edge of the tablet is positioned at a test separation distance less than or equal to the distance required for back surface or edge triggering, with both the antenna and sensor pad located at least 20 mm laterally outside the edge (boundary) of the phantom, along the direction of maximum antenna and sensor offset. For the back surface, if the direction of maximum offset is not aligned with the tablet coordinates (physical edges) the tablet test position would not be aligned with the phantom coordinates (orientations). Each applicable tablet edge should be positioned perpendicularly to the phantom to determine sensor coverage. For antennas and/or sensors located near the corner of a tablet, both adjacent edges must be considered.

(2) The similar sequence of steps applied to determine sensor triggering distance in section 6.2 are used to verify back surface and edge sensor coverage by moving the tablet (sensor and antenna) horizontally toward the phantom while maintaining the same vertical separation between the back surface or edge and the phantom.

(3) After the exact location where triggering of power reduction is determined, with respect to the sensor and antenna, the tablet movement should be continued, in 3 mm increments, until both the sensor and antenna(s) are fully under the phantom and at least 20 mm inside the phantom edge.

(4) The process is then repeated from the opposite direction, starting at the other end of the maximum antenna and sensor offset, by rotating the tablet 180° along the vertical axis.

(5) The triggering points should be documented graphically, with the antenna and sensor clearly identified, along with all relevant dimensions.

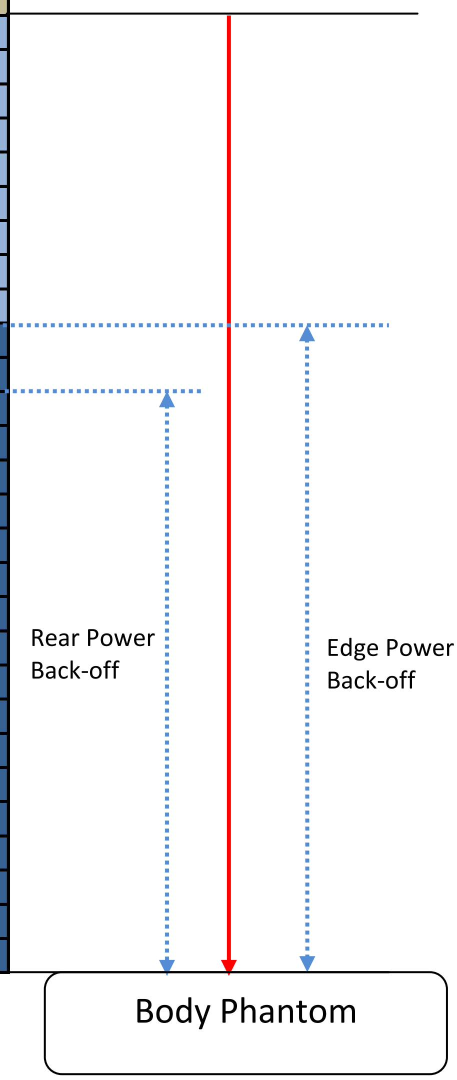
(6) If the subsequently measured peak SAR location for the antenna is not between the triggering points, established by the sensor coverage tests from opposite ends of the antenna and sensor, additional SAR tests may be required for conditions where only part of the back surface or edge of a tablet corresponding to the antenna is in proximity to the user and the sensor may not be triggering as desired. A KDB inquiry must be submitted by the test lab to determine if additional tests are required and the proper test configurations to use for testing. This may include situations where the sensor coverage region is too small for the antenna, the sensor is located too far away from the antenna, the sensor location is insufficient to cover multiple antennas or the antenna is at the corner of a tablet etc.

9.3 Proximity Sensor Status Table of trigger distance

As per the KDB 616217 D04 SAR for laptop and tablets v01r0, section 6.2, the following procedure is used to determine the triggering distances.

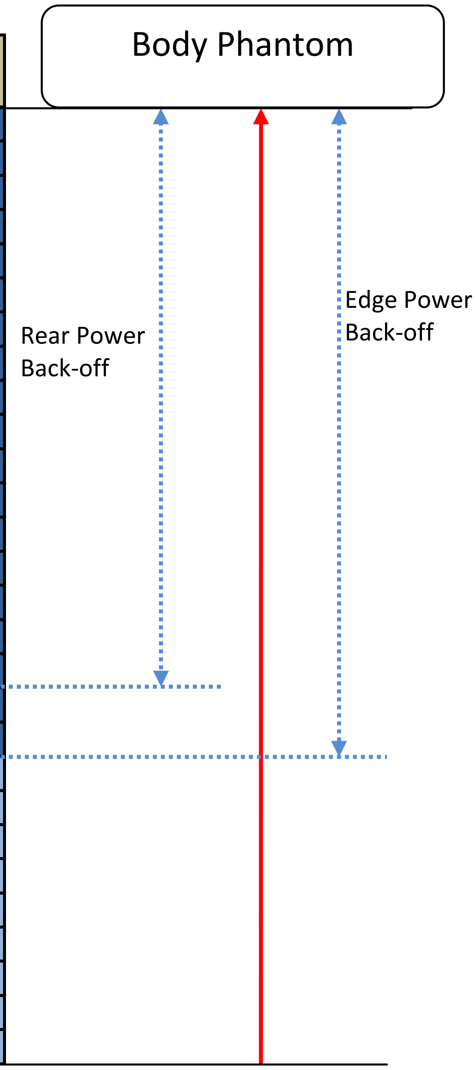
Proximity Sensor Status Table when DUT is moving towards the phantom

Distance to the DUT (mm)	Proximity Sensor Status – Rear Surface	Proximity Sensor Status – Top-Edge
30	OFF	OFF
27	OFF	OFF
25	OFF	OFF
24	OFF	OFF
23	OFF	OFF
22	OFF	OFF
21	OFF	OFF
20	OFF	OFF
19	OFF	OFF
18	OFF	ON
17	OFF	ON
16	ON	ON
15	ON	ON
14	ON	ON
13	ON	ON
12	ON	ON
11	ON	ON
10	ON	ON
9	ON	ON
8	ON	ON
7	ON	ON
6	ON	ON
5	ON	ON
4	ON	ON
3	ON	ON
2	ON	ON
1	ON	ON
0	ON	ON



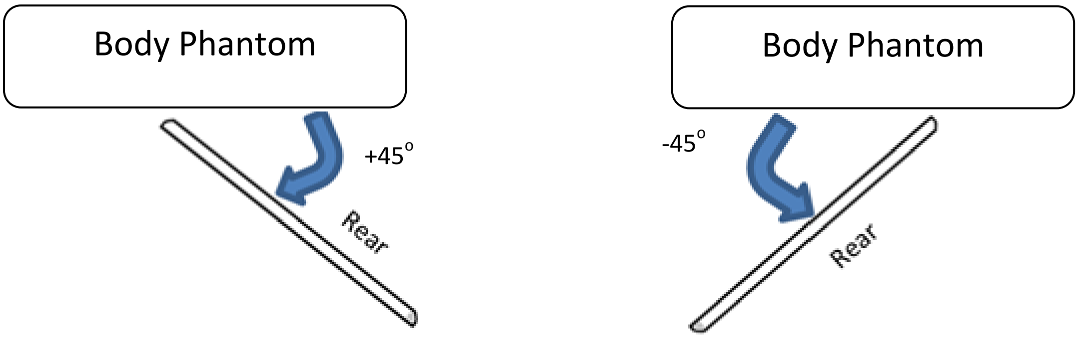
Proximity Sensor Status Table when DUT is moving away the phantom

Distance to the DUT (mm)	Proximity Sensor Status – Rear Surface	Proximity Sensor Status – Top-Edge
0	ON	ON
1	ON	ON
2	ON	ON
3	ON	ON
4	ON	ON
5	ON	ON
6	ON	ON
7	ON	ON
8	ON	ON
9	ON	ON
10	ON	ON
11	ON	ON
12	ON	ON
13	ON	ON
14	ON	ON
15	ON	ON
16	ON	ON
17	OFF	ON
18	OFF	ON
19	OFF	OFF
20	OFF	OFF
21	OFF	OFF
22	OFF	OFF
23	OFF	OFF
24	OFF	OFF
25	OFF	OFF
27	OFF	OFF
30	OFF	OFF



9.4 Tilt angle influences to proximity sensor triggering

As per the KDB 616217 D04 SAR for laptop and tablets v01r0, section 6.4, the following procedure is used to determine the tilt angle influences to proximity sensor triggering.

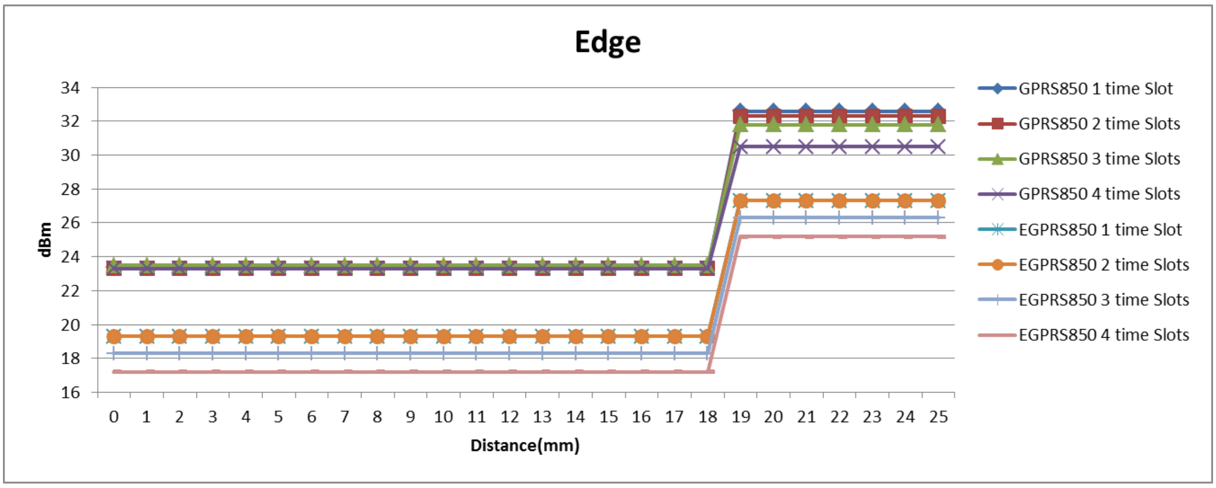


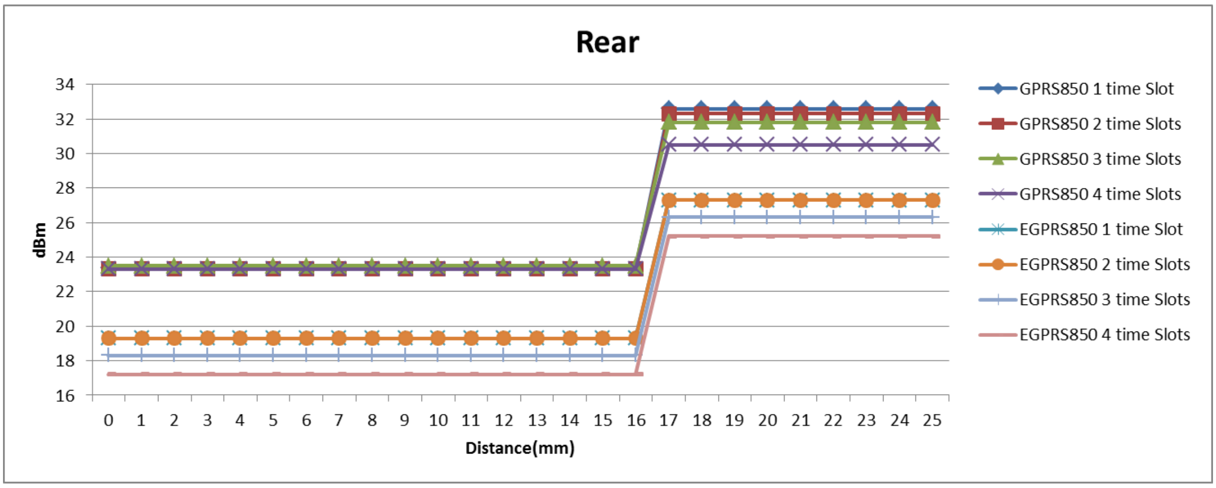
Distance to the DUT (mm)	Proximity Sensor Status 0° to +45°	Proximity Sensor Status 0° to -45°
15	ON	ON
14	ON	ON
13	ON	ON
12	ON	ON
11	ON	ON
10	ON	ON
9	ON	ON
8	ON	ON
7	ON	ON
6	ON	ON
5	ON	ON
4	ON	ON
3	ON	ON

9.5 Power Reduction per Air-interface

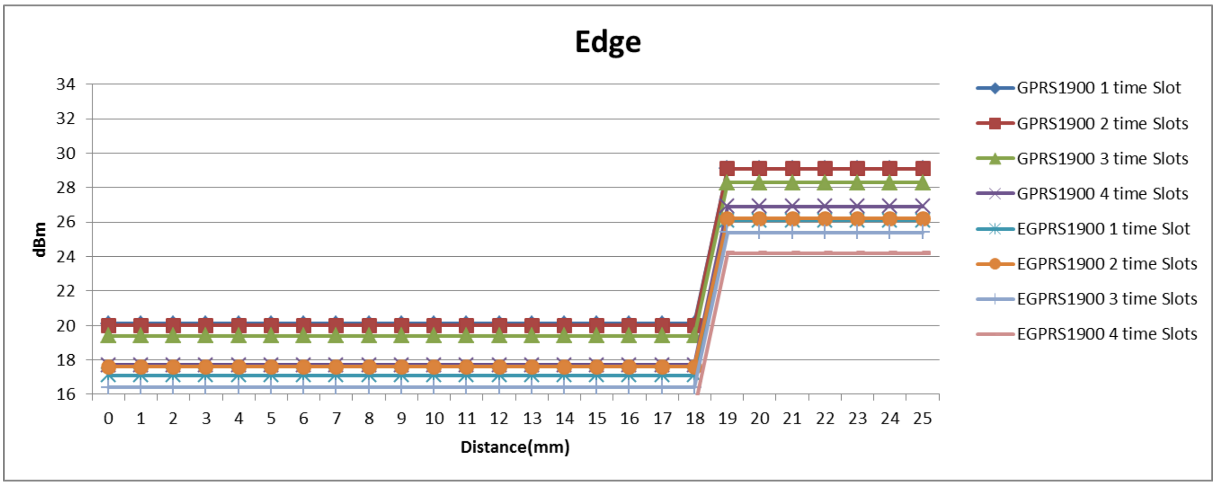
The following graphs show the power level and the distance from the DUT to the flat phantom for the Top-Edge and Rear Surface.

