



FCC 47 CFR § 2.1093  
IEEE Std 1528-2013

**SAR EVALUATION REPORT**

**FOR**

**GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, ANT+, NFC and WPT**

**MODEL NUMBER: SM-N976B**

**FCC ID: A3LSMN976B**

**REPORT NUMBER: 4789009800-S1V3**

**ISSUE DATE: 6/24/2019**

*Prepared for*  
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**TL-637**

**Revision History**

Rev.	Date	Revisions	Revised By
V1	6/18/2019	Initial Issue	Sunghoon Kim
V2	6/21/2019	-Updated §6.1., §6.2., §6.3., §6.7., §6.7.1., §7., §8., §9.3.1, §9.4., §9.5., §10.18., §13., and Appendix B.	Sunghoon Kim
V3	6/24/2019	-Updated §6.7.	Sunghoon Kim

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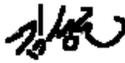
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# 1. Attestation of Test Results

Applicant Name		SAMSUNG ELECTRONICS CO.,LTD.			
FCC ID		A3LSMN976B			
Model Number		SM-N976B			
Applicable Standards		FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013			
<b>SAR Limits (W/Kg)</b>					
Exposure Category		Peak spatial-average(1g of tissue)		Product Specific 10-g (10g of tissue)	
General population / Uncontrolled exposure		1.6		4.0	
<b>The Highest Reported SAR (W/kg)</b>					
<b>RF Exposure Conditions</b>		<b>Equipment Class</b>			
		<b>Licensed</b>	<b>DTS</b>	<b>U-NII</b>	<b>DSS(BT)</b>
Head		0.20	0.43	0.18	0.39
Body-worn		0.74	0.07	0.25	<0.10
Hotspot		1.25	0.17	0.27	<0.10
Product Specific 10g		2.58	N/A	1.37	N/A
Simultaneous TX	Head	0.85	0.85	0.85	0.78
	Body-worn	1.27	1.27	1.27	1.18
	Hotspot	1.51	1.51	1.51	1.25
	Product Specific 10g	3.95	N/A	3.95	N/A
Date Tested		5/13/2019 to 6/17/2019 , 6/21/2019			
Test Results		Pass			
<p>UL Korea, Ltd. 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 Korea, Ltd. 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.</p> <p><b>Note:</b> 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 Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. 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 IAS, any agency of the Federal Government, or any agency of any government.</p>					
Approved & Released By:			Prepared By:		
					
Justin Park Lead Test Engineer UL Korea, Ltd. Suwon Laboratory			Sunghoon Kim Test Engineer UL Korea, Ltd. Suwon Laboratory		

## 2. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE STD 1528-2013, ANSI C63.26-2015 the following FCC Published RF exposure [KDB](#) procedures:

- 248227 D01 802.11 Wi-Fi SAR v02r02
- 447498 D01 General RF Exposure Guidance v06
- 648474 D04 Handset SAR v01r03
- 690783 D01 SAR Listings on Grants v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02
- 941225 D01 3G SAR Procedures v03r01
- 941225 D05 SAR for LTE Devices v02r05
- 941225 D05A LTE Rel.10 KDB Inquiry Sheet v01r02
- 941225 D06 Hotspot Mode v02r01
- 941225 D07 UMPC Mini Tablet v01r02
- 971168 D01 Power Meas License Digital System v03r01

In addition to the above, the following information was used:

- [TCB workshop](#) October, 2014; Page 36, RF Exposure Procedures Update (Overlapping LTE Bands)
- [TCB workshop](#) October, 2014; Page 37, RF Exposure Procedures Update (Other LTE Considerations)
- [TCB workshop](#) October, 2016; Page 7, RF Exposure Procedures (Bluetooth Duty Factor)
- [TCB workshop](#) October, 2016; Page 18, RF Exposure Procedures (DUT Holder Perturbations)
- [TCB workshop](#) May, 2017; Page 6, RF Exposure Procedures (LTE Test Conditions)
- [TCB workshop](#) Nov, 2017; Page 9, RF Exposure Procedures (Uplink CA SAR Test Guidance)
- [TCB workshop](#) April, 2018; Page 3, RF Exposure Procedures (LTE DL CA SAR Test Exclusion Update)
- [TCB workshop](#) April, 2019 Page 10, Exposure Procedures (802.11ax SAR Testing)

## 3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at

Suwon
SAR 1 Room
SAR 2 Room
SAR 3 Room
SAR 4 Room
SAR 5 Room

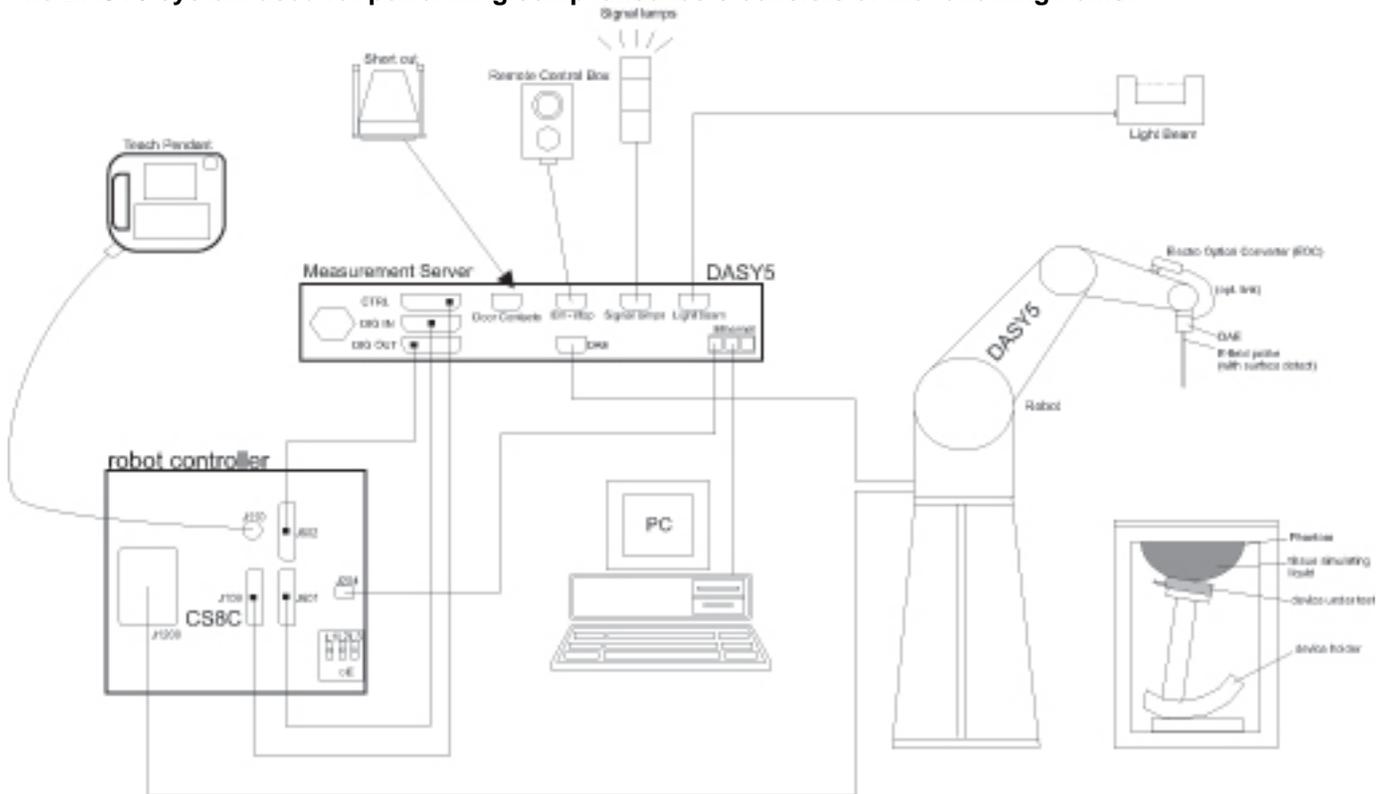
UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637.

The full scope of accreditation can be viewed at <http://www.iasonline.org/PDF/TL/TL-637.pdf>.

## 4. SAR Measurement System & Test Equipment

### 4.1. SAR Measurement System

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.

## 4.2. SAR Scan Procedures

### 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

	$\leq 3$ GHz	$> 3$ GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	$5 \pm 1$ mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: $\Delta x_{Area}$ , $\Delta y_{Area}$	$\leq 2$ GHz: $\leq 15$ mm $2 - 3$ GHz: $\leq 12$ mm	$3 - 4$ GHz: $\leq 12$ mm $4 - 6$ GHz: $\leq 10$ mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

**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

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: $\Delta x_{Zoom}, \Delta y_{Zoom}$			≤ 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 1 <sup>st</sup> 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: $\delta$ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details. * When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is ≤ 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.

### 4.3. Test Equipment

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.

#### Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	Agilent	E5071C	MY46522054	8-7-2019
Dielectric Assessment Kit	SPEAG	DAK-3.5	1046	4-19-2020
Dielectric Assessment Kit	SPEAG	DAK-3.5	1196	6-26-2019
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	LKM	DTM3000	3424	8-9-2019

#### System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
MXG Analog Signal Generator	Agilent	N5181A	MY50145882	8-7-2019
Power Sensor	Agilent	U2000A	MY54260010	8-7-2019
Power Sensor	Agilent	U2000A	MY54260007	8-7-2019
Power Amplifier	EXODUS	1410025-AMP2027-10003	10003	8-8-2019
Directional Coupler	Agilent	772D	MY52180193	8-7-2019
Directional Coupler	Agilent	778D	MY52180432	8-7-2019
Low Pass Filter	MICROLAB	LA-15N	03943	8-7-2019
Low Pass Filter	FILTRON	L14012FL	1410003S	8-7-2019
Low Pass Filter	MICROLAB	LA-60N	03942	8-7-2019
Attenuator	Agilent	8491B/003	MY39269292	8-7-2019
Attenuator	Agilent	8491B/010	MY39269315	8-7-2019
Attenuator	Agilent	8491B/020	MY39269298	8-7-2019
E-Field Probe (SAR1)	SPEAG	EX3DV4	7376	9-26-2019
E-Field Probe (SAR3)	SPEAG	EX3DV4	7314	8-30-2019
E-Field Probe (SAR4)	SPEAG	EX3DV4	3991	5-24-2019
E-Field Probe (SAR5)	SPEAG	EX3DV4	3871	8-28-2019
Data Acquisition Electronics (SAR1)	SPEAG	DAE4	1447	3-21-2020
Data Acquisition Electronics (SAR3)	SPEAG	DAE4	1468	8-22-2019
Data Acquisition Electronics (SAR4)	SPEAG	DAE4	1259	7-26-2019
Data Acquisition Electronics (SAR5)	SPEAG	DAE4	1343	8-28-2019
System Validation Dipole	SPEAG	D750V3	1122	2-19-2020
System Validation Dipole	SPEAG	D835V2	4d174	1-23-2021
System Validation Dipole	SPEAG	D1750V2	1125	2-16-2020
System Validation Dipole	SPEAG	D1900V2	5d190	10-23-2020
System Validation Dipole	SPEAG	D2450V2	939	10-16-2020
System Validation Dipole	SPEAG	D2600V2	1097	1-17-2020
System Validation Dipole	SPEAG	D5GHzV2	1184	8-21-2020
Thermometer (SAR1)	Lutron	MHB-382SD	AH.91463	8-8-2019
Thermometer (SAR3)	Lutron	MHB-382SD	AH.50213	8-14-2019
Thermometer (SAR4),(SAR5)	Lutron	MHB-382SD	AJ.45903	5-17-2020

#### Others

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator	R & S	CMW500	150313	8-9-2019
Base Station Simulator	R & S	CMW500	150314	8-9-2019
Base Station Simulator	R & S	CMW500	162790	8-9-2019
Wireless Connectivity Tester	R & S	CMW270	100982	8-8-2019
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	8-7-2019

#### Note(s):

Refer to Appendix F that mentioned about justification for Extended SAR Dipole Calibrations.

(D750V3, SN : 1122, D1750V2, SN : 1125, and D2600, SN : 1097)

## 5. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

## 6. Device Under Test (DUT) Information

### 6.1. DUT Description

Device Dimension	Overall (Length x Width): 77.6 mm x 162.5 mm Overall Diagonal: 177.8 mm Display Diagonal: 170.1 mm																																																
Back Cover	<input checked="" type="checkbox"/> The Back Cover is not removable.																																																
Battery Options	<input checked="" type="checkbox"/> The rechargeable battery is not user accessible																																																
Wireless Router (Hotspot)	Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices. <input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 2.4 GHz) <input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 5.8 GHz_UNII-3 band)																																																
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 2.4 GHz) <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 5 GHz : Ch.36 – Ch.48, Ch.149 – Ch.165))																																																
Test Sample Information	<table border="1"> <thead> <tr> <th>No.</th> <th>S/N</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>R3CM40CW0CE</td> <td>Main Conducted</td> </tr> <tr> <td>2</td> <td>R3CM40CW7RX</td> <td>Main Conducted</td> </tr> <tr> <td>3</td> <td>R3CM40CW9DH</td> <td>Main Conducted</td> </tr> <tr> <td>5</td> <td>R3CM506PPMB</td> <td>Wi-Fi &amp; BT Conducted</td> </tr> <tr> <td>6</td> <td>R3CM506NKXL</td> <td>SAR</td> </tr> <tr> <td>7</td> <td>R3CM506N49W</td> <td>SAR</td> </tr> <tr> <td>8</td> <td>R3CM40CW0MV</td> <td>SAR</td> </tr> <tr> <td>9</td> <td>R3CM40CW0NZ</td> <td>SAR</td> </tr> <tr> <td>10</td> <td>R3CM503RJ0P</td> <td>SAR</td> </tr> <tr> <td>11</td> <td>R3CM40CW67N</td> <td>SAR</td> </tr> <tr> <td>12</td> <td>R3CM506N3GR</td> <td>SAR</td> </tr> <tr> <td>13</td> <td>R3CM503RHHV</td> <td>SAR</td> </tr> <tr> <td>14</td> <td>R3CM506Q87A</td> <td>SAR</td> </tr> <tr> <td>15</td> <td>R3CM506QA3N</td> <td>SAR</td> </tr> <tr> <td>16</td> <td>ce6340c773197e35</td> <td>SAR</td> </tr> </tbody> </table>	No.	S/N	Notes	1	R3CM40CW0CE	Main Conducted	2	R3CM40CW7RX	Main Conducted	3	R3CM40CW9DH	Main Conducted	5	R3CM506PPMB	Wi-Fi & BT Conducted	6	R3CM506NKXL	SAR	7	R3CM506N49W	SAR	8	R3CM40CW0MV	SAR	9	R3CM40CW0NZ	SAR	10	R3CM503RJ0P	SAR	11	R3CM40CW67N	SAR	12	R3CM506N3GR	SAR	13	R3CM503RHHV	SAR	14	R3CM506Q87A	SAR	15	R3CM506QA3N	SAR	16	ce6340c773197e35	SAR
No.	S/N	Notes																																															
1	R3CM40CW0CE	Main Conducted																																															
2	R3CM40CW7RX	Main Conducted																																															
3	R3CM40CW9DH	Main Conducted																																															
5	R3CM506PPMB	Wi-Fi & BT Conducted																																															
6	R3CM506NKXL	SAR																																															
7	R3CM506N49W	SAR																																															
8	R3CM40CW0MV	SAR																																															
9	R3CM40CW0NZ	SAR																																															
10	R3CM503RJ0P	SAR																																															
11	R3CM40CW67N	SAR																																															
12	R3CM506N3GR	SAR																																															
13	R3CM503RHHV	SAR																																															
14	R3CM506Q87A	SAR																																															
15	R3CM506QA3N	SAR																																															
16	ce6340c773197e35	SAR																																															

## 6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode		Duty Cycle used for SAR testing
GSM	850 1900	Voice (GMSK)	GPRS Multi-Slot Class:	GSM Voice: 12.5% (E)GPRS: 1 Slot: 12.5% 2 Slots: 25% 3 Slots: 37.5% 4 Slots: 50%
		GPRS (GMSK)	<input type="checkbox"/> Class 8 - 1 Up, 4 Down <input type="checkbox"/> Class 10 - 2 Up, 4 Down <input type="checkbox"/> Class 12 - 4 Up, 4 Down <input checked="" type="checkbox"/> Class 33 - 4 Up, 5 Down	
Does this device support DTM (Dual Transfer Mode)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
W-CDMA (UMTS)	Band II Band IV Band V	UMTS Rel. 99 (Voice & Data) HSDPA (Category 24) HSUPA (Category 6) DC-HSDPA (Category 24) HSPA+ (DL only)		100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 7 FDD Band 12 FDD Band 13 FDD Band 17 FDD Band 25 FDD Band 26 FDD Band 66 TDD Band 41 TDD Band 41-HPUE TDD Band 38	QPSK 16QAM 64QAM Rel. 14 Carrier Aggregation (2 Uplink and 4 Downlinks)		100% (FDD) 63.3% (TDD, Power class 3) 43.3% (TDD, Power class 2)
	FDD Band 7_2CC TDD Band 38_2CC			
	Does this device support SV-LTE (1xRTT-LTE)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20) 802.11ax (HE20)		99.7% (802.11b) 98.2% (802.11g) 98.1% (802.11n 20MHz BW) 98.1% (802.11ax 20MHz BW)
		5 GHz	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80) 802.11ax (HE20) 802.11ax (HE40) 802.11ax (HE80)	
	Does this device support bands 5.60 ~ 5.65 GHz? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Does this device support Band gap channel(s)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Bluetooth	2.4 GHz	Version 5.0 LE		76.9% (DH5)

### Notes:

1. This device supports uplink-downlink configuration 0-6. The configuration with the highest duty cycle was used for Power class 3 (uplink-downlink configuration 0 at 63.3%). Power class 2 does not support uplink-downlink configuration 0 and 6, therefore the highest available duty cycle was used for Power class 2 (uplink-downlink configuration 1 at 43.3%).
2. The Bluetooth protocol is considered source-based averaging. Bluetooth GFSK (DH5) was verified to have the highest duty cycle of 76.9% and was considered and used for SAR Testing.
3. Duty cycle for Wi-Fi is referenced from the DTS and UNII report.

### 6.3. Nominal and Maximum Output Power

KDB 447498 sec.4.1. at the maximum rated output power and within the tune-up tolerance range specified for the product, but not more than 2 dB lower than the maximum tune-up tolerance limit

RF Air interface	Antenna	Mode	Time Slots	Max. RF Output Power (dBm)		Reduced. RF Output Power (dBm)	
				Tune-up Limit	Frame Power	Tune-up Limit	Frame Power
GSM850	Main 1-1	Voice/GPRS	1	35.0	26.0		
		GPRS	2	32.0	26.0		
		GPRS	3	30.8	26.5		
		GPRS	4	29.6	26.6		
		EGPRS	1	27.5	18.5		
		EGPRS	2	24.5	18.5		
		EGPRS	3	23.3	19.0		
GSM1900	Main 1-1	Voice/GPRS	1	31.0	22.0	30.0	21.0
		GPRS	2	27.5	21.5	26.5	20.5
		GPRS	3	26.0	21.7	25.0	20.7
		GPRS	4	25.0	22.0	24.0	21.0
		EGPRS	1	26.0	17.0	25.0	16.0
		EGPRS	2	23.0	17.0	22.0	16.0
		EGPRS	3	21.5	17.2	20.5	16.2
		EGPRS	4	20.1	17.1	19.1	16.1

RF Air interface	Antenna	Mode	Max. RF Output Power (dBm)	Reduced. RF Output Power (dBm)
W-CDMA Band II	Main 1-1	R99	24.0	21.0
		HSDPA	24.0	21.0
		HSUPA	24.0	21.0
		DC-HSDPA	24.0	21.0
W-CDMA Band IV	Main 1-1	R99	25.0	22.0
		HSDPA	24.5	21.5
		HSUPA	24.5	21.5
		DC-HSDPA	24.5	21.5
W-CDMA Band V	Main 1-1	R99	25.7	
		HSDPA	24.5	
		HSUPA	23.0	
		DC-HSDPA	23.5	

**Notes:**

1. The device utilizes power reduction under some portable hotspot conditions for SAR compliance. There is power reduction for WWAN bands (GSM1900, WCDMA Band II, IV). The reduced powers were confirmed via conducted power measurements the RF port. Detailed description of the hotspot power reduction mechanism is included in the operational description.
2. WWAN bands (WCDMA Band II, IV) has support to proximity sensor back-off function. it is operating during extremity (hand-held) use conditions. And This function is apply to phablet 10-g SAR exposure condition. Other Head and Body exposure conditions are performed SAR test at full power. The proximity sensor details explain in SAR report according to Section 6 in KDB 616217.

