FCC OET BULLETIN 65 SUPPLEMENT C 01-01
IEEE Std 1528-2003 and IEEE Std 1528a-2005

SAR EVALUATION REPORT

For

CDMA BC0/1/10 (1xRTT, Rev A); LTE B25(1900)/B26/B41(2600). 1 TX ant. USB modem.

Model: AC341U
FCC ID: PY3AC341U

Report Number: 13U14931-5A
Issue Date: 05/10/2013

Prepared for

NETGEAR INC.
2200 FARADAY AVENUE,
CARLSBAD, CA 92008

Prepared by

UL Verification Services
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	05/03/2013	Initial issue	--
A	05/10/2013	Made following changes: 1. Sec 7.3: Changed section title and added 1.4MHz Channel Bandwidth 2. Sec 9.5: Added output power for 1.4MHz bandwidth	Roy Chen

UL Verification Services Inc. FORM NO: CCSUP4031G
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

Table of Contents

1. Attestation of Test Results

Applicant	Netgear Inc.
DUT description	CDMA BC0/1/10, LTE B2/B26/B41, 1 TX ant. USB modem.
Model	AC341U
Test device is	An identical prototype
Device category	Portable
Exposure category	General Population/Uncontrolled Exposure
Date tested	04/01/2013 - 05/01/2013
Highest Reported SAR	1.343 W/kg (Limit = 1.6 W/kg)
Applicable Standards	OET Bulletin 65 Supplement C IEEE Std 1528-2003 and IEEE Std 1528a-2005 FCC Published RF exposure KDB procedures, and TCB workshop updates
Test Results	Pass

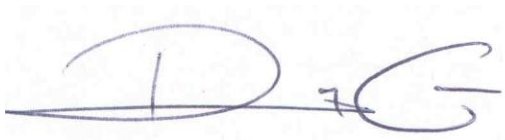
UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.

Approved & Released By:

Sunny Shih
WiSE Operations Manager
UL Verification Services Inc.

Prepared By:



Roy Chen
WiSE SAR Technician
UL Verification Services Inc.

2. Test Methodology

The tests documented in this report were performed in accordance with FCC OET Bulletin 65 Supplement C Edition 01-01, IEEE STD 1528-2003, IEEE Std 1528a-2005, the following FCC Published RF exposure KDB procedures and TCB workshop updates:

- 941225 D01 SAR test for 3G devices v02
- 941225 D05 SAR for LTE Devices v02
- 447498 D01 General RF Exposure Guidance v05
- 447498 D02 SAR Procedures for Dongle Xmtr v02
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01
- 865664 D02 SAR Reporting v01

3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. Calibration and Uncertainty

4.1. Measuring Instrument Calibration

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
S-Parameter Network Analyzer	Agilent	8753ES	MY40001647	6/27/2013
Dielectronic Probe kit	HP	85070C	2569	N/A
Dielectronic Probe kit	HP	85070E	594	N/A
Synthesized Signal Generator	HP	8665B	3744A01084	5/13/2013
Power Meter	HP	438A	2822A05684	10/7/2013
Power Sensor A	HP	8481A	2702A66876	8/1/2013
Power Sensor B	HP	8482A	2349A08568	9/26/2013
Amplifier	MITEQ	4D00400600-50-30P	1620606	N/A
Directional coupler	Werlatone	C8060-102	2141	N/A
Base Station Simulator	R & S	CMU200	118339	5/20/2013
Base Station Simulator	R & S	CMW500	132911	2/21/2014
Thermometer	ERTCO	639-1S	8350	7/30/2013
E-Field Probe	SPEAG	EX3DV4	3686	3/11/2014
Data Acquisition Electronics	SPEAG	DAE3	500	6/13/2013
System Validation Dipole	SPEAG	D835V2	4d002	10/24/2013
System Validation Dipole	SPEAG	D1900V2	5d043	11/6/2013
System Validation Dipole	SPEAG	D2600V2	1006	9/13/2013

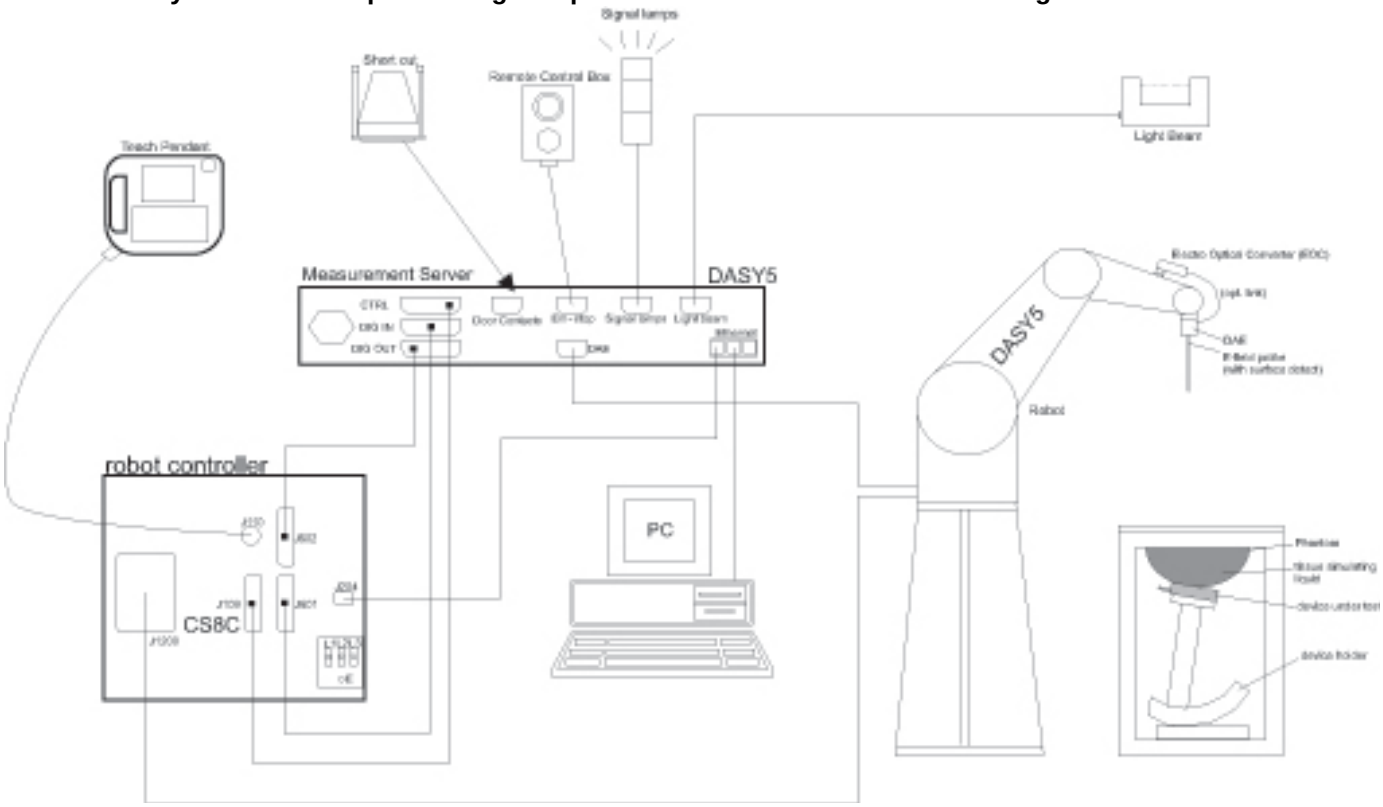
4.2. Measurement Uncertainty

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

Component	Error, %	Distribution	Divisor	Sensitivity	U (Xi), %
Measurement System					
Probe Calibration (k=1)	**6.00**	Normal	1	1	6.00
Axial Isotropy	1.15	Rectangular	1.732	0.7071	0.47
Hemispherical Isotropy	2.30	Rectangular	1.732	0.7071	0.94
Boundary Effect	0.90	Rectangular	1.732	1	0.52
Probe Linearity	3.45	Rectangular	1.732	1	1.99
System Detection Limits	1.00	Rectangular	1.732	1	0.58
Readout Electronics	0.30	Normal	1	1	0.30
Response Time	0.80	Rectangular	1.732	1	0.46
Integration Time	2.60	Rectangular	1.732	1	1.50
RF Ambient Conditions - Noise	3.00	Rectangular	1.732	1	1.73
RF Ambient Conditions - Reflections	3.00	Rectangular	1.732	1	1.73
Probe Positioner Mechanical Tolerance	0.40	Rectangular	1.732	1	0.23
Probe Positioning with respect to Phantom	2.90	Rectangular	1.732	1	1.67
Extrapolation, Interpolation and Integration	1.00	Rectangular	1.732	1	0.58
Test Sample Related					
Test Sample Positioning	2.90	Normal	1	1	2.90
Device Holder Uncertainty	3.60	Normal	1	1	3.60
Output Power Variation - SAR Drift	5.00	Rectangular	1.732	1	2.89
Phantom and Tissue Parameters					
Phantom Uncertainty (shape and thickness)	4.00	Rectangular	1.732	1	2.31
Liquid Conductivity - deviation from target	5.00	Rectangular	1.732	0.64	1.85
Liquid Conductivity - measurement	**4.97**	Normal	1	0.64	3.18
Liquid Permittivity - deviation from target	5.00	Rectangular	1.732	0.6	1.73
Liquid Permittivity - measurement uncertainty	**-3.99**	Normal	1	0.6	-2.39
				Combined Standard Uncertainty Uc(y) =	10.52
				Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =	21.04 %
				Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =	1.66 dB

5. Measurement System Description and Setup

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



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

6. SAR Measurement Procedure

6.1. Normal SAR Measurement Procedure

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01

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

Step 3: 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 Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01 (Draft)

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

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

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

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be larger than the step size in Z-direction.

6.2. Volume Scan Procedures

Step 1: Repeat Step 1-4 in Section 6.1

Step 2: Volume Scan
Volume Scans are used to assess peak SAR and averaged SAR measurements in largely extended 3-dimensional volumes within any phantom. This measurement does not need any previous area scan. The grid can be anchored to a user specific point or to the current probe location.