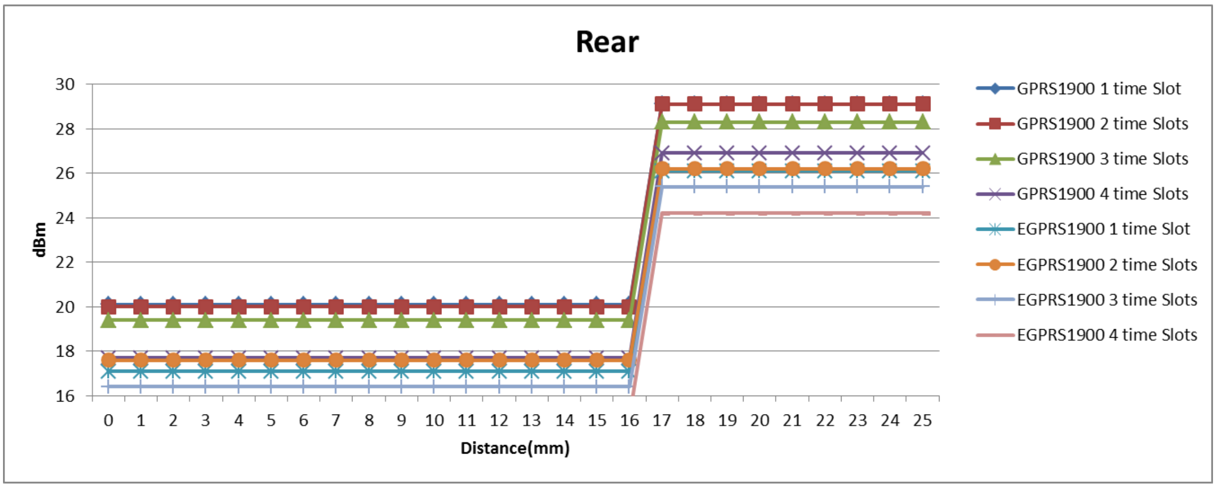
GSM850 Band



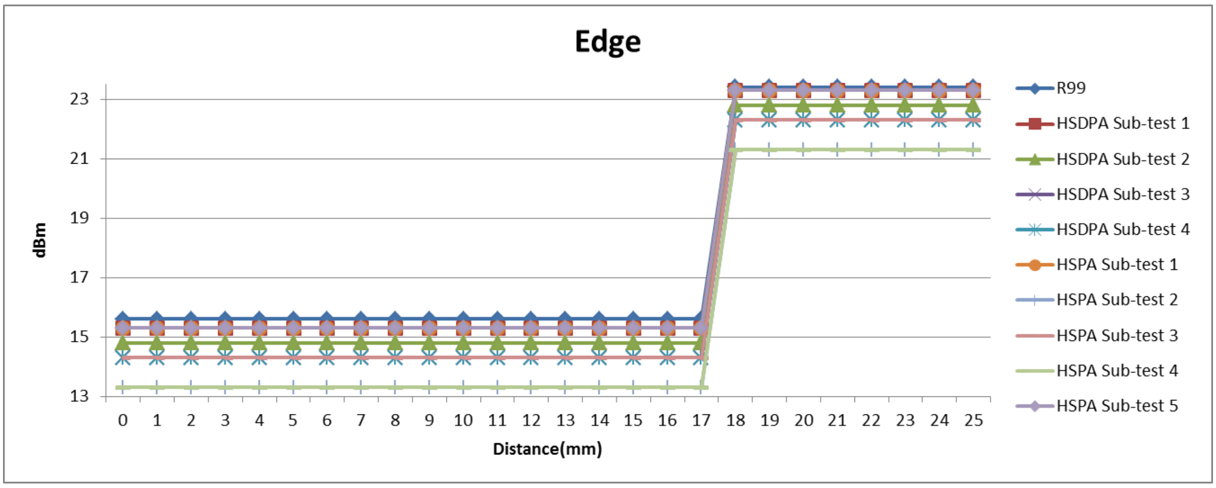


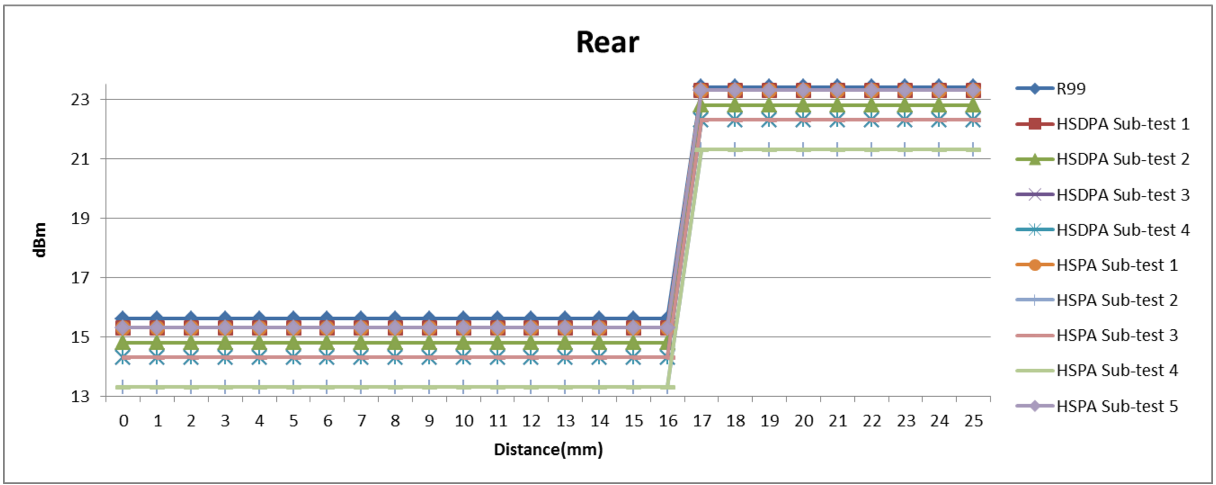
GSM1900 Band



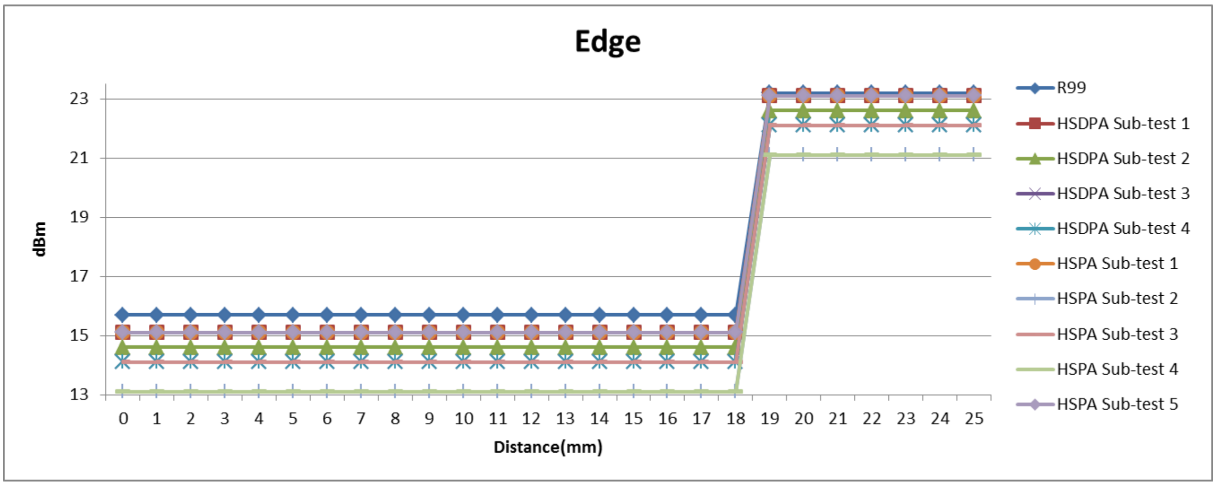


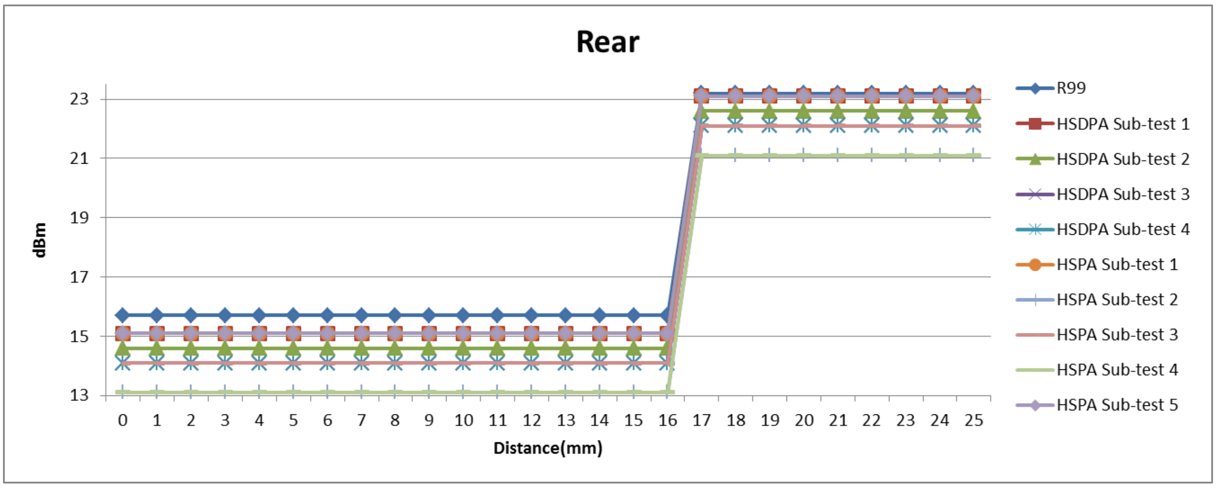
WCDMA Band II



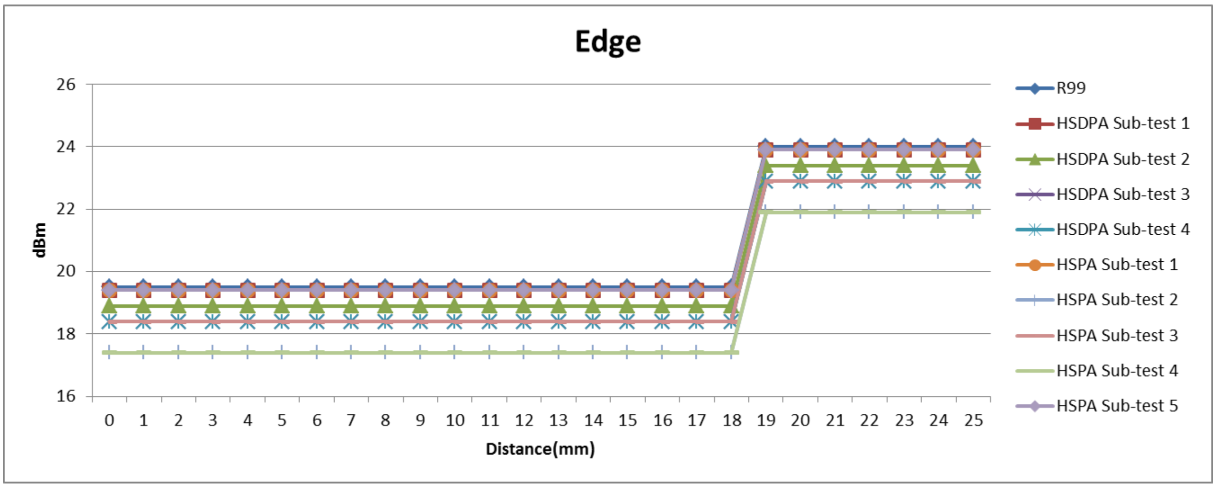


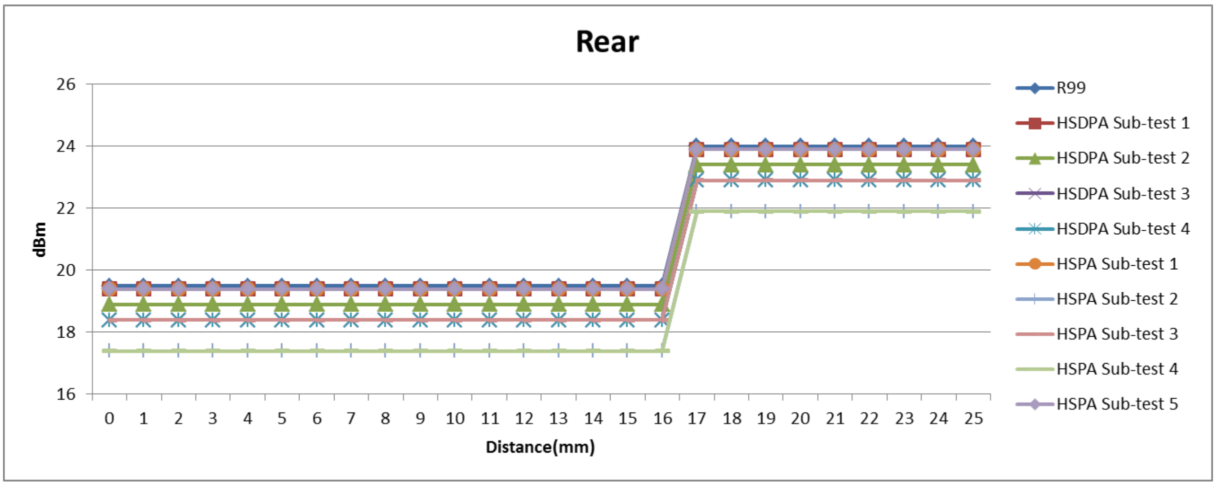
WCDMA Band IV



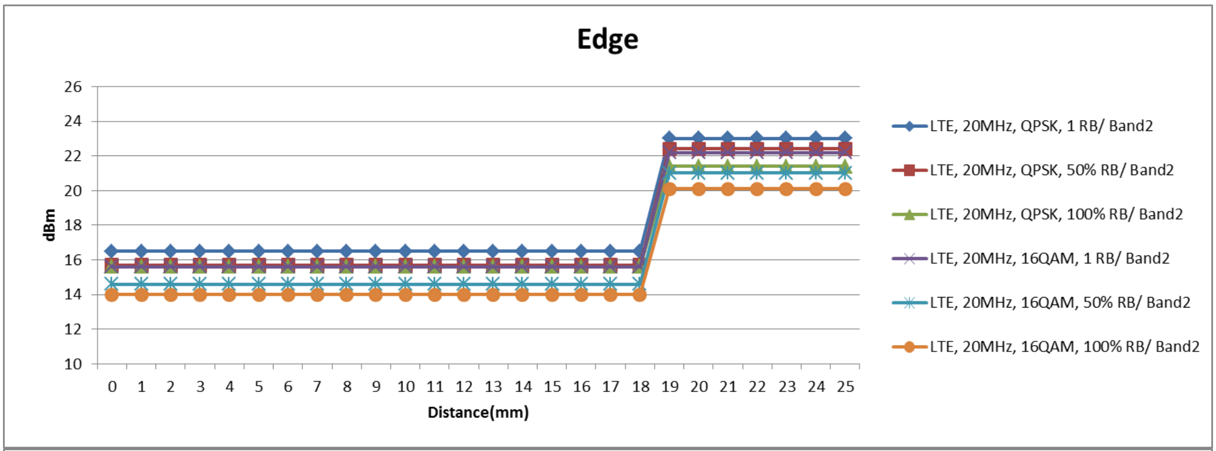


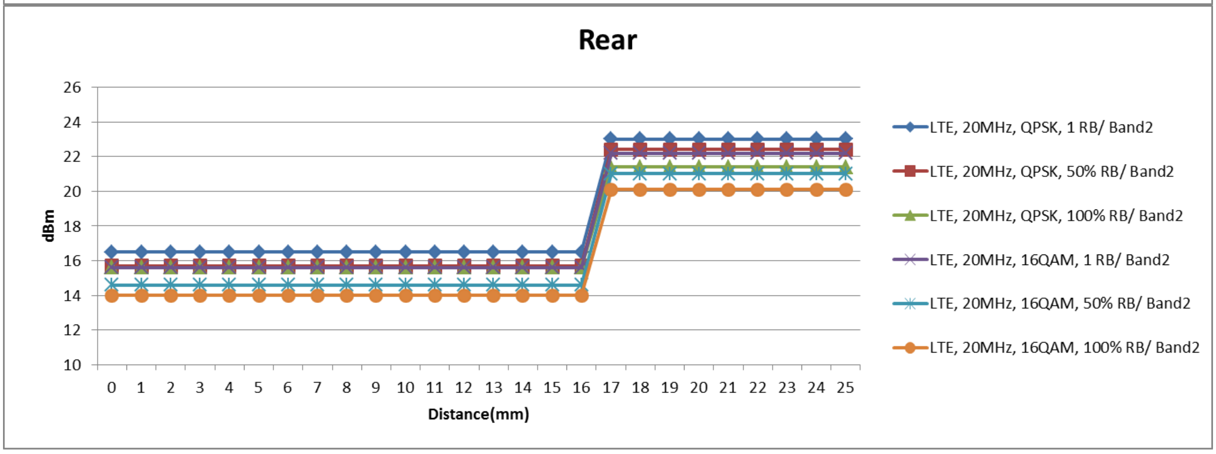
WCDMA Band V

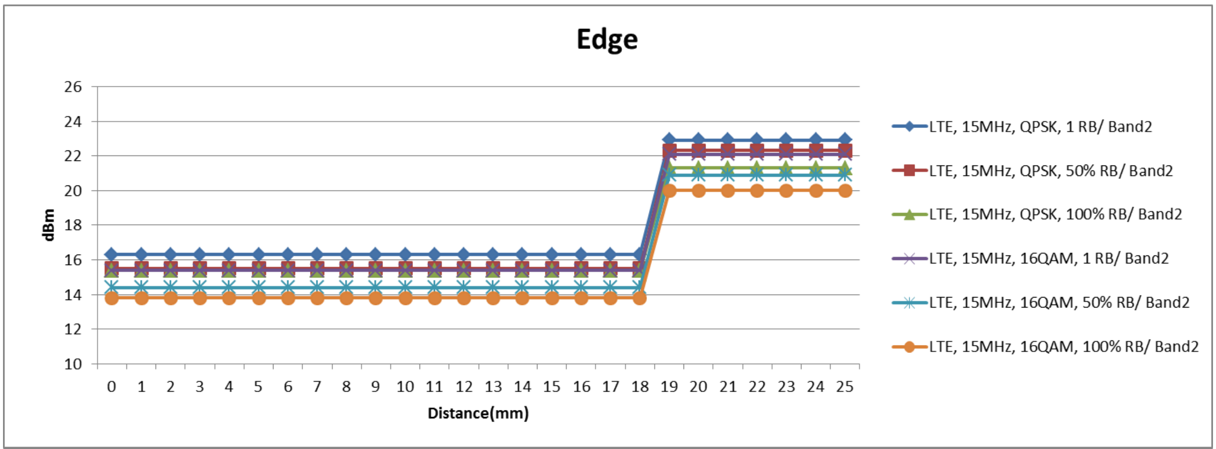

Edge
26
24
22
20
18
16
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
R99
HSDPA Sub-test 1
HSDPA Sub-test 2
HSDPA Sub-test 3
HSDPA Sub-test 4
HSPA Sub-test 1
HSPA Sub-test 2
HSPA Sub-test 3
HSPA Sub-test 4
HSPA Sub-test 5

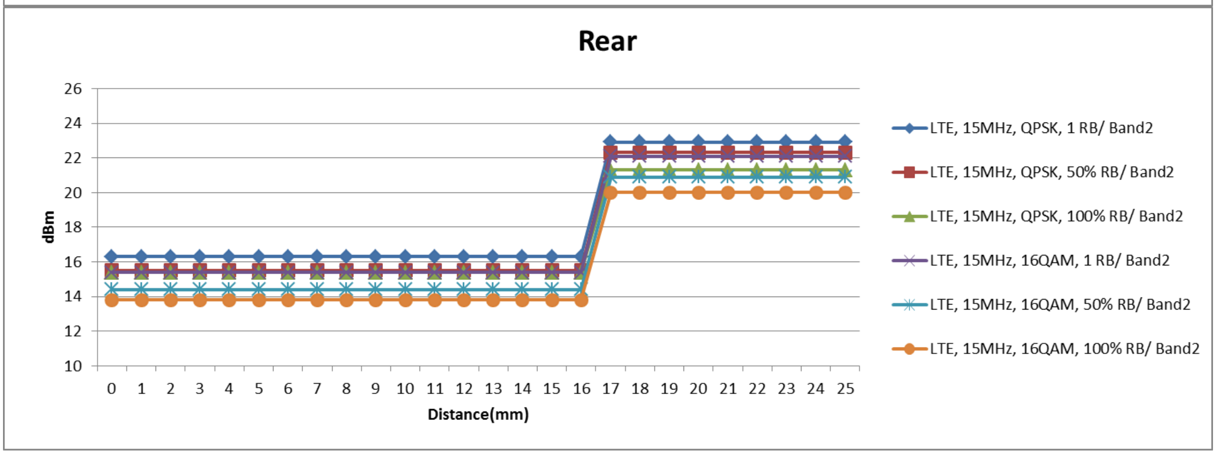

Rear
26
24
22
20
18
16
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
R99
HSDPA Sub-test 1
HSDPA Sub-test 2
HSDPA Sub-test 3
HSDPA Sub-test 4
HSPA Sub-test 1
HSPA Sub-test 2
HSPA Sub-test 3
HSPA Sub-test 4
HSPA Sub-test 5

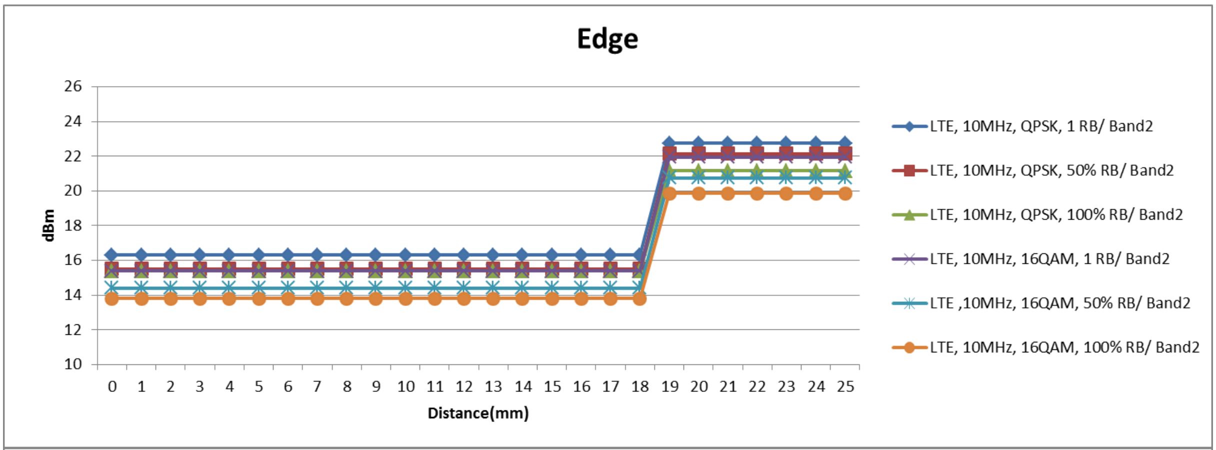
LTE Band 2

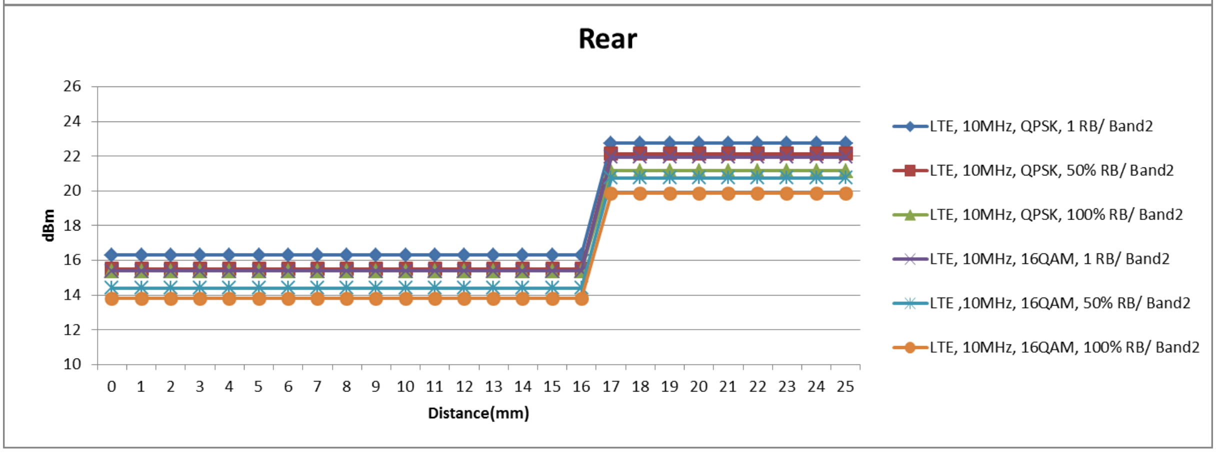

Edge
26
24
22
20
18
16
14
12
10
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 20MHz, QPSK, 1 RB/ Band2
LTE, 20MHz, QPSK, 50% RB/ Band2
LTE, 20MHz, QPSK, 100% RB/ Band2
LTE, 20MHz, 16QAM, 1 RB/ Band2
LTE, 20MHz, 16QAM, 50% RB/ Band2
LTE, 20MHz, 16QAM, 100% RB/ Band2

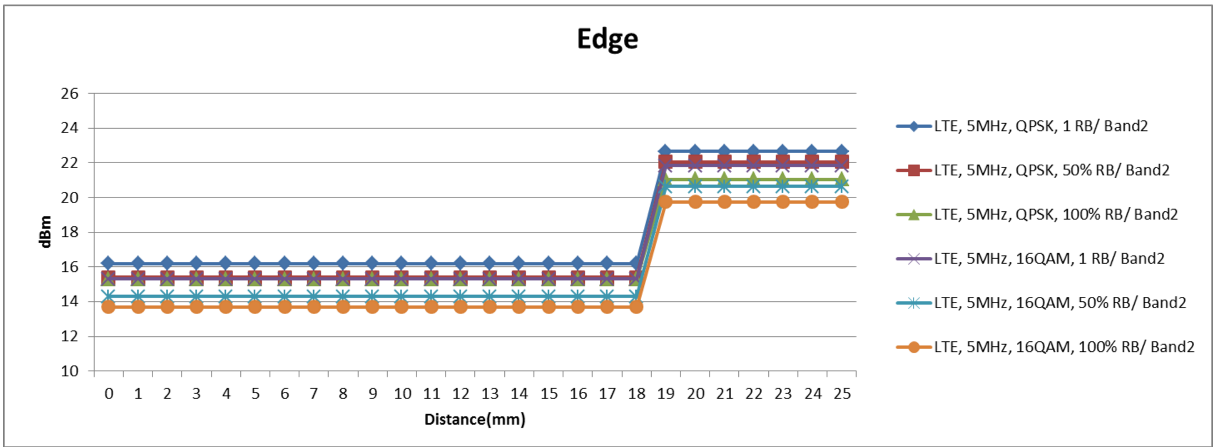

Rear
26
24
22
20
18
16
14
12
10
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 20MHz, QPSK, 1 RB/ Band2
LTE, 20MHz, QPSK, 50% RB/ Band2
LTE, 20MHz, QPSK, 100% RB/ Band2
LTE, 20MHz, 16QAM, 1 RB/ Band2
LTE, 20MHz, 16QAM, 50% RB/ Band2
LTE, 20MHz, 16QAM, 100% RB/ Band2

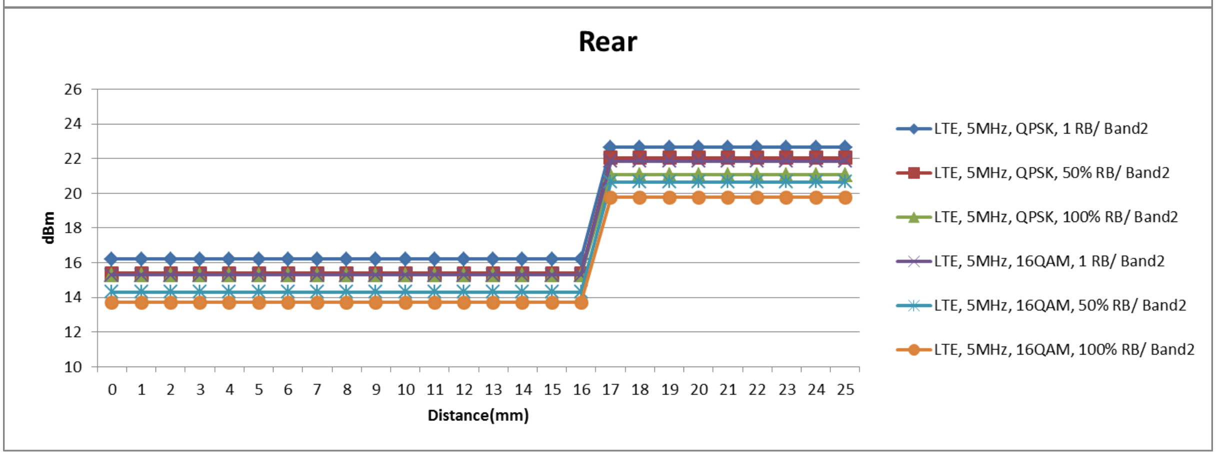

Edge
26
24
22
20
18
16
14
12
10
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 15MHz, QPSK, 1 RB/ Band2
LTE, 15MHz, QPSK, 50% RB/ Band2
LTE, 15MHz, QPSK, 100% RB/ Band2
LTE, 15MHz, 16QAM, 1 RB/ Band2
LTE, 15MHz, 16QAM, 50% RB/ Band2
LTE, 15MHz, 16QAM, 100% RB/ Band2

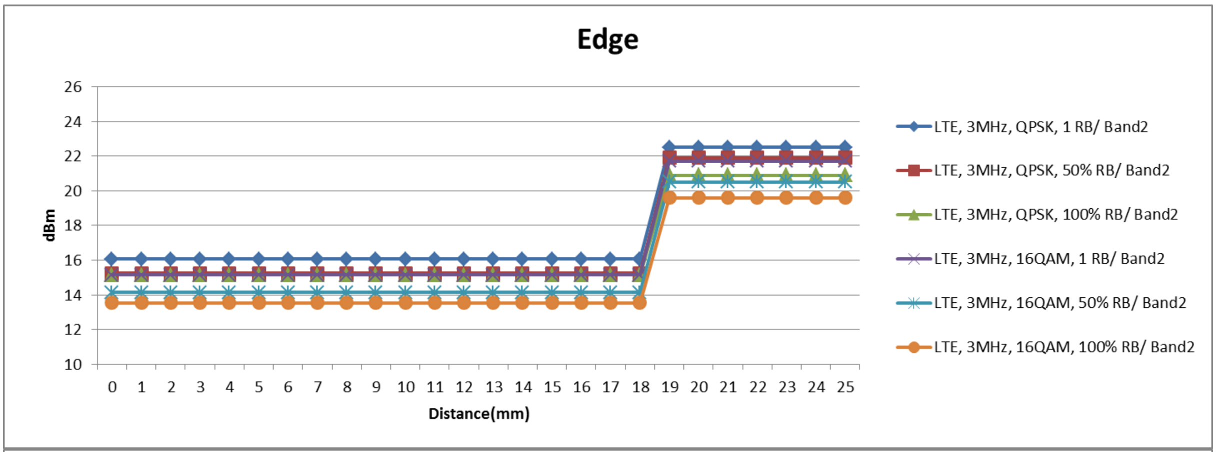

Rear
26
24
22
20
18
16
14
12
10
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 15MHz, QPSK, 1 RB/ Band2
LTE, 15MHz, QPSK, 50% RB/ Band2
LTE, 15MHz, QPSK, 100% RB/ Band2
LTE, 15MHz, 16QAM, 1 RB/ Band2
LTE, 15MHz, 16QAM, 50% RB/ Band2
LTE, 15MHz, 16QAM, 100% RB/ Band2

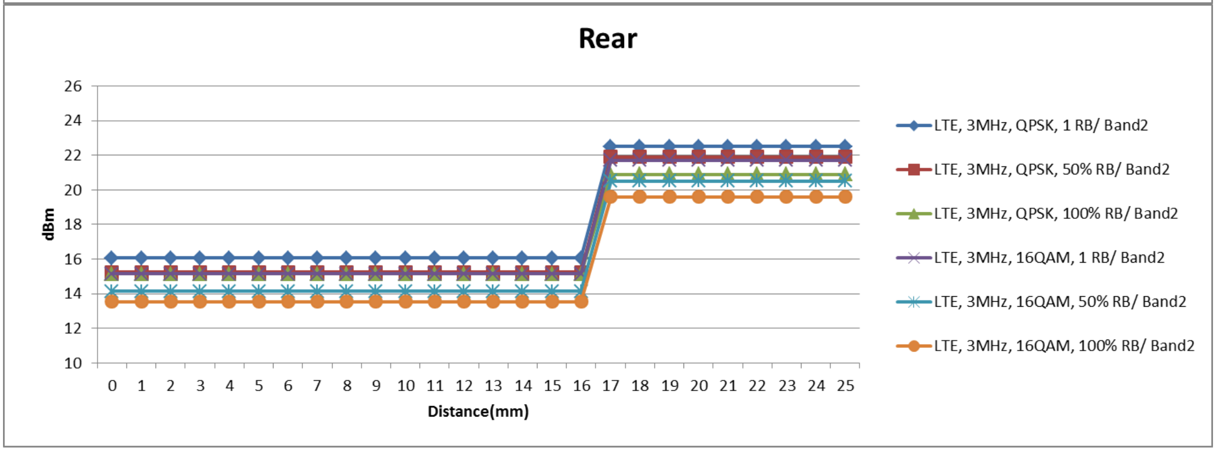

Edge
dBm
Distance(mm)
LTE, 10MHz, QPSK, 1 RB/ Band2
LTE, 10MHz, QPSK, 50% RB/ Band2
LTE, 10MHz, QPSK, 100% RB/ Band2
LTE, 10MHz, 16QAM, 1 RB/ Band2
LTE ,10MHz, 16QAM, 50% RB/ Band2
LTE, 10MHz, 16QAM, 100% RB/ Band2

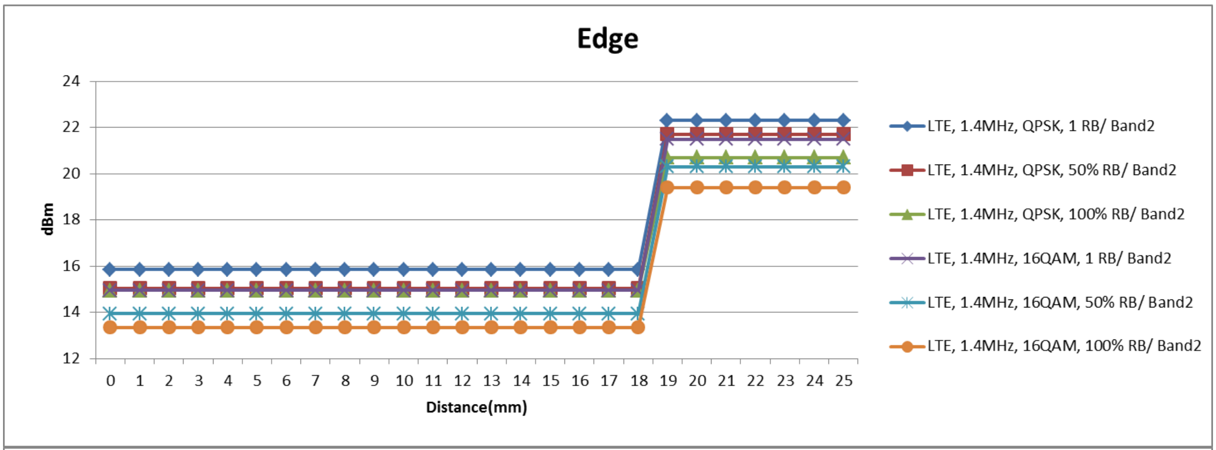

Rear
dBm
Distance(mm)
LTE, 10MHz, QPSK, 1 RB/ Band2
LTE, 10MHz, QPSK, 50% RB/ Band2
LTE, 10MHz, QPSK, 100% RB/ Band2
LTE, 10MHz, 16QAM, 1 RB/ Band2
LTE ,10MHz, 16QAM, 50% RB/ Band2
LTE, 10MHz, 16QAM, 100% RB/ Band2

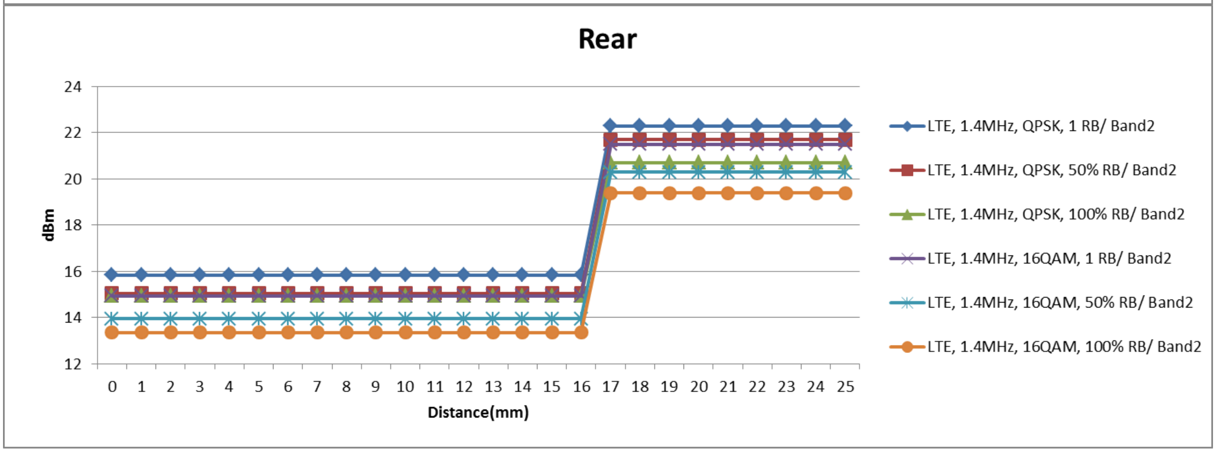

Edge
dBm
Distance(mm)
LTE, 5MHz, QPSK, 1 RB/ Band2
LTE, 5MHz, QPSK, 50% RB/ Band2
LTE, 5MHz, QPSK, 100% RB/ Band2
LTE, 5MHz, 16QAM, 1 RB/ Band2
LTE, 5MHz, 16QAM, 50% RB/ Band2
LTE, 5MHz, 16QAM, 100% RB/ Band2


Rear
dBm
Distance(mm)
LTE, 5MHz, QPSK, 1 RB/ Band2
LTE, 5MHz, QPSK, 50% RB/ Band2
LTE, 5MHz, QPSK, 100% RB/ Band2
LTE, 5MHz, 16QAM, 1 RB/ Band2
LTE, 5MHz, 16QAM, 50% RB/ Band2
LTE, 5MHz, 16QAM, 100% RB/ Band2

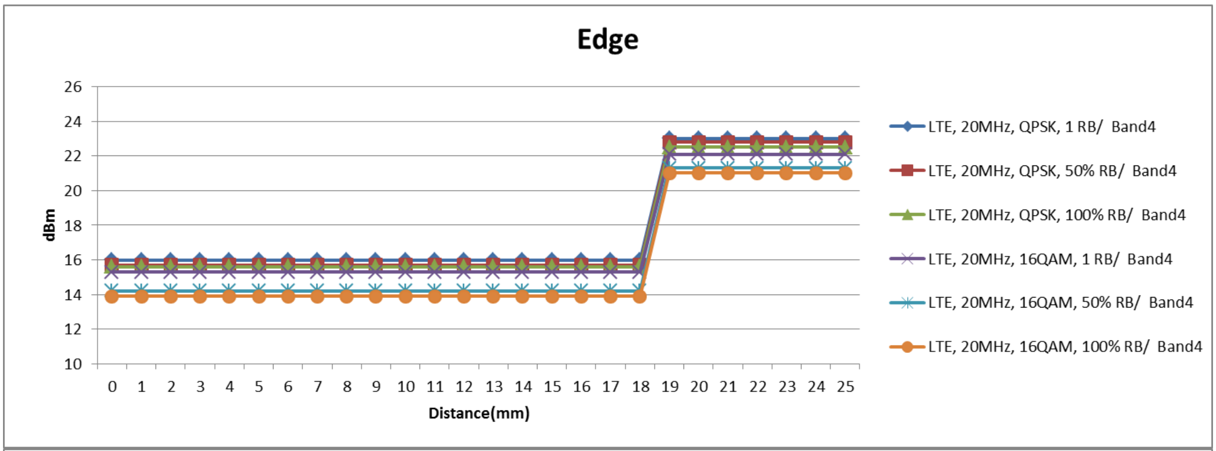

Edge
dBm
Distance(mm)
LTE, 3MHz, QPSK, 1 RB/ Band2
LTE, 3MHz, QPSK, 50% RB/ Band2
LTE, 3MHz, QPSK, 100% RB/ Band2
LTE, 3MHz, 16QAM, 1 RB/ Band2
LTE, 3MHz, 16QAM, 50% RB/ Band2
LTE, 3MHz, 16QAM, 100% RB/ Band2