RF Air interface	Antenna	Mode	Max. RF Output Power (dBm)	Reduced. RF Output Power (dBm)
LTE Band 2*	Main 1-1	QPSK	24.0	21.0
LTE Band 4*	Main 1-1	QPSK	25.0	22.0
LTE Band 5	Main 1-1	QPSK	25.7	
LTE Band 7	Main 1-2	QPSK	25.0	22.0
LTE Band 12	Main 1-1	QPSK	25.5	
LTE Band 13	Main 1-1	QPSK	25.5	
LTE Band 17*	Main 1-1	QPSK	25.5	
LTE Band 25	Main 1-1	QPSK	24.5	21.5
LTE Band 26	Main 1-1	QPSK	25.3	
LTE Band 66	Main 1-1	QPSK	25.0	22.0
LTE Band 38	Main 1-2	QPSK	24.0	22.0
LTE Band 41 -Power Class 3-	Main 1-2	QPSK	23.0	
LTE Band 41 (HPUE) -Power Class 2-	Main 1-2	QPSK	26.0	24.0
LTE-Uplink 2CA -Band 7-	Main 1-2	QPSK	25.0	22.0
LTE-Uplink 2CA -Band 38-	Main 1-2	QPSK	24.0	22.0

**Notes:**

1. The device utilizes power reduction under some portable hotspot conditions for SAR compliance. There is power reduction for WWAN bands (LTE Band 2, 4, 7, 25, 66, 38, 41-HPUE). The reduced powers were confirmed via conducted power measurements the RF port. Detailed description of the hotspot power reduction mechanism is included in the operational description.
2. WWAN bands (LTE Band 2, 4, 7, 25, 66) has support to proximity sensor back-off function. it is operating during extremity (hand-held) use conditions. And This function is apply to phablet 10-g SAR exposure condition. Other Head and Body exposure conditions are performed SAR test at full power. The proximity sensor details explain in SAR report according to Section 6 in KDB 616217.
3. LTE QPSK configuration has the highest maximum average output power per 3GPP standard.
4. LTE Band 2 (Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.
5. LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.
6. LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.
7. LTE-uplink 2CA are the total combined power of the UL CA.

RF Air interface	Mode	Normal WLAN mode power (dBm)		RSDB WLAN mode power (dBm)	
		Max. RF Output Power	Reduced. RF Output Power	Max. RF Output Power	Reduced. RF Output Power
WiFi 2.4 GHz (Ch.1- Ch.11)	802.11b	19.0	16.0	16.0	14.0
	802.11g	16.0	16.0	16.0	14.0
	802.11n HT20	16.0	16.0	16.0	14.0
	802.11ax HE20	16.0	16.0	16.0	14.0
WiFi 2.4 GHz (Ch.12)	802.11b	3.5	3.5	3.5	3.5
	802.11g	3.5	3.5	3.5	3.5
	802.11n HT20	3.5	3.5	3.5	3.5
	802.11ax HE20	3.5	3.5	3.5	3.5
WiFi 2.4 GHz (Ch.13)	802.11b	1.5	1.5	1.5	1.5
	802.11g	1.5	1.5	1.5	1.5
	802.11n HT20	1.5	1.5	1.5	1.5
	802.11ax HE20	1.5	1.5	1.5	1.5
WiFi 5 GHz	802.11a	16.0	13.0	14.0	13.0
	802.11n HT20	16.0	13.0	14.0	13.0
	802.11n HT40	15.0	13.0	14.0	13.0
	802.11ac VHT20	16.0	13.0	14.0	13.0
	802.11ac VHT40	15.0	13.0	14.0	13.0
	802.11ac VHT80	14.0	13.0	14.0	13.0
	802.11ax HE20	16.0	13.0	14.0	13.0
	802.11ax HE40	15.0	13.0	14.0	13.0
802.11ax HE80	14.0	13.0	14.0	13.0	
Bluetooth		17.0			
Bluetooth-EDR		12.0			
Bluetooth-LE_1M		7.5			
Bluetooth-LE_2M		9.0			

**Note(s):**

1. This device uses an independent fixed level power reduction mechanism for WLAN operations during RCV operated. Detailed descriptions of the power reduction mechanism are included in the operational description.
2. RSDB WLAN mode power is same or lower than Normal WLAN mode power in All RF exposure conditions. So All RF exposure conditions were evaluated using Normal WLAN mode. And Normal WLAN's SAR levels were used to determine for simultaneous transmission SAR test exclusion of RSDB mode.
3. WLAN has the same total MIMO as SISO, and it is not the expected 3dB higher. Which impacts simultaneous evaluation.

### 6.4. General LTE SAR Test and Reporting Considerations

Item	Description						
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 2	Frequency range: 1850 - 1910 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	18700 /1860	18675/ 1857.5	18650/ 1855	18625/ 1852.5	18615/ 1851.5	18607/ 1850.7
	Mid	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880
	High	19100/ 1900	19125/ 1902.5	19150/ 1905	19175/ 1907.5	19185/ 1908.5	19193/ 1909.3
	Band 4	Frequency range: 1710 - 1755 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	20050/ 1720	20025/ 1717.5	20000/ 1715	19975/ 1712.5	19965/ 1711.5	19957/ 1710.7
	Mid	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5
	High	20300/ 1745	20325/ 1747.5	20350/ 1750	20375/ 1752.5	20385/ 1753.5	20393/ 1754.3
	Band 5	Frequency range: 824 - 849 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low			20450/ 829	20425/ 826.5	20415/ 825.5	20407/ 824.7
	Mid			20525/ 836.5	20525/ 836.5	20525/ 836.5	20525/ 836.5
	High			20600/ 844	20625/ 846.5	20635/ 847.5	20643/ 848.3
	Band 7	Frequency range: 2500 - 2570 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	20850 2510	20825 2507.5	20800 2505	20775 2502.5		
	Mid	21100 2535	21100 2535	21100 2535	21100 2535		
	High	21350 2560	21375 2562.5	21400 2565	21425 2567.5		
	Band 12	Frequency range: 699 – 716 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low			23060/ 704	23035/ 701.5	23025/ 700.5	23017/ 699.7
Mid			23095/ 707.5	23095/ 707.5	23095/ 707.5	23095/ 707.5	
High			23130/ 711	23155/ 713.5	23165/ 714.5	23173/ 715.3	
Band 13	Frequency range: 777 - 787 MHz						
	Channel Bandwidth						
	20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz	
Low				23205/ 779.5			
Mid			23230/ 782	23230/ 782			
High				23255/ 784.5			

**General LTE SAR Test and Reporting Considerations (Continued)**

Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 17	Frequency range: 704 - 716 MHz				
		Channel Bandwidth				
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz
Low			23780/ 709	23755/ 706.5		
Mid			23790/ 710	23790/ 710		
High			23800/ 711	23825/ 713.5		
Band 25	Frequency range: 1850 - 1915 MHz					
	Channel Bandwidth					
	20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
Low	26140/ 1860	26115/ 1857.5	26090/ 1855	26065/ 1852.5	26055/ 1851.5	26047/ 1850.7
Mid	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5
High	26590/ 1905	26615/ 1907.5	26640/ 1910	26665/ 1912.5	26675/ 1913.5	26683/ 1914.3
Band 26	Frequency range: 814 - 849 MHz					
	Channel Bandwidth					
	20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
Low		26765/ 821.5	26740/ 819	26715/ 816.5	26705/ 815.5	26697/ 814.7
Mid		26865/ 831.5	26865/ 831.5	26865/ 831.5	26865/ 831.5	26865/ 831.5
High		26965/ 841.5	26990/ 844	27015/ 846.5	27025/ 847.5	27033/ 848.3
Band 38	Frequency range: 2570 - 2620 MHz					
	Channel Bandwidth					
	20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
Low	37850/ 2580	37825/ 2577.5	37800/ 2575	37775/ 2572.5		
Mid	38000/ 2595	38000/ 2595	38000/ 2595	38000/ 2595		
High	38150 2610	38175/ 2612.5	38200/ 2615	38225/ 2617.5		
Band 41	Frequency range: 2496 - 2690 MHz					
	Channel Bandwidth					
	20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
Low	39750 / 2506.0					
Low-Mid	40185 / 2549.5					
Mid	40620 / 2593.0					
Mid-High	41055 / 2636.5					
High	41490 / 2680.0					
Band 66	Frequency range: 1710 - 1780 MHz					
	Channel Bandwidth					
	20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
Low	132072/ 1720	132047/ 1717.5	132022/ 1715	131997/ 1712.5	131987/ 1711.5	131979/ 1710.7
Mid	132322/ 1745	132322/ 1745	132322/ 1745	132322/ 1745	132322/ 1745	132322/ 1745
High	132572/ 1770	132597/ 1772.5	132622/ 1775	132647/ 1777.5	132657/ 1778.5	132665/ 1779.3

**General LTE SAR Test and Reporting Considerations (Continued)**

LTE transmitter and antenna implementation	Refer to Appendix A.																																																														
Maximum power reduction (MPR)	<p style="text-align: center;"><b>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (N<sub>RB</sub>)</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> </thead> <tbody> <tr> <td>QPSK</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 3</td> </tr> <tr> <td>256 QAM</td> <td colspan="6" style="text-align: center;">≥ 1</td> <td>≤ 5</td> </tr> </tbody> </table> <p>MPR Built-in by design                      The manufacturer MPR values are always within the 3GPP maximum MPR allowance but may not follow the default MPR values.                      A-MPR (additional MPR) was disabled during SAR testing</p>	Modulation	Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> )						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	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3	256 QAM	≥ 1						≤ 5
Modulation	Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> )						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																																																								
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2																																																								
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3																																																								
256 QAM	≥ 1						≤ 5																																																								
Power reduction	Yes																																																														
Spectrum plots for RB configurations	A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																																														

**Notes:**

- SAR Testing for LTE was performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

### 6.5. LTE (TDD) Considerations

According to KDB 941225 D05 SAR for LTE Devices, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

LTE TDD Bands support 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

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

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$		
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-		
9	$13168 \cdot T_s$			-		

#### Calculated Duty Cycle

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

Calculated Duty Cycle = Extended cyclic prefix in uplink x ( $T_s$ ) x # of S + # of U

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle =  $5120 \times [1/(15000 \times 2048)] \times 2 + 6 \text{ ms} = 63.33\%$

where

$T_s = 1/(15000 \times 2048)$  seconds

**Note(s):**

This device supports uplink-downlink configurations 0-6. The configuration with highest duty cycle was used for SAR Testing: configuration 0 at 63.3% duty cycle for Power class 3, configuration 1 at 43.3% duty cycle for Power class 2 and Special Subframe 7.

### 6.6. LTE Carrier Aggregation

#### DL Inter-Band (2CC Max)

E-UTRA CA configuration (BCS)	E-UTRA Band	Bandwidth						Max Aggregated BW
		1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
CA_2A-4A (0)(1)(2)	Band 2	Yes	Yes	Yes	Yes	Yes	Yes	40 MHz
	Band 4			Yes	Yes	Yes	Yes	
	Band 2			Yes	Yes			20 MHz
	Band 4			Yes	Yes			
	Band 2			Yes	Yes	Yes	Yes	40 MHz
	Band 4			Yes	Yes	Yes	Yes	
CA_2A-5A (0)(1)	Band 2			Yes	Yes	Yes	Yes	30 MHz
	Band 5			Yes	Yes			
	Band 2			Yes	Yes			20 MHz
	Band 5			Yes	Yes			
CA_2A-7A(0)	Band 2			Yes	Yes	Yes	Yes	40 MHz
	Band 7			Yes	Yes	Yes	Yes	
CA_2A-12A (0)(1)(2)	Band 2			Yes	Yes	Yes	Yes	30 MHz
	Band 12			Yes	Yes			
	Band 2			Yes	Yes	Yes	Yes	30 MHz
	Band 12		Yes	Yes	Yes			
	Band 2			Yes	Yes			20 MHz
	Band 12			Yes	Yes			
CA_2A-13A (0)(1)	Band 2			Yes	Yes	Yes	Yes	30 MHz
	Band 13				Yes			
	Band 2			Yes	Yes			20 MHz
	Band 13				Yes			
CA_2A-17A (0)	Band 2			Yes	Yes			20 MHz
	Band 17			Yes	Yes			
CA_2A-66A (0)(1)(2)	Band 2	Yes	Yes	Yes	Yes	Yes	Yes	40 MHz
	Band 66			Yes	Yes	Yes	Yes	
	Band 2			Yes	Yes			20 MHz
	Band 66			Yes	Yes			
	Band 2			Yes	Yes	Yes	Yes	40 MHz
	Band 66			Yes	Yes	Yes	Yes	
CA_4A-5A (0)(1)	Band 4			Yes	Yes			20 MHz
	Band 5			Yes	Yes			
	Band 4			Yes	Yes	Yes	Yes	30 MHz
	Band 5			Yes	Yes			
CA_4A-7A (0)(1)	Band 4			Yes	Yes			30 MHz
	Band 7			Yes	Yes	Yes	Yes	
	Band 4			Yes	Yes	Yes	Yes	40 MHz
	Band 7			Yes	Yes	Yes	Yes	

**DL Inter-Band (2CC Max) (Continued)**

E-UTRA CA configuration (BCS)	E-UTRA Band	Bandwidth						Max Aggregated BW
		1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
CA_4A-12A (0)(1)(2)(3)(4)(5)	Band 4	Yes	Yes	Yes	Yes			20 MHz
	Band 12			Yes	Yes			
	Band 4	Yes	Yes	Yes	Yes	Yes	Yes	30 MHz
	Band 12			Yes	Yes			
	Band 4			Yes	Yes	Yes	Yes	30 MHz
	Band 12		Yes	Yes	Yes			
	Band 4			Yes	Yes			20 MHz
	Band 12			Yes	Yes			
	Band 4			Yes	Yes	Yes	Yes	30 MHz
	Band 12			Yes	Yes			
	Band 4			Yes	Yes	Yes		20 MHz
	Band 12			Yes				
CA_4A-13A (0)(1)	Band 4			Yes	Yes	Yes	Yes	30 MHz
	Band 13				Yes			
	Band 4			Yes	Yes			20 MHz
	Band 13				Yes			
CA_4A-17A (0)	Band 4			Yes	Yes			20 MHz
	Band 17			Yes	Yes			
CA_5A-7A (0)(1)	Band 5	Yes	Yes	Yes	Yes			30 MHz
	Band 7				Yes	Yes	Yes	
	Band 5			Yes	Yes			30 MHz
	Band 7				Yes	Yes	Yes	
CA_5A-41A (0)	Band 5			Yes	Yes			30 MHz
	Band 41						Yes	
CA_12A-66A (0)(1)(2)(3)(4)(5)	Band 12			Yes	Yes			20 MHz
	Band 66	Yes	Yes	Yes	Yes			
	Band 12			Yes	Yes			30 MHz
	Band 66	Yes	Yes	Yes	Yes	Yes	Yes	
	Band 12		Yes	Yes	Yes			30 MHz
	Band 66			Yes	Yes	Yes	Yes	
	Band 12			Yes	Yes			20 MHz
	Band 66			Yes	Yes			
	Band 12			Yes	Yes			30 MHz
	Band 66			Yes	Yes	Yes	Yes	
	Band 12			Yes				20 MHz
	Band 66			Yes	Yes	Yes		

**DL Inter-Band (3CC Max)**

E-UTRA CA configuration (BCS)	E-UTRA Band	Bandwidth						Max Aggregated BW
		1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
CA_2A-4A-5A (0)	Band 2			Yes	Yes	Yes	Yes	50 MHz
	Band 4			Yes	Yes	Yes	Yes	
	Band 5			Yes	Yes			
CA_2A-4A-7A (0)	Band 2			Yes	Yes	Yes	Yes	60 MHz
	Band 4			Yes	Yes	Yes	Yes	
	Band 7			Yes	Yes	Yes	Yes	
CA_2A-4A-13A (0)	Band 2			Yes	Yes	Yes	Yes	50 MHz
	Band 4			Yes	Yes	Yes	Yes	
	Band 13				Yes			
CA_2A-7A-7A (0)	Band 2			Yes	Yes	Yes	Yes	60 MHz
	Band 7	See CA_7A-7A (1)						
CA_2A-7C (0)	Band 2			Yes	Yes	Yes	Yes	60 MHz
	Band 7	See CA_7C (1)						
CA_4A-4A-12A (0)	Band 4	See CA_4A-4A (0)						50 MHz
	Band 12			Yes	Yes			
CA_4A-4A-17A (0)	Band 4	See CA_4A-4A (0)						50 MHz
	Band 17				Yes			
CA_4A-7C (0)	Band 4			Yes	Yes	Yes	Yes	60 MHz
	Band 7	See CA_7C (1)						
CA_5A-7A-7A (0)	Band 5			Yes	Yes			50 MHz
	Band 7	See CA_7A-7A (3)						
CA_5A-7C (0)	Band 5			Yes	Yes			50 MHz
	Band 7	See CA_7C (1)						
CA_7A-66A-66A (0)	Band 7			Yes	Yes	Yes	Yes	60 MHz
	Band 66	See CA_66A-66A (0)						
CA_12A-66A-66A (0)	Band 12			Yes	Yes			50 MHz
	Band 66	See CA_66A-66A (0)						

**DL Inter-Band (4CC Max)**

E-UTRA CA configuration (BCS)	E-UTRA Band	Bandwidth						Max Aggregated BW
		1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
CA_7C-66A-66A (0)	Band 7	See CA_7C (1)						60 MHz
	Band 66	See CA_66A-66A (0)						

**DL Inter-Band (Nom-Contiguous)**

E-UTRA CA configuration (BCS)	E-UTRA Band	Allowed Channel BW Per Carrier (MHz)					Max Aggregated BW
		1st Carrier	2nd Carrier	3rd Carrier	4th Carrier	5th Carrier	
CA_2A-2A(0)	Band 2	5,10,15,20	5,10,15,20				40 MHz
CA_4A-4A (0)(1)	Band 4	5,10,15,20	5,10,15,20				40 MHz
	Band 4	5,10	5,10				20 MHz
CA_7A-7A (0)(1)(2)(3)	Band 7	5	15				40 MHz
		10	10,15				
		15	15,20				
		20	20				
	Band 7	5,10,15,20	5,10,15,20				40 MHz
	Band 7	5,10,15,20	5,10				30 MHz
	Band 7	10,15,20	10,15,20				40 MHz
CA_41A-41A (0)(1)	Band 41	10,15,20	10,15,20				40 MHz
	Band 41	5,10,15,20	5,10,15,20				40 MHz
CA_66A-66A(0)	Band 66	5,10,15,20	5,10,15,20				40 MHz
CA_41A-41C (0)	Band 41	5,10,15,20	See CA_41C (1)				60 MHz
		See CA_41C (1)	5,10,15,20				
CA_41C-41C (0)	Band 41	See CA_41C (0)					80 MHz
	Band 41	See CA_41C (0)					
CA_41A-41D (0)	Band 41	5,10,15,20	See CA_41D (0)				80 MHz
	Band 41	See CA_41D (0)	5,10,15,20				