Step 3: Power drift measurement
The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

7. Device Under Test

CDMA BC0/1/10, LTE B2/B26/B41, 1 TX ant. USB modem. Model: AC341U	
Operating Configuration(s)	USB Plugged to the Host Device
Exposure Condition(s)	Horizontal Up, Horizontal Down, Vertical Front, Vertical Back, and Bottom Tip
Device dimension (L x W)	5.20 cm x 6.46 cm

7.1. Wireless Technologies

Wireless Technology and Frequency Bands	CDMA BC0/BC1/BC10 LTE FDD Band 25, 26, and 41
Mode	CDMA: 1xRTT 1xEv-Do (Rel. 0) 1xEv-Do (Rev. A) LTE: QPSK, 16QAM
Duty Cycle	CDMA BC0, BC1, BC10: 100% LTE (FDD) Band 25, 26: 100% LTE (TDD) Band 41: 60%

7.2. Simultaneous Transmission Condition

N/A

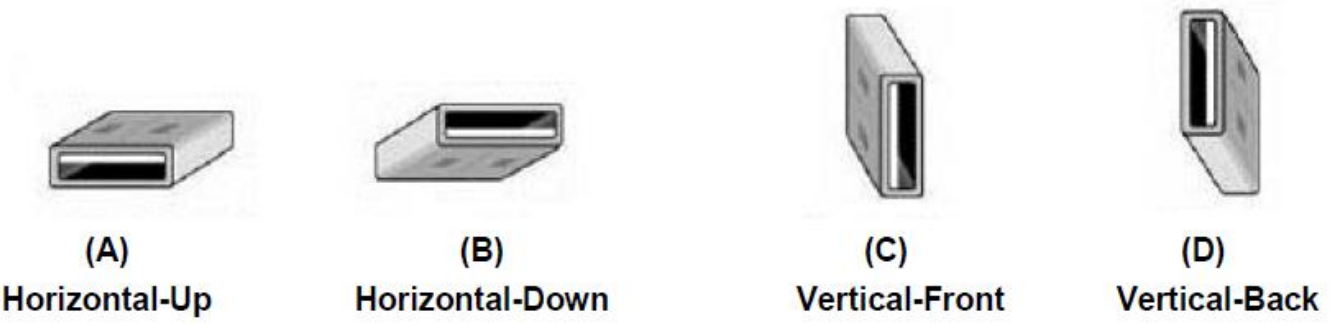
7.3. General LTE SAR Test and Reporting Considerations

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Frequency range, Channel Bandwidth, Numbers and Frequencies</td><td>
<table>
<tr><td rowspan="3">Band 25</td><td colspan="6">Frequency range: 1850 - 1915 MHz</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td></td><td></td><td>26090/ 1855</td><td>26065/ 1852.5</td><td>26055/ 1851.5</td><td></td></tr>
<tr><td>Mid</td><td></td><td></td><td>26365/ 1882.5</td><td>26365/ 1882.5</td><td>26365/ 1882.5</td><td></td></tr>
<tr><td>High</td><td></td><td></td><td>26640/ 1910</td><td>26665/ 1912.5</td><td>26675/ 1913.5</td><td></td></tr>
<tr><td rowspan="3">Band 26</td><td colspan="6">Frequency range: 814 - 849 MHz</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td></td><td></td><td>26740/ 819.0</td><td>26715/ 816.5</td><td>26705/ 815.5</td><td>26697/ 814.7</td></tr>
<tr><td>Mid</td><td></td><td></td><td>26865/ 831.5</td><td>26865/ 831.5</td><td>26865/ 831.5</td><td>26865/ 831.5</td></tr>
<tr><td>High</td><td></td><td></td><td>26990/ 844.0</td><td>27015/ 846.5</td><td>27025/ 847.5</td><td>27033/ 848.3</td></tr>
<tr><td rowspan="3">Band 41</td><td colspan="6">Frequency range: 2496 - 2690 MHz</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td>39750/ 2506.0</td><td>39725/ 2503.5</td><td>39700/ 2501.0</td><td></td><td></td><td></td></tr>
<tr><td>Mid</td><td>40620/ 2593.0</td><td>40620/ 2593.0</td><td>40620/ 2593.0</td><td></td><td></td><td></td></tr>
<tr><td>High</td><td>41490/ 2680.0</td><td>41515/ 2682.5</td><td>41540/ 2685.0</td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>LTE transmitter and antenna implementation</td><td>LTE, GSM and WCDMA share the same Tx antenna</td></tr>
<tr><td>Maximum power reduction (MPR)</td><td>
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
</table>
MPR Built-in by design
A-MPR (additional MPR) was disabled during SAR testing
</td></tr>
<tr><td>Power reduction</td><td>No</td></tr>
<tr><td>Spectrum plots for RB configurations</td><td>When a properly configured base station simulator is not used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration should be included in the SAR report to demonstrate that the tested RB allocations have been correctly established at the maximum output power conditions.</td></tr>
</table>

8. Summary of Test Configurations

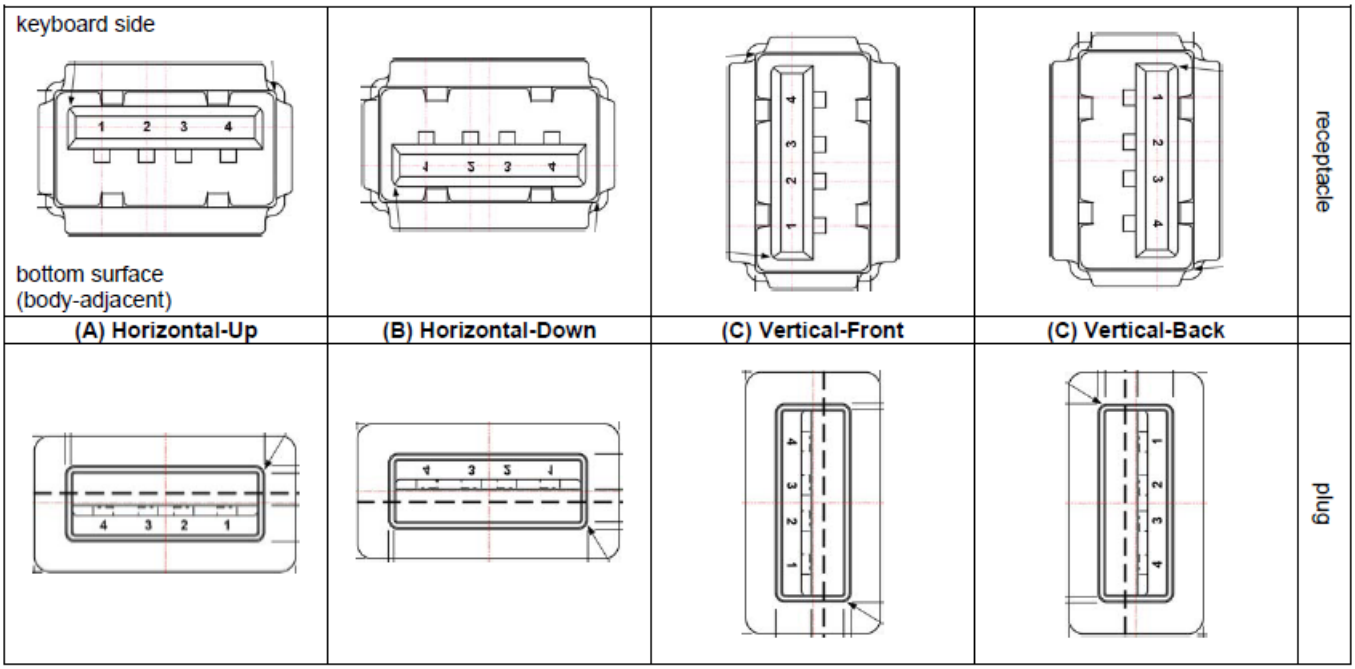
Refer to Sec. 17 Antenna Location and Separation Distances and Sec. 18. Photos of Normal Operation Configurations

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Horizontal-Up (A)	5.1 mm	Yes	
Horizontal-Down (B)	9.35 mm	Yes	
Vertical-Front (C)	17 mm	Yes	
Vertical-Back (D)	6 mm	Yes	
Bottom Tip	23 mm	Yes	
Tip	44 mm	No	SAR is not required because the distance from the antenna to the tip of the dongle is > 1 cm as per KDB 447498 D02 SAR Procedures for Dongle Xmtr v02



These are USB connector orientations on laptop computers; USB dongles have the reverse configuration for plugging into the corresponding laptop computers.

USB Connector Orientations Implemented on Laptop Computers



9. RF Output Power Measurement

9.1. CDMA BC0

	Min	Max
Tune-up Tolerance (dB):	-1.0	1.0

Output Power Tolerance	1xRTT (dBm)	1xEVDO Rel. 0 (dBm)	1xEVDO Rev. A (dBm)
Max	25.0	25.0	25.0
Target	**24.0**	**24.0**	**24.0**
Min	23.0	23.0	23.0

1xRTT

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

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

- Call Setup > Shift & Preset
- Cell Info > Cell Parameters > System ID (SID) > 8
  > Network ID (NID) > 65535
  > Reg. Ch. #.: 384
- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > Please see following table or details
- FCH Service Option (SO) Setup > Please see following table or details
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps
  > R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Rvs Power Ctrl > Active bits
  - Rvs Power Ctrl > All Up bits (Maximum TxPout)

RESULTS

Band	Mode	Ch	Freq. (MHz)	Avg Pwr (dBm)
BC 0	RC1 SO55 (Loopback)	1013	824.70	24.4
		384	836.52	24.3
		777	848.31	24.3
	RC3 SO55 (Loopback)	1013	824.70	24.5
		384	836.52	24.4
		777	848.31	24.5
	RC3 SO32 (+F-SCH)	1013	824.70	24.4
		384	836.52	24.5
		777	848.31	24.5

1xEv-Do Rel. 0

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

Application	Rev, License
1xEV-DO Terminal Test	B.13.10, L

EVDO Release 0 - RTAPS

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 >
  - Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -93 dBm/1.23 MHz
  - System ID: 8; NID: 65535, Reg. Ch. #.:384
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > RTAP
  - RTAP Rate > 153.6 kbps
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

EVDO Release 0 - FTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 >
  - Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -93 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > FTAP (default)
  - FTAP Rate > 307.2 kbps (2 Slot, QPSK)
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