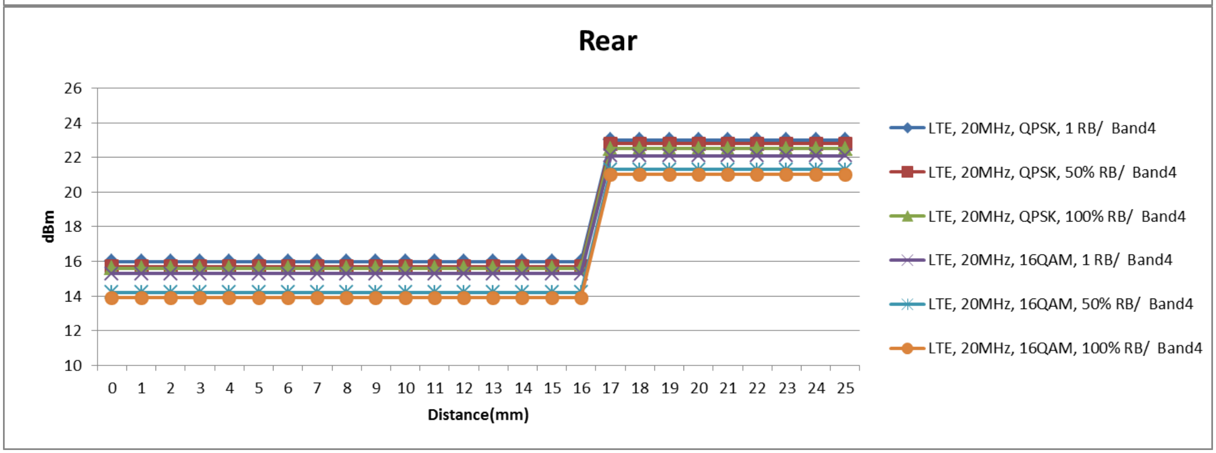

Rear
dBm
Distance(mm)
LTE, 3MHz, QPSK, 1 RB/ Band2
LTE, 3MHz, QPSK, 50% RB/ Band2
LTE, 3MHz, QPSK, 100% RB/ Band2
LTE, 3MHz, 16QAM, 1 RB/ Band2
LTE, 3MHz, 16QAM, 50% RB/ Band2
LTE, 3MHz, 16QAM, 100% RB/ Band2

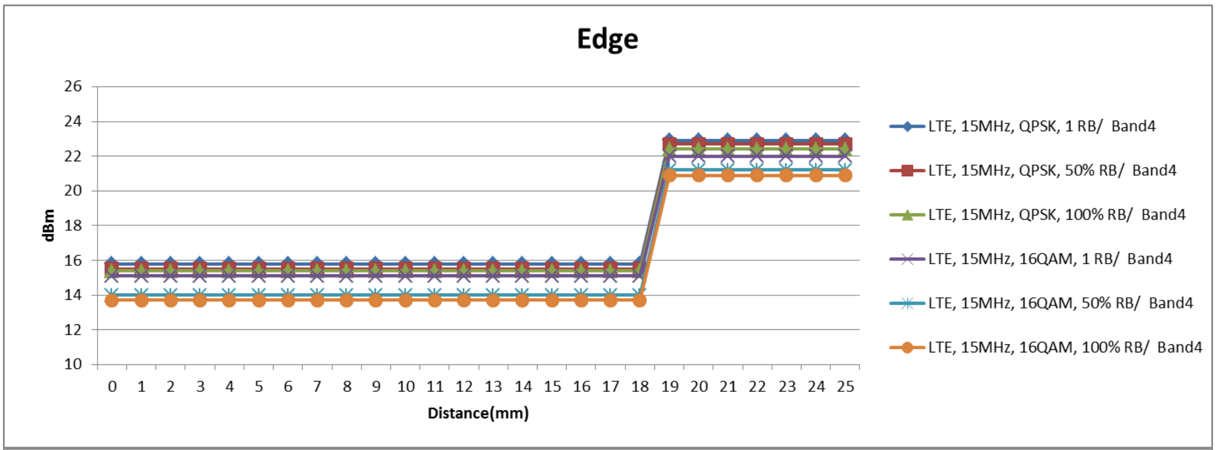

Edge
dBm
Distance(mm)
LTE, 1.4MHz, QPSK, 1 RB/ Band2
LTE, 1.4MHz, QPSK, 50% RB/ Band2
LTE, 1.4MHz, QPSK, 100% RB/ Band2
LTE, 1.4MHz, 16QAM, 1 RB/ Band2
LTE, 1.4MHz, 16QAM, 50% RB/ Band2
LTE, 1.4MHz, 16QAM, 100% RB/ Band2

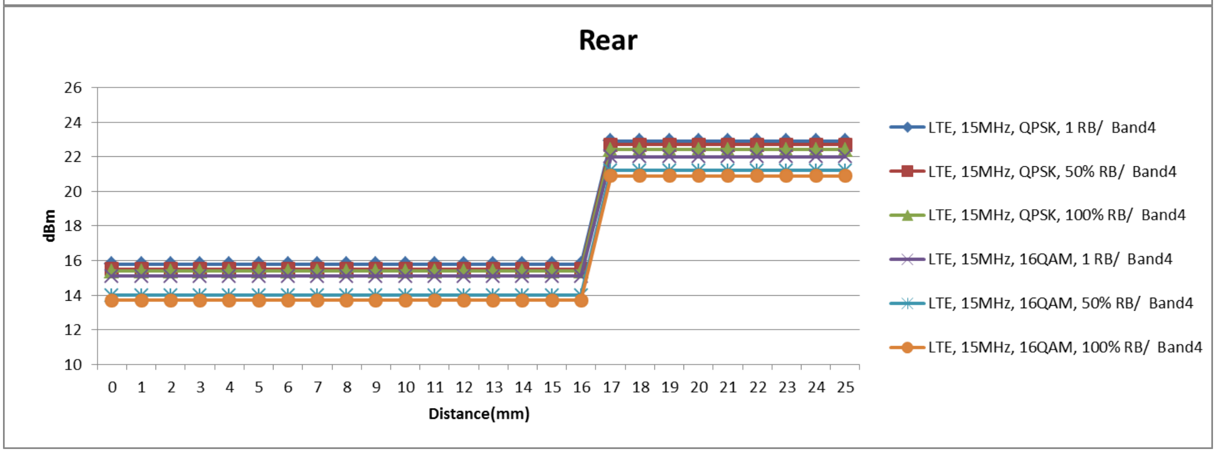

Rear
dBm
Distance(mm)
LTE, 1.4MHz, QPSK, 1 RB/ Band2
LTE, 1.4MHz, QPSK, 50% RB/ Band2
LTE, 1.4MHz, QPSK, 100% RB/ Band2
LTE, 1.4MHz, 16QAM, 1 RB/ Band2
LTE, 1.4MHz, 16QAM, 50% RB/ Band2
LTE, 1.4MHz, 16QAM, 100% RB/ Band2

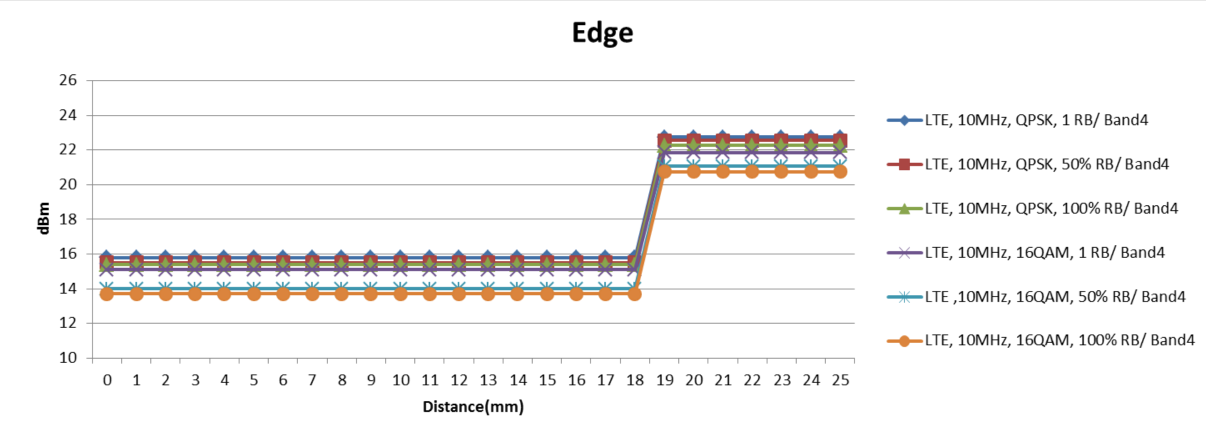
LTE Band 4

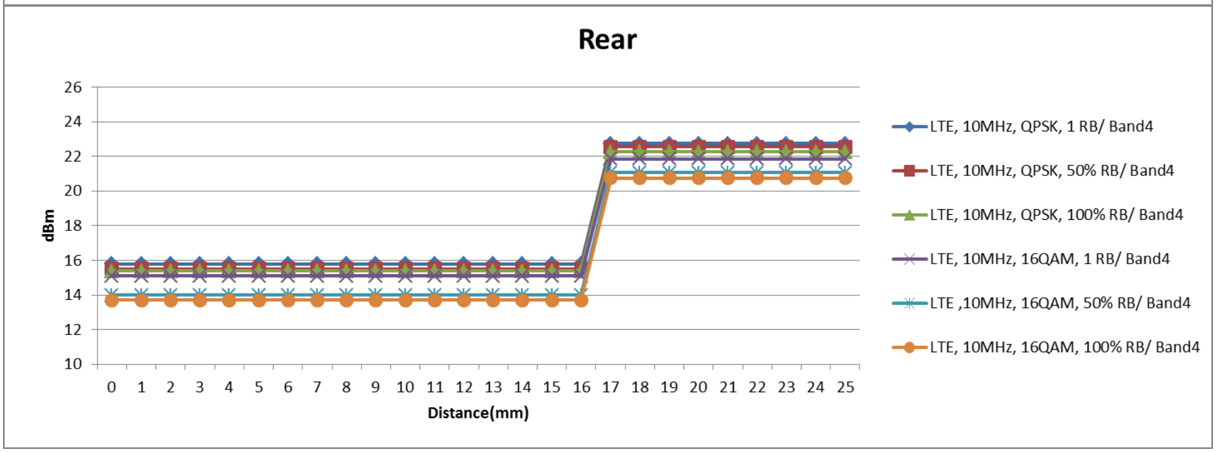

Edge
26
24
22
20
18
16
14
12
10
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 20MHz, QPSK, 1 RB/ Band4
LTE, 20MHz, QPSK, 50% RB/ Band4
LTE, 20MHz, QPSK, 100% RB/ Band4
LTE, 20MHz, 16QAM, 1 RB/ Band4
LTE, 20MHz, 16QAM, 50% RB/ Band4
LTE, 20MHz, 16QAM, 100% RB/ Band4

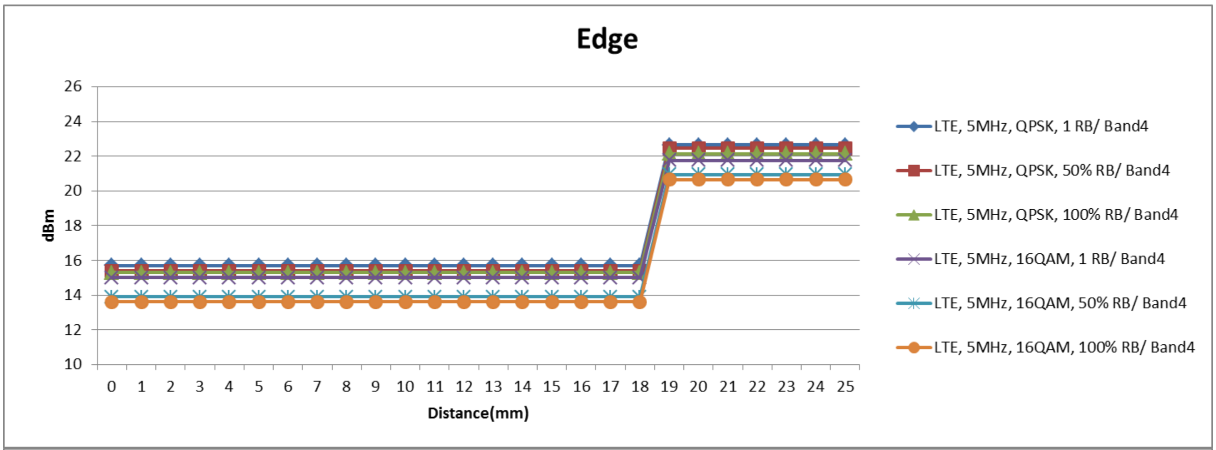

Rear
26
24
22
20
18
16
14
12
10
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 20MHz, QPSK, 1 RB/ Band4
LTE, 20MHz, QPSK, 50% RB/ Band4
LTE, 20MHz, QPSK, 100% RB/ Band4
LTE, 20MHz, 16QAM, 1 RB/ Band4
LTE, 20MHz, 16QAM, 50% RB/ Band4
LTE, 20MHz, 16QAM, 100% RB/ Band4

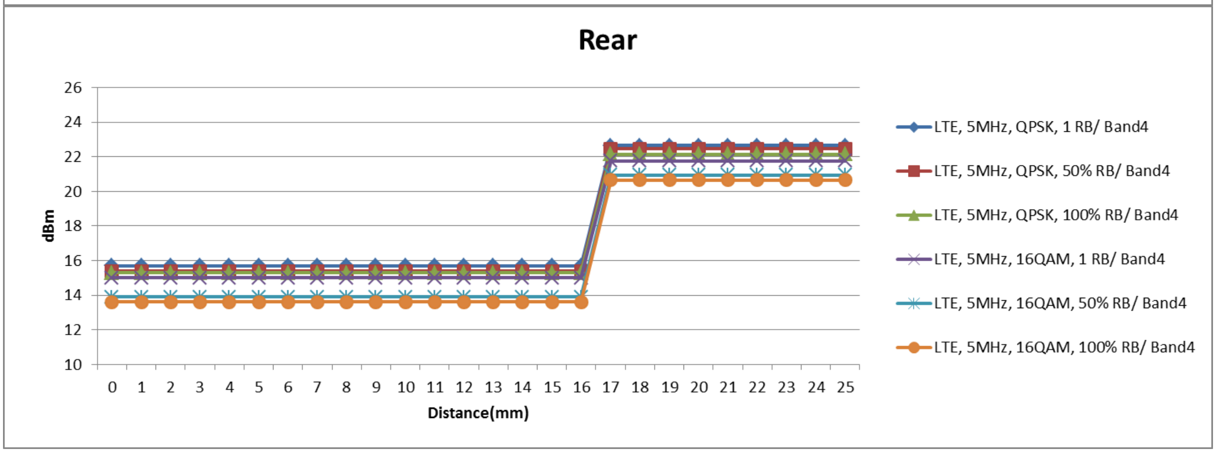

Edge
26
24
22
20
18
16
14
12
10
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 15MHz, QPSK, 1 RB/ Band4
LTE, 15MHz, QPSK, 50% RB/ Band4
LTE, 15MHz, QPSK, 100% RB/ Band4
LTE, 15MHz, 16QAM, 1 RB/ Band4
LTE, 15MHz, 16QAM, 50% RB/ Band4
LTE, 15MHz, 16QAM, 100% RB/ Band4

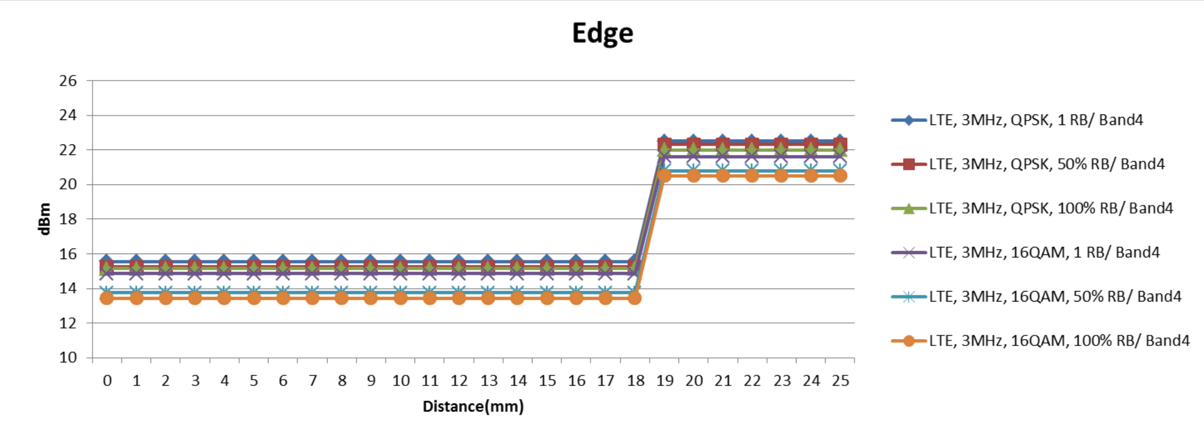

Rear
26
24
22
20
18
16
14
12
10
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 15MHz, QPSK, 1 RB/ Band4
LTE, 15MHz, QPSK, 50% RB/ Band4
LTE, 15MHz, QPSK, 100% RB/ Band4
LTE, 15MHz, 16QAM, 1 RB/ Band4
LTE, 15MHz, 16QAM, 50% RB/ Band4
LTE, 15MHz, 16QAM, 100% RB/ Band4

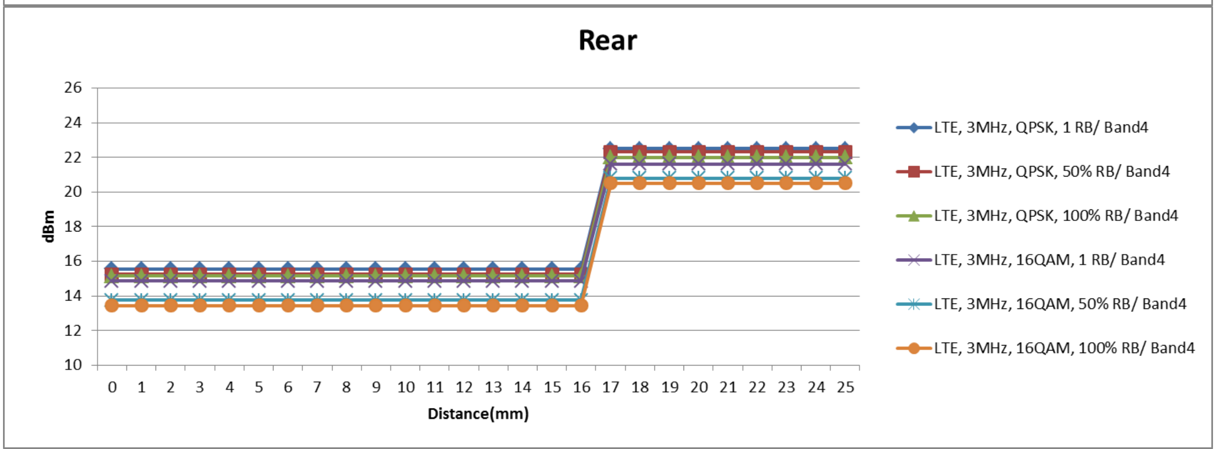

Edge
26
24
22
20
18
16
14
12
10
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 10MHz, QPSK, 1 RB/ Band4
LTE, 10MHz, QPSK, 50% RB/ Band4
LTE, 10MHz, QPSK, 100% RB/ Band4
LTE, 10MHz, 16QAM, 1 RB/ Band4
LTE ,10MHz, 16QAM, 50% RB/ Band4
LTE, 10MHz, 16QAM, 100% RB/ Band4

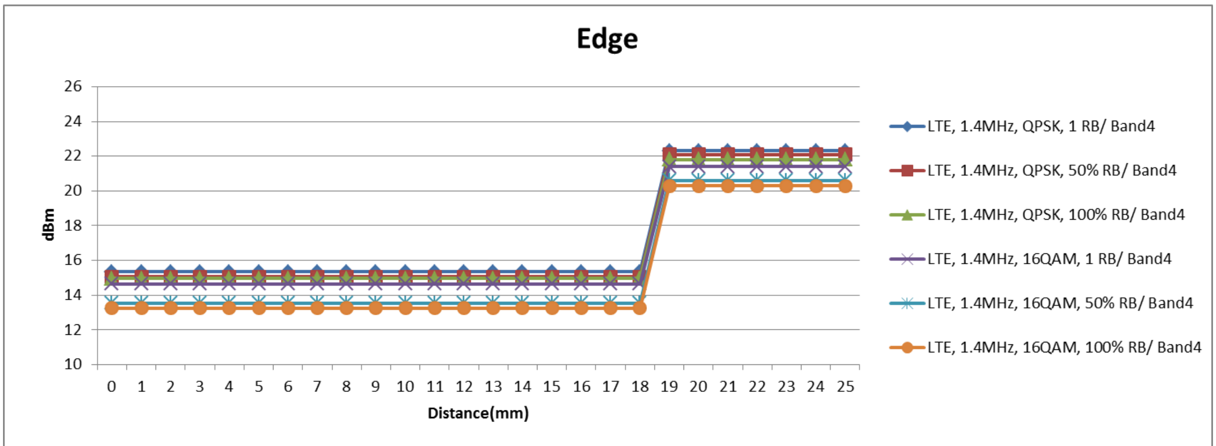

Rear
26
24
22
20
18
16
14
12
10
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 10MHz, QPSK, 1 RB/ Band4
LTE, 10MHz, QPSK, 50% RB/ Band4
LTE, 10MHz, QPSK, 100% RB/ Band4
LTE, 10MHz, 16QAM, 1 RB/ Band4
LTE ,10MHz, 16QAM, 50% RB/ Band4
LTE, 10MHz, 16QAM, 100% RB/ Band4

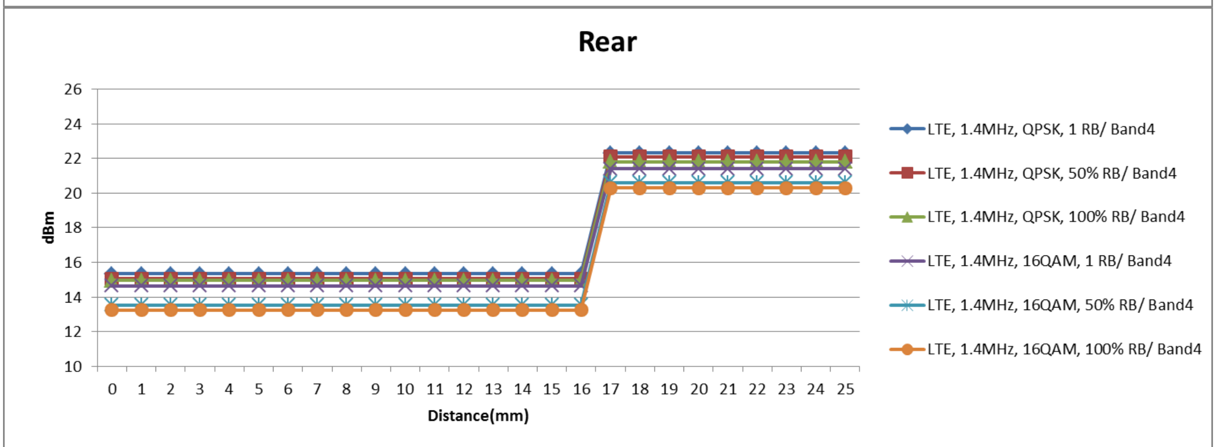

Edge
26
24
22
20
18
16
14
12
10
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 5MHz, QPSK, 1 RB/ Band4
LTE, 5MHz, QPSK, 50% RB/ Band4
LTE, 5MHz, QPSK, 100% RB/ Band4
LTE, 5MHz, 16QAM, 1 RB/ Band4
LTE, 5MHz, 16QAM, 50% RB/ Band4
LTE, 5MHz, 16QAM, 100% RB/ Band4


Rear
26
24
22
20
18
16
14
12
10
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 5MHz, QPSK, 1 RB/ Band4
LTE, 5MHz, QPSK, 50% RB/ Band4
LTE, 5MHz, QPSK, 100% RB/ Band4
LTE, 5MHz, 16QAM, 1 RB/ Band4
LTE, 5MHz, 16QAM, 50% RB/ Band4
LTE, 5MHz, 16QAM, 100% RB/ Band4

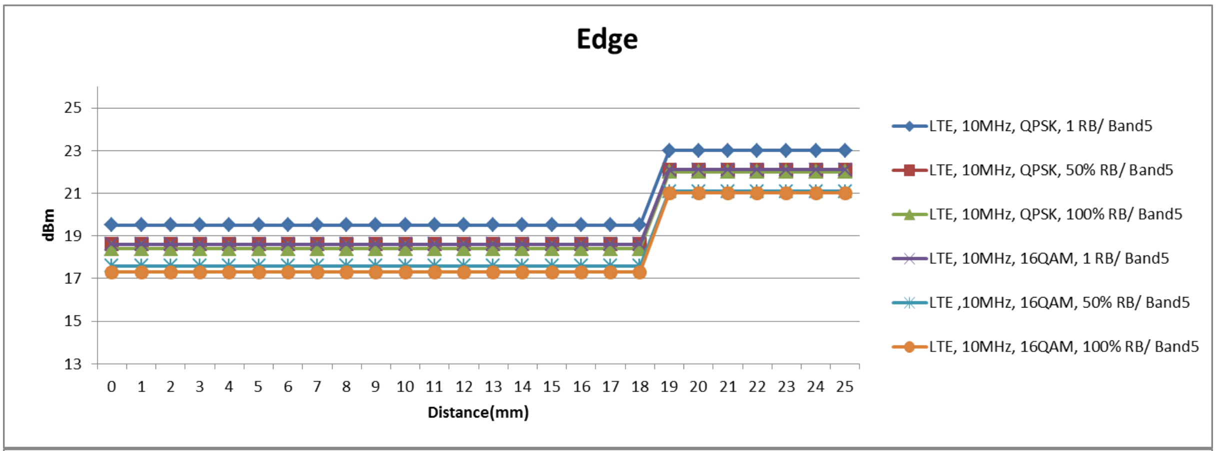

Edge
dBm
Distance(mm)
LTE, 3MHz, QPSK, 1 RB/ Band4
LTE, 3MHz, QPSK, 50% RB/ Band4
LTE, 3MHz, QPSK, 100% RB/ Band4
LTE, 3MHz, 16QAM, 1 RB/ Band4
LTE, 3MHz, 16QAM, 50% RB/ Band4
LTE, 3MHz, 16QAM, 100% RB/ Band4