**DL Inter-Band (Contiguous)**

E-UTRA CA configuration (BCS)	E-UTRA Band	Allowed Channel BW Per Carrier (MHz)					Max Aggregated BW
		1st Carrier	2nd Carrier	3rd Carrier	4th Carrier	5th Carrier	
CA_2C (0)	Band 2	5	20				40 MHz
		10	15,20				
		15	10,15,20				
		20	5,10,15,20				
CA_7C (0)(1)(2)	Band 7	15	15				40 MHz
		20	20				40 MHz
		10	20				
		15	15,20				40 MHz
		20	10,15,20				
		15	10,15				40 MHz
		20	15,20				
CA_38C (0)	Band 38	15	15				40 MHz
		20	20				
CA_41C (0)(1)(2)(3)	Band 41	10	20				40 MHz
		15	15,20				
		20	10,15,20				
	Band 41	5,10	20				40 MHz
		15	15,20				
		20	5,10,15,20				
	Band 41	10	15,20				40 MHz
		15	10,15,20				
		20	10,15,20				
	Band 41	10	20				40 MHz
		20	20				
	CA_66B (0)	Band 66	5	5,10,15			
10			5,10				
15			5				
CA_66C (0)	Band 66	5	20				40 MHz
		10	15,20				
		15	10,15,20				
		20	5,10,15,20				

**DL Inter-Band (Contiguous) (continued)**

E-UTRA CA configuration (BCS)	E-UTRA Band	Allowed Channel BW Per Carrier (MHz)					Max Aggregated BW
		1st Carrier	2nd Carrier	3rd Carrier	4th Carrier	5th Carrier	
CA_41D (0)	Band 41	10	20	15			60 MHz
		10	15,20	20			
		15	20	10,15			
		15	10,15,20	20			
		20	15,20	10			
		20	10,15,20	15,20			

**UL Inter-Band (Contiguous)**

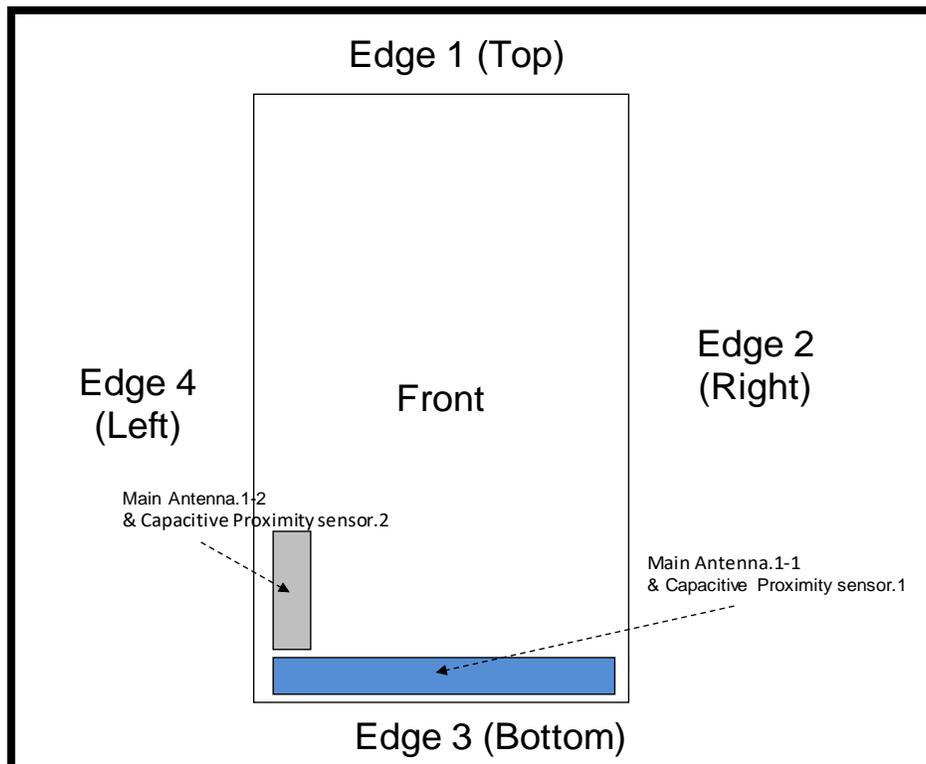
E-UTRA CA configuration (BCS)	E-UTRA Band	Allowed Channel BW Per Carrier (MHz)					Max Aggregated BW
		1st Carrier	2nd Carrier	3rd Carrier	4th Carrier	5th Carrier	
CA_7C (0)(1)(2)	Band 7	15	15				40 MHz
		20	20				40 MHz
		10	20				
		15	15,20				
		20	10,15,20				40 MHz
		15	10,15				
		20	15,20				
CA_38C (0)	Band 38	15	15				40 MHz
		20	20				

**Note(s):**

1. For supported channels, please refer to §6.4.
2. This device supports DL 4X4 MIMO for LTE Band 4, 7, 66. Please refer to Sec.9.3.1 for detailed LTE CA combination with 4X4 DL MIMO.

## 6.7. Proximity Sensor feature

The DUT has two proximity sensors to reduce the output power. The position of the sensors and antenna are as shown in the graphic.



### Notes:

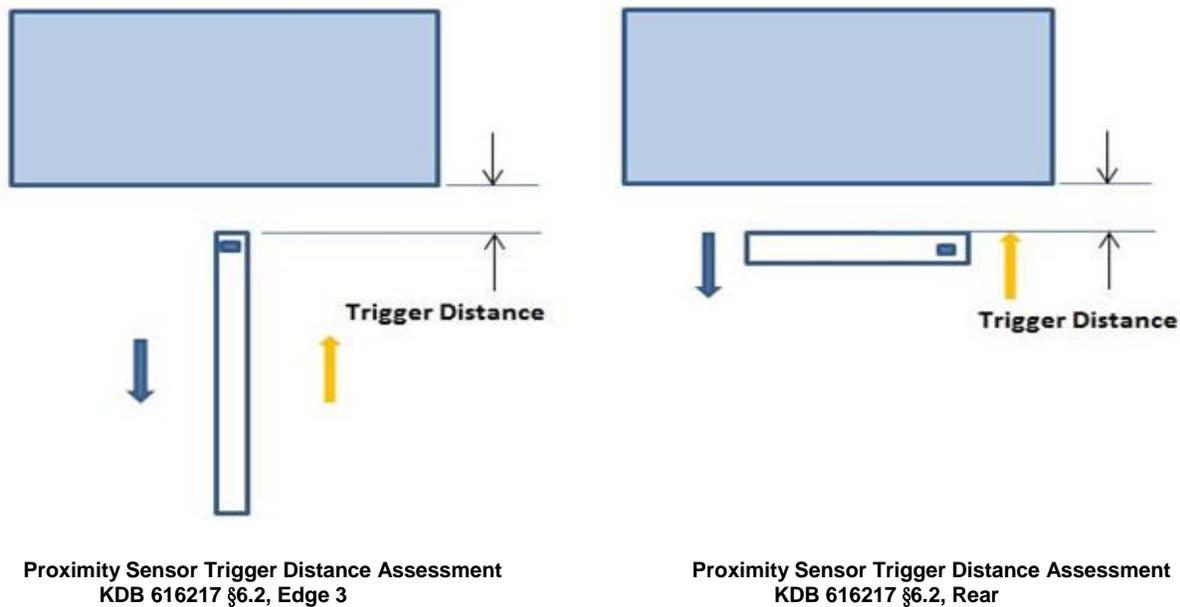
1. Proximity sensor.1 is related to only Main Antenna.1-1.
2. Proximity sensor.2 is related to only Main Antenna.1-2.

### 6.7.1. Proximity Sensor Triggering Distance (KDB 616217 §6.2)

Rear and Edge 3 of the DUT was placed directly below the flat phantom. The DUT was moved toward the phantom in accordance with the steps outlined in KDB 616217 §6.2 to determine the trigger distance for enabling power reduction. The DUT was moved away from the phantom to determine the trigger distance for resuming full power.

The DUT featured a visual indicator on its display that showed the status of the proximity sensor (Triggered or not triggered). This was used to determine the status of the sensor during the proximity sensor assessment as monitoring the output power directly was not practical without affecting the measurement.

It was confirmed separately that the output power was altered according to the proximity sensor status indication. This was achieved by observing the proximity sensor status at the same time as monitoring the conducted power. Section 9 contains both the full and reduced conducted power measurements.



**LEGEND**

- Direction of DUT travel for determination of power reduction triggering point
- Direction of DUT travel for determination of full power resumption triggering point

#### Summary of Trigger Distances

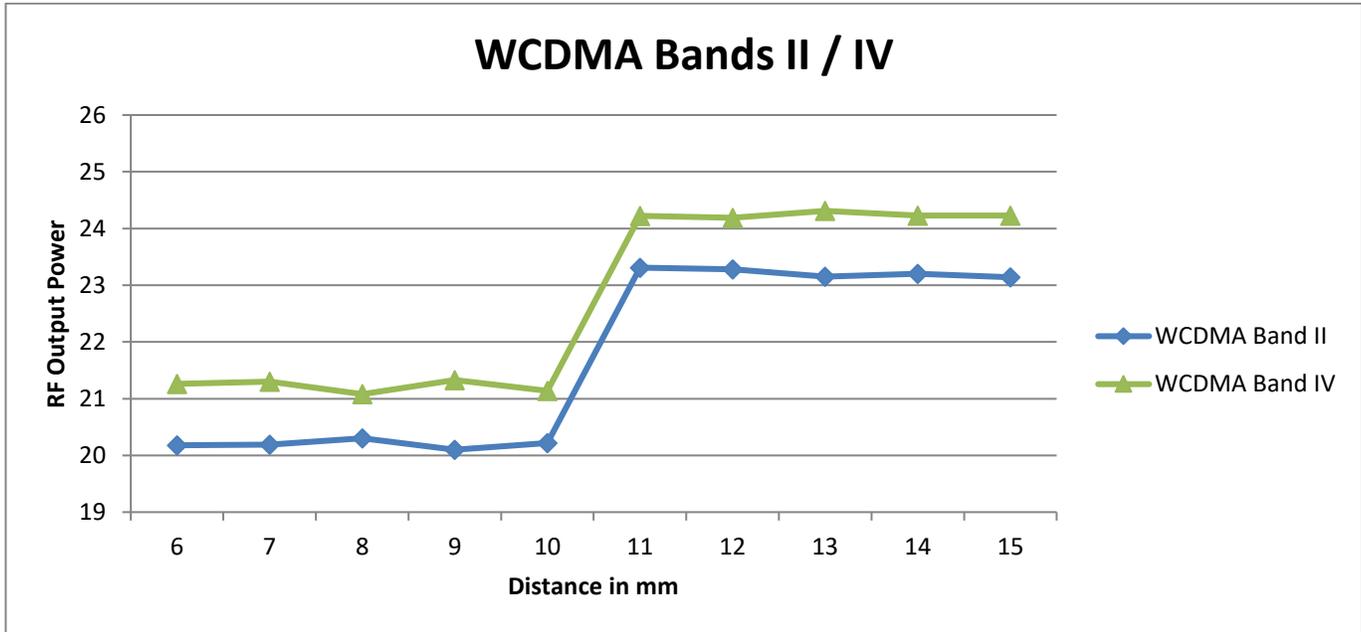
Tissue simulating liquid	Antenna	Trigger distance - Rear		Trigger distance – Edge 3	
		Moving toward phantom	Moving from phantom	Moving toward phantom	Moving from phantom
1750 Body	Main Ant.1-1	10 mm	10 mm	13 mm	13 mm
1900 Body	Main Ant.1-1	10 mm	10 mm	13 mm	13 mm
2600 Body	Main Ant.1-2	10 mm	10 mm	13 mm	13 mm

**Proximity Sensor Triggering Distance Measurement Results**

**WCDMA Bands II / IV**

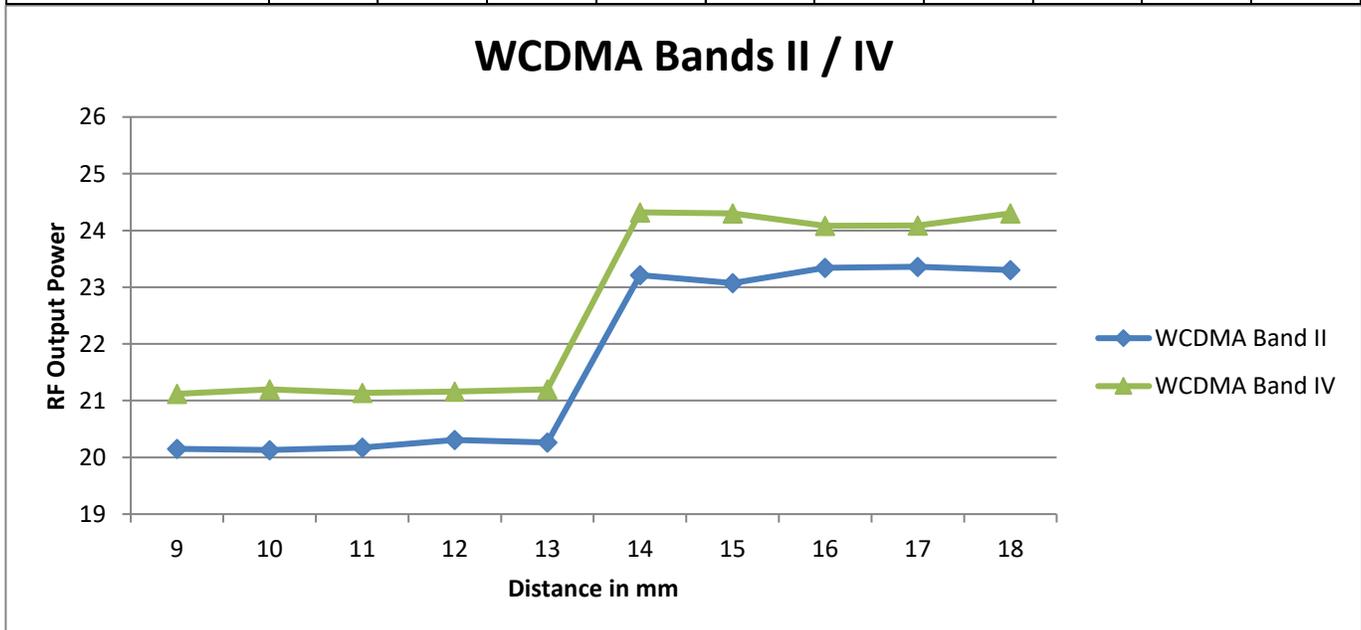
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	6	7	8	9	10	11	12	13	14	15
WCDMA Band II	20.2	20.2	20.3	20.1	20.2	23.3	23.3	23.2	23.2	23.1
WCDMA Band IV	21.3	21.3	21.1	21.3	21.1	24.2	24.2	24.3	24.2	24.2



Edge 3, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

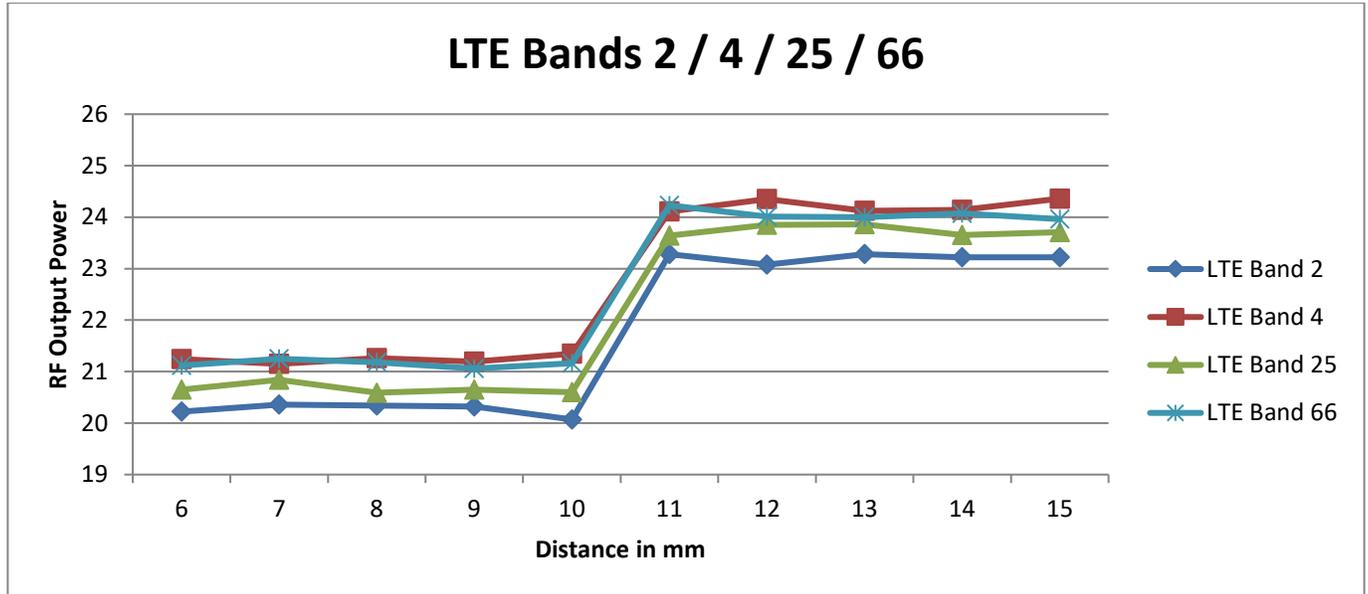
Distance to DUT vs. Output Power in dBm										
Distance (mm)	9	10	11	12	13	14	15	16	17	18
WCDMA Band II	20.2	20.1	20.2	20.3	20.3	23.2	23.1	23.3	23.4	23.3
WCDMA Band IV	21.1	21.2	21.1	21.2	21.2	24.3	24.3	24.1	24.1	24.3



**LTE Bands 2 / 4 / 25 / 66 (Main Ant.1-1)**

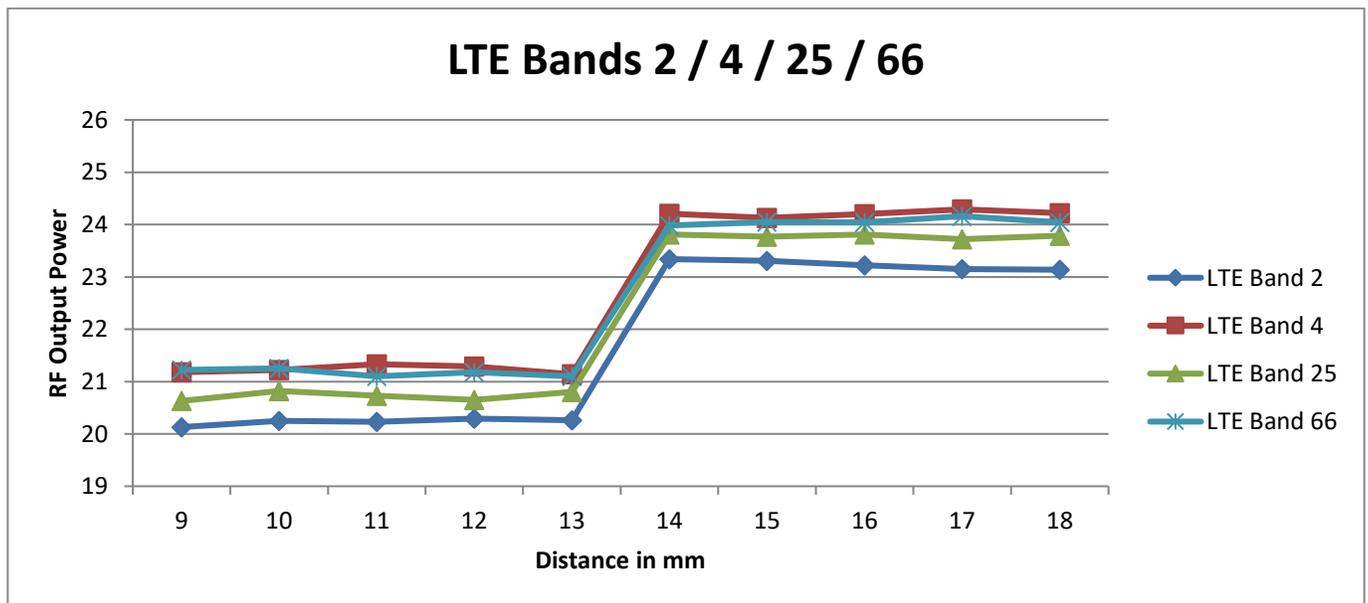
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	6	7	8	9	10	11	12	13	14	15
LTE Band 2	20.2	20.4	20.3	20.3	20.1	23.3	23.1	23.3	23.2	23.2
LTE Band 4	21.2	21.2	21.3	21.2	21.4	24.1	24.4	24.1	24.1	24.4
LTE Band 25	20.7	20.8	20.6	20.7	20.6	23.6	23.9	23.9	23.7	23.7
LTE Band 66	21.1	21.3	21.2	21.1	21.2	24.2	24.0	24.0	24.1	24.0