RESULTS

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Avg Pwr (dBm)
BC0	307.2 kbps (2 slot, QPSK)	153.6 kbps	1013	824.7	24.4
			384	836.52	24.5
			777	848.31	24.4

1xEv-Do Rev. A

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

Application	Rev, License
1xEV-DO Terminal Test	B.13.10, L

EVDO Rev. A – RETAP

- Call Setup > Shift & Preset
- Cell Power > --93 and -96 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- R-Data Pkt Size > 4096
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

EVDO Rev. A - FETAP

- Call Setup > Shift & Preset
- Cell Power > -93, and -96 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

RESULTS

Band	FETAP Traffic Format	Channel	f (MHz)	Avg Pwr (dBm)
BC0	307.2k, QPSK/ ACK channel is transmitted at all the slots	1013	824.70	24.3
		384	836.52	24.3
		777	848.31	24.3

9.2. CDMA BC1

	Min	Max
Tune-up Tolerance (dB):	-1.0	1.0

Output Power Tolerance	1xRTT (dBm)	1xEVDO Rel. 0 (dBm)	1xEVDO Rev. A (dBm)
Max	23.0	23.0	23.0
Target	**22.0**	**22.0**	**22.0**
Min	21.0	21.0	21.0

1xRTT

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

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

- Call Setup > Shift & Preset
- Cell Info > Cell Parameters > System ID (SID) > 8
  > Network ID (NID) > 65535
  > Reg. Ch. #.: 600
- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > Please see following table or details
- FCH Service Option (SO) Setup > Please see following table or details
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps
  > R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Rvs Power Ctrl > Active bits
  - Rvs Power Ctrl > All Up bits (Maximum TxPout)

RESULTS

Band	Mode	Ch	Freq. (MHz)	Avg Pwr (dBm)
BC 1	RC1 SO55 (Loopback)	25	1851.25	22.7
		600	1880.00	22.7
		1175	1908.75	22.7
	RC3 SO55 (Loopback)	25	1851.25	22.7
		600	1880.00	22.7
		1175	1908.75	22.7
	RC3 SO32 (+F-SCH)	25	1851.25	22.7
		600	1880.00	22.7
		1175	1908.75	22.6

1xEv-Do Rel. 0

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

Application	Rev, License
1xEV-DO Terminal Test	B.13.10, L

EVDO Release 0 - RTAPS

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 >
  - Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -93 dBm/1.23 MHz
  - System ID: 8; NID: 65535, Reg. Ch. # 600
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > RTAP
  - RTAP Rate > 153.6 kbps
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

EVDO Release 0 - FTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 >
  - Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -93 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > FTAP (default)
  - FTAP Rate > 307.2 kbps (2 Slot, QPSK)
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

RESULTS

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Avg Pwr (dBm)
BC1	307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	22.3
			600	1880.00	22.3
			1175	1908.75	22.3

1xEv-Do Rev. A

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

Application	Rev, License
1xEV-DO Terminal Test	B.13.10, L

EVDO Rev. A – RETAP

- Call Setup > Shift & Preset
- Cell Power > --93 and -96 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- R-Data Pkt Size > 4096
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

EVDO Rev. A - FETAP

- Call Setup > Shift & Preset
- Cell Power > -93, and -96 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

RESULTS

Band	FETAP Traffic Format	RETAP Data Payload	Channel	f (MHz)	Avg Pwr (dBm)
BC1	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	22.4
			600	1880.00	22.4
			1175	1908.75	22.3

9.3. CDMA BC10

	Min	Max
Tune-up Tolerance (dB):	-1.0	1.0

Output Power Tolerance	1xRTT (dBm)	1xEVDO Rel. 0 (dBm)	1xEVDO Rev. A (dBm)
Max	25.0	25.0	25.0
Target	**24.0**	**24.0**	**24.0**
Min	23.0	23.0	23.0

1xRTT

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

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

- Call Setup > Shift & Preset
- Cell Info > Cell Parameters > System ID (SID) 8
  > Network ID (NID) > 65535
  > Reg. Ch. #.: 580
- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > Please see following table or details
- FCH Service Option (SO) Setup > Please see following table or details
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps
  > R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Rvs Power Ctrl > Active bits
  - Rvs Power Ctrl > All Up bits (Maximum TxPout)

RESULTS

Band	Mode	Ch	Freq. (MHz)	Avg Pwr (dBm)
BC 10	RC1 SO55 (Loopback)	476	817.9	24.3
		580	820.5	24.3
		684	823.1	24.3
	RC3 SO55 (Loopback)	476	817.9	24.4
		580	820.5	24.4
		684	823.1	24.5
	RC3 SO32 (+F-SCH)	476	817.9	24.4
		580	820.5	24.3
		684	823.1	24.4

1xEv-Do Rel. 0

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

Application	Rev, License
1xEV-DO Terminal Test	B.13.10, L

EVDO Release 0 - RTAPS

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 >
  - Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -93 dBm/1.23 MHz
  - System ID: 8; NID: 65535, Reg. Ch. #.: 580.
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > RTAP
  - RTAP Rate > 153.6 kbps
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

EVDO Release 0 - FTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 >
  - Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -93 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > FTAP (default)
  - FTAP Rate > 307.2 kbps (2 Slot, QPSK)
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

RESULTS

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Avg Pwr (dBm)
BC10	307.2 kbps (2 slot, QPSK)	153.6 kbps	476	817.9	24.5
			580	820.5	24.5
			684	823.1	24.5

1xEv-Do Rev. A

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

Application	Rev, License
1xEV-DO Terminal Test	B.13.10, L

EVDO Rev. A – RETAP

- Call Setup > Shift & Preset
- Cell Power > --93 and -96 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- R-Data Pkt Size > 4096
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

EVDO Rev. A - FETAP

- Call Setup > Shift & Preset
- Cell Power > -93, and -96 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

RESULTS

Band	FETAP Traffic Format	RETAP Data Payload	Channel	f (MHz)	Avg Pwr (dBm)
BC10	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	476	817.9	24.5
			580	820.5	24.5
			684	823.1	24.4

9.4. LTE FDD Band 25

	Min	Max
Tune-up Tolerance (dB):	-1	1.0

Output Power Tolerance	QPSK (dBm)	16QAM (dBm)
Max	23.0	23.0
Target	**22.0**	**22.0**
Min	21.0	21.0

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 Signalling 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.

Results

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)
10	26090	1855.0	QPSK	1	0	0	22.8
				1	24	0	22.7
				1	49	0	22.6
				25	0	1	21.7
				25	12	1	21.6
				25	24	1	21.6
				50	0	1	21.6
			16QAM	1	0	1	21.5
				1	24	1	21.4
				1	49	1	21.2
				25	0	2	20.8
				25	12	2	20.7
				25	24	2	20.7
				50	0	2	20.6
	26365	1882.5	QPSK	1	0	0	22.7
				1	24	0	22.8
				1	49	0	22.8
				25	0	1	21.6
				25	12	1	21.6
				25	24	1	21.6
				50	0	1	21.6
			16QAM	1	0	1	21.9
				1	24	1	22.0
				1	49	1	22.0
				25	0	2	20.8
				25	12	2	20.8
				25	24	2	20.9
				50	0	2	20.6
	26640	1910.0	QPSK	1	0	0	22.6
				1	24	0	22.3
				1	49	0	22.4
				25	0	1	21.5
				25	12	1	21.3
				25	24	1	21.2
				50	0	1	21.3
			16QAM	1	0	1	21.3
				1	24	1	21.0
				1	49	1	21.0
				25	0	2	20.6
				25	12	2	20.4
				25	24	2	20.4
				50	0	2	20.4

LTE FDD Band 25 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)
5	26065	1852.5	QPSK	1	0	0	22.8
				1	12	0	22.7
				1	24	0	22.7
				12	0	1	21.8
				12	6	1	21.7
				12	11	1	21.7
				25	0	1	21.8
			16QAM	1	0	1	22.1
				1	12	1	22.0
				1	24	1	22.0
				12	0	2	20.9
				12	6	2	20.9
				12	11	2	20.8
				25	0	2	20.7
	26365	1882.5	QPSK	1	0	0	22.7
				1	12	0	22.8
				1	24	0	22.9
				12	0	1	21.7
				12	6	1	21.7
				12	11	1	21.7
				25	0	1	21.6
			16QAM	1	0	1	21.7
				1	12	1	21.8
				1	24	1	21.8
				12	0	2	20.7
				12	6	2	20.8
				12	11	2	20.8
				25	0	2	20.7
	26665	1912.5	QPSK	1	0	0	22.4
				1	12	0	22.4
				1	24	0	22.5
				12	0	1	21.4
				12	6	1	21.4
				12	11	1	21.4
				25	0	1	21.3
			16QAM	1	0	1	21.6
				1	12	1	21.6
				1	24	1	21.7
				12	0	2	20.5
				12	6	2	20.4
				12	11	2	20.4
				25	0	2	20.3

LTE FDD Band 25 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)
3	26055	1851.5	QPSK	1	0	0	22.9
				1	7	0	22.9
				1	14	0	22.8
				8	0	1	21.9
				8	4	1	21.9
				8	7	1	21.8
				15	0	1	21.8
			16QAM	1	0	1	22.1
				1	7	1	22.0
				1	14	1	22.0
				8	0	2	20.9
				8	4	2	20.9
				8	7	2	20.9
				15	0	2	20.9
	26365	1882.5	QPSK	1	0	0	22.8
				1	7	0	22.7
				1	14	0	22.8
				8	0	1	21.7
				8	4	1	21.7
				8	7	1	21.8
				15	0	1	21.7
			16QAM	1	0	1	21.9
				1	7	1	21.9
				1	14	1	22.0
				8	0	2	20.8
				8	4	2	20.8
				8	7	2	20.8
				15	0	2	20.8
	26675	1913.5	QPSK	1	0	0	22.3
				1	7	0	22.3
				1	14	0	22.4
				8	0	1	21.4
				8	4	1	21.4
				8	7	1	21.5
				15	0	1	21.5
			16QAM	1	0	1	20.8
				1	7	1	20.9
				1	14	1	20.9
				8	0	2	20.4
				8	4	2	20.4
				8	7	2	20.5
				15	0	2	20.4

9.5. LTE FDD Band 26

	Min	Max
Tune-up Tolerance (dB):	-1	1.0

Output Power Tolerance	QPSK (dBm)	16QAM (dBm)
Max	24.0	24.0
Target	**23.0**	**23.0**
Min	22.0	22.0

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 Signalling 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.