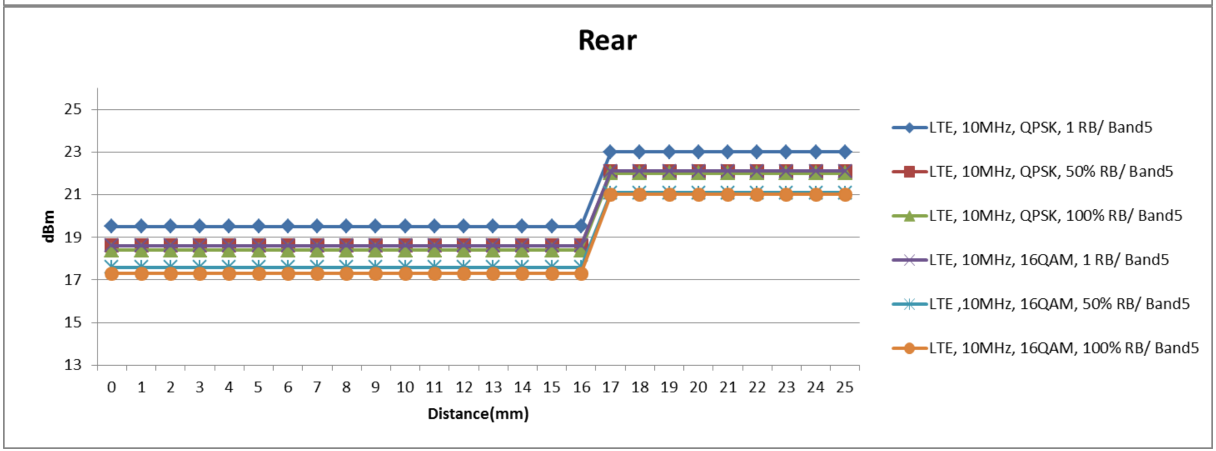

Rear
dBm
Distance(mm)
LTE, 3MHz, QPSK, 1 RB/ Band4
LTE, 3MHz, QPSK, 50% RB/ Band4
LTE, 3MHz, QPSK, 100% RB/ Band4
LTE, 3MHz, 16QAM, 1 RB/ Band4
LTE, 3MHz, 16QAM, 50% RB/ Band4
LTE, 3MHz, 16QAM, 100% RB/ Band4

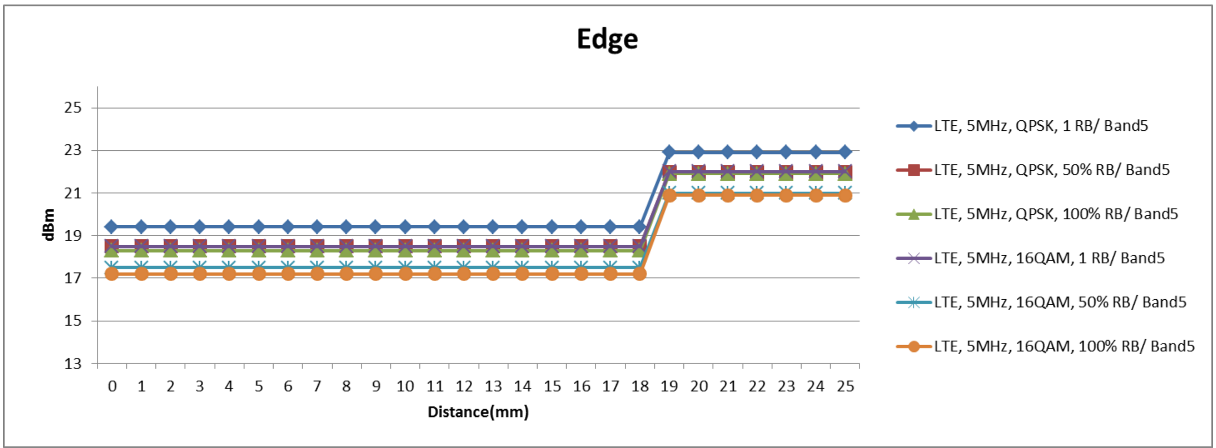

Edge
dBm
Distance(mm)
LTE, 1.4MHz, QPSK, 1 RB/ Band4
LTE, 1.4MHz, QPSK, 50% RB/ Band4
LTE, 1.4MHz, QPSK, 100% RB/ Band4
LTE, 1.4MHz, 16QAM, 1 RB/ Band4
LTE, 1.4MHz, 16QAM, 50% RB/ Band4
LTE, 1.4MHz, 16QAM, 100% RB/ Band4

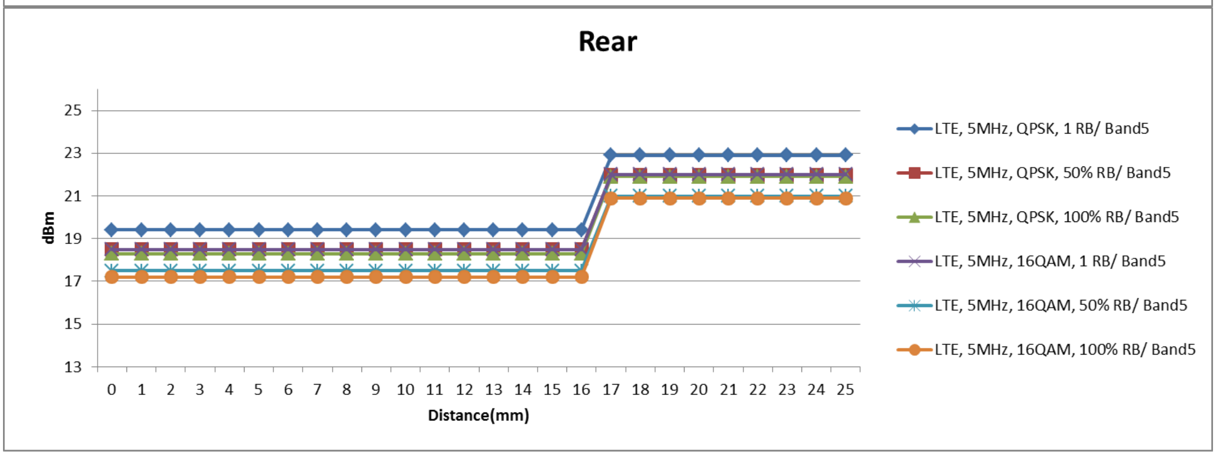

Rear
dBm
Distance(mm)
LTE, 1.4MHz, QPSK, 1 RB/ Band4
LTE, 1.4MHz, QPSK, 50% RB/ Band4
LTE, 1.4MHz, QPSK, 100% RB/ Band4
LTE, 1.4MHz, 16QAM, 1 RB/ Band4
LTE, 1.4MHz, 16QAM, 50% RB/ Band4
LTE, 1.4MHz, 16QAM, 100% RB/ Band4

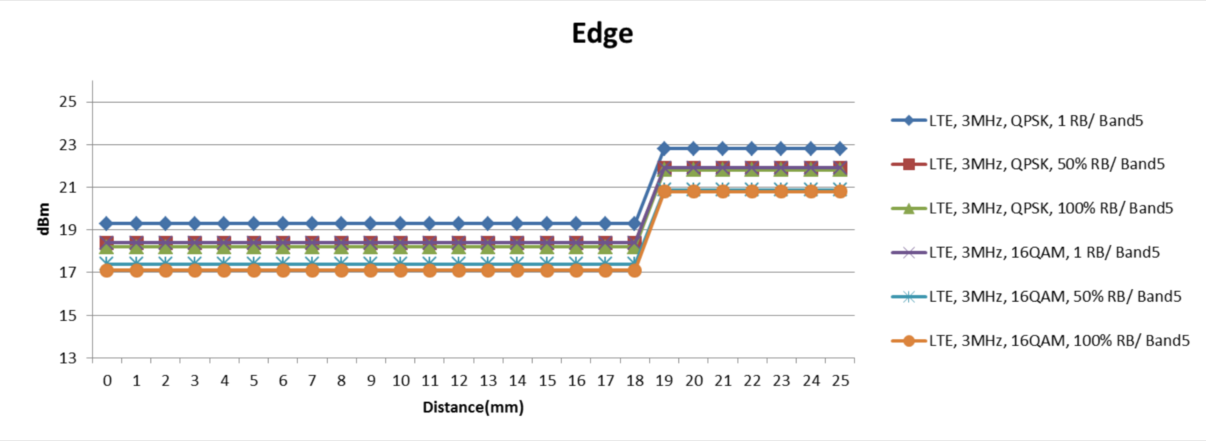
LTE Band 5

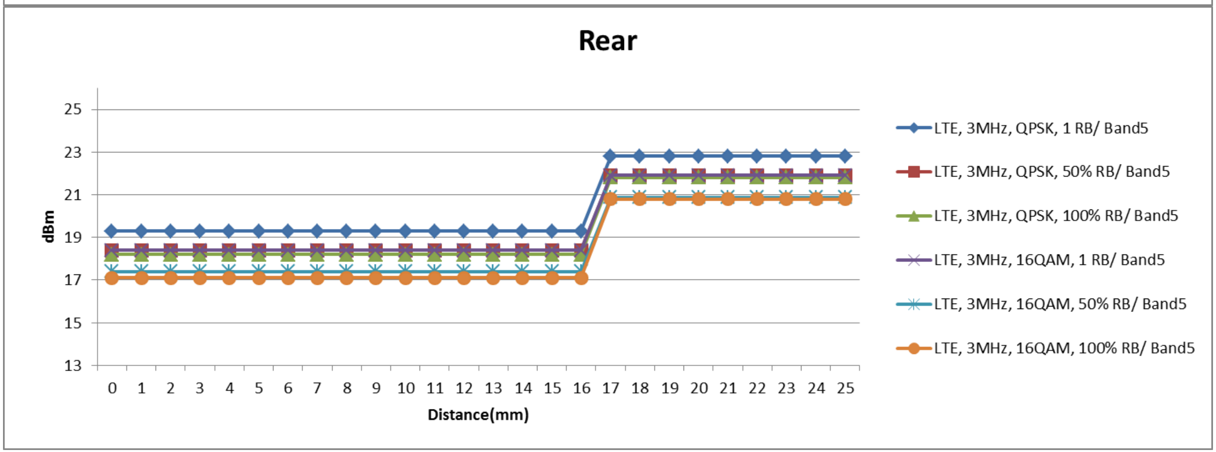

Edge
dBm
Distance(mm)
LTE, 10MHz, QPSK, 1 RB/ Band5
LTE, 10MHz, QPSK, 50% RB/ Band5
LTE, 10MHz, QPSK, 100% RB/ Band5
LTE, 10MHz, 16QAM, 1 RB/ Band5
LTE ,10MHz, 16QAM, 50% RB/ Band5
LTE, 10MHz, 16QAM, 100% RB/ Band5

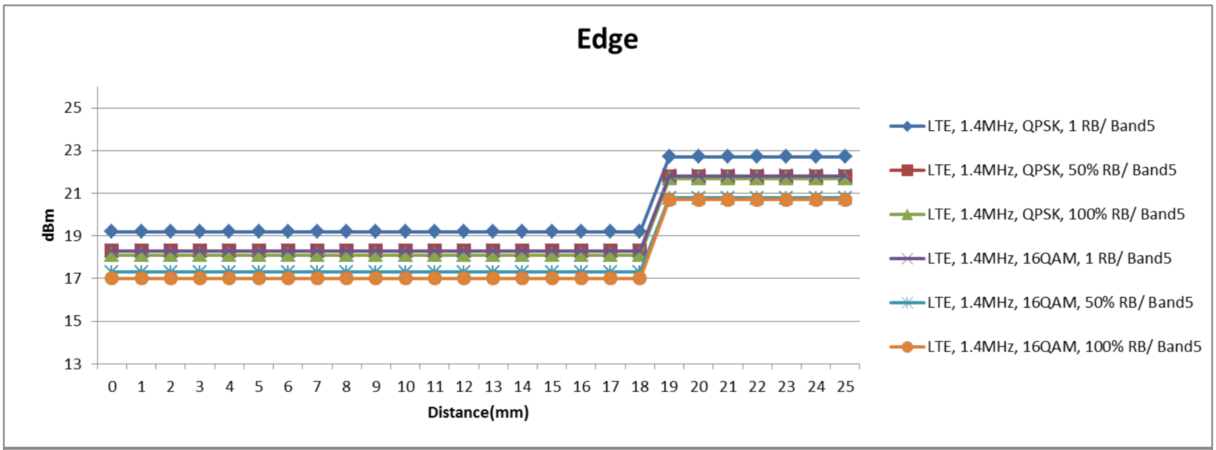

Rear
dBm
Distance(mm)
LTE, 10MHz, QPSK, 1 RB/ Band5
LTE, 10MHz, QPSK, 50% RB/ Band5
LTE, 10MHz, QPSK, 100% RB/ Band5
LTE, 10MHz, 16QAM, 1 RB/ Band5
LTE ,10MHz, 16QAM, 50% RB/ Band5
LTE, 10MHz, 16QAM, 100% RB/ Band5

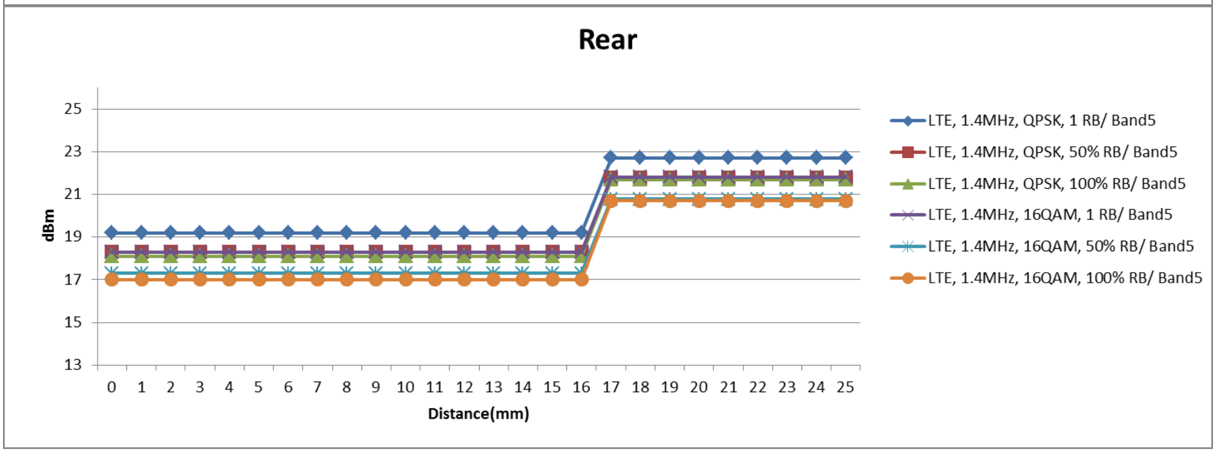

Edge
dBm
Distance(mm)
LTE, 5MHz, QPSK, 1 RB/ Band5
LTE, 5MHz, QPSK, 50% RB/ Band5
LTE, 5MHz, QPSK, 100% RB/ Band5
LTE, 5MHz, 16QAM, 1 RB/ Band5
LTE, 5MHz, 16QAM, 50% RB/ Band5
LTE, 5MHz, 16QAM, 100% RB/ Band5


Rear
dBm
Distance(mm)
LTE, 5MHz, QPSK, 1 RB/ Band5
LTE, 5MHz, QPSK, 50% RB/ Band5
LTE, 5MHz, QPSK, 100% RB/ Band5
LTE, 5MHz, 16QAM, 1 RB/ Band5
LTE, 5MHz, 16QAM, 50% RB/ Band5
LTE, 5MHz, 16QAM, 100% RB/ Band5

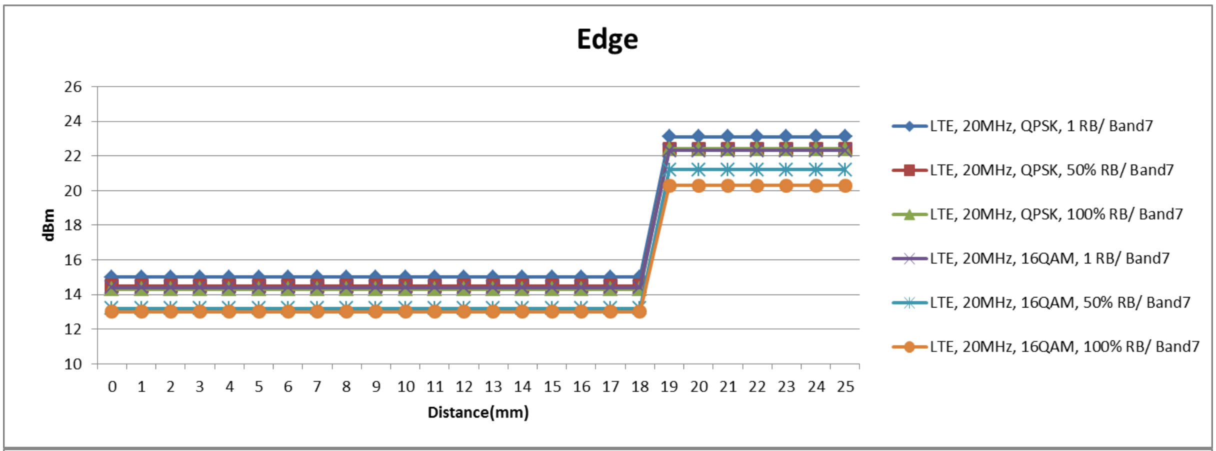

Edge
dBm
Distance(mm)
LTE, 3MHz, QPSK, 1 RB/ Band5
LTE, 3MHz, QPSK, 50% RB/ Band5
LTE, 3MHz, QPSK, 100% RB/ Band5
LTE, 3MHz, 16QAM, 1 RB/ Band5
LTE, 3MHz, 16QAM, 50% RB/ Band5
LTE, 3MHz, 16QAM, 100% RB/ Band5

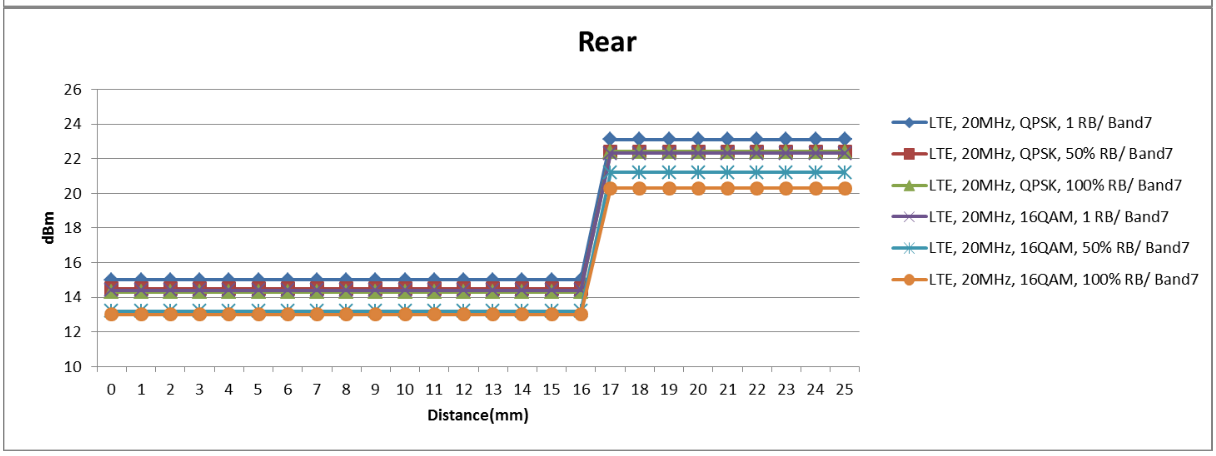

Rear
dBm
Distance(mm)
LTE, 3MHz, QPSK, 1 RB/ Band5
LTE, 3MHz, QPSK, 50% RB/ Band5
LTE, 3MHz, QPSK, 100% RB/ Band5
LTE, 3MHz, 16QAM, 1 RB/ Band5
LTE, 3MHz, 16QAM, 50% RB/ Band5
LTE, 3MHz, 16QAM, 100% RB/ Band5

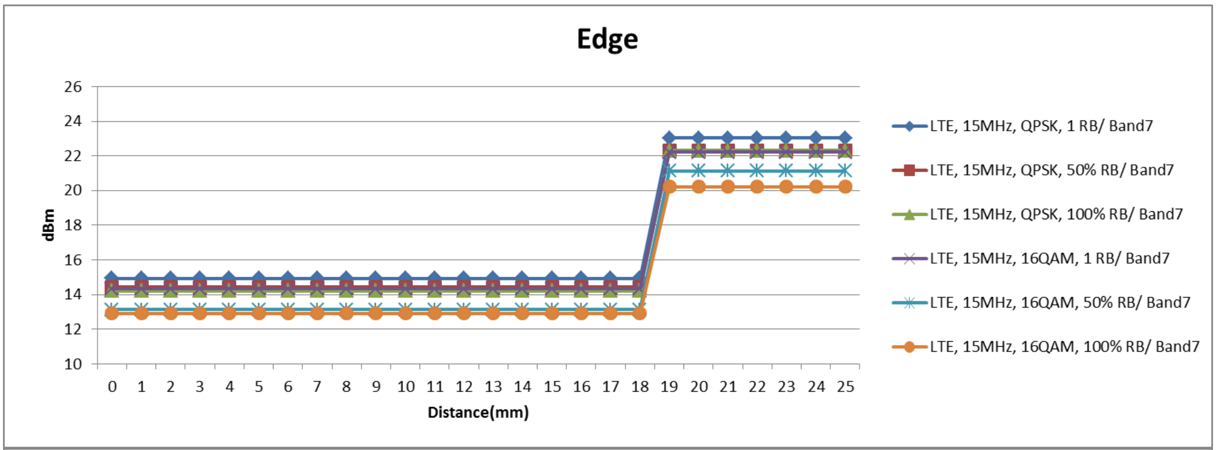

Edge
dBm
Distance(mm)
LTE, 1.4MHz, QPSK, 1 RB/ Band5
LTE, 1.4MHz, QPSK, 50% RB/ Band5
LTE, 1.4MHz, QPSK, 100% RB/ Band5
LTE, 1.4MHz, 16QAM, 1 RB/ Band5
LTE, 1.4MHz, 16QAM, 50% RB/ Band5
LTE, 1.4MHz, 16QAM, 100% RB/ Band5

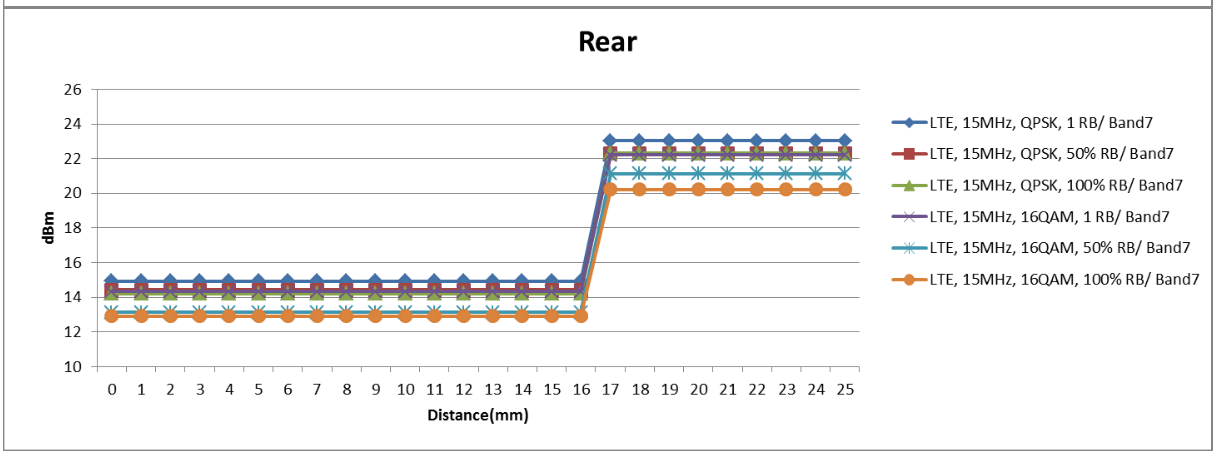

Rear
dBm
Distance(mm)
LTE, 1.4MHz, QPSK, 1 RB/ Band5
LTE, 1.4MHz, QPSK, 50% RB/ Band5
LTE, 1.4MHz, QPSK, 100% RB/ Band5
LTE, 1.4MHz, 16QAM, 1 RB/ Band5
LTE, 1.4MHz, 16QAM, 50% RB/ Band5
LTE, 1.4MHz, 16QAM, 100% RB/ Band5

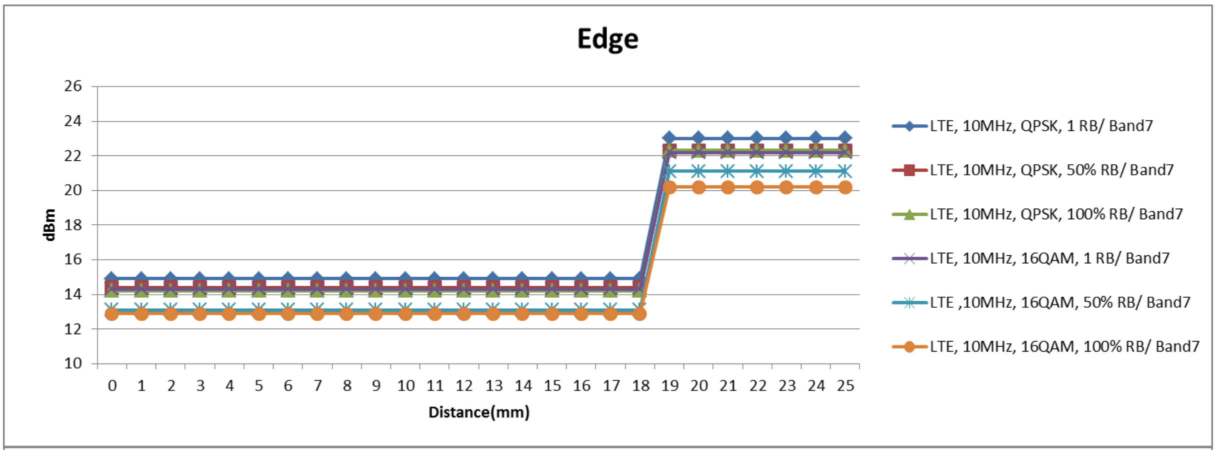
LTE Band 7

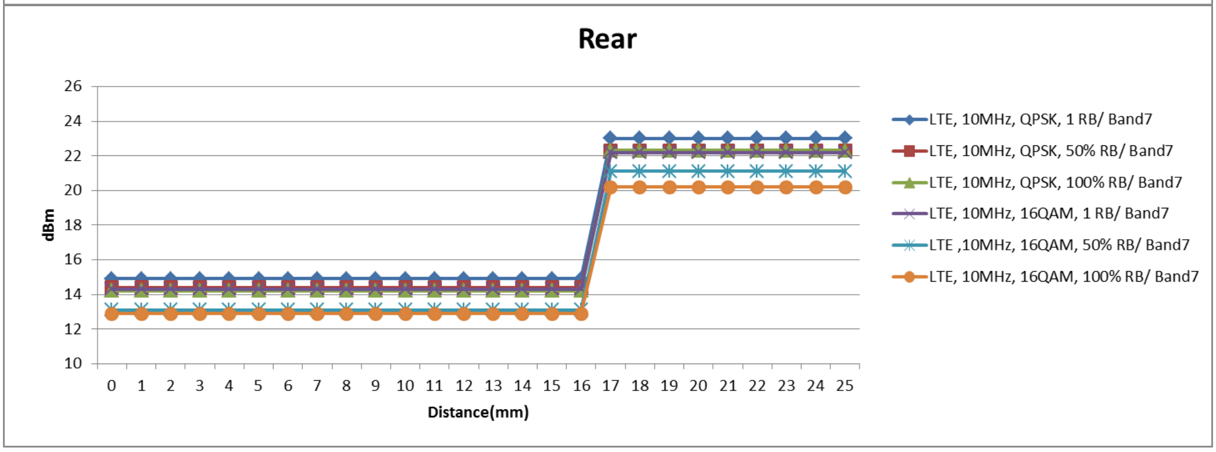

Edge
dBm
Distance(mm)
LTE, 20MHz, QPSK, 1 RB/ Band7
LTE, 20MHz, QPSK, 50% RB/ Band7
LTE, 20MHz, QPSK, 100% RB/ Band7
LTE, 20MHz, 16QAM, 1 RB/ Band7
LTE, 20MHz, 16QAM, 50% RB/ Band7
LTE, 20MHz, 16QAM, 100% RB/ Band7