Edge 3, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

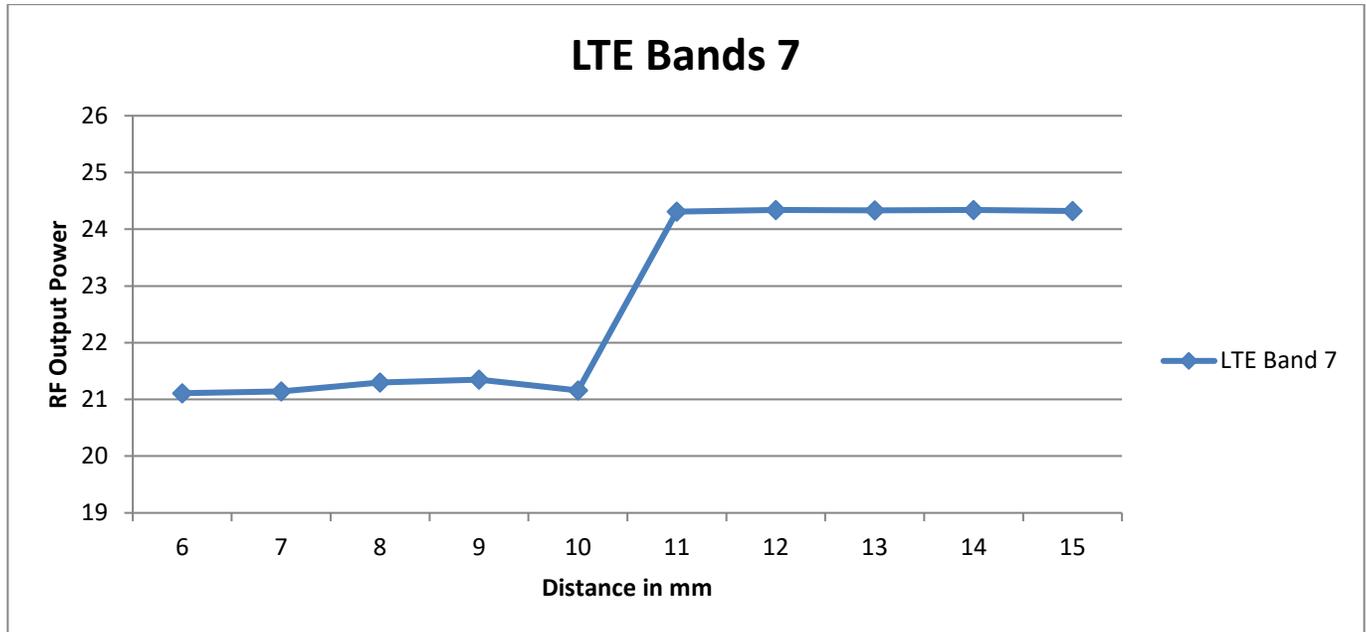
Distance to DUT vs. Output Power in dBm										
Distance (mm)	9	10	11	12	13	14	15	16	17	18
LTE Band 2	20.1	20.3	20.2	20.3	20.3	23.3	23.3	23.2	23.2	23.1
LTE Band 4	21.2	21.2	21.3	21.3	21.1	24.2	24.1	24.2	24.3	24.2
LTE Band 25	20.6	20.8	20.7	20.7	20.8	23.8	23.8	23.8	23.7	23.8
LTE Band 66	21.2	21.3	21.1	21.2	21.1	24.0	24.1	24.0	24.2	24.0



**LTE Bands 7 (Main Ant.1-2)**

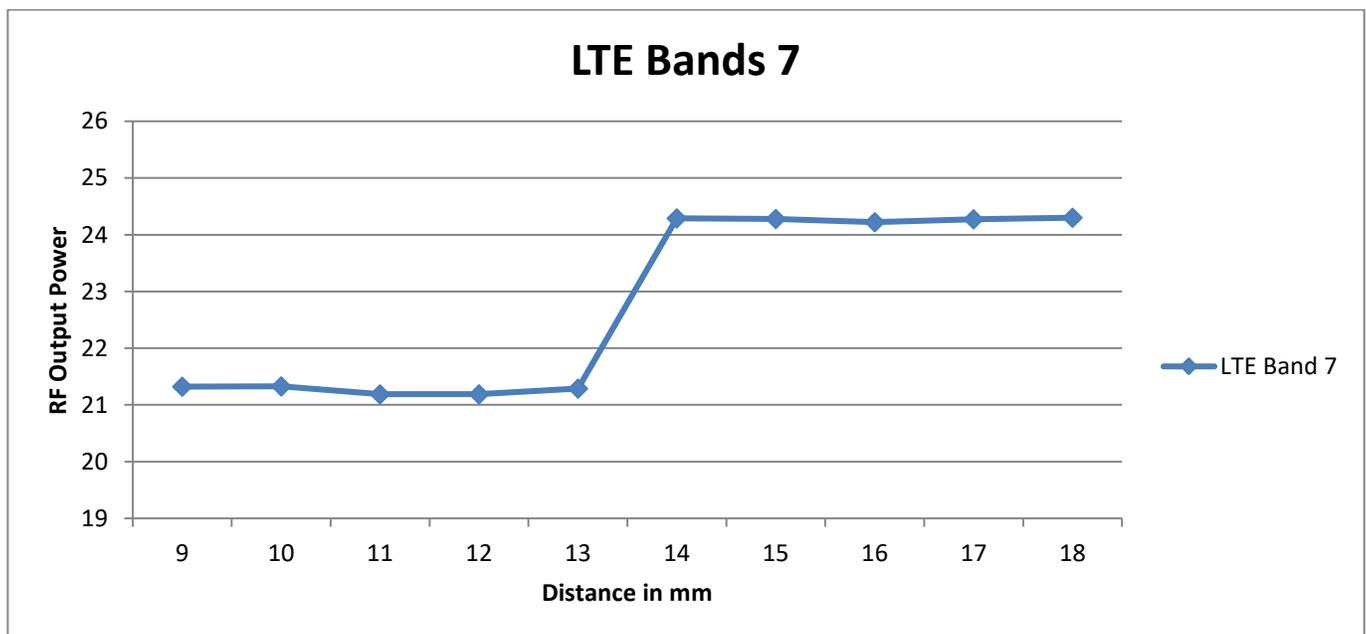
Rear, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	6	7	8	9	10	11	12	13	14	15
LTE Band 7	21.1	21.1	21.3	21.4	21.2	24.3	24.3	24.3	24.3	24.3



Edge 3, DUT Moving Toward (Trigger) and Away (Release) from the Phantom

Distance to DUT vs. Output Power in dBm										
Distance (mm)	9	10	11	12	13	14	15	16	17	18
LTE Band 7	21.3	21.3	21.2	21.2	21.3	24.3	24.3	24.2	24.3	24.3



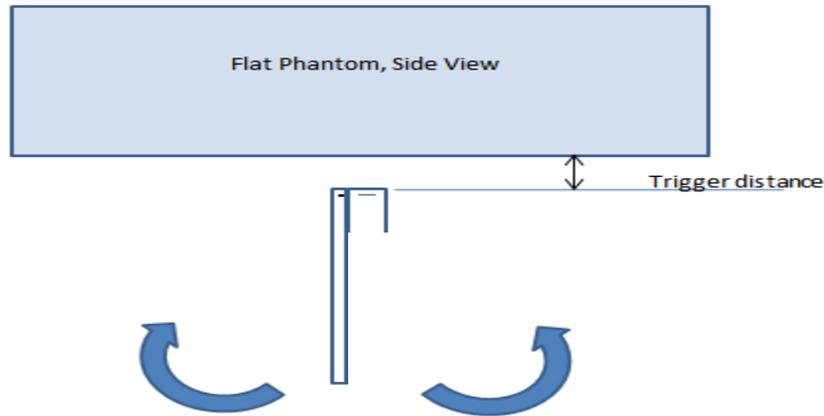
### 6.7.2. Proximity Sensor Coverage (KDB 616217 §6.3)

As there is no spatial offset between the antenna and the proximity sensor element, proximity sensor coverage did not need to be assessed.

### 6.7.3. Proximity Sensor Tilt Angle Assessment (KDB 616217 §6.4)

The DUT was positioned directly below the flat phantom at the minimum measured trigger distance with Edge 3 parallel to the base of the flat phantom for each band.

The EUT was rotated about Edge 3 for angles up to +/- 45°. If the output power increased during the rotation the DUT was moved 1mm toward the phantom and the rotation repeated. This procedure was repeated until the power remained reduced for all angles up to +/- 45°.



Proximity sensor tilt angle assessment (Edge 3) KDB 616217 §6.4

### Summary of Tablet Tilt Angle Influence to Proximity Sensor Triggering (Edge 3)

Band (MHz)	Minimum trigger distance measured according to KDB 616217 §6.2	Minimum distance at which power reduction was maintained over +/-45°	Power reduction status										
			-45°	-40°	-30°	-20°	-10°	0°	10°	20°	30°	40°	45°
1750	13 mm	13 mm	On	On	On	On	On	On	On	On	On	On	On
1900	13 mm	13 mm	On	On	On	On	On	On	On	On	On	On	On
2600	13 mm	13 mm	On	On	On	On	On	On	On	On	On	On	On

### 6.7.4. Resulting test positions for SAR measurements

Wireless technologies	DUT Position	§6.2 Triggering Distance	§6.3 Coverage	§6.4 Tilt Angle	Worst case distance for SAR
WWAN (Main Ant.1-1 & Main Ant.1-2)	Rear	10 mm	N/A	N/A	9 mm
	Edge 3	13 mm	N/A	13 mm	12 mm

## 7. RF Exposure Conditions (Test Configurations)

Refer to Appendix A for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

Wireless technologies	RF Exposure Conditions	Antennaa	DUT-to-User Separation	Test Position	Antenna-to-edge/surface	SAR Required	Note	
WWAN	Head	Main Ant. 1 & 2	0 mm	Left Touch	N/A	Yes		
				Left Tilt (15°)	N/A	Yes		
				Right Touch	N/A	Yes		
				Right Tilt (15°)	N/A	Yes		
	Body	Main Ant. 1 & 2	15 mm	Rear	N/A	Yes		
				Front	N/A	Yes		
	Hotspot	Main Ant.1	10 mm	Rear	< 25 mm	Yes		
				Front	< 25 mm	Yes		
				Edge 1 (Top)	> 25 mm	No	1	
				Edge 2 (Right)	< 25 mm	Yes		
				Edge 3 (Bottom)	< 25 mm	Yes		
	Hotspot	Main Ant.2	10 mm	Edge 4 (Left)	< 25 mm	Yes		
				Rear	< 25 mm	Yes		
				Front	< 25 mm	Yes		
				Edge 1 (Top)	> 25 mm	No	1	
				Edge 2 (Right)	> 25 mm	No	1	
	Product Specific 10-g	Main Ant.1 & Main Ant. 2	0 mm	Edge 3 (Bottom)	< 25 mm	Yes		
				Edge 4 (Left)	< 25 mm	Yes		
				Rear		Refer to notes 2 & 3		
				Front				
Edge 1 (Top)								
Edge 2 (Right)								
Edge 3 (Bottom)								
WLAN & BT	Head	WLAN/BT Ant.1 & WLAN Ant.2	0 mm	Left Touch	N/A	Yes		
				Left Tilt (15°)	N/A	Yes		
				Right Touch	N/A	Yes		
				Right Tilt (15°)	N/A	Yes		
	Body	WLAN/BT Ant.1 & WLAN Ant.2	15 mm	Rear	N/A	Yes		
				Front	N/A	Yes		
	Hotspot	WLAN/BT Ant.1 & WLAN Ant.2	10 mm	Rear	< 25 mm	Yes		
				Front	< 25 mm	Yes		
				Edge 1 (Top)	< 25 mm	Yes		
				Edge 2 (Right)	> 25 mm	No	1	
				Edge 3 (Bottom)	> 25 mm	No	1	
	Product Specific 10-g	WLAN/BT Ant.1 & WLAN Ant.2	0 mm	Edge 4 (Left)	< 25 mm	Yes		
				Rear		Refer to notes 2 & 4		
				Front				
				Edge 1 (Top)				
Edge 2 (Right)								
Edge 3 (Bottom)								
Edge 4 (Left)								

**Notes:**

- SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.
- For Phablet devices: When hotspot mode applies, Product specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.
- For Phablet devices : When hotspot mode applies and power reduction applies to hotspot mode, Product specific 10-g SAR is required for each test position that has and adjusted SAR to maximum power that is > 1.2 W/kg.
- For Phablet devices: When hotspot mode is not supported, Product specific 10-g SAR is required for all surfaces and edges with an antenna located at ≤ 25mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions.
- WIFI1 and WIFI2 as indicated in antenna specification are written as ANT1 (Antenna 1) and ANT2 (Antenna 2) in this report

## 8. Dielectric Property Measurements & System Check

### 8.1 Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within  $\pm 2^\circ\text{C}$  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.

#### Tissue Dielectric Parameters

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

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

#### IEEE Std 1528-2013

Refer to Table 3 within the IEEE Std 1528-2013

**Dielectric Property Measurements Results:**

**SAR 1 Room**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)		
6-5-2019	Head 2450	e'	40.5300	Relative Permittivity (ε):	40.53	39.20	3.39	5	
		e"	13.2400	Conductivity (σ):	1.80	1.80	0.20	5	
	Head 2400	e'	40.7400	Relative Permittivity (ε):	40.74	39.30	3.67	5	
		e"	13.1400	Conductivity (σ):	1.75	1.75	0.11	5	
	Head 2480	e'	40.4200	Relative Permittivity (ε):	40.42	39.16	3.21	5	
		e"	13.3400	Conductivity (σ):	1.84	1.83	0.39	5	
6-5-2019	Body 2450	e'	51.2200	Relative Permittivity (ε):	51.22	52.70	-2.81	5	
		e"	14.0800	Conductivity (σ):	1.92	1.95	-1.64	5	
	Body 2400	e'	51.3600	Relative Permittivity (ε):	51.36	52.77	-2.68	5	
		e"	13.9400	Conductivity (σ):	1.86	1.90	-1.99	5	
	Body 2480	e'	51.1200	Relative Permittivity (ε):	51.12	52.66	-2.93	5	
		e"	14.1700	Conductivity (σ):	1.95	1.99	-1.92	5	
6-6-2019	Body 2600	e'	50.8300	Relative Permittivity (ε):	50.83	52.51	-3.20	5	
		e"	15.2400	Conductivity (σ):	2.20	2.16	1.96	5	
	Body 2500	e'	51.2100	Relative Permittivity (ε):	51.21	52.64	-2.71	5	
		e"	15.0100	Conductivity (σ):	2.09	2.02	3.28	5	
	Body 2700	e'	50.4900	Relative Permittivity (ε):	50.49	52.38	-3.62	5	
		e"	15.4700	Conductivity (σ):	2.32	2.30	0.92	5	
6-6-2019	Head 5250	e'	37.2500	Relative Permittivity (ε):	37.25	35.93	3.66	5	
		e"	15.7800	Conductivity (σ):	4.61	4.70	-2.04	5	
	Head 5260	e'	37.2300	Relative Permittivity (ε):	37.23	35.92	3.64	5	
		e"	15.7800	Conductivity (σ):	4.62	4.71	-2.06	5	
	Head 5600	e'	36.6200	Relative Permittivity (ε):	36.62	35.53	3.06	5	
		e"	15.9100	Conductivity (σ):	4.95	5.06	-2.10	5	
	Head 5750	e'	36.3400	Relative Permittivity (ε):	36.34	35.36	2.76	5	
		e"	15.9800	Conductivity (σ):	5.11	5.21	-2.01	5	
	Head 5825	e'	36.1900	Relative Permittivity (ε):	36.19	35.30	2.52	5	
		e"	16.0100	Conductivity (σ):	5.19	5.27	-1.60	5	
	6-10-2019	Body 2600	e'	51.1800	Relative Permittivity (ε):	51.18	52.51	-2.53	5
			e"	14.6100	Relative Permittivity (ε):	2.11	2.16	-2.25	5
Body 2500		e'	51.4800	Relative Permittivity (ε):	51.48	52.64	-2.20	5	
		e"	14.3500	Relative Permittivity (ε):	1.99	2.02	-1.26	5	
Body 2700		e'	50.8800	Relative Permittivity (ε):	50.88	52.38	-2.87	5	
		e"	14.8500	Relative Permittivity (ε):	2.23	2.30	-3.13	5	
6-10-2019	Head 2600	e'	37.9100	Relative Permittivity (ε):	37.91	39.01	-2.82	5	
		e"	13.5900	Relative Permittivity (ε):	1.96	1.96	0.13	5	
	Head 2500	e'	38.3000	Relative Permittivity (ε):	38.30	39.14	-2.14	5	
		e"	13.3600	Relative Permittivity (ε):	1.86	1.85	0.17	5	
	Head 2700	e'	37.5300	Relative Permittivity (ε):	37.53	38.88	-3.48	5	
		e"	13.7900	Relative Permittivity (ε):	2.07	2.07	0.00	5	
6-13-2019	Head 2450	e'	39.4100	Relative Permittivity (ε):	39.41	39.20	0.54	5	
		e"	12.9300	Relative Permittivity (ε):	1.76	1.80	-2.14	5	
	Head 2400	e'	39.5100	Relative Permittivity (ε):	39.51	39.30	0.54	5	
		e"	12.7900	Relative Permittivity (ε):	1.71	1.75	-2.56	5	
	Head 2480	e'	39.3300	Relative Permittivity (ε):	39.33	39.16	0.43	5	
		e"	13.0500	Relative Permittivity (ε):	1.80	1.83	-1.80	5	
6-13-2019	Body 2450	e'	53.6800	Relative Permittivity (ε):	53.68	52.70	1.86	5	
		e"	14.6700	Relative Permittivity (ε):	2.00	1.95	2.49	5	
	Body 2400	e'	53.7500	Relative Permittivity (ε):	53.75	52.77	1.85	5	
		e"	14.5300	Relative Permittivity (ε):	1.94	1.90	2.16	5	
	Body 2480	e'	53.6100	Relative Permittivity (ε):	53.61	52.66	1.80	5	
		e"	14.7700	Relative Permittivity (ε):	2.04	1.99	2.24	5	
6-13-2019	Head 5250	e'	36.9500	Relative Permittivity (ε):	36.95	35.93	2.83	5	
		e"	15.6200	Relative Permittivity (ε):	4.56	4.70	-3.03	5	
	Head 5260	e'	36.9200	Relative Permittivity (ε):	36.92	35.92	2.78	5	
		e"	15.6300	Relative Permittivity (ε):	4.57	4.71	-2.99	5	
	Head 5600	e'	36.4300	Relative Permittivity (ε):	36.43	35.53	2.52	5	
		e"	15.7800	Relative Permittivity (ε):	4.91	5.06	-2.90	5	
	Head 5750	e'	36.2100	Relative Permittivity (ε):	36.21	35.36	2.40	5	
		e"	15.8800	Relative Permittivity (ε):	5.08	5.21	-2.62	5	
	Head 5825	e'	36.0900	Relative Permittivity (ε):	36.09	35.30	2.24	5	
		e"	15.9200	Relative Permittivity (ε):	5.16	5.27	-2.16	5	

**SAR 1 Room (Continued)**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
6-17-2019	Body 2600	e'	54.6500	Relative Permittivity ( $\epsilon_r$ ):	54.65	52.51	4.07	5
		e''	15.2300	Conductivity ( $\sigma$ ):	2.20	2.16	1.90	5
	Body 2500	e'	54.9100	Relative Permittivity ( $\epsilon_r$ ):	54.91	52.64	4.32	5
		e''	14.9800	Conductivity ( $\sigma$ ):	2.08	2.02	3.07	5
	Body 2700	e'	54.3800	Relative Permittivity ( $\epsilon_r$ ):	54.38	52.38	3.81	5
		e''	15.4400	Conductivity ( $\sigma$ ):	2.32	2.30	0.72	5
6-21-2019	Head 2600	e'	39.4600	Relative Permittivity ( $\epsilon_r$ ):	39.46	39.01	1.15	5
		e''	14.0100	Conductivity ( $\sigma$ ):	2.03	1.96	3.22	5
	Head 2500	e'	39.8400	Relative Permittivity ( $\epsilon_r$ ):	39.84	39.14	1.80	5
		e''	13.7100	Conductivity ( $\sigma$ ):	1.91	1.85	2.79	5
	Head 2700	e'	39.0300	Relative Permittivity ( $\epsilon_r$ ):	39.03	38.88	0.37	5
		e''	14.2200	Conductivity ( $\sigma$ ):	2.13	2.07	3.12	5