Results

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)
10	26740	819.0	QPSK	1	0	0	23.5
				1	24	0	23.5
				1	49	0	23.7
				25	0	1	22.5
				25	12	1	22.5
				25	24	1	22.6
				50	0	1	22.5
			16QAM	1	0	1	22.7
				1	24	1	22.7
				1	49	1	22.9
				25	0	2	21.6
				25	12	2	21.5
				25	24	2	21.7
				50	0	2	21.5
	26865	831.5	QPSK	1	0	0	23.7
				1	24	0	23.6
				1	49	0	23.6
				25	0	1	22.7
				25	12	1	22.5
				25	24	1	22.5
				50	0	1	22.6
			16QAM	1	0	1	22.9
				1	24	1	22.8
				1	49	1	22.8
				25	0	2	21.6
				25	12	2	21.6
				25	24	2	21.6
				50	0	2	21.6
	26990	844.0	QPSK	1	0	0	23.4
				1	24	0	23.7
				1	49	0	23.7
				25	0	1	22.5
				25	12	1	22.6
				25	24	1	22.7
				50	0	1	22.5
			16QAM	1	0	1	22.6
				1	24	1	22.9
				1	49	1	23.0
				25	0	2	21.5
				25	12	2	21.7
				25	24	2	21.7
				50	0	2	21.5

LTE FDD Band 26 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)
5	26715	816.5	QPSK	1	0	0	23.7
				1	12	0	23.7
				1	24	0	23.7
				12	0	1	22.7
				12	6	1	22.6
				12	11	1	22.5
				25	0	1	22.6
			16QAM	1	0	1	22.6
				1	12	1	22.6
				1	24	1	22.6
				12	0	2	21.6
				12	6	2	21.6
				12	11	2	21.6
				25	0	2	21.6
	26865	831.5	QPSK	1	0	0	23.6
				1	12	0	23.5
				1	24	0	23.5
				12	0	1	22.6
				12	6	1	22.6
				12	11	1	22.6
				25	0	1	22.5
			16QAM	1	0	1	22.8
				1	12	1	22.8
				1	24	1	22.8
				12	0	2	21.6
				12	6	2	21.6
				12	11	2	21.6
				25	0	2	21.5
	27015	846.5	QPSK	1	0	0	23.7
				1	12	0	23.7
				1	24	0	23.7
				12	0	1	22.7
				12	6	1	22.7
				12	11	1	22.7
				25	0	1	22.6
			16QAM	1	0	1	22.9
				1	12	1	22.8
				1	24	1	22.9
				12	0	2	21.7
				12	6	2	21.7
				12	11	2	21.7
				25	0	2	21.6

LTE FDD Band 26 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)
3	26705	815.5	QPSK	1	0	0	23.6
				1	7	0	23.6
				1	14	0	23.5
				8	0	1	22.7
				8	4	1	22.7
				8	7	1	22.6
				15	0	1	22.6
			16QAM	1	0	1	21.9
				1	7	1	22.0
				1	14	1	22.0
				8	0	2	21.6
				8	4	2	21.6
				8	7	2	21.6
				15	0	2	21.6
	26865	831.5	QPSK	1	0	0	23.5
				1	7	0	23.5
				1	14	0	23.5
				8	0	1	22.6
				8	4	1	22.6
				8	7	1	22.6
				15	0	1	22.6
			16QAM	1	0	1	21.9
				1	7	1	21.9
				1	14	1	21.9
				8	0	2	21.5
				8	4	2	21.5
				8	7	2	21.6
				15	0	2	21.5
	27025	847.5	QPSK	1	0	0	23.6
				1	7	0	23.7
				1	14	0	23.6
				8	0	1	22.7
				8	4	1	22.7
				8	7	1	22.8
				15	0	1	22.7
			16QAM	1	0	1	22.0
				1	7	1	22.1
				1	14	1	22.1
				8	0	2	21.6
				8	4	2	21.7
				8	7	2	21.7
				15	0	2	21.6

LTE FDD Band 26 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)
1.4	26697	814.7	QPSK	1	0	0	23.6
				1	2	0	23.5
				1	5	0	23.6
				3	0	1	23.6
				3	1	1	23.6
				3	2	1	23.7
				6	0	1	22.8
			16-QAM	1	0	1	22.3
				1	2	1	22.2
				1	5	1	22.1
				13	0	2	23.0
				3	1	2	22.7
				3	2	2	22.6
				6	0	2	21.9
	26865	831.5	QPSK	1	0	0	24.0
				1	2	0	23.6
				1	5	0	23.7
				3	0	1	23.7
				3	1	1	23.8
				3	2	1	23.8
				6	0	1	22.7
			16QAM	1	0	1	22.9
				1	2	1	22.7
				1	5	1	22.7
				13	0	2	22.6
				3	1	2	22.3
				3	2	2	23.0
				6	0	2	21.8
	27703	847.5	QPSK	1	0	0	21.2
				1	2	0	20.5
				1	5	0	19.5
				3	0	1	20.8
				3	1	1	20.6
				3	2	1	20.5
				6	0	1	20.9
			16QAM	1	0	1	20.9
				1	2	1	20.1
				1	5	1	19.2
				13	0	2	20.6
				3	1	2	20.4
				3	2	2	20.4
				6	0	2	20.3

9.6. LTE TDD Band 41

	Min	Max
Tune-up Tolerance (dB):	-1.0	1.0

Output Power Tolerance	QPSK (dBm)	16QAM (dBm)
Max	22.5	22.5
Target	**21.5**	**21.5**
Min	20.5	20.5

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 Signalling Value of "NS_01".

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

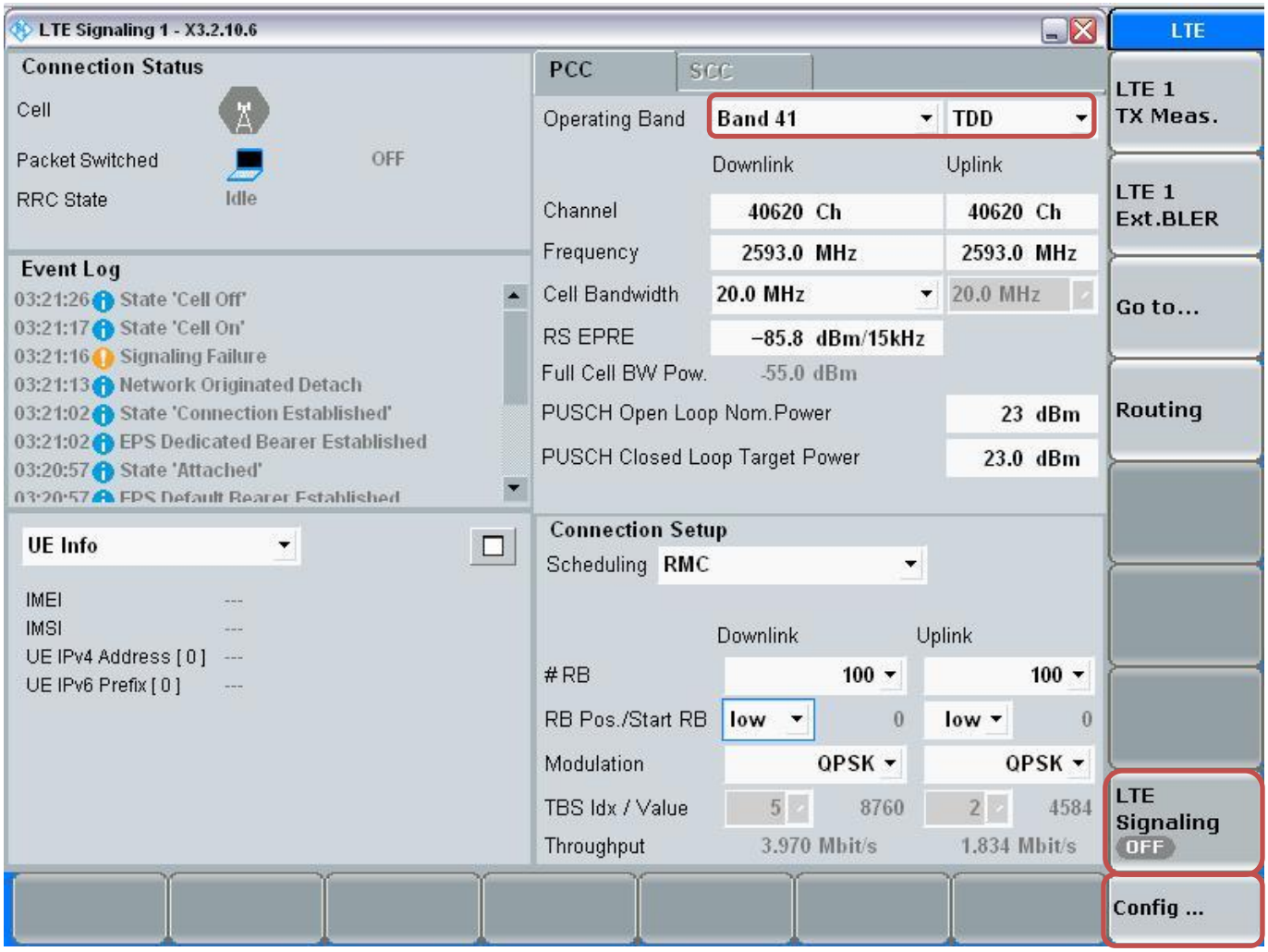
Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	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.