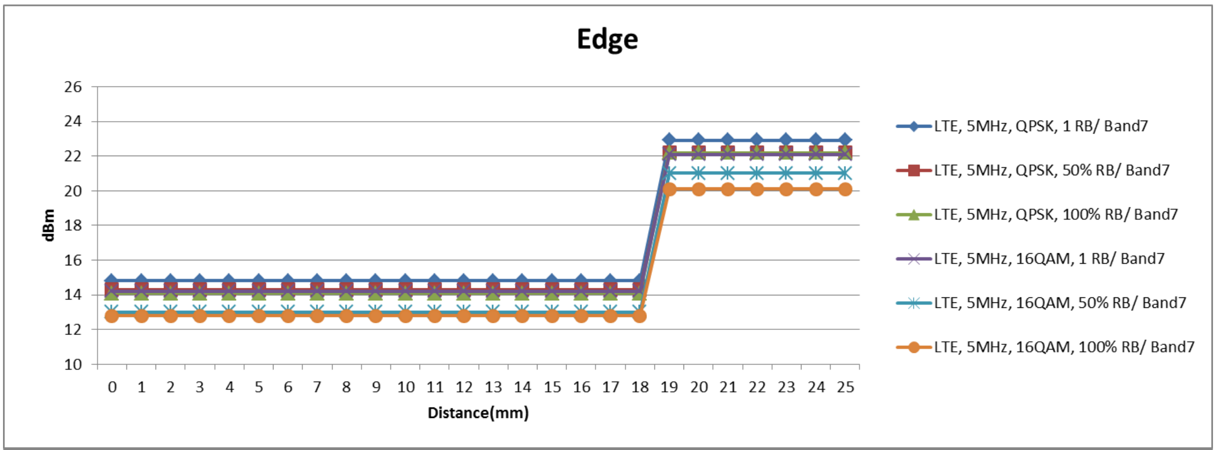

Rear
dBm
Distance(mm)
LTE, 20MHz, QPSK, 1 RB/ Band7
LTE, 20MHz, QPSK, 50% RB/ Band7
LTE, 20MHz, QPSK, 100% RB/ Band7
LTE, 20MHz, 16QAM, 1 RB/ Band7
LTE, 20MHz, 16QAM, 50% RB/ Band7
LTE, 20MHz, 16QAM, 100% RB/ Band7

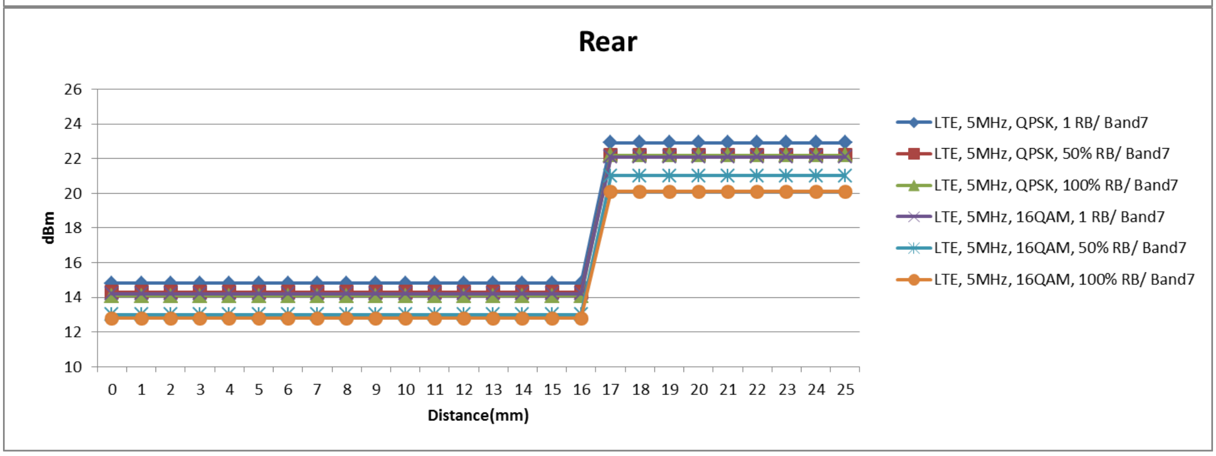

Edge
dBm
Distance(mm)
LTE, 15MHz, QPSK, 1 RB/ Band7
LTE, 15MHz, QPSK, 50% RB/ Band7
LTE, 15MHz, QPSK, 100% RB/ Band7
LTE, 15MHz, 16QAM, 1 RB/ Band7
LTE, 15MHz, 16QAM, 50% RB/ Band7
LTE, 15MHz, 16QAM, 100% RB/ Band7


Rear
dBm
Distance(mm)
LTE, 15MHz, QPSK, 1 RB/ Band7
LTE, 15MHz, QPSK, 50% RB/ Band7
LTE, 15MHz, QPSK, 100% RB/ Band7
LTE, 15MHz, 16QAM, 1 RB/ Band7
LTE, 15MHz, 16QAM, 50% RB/ Band7
LTE, 15MHz, 16QAM, 100% RB/ Band7

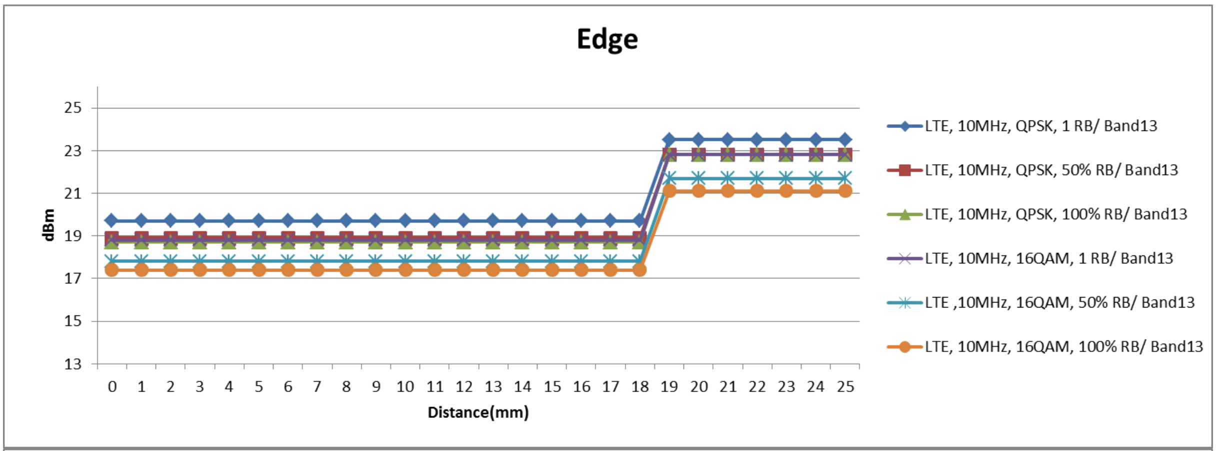

Edge
dBm
Distance(mm)
LTE, 10MHz, QPSK, 1 RB/ Band7
LTE, 10MHz, QPSK, 50% RB/ Band7
LTE, 10MHz, QPSK, 100% RB/ Band7
LTE, 10MHz, 16QAM, 1 RB/ Band7
LTE ,10MHz, 16QAM, 50% RB/ Band7
LTE, 10MHz, 16QAM, 100% RB/ Band7

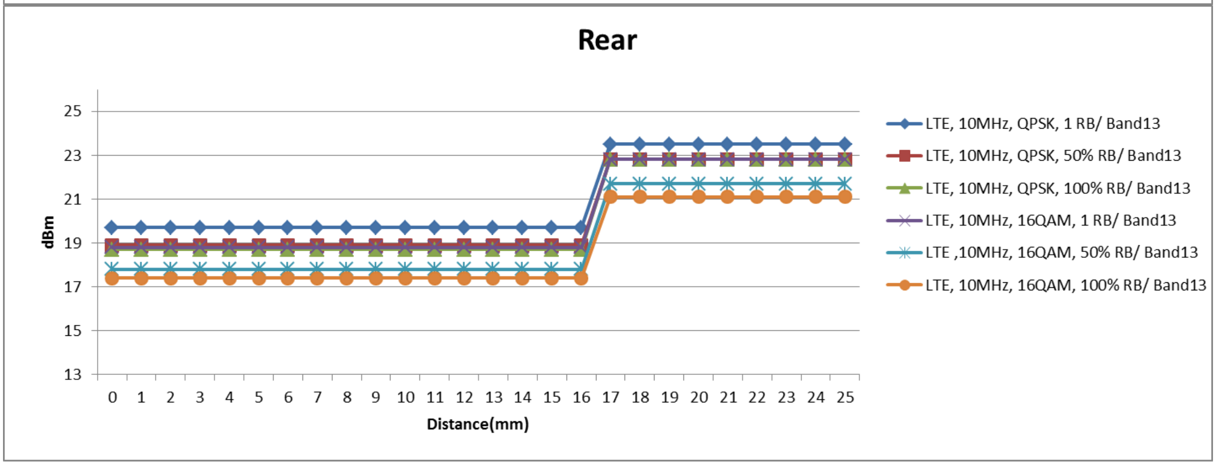

Rear
dBm
Distance(mm)
LTE, 10MHz, QPSK, 1 RB/ Band7
LTE, 10MHz, QPSK, 50% RB/ Band7
LTE, 10MHz, QPSK, 100% RB/ Band7
LTE, 10MHz, 16QAM, 1 RB/ Band7
LTE ,10MHz, 16QAM, 50% RB/ Band7
LTE, 10MHz, 16QAM, 100% RB/ Band7

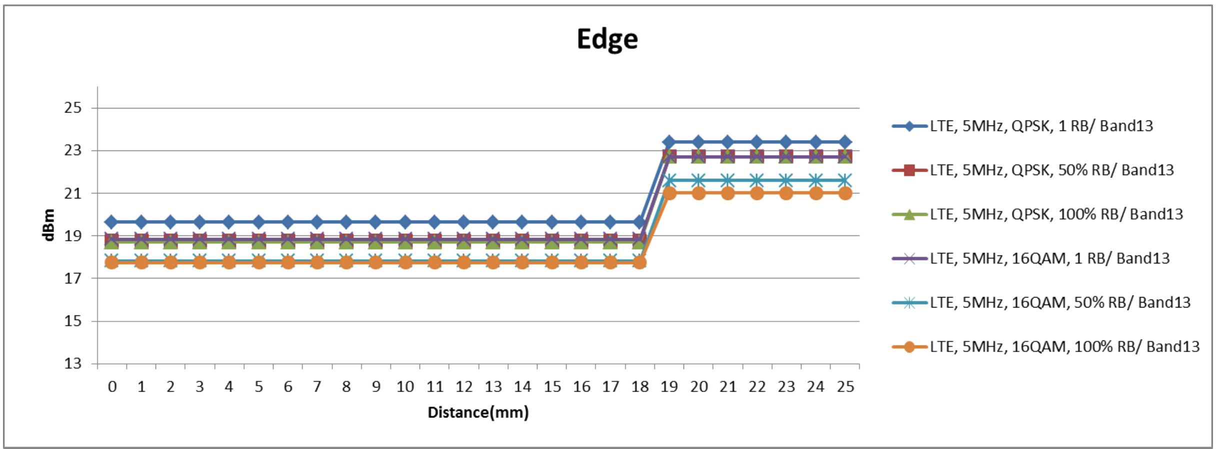

Edge
dBm
Distance(mm)
LTE, 5MHz, QPSK, 1 RB/ Band7
LTE, 5MHz, QPSK, 50% RB/ Band7
LTE, 5MHz, QPSK, 100% RB/ Band7
LTE, 5MHz, 16QAM, 1 RB/ Band7
LTE, 5MHz, 16QAM, 50% RB/ Band7
LTE, 5MHz, 16QAM, 100% RB/ Band7

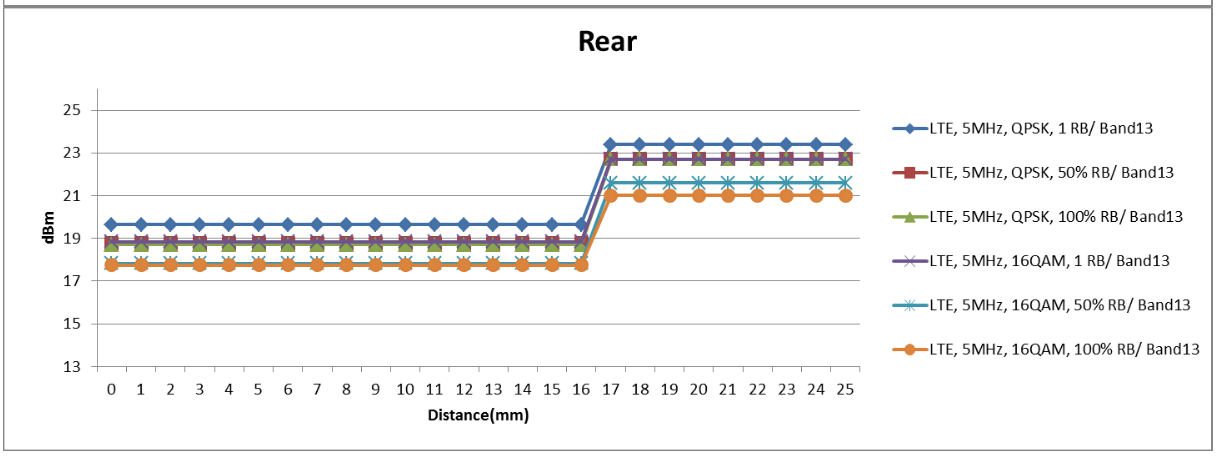

Rear
dBm
Distance(mm)
LTE, 5MHz, QPSK, 1 RB/ Band7
LTE, 5MHz, QPSK, 50% RB/ Band7
LTE, 5MHz, QPSK, 100% RB/ Band7
LTE, 5MHz, 16QAM, 1 RB/ Band7
LTE, 5MHz, 16QAM, 50% RB/ Band7
LTE, 5MHz, 16QAM, 100% RB/ Band7

LTE Band 13

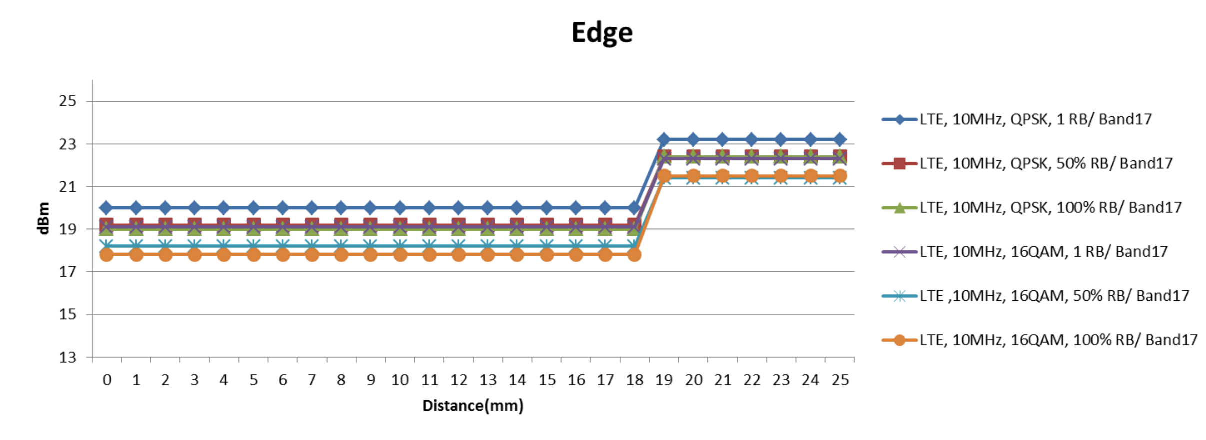

Edge
25
23
21
19
17
15
13
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 10MHz, QPSK, 1 RB/ Band13
LTE, 10MHz, QPSK, 50% RB/ Band13
LTE, 10MHz, QPSK, 100% RB/ Band13
LTE, 10MHz, 16QAM, 1 RB/ Band13
LTE ,10MHz, 16QAM, 50% RB/ Band13
LTE, 10MHz, 16QAM, 100% RB/ Band13

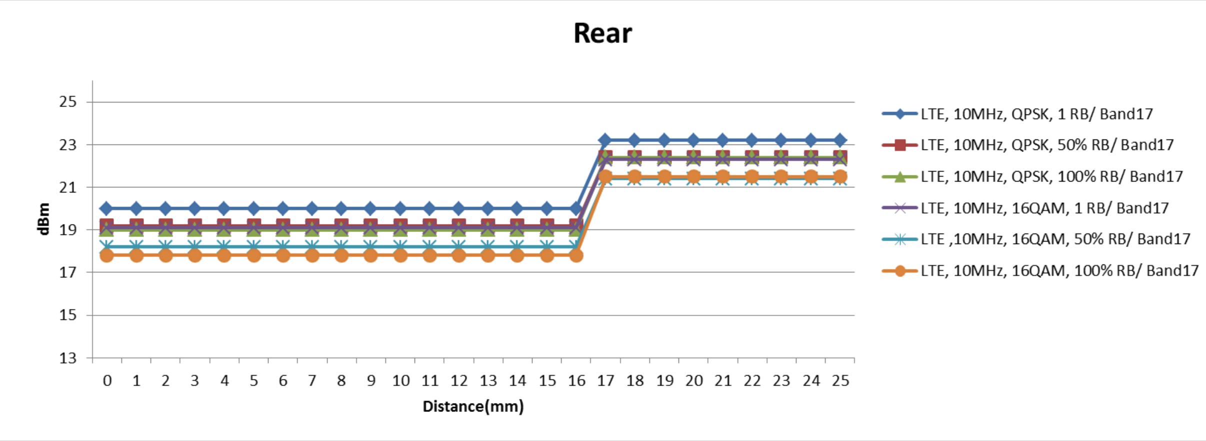

Rear
25
23
21
19
17
15
13
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 10MHz, QPSK, 1 RB/ Band13
LTE, 10MHz, QPSK, 50% RB/ Band13
LTE, 10MHz, QPSK, 100% RB/ Band13
LTE, 10MHz, 16QAM, 1 RB/ Band13
LTE ,10MHz, 16QAM, 50% RB/ Band13
LTE, 10MHz, 16QAM, 100% RB/ Band13

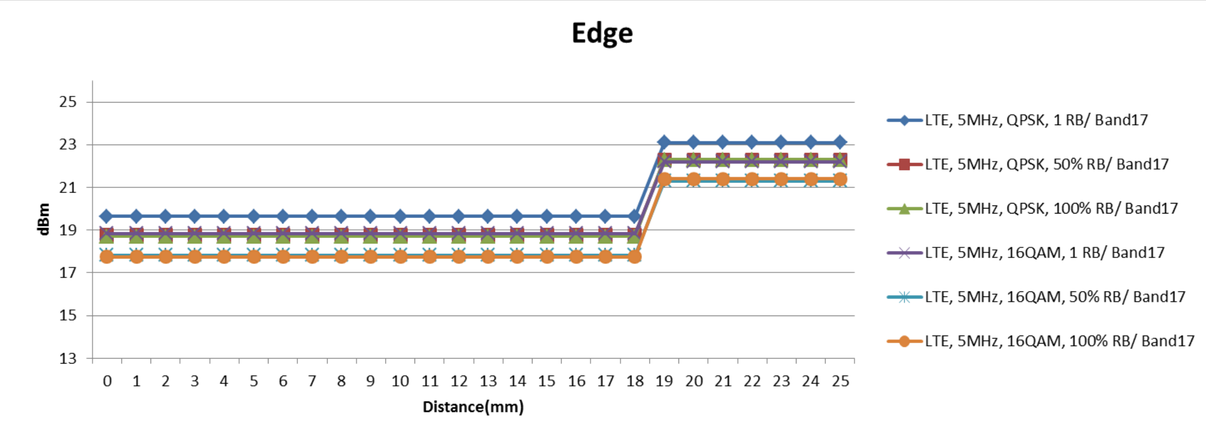

Edge
25
23
21
19
17
15
13
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 5MHz, QPSK, 1 RB/ Band13
LTE, 5MHz, QPSK, 50% RB/ Band13
LTE, 5MHz, QPSK, 100% RB/ Band13
LTE, 5MHz, 16QAM, 1 RB/ Band13
LTE, 5MHz, 16QAM, 50% RB/ Band13
LTE, 5MHz, 16QAM, 100% RB/ Band13

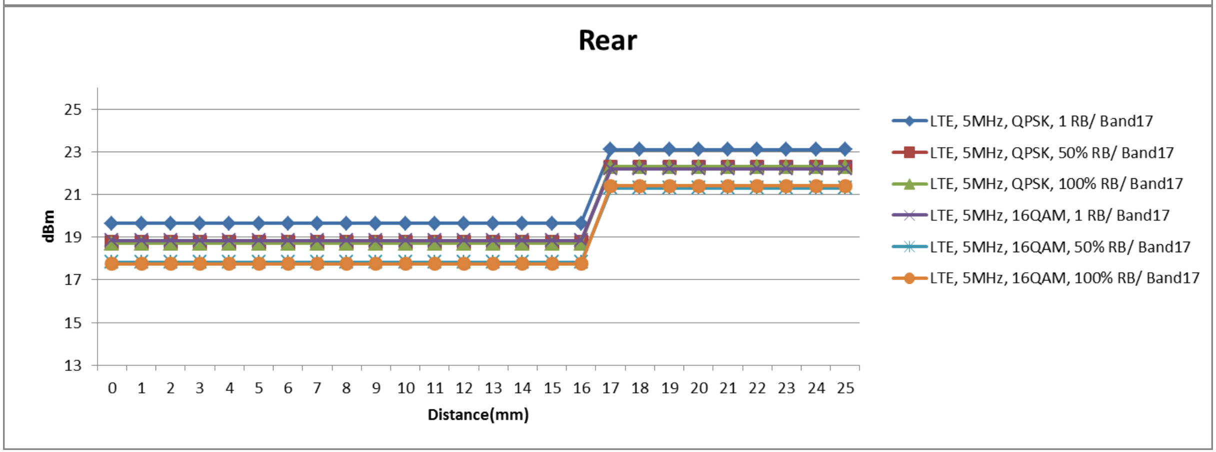

Rear
25
23
21
19
17
15
13
dBm
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance(mm)
LTE, 5MHz, QPSK, 1 RB/ Band13
LTE, 5MHz, QPSK, 50% RB/ Band13
LTE, 5MHz, QPSK, 100% RB/ Band13
LTE, 5MHz, 16QAM, 1 RB/ Band13
LTE, 5MHz, 16QAM, 50% RB/ Band13
LTE, 5MHz, 16QAM, 100% RB/ Band13

LTE Band 17


Edge
dBm
Distance(mm)
LTE, 10MHz, QPSK, 1 RB/ Band17
LTE, 10MHz, QPSK, 50% RB/ Band17
LTE, 10MHz, QPSK, 100% RB/ Band17
LTE, 10MHz, 16QAM, 1 RB/ Band17
LTE ,10MHz, 16QAM, 50% RB/ Band17
LTE, 10MHz, 16QAM, 100% RB/ Band17

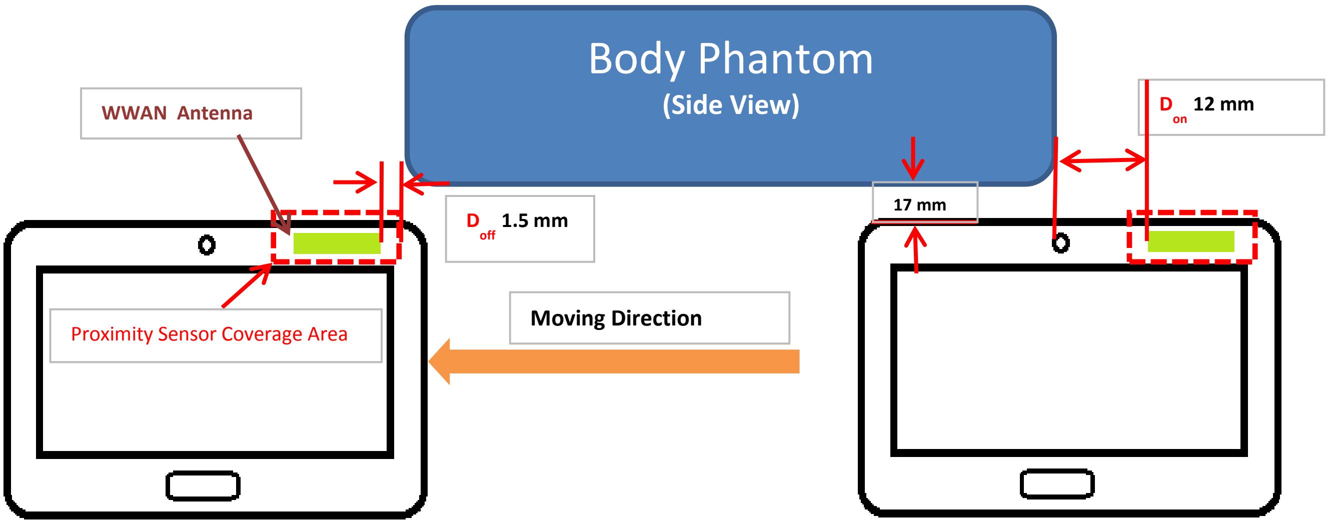

Rear
dBm
Distance(mm)
LTE, 10MHz, QPSK, 1 RB/ Band17
LTE, 10MHz, QPSK, 50% RB/ Band17
LTE, 10MHz, QPSK, 100% RB/ Band17
LTE, 10MHz, 16QAM, 1 RB/ Band17
LTE ,10MHz, 16QAM, 50% RB/ Band17
LTE, 10MHz, 16QAM, 100% RB/ Band17


Edge
dBm
Distance(mm)
LTE, 5MHz, QPSK, 1 RB/ Band17
LTE, 5MHz, QPSK, 50% RB/ Band17
LTE, 5MHz, QPSK, 100% RB/ Band17
LTE, 5MHz, 16QAM, 1 RB/ Band17
LTE, 5MHz, 16QAM, 50% RB/ Band17
LTE, 5MHz, 16QAM, 100% RB/ Band17


Rear
dBm
Distance(mm)
LTE, 5MHz, QPSK, 1 RB/ Band17
LTE, 5MHz, QPSK, 50% RB/ Band17
LTE, 5MHz, QPSK, 100% RB/ Band17
LTE, 5MHz, 16QAM, 1 RB/ Band17
LTE, 5MHz, 16QAM, 50% RB/ Band17
LTE, 5MHz, 16QAM, 100% RB/ Band17

9.6 Proximity Sensor Coverage Area

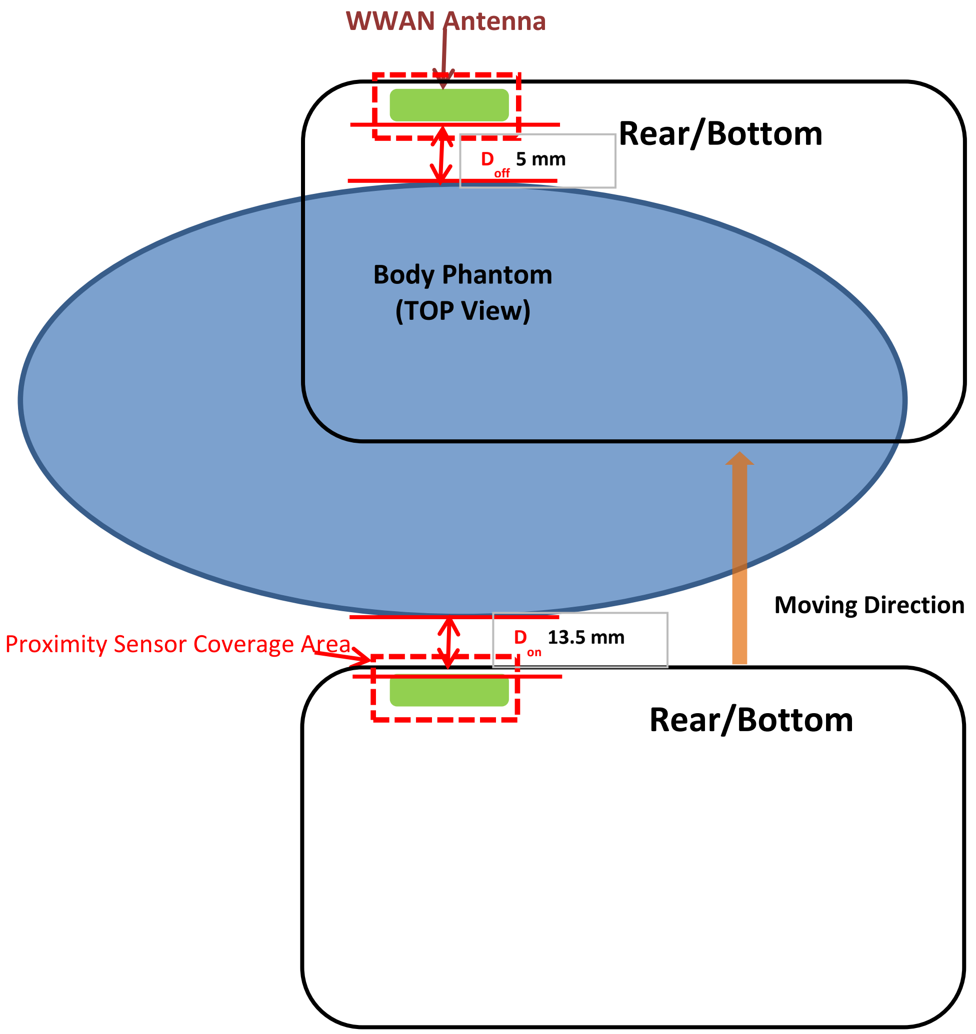
- **Edge Coverage**



The DUT is positioned perpendicular to the phantom with the test separation distance, 17 mm, away from the phantom. The DUT is moved laterally to find the distance of triggering sensor on and off

- The minimum distance from the WWAN Antenna to the edge of body phantom to trigger proximity sensor on, D_{on}, is 12 mm.
- The minimum distance from the WWAN Antenna to the edge of body phantom to trigger proximity sensor off, D_{off}, is 1.5 mm.