**SAR 3 Room**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
5-21-2019	Head 750	e'	43.3100	Relative Permittivity ( $\epsilon_r$ ):	43.31	41.96	3.21	5
		e''	21.4800	Conductivity ( $\sigma$ ):	0.90	0.89	0.30	5
	Head 700	e'	44.0000	Relative Permittivity ( $\epsilon_r$ ):	44.00	42.22	4.22	5
		e''	21.7900	Conductivity ( $\sigma$ ):	0.85	0.89	-4.62	5
	Head 790	e'	42.7800	Relative Permittivity ( $\epsilon_r$ ):	42.78	41.76	2.45	5
		e''	21.2300	Conductivity ( $\sigma$ ):	0.93	0.90	4.06	5
5-23-2019	Body 5250	e'	47.6200	Relative Permittivity ( $\epsilon_r$ ):	47.62	48.95	-2.72	5
		e''	18.3500	Conductivity ( $\sigma$ ):	5.36	5.35	0.07	5
	Body 5300	e'	47.5800	Relative Permittivity ( $\epsilon_r$ ):	47.58	48.88	-2.67	5
		e''	18.3500	Conductivity ( $\sigma$ ):	5.41	5.41	-0.07	5
	Body 5600	e'	47.0500	Relative Permittivity ( $\epsilon_r$ ):	47.05	48.48	-2.95	5
		e''	18.6500	Conductivity ( $\sigma$ ):	5.81	5.76	0.80	5
	Body 5750	e'	46.7900	Relative Permittivity ( $\epsilon_r$ ):	46.79	48.27	-3.08	5
		e''	18.8200	Conductivity ( $\sigma$ ):	6.02	5.94	1.37	5
	Body 5825	e'	46.6600	Relative Permittivity ( $\epsilon_r$ ):	46.66	48.20	-3.20	5
		e''	18.8800	Conductivity ( $\sigma$ ):	6.12	6.00	1.92	5
5-31-2019	Body 835	e'	56.1000	Relative Permittivity ( $\epsilon_r$ ):	56.10	55.20	1.63	5
		e''	20.8800	Conductivity ( $\sigma$ ):	0.97	0.97	-0.06	5
	Body 820	e'	56.2100	Relative Permittivity ( $\epsilon_r$ ):	56.21	55.28	1.69	5
		e''	20.9400	Conductivity ( $\sigma$ ):	0.95	0.97	-1.42	5
	Body 850	e'	55.9700	Relative Permittivity ( $\epsilon_r$ ):	55.97	55.16	1.47	5
		e''	20.8500	Conductivity ( $\sigma$ ):	0.99	0.99	-0.17	5
6-3-2019	Head 835	e'	40.7600	Relative Permittivity ( $\epsilon_r$ ):	40.76	41.50	-1.78	5
		e''	19.4100	Conductivity ( $\sigma$ ):	0.90	0.90	0.13	5
	Head 820	e'	40.9200	Relative Permittivity ( $\epsilon_r$ ):	40.92	41.60	-1.64	5
		e''	19.4400	Conductivity ( $\sigma$ ):	0.89	0.90	-1.35	5
	Head 850	e'	40.5800	Relative Permittivity ( $\epsilon_r$ ):	40.58	41.50	-2.22	5
		e''	19.3700	Conductivity ( $\sigma$ ):	0.92	0.92	0.05	5
6-3-2019	Body 835	e'	56.3400	Relative Permittivity ( $\epsilon_r$ ):	56.34	55.20	2.07	5
		e''	20.3800	Conductivity ( $\sigma$ ):	0.95	0.97	-2.45	5
	Body 820	e'	56.4400	Relative Permittivity ( $\epsilon_r$ ):	56.44	55.28	2.10	5
		e''	20.4800	Conductivity ( $\sigma$ ):	0.93	0.97	-3.58	5
	Body 850	e'	56.1600	Relative Permittivity ( $\epsilon_r$ ):	56.16	55.16	1.82	5
		e''	20.2500	Conductivity ( $\sigma$ ):	0.96	0.99	-3.05	5
6-6-2019	Body 835	e'	56.3400	Relative Permittivity ( $\epsilon_r$ ):	56.34	55.20	2.07	5
		e''	20.4800	Conductivity ( $\sigma$ ):	0.95	0.97	-1.97	5
	Body 820	e'	56.4300	Relative Permittivity ( $\epsilon_r$ ):	56.43	55.28	2.09	5
		e''	20.5200	Conductivity ( $\sigma$ ):	0.94	0.97	-3.39	5
	Body 850	e'	56.2300	Relative Permittivity ( $\epsilon_r$ ):	56.23	55.16	1.95	5
		e''	20.4600	Conductivity ( $\sigma$ ):	0.97	0.99	-2.04	5
6-7-2019	Head 835	e'	41.5000	Relative Permittivity ( $\epsilon_r$ ):	41.50	41.50	0.00	5
		e''	19.1600	Conductivity ( $\sigma$ ):	0.89	0.90	-1.16	5
	Head 820	e'	41.6800	Relative Permittivity ( $\epsilon_r$ ):	41.68	41.60	0.19	5
		e''	19.1800	Conductivity ( $\sigma$ ):	0.87	0.90	-2.67	5
	Head 850	e'	41.3200	Relative Permittivity ( $\epsilon_r$ ):	41.32	41.50	-0.43	5
		e''	19.1300	Conductivity ( $\sigma$ ):	0.90	0.92	-1.19	5

**SAR 3 Room (Continued)**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)		
6-7-2019	Body 5250	e'	48.8600	Relative Permittivity (ε <sub>r</sub> ):	48.86	48.95	-0.19	5	
		e"	18.1000	Conductivity (σ):	5.28	5.35	-1.29	5	
	Body 5300	e'	48.6700	Relative Permittivity (ε <sub>r</sub> ):	48.67	48.88	-0.44	5	
		e"	18.2300	Conductivity (σ):	5.37	5.41	-0.72	5	
	Body 5600	e'	48.1600	Relative Permittivity (ε <sub>r</sub> ):	48.16	48.48	-0.66	5	
		e"	18.5100	Conductivity (σ):	5.76	5.76	0.04	5	
	Body 5750	e'	47.8900	Relative Permittivity (ε <sub>r</sub> ):	47.89	48.27	-0.80	5	
		e"	18.7400	Conductivity (σ):	5.99	5.94	0.94	5	
	Body 5825	e'	47.8400	Relative Permittivity (ε <sub>r</sub> ):	47.84	48.20	-0.75	5	
		e"	18.7500	Conductivity (σ):	6.07	6.00	1.22	5	
	6-10-2019	Body 5250	e'	47.8400	Relative Permittivity (ε <sub>r</sub> ):	47.84	48.95	-2.27	5
			e"	18.5400	Conductivity (σ):	5.41	5.35	1.10	5
Body 5300		e'	47.7800	Relative Permittivity (ε <sub>r</sub> ):	47.78	48.88	-2.26	5	
		e"	18.5700	Conductivity (σ):	5.47	5.41	1.13	5	
Body 5600		e'	47.2500	Relative Permittivity (ε <sub>r</sub> ):	47.25	48.48	-2.53	5	
		e"	18.8700	Conductivity (σ):	5.88	5.76	1.99	5	
Body 5750		e'	47.0300	Relative Permittivity (ε <sub>r</sub> ):	47.03	48.27	-2.58	5	
		e"	19.0100	Conductivity (σ):	6.08	5.94	2.39	5	
Body 5825		e'	46.8800	Relative Permittivity (ε <sub>r</sub> ):	46.88	48.20	-2.74	5	
		e"	19.0900	Conductivity (σ):	6.18	6.00	3.05	5	
6-13-2019		Body 5250	e'	47.6800	Relative Permittivity (ε <sub>r</sub> ):	47.68	48.95	-2.60	5
			e"	17.9400	Conductivity (σ):	5.24	5.35	-2.17	5
	Body 5260	e'	47.6600	Relative Permittivity (ε <sub>r</sub> ):	47.66	48.94	-2.61	5	
		e"	17.9500	Conductivity (σ):	5.25	5.36	-2.14	5	
	Body 5600	e'	47.1200	Relative Permittivity (ε <sub>r</sub> ):	47.12	48.48	-2.80	5	
		e"	18.2400	Conductivity (σ):	5.68	5.76	-1.41	5	
	Body 5750	e'	46.8800	Relative Permittivity (ε <sub>r</sub> ):	46.88	48.27	-2.89	5	
		e"	18.3900	Conductivity (σ):	5.88	5.94	-0.95	5	
	Body 5825	e'	46.7600	Relative Permittivity (ε <sub>r</sub> ):	46.76	48.20	-2.99	5	
		e"	18.4600	Conductivity (σ):	5.98	6.00	-0.35	5	

**SAR 4 Room**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
5-13-2019	Body 1750	e'	53.4000	Relative Permittivity (ε <sub>r</sub> ):	53.40	53.44	-0.08	5
		e"	15.1500	Conductivity (σ):	1.47	1.49	-0.81	5
	Body 1710	e'	53.5200	Relative Permittivity (ε <sub>r</sub> ):	53.52	53.54	-0.04	5
		e"	15.2300	Conductivity (σ):	1.45	1.46	-0.92	5
	Body 1755	e'	53.3800	Relative Permittivity (ε <sub>r</sub> ):	53.38	53.43	-0.09	5
		e"	15.1300	Conductivity (σ):	1.48	1.49	-0.86	5
5-13-2019	Body 1900	e'	53.1100	Relative Permittivity (ε <sub>r</sub> ):	53.11	53.30	-0.36	5
		e"	14.8100	Conductivity (σ):	1.56	1.52	2.94	5
	Body 1850	e'	53.1800	Relative Permittivity (ε <sub>r</sub> ):	53.18	53.30	-0.23	5
		e"	14.9100	Conductivity (σ):	1.53	1.52	0.90	5
	Body 1910	e'	53.0900	Relative Permittivity (ε <sub>r</sub> ):	53.09	53.30	-0.39	5
		e"	14.8000	Conductivity (σ):	1.57	1.52	3.41	5

**SAR 5 Room**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
5-20-2019	Head 1900	e'	40.6000	Relative Permittivity ( $\epsilon_r$ ):	40.60	40.00	1.50	5
		e"	13.8100	Conductivity ( $\sigma$ ):	1.46	1.40	4.21	5
	Head 1850	e'	40.7500	Relative Permittivity ( $\epsilon_r$ ):	40.75	40.00	1.88	5
		e"	13.7500	Conductivity ( $\sigma$ ):	1.41	1.40	1.03	5
	Head 1910	e'	40.5700	Relative Permittivity ( $\epsilon_r$ ):	40.57	40.00	1.43	5
		e"	13.8300	Conductivity ( $\sigma$ ):	1.47	1.40	4.91	5
5-20-2019	Head 1750	e'	41.1100	Relative Permittivity ( $\epsilon_r$ ):	41.11	40.08	2.56	5
		e"	13.6300	Conductivity ( $\sigma$ ):	1.33	1.37	-3.12	5
	Head 1710	e'	41.3100	Relative Permittivity ( $\epsilon_r$ ):	41.31	40.15	2.90	5
		e"	13.5600	Conductivity ( $\sigma$ ):	1.29	1.35	-4.24	5
	Head 1755	e'	41.0900	Relative Permittivity ( $\epsilon_r$ ):	41.09	40.08	2.53	5
		e"	13.6300	Conductivity ( $\sigma$ ):	1.33	1.37	-3.04	5
5-21-2019	Body 750	e'	53.9600	Relative Permittivity ( $\epsilon_r$ ):	53.96	55.55	-2.86	5
		e"	23.9000	Conductivity ( $\sigma$ ):	1.00	0.96	3.49	5
	Body 700	e'	54.1200	Relative Permittivity ( $\epsilon_r$ ):	54.12	55.74	-2.90	5
		e"	25.0800	Conductivity ( $\sigma$ ):	0.98	0.96	1.77	5
	Body 790	e'	53.7900	Relative Permittivity ( $\epsilon_r$ ):	53.79	55.39	-2.89	5
		e"	22.9900	Conductivity ( $\sigma$ ):	1.01	0.97	4.52	5
5-23-2019	Body 1750	e'	54.2400	Relative Permittivity ( $\epsilon_r$ ):	54.24	53.44	1.50	5
		e"	15.0600	Conductivity ( $\sigma$ ):	1.47	1.49	-1.40	5
	Body 1710	e'	54.3200	Relative Permittivity ( $\epsilon_r$ ):	54.32	53.54	1.45	5
		e"	15.1100	Conductivity ( $\sigma$ ):	1.44	1.46	-1.70	5
	Body 1755	e'	54.2300	Relative Permittivity ( $\epsilon_r$ ):	54.23	53.43	1.50	5
		e"	15.0500	Conductivity ( $\sigma$ ):	1.47	1.49	-1.38	5
5-23-2019	Body 1900	e'	53.9100	Relative Permittivity ( $\epsilon_r$ ):	53.91	53.30	1.14	5
		e"	14.8800	Conductivity ( $\sigma$ ):	1.57	1.52	3.42	5
	Body 1850	e'	54.0100	Relative Permittivity ( $\epsilon_r$ ):	54.01	53.30	1.33	5
		e"	14.9800	Conductivity ( $\sigma$ ):	1.54	1.52	1.38	5
	Body 1910	e'	53.8900	Relative Permittivity ( $\epsilon_r$ ):	53.89	53.30	1.11	5
		e"	14.8800	Conductivity ( $\sigma$ ):	1.58	1.52	3.97	5
5-27-2019	Body 1750	e'	51.7000	Relative Permittivity ( $\epsilon_r$ ):	51.70	53.44	-3.26	5
		e"	14.8200	Conductivity ( $\sigma$ ):	1.44	1.49	-2.97	5
	Body 1710	e'	51.7900	Relative Permittivity ( $\epsilon_r$ ):	51.79	53.54	-3.28	5
		e"	14.9300	Conductivity ( $\sigma$ ):	1.42	1.46	-2.87	5
	Body 1755	e'	51.6900	Relative Permittivity ( $\epsilon_r$ ):	51.69	53.43	-3.25	5
		e"	14.8000	Conductivity ( $\sigma$ ):	1.44	1.49	-3.02	5
6-3-2019	Head 1900	e'	39.6200	Relative Permittivity ( $\epsilon_r$ ):	39.62	40.00	-0.95	5
		e"	13.7400	Conductivity ( $\sigma$ ):	1.45	1.40	3.68	5
	Head 1850	e'	39.8600	Relative Permittivity ( $\epsilon_r$ ):	39.86	40.00	-0.35	5
		e"	13.6800	Conductivity ( $\sigma$ ):	1.41	1.40	0.51	5
	Head 1910	e'	39.5700	Relative Permittivity ( $\epsilon_r$ ):	39.57	40.00	-1.08	5
		e"	13.7600	Conductivity ( $\sigma$ ):	1.46	1.40	4.38	5
6-3-2019	Body 1900	e'	52.1200	Relative Permittivity ( $\epsilon_r$ ):	52.12	53.30	-2.21	5
		e"	14.4800	Conductivity ( $\sigma$ ):	1.53	1.52	0.64	5
	Body 1850	e'	52.1800	Relative Permittivity ( $\epsilon_r$ ):	52.18	53.30	-2.10	5
		e"	14.5400	Conductivity ( $\sigma$ ):	1.50	1.52	-1.60	5
	Body 1910	e'	52.1000	Relative Permittivity ( $\epsilon_r$ ):	52.10	53.30	-2.25	5
		e"	14.4700	Conductivity ( $\sigma$ ):	1.54	1.52	1.10	5
6-6-2019	Head 2600	e'	39.2200	Relative Permittivity ( $\epsilon_r$ ):	39.22	39.01	0.54	5
		e"	13.8400	Conductivity ( $\sigma$ ):	2.00	1.96	1.97	5
	Head 2500	e'	39.4000	Relative Permittivity ( $\epsilon_r$ ):	39.40	39.14	0.67	5
		e"	13.7900	Conductivity ( $\sigma$ ):	1.92	1.85	3.39	5
	Head 2700	e'	39.0300	Relative Permittivity ( $\epsilon_r$ ):	39.03	38.88	0.37	5
		e"	13.8600	Conductivity ( $\sigma$ ):	2.08	2.07	0.51	5

**SAR 5 Room (Continued)**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
6-11-2019	Body 1750	e'	51.2800	Relative Permittivity ( $\epsilon_r$ ):	51.28	53.44	-4.04	5
		e"	14.8600	Conductivity ( $\sigma$ ):	1.45	1.49	-2.70	5
	Body 1710	e'	51.3300	Relative Permittivity ( $\epsilon_r$ ):	51.33	53.54	-4.13	5
		e"	14.9700	Conductivity ( $\sigma$ ):	1.42	1.46	-2.61	5
	Body 1755	e'	51.2800	Relative Permittivity ( $\epsilon_r$ ):	51.28	53.43	-4.02	5
		e"	14.8500	Conductivity ( $\sigma$ ):	1.45	1.49	-2.69	5
6-11-2019	Body 1900	e'	51.0800	Relative Permittivity ( $\epsilon_r$ ):	51.08	53.30	-4.17	5
		e"	14.6400	Conductivity ( $\sigma$ ):	1.55	1.52	1.75	5
	Body 1850	e'	51.1900	Relative Permittivity ( $\epsilon_r$ ):	51.19	53.30	-3.96	5
		e"	14.7100	Conductivity ( $\sigma$ ):	1.51	1.52	-0.45	5
	Body 1910	e'	51.0600	Relative Permittivity ( $\epsilon_r$ ):	51.06	53.30	-4.20	5
		e"	14.6300	Conductivity ( $\sigma$ ):	1.55	1.52	2.22	5
6-12-2019	Head 1900	e'	40.5500	Relative Permittivity ( $\epsilon_r$ ):	40.55	40.00	1.37	5
		e"	13.4400	Conductivity ( $\sigma$ ):	1.42	1.40	1.42	5
	Head 1850	e'	40.6500	Relative Permittivity ( $\epsilon_r$ ):	40.65	40.00	1.63	5
		e"	13.5600	Conductivity ( $\sigma$ ):	1.39	1.40	-0.37	5
	Head 1910	e'	40.5300	Relative Permittivity ( $\epsilon_r$ ):	40.53	40.00	1.33	5
		e"	13.4300	Conductivity ( $\sigma$ ):	1.43	1.40	1.88	5

## 8.2 System 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 re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

### 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 for SAR measurements ≤ 3 GHz and ≥ 10.0 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 2.5 mm.  
For 5 GHz band - Distance between probe sensors and phantom surface was set to 1.4 mm
- The dipole input power (forward power) was 100 mW.
- The results are normalized to 1 W input power.