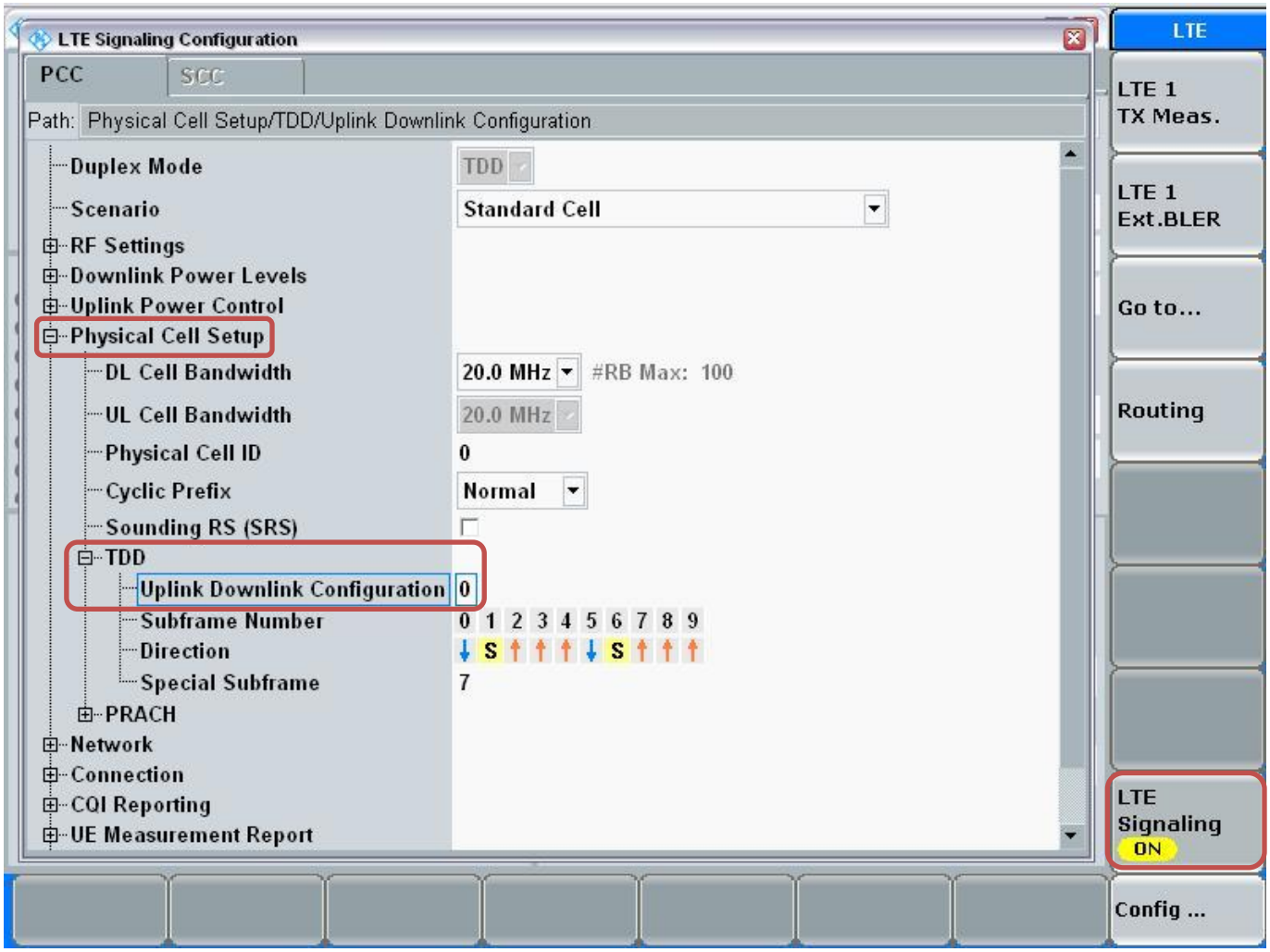
Procedure used to establish SAR test signal for LTE TDD Band 41

Set to CMW-500 with following parameters:

- Turn the LTE Signaling off using “ON | OFF” key
- Operating Band: Select Band 41 and TDD
- Go to “Config….”

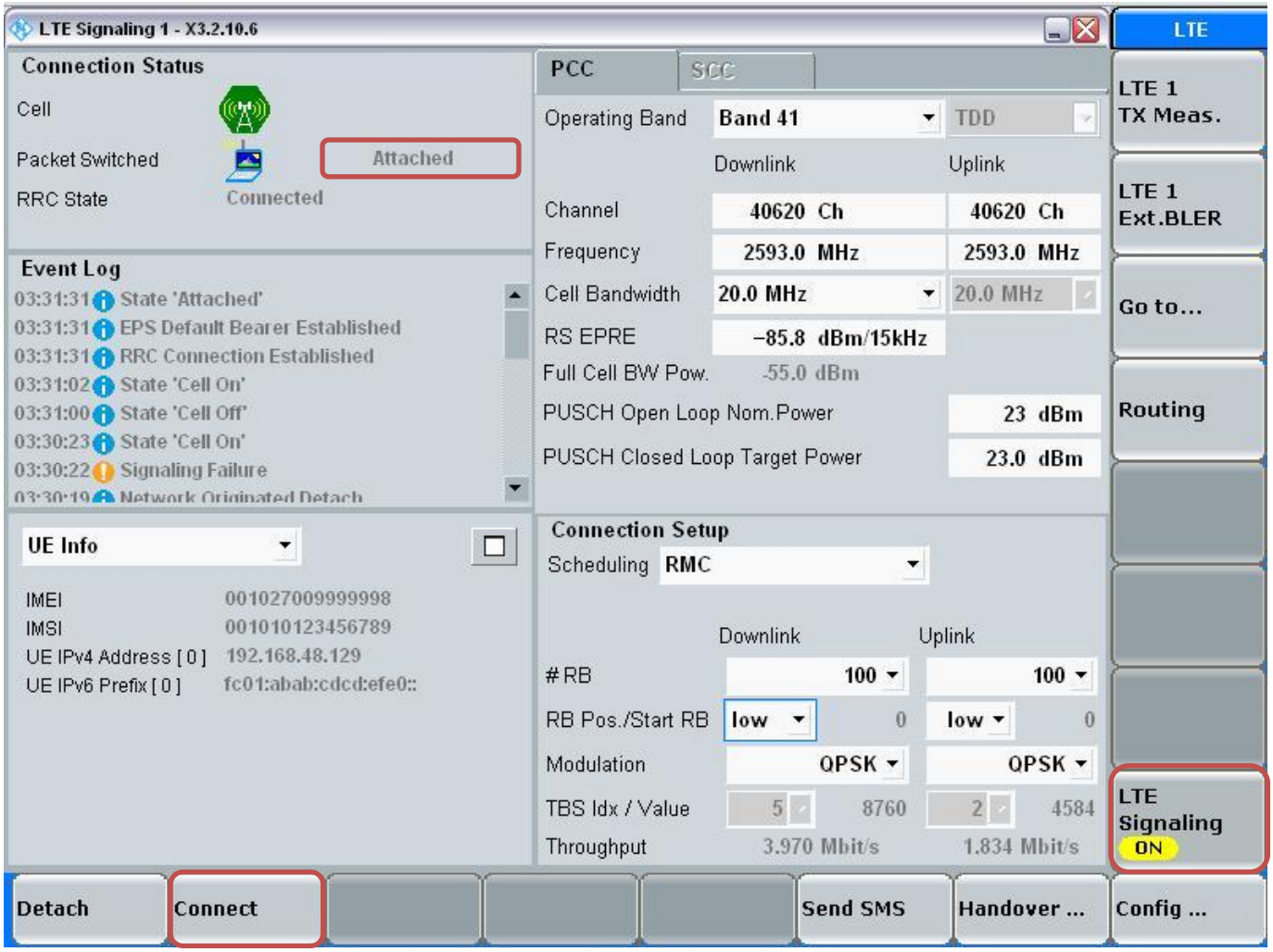


- Go to “Physical Cell Setup”
- Select “TDD” and Set “Uplink Downlink Configuration” to “0”
- Turn the cell on using “ON | OFF” key



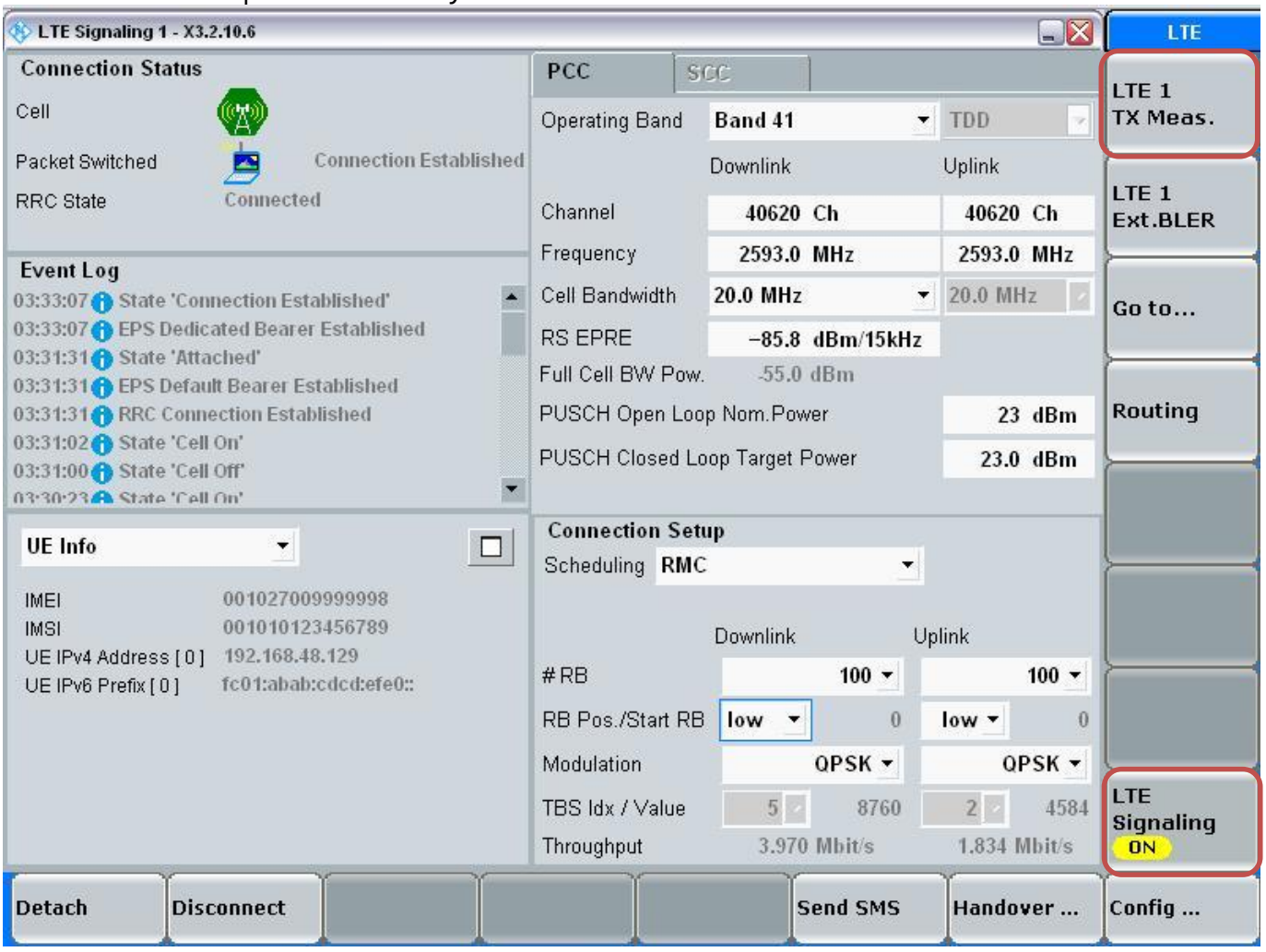
Connect to EUT

- Turn the cell on using “ON | OFF” key
- After EUT is Attached
- Select “Connect”