- Rear Coverage



The DUT is positioned under the phantom with the test separation distance, 15 mm, away from the phantom. The DUT is moved laterally to find the distance of triggering sensor on and off

- The minimum distance from the WWAN Antenna to the edge of body phantom to trigger proximity sensor on, D_{on}, is 13.5 mm.
- The minimum distance from the WWAN Antenna to the edge of body phantom to trigger proximity sensor off, D_{off}, is 5 mm

10 RF Output Power Measurement

10.1 GSM

GPRS(GMSK) Mode Coding scheme : CS-1

Band	Slot	Channel No.	Frequency (MHz)	W/o Power back-off		W/ Power back-off	
				Average power(dBm)	Frame Avg Pwr(dBm)	Average power(dBm)	Frame Avg Pwr(dBm)
850	1	128	824.2	32.1	23.1	23.2	14.2
		190	836.6	32.5	23.5	23.4	14.4
		251	848.8	32.6	23.6	23.3	14.3
	2	128	824.2	32.0	26.0	23.1	17.1
		190	836.6	32.3	26.3	23.3	17.3
		251	848.8	32.3	26.3	23.4	17.4
	3	128	824.2	31.4	27.1	23.5	19.2
		190	836.6	31.7	27.4	23.7	19.4
		251	848.8	31.8	27.5	23.8	19.5
	4	128	824.2	31.1	28.1	23.2	20.2
		190	836.6	31.2	28.2	23.3	20.3
		251	848.8	31.2	28.2	23.1	20.1

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

Band	Slot	Channel No.	Frequency (MHz)	W/o Power back-off		W/ Power back-off	
				Average power(dBm)	Frame Avg Pwr(dBm)	Average power(dBm)	Frame Avg Pwr(dBm)
850	1	128	824.2	27.2	18.2	19.3	10.3
		190	836.6	27.3	18.3	19.2	10.2
		251	848.8	27.0	18.0	19.0	10.0
	2	128	824.2	27.2	21.2	19.3	13.3
		190	836.6	27.3	21.3	19.2	13.2
		251	848.8	27.0	21.0	19.0	13.0
	3	128	824.2	26.3	22.0	18.3	14.0
		190	836.6	26.1	21.8	18.1	13.8
		251	848.8	26.0	21.7	18.0	13.7
	4	128	824.2	25.1	22.1	17.2	14.2
		190	836.6	25.2	22.2	17.1	14.1
		251	848.8	25.0	22.0	17.0	14.0

Note(s):

1. GPRS(GMSK) mode with 4 time slots, based on the output power measurements above
2. SAR is not required for EGPRS (8PSK) mode because its output power is less than that of GPRS Mode

GPRS(GMSK) Mode Coding scheme : CS-1

Band	Slot	Channel No.	Frequency (MHz)	W/o Power back-off		W/ Power back-off	
				Average power(dBm)	Frame Avg Pwr(dBm)	Average power(dBm)	Frame Avg Pwr(dBm)
1900	1	512	1850.2	29.0	20.0	20.1	11.1
		661	1880.0	29.1	20.1	20.0	11.0
		810	1909.8	29.0	20.0	20.0	11.0
	2	512	1850.2	28.1	22.1	19.9	13.9
		661	1880.0	28.3	22.3	20.0	14.0
		810	1909.8	28.2	22.1	20.0	14.0
	3	512	1850.2	28.8	24.5	19.2	14.9
		661	1880.0	28.9	24.6	19.4	15.1
		810	1909.8	28.7	24.4	19.3	15.0
	4	512	1850.2	26.6	23.6	19.3	16.3
		661	1880.0	26.7	23.7	19.4	16.4
		810	1909.8	26.5	23.5	19.3	16.3

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

Band	Slot	Channel No.	Frequency (MHz)	W/o Power back-off		W/ Power back-off	
				Average power(dBm)	Frame Avg Pwr(dBm)	Average power(dBm)	Frame Avg Pwr(dBm)
1900	1	512	1850.2	26.1	17.1	17.1	8.1
		661	1880.0	26.1	17.1	17.1	8.1
		810	1909.8	26.0	17.0	17.0	8.0
	2	512	1850.2	26.1	20.1	17.6	11.6
		661	1880.0	26.2	20.2	17.1	11.1
		810	1909.8	26.0	20.0	17.0	11.0
	3	512	1850.2	25.3	21.0	16.4	12.1
		661	1880.0	25.4	21.1	16.4	12.1
		810	1909.8	25.1	20.8	16.4	12.1
	4	512	1850.2	24.1	21.1	15.0	12.0
		661	1880.0	24.2	21.2	15.1	12.1
		810	1909.8	24.0	21.0	15.1	12.1

Note(s):

1. GPRS(GMSK) mode with 3 time slots, based on the output power measurements above
2. SAR is not required for EGPRS (8PSK) mode because its output power is less than that of GPRS Mode

10.2 WCDMA

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	Mode	UL/DL Channel No.	Frequency(MHz)	Average power(dBm)	
				W/o Power back-off	W/ Power back-off
WCDMA Band II	Rel 99	9262/9662	1852.4	23.3	15.4
		9400/9800	1880.0	23.3	15.4
		9538/9983	1907.6	23.4	15.6
WCDMA Band IV	Rel 99	1312/1537	1712.4	23.0	15.7
		1413/1638	1732.6	23.2	15.7
		1513/1738	1752.6	23.0	15.6
WCDMA Band V	Rel 99	4132/4157	826.4	24.0	19.5
		4182/4407	836.4	23.7	19.3
		4233/4458	846.6	23.8	19.3

HSDPA

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
WCDMA 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	Mode	UL/DL Channel No.	Frequency(MHz)	Average power(dBm)	
				W/o Power back-off	W/ Power back-off
HSDPA II	1	9262/9662	1852.4	23.2	15.1
		9400/9800	1880.0	23.1	15.1
		9538/9983	1907.6	23.3	15.3
	2	9262/9662	1852.4	22.7	14.6
		9400/9800	1880.0	22.6	14.6
		9538/9983	1907.6	22.8	14.8
	3	9262/9662	1852.4	22.2	14.1
		9400/9800	1880.0	22.1	14.1
		9538/9983	1907.6	22.3	14.3
	4	9262/9662	1852.4	22.2	14.1
		9400/9800	1880.0	22.1	14.1
		9538/9983	1907.6	22.3	14.3
HSDPA IV	1	1312/1537	1712.4	22.9	14.3
		1413/1638	1732.6	23.1	15.1
		1513/1738	1752.6	22.9	14.7
	2	1312/1537	1712.4	22.4	13.8
		1413/1638	1732.6	22.6	14.6
		1513/1738	1752.6	22.4	14.2
	3	1312/1537	1712.4	21.9	13.3
		1413/1638	1732.6	22.1	14.1
		1513/1738	1752.6	21.9	13.7
	4	1312/1537	1712.4	21.9	13.3
		1413/1638	1732.6	22.1	14.1
		1513/1738	1752.6	21.9	13.7
HSDPA V	1	4132/4157	826.4	23.9	19.4
		4182/4407	836.4	23.5	19.0
		4233/4458	846.6	23.7	19.2
	2	4132/4157	826.4	23.4	18.9
		4182/4407	836.4	23.0	18.5
		4233/4458	846.6	23.2	18.7
	3	4132/4157	826.4	22.9	18.4
		4182/4407	836.4	22.5	18.0
		4233/4458	846.6	22.7	18.2
	4	4132/4157	826.4	22.9	18.4
		4182/4407	836.4	22.5	18.0
		4233/4458	846.6	22.7	18.2

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
WCDMA 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	Mode	UL/DL Channel No.	Frequency(MHz)	Average power(dBm)	
				W/o Power back-off	W/ Power back-off
HSUPA II	1	9262/9662	1852.4	23.2	15.1
		9400/9800	1880.0	23.1	15.1
		9538/9983	1907.6	23.3	15.3
	2	9262/9662	1852.4	21.2	13.1
		9400/9800	1880.0	21.1	13.1
		9538/9983	1907.6	21.3	13.3
	3	9262/9662	1852.4	22.2	14.1
		9400/9800	1880.0	22.1	14.1
		9538/9983	1907.6	22.3	14.3
	4	9262/9662	1852.4	21.2	13.1
		9400/9800	1880.0	21.1	13.1
		9538/9983	1907.6	21.3	13.3
	5	9262/9662	1852.4	23.2	15.1
		9400/9800	1880.0	23.1	15.1
		9538/9983	1907.6	23.3	15.3
HSUPA IV	1	1312/1537	1712.4	22.9	14.3
		1413/1638	1732.6	23.1	15.1
		1513/1738	1752.6	22.9	14.7
	2	1312/1537	1712.4	20.9	12.3
		1413/1638	1732.6	21.1	13.1
		1513/1738	1752.6	20.9	12.7
	3	1312/1537	1712.4	21.9	13.3
		1413/1638	1732.6	22.1	14.1
		1513/1738	1752.6	21.9	13.7
	4	1312/1537	1712.4	20.9	12.3
		1413/1638	1732.6	21.1	13.1
		1513/1738	1752.6	20.9	12.7
	5	1312/1537	1712.4	22.9	14.3
		1413/1638	1732.6	23.1	15.1
		1513/1738	1752.6	22.9	14.7
HSUPA V	1	4132/4157	826.4	23.9	19.4
		4182/4407	836.4	23.5	19.0
		4233/4458	846.6	23.7	19.2
	2	4132/4157	826.4	21.9	17.4
		4182/4407	836.4	21.5	17.0
		4233/4458	846.6	21.7	17.2
	3	4132/4157	826.4	22.9	18.4
		4182/4407	836.4	22.5	18.0
		4233/4458	846.6	22.7	18.2
	4	4132/4157	826.4	21.9	17.4
		4182/4407	836.4	21.5	17.0
		4233/4458	846.6	21.7	17.2
	5	4132/4157	826.4	23.9	19.4
		4182/4407	836.4	23.5	19.0
		4233/4458	846.6	23.7	19.2

10.3 LTE

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 +/- 2dBm). 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 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.					

10.3.1 LTE Band 2

Output power table

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm) W/o Power back-off	Average power(dBm) W/ Power back-off
2	20	18700	1860.0	QPSK	1	0	0	22.8	15.9
					1	49	0	22.0	15.6
					1	99	0	22.0	15.3
					50	0	1	22.2	15.2
					50	24	1	21.4	14.9
					50	49	1	21.3	14.8
					100	0	1	21.2	15.1
				16QAM	1	0	1	22.2	15.5
					1	49	1	21.2	15.1
					1	99	1	21.0	14.8
					50	0	2	20.8	14.5
					50	24	2	20.5	14.1
					50	49	2	20.4	13.9
					100	0	2	20.1	13.9
		18900	1880.0	QPSK	1	0	0	22.9	15.9
					1	49	0	22.1	15.8
					1	99	0	22.0	15.7
					50	0	1	22.3	15.6
					50	24	1	21.5	15.2
					50	49	1	21.4	15.0
					100	0	1	21.3	15.0
				16QAM	1	0	1	22.2	15.4
					1	49	1	21.2	15.0
					1	99	1	21.0	14.7
					50	0	2	21.0	14.6
					50	24	2	20.5	14.2
					50	49	2	20.4	14.0
					100	0	2	20.1	13.9
		19100	1900.0	QPSK	1	0	0	23.0	16.0
					1	49	0	22.2	15.9
					1	99	0	22.1	15.8
					50	0	1	22.4	15.7
					50	24	1	21.6	15.4
					50	49	1	21.5	15.3
					100	0	1	21.4	15.6
				16QAM	1	0	1	22.2	15.6
					1	49	1	21.2	15.2
					1	99	1	21.2	14.9
					50	0	2	21.0	14.6
					50	24	2	20.5	14.2
					50	49	2	20.4	14.0
					100	0	2	20.1	14.0

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	
								W/o Power back-off	W/ Power back-off
2	15	18675	1857.5	QPSK	1	0	0	22.7	15.7
					1	37	0	21.9	15.4
					1	74	0	21.9	15.1
					36	0	1	22.1	15.0
					36	18	1	21.3	14.7
					36	35	1	21.2	14.6
					75	0	1	21.1	14.9
				16QAM	1	0	1	22.1	15.3
					1	37	1	21.1	14.9
					1	74	1	20.9	14.6
					36	0	2	20.7	14.3
					36	18	2	20.4	13.9
					36	35	2	20.3	13.7
					75	0	2	20.0	13.7
		18900	1880.0	QPSK	1	0	0	22.9	15.7
					1	37	0	22.1	15.6
					1	74	0	22.0	15.5
					36	0	1	22.3	15.4
					36	18	1	21.5	15.0
					36	35	1	21.4	14.8
					75	0	1	21.3	14.8
				16QAM	1	0	1	22.1	15.2
					1	37	1	21.1	14.8
					1	74	1	21.1	14.5
					36	0	2	20.9	14.4
					36	18	2	20.4	14.0
					36	35	2	20.3	13.8
					75	0	2	20.0	13.7
		19125	1902.5	QPSK	1	0	0	22.8	15.8
					1	37	0	22.0	15.7
					1	74	0	21.9	15.6
					36	0	1	22.2	15.5
					36	18	1	21.4	15.2
					36	35	1	21.3	15.1
					75	0	1	21.2	15.4
				16QAM	1	0	1	22.1	15.4
					1	37	1	21.1	15.0
					1	74	1	20.9	14.7
					36	0	2	20.9	14.4
					36	18	2	20.4	14.0
					36	35	2	20.3	13.8
					75	0	2	20.0	13.8

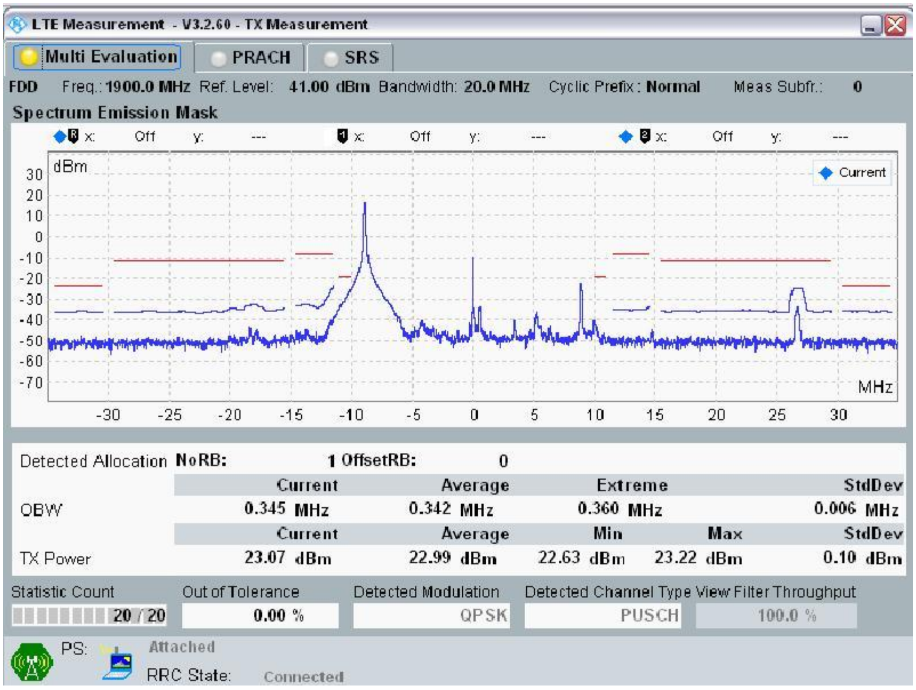
Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	
								W/o Power back-off	W/ Power back-off
2	10	18650	1855.0	QPSK	1	0	0	22.6	15.7
					1	24	0	21.8	15.4
					1	49	0	21.8	15.1
					25	0	1	22.0	15.0
					25	12	1	21.2	14.7
					25	24	1	21.1	14.6
					50	0	1	21.0	14.9
				16QAM	1	0	1	22.0	15.3
					1	24	1	21.0	14.9
					1	49	1	20.8	14.6
					25	0	2	20.6	14.3
					25	12	2	20.3	13.9
					25	24	2	20.2	13.7
					50	0	2	19.9	13.7
		18900	1880.0	QPSK	1	0	0	22.8	15.7
					1	24	0	21.9	15.6
					1	49	0	21.9	15.5
					25	0	1	22.2	15.4
					25	12	1	21.4	15.0
					25	24	1	21.3	14.8
					50	0	1	21.2	14.8
				16QAM	1	0	1	22.0	15.2
					1	24	1	21.0	14.8
					1	49	1	21.0	14.5
					25	0	2	20.8	14.4
					25	12	2	20.3	14.0
					25	24	2	20.2	13.8
					50	0	2	19.9	13.7
		19150	1905.0	QPSK	1	0	0	22.7	15.8
					1	24	0	21.9	15.7
					1	49	0	21.8	15.6
					25	0	1	22.1	15.5
					25	12	1	21.3	15.2
					25	24	1	21.2	15.1
					50	0	1	21.1	15.4
				16QAM	1	0	1	22.0	15.4
					1	24	1	21.0	15.0
					1	49	1	20.8	14.7
					25	0	2	20.8	14.4
					25	12	2	20.3	14.0
					25	24	2	20.2	13.8
					50	0	2	19.9	13.8

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	
								W/o Power back-off	W/ Power back-off
2	5	18625	1852.5	QPSK	1	0	0	22.5	15.6
					1	12	0	21.7	15.3
					1	24	0	21.7	15.0
					12	0	1	21.9	14.9
					12	6	1	21.1	14.6
					12	11	1	21.0	14.5
					25	0	1	20.9	14.8
				16QAM	1	0	1	21.9	15.2
					1	12	1	20.9	14.8
					1	24	1	20.7	14.5
					12	0	2	20.5	14.2
					12	6	2	20.2	13.8
					12	11	2	20.1	13.6
					25	0	2	19.8	13.6
		18900	1880.0	QPSK	1	0	0	22.7	15.6
					1	12	0	21.8	15.5
					1	24	0	21.8	15.4
					12	0	1	22.1	15.3
					12	6	1	21.3	14.9
					12	11	1	21.2	14.7
					25	0	1	21.1	14.7
				16QAM	1	0	1	21.9	15.1
					1	12	1	20.9	14.7
					1	24	1	20.9	14.4
					12	0	2	20.7	14.3
					12	6	2	20.2	13.9
					12	11	2	20.1	13.7
					25	0	2	19.8	13.6
		19175	1907.5	QPSK	1	0	0	22.6	15.7
					1	12	0	21.8	15.6
					1	24	0	21.7	15.5
					12	0	1	22.0	15.4
					12	6	1	21.2	15.1
					12	11	1	21.1	15.0
					25	0	1	21.0	15.3
				16QAM	1	0	1	21.9	15.3
					1	12	1	20.9	14.9
					1	24	1	20.7	14.6
					12	0	2	20.7	14.3
					12	6	2	20.2	13.9
					12	11	2	20.1	13.7
					25	0	2	19.8	13.7

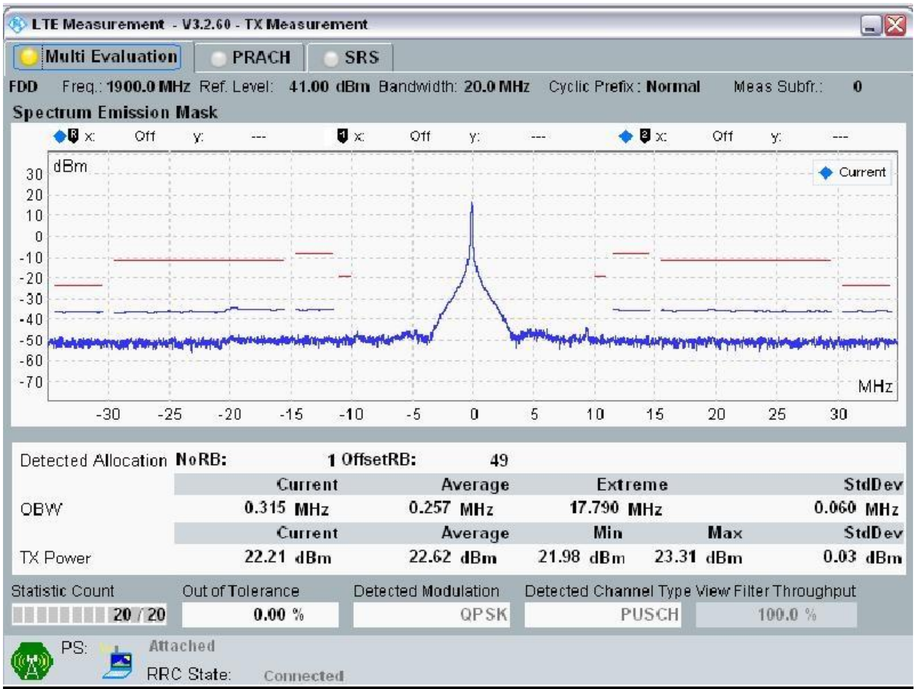
Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm) W/o Power back-off	Average power(dBm) W/ Power back-off
2	3	18615	1851.5	QPSK	1	0	0	22.3	15.5
					1	7	0	21.5	15.2
					1	14	0	21.5	14.9
					8	0	1	21.7	14.8
					8	4	1	20.9	14.5
					8	7	1	20.8	14.4
					15	0	1	20.7	14.7
				16QAM	1	0	1	21.7	15.1
					1	7	1	20.7	14.7
					1	14	1	20.5	14.4
					8	0	2	20.3	14.1
					8	4	2	20.0	13.7
					8	7	2	19.9	13.5
					15	0	2	19.6	13.5
		18900	1880.0	QPSK	1	0	0	22.5	15.5
					1	7	0	21.7	15.4
					1	14	0	21.6	15.3
					8	0	1	21.9	15.2
					8	4	1	21.1	14.8
					8	7	1	21.0	14.6
					15	0	1	20.9	14.6
				16QAM	1	0	1	21.7	15.0
					1	7	1	20.7	14.6
					1	14	1	20.7	14.3
					8	0	2	20.5	14.2
					8	4	2	20.0	13.8
					8	7	2	19.9	13.6
					15	0	2	19.6	13.5
		19184	1908.4	QPSK	1	0	0	22.4	15.6
					1	7	0	21.6	15.5
					1	14	0	21.5	15.4
					8	0	1	21.8	15.3
					8	4	1	21.0	14.9
					8	7	1	20.9	14.8
					15	0	1	20.8	15.2
				16QAM	1	0	1	21.7	15.2
					1	7	1	20.7	14.8
					1	14	1	20.5	14.5
					8	0	2	20.5	14.2
					8	4	2	20.0	13.8
					8	7	2	19.9	13.6
					15	0	2	19.6	13.6

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm) W/o Power back-off	Average power(dBm) W/ Power back-off
2	1.4	18607	1850.7	QPSK	1	0	0	22.1	15.3
					1	2	0	21.3	15.0
					1	5	0	21.3	14.7
					3	0	1	21.5	14.6
					3	1	1	20.7	14.3
					3	2	1	20.6	14.2
					6	0	1	20.5	14.5
				16QAM	1	0	1	21.5	14.9
					1	2	1	20.5	14.5
					1	5	1	20.3	14.2
					3	0	2	20.1	13.9
					3	1	2	19.8	13.5
					3	2	2	19.7	13.3
					6	0	2	19.4	13.3
		18900	1880.0	QPSK	1	0	0	22.3	15.3
					1	2	0	21.5	15.2
					1	5	0	21.4	15.1
					3	0	1	21.7	15.0
					3	1	1	20.9	14.6
					3	2	1	20.8	14.4
					6	0	1	20.7	14.4
				16QAM	1	0	1	21.5	14.8
					1	2	1	20.5	14.4
					1	5	1	20.5	14.1
					3	0	2	20.3	14.0
					3	1	2	19.8	13.6
					3	2	2	19.7	13.4
					6	0	2	19.4	13.3
		19192	1909.2	QPSK	1	0	0	22.2	15.4
					1	2	0	21.4	15.3
					1	5	0	21.3	15.2
					3	0	1	21.6	15.1
					3	1	1	20.8	14.7
					3	2	1	20.7	14.6
					6	0	1	20.6	15.0
				16QAM	1	0	1	21.5	15.0
					1	2	1	20.5	14.6
					1	5	1	20.3	14.3
					3	0	2	20.3	14.0
					3	1	2	19.8	13.6
					3	2	2	19.7	13.4
					6	0	2	19.4	13.4

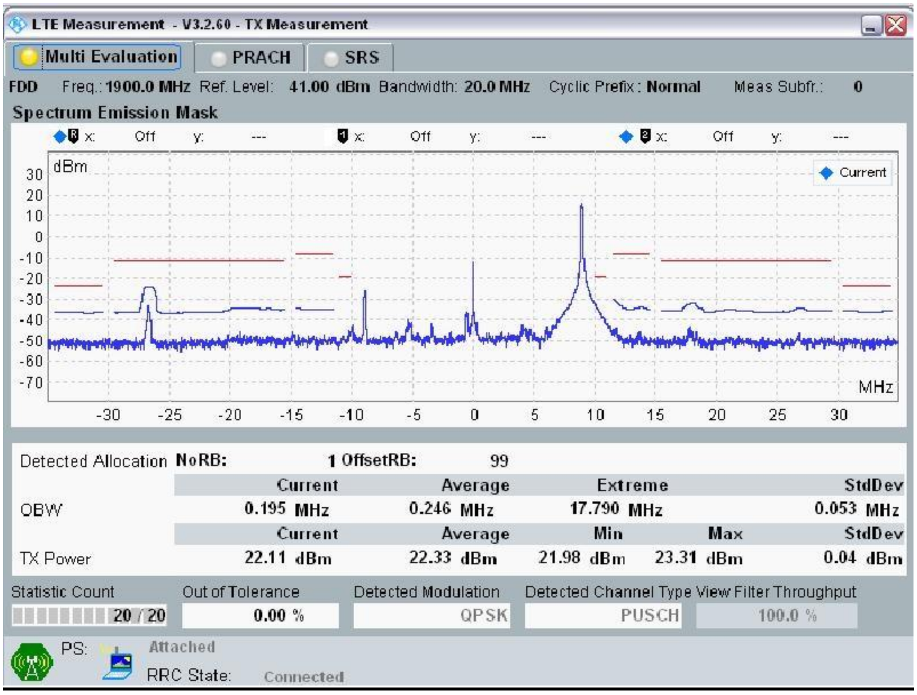
Spectrum Plots for the Test RB allocations