### Reference Target SAR Values

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

System Dipole	Serial No.	Cal. Date	Freq. (MHz)	Target SAR Values (W/kg)		
				1g/10g	Head	Body
D750V3	1122	2-19-2018	750	1g	8.22	8.63
				10g	5.35	5.72
D835V2	4d174	1-23-2019	835	1g	9.28	9.47
				10g	6.04	6.23
D1750V2	1125	2-16-2018	1750	1g	36.50	36.80
				10g	19.30	19.50
D1900V2	5d190	10-23-2018	1900	1g	39.10	39.00
				10g	20.40	20.50
D2450V2	939	10-16-2018	2450	1g	53.20	50.10
				10g	24.80	23.50
D2600V2	1097	1-17-2018	2600	1g	56.40	54.40
				10g	25.30	24.20
D5GHzV2	1184	8-21-2018	5250	1g	81.10	75.00
				10g	23.40	20.90
			5600	1g	85.00	78.60
				10g	24.40	22.00
			5750	1g	82.60	76.20
				10g	23.70	21.20

### Note(s):

Refer to Appendix F that mentioned about justification for Extended SAR Dipole Calibrations (D750, SN : 1122, D1750, SN : 1125, D2600, SN : 1097)

**System 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.

**SAR 1 Room**

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
6-5-2019	D2450V2	939	Head	1g	5.17	51.7	53.20	-2.82	
				10g	2.36	23.6	24.80	-4.84	
6-5-2019	D2450V2	939	Body	1g	5.01	50.1	50.10	0.00	
				10g	2.36	23.6	23.50	0.43	
6-6-2019	D2600V2	1097	Body	1g	5.18	51.8	54.4	-4.78	1, 2
				10g	2.23	22.3	24.2	-7.85	
6-6-2019	D5GHzV2 (5250)	1184	Head	1g	7.69	76.9	81.10	-5.18	
				10g	2.20	22.0	23.40	-5.98	
6-6-2019	D5GHzV2 (5600)	1184	Head	1g	7.92	79.2	85.00	-6.82	3, 4
				10g	2.23	22.3	24.40	-8.61	
6-6-2019	D5GHzV2 (5750)	1184	Head	1g	8.58	85.8	82.60	3.87	
				10g	2.43	24.3	23.70	2.53	
6-10-2019	D2600V2	1097	Body	1g	5.32	53.2	54.40	-2.21	
				10g	2.39	23.9	24.20	-1.24	
6-10-2019	D2600V2	1097	Head	1g	5.77	57.7	56.40	2.30	
				10g	2.53	25.3	25.30	0.00	
6-13-2019	D2450V2	939	Head	1g	5.72	57.2	53.20	7.52	5, 6
				10g	2.62	26.2	24.80	5.65	
6-13-2019	D2450V2	939	Body	1g	5.05	50.5	50.10	0.80	
				10g	2.29	22.9	23.50	-2.55	
6-13-2019	D5GHzV2 (5250)	1184	Head	1g	7.70	77.0	81.10	-5.06	
				10g	2.20	22.0	23.40	-5.98	
6-13-2019	D5GHzV2 (5600)	1184	Head	1g	8.75	87.5	85.00	2.94	
				10g	2.46	24.6	24.40	0.82	
6-13-2019	D5GHzV2 (5750)	1184	Head	1g	8.53	85.3	82.60	3.27	
				10g	2.42	24.2	23.70	2.11	
6-17-2019	D2600V2	1097	Body	1g	5.54	55.4	54.40	1.84	
				10g	2.36	23.6	24.20	-2.48	
6-21-2019	D2600V2	1097	Head	1g	5.68	56.8	56.40	0.71	
				10g	2.51	25.1	25.30	-0.79	

**SAR 3 Room**

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
5-21-2019	D750V3	1122	Head	1g	0.85	8.5	8.22	3.28	7, 8
				10g	0.56	5.6	5.35	5.42	
5-23-2019	D5GHzV2 (5250)	1184	Body	1g	7.93	79.3	75.00	5.73	
				10g	2.22	22.2	20.90	6.22	
5-23-2019	D5GHzV2 (5600)	1184	Body	1g	8.31	83.1	78.60	5.73	
				10g	2.30	23.0	22.00	4.55	
5-23-2019	D5GHzV2 (5750)	1184	Body	1g	7.93	79.3	76.20	4.07	
				10g	2.22	22.2	21.20	4.72	
5-31-2019	D835V2	4d174	Body	1g	1.01	10.1	9.47	6.65	
				10g	0.66	6.6	6.23	6.42	
6-3-2019	D835V2	4d174	Head	1g	0.97	9.7	9.28	4.63	
				10g	0.64	6.4	6.04	5.63	
6-3-2019	D835V2	4d174	Body	1g	0.99	9.9	9.47	4.65	
				10g	0.65	6.5	6.23	4.49	
6-6-2019	D835V2	4d174	Body	1g	0.92	9.2	9.47	-3.17	
				10g	0.60	6.0	6.23	-3.05	
6-7-2019	D835V2	4d174	Head	1g	1.00	10.0	9.28	7.22	9, 10
				10g	0.65	6.5	6.04	8.11	
6-7-2019	D5GHzV2 (5250)	1184	Body	1g	7.57	75.7	75.00	0.93	
				10g	2.12	21.2	20.90	1.44	
6-7-2019	D5GHzV2 (5600)	1184	Body	1g	8.15	81.5	78.60	3.69	
				10g	2.26	22.6	22.00	2.73	
6-7-2019	D5GHzV2 (5750)	1184	Body	1g	7.42	74.2	76.20	-2.62	
				10g	2.08	20.8	21.20	-1.89	
6-10-2019	D5GHzV2 (5250)	1184	Body	1g	7.87	78.7	75.00	4.93	
				10g	2.21	22.1	20.90	5.74	
6-10-2019	D5GHzV2 (5600)	1184	Body	1g	8.29	82.9	78.60	5.47	
				10g	2.30	23.0	22.00	4.55	
6-10-2019	D5GHzV2 (5750)	1184	Body	1g	7.94	79.4	76.20	4.20	
				10g	2.22	22.2	21.20	4.72	
6-13-2019	D5GHzV2 (5250)	1184	Body	1g	7.20	72.0	75.00	-4.00	
				10g	2.02	20.2	20.90	-3.35	
6-13-2019	D5GHzV2 (5600)	1184	Body	1g	7.84	78.4	78.60	-0.25	
				10g	2.17	21.7	22.00	-1.36	
6-13-2019	D5GHzV2 (5750)	1184	Body	1g	7.10	71.0	76.20	-6.82	
				10g	1.98	19.8	21.20	-6.60	

**SAR 4 Room**

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
5-13-2019	D1750V2	1125	Body	1g	3.68	36.8	36.80	0.00	
				10g	1.95	19.5	19.50	0.00	
5-13-2019	D1900V2	5d190	Body	1g	3.98	39.8	39.00	2.05	11, 12
				10g	2.08	20.8	20.50	1.46	

**SAR 5 Room**

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
5-20-2019	D1750V2	1125	Head	1g	3.47	34.7	36.50	-4.93	13, 14
				10g	1.82	18.2	19.30	-5.70	
5-20-2019	D1900V2	5d190	Head	1g	3.97	39.7	39.10	1.53	
				10g	2.02	20.2	20.40	-0.98	
5-21-2019	D750V3	1122	Body	1g	0.85	8.5	8.63	-1.39	
				10g	0.56	5.6	5.72	-1.40	
5-23-2019	D1750V2	1125	Body	1g	3.57	35.7	36.80	-2.99	
				10g	1.89	18.9	19.50	-3.08	
5-23-2019	D1900V2	5d190	Body	1g	3.95	39.5	39.00	1.28	
				10g	2.06	20.6	20.50	0.49	
5-27-2019	D1750V2	1125	Body	1g	3.52	35.2	36.80	-4.35	
				10g	1.86	18.6	19.50	-4.62	
6-3-2019	D1900V2	5d190	Head	1g	4.12	41.2	39.10	5.37	15, 16
				10g	2.10	21.0	20.40	2.94	
6-3-2019	D1900V2	5d190	Body	1g	3.82	38.2	39.00	-2.05	
				10g	1.98	19.8	20.50	-3.41	
6-6-2019	D2600V2	1097	Head	1g	5.87	58.7	56.40	4.08	
				10g	2.63	26.3	25.30	3.95	
6-11-2019	D1750V2	1125	Body	1g	3.53	35.3	36.80	-4.08	
				10g	1.86	18.6	19.50	-4.62	
6-11-2019	D1900V2	5d190	Body	1g	3.95	39.5	39.00	1.28	
				10g	2.04	20.4	20.50	-0.49	
6-12-2019	D1900V2	5d190	Head	1g	3.83	38.3	39.10	-2.05	
				10g	1.99	19.9	20.40	-2.45	

## 9. Conducted Output Power Measurements

### 9.1 GSM

Per KDB 941225 D01 3G SAR Procedures:

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

#### GSM850 Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Average Power (dBm)			
					Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM (Voice)	CS1	1	128	824.2	34.0	24.9	35.0	26.0
			190	836.6	34.0	24.9		
			251	848.8	33.9	24.9		
GPRS (GMSK)	CS1	1	128	824.2	34.0	25.0	35.0	26.0
			190	836.6	33.9	24.9		
			251	848.8	33.9	24.8		
		2	128	824.2	31.2	25.2	32.0	26.0
			190	836.6	31.2	25.2		
			251	848.8	31.0	25.0		
		3	128	824.2	29.6	25.3	30.8	26.5
			190	836.6	29.6	25.4		
			251	848.8	29.6	25.3		
		4	128	824.2	28.6	25.6	29.6	26.6
			190	836.6	28.8	25.8		
			251	848.8	28.4	25.4		
EGPRS (8PSK)	MCS5	1	128	824.2	27.5	18.5	27.5	18.5
			190	836.6	27.1	18.1		
			251	848.8	26.8	17.8		
		2	128	824.2	24.5	18.5	24.5	18.5
			190	836.6	24.1	18.1		
			251	848.8	24.1	18.0		
		3	128	824.2	23.1	18.8	23.3	19.0
			190	836.6	23.1	18.8		
			251	848.8	22.8	18.6		
		4	128	824.2	22.0	19.0	22.1	19.1
			190	836.6	22.0	19.0		
			251	848.8	21.7	18.7		

#### Notes:

The worst-case configuration and mode for SAR testing is determined to be as follows:

- GMSK (GPRS) mode with 4 time slots for Max power, based on the Tune-up Procedure. Refer to §6.3.
- SAR is not required for EGPRS (8PSK) mode because the maximum output power and tune-up limit is  $\leq 1/4$ dB higher than GMSK GPRS or the adjusted SAR of the highest reported SAR of GMSK GPRS is  $\leq 1.2$ W/kg.

**GSM1900 Measured Results**

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Average Power (dBm)				Reduced Average Power (dBm) Hotspot back-off			
					Measured		Tune-up Limit		Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM (Voice)	CS1	1	512	1850.2	30.3	21.3	31.0	22.0	29.2	20.1	30.0	21.0
			661	1880.0	30.6	21.6			29.8	20.8		
			810	1909.8	30.8	21.8			30.0	21.0		
GPRS (GMSK)	CS1	1	512	1850.2	30.3	21.2	31.0	22.0	29.2	20.2	30.0	21.0
			661	1880.0	30.7	21.7			29.8	20.7		
			810	1909.8	30.8	21.8			30.0	20.9		
		2	512	1850.2	26.5	20.5	27.5	21.5	25.6	19.6	26.5	20.5
			661	1880.0	27.2	21.2			26.3	20.3		
			810	1909.8	27.4	21.4			26.5	20.5		
		3	512	1850.2	25.1	20.8	26.0	21.7	23.8	19.5	25.0	20.7
			661	1880.0	25.6	21.4			24.7	20.4		
			810	1909.8	25.8	21.6			25.0	20.7		
		4	512	1850.2	23.6	20.6	25.0	22.0	22.7	19.7	24.0	21.0
			661	1880.0	24.5	21.5			23.4	20.4		
			810	1909.8	24.7	21.7			23.8	20.8		
EGPRS (8PSK)	MCS5	1	512	1850.2	25.1	16.0	26.0	17.0	24.0	15.0	25.0	16.0
			661	1880.0	25.5	16.5			24.5	15.5		
			810	1909.8	25.7	16.6			24.9	15.9		
		2	512	1850.2	21.8	15.8	23.0	17.0	21.0	15.0	22.0	16.0
			661	1880.0	22.4	16.4			21.5	15.4		
			810	1909.8	22.8	16.8			21.8	15.7		
		3	512	1850.2	20.5	16.2	21.5	17.2	19.4	15.1	20.5	16.2
			661	1880.0	21.0	16.7			19.9	15.7		
			810	1909.8	21.5	17.2			20.3	16.0		
		4	512	1850.2	19.1	16.1	20.1	17.1	18.0	15.0	19.1	16.1
			661	1880.0	19.6	16.6			18.5	15.5		
			810	1909.8	19.7	16.7			18.9	15.9		

**Notes:**

The worst-case configuration and mode for SAR testing is determined to be as follows:

- GMSK (GPRS) mode with 4 time slots for Max power & Reduced power, based on the Tune-up Procedure. Refer to §6.3.
- SAR is not required for EGPRS (8PSK) mode because the maximum output power and tune-up limit is ≤ 1/4dB higher than GMSK GPRS or the adjusted SAR of the highest reported SAR of GMSK GPRS is ≤ 1.2W/kg.

## 9.2 W-CDMA

### Release 99 Setup Procedures used to establish the test signals

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

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	$\beta_c/\beta_d$	8/15

### HSDPA Setup Procedures used to establish the test signals

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm 2			
	$\beta_c$	2/15	11/15	15/15	15/15
	$\beta_d$	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	$\beta_c/\beta_d$	2/15	11/15	15/8	15/4
	$\beta_{hs}$	4/15	24/15	30/15	30/15
MPR (dB)	0	0	0.5	0.5	
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			
	$A_{hs}=\beta_{hs}/\beta_c$	30/15			

**HSPA (HSDPA & HSUPA) Setup Procedures used to establish the test signals**

The following 5 Sub-tests were completed according to Release 6 procedures in table C,11.1.3 of 3GPP TS 34.121-1 v13. A summary of these settings are illustrated below:

	Mode	HSPA				
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2 kbps RMC				
	HSDPA FRC	H-Set 1				
	HSUPA Test	HSPA				
	Power Control Algorithm	Algorithm 2				Algorithm 1
	$\beta_c$	11/15	6/15	15/15	2/15	15/15
	$\beta_d$	15/15	15/15	9/15	15/15	0
	$\beta_{ec}$	209/225	12/15	30/15	2/15	5/15
	$\beta_c/\beta_d$	11/15	6/15	15/9	2/15	-
	$\beta_{hs}$	22/15	12/15	30/15	4/15	5/15
	$\beta_{ed}$	1309/225	94/75	47/15	56/75	47/15
CM (dB)	1	3	2	3	1	
MPR (dB)	0	2	1	2	0	
HSDPA Specific Settings	DACK	8				0
	DNAK	8				0
	DCQI	8				0
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	A <sub>hs</sub> = $\beta_{hs}/\beta_c$	30/15				
HSUPA Specific Settings	E-DPDCCH	6	8	8	5	0
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	12
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	67
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E-TFCIs	5	5	2	5	1
	Reference E-TFCI	11	11	11	11	67
	Reference E-TFCI PO	4	4	4	4	18
	Reference E-TFCI	67	67	92	67	67
	Reference E-TFCI PO	18	18	18	18	18
	Reference E-TFCI	71	71	71	71	71
	Reference E-TFCI PO	23	23	23	23	23
	Reference E-TFCI	75	75	75	75	75
	Reference E-TFCI PO	26	26	26	26	26
	Reference E-TFCI	81	81	81	81	81
Reference E-TFCI PO	27	27	27	27	27	
Maximum Channelization Codes	2xSF2				SF4	

**DC-HSDPA Setup Procedures used to establish the test signals**

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

**Table E.5.0: Levels for HSDPA connection setup**

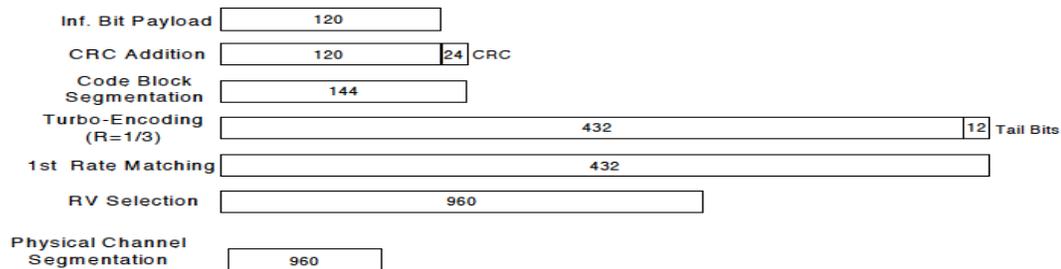
Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

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

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



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

The following 4 Sub-tests for HSDPA were completed according to Release 8 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest 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-Set 12			
	Power Control Algorithm	Algorithm2			
	$\beta_c$	2/15	11/15	15/15	15/15
	$\beta_d$	15/15	15/15	8/15	4/15
	$\beta_d$ (SF)	64			
	$\beta_c/\beta_d$	2/15	11/15	15/8	15/4
	$\beta_{hs}$	4/15	24/15	30/15	30/15
MPR (dB)	0	0	0.5	0.5	
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

**HSPA+**

HSPA+ is only support to down link. Therefore, the RF conducted power is not measured.

**W-CDMA Band II Measured Results**

Mode	UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)			Reduced Average Power (dBm) Hotspot back-off			Reduced Average Power (dBm) Proximity sensor back-off			
			Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit	
Release 99	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	23.4	NA	24.0	20.4	NA	21.0	20.4	NA	21.0
		9400	1880.0	23.0			19.9			19.8		
		9538	1907.6	23.8			20.7			20.7		
HSDPA	Subtest 1	9262	1852.4	23.5	0	24.0	20.4	0	21.0	20.4	0	21.0
		9400	1880.0	23.0			19.8			19.8		
		9538	1907.6	23.8			20.7			20.6		
	Subtest 2	9262	1852.4	23.0	0	24.0	20.4	0	21.0	20.3	0	21.0
		9400	1880.0	22.4			19.8			19.8		
		9538	1907.6	23.3			20.6			20.6		
	Subtest 3	9262	1852.4	22.4	0.5	23.5	20.4	0	21.0	20.3	0	21.0
		9400	1880.0	21.9			19.8			19.8		
		9538	1907.6	22.8			20.6			20.6		
	Subtest 4	9262	1852.4	21.9	0.5	23.5	20.4	0	21.0	20.4	0	21.0
		9400	1880.0	21.3			19.8			19.8		
		9538	1907.6	22.2			20.7			20.6		
HSUPA	Subtest 1	9262	1852.4	22.4	0	24.0	19.3	0	21.0	19.3	0	21.0
		9400	1880.0	21.8			18.8			18.8		
		9538	1907.6	22.7			19.7			19.6		
	Subtest 2	9262	1852.4	21.3	2	22.0	19.3	0	21.0	19.3	0	21.0
		9400	1880.0	20.8			18.8			18.8		
		9538	1907.6	21.6			19.6			19.6		
	Subtest 3	9262	1852.4	22.3	1	23.0	19.3	0	21.0	19.3	0	21.0
		9400	1880.0	21.8			18.8			18.8		
		9538	1907.6	22.7			19.6			19.6		
	Subtest 4	9262	1852.4	21.3	2	22.0	19.3	0	21.0	19.3	0	21.0
		9400	1880.0	20.8			18.8			18.8		
		9538	1907.6	21.6			19.6			19.6		
	Subtest 5	9262	1852.4	23.5	0	24.0	20.5	0	21.0	20.5	0	21.0
		9400	1880.0	22.9			19.9			19.9		
		9538	1907.6	23.7			20.7			20.7		
DC-HSDPA	Subtest 1	9262	1852.4	23.4	0	24.0	20.4	0	21.0	20.4	0	21.0
		9400	1880.0	23.2			20.1			20.0		
		9538	1907.6	23.6			20.5			20.5		
	Subtest 2	9262	1852.4	23.0	0	24.0	20.4	0	21.0	20.4	0	21.0
		9400	1880.0	22.5			20.0			20.0		
		9538	1907.6	23.1			20.4			20.4		
	Subtest 3	9262	1852.4	21.4	0.5	23.5	20.4	0	21.0	20.4	0	21.0
		9400	1880.0	21.0			20.1			20.0		
		9538	1907.6	21.6			20.4			20.4		
	Subtest 4	9262	1852.4	22.0	0.5	23.5	20.4	0	21.0	20.4	0	21.0
		9400	1880.0	21.5			20.1			20.1		
		9538	1907.6	22.1			20.5			20.5		