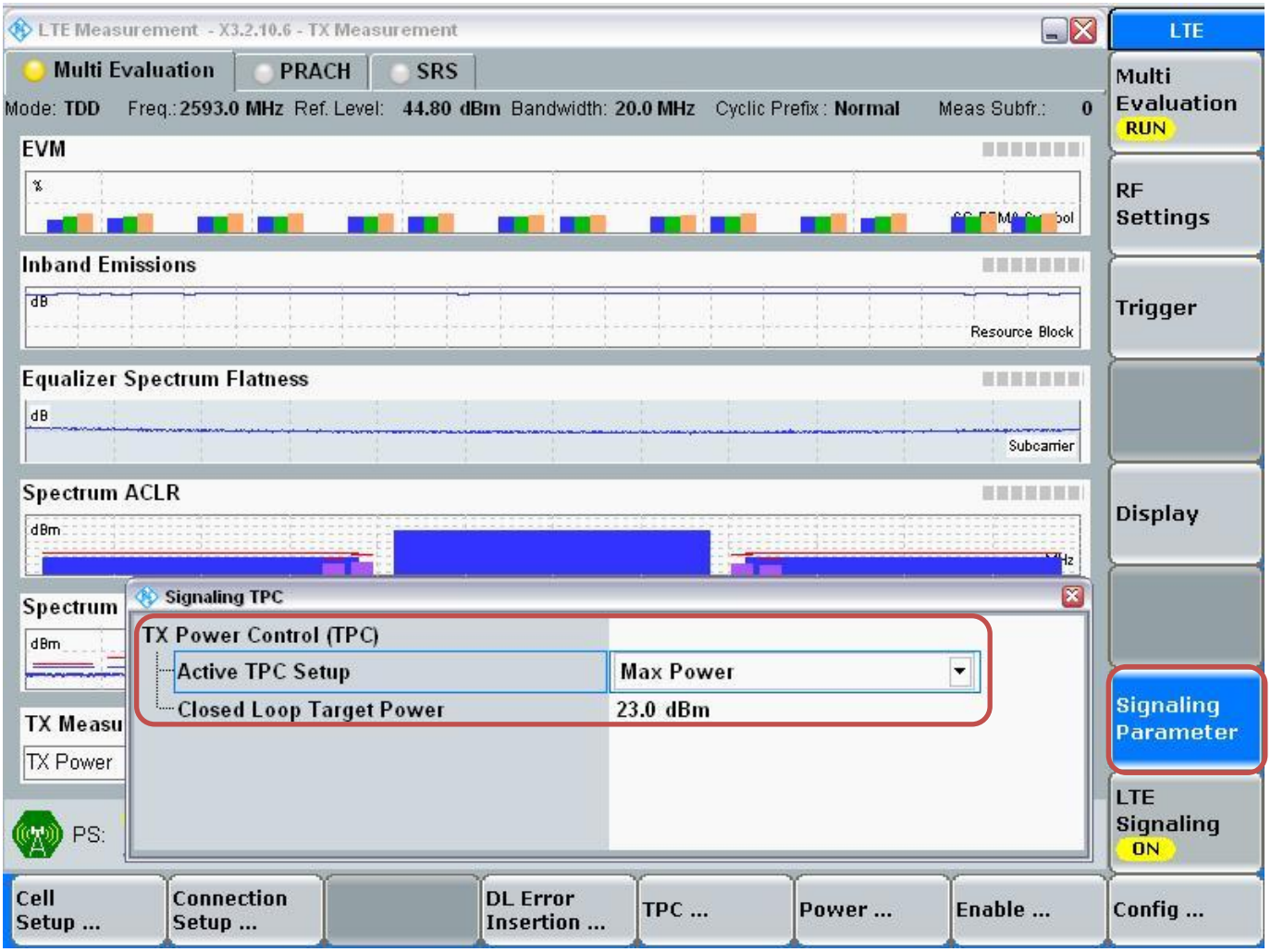


Max Power Setting

- Select “LTE 1 TX Meas.”
- Press “RESTART | STOP” Soft key

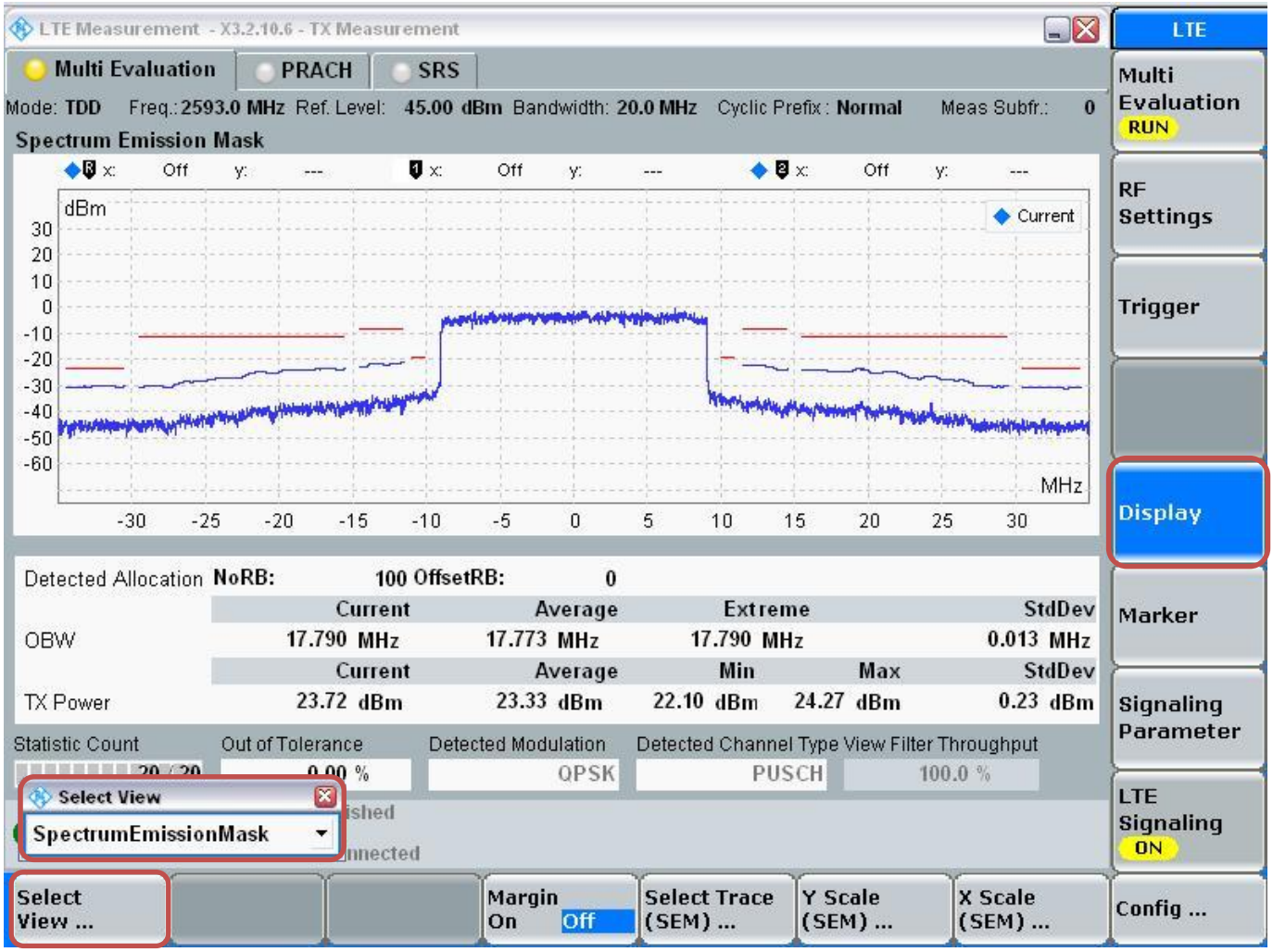


- Select “Signaling Parameter”
- Select “TX Power Control (TPC)” > Select “Active TPC Setup” to “Max Power” > Set “Closed Loop Target Power” to “23 dBm”



View TX Power

- Go to “Display”
- Select “Select View…”
- Select “Spectrum Emission Mask”



LTE TDD Band 41 Results

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)
20	39750	2506.0	QPSK	1	0	0	22.1
				1	49	0	22.0
				1	99	0	22.1
				50	0	1	21.0
				50	24	1	20.8
				50	49	1	20.8
				100	0	1	20.8
			16QAM	1	0	1	21.1
				1	49	1	21.0
				1	99	1	21.1
				50	0	2	19.8
				50	24	2	19.8
				50	49	2	19.8
				100	0	2	19.8
	40620	2593.0	QPSK	1	0	0	21.7
				1	49	0	21.9
				1	99	0	22.0
				50	0	1	20.7
				50	24	1	20.8
				50	49	1	20.8
				100	0	1	20.8
			16QAM	1	0	1	20.6
				1	49	1	20.7
				1	99	1	20.7
				50	0	2	19.6
				50	24	2	19.7
				50	49	2	19.8
				100	0	2	19.8
	41490	2680.0	QPSK	1	0	0	21.9
				1	49	0	21.9
				1	99	0	21.9
				50	0	1	20.8
				50	24	1	20.8
				50	49	1	20.8
				100	0	1	20.8
			16QAM	1	0	1	21.3
				1	49	1	21.3
				1	99	1	21.3
				50	0	2	19.7
				50	24	2	19.7
				50	49	2	19.8
				100	0	2	19.8