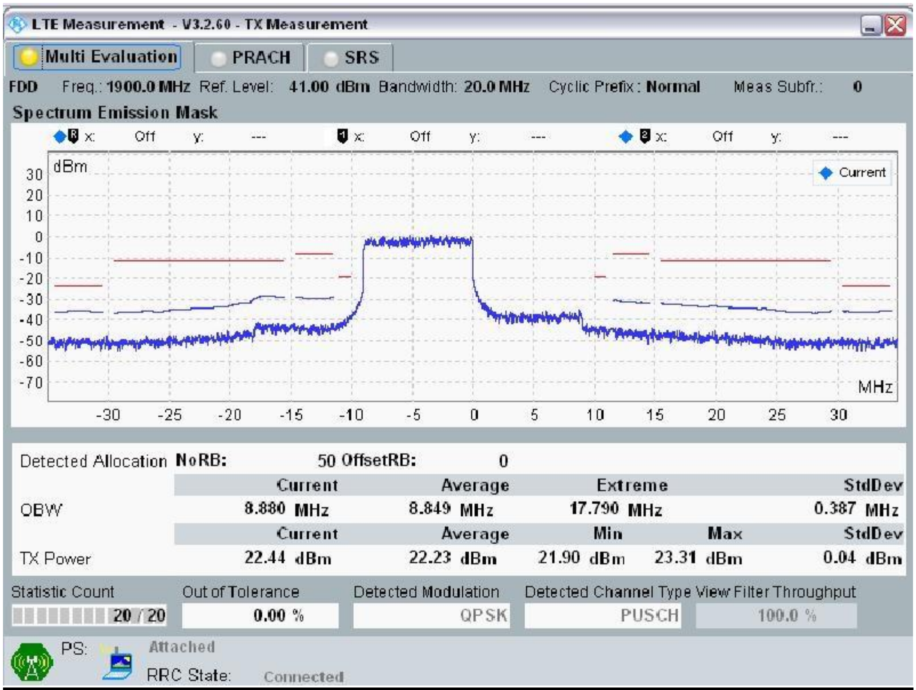
20MHz Band Width: Ch 19100, RB Size=1; RB Offset = 0



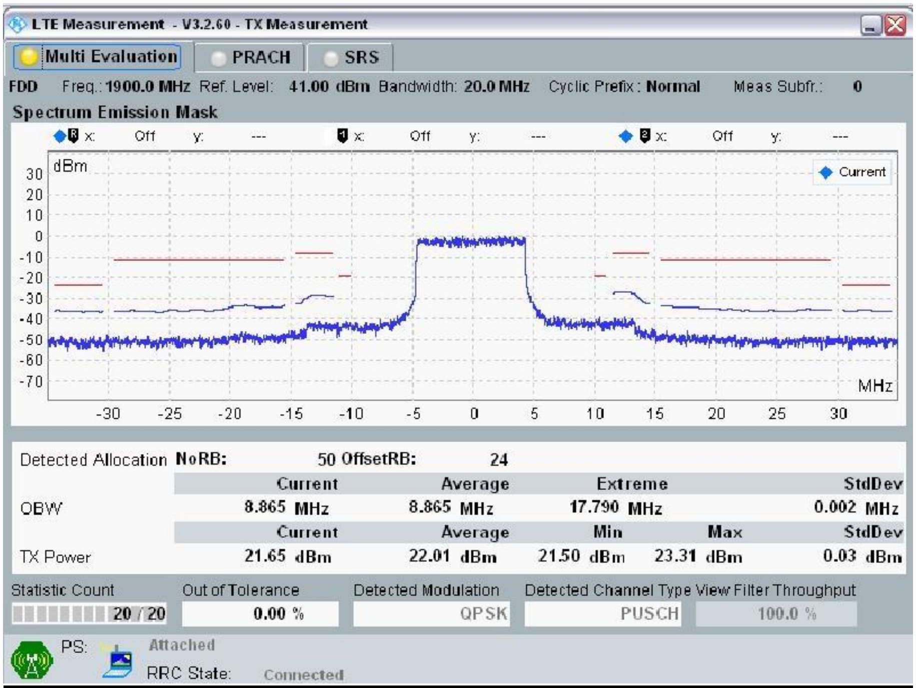
20MHz Band Width: Ch 19100, RB Size=1; RB Offset = 49



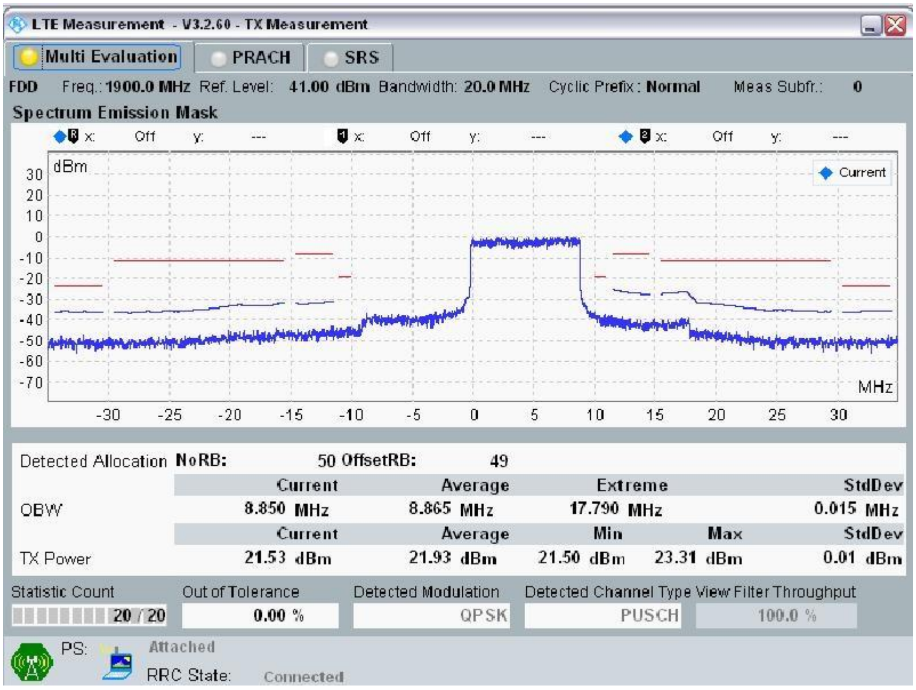
20MHz Band Width: Ch 19100, RB Size=1; RB Offset = 99



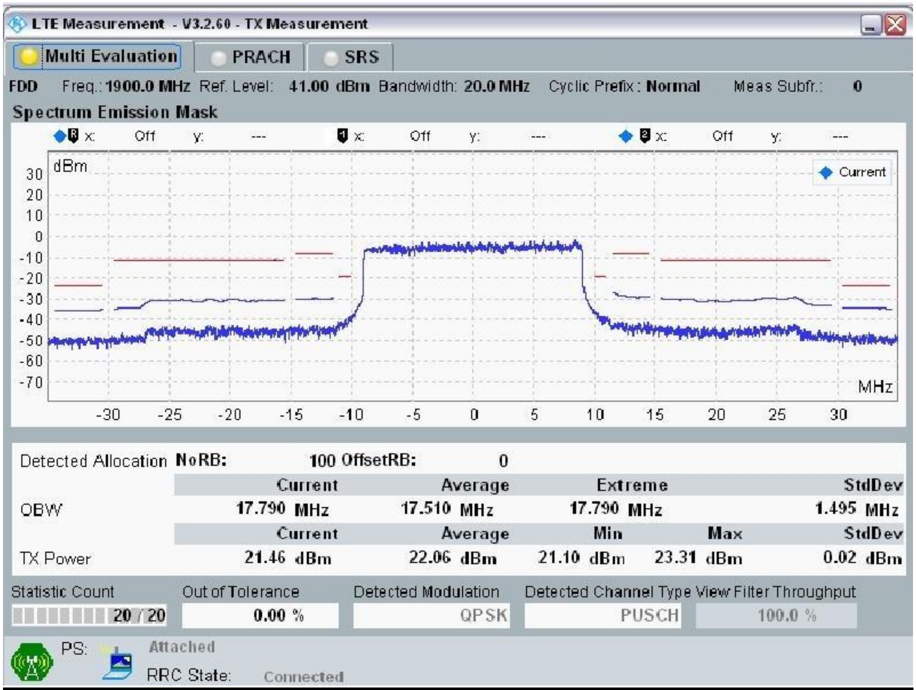
20MHz Band Width: Ch 19100, RB Size=50; RB Offset = 0



20MHz Band Width: Ch 19100, RB Size=50; RB Offset = 24



20MHz Band Width: Ch 19100, RB Size=50; RB Offset = 49



20MHz Band Width: Ch 19100, RB Size=100; RB Offset = 0

10.3.2 LTE Band 4

Output power table

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm) W/o Power back-off	Average power(dBm) W/ Power back-off
4	20	20050	1720.0	QPSK	1	0	0	22.8	15.9
					1	49	0	22.5	15.4
					1	99	0	22.4	15.0
					50	0	1	22.0	15.0
					50	24	1	21.7	14.6
					50	49	1	21.6	14.1
					100	0	1	21.5	14.0
				16QAM	1	0	1	22.0	15.0
					1	49	1	21.7	14.5
					1	99	1	21.6	14.0
					50	0	2	21.2	14.2
					50	24	2	21.0	13.7
					50	49	2	21.0	13.2
					100	0	2	20.9	13.2
		20175	1732.5	QPSK	1	0	0	22.9	15.9
					1	49	0	22.6	15.4
					1	99	0	22.5	15.0
					50	0	1	22.1	15.0
					50	24	1	21.8	14.6
					50	49	1	21.7	14.1
					100	0	1	21.6	14.0
				16QAM	1	0	1	22.0	15.0
					1	49	1	21.7	14.5
					1	99	1	21.6	14.0
					50	0	2	21.2	14.2
					50	24	2	21.0	13.7
					50	49	2	21.0	13.2
					100	0	2	20.9	13.2
		20300	1745.0	QPSK	1	0	0	23.0	16.0
					1	49	0	22.8	15.8
					1	99	0	22.7	15.7
					50	0	1	22.8	15.7
					50	24	1	22.6	14.9
					50	49	1	22.5	14.8
					100	0	1	22.5	15.6
				16QAM	1	0	1	22.1	15.3
					1	49	1	21.8	14.8
					1	99	1	21.7	14.8
					50	0	2	21.3	14.2
					50	24	2	21.1	14.1
					50	49	2	21.1	14.0
					100	0	2	21.0	13.9

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	
								W/o Power back-off	W/ Power back-off
4	15	20025	1717.5	QPSK	1	0	0	22.7	15.6
					1	37	0	22.4	15.2
					1	74	0	22.3	14.8
					36	0	1	21.9	14.8
					36	18	1	21.6	14.4
					36	35	1	21.5	13.9
					75	0	1	21.4	13.8
				16QAM	1	0	1	21.9	14.8
					1	37	1	21.6	14.3
					1	74	1	21.5	13.8
					36	0	2	21.1	14.0
					36	18	2	20.9	13.5
					36	35	2	20.9	13.0
					75	0	2	20.8	13.0
		20175	1732.5	QPSK	1	0	0	22.8	15.7
					1	37	0	22.5	15.2
					1	74	0	22.4	14.8
					36	0	1	22.0	14.8
					36	18	1	21.7	14.4
					36	35	1	21.6	13.9
					75	0	1	21.5	13.8
				16QAM	1	0	1	21.9	14.8
					1	37	1	21.6	14.3
					1	74	1	21.5	13.8
					36	0	2	21.1	14.0
					36	18	2	20.9	13.5
					36	35	2	20.9	13.0
					75	0	2	20.8	13.0
		20325	1747.5	QPSK	1	0	0	22.9	15.8
					1	37	0	22.7	15.6
					1	74	0	22.6	15.5
					36	0	1	22.7	15.5
					36	18	1	22.5	14.7
					36	35	1	22.4	14.6
					75	0	1	22.4	15.4
				16QAM	1	0	1	22.0	15.1
					1	37	1	21.7	14.6
					1	74	1	21.6	14.6
					36	0	2	21.2	14.0
					36	18	2	21.0	13.9
					36	35	2	21.0	13.8
					75	0	2	20.9	13.7

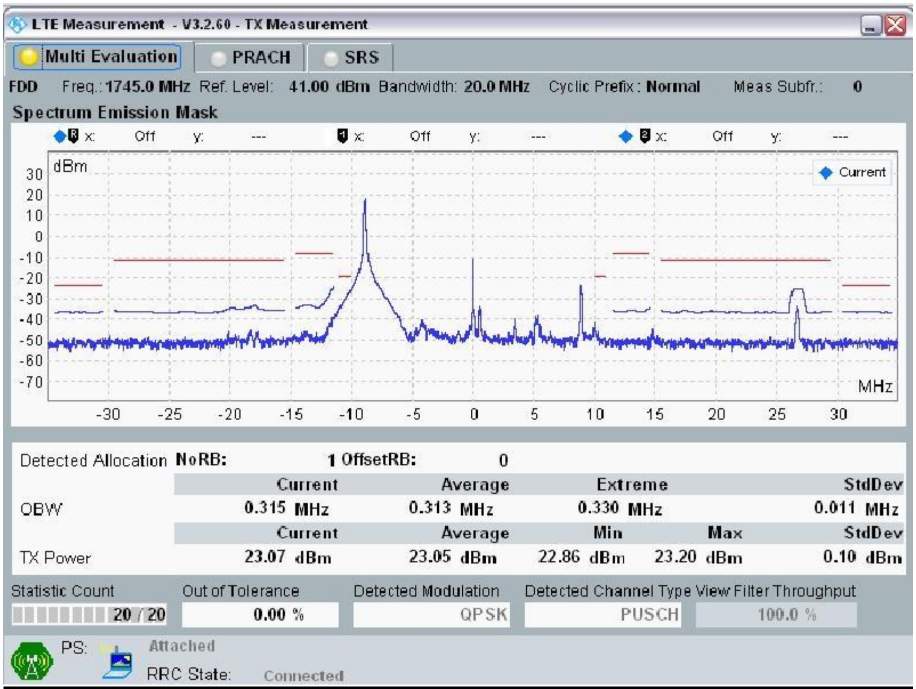
Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	
								W/o Power back-off	W/ Power back-off
4	10	20000	1715.0	QPSK	1	0	0	22.6	15.6
					1	24	0	22.3	15.2
					1	49	0	22.2	14.8
					25	0	1	21.8	14.8
					25	12	1	21.5	14.4
					25	24	1	21.4	13.9
					50	0	1	21.3	13.8
				16QAM	1	0	1	21.8	14.8
					1	24	1	21.5	14.3
					1	49	1	21.4	13.8
					25	0	2	21.0	14.0
					25	12	2	20.8	13.5
					25	24	2	20.8	13.0
					50	0	2	20.7	13.0
		20175	1732.5	QPSK	1	0	0	22.7	15.7
					1	24	0	22.4	15.2
					1	49	0	22.3	14.8
					25	0	1	21.9	14.8
					25	12	1	21.6	14.4
					25	24	1	21.5	13.9
					50	0	1	21.4	13.8
				16QAM	1	0	1	21.8	14.8
					1	24	1	21.5	14.3
					1	49	1	21.4	13.8
					25	0	2	21.0	14.0
					25	12	2	20.8	13.5
					25	24	2	20.8	13.0
					50	0	2	20.7	13.0
		20350	1750.0	QPSK	1	0	0	22.8	15.8
					1	24	0	22.6	15.6
					1	49	0	22.5	15.5
					25	0	1	22.6	15.5
					25	12	1	22.4	14.7
					25	24	1	22.3	14.6
					50	0	1	22.3	15.4
				16QAM	1	0	1	21.9	15.1
					1	24	1	21.6	14.6
					1	49	1	21.5	14.6
					25	0	2	21.1	14.0
					25	12	2	20.9	13.9
					25	24	2	20.9	13.8
					50	0	2	20.8	13.7

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	
								W/o Power back-off	W/ Power back-off
4	5	19975	1712.5	QPSK	1	0	0	22.5	15.5
					1	12	0	22.2	15.1
					1	24	0	22.1	14.7
					12	0	1	21.7	14.7
					12	6	1	21.4	14.3
					12	11	1	21.3	13.8
					25	0	1	21.2	13.7
				16QAM	1	0	1	21.7	14.7
					1	12	1	21.4	14.2
					1	24	1	21.3	13.7
					12	0	2	20.9	13.9
					12	6	2	20.7	13.4
					12	11	2	20.7	12.9
					25	0	2	20.6	12.9
		20175	1732.5	QPSK	1	0	0	22.6	15.6
					1	12	0	22.3	15.1
					1	24	0	22.2	14.7
					12	0	1	21.8	14.7
					12	6	1	21.5	14.3
					12	11	1	21.4	13.8
					25	0	1	21.3	13.7
				16QAM	1	0	1	21.7	14.7
					1	12	1	21.4	14.2
					1	24	1	21.3	13.7
					12	0	2	20.9	13.9
					12	6	2	20.7	13.4
					12	11	2	20.7	12.9
					25	0	2	20.6	12.9
		20375	1752.5	QPSK	1	0	0	22.7	15.7
					1	12	0	22.5	15.5
					1	24	0	22.4	15.4
					12	0	1	22.5	15.4
					12	6	1	22.3	14.6
					12	11	1	22.2	14.5
					25	0	1	22.2	15.3
				16QAM	1	0	1	21.8	15.0
					1	12	1	21.5	14.5
					1	24	1	21.4	14.5
					12	0	2	21.0	13.9
					12	6	2	20.8	13.8
					12	11	2	20.8	13.7
					25	0	2	20.7	13.6

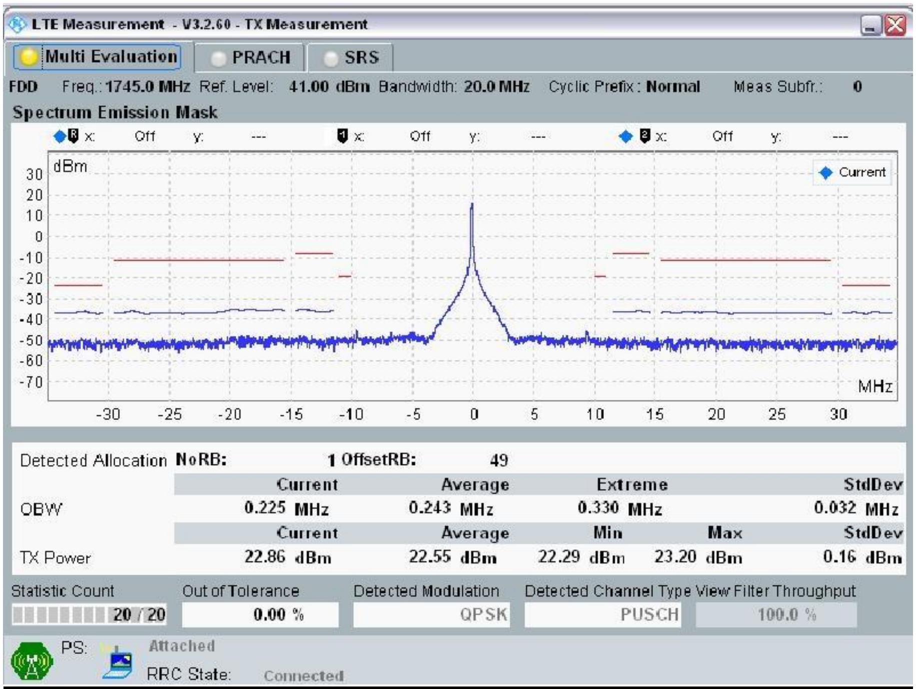
Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	
								W/o Power back-off	W/ Power back-off
4	3	19965	1711.5	QPSK	1	0	0	22.3	15.4
					1	7	0	22.0	15.0
					1	14	0	21.9	14.6
					8	0	1	21.5	14.6
					8	4	1	21.2	14.2
					8	7	1	21.1	13.7
					15	0	1	21.0	13.6
				16QAM	1	0	1	21.5	14.6
					1	7	1	21.2	14.1
					1	14	1	21.1	13.6
					8	0	2	20.7	13.8
					8	4	2	20.5	13.3
					8	7	2	20.5	12.8
					15	0	2	20.4	12.8
		20175	1732.5	QPSK	1	0	0	22.4	15.5
					1	7	0	22.1	15.0
					1	14	0	22.0	14.6
					8	0	1	21.6	14.6
					8	4	1	21.3	14.2
					8	7	1	21.2	13.7
					15	0	1	21.1	13.6
				16QAM	1	0	1	21.5	14.6
					1	7	1	21.2	14.1
					1	14	1	21.1	13.6
					8	0	2	20.7	13.8
					8	4	2	20.5	13.3
					8	7	2	20.5	12.8
					15	0	2	20.4	12.8
		20384	1753.4	QPSK	1	0	0	22.5	15.6
					1	7	0	22.3	15.4
					1	14	0	22.2	15.3
					8	0	1	22.3	15.3
					8	4	1	22.1	14.5
					8	7	1	22.0	14.4
					15	0	1	22.0	15.2
				16QAM	1	0	1	21.6	14.9
					1	7	1	21.3	14.4
					1	14	1	21.2	14.4
					8	0	2	20.8	13.8
					8	4	2	20.6	13.7
					8	7	2	20.6	13.6
					15	0	2	20.5	13.5

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	
								W/o Power back-off	W/ Power back-off
4	1.4	19957	1710.7	QPSK	1	0	0	22.1	15.2
					1	2	0	21.8	14.8
					1	5	0	21.7	14.4
					3	0	1	21.3	14.4
					3	1	1	21.0	14.0
					3	2	1	20.9	13.5
					6	0	1	20.8	13.4
				16QAM	1	0	1	21.3	14.4
					1	2	1	21.0	13.9
					1	5	1	20.9	13.4
					3	0	2	20.5	13.6
					3	1	2	20.3	13.1
					3	2	2	20.3	12.6
					6	0	2	20.2	12.6
		20175	1732.5	QPSK	1	0	0	22.2	15.3
					1	2	0	21.9	14.8
					1	5	0	21.8	14.4
					3	0	1	21.4	14.4
					3	1	1	21.1	14.0
					3	2	1	21.0	13.5
					6	0	1	20.9	13.4
				16QAM	1	0	1	21.3	14.4
					1	2	1	21.0	13.9
					1	5	1	20.9	13.4
					3	0	2	20.5	13.6
					3	1	2	20.3	13.1
					3	2	2	20.3	12.6
					6	0	2	20.2	12.6
		20392	1754.2	QPSK	1	0	0	22.3	15.4
					1	2	0	22.1	15.2
					1	5	0	22.0	15.1
					3	0	1	22.1	15.1
					3	1	1	21.9	14.3
					3	2	1	21.8	14.2
					6	0	1	21.8	15.0
				16QAM	1	0	1	21.4	14.7
					1	2	1	21.1	14.2
					1	5	1	21.0	14.2
					3	0	2	20.6	13.6
					3	1	2	20.4	13.5
					3	2	2	20.4	13.4
					6	0	2	20.3	13.3

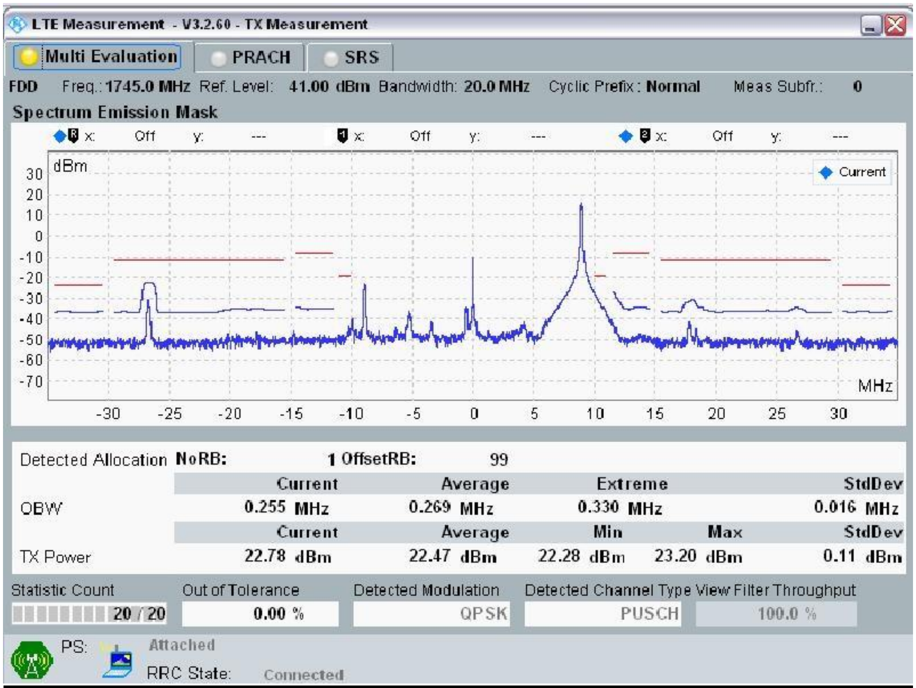
Spectrum Plots for the Test RB allocations



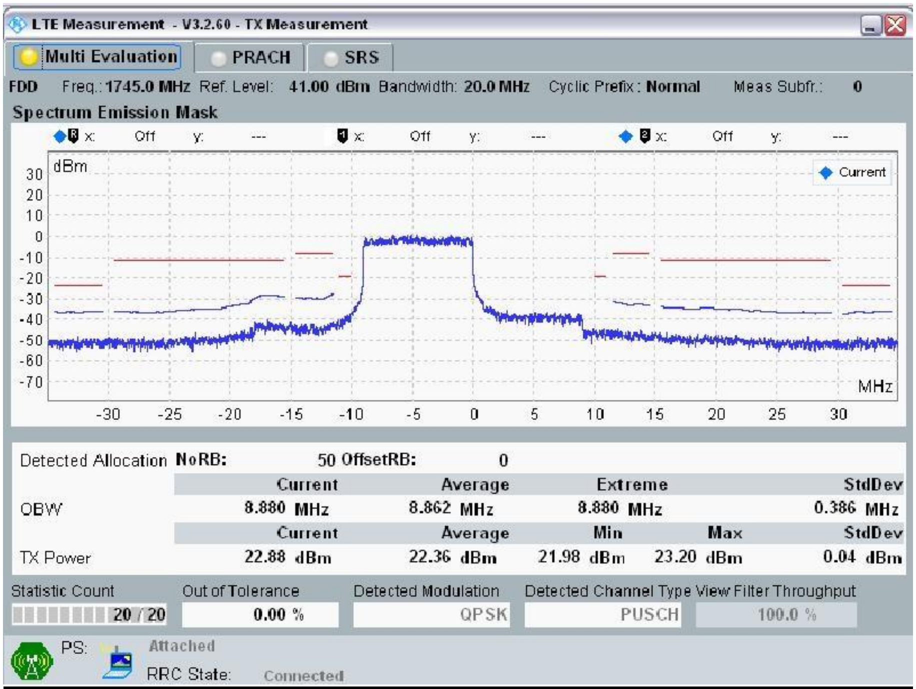
20MHz Band Width: Ch 20300, RB Size=1; RB Offset = 0