**W-CDMA Band IV Measured Results**

Mode	UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)			Reduced Average Power (dBm) Hotspot back-off			Reduced Average Power (dBm) Proximity sensor back-off			
			Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit	
Release 99	Rel 99 (RMC, 12.2 kbps)	1312	1712.4	24.0	NA	25.0	21.0	NA	22.0	21.0	NA	22.0
		1413	1732.6	24.3			21.3			21.3		
		1513	1752.6	24.1			21.2			21.2		
HSDPA	Subtest 1	1312	1712.4	23.9	0	24.5	21.0	0	21.5	21.0	0	21.5
		1413	1732.6	24.2			21.3			21.3		
		1513	1752.6	24.0			21.2			21.2		
	Subtest 2	1312	1712.4	23.3	0	24.5	21.0	0	21.5	21.0	0	21.5
		1413	1732.6	23.8			21.3			21.3		
		1513	1752.6	23.6			21.1			21.2		
	Subtest 3	1312	1712.4	22.3	0.5	24.0	21.0	0	21.5	21.0	0	21.5
		1413	1732.6	22.8			21.3			21.3		
		1513	1752.6	22.6			21.1			21.2		
	Subtest 4	1312	1712.4	22.3	0.5	24.0	21.0	0	21.5	21.0	0	21.5
		1413	1732.6	22.8			21.3			21.3		
		1513	1752.6	22.7			21.2			21.2		
HSUPA	Subtest 1	1312	1712.4	22.0	0	24.5	20.0	0	21.5	20.0	0	21.5
		1413	1732.6	22.3			20.4			20.4		
		1513	1752.6	22.2			20.2			20.3		
	Subtest 2	1312	1712.4	20.5	2	22.5	20.0	0	21.5	20.0	0	21.5
		1413	1732.6	20.9			20.4			20.4		
		1513	1752.6	20.7			20.2			20.2		
	Subtest 3	1312	1712.4	22.0	1	23.5	20.0	0	21.5	20.0	0	21.5
		1413	1732.6	22.3			20.4			20.4		
		1513	1752.6	22.2			20.2			20.2		
	Subtest 4	1312	1712.4	21.0	2	22.5	20.0	0	21.5	20.0	0	21.5
		1413	1732.6	21.3			20.4			20.4		
		1513	1752.6	21.2			20.2			20.2		
	Subtest 5	1312	1712.4	24.1	0	24.5	21.1	0	21.5	21.1	0	21.5
		1413	1732.6	24.4			21.4			21.4		
		1513	1752.6	24.3			21.3			21.3		
DC-HSDPA	Subtest 1	1312	1712.4	23.8	0	24.5	21.0	0	21.5	21.0	0	21.5
		1413	1732.6	24.4			21.5			21.5		
		1513	1752.6	24.2			21.4			21.4		
	Subtest 2	1312	1712.4	23.4	0	24.5	21.0	0	21.5	21.0	0	21.5
		1413	1732.6	23.9			21.5			21.4		
		1513	1752.6	23.7			21.4			21.4		
	Subtest 3	1312	1712.4	22.4	0.5	24.0	20.0	0	21.5	20.0	0	21.5
		1413	1732.6	22.9			21.4			21.5		
		1513	1752.6	22.7			21.4			21.4		
	Subtest 4	1312	1712.4	22.4	0.5	24.0	21.1	0	21.5	21.0	0	21.5
		1413	1732.6	22.7			21.5			21.4		
		1513	1752.6	22.7			21.4			21.4		

**W-CDMA Band V Measured Results**

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	4132	826.4	25.2	NA	25.7
		4183	836.6	25.2		
		4233	846.6	25.1		
HSDPA	Subtest 1	4132	826.4	23.2	0	24.5
		4183	836.6	23.2		
		4233	846.6	23.0		
	Subtest 2	4132	826.4	22.7	0	24.5
		4183	836.6	22.7		
		4233	846.6	22.6		
	Subtest 3	4132	826.4	22.2	0.5	24.0
		4183	836.6	22.2		
		4233	846.6	22.0		
	Subtest 4	4132	826.4	21.7	0.5	24.0
		4183	836.6	21.7		
		4233	846.6	21.5		
HSUPA	Subtest 1	4132	826.4	21.3	0	23.0
		4183	836.6	21.3		
		4233	846.6	21.1		
	Subtest 2	4132	826.4	20.2	2	21.0
		4183	836.6	20.2		
		4233	846.6	20.0		
	Subtest 3	4132	826.4	21.3	1	22.0
		4183	836.6	21.3		
		4233	846.6	21.1		
	Subtest 4	4132	826.4	20.2	2	21.0
		4183	836.6	20.2		
		4233	846.6	20.0		
	Subtest 5	4132	826.4	22.2	0	23.0
		4183	836.6	22.2		
		4233	846.6	22.1		
DC-HSDPA	Subtest 1	4132	826.4	23.1	0	23.5
		4183	836.6	23.2		
		4233	846.6	23.1		
	Subtest 2	4132	826.4	22.6	0	23.5
		4183	836.6	22.7		
		4233	846.6	22.6		
	Subtest 3	4132	826.4	20.8	0.5	23.0
		4183	836.6	20.9		
		4233	846.6	20.7		
	Subtest 4	4132	826.4	21.9	0.5	23.0
		4183	836.6	21.7		
		4233	846.6	21.6		

### 9.3 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 1, 2 and 3**

Modulation	Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> )						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
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

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 (subclause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N <sub>RB</sub> )	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	N/A
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36, 66, 70	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
NS_04	6.6.2.2.2, 6.6.3.3.19	41	5, 10, 15, 20	Table 6.2.4-4, Table 6.2.4-4a	
			10, 15, 20	≥ 50 (NOTE 1)	≤ 1 (NOTE 1)
NS_05	6.6.3.3.1	1	15, 20	Table 6.2.4-18 (NOTE 2)	
			10, 15, 20	≥ 50	≤ 1 (NOTE 1)
			15, 20	Table 6.2.4-18 (NOTE 2)	
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	13	10	Table 6.2.4-2	
6.6.3.3.2					
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	6.6.2.2.1	20	15, 20	Table 6.2.4-3	
NS_11	6.6.2.2.1	23	1.4, 3, 5, 10, 15, 20	Table 6.2.4-5	
				6.6.3.3.13	
NS_12	6.6.3.3.5	26	1.4, 3, 5, 10, 15	Table 6.2.4-6	
				6.6.3.3.6	
NS_13	6.6.3.3.6	26	5	Table 6.2.4-7	
NS_14	6.6.3.3.7	26	10, 15	Table 6.2.4-8	
NS_15	6.6.3.3.8	26	1.4, 3, 5, 10, 15	Table 6.2.4-9	
				Table 6.2.4-10	
NS_16	6.6.3.3.9	27	3, 5, 10	Table 6.2.4-11, Table 6.2.4-12, Table 6.2.4-13	
NS_17	6.6.3.3.10	28	5, 10	Table 5.6-1	N/A
				5	≥ 2
NS_18	6.6.3.3.11	28	10, 15, 20	≥ 1	≤ 4
				Table 6.2.4-14	
NS_19	6.6.2.2.2	44	10, 15, 20	Table 6.2.4-14	
				6.6.2.2.1	
NS_20	6.6.3.3.14	23	5, 10, 15, 20	Table 6.2.4-15	
NS_21	6.6.2.2.1	30	5, 10	Table 6.2.4-16	
				6.6.3.3.15	
NS_22	6.6.3.3.16	42, 43	5, 10, 15, 20	Table 6.2.4-17	
NS_23	6.6.3.3.17	42, 43	5, 10, 15, 20	N/A	
NS_24	6.6.3.3.20	65 (NOTE 4)	5, 10, 15, 20	Table 6.2.4-19	
NS_25	6.6.3.3.21	65 (NOTE 4)	5, 10, 15, 20	Table 6.2.4-20	
NS_26	6.6.3.3.22	68	10, 15	Table 6.2.4-21	
NS_27	6.6.2.2.5, 6.6.3.3.23	48	5, 10, 15, 20	Table 6.2.4-22	
				Table 6.2.4-23	
NS_28	6.2.2A, 6.6.3.3.24	46 (NOTE 5)	20	Table 6.2.4-23	
				Table 6.2.4-24	
NS_29	6.2.2A, 6.6.2.3.1a, 6.6.3.3.25	46 (NOTE 5)	20	Table 6.2.4-24	
				Table 6.2.4-25	
NS_30	6.2.2A, 6.6.3.3.26	46 (NOTE 5)	20	Table 6.2.4-25	
				Table 6.2.4-26	
NS_31	6.2.2A, 6.6.3.3.27	46 (NOTE 5)	20	Table 6.2.4-26	
				-	
NS_32	-	-	-	-	-

NOTE 1: Applicable when the lower edge of the assigned E-UTRA UL channel bandwidth frequency is larger than or equal to the upper edge of PHS band (1915.7 MHz) + 4 MHz + the channel BW assigned, where channel BW is as defined in subclause 5.6. A-MPR for

# 1. Max power Results

## LTE Band 5 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					
				Measured Pwr (dBm)			MPR	Tune-up Limit	
				20525	836.5 MHz	20625			
10 MHz	QPSK	1	0		25.2		0.0	25.7	
		1	25		25.0		0.0	25.7	
		1	49		25.0		0.0	25.7	
		25	0		22.7		2.0	23.7	
		25	12		22.6		2.0	23.7	
		25	25		22.6		2.0	23.7	
	16QAM	50	0		22.6		2.0	23.7	
		1	0		23.1		2.0	23.7	
		1	25		22.8		2.0	23.7	
		1	49		22.8		2.0	23.7	
		25	0		21.7		3.0	22.7	
		25	12		21.7		3.0	22.7	
	64QAM	25	25		21.7		3.0	22.7	
		50	0		21.6		3.0	22.7	
		1	0		21.9		3.0	22.7	
		1	25		21.7		3.0	22.7	
		1	49		21.8		3.0	22.7	
		25	0		20.7		4.0	21.7	
	5 MHz	QPSK	25	12		20.7		4.0	21.7
			25	25		20.6		4.0	21.7
			50	0		20.7		4.0	21.7
1			0	25.1	25.1	25.0	0.0	25.7	
1			12	25.2	25.1	24.9	0.0	25.7	
1			24	25.1	25.0	24.9	0.0	25.7	
16QAM		12	0	22.6	22.7	22.5	2.0	23.7	
		12	7	22.6	22.6	22.5	2.0	23.7	
		12	13	22.6	22.6	22.5	2.0	23.7	
		25	0	22.6	22.6	22.5	2.0	23.7	
		1	0	23.1	23.0	23.1	2.0	23.7	
		1	12	23.0	23.1	23.1	2.0	23.7	
64QAM		1	24	23.2	23.0	22.9	2.0	23.7	
		12	0	21.7	21.7	21.6	3.0	22.7	
		12	7	21.7	21.6	21.6	3.0	22.7	
		12	13	21.7	21.7	21.6	3.0	22.7	
		25	0	21.6	21.6	21.5	3.0	22.7	
		1	0	21.7	22.0	21.6	3.0	22.7	
64QAM		1	12	21.8	21.8	21.6	3.0	22.7	
		1	24	21.7	22.0	21.7	3.0	22.7	
		12	0	20.6	20.7	20.5	4.0	21.7	
	12	7	20.6	20.7	20.5	4.0	21.7		
	12	13	20.6	20.7	20.5	4.0	21.7		
	25	0	20.7	20.7	20.6	4.0	21.7		

**LTE Band 5 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				20415	20525	20635		
				825.5 MHz	836.5 MHz	847.5 MHz		
3 MHz	QPSK	1	0	25.1	25.1	25.0	0.0	25.7
		1	8	25.1	24.9	25.0	0.0	25.7
		1	14	25.1	25.0	25.0	0.0	25.7
		8	0	22.6	22.6	22.5	2.0	23.7
		8	4	22.6	22.6	22.5	2.0	23.7
		8	7	22.6	22.6	22.5	2.0	23.7
		15	0	22.6	22.6	22.5	2.0	23.7
	16QAM	1	0	22.9	23.0	22.6	2.0	23.7
		1	8	23.3	22.9	22.7	2.0	23.7
		1	14	23.2	22.9	22.7	2.0	23.7
		8	0	21.6	21.6	21.5	3.0	22.7
		8	4	21.6	21.6	21.5	3.0	22.7
		8	7	21.6	21.6	21.5	3.0	22.7
	64QAM	15	0	21.6	21.7	21.5	3.0	22.7
		1	0	21.8	21.9	21.7	3.0	22.7
		1	8	22.0	22.2	21.4	3.0	22.7
		1	14	21.8	22.0	21.3	3.0	22.7
		8	0	20.5	20.7	20.4	4.0	21.7
		8	4	20.6	20.6	20.4	4.0	21.7
		8	7	20.5	20.7	20.4	4.0	21.7
	1.4 MHz	QPSK	15	0	20.6	20.7	20.5	4.0
1			0	25.0	25.1	25.0	0.0	25.7
1			3	25.1	25.1	25.1	0.0	25.7
1			5	25.1	25.1	25.1	0.0	25.7
3			0	25.1	25.0	25.0	0.0	25.7
3			1	25.1	25.0	25.0	0.0	25.7
3			3	25.1	25.0	25.0	0.0	25.7
16QAM		6	0	22.5	22.6	22.4	2.0	23.7
		1	0	23.0	23.2	23.2	2.0	23.7
		1	3	23.0	23.2	23.2	2.0	23.7
		1	5	23.0	23.2	23.2	2.0	23.7
		3	0	22.7	22.9	22.9	2.0	23.7
		3	1	22.7	22.9	22.9	2.0	23.7
64QAM		3	3	22.7	22.9	22.9	2.0	23.7
		6	0	22.7	21.5	21.4	3.0	22.7
	1	0	21.8	21.9	22.6	3.0	22.7	
	1	3	21.8	21.9	21.9	3.0	22.7	
	1	5	21.8	21.9	21.9	3.0	22.7	
	3	0	21.7	21.8	21.8	3.0	22.7	
	3	1	21.7	21.9	21.9	3.0	22.7	
	3	3	21.7	21.9	21.9	3.0	22.7	
	6	0	20.6	20.6	20.5	4.0	21.7	

**Note(s):**

10 MHz Bandwidths does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE Devices

**LTE Band 7 Measured Results**

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				20850	21100	21350		
				2510 MHz	2535 MHz	2560 MHz		
20 MHz	QPSK	1	0	24.2	24.3	24.0	0.0	25
		1	49	24.1	24.3	23.8	0.0	25
		1	99	24.0	24.0	24.1	0.0	25
		50	0	22.2	22.3	22.1	1.0	24
		50	24	22.1	22.2	22.1	1.0	24
		50	50	22.1	22.1	22.0	1.0	24
		100	0	22.1	22.2	22.1	1.0	24
	16QAM	1	0	22.4	22.7	22.5	1.0	24
		1	49	22.2	22.4	22.3	1.0	24
		1	99	22.4	22.3	22.1	1.0	24
		50	0	21.2	21.3	21.1	2.0	23
		50	24	21.2	21.2	21.1	2.0	23
		50	50	21.1	21.1	21.0	2.0	23
		100	0	21.1	21.2	21.1	2.0	23
	64QAM	1	0	21.6	21.7	21.6	2.0	23
		1	49	21.4	21.4	21.4	2.0	23
		1	99	21.4	21.3	21.3	2.0	23
		50	0	20.2	20.3	20.1	3.0	22
		50	24	20.1	20.2	20.0	3.0	22
		50	50	20.1	20.2	20.0	3.0	22
		100	0	20.1	20.2	20.1	3.0	22
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				20825	21100	21375		
				2507.5 MHz	2535 MHz	2562.5 MHz		
15 MHz	QPSK	1	0	24.2	24.2	24.1	0.0	25
		1	37	24.2	24.1	24.0	0.0	25
		1	74	24.0	24.1	24.0	0.0	25
		36	0	22.2	22.3	22.1	1.0	24
		36	20	22.2	22.2	22.1	1.0	24
		36	39	22.1	22.2	22.0	1.0	24
		75	0	22.3	22.3	22.2	1.0	24
	16QAM	1	0	22.5	22.6	22.4	1.0	24
		1	37	22.5	22.5	22.4	1.0	24
		1	74	22.3	22.3	22.1	1.0	24
		36	0	21.1	21.3	21.1	2.0	23
		36	20	21.1	21.2	21.0	2.0	23
		36	39	21.1	21.2	21.0	2.0	23
		75	0	21.2	21.3	21.1	2.0	23
	64QAM	1	0	21.4	21.6	21.4	2.0	23
		1	37	21.4	21.4	21.3	2.0	23
		1	74	21.2	21.3	21.3	2.0	23
		36	0	20.2	20.3	20.1	3.0	22
		36	20	20.1	20.2	20.1	3.0	22
		36	39	20.1	20.2	20.1	3.0	22
		75	0	20.2	20.2	20.1	3.0	22

**LTE Band 7 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				20800	21100	21400		
				2505 MHz	2535 MHz	2565 MHz		
10 MHz	QPSK	1	0	24.1	24.2	24.0	0.0	25
		1	25	24.0	24.2	23.9	0.0	25
		1	49	24.0	24.2	24.1	0.0	25
		25	0	22.1	22.2	22.1	1.0	24
		25	12	22.1	22.2	22.1	1.0	24
		25	25	22.1	22.1	22.1	1.0	24
		50	0	22.1	22.2	22.1	1.0	24
	16QAM	1	0	22.4	22.5	22.5	1.0	24
		1	25	22.3	22.2	22.2	1.0	24
		1	49	22.3	22.2	22.3	1.0	24
		25	0	21.1	21.2	21.1	2.0	23
		25	12	21.1	21.2	21.1	2.0	23
		25	25	21.1	21.2	21.1	2.0	23
		50	0	21.1	21.2	21.1	2.0	23
	64QAM	1	0	21.3	21.4	21.4	2.0	23
		1	25	21.2	21.2	21.1	2.0	23
		1	49	21.3	21.3	21.1	2.0	23
		25	0	20.1	20.3	20.1	3.0	22
		25	12	20.1	20.2	20.1	3.0	22
		25	25	20.1	20.2	20.1	3.0	22
		50	0	20.1	20.2	20.1	3.0	22
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				20775	21100	21425		
				2502.5 MHz	2535 MHz	2567.5 MHz		
5 MHz	QPSK	1	0	24.0	24.1	24.1	0.0	25
		1	12	24.2	24.2	24.2	0.0	25
		1	24	24.1	24.3	24.3	0.0	25
		12	0	22.1	22.2	22.2	1.0	24
		12	7	22.1	22.1	22.1	1.0	24
		12	13	22.1	22.1	22.1	1.0	24
		25	0	22.1	22.2	22.2	1.0	24
	16QAM	1	0	22.4	22.3	22.3	1.0	24
		1	12	22.3	22.3	22.3	1.0	24
		1	24	22.4	22.3	22.3	1.0	24
		12	0	21.1	21.2	21.2	2.0	23
		12	7	21.1	21.2	21.2	2.0	23
		12	13	21.1	21.2	21.2	2.0	23
		25	0	21.1	21.2	21.2	2.0	23
	64QAM	1	0	21.6	21.4	21.4	2.0	23
		1	12	21.6	21.4	21.4	2.0	23
		1	24	21.5	21.4	21.4	2.0	23
		12	0	20.1	20.2	20.2	3.0	22
		12	7	20.1	20.2	20.2	3.0	22
		12	13	20.1	20.1	20.2	3.0	22
		25	0	20.1	20.2	20.2	3.0	22

**LTE Band 12 Measured Results**

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				23095	707.5 MHz			
10 MHz	QPSK	1	0				0.0	25.5
		1	25				0.0	25.5
		1	49				0.0	25.5
		25	0				2.0	23.5
		25	12				2.0	23.5
		25	25				2.0	23.5
	16QAM	50	0				2.0	23.5
		1	0				2.0	23.5
		1	25				2.0	23.5
		1	49				2.0	23.5
		25	0				3.0	22.5
		25	12				3.0	22.5
	64QAM	25	25				3.0	22.5
		50	0				3.0	22.5
		1	0				3.0	22.5
		1	25				3.0	22.5
		1	49				3.0	22.5
		25	0				4.0	21.5
5 MHz	QPSK	25	12				4.0	21.5
		25	25				4.0	21.5
		50	0				4.0	21.5
		1	0				4.0	21.5
		1	25				4.0	21.5
		1	49				4.0	21.5
	16QAM	25	0				4.0	21.5
		25	12				4.0	21.5
		25	25				4.0	21.5
		50	0				4.0	21.5
		1	0				4.0	21.5
		1	12				4.0	21.5
	64QAM	1	24				4.0	21.5
		12	0				4.0	21.5
		12	7				4.0	21.5
		12	13				4.0	21.5
		25	0				4.0	21.5
		25	0				4.0	21.5