LTE TDD Band 41 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)
15	39725	2503.5	QPSK	1	0	0	21.9
				1	37	0	21.9
				1	74	0	21.9
				36	0	1	20.7
				36	16	1	20.7
				36	35	1	20.7
				75	0	1	20.7
			16QAM	1	0	1	21.2
				1	37	1	21.2
				1	74	1	21.2
				36	0	2	19.9
				36	16	2	19.9
				36	35	2	19.9
				75	0	2	19.7
	40620	2593.0	QPSK	1	0	0	21.8
				1	37	0	22.0
				1	74	0	22.0
				36	0	1	20.7
				36	16	1	20.9
				36	35	1	20.9
				75	0	1	20.8
			16QAM	1	0	1	21.0
				1	37	1	21.2
				1	74	1	21.2
				36	0	2	19.6
				36	16	2	19.6
				36	35	2	19.7
				75	0	2	19.7
	41515	2682.5	QPSK	1	0	0	22.0
				1	37	0	22.0
				1	74	0	22.0
				36	0	1	20.9
				36	16	1	20.8
				36	35	1	20.8
				75	0	1	20.6
			16QAM	1	0	1	20.4
				1	37	1	20.4
				1	74	1	20.4
				36	0	2	19.9
				36	16	2	19.9
				36	35	2	19.7
				75	0	2	19.7

LTE TDD Band 41 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)
10	39700	2501.0	QPSK	1	0	0	22.1
				1	24	0	22.0
				1	49	0	22.2
				25	0	1	21.0
				25	12	1	20.9
				25	24	1	20.9
				50	0	1	20.8
			16QAM	1	0	1	21.4
				1	24	1	21.4
				1	49	1	21.5
				25	0	2	20.0
				25	12	2	19.9
				25	24	2	19.9
				50	0	2	19.7
	40620	2593.0	QPSK	1	0	0	21.8
				1	24	0	22.0
				1	49	0	22.0
				25	0	1	20.7
				25	12	1	20.9
				25	24	1	20.9
				50	0	1	20.8
			16QAM	1	0	1	20.8
				1	24	1	20.9
				1	49	1	20.9
				25	0	2	19.5
				25	12	2	19.6
				25	24	2	19.7
				50	0	2	19.7
	41540	2685.0	QPSK	1	0	0	21.9
				1	24	0	21.9
				1	49	0	22.0
				25	0	1	20.9
				25	12	1	20.9
				25	24	1	20.8
				50	0	1	20.8
			16QAM	1	0	1	20.9
				1	24	1	20.9
				1	49	1	20.9
				25	0	2	19.8
				25	12	2	19.8
				25	24	2	19.7
				50	0	2	19.7

10. Tissue Dielectric Properties

IEEE Std 1528-2003 Table 2

Target Frequency (MHz)	Head	
	ε_r	σ (S/m)
300	45.3	0.87
450	43.5	0.87
835	41.5	0.90
900	41.5	0.97
1450	40.5	1.20
1800 – 2000	40.0	1.40
2450	39.2	1.80
2600	39.0	1.96
3000	38.5	2.40

FCC OET Bulletin 65 Supplement C 01-01

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

10.1. Composition of Ingredients for the Tissue Material Used in the SAR Tests

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

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450-2600	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

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

10.2. Tissue Dielectric Parameter Check Results

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized.

The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.

Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
4/1/2013	Body 835	e'	54.2700	Relative Permittivity (εr):	54.27	55.20	-1.68	5
		e"	21.9300	Conductivity (σ):	1.02	0.97	**4.97**	5
	Body 820	e'	54.4200	Relative Permittivity (εr):	54.42	55.28	-1.55	5
		e"	22.0400	Conductivity (σ):	1.00	0.97	3.76	5
	Body 850	e'	54.1300	Relative Permittivity (εr):	54.13	55.16	-1.86	5
		e"	21.8600	Conductivity (σ):	1.03	0.99	4.66	5
4/3/2013	Body 1900	e'	51.1900	Relative Permittivity (ϵ_r):	51.19	53.30	-3.96	5
		e"	14.1400	Conductivity (σ):	1.49	1.52	-1.72	5
	Body 1850	e'	51.3500	Relative Permittivity (ϵ_r):	51.35	53.30	-3.66	5
		e"	14.0500	Conductivity (σ):	1.45	1.52	-4.92	5
	Body 1910	e'	51.1600	Relative Permittivity (ϵ_r):	51.16	53.30	**-4.02**	5
		e"	14.1600	Conductivity (σ):	1.50	1.52	-1.06	5
4/8/2013	Body 835	e'	53.9400	Relative Permittivity (ϵ_r):	53.94	55.20	-2.28	5
		e"	21.5100	Conductivity (σ):	1.00	0.97	2.96	5
	Body 820	e'	54.0800	Relative Permittivity (ϵ_r):	54.08	55.28	-2.17	5
		e"	21.5800	Conductivity (σ):	0.98	0.97	1.60	5
	Body 850	e'	53.8300	Relative Permittivity (ϵ_r):	53.83	55.16	-2.41	5
		e"	21.4500	Conductivity (σ):	1.01	0.99	2.70	5
4/10/2013	Body 2600	e'	52.8700	Relative Permittivity (ϵ_r):	52.87	52.51	0.68	5
		e"	14.7500	Conductivity (σ):	2.13	2.16	-1.32	5
	Body 2500	e'	53.2400	Relative Permittivity (ϵ_r):	53.24	52.64	1.15	5
		e"	14.2900	Conductivity (σ):	1.99	2.02	-1.68	5
	Body 2700	e'	52.4900	Relative Permittivity (ϵ_r):	52.49	52.38	0.20	5
		e"	15.1800	Conductivity (σ):	2.28	2.30	-0.97	5
4/16/2013	Body 835	e'	54.3900	Relative Permittivity (ϵ_r):	54.39	55.20	-1.47	5
		e"	21.9200	Conductivity (σ):	1.02	0.97	4.92	5
	Body 820	e'	54.5300	Relative Permittivity (ϵ_r):	54.53	55.28	-1.35	5
		e"	22.0100	Conductivity (σ):	1.00	0.97	3.62	5
	Body 850	e'	54.2000	Relative Permittivity (ϵ_r):	54.20	55.16	-1.74	5
		e"	21.8900	Conductivity (σ):	1.03	0.99	4.81	5
4/16/2013	Body 1900	e'	51.3800	Relative Permittivity (ϵ_r):	51.38	53.30	-3.60	5
		e"	14.7000	Conductivity (σ):	1.55	1.52	2.17	5
	Body 1850	e'	51.5400	Relative Permittivity (ϵ_r):	51.54	53.30	-3.30	5
		e"	14.5800	Conductivity (σ):	1.50	1.52	-1.33	5
	Body 1910	e'	51.3500	Relative Permittivity (ϵ_r):	51.35	53.30	-3.66	5
		e"	14.7000	Conductivity (σ):	1.56	1.52	2.71	5
4/29/2013	Body 2600	e'	51.4500	Relative Permittivity (ϵ_r):	51.45	52.51	-2.02	5
		e"	15.2900	Conductivity (σ):	2.21	2.16	2.30	5
	Body 2500	e'	51.8400	Relative Permittivity (ϵ_r):	51.84	52.64	-1.51	5
		e"	14.9100	Conductivity (σ):	2.07	2.02	2.59	5
	Body 2700	e'	51.0600	Relative Permittivity (ϵ_r):	51.06	52.38	-2.53	5
		e"	15.6200	Conductivity (σ):	2.35	2.30	1.90	5

11. System Performance Check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are remeasured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

11.1. System Performance Check Measurement Conditions

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ±0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm ± 0.5 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm ± 0.5 cm for measurements > 3 GHz.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
  For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 (below 3 GHz) and/or 8x8x7 (above 3 GHz) fine cube was chosen for the cube.
- Distance between probe sensors and phantom surface was set to 3 mm.
  For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was 100 mW.
- The results are normalized to 1 W input power.

11.2. Reference SAR Values for System Performance Check

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

System Dipole	Serial No.	Cal. Date	Freq. (MHz)	Target SAR Values (mW/g)		
				1g/10g	Head	Body
D835V2	4d002	10/24/12	835	1g	9.58	9.48
				10g	6.28	6.26
D1900V2	5d043	11/6/12	1900	1g	39.9	40.9
				10g	20.9	21.6
D2600V2	1006	09/13/12	2600	1g	57.6	54.8
				10g	25.7	24.5

11.3. System Performance Check Results

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within 10% of the manufacturer calibrated dipole SAR target.