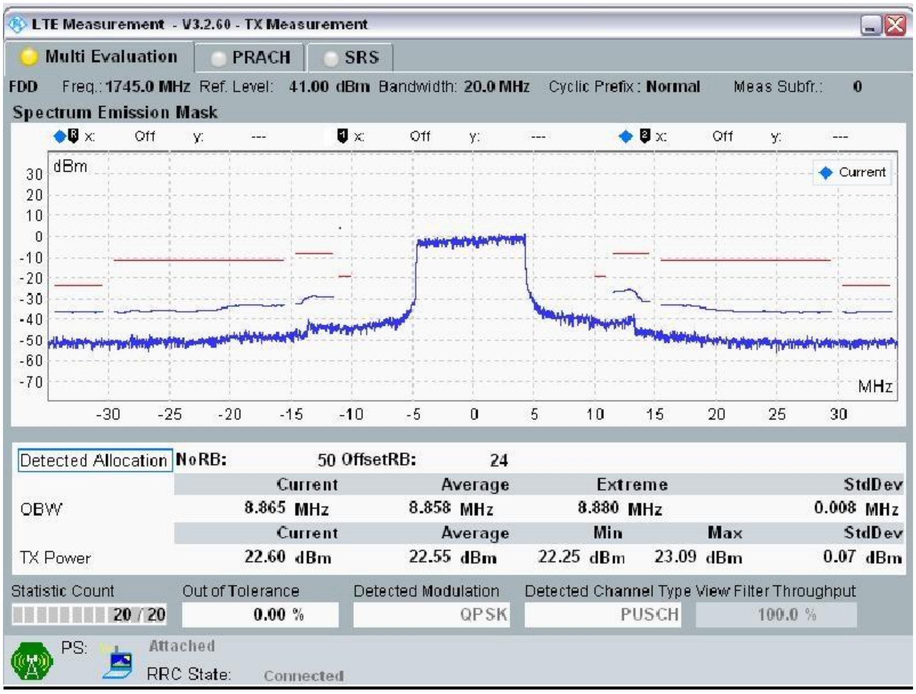
20MHz Band Width: Ch 20300, RB Size=1; RB Offset = 49



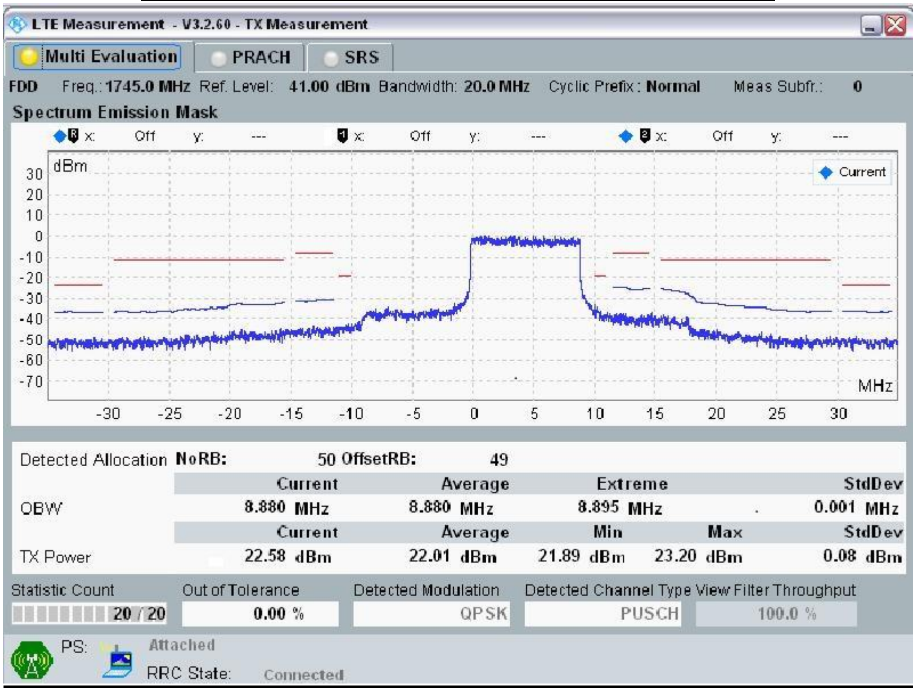
20MHz Band Width: Ch 20300, RB Size=1; RB Offset = 99



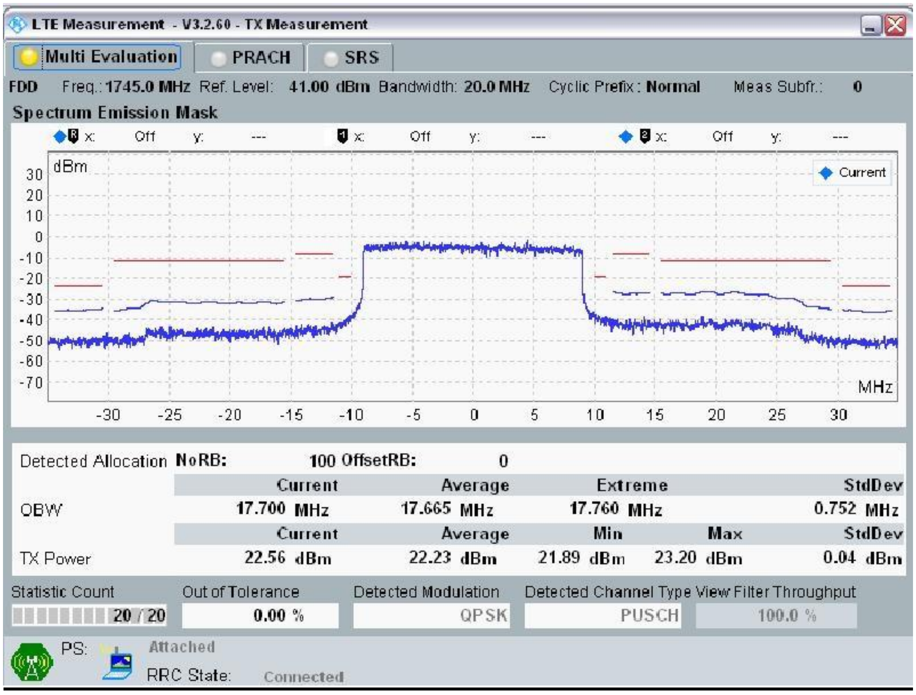
20MHz Band Width: Ch 20300, RB Size=50; RB Offset = 0



20MHz Band Width: Ch 20300, 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

10.3.3 LTE Band 5

Output power table

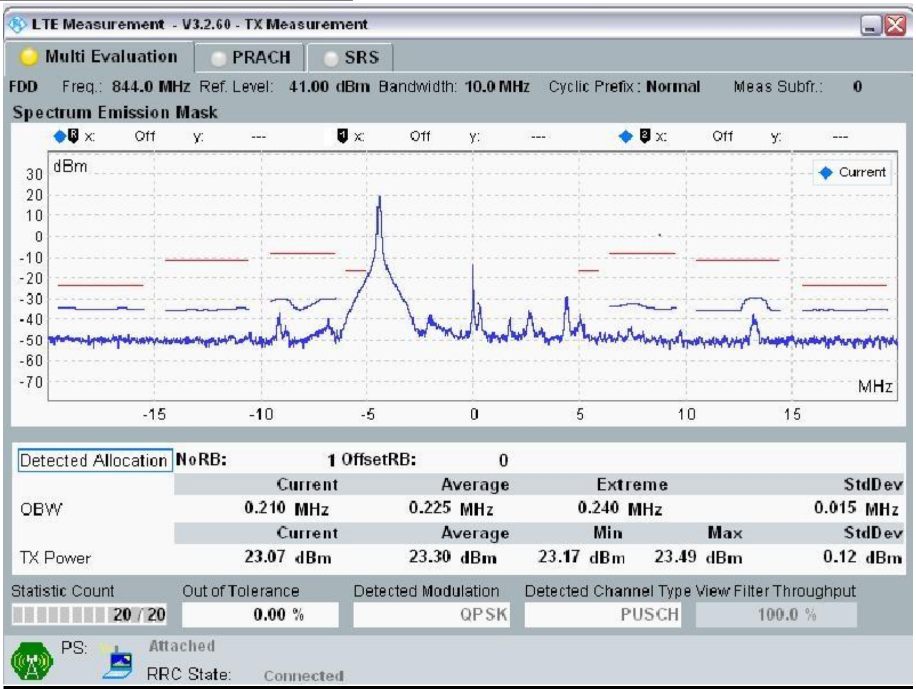
Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	
								W/o Power back-off	W/ Power back-off
5	10	20450	829.0	QPSK	1	0	0	22.9	19.4
					1	24	0	22.8	19.2
					1	49	0	22.5	19.1
					25	0	1	22.0	18.5
					25	12	1	22.0	18.4
					25	24	1	21.9	18.3
					50	0	1	21.9	18.3
				16QAM	1	0	1	22.0	18.5
					1	24	1	22.0	18.6
					1	49	1	21.9	18.5
					25	0	2	20.9	17.5
					25	12	2	20.9	17.4
					25	24	2	20.9	17.3
					50	0	2	20.9	17.2
		20525	836.5	QPSK	1	0	0	22.7	19.4
					1	24	0	22.6	19.2
					1	49	0	22.4	19.1
					25	0	1	22.0	18.5
					25	12	1	22.0	18.4
					25	24	1	22.0	18.3
					50	0	1	21.9	18.3
				16QAM	1	0	1	22.1	18.5
					1	24	1	22.2	18.6
					1	49	1	22.0	18.5
					25	0	2	21.1	17.5
					25	12	2	20.9	17.4
					25	24	2	20.9	17.3
					50	0	2	21.0	17.2
		20600	844.0	QPSK	1	0	0	23.0	19.5
					1	24	0	22.9	19.3
					1	49	0	22.6	19.2
					25	0	1	22.1	18.6
					25	12	1	22.1	18.5
					25	24	1	22.0	18.4
					50	0	1	22.0	18.4
				16QAM	1	0	1	22.1	18.6
					1	24	1	22.1	18.7
					1	49	1	22.0	18.6
					25	0	2	21.0	17.6
					25	12	2	21.0	17.5
					25	24	2	21.0	17.4
					50	0	2	21.0	17.3

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	
								W/o Power back-off	W/ Power back-off
5	5	20425	826.5	QPSK	1	0	0	22.8	19.3
					1	12	0	22.7	19.1
					1	24	0	22.4	19.0
					12	0	1	21.9	18.4
					12	6	1	21.9	18.3
					12	11	1	21.8	18.2
					25	0	1	21.8	18.2
				16QAM	1	0	1	21.9	18.4
					1	12	1	21.9	18.5
					1	24	1	21.8	18.4
					12	0	2	20.8	17.4
					12	6	2	20.8	17.3
					12	11	2	20.8	17.2
					25	0	2	20.8	17.1
		20525	836.5	QPSK	1	0	0	22.6	19.3
					1	12	0	22.5	19.1
					1	24	0	22.3	19.0
					12	0	1	21.9	18.4
					12	6	1	21.9	18.3
					12	11	1	21.9	18.2
					25	0	1	21.8	18.2
				16QAM	1	0	1	22.0	18.4
					1	12	1	22.1	18.5
					1	24	1	21.9	18.4
					12	0	2	21.0	17.4
					12	6	2	20.8	17.3
					12	11	2	20.8	17.2
					25	0	2	20.9	17.1
		20625	846.5	QPSK	1	0	0	22.9	19.4
					1	12	0	22.8	19.2
					1	24	0	22.5	19.1
					12	0	1	22.0	18.5
					12	6	1	22.0	18.4
					12	11	1	21.9	18.3
					25	0	1	21.9	18.3
				16QAM	1	0	1	22.0	18.5
					1	12	1	22.0	18.6
					1	24	1	21.9	18.5
					12	0	2	20.9	17.5
					12	6	2	20.9	17.4
					12	11	2	20.9	17.3
					25	0	2	20.9	17.2

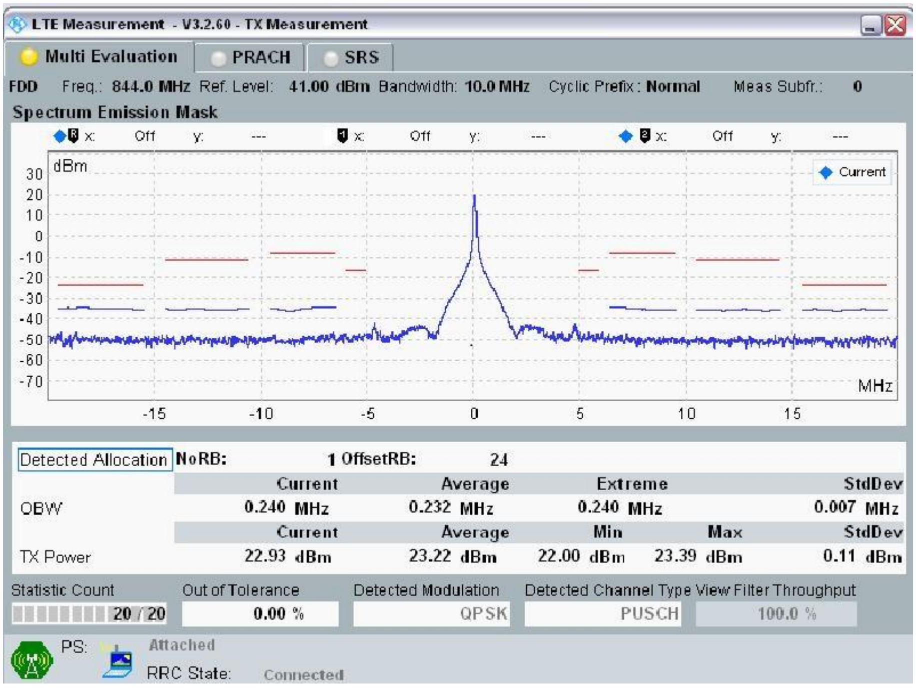
Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	
								W/o Power back-off	W/ Power back-off
5	3	20415	825.5	QPSK	1	0	0	22.7	19.2
					1	7	0	22.6	19.0
					1	14	0	22.3	18.9
					8	0	1	21.8	18.3
					8	4	1	21.8	18.2
					8	7	1	21.7	18.1
					15	0	1	21.7	18.1
				16QAM	1	0	1	21.8	18.3
					1	7	1	21.8	18.4
					1	14	1	21.7	18.3
					8	0	2	20.7	17.3
					8	4	2	20.7	17.2
					8	7	2	20.7	17.1
					15	0	2	20.7	17.0
		20525	836.5	QPSK	1	0	0	22.5	19.2
					1	7	0	22.4	19.0
					1	14	0	22.2	18.9
					8	0	1	21.8	18.3
					8	4	1	21.8	18.2
					8	7	1	21.8	18.1
					15	0	1	21.7	18.1
				16QAM	1	0	1	21.9	18.3
					1	7	1	22.0	18.4
					1	14	1	21.8	18.3
					8	0	2	20.9	17.3
					8	4	2	20.7	17.2
					8	7	2	20.7	17.1
					15	0	2	20.8	17.0
		20634	847.4	QPSK	1	0	0	22.8	19.3
					1	7	0	22.7	19.1
					1	14	0	22.4	19.0
					8	0	1	21.9	18.4
					8	4	1	21.9	18.3
					8	7	1	21.8	18.2
					15	0	1	21.8	18.2
				16QAM	1	0	1	21.9	18.4
					1	7	1	21.9	18.5
					1	14	1	21.8	18.4
					8	0	2	20.8	17.4
					8	4	2	20.8	17.3
					8	7	2	20.8	17.2
					15	0	2	20.8	17.1

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	
								W/o Power back-off	W/ Power back-off
5	1.4	20407	824.7	QPSK	1	0	0	22.6	19.1
					1	2	0	22.5	18.9
					1	5	0	22.2	18.8
					3	0	1	21.7	18.2
					3	1	1	21.7	18.1
					3	2	1	21.6	18.0
					6	0	1	21.6	18.0
				16QAM	1	0	1	21.7	18.2
					1	2	1	21.7	18.3
					1	5	1	21.6	18.2
					3	0	2	20.6	17.2
					3	1	2	20.6	17.1
					3	2	2	20.6	17.0
					6	0	2	20.6	16.9
		20525	836.5	QPSK	1	0	0	22.4	19.1
					1	2	0	22.3	18.9
					1	5	0	22.1	18.8
					3	0	1	21.7	18.2
					3	1	1	21.7	18.1
					3	2	1	21.7	18.0
					6	0	1	21.6	18.0
				16QAM	1	0	1	21.8	18.2
					1	2	1	21.9	18.3
					1	5	1	21.7	18.2
					3	0	2	20.8	17.2
					3	1	2	20.6	17.1
					3	2	2	20.6	17.0
					6	0	2	20.7	16.9
		20642	848.2	QPSK	1	0	0	22.7	19.2
					1	2	0	22.6	19.0
					1	5	0	22.3	18.9
					3	0	1	21.8	18.3
					3	1	1	21.8	18.2
					3	2	1	21.7	18.1
					6	0	1	21.7	18.1
				16QAM	1	0	1	21.8	18.3
					1	2	1	21.8	18.4
					1	5	1	21.7	18.3
					3	0	2	20.7	17.3
					3	1	2	20.7	17.2
					3	2	2	20.7	17.1
					6	0	2	20.7	17.0

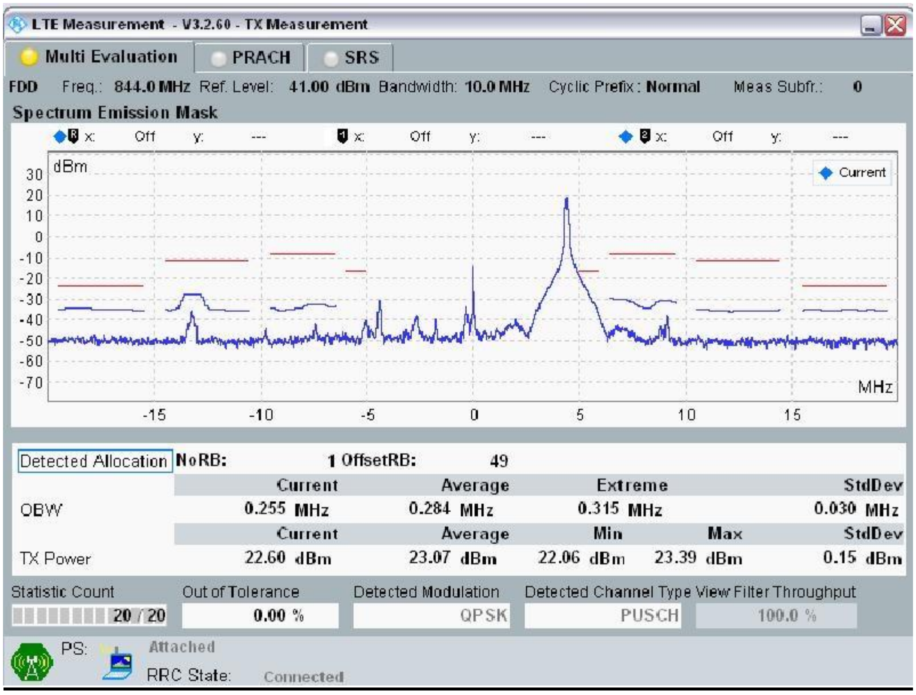
Spectrum Plots for the Test RB allocations



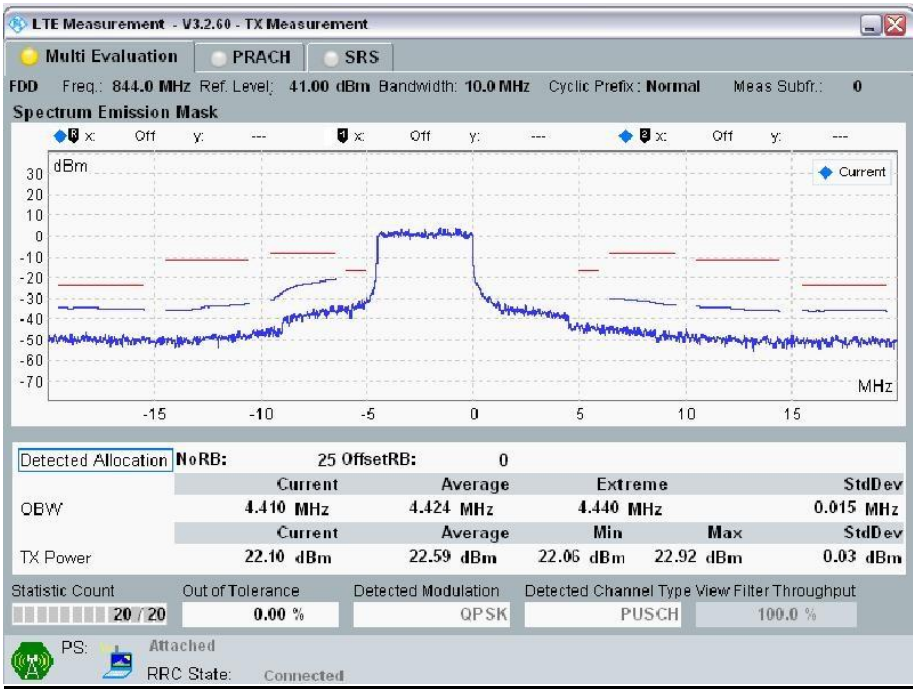
10MHz Band Width: Ch 20600, RB Size=1; RB Offset = 0



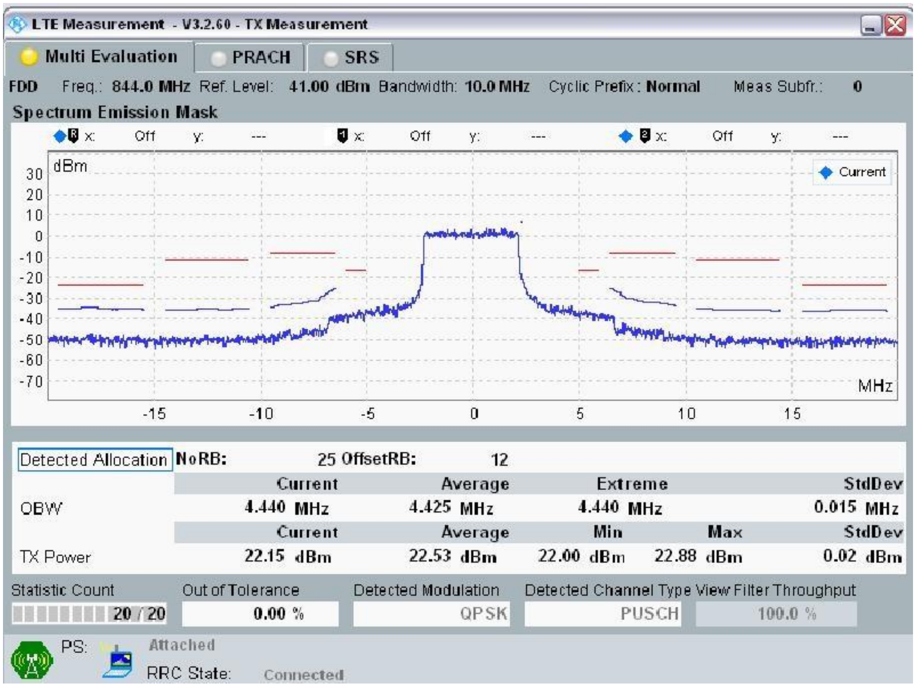
10MHz Band Width: Ch 20600, RB Size=1; RB Offset = 24



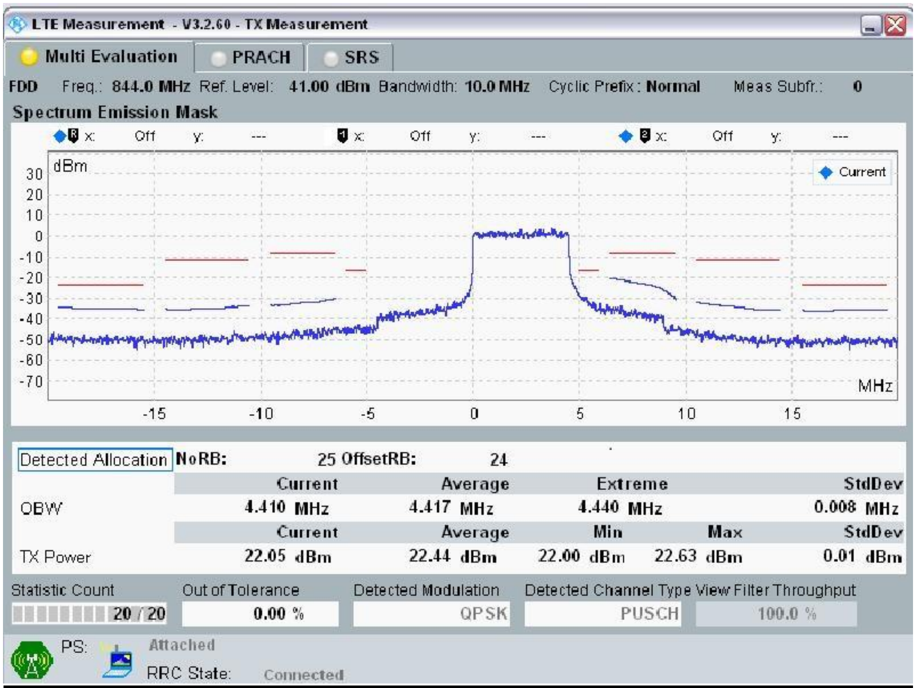
10MHz Band Width: Ch 20600, RB Size=1; RB Offset = 49



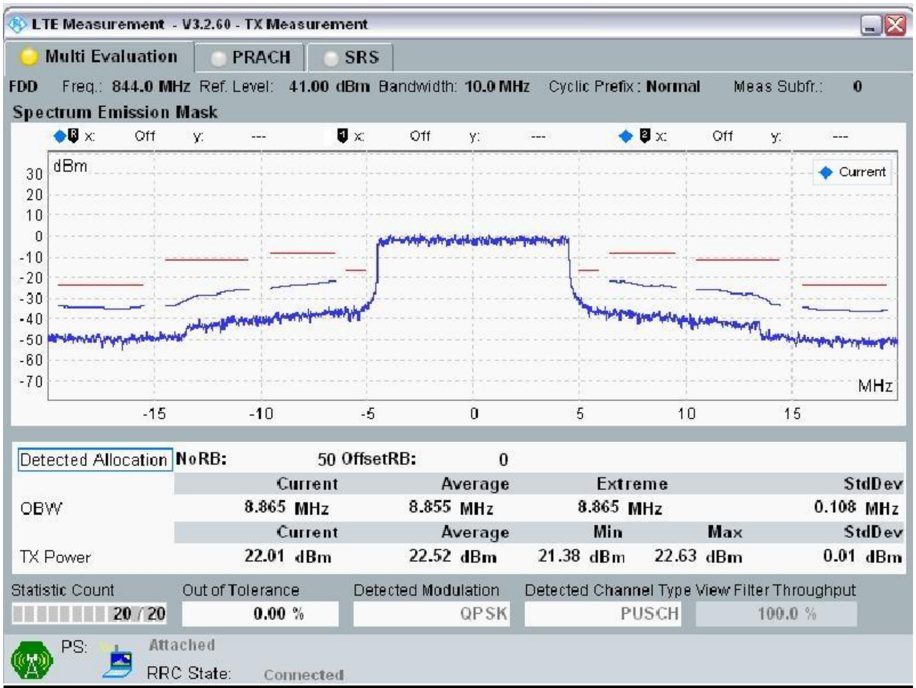
10MHz Band Width: Ch 20600, RB Size=25; RB Offset = 0



10MHz Band Width: Ch 20600, RB Size=25; RB Offset = 12



10MHz Band Width: Ch 20600, RB Size=25; RB Offset = 24



10MHz Band Width: Ch 20600, RB Size=50; RB Offset = 0