Date Tested	System Dipole		T.S. Liquid		Measured Results			Target (Ref. Value)	Delta ±10 %	Est./Zoom Ratio ±3 %	Plot No.
	Type	Serial #			Area Scan	Zoom Scan	Normalize to 1 W				
4/1/2013	D835V2	4d002	Body	1g	1.02	1.00	10.0	9.48	5.38	2.06	1,2
				10g	0.68	0.66	6.6	6.26	5.27		
4/3/2013	D1900V2	5d043	Body	1g	3.95	4.01	40.1	40.9	-1.96	-1.52	
				10g	1.98	2.11	21.1	21.6	-2.31		
4/8/2013	D835V2	4d002	Body	1g	0.96	0.95	9.5	9.48	0.32	1.14	
				10g	0.65	0.63	6.3	6.26	0.00		
4/10/2013	D2600V2	1006	Body	1g	5.97	5.84	58.40	54.80	6.57	2.18	3,4
				10g	2.62	2.57	25.70	24.50	4.90		
4/16/2013	D835V2	4d002	Body	1g	1.00	0.99	9.9	9.48	4.11	1.30	
				10g	0.67	0.65	6.5	6.26	3.83		
4/16/2013	D1900V2	5d043	Body	1g	3.89	3.87	38.7	40.9	-5.38	0.51	5,6
				10g	1.97	2.04	20.4	21.6	-5.56		
4/29/2013	D2600V2	1006	Body	1g	5.95	5.84	58.40	54.80	6.57	1.85	
				10g	2.63	2.58	25.80	24.50	5.31		

12. SAR Test Results

12.1. CDMA BC 0

Test Position	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Horizontal-Up	5	1xRTT (RC3 SO55)	1013	824.70	25.0	24.4	1.120	1.286	1	
			384	836.52	25.0	24.5	1.020	1.144		
			777	848.31	25.0	24.5	0.768	0.862		
Horizontal-Down	5	1xRTT (RC3 SO55)	1013	824.70	25.0	24.4				1
			384	836.52	25.0	24.5	0.676	0.758		
			777	848.31	25.0	24.5				1
Vertical Front	5	1xRTT (RC3 SO55)	1013	824.70	25.0	24.4				1
			384	836.52	25.0	24.5	0.106	0.119		
			777	848.31	25.0	24.5				1
Vertical Back	5	1xRTT (RC3 SO55)	1013	824.70	25.0	24.4				1
			384	836.52	25.0	24.5	0.478	0.536		
			777	848.31	25.0	24.5				1
Bottom Tip	5	1xRTT (RC3 SO55)	1013	824.70	25.0	24.4				1
			384	836.52	25.0	24.5	0.480	0.539		
			777	848.31	25.0	24.5				1

12.2. CDMA BC 1

Test Position	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Horizontal-Up	5	1xRTT (RC3 SO55)	25	1851.25	23.0	22.7	0.901	0.965		
			600	1880.00	23.0	22.7	0.917	0.983		
			1175	1908.75	23.0	22.6	0.999	1.095	2	
Horizontal-Down	5	1xRTT (RC3 SO55)	25	1851.25	23.0	22.7	0.783	0.839		
			600	1880.00	23.0	22.7	0.760	0.814		
			1175	1908.75	23.0	22.6	0.803	0.880		
Vertical Front	5	1xRTT (RC3 SO55)	25	1851.25	23.0	22.7				1
			600	1880.00	23.0	22.7	0.084	0.090		
			1175	1908.75	23.0	22.6				1
Vertical Back	5	1xRTT (RC3 SO55)	25	1851.25	23.0	22.7				1
			600	1880.00	23.0	22.7	0.581	0.623		
			1175	1908.75	23.0	22.6				1
Bottom Tip	5	1xRTT (RC3 SO55)	25	1851.25	23.0	22.7				1
			600	1880.00	23.0	22.7	0.332	0.356		
			1175	1908.75	23.0	22.6				1

Note(s):

1. According to KDB 447498, Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz.

12.3. CDMA BC 10

Test Position	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Horizontal-Up	5	1xRTT (RC3 SO55)	476	817.90	25.0	24.4	1.170	1.343	3	
			580	820.50	25.0	24.3	1.140	1.339		
			684	823.10	25.0	24.4	1.030	1.183		
Horizontal-Down	5	1xRTT (RC3 SO55)	476	817.90	25.0	24.4				1
			580	820.50	25.0	24.3	0.649	0.763		
			684	823.10	25.0	24.4				1
Vertical Front	5	1xRTT (RC3 SO55)	476	817.90	25.0	24.4				1
			580	820.50	25.0	24.3	0.125	0.147		
			684	823.10	25.0	24.4				1
Vertical Back	5	1xRTT (RC3 SO55)	476	817.90	25.0	24.4				1
			580	820.50	25.0	24.3	0.408	0.479		
			684	823.10	25.0	24.4				1
Bottom Tip	5	1xRTT (RC3 SO55)	476	817.90	25.0	24.4				1
			580	820.50	25.0	24.3	0.487	0.572		
			684	823.10	25.0	24.4				1

Note(s):

1. According to KDB 447498, Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz.

12.4. LTE FDD Band 25 (10 MHz Bandwidth)

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	
Horizontal Up	QPSK	5	26090	1860.0	1	0	23.0	22.8	0.933	0.977	
					25	0	22.0	21.7	0.728	0.780	
			26365	1882.5	1	0	23.0	22.8	0.925	0.969	
					25	0	22.0	21.7	0.719	0.770	
			26640	1905.0	1	0	23.0	22.8	0.990	**1.037**	4
					25	0	22.0	21.7	0.772	0.827	
					50	0	21.0	21.3	0.757	0.706	
Horizontal Down	QPSK	5	26090	1860.0	1	0	23.0	22.8	0.799	0.837	
					25	0	22.0	21.7	0.621	0.665	
					50	0	21.0	21.6	0.596	0.519	
			26365	1882.5	1	0	23.0	22.8	0.765	0.801	
					25	0	22.0	21.7	0.577	0.618	
			26640	1905.0	1	0	23.0	22.8	0.797	0.835	
					25	0	22.0	21.7	0.610	0.654	
Vertical Front	QPSK	5	26365	1882.5	1	0	23.0	22.8	0.088	0.092	
					25	0	22.0	21.7	0.080	0.086	
Vertical Back	QPSK	5	26365	1882.5	1	0	23.0	22.8	0.571	0.598	
					25	0	22.0	21.7	0.443	0.475	
Bottom Tip	QPSK	5	26365	1882.5	1	0	23.0	22.8	0.414	0.434	
					25	0	22.0	21.7	0.324	0.347	

Note(s):

Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:

- Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
- Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are $\geq$ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
- Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
- Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

12.5. LTE FDD Band 26 (10 MHz Bandwidth)

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	
Horizontal Up	QPSK	5	26740	819.0	1	49	24.0	23.7	0.959	1.028	5
					25	24	23.0	22.6	0.741	0.812	
					50	0	23.0	22.5	0.730	0.819	
			26865	831.5	1	0	24.0	23.7	0.933	1.000	
					25	0	23.0	22.7	0.705	0.755	
			26990	844.0	1	24	24.0	23.7	0.823	0.882	
					25	24	23.0	22.7	0.625	0.670	
Horizontal Down	QPSK	5	26865	831.5	1	0	24.0	23.7	0.511	0.548	
					25	0	23.0	22.7	0.402	0.431	
Vertical Front	QPSK	5	26865	831.5	1	0	24.0	23.7	0.101	0.108	
					25	0	23.0	22.7	0.078	0.084	
Vertical Back	QPSK	5	26865	831.5	1	0	24.0	23.7	0.357	0.383	
					25	0	23.0	22.7	0.279	0.299	
Bottom Tip	QPSK	5	26865	831.5	1	0	24.0	23.7	0.423	0.453	
					25	0	23.0	22.7	0.335	0.359	

Note(s):

Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:

- Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
- Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are $\geq$ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
- Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
- Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

12.6. LTE TDD Band 41 (20 MHz Bandwidth)

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	
Horizontal Up	QPSK	5	39750	2506.0	1	0	22.5	22.1	0.517	0.567	
					50	0	21.5	21.0	0.449	0.504	
			40620	2593.0	1	49	22.5	21.9	0.713	0.819	6
					50	24	21.5	20.8	0.648	0.761	
					100	0	21.5	20.8	0.572	0.672	
			41490	2680.0	1	0	22.5	21.9	0.712	0.817	
					50	0	21.5	20.8	0.640	0.752	
Horizontal Down	QPSK	5	40620	2593.0	1	49	22.5	21.9	0.656	0.753	
					50	24	21.5	20.8	0.589	0.692	
Vertical Front	QPSK	5	40620	2593.0	1	49	22.5	21.9	0.387	0.444	
					50	24	21.5	20.8	0.351	0.412	
Vertical Back	QPSK	5	40620	2593.0	1	49	22.5	21.9	0.578	0.664	
					50	24	21.5	20.8	0.530	0.623	
Bottom Tip	QPSK	5	40620	2593.0	1	49	22.5	21.9	0.375	0.431	
					50	24	21.5	20.8	0.350	0.411	

Note(s):

Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:

- Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
- Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are $\geq$ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
- Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
- Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

13. Summary of Highest Measured SAR Values

Results of highest SAR values for each frequency band and mode

Technology/Band	Test Configuration	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	1-g SAR (W/kg)
CDMA BC0	Horizontal-Up	1xRTT (RC3 SO32)	5	1013	824.7	1.120
CDMA BC1	Horizontal-Up	1xRTT (RC3 SO32)	5	1175	1908.8	0.998
CDMA BC10	Horizontal-Up	1xRTT (RC3 SO32)	5	476	817.9	1.170
LTE Band 25	Horizontal-Up	10 MHz (QPSK) RB 1/0	5	26640	1905.0	0.990
LTE Band 26	Horizontal-Up	10 MHz (QPSK) RB 1/49	5	26740	819.0	0.959
LTE Band 41	Horizontal-Up	20 MHz (QPSK) RB 1/49	5	40620	2593.0	0.713

14. SAR Measurement Variability

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

14.1. The Highest Measured SAR Configuration in Each Frequency Band

Body-worn Accessory Exposure Condition

Not Applicable. Highest measured SAR is < 0.80 W/kg.

Note(s):

1. Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.
2. Repeated measurement was performed on the highest measured SAR configuration in each frequency band only.

14.2. Repeated Measurement Results

Head Exposure Condition

Not Applicable. Highest measured SAR is < 0.80 W/kg.

Body-worn Accessory Exposure Condition

Not Applicable. Highest measured SAR is < 0.80 W/kg.

Wireless Technologies	Test Configuration	Mode	Ch #.	Freq. (MHz)	Meas. SAR (W/kg)		Largest to Smallest
					Original	Repeated	
CDMA BC 10	Horizontal-Up	1xRTT (RC3 SO32)	476	817.9	1.170	1.120	1.04
CDMA BC 1	Horizontal-Up	1xRTT (RC3 SO32)	1175	1909.8	0.998	0.999	1.00
LTE Band 41	Horizontal-Up	20 MHz (QPSK) RB 1/49	40620	2593.0	0.713	0.713	1.00

Note(s):

1. Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not > 1.20.
2. Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.

15. Appendixes

Refer to separated files for the following appendixes.

15.1. System Performance Check Plots

15.2. Highest SAR Test Plots

15.3. Calibration Certificate for E-Field Probe EX3DV4 - SN 3686

15.4. Calibration Certificate for D835V2 - SN 4d002

15.5. Calibration Certificate for D1900V2 - SN 5d043

15.6. Calibration Certificate for D2600V2 - SN 1006