**LTE Band 12 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				23025	23095	23165		
				700.5 MHz	707.5 MHz	714.5 MHz		
3 MHz	QPSK	1	0	24.0	24.1	24.1	0.0	25.5
		1	8	24.0	23.8	24.1	0.0	25.5
		1	14	24.0	24.0	24.1	0.0	25.5
		8	0	21.5	21.5	21.6	2.0	23.5
		8	4	21.4	21.5	21.5	2.0	23.5
		8	7	21.4	21.4	21.5	2.0	23.5
	16QAM	15	0	21.4	21.5	21.5	2.0	23.5
		1	0	22.0	21.8	21.8	2.0	23.5
		1	8	22.2	22.0	22.0	2.0	23.5
		1	14	21.9	21.7	21.8	2.0	23.5
		8	0	20.4	20.5	20.6	3.0	22.5
		8	4	20.5	20.6	20.6	3.0	22.5
	64QAM	8	7	20.4	20.6	20.6	3.0	22.5
		15	0	20.5	20.5	20.6	3.0	22.5
		1	0	20.8	20.7	20.7	3.0	22.5
		1	8	21.0	20.7	20.4	3.0	22.5
		1	14	20.7	20.9	20.8	3.0	22.5
		8	0	19.5	19.5	19.6	4.0	21.5
1.4 MHz	QPSK	8	4	19.5	19.5	19.6	4.0	21.5
		8	7	19.4	19.5	19.5	4.0	21.5
		15	0	19.5	19.6	19.6	4.0	21.5
		1	0	23.9	24.1	24.1	0.0	25.5
		1	3	24.0	24.1	24.1	0.0	25.5
		1	5	24.0	24.1	24.1	0.0	25.5
	16QAM	3	0	24.0	24.0	24.0	0.0	25.5
		3	1	24.0	24.0	24.0	0.0	25.5
		3	3	24.0	24.1	24.0	0.0	25.5
		6	0	21.6	21.6	21.7	2.0	23.5
		1	0	21.6	22.0	22.0	2.0	23.5
		1	3	21.6	22.0	22.0	2.0	23.5
	64QAM	1	5	21.6	22.0	22.0	2.0	23.5
		3	0	21.6	21.9	21.8	2.0	23.5
		3	1	21.6	21.9	21.8	2.0	23.5
		3	3	21.6	21.9	21.8	2.0	23.5
		6	0	21.6	21.7	21.7	3.0	22.5
		1	0	20.6	20.9	20.7	3.0	22.5
16QAM	1	3	20.4	20.8	20.6	3.0	22.5	
	1	5	20.3	20.7	20.8	3.0	22.5	
	3	0	20.5	20.6	20.6	3.0	22.5	
	3	1	20.5	20.6	20.7	3.0	22.5	
	3	3	20.5	20.6	20.7	3.0	22.5	
	6	0	19.4	19.5	19.6	4.0	21.5	

**Note(s):**

10 MHz Bandwidths does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE Devices

**LTE Band 13 Measured Results**

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			
				Measured Pwr (dBm)		MPR	Tune-up Limit
				23230	782 MHz		
10 MHz	QPSK	1	0	24.4		0.0	25.5
		1	25	24.4		0.0	25.5
		1	49	24.4		0.0	25.5
		25	0	22.0		2.0	23.5
		25	12	22.0		2.0	23.5
		25	25	21.9		2.0	23.5
	16QAM	50	0	22.0		2.0	23.5
		1	0	22.2		2.0	23.5
		1	25	22.0		2.0	23.5
		1	49	22.2		2.0	23.5
		25	0	21.1		3.0	22.5
		25	12	21.0		3.0	22.5
	64QAM	25	25	21.0		3.0	22.5
		50	0	21.0		3.0	22.5
		1	0	21.1		3.0	22.5
		1	25	20.9		3.0	22.5
		1	49	20.9		3.0	22.5
		25	0	20.0		4.0	21.5
5 MHz	QPSK	25	12	20.0		4.0	21.5
		25	25	20.0		4.0	21.5
		50	0	20.0		4.0	21.5
		1	0	24.4		0.0	25.5
		1	12	24.4		0.0	25.5
		1	24	24.4		0.0	25.5
	16QAM	12	0	22.0		2.0	23.5
		12	7	21.9		2.0	23.5
		12	13	22.0		2.0	23.5
		25	0	22.0		2.0	23.5
		1	0	22.2		2.0	23.5
		1	12	22.3		2.0	23.5
	64QAM	1	24	22.3		2.0	23.5
		12	0	21.1		3.0	22.5
		12	7	21.0		3.0	22.5
		12	13	21.0		3.0	22.5
		25	0	21.0		3.0	22.5
		1	0	21.3		3.0	22.5
64QAM	1	12	21.3		3.0	22.5	
	1	24	21.2		3.0	22.5	
	12	0	20.0		4.0	21.5	
	12	7	20.0		4.0	21.5	
	12	13	19.9		4.0	21.5	
	25	0	20.0		4.0	21.5	

**Note(s):**  
 10/5 MHz Bandwidths does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE Devices

**LTE Band 25 Measured Results**

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				26140	26365	26590		
				1860 MHz	1882.5 MHz	1905 MHz		
20 MHz	QPSK	1	0	23.7	23.5	24.0	0.0	24.5
		1	49	23.5	23.4	23.8	0.0	24.5
		1	99	23.5	23.3	23.9	0.0	24.5
		50	0	22.2	22.0	22.6	1.0	23.5
		50	24	22.2	22.0	22.6	1.0	23.5
		50	50	22.1	21.9	22.5	1.0	23.5
		100	0	22.1	21.9	22.5	1.0	23.5
	16QAM	1	0	22.6	22.6	22.9	1.0	23.5
		1	49	22.3	22.4	22.6	1.0	23.5
		1	99	22.4	22.4	22.5	1.0	23.5
		50	0	21.2	21.1	21.7	2.0	22.5
		50	24	21.2	21.0	21.6	2.0	22.5
		50	50	21.1	21.0	21.6	2.0	22.5
		100	0	21.1	20.9	21.6	2.0	22.5
	64QAM	1	0	21.7	21.5	21.9	2.0	22.5
		1	49	21.4	21.2	21.6	2.0	22.5
		1	99	21.4	21.3	21.5	2.0	22.5
		50	0	20.2	20.0	20.7	3.0	21.5
		50	24	20.1	20.0	20.6	3.0	21.5
		50	50	20.1	19.9	20.5	3.0	21.5
		100	0	20.1	19.9	20.6	3.0	21.5
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26115	26365	26615		
				1857.5 MHz	1882.5 MHz	1907.5 MHz		
15 MHz	QPSK	1	0	23.7	23.5	24.0	0.0	24.5
		1	37	23.9	23.3	24.0	0.0	24.5
		1	74	23.6	23.3	23.8	0.0	24.5
		36	0	22.2	22.0	22.6	1.0	23.5
		36	20	22.1	21.9	22.5	1.0	23.5
		36	39	22.1	21.9	22.5	1.0	23.5
		75	0	22.2	22.0	22.6	1.0	23.5
	16QAM	1	0	22.6	22.4	22.9	1.0	23.5
		1	37	22.7	22.4	22.9	1.0	23.5
		1	74	22.4	22.3	22.6	1.0	23.5
		36	0	21.2	21.0	21.6	2.0	22.5
		36	20	21.2	20.9	21.5	2.0	22.5
		36	39	21.1	20.9	21.5	2.0	22.5
		75	0	21.2	21.0	21.6	2.0	22.5
	64QAM	1	0	21.5	21.3	21.9	2.0	22.5
		1	37	21.6	21.1	21.8	2.0	22.5
		1	74	21.3	21.1	21.7	2.0	22.5
		36	0	20.2	19.9	20.6	3.0	21.5
		36	20	20.2	19.9	20.5	3.0	21.5
		36	39	20.1	19.9	20.5	3.0	21.5
		75	0	20.2	20.0	20.6	3.0	21.5

**LTE Band 25 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26090	26365	26640		
				1855 MHz	1882.5 MHz	1910 MHz		
10 MHz	QPSK	1	0	23.7	23.5	23.9	0.0	24.5
		1	25	23.6	23.3	23.8	0.0	24.5
		1	49	23.7	23.3	23.9	0.0	24.5
		25	0	22.3	22.0	22.5	1.0	23.5
		25	12	22.2	21.9	22.5	1.0	23.5
		25	25	22.2	21.9	22.4	1.0	23.5
	16QAM	50	0	22.2	21.9	22.5	1.0	23.5
		1	0	22.6	22.6	22.8	1.0	23.5
		1	25	22.5	22.2	22.5	1.0	23.5
		1	49	22.5	22.4	22.6	1.0	23.5
		25	0	21.3	21.0	21.6	2.0	22.5
		25	12	21.3	21.0	21.5	2.0	22.5
	64QAM	25	25	21.3	21.0	21.5	2.0	22.5
		50	0	21.3	20.9	21.5	2.0	22.5
		1	0	21.5	21.2	21.9	2.0	22.5
		1	25	21.3	21.0	21.7	2.0	22.5
		1	49	21.5	21.2	21.7	2.0	22.5
		25	0	20.2	20.0	20.6	3.0	21.5
5 MHz	QPSK	25	12	20.2	20.0	20.5	3.0	21.5
		25	25	20.2	20.0	20.5	3.0	21.5
		50	0	20.2	20.0	20.5	3.0	21.5
		1	0	23.7	23.4	23.8	0.0	24.5
		1	12	23.8	23.4	23.8	0.0	24.5
		1	24	23.7	23.4	23.9	0.0	24.5
	16QAM	12	0	22.3	21.9	22.5	1.0	23.5
		12	7	22.3	21.9	22.4	1.0	23.5
		12	13	22.2	21.9	22.5	1.0	23.5
		25	0	22.3	21.9	22.5	1.0	23.5
		1	0	22.6	22.3	22.9	1.0	23.5
		1	12	22.4	22.4	23.0	1.0	23.5
	64QAM	1	24	22.7	22.4	22.7	1.0	23.5
		12	0	21.4	21.0	21.5	2.0	22.5
		12	7	21.4	21.0	21.5	2.0	22.5
		12	13	21.4	21.0	21.5	2.0	22.5
		25	0	21.3	21.0	21.5	2.0	22.5
		1	0	21.4	21.3	21.9	2.0	22.5
64QAM	1	12	21.4	21.2	21.7	2.0	22.5	
	1	24	21.5	21.4	21.7	2.0	22.5	
	12	0	20.2	19.9	20.5	3.0	21.5	
	12	7	20.2	19.9	20.4	3.0	21.5	
	12	13	20.2	19.9	20.4	3.0	21.5	
	25	0	20.3	20.0	20.5	3.0	21.5	

**LTE Band 25 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26055	26365	26675		
				1851.5 MHz	1882.5 MHz	1913.5 MHz		
3 MHz	QPSK	1	0	23.8	23.5	23.8	0.0	24.5
		1	8	24.0	23.4	24.0	0.0	24.5
		1	14	23.8	23.4	23.9	0.0	24.5
		8	0	22.2	21.9	22.4	1.0	23.5
		8	4	22.2	21.9	22.3	1.0	23.5
		8	7	22.2	21.8	22.3	1.0	23.5
		15	0	22.2	21.9	22.3	1.0	23.5
	16QAM	1	0	22.8	22.4	22.6	1.0	23.5
		1	8	22.9	22.2	22.6	1.0	23.5
		1	14	22.7	22.3	22.6	1.0	23.5
		8	0	21.2	21.0	21.4	2.0	22.5
		8	4	21.3	21.0	21.4	2.0	22.5
		8	7	21.2	21.0	21.4	2.0	22.5
		15	0	21.3	20.9	21.4	2.0	22.5
	64QAM	1	0	21.4	21.2	21.8	2.0	22.5
		1	8	21.6	21.3	21.5	2.0	22.5
		1	14	21.5	21.4	21.6	2.0	22.5
		8	0	20.2	19.9	20.4	3.0	21.5
		8	4	20.2	19.9	20.4	3.0	21.5
		8	7	20.2	19.9	20.4	3.0	21.5
		15	0	20.2	20.1	20.4	3.0	21.5
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26047	26365	26683		
				1850.7 MHz	1882.5 MHz	1914.3 MHz		
1.4 MHz	QPSK	1	0	23.8	23.5	23.8	0.0	24.5
		1	3	23.7	23.3	23.8	0.0	24.5
		1	5	23.7	23.3	23.8	0.0	24.5
		3	0	23.6	23.3	23.7	0.0	24.5
		3	1	23.5	23.4	23.8	0.0	24.5
		3	3	23.7	23.3	23.8	0.0	24.5
		6	0	22.2	21.8	22.3	1.0	23.5
	16QAM	1	0	22.6	22.1	22.7	1.0	23.5
		1	3	22.3	22.1	22.7	1.0	23.5
		1	5	22.6	22.0	22.7	1.0	23.5
		3	0	22.2	22.0	22.3	1.0	23.5
		3	1	22.1	21.9	22.4	1.0	23.5
		3	3	22.2	21.9	22.4	1.0	23.5
		6	0	21.3	20.9	21.3	2.0	22.5
	64QAM	1	0	21.3	21.3	21.8	2.0	22.5
		1	3	21.3	21.1	21.6	2.0	22.5
		1	5	21.6	21.2	21.3	2.0	22.5
		3	0	21.3	20.9	21.4	2.0	22.5
		3	1	21.3	21.0	21.5	2.0	22.5
		3	3	21.3	20.9	21.5	2.0	22.5
		6	0	20.2	19.9	20.3	3.0	21.5

**LTE Band 26 Measured Results**

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				26865	831.5 MHz			
15 MHz	QPSK	1	0		24.1		0.0	25.3
		1	37		24.2		0.0	25.3
		1	74		23.8		0.0	25.3
		36	0		21.5		2.0	23.3
		36	20		21.4		2.0	23.3
		36	39		21.4		2.0	23.3
	16QAM	75	0		21.6		2.0	23.3
		1	0		21.8		2.0	23.3
		1	37		21.9		2.0	23.3
		1	74		21.6		2.0	23.3
		36	0		20.6		3.0	22.3
		36	20		20.5		3.0	22.3
	64QAM	36	39		20.5		3.0	22.3
		75	0		20.6		3.0	22.3
		1	0		21.2		3.0	22.3
		1	37		21.0		3.0	22.3
		1	74		20.8		3.0	22.3
		36	0		19.6		4.0	21.3
10 MHz	QPSK	36	20		19.5		4.0	21.3
		36	39		19.5		4.0	21.3
		75	0		19.6		4.0	21.3
		1	0	23.9	24.1	24.0	0.0	25.3
		1	25	23.9	24.0	23.8	0.0	25.3
		1	49	23.8	23.9	23.8	0.0	25.3
	16QAM	25	0	21.4	21.5	21.5	2.0	23.3
		25	12	21.4	21.5	21.5	2.0	23.3
		25	25	21.3	21.5	21.4	2.0	23.3
		50	0	21.4	21.5	21.5	2.0	23.3
		1	0	21.6	21.8	21.6	2.0	23.3
		1	25	21.3	21.6	21.5	2.0	23.3
64QAM	1	49	21.6	21.6	21.6	2.0	23.3	
	25	0	20.5	20.7	20.5	3.0	22.3	
	25	12	20.4	20.6	20.5	3.0	22.3	
	25	25	20.4	20.6	20.5	3.0	22.3	
	50	0	20.4	20.6	20.6	3.0	22.3	
	1	0	20.7	20.8	20.7	3.0	22.3	
10 MHz	64QAM	1	25	20.4	20.6	20.5	3.0	22.3
		1	49	20.6	20.7	20.7	3.0	22.3
		25	0	19.5	19.7	19.6	4.0	21.3
		25	12	19.5	19.7	19.6	4.0	21.3
		25	25	19.4	19.6	19.6	4.0	21.3
		50	0	19.5	19.7	19.6	4.0	21.3

**LTE Band 26 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26715	26865	27015		
				816.5 MHz	831.5 MHz	846.5 MHz		
5 MHz	QPSK	1	0	23.8	24.0	23.9	0.0	25.3
		1	12	23.8	23.9	23.9	0.0	25.3
		1	24	23.8	24.0	23.9	0.0	25.3
		12	0	21.4	21.5	21.4	2.0	23.3
		12	7	21.3	21.5	21.4	2.0	23.3
		12	13	21.4	21.5	21.4	2.0	23.3
		25	0	21.3	21.5	21.4	2.0	23.3
	16QAM	1	0	21.8	22.0	21.9	2.0	23.3
		1	12	21.7	22.0	21.3	2.0	23.3
		1	24	21.6	21.8	21.6	2.0	23.3
		12	0	20.5	20.6	20.5	3.0	22.3
		12	7	20.4	20.6	20.5	3.0	22.3
		12	13	20.4	20.6	20.5	3.0	22.3
		25	0	20.4	20.6	20.4	3.0	22.3
	64QAM	1	0	21.0	21.1	20.4	3.0	22.3
		1	12	20.8	20.9	20.7	3.0	22.3
		1	24	20.7	20.9	20.5	3.0	22.3
		12	0	19.5	19.7	19.5	4.0	21.3
		12	7	19.4	19.6	19.5	4.0	21.3
		12	13	19.4	19.6	19.5	4.0	21.3
		25	0	19.4	19.6	19.5	4.0	21.3
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26705	26865	27025		
				815.5 MHz	831.5 MHz	847.5 MHz		
3 MHz	QPSK	1	0	23.9	24.1	23.9	0.0	25.3
		1	8	23.9	24.0	24.1	0.0	25.3
		1	14	23.9	24.0	23.9	0.0	25.3
		8	0	21.3	21.5	21.4	2.0	23.3
		8	4	21.3	21.5	21.4	2.0	23.3
		8	7	21.4	21.5	21.3	2.0	23.3
		15	0	21.3	21.5	21.4	2.0	23.3
	16QAM	1	0	21.8	22.0	21.7	2.0	23.3
		1	8	21.8	22.0	21.7	2.0	23.3
		1	14	21.9	22.0	21.6	2.0	23.3
		8	0	21.5	21.7	20.5	3.0	22.3
		8	4	21.5	21.7	20.5	3.0	22.3
		8	7	21.5	21.7	20.5	3.0	22.3
		15	0	21.5	21.7	20.5	3.0	22.3
	64QAM	1	0	20.7	21.0	20.4	3.0	22.3
		1	8	20.7	21.0	20.4	3.0	22.3
		1	14	20.8	21.0	20.5	3.0	22.3
		8	0	20.5	20.7	19.4	4.0	21.3
		8	4	20.5	20.7	19.5	4.0	21.3
		8	7	20.5	20.7	19.4	4.0	21.3
		15	0	20.5	20.8	19.5	4.0	21.3

**LTE Band 26 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26697	26865	27033		
				814.7 MHz	831.5 MHz	848.3 MHz		
1.4 MHz	QPSK	1	0	23.3	24.1	23.9	0.0	25.3
		1	3	23.6	24.1	24.0	0.0	25.3
		1	5	23.9	24.1	24.0	0.0	25.3
		3	0	23.6	24.2	24.2	0.0	25.3
		3	1	23.7	24.2	24.2	0.0	25.3
		3	3	23.9	24.2	24.2	0.0	25.3
		6	0	21.3	21.5	21.3	2.0	23.3
	16QAM	1	0	21.3	22.0	22.0	2.0	23.3
		1	3	21.6	22.0	22.0	2.0	23.3
		1	5	21.7	22.0	22.0	2.0	23.3
		3	0	21.4	21.9	21.9	2.0	23.3
		3	1	21.6	22.0	21.9	2.0	23.3
		3	3	21.7	22.0	21.9	2.0	23.3
		6	0	21.5	21.7	21.7	3.0	22.3
	64QAM	1	0	20.8	21.0	21.0	3.0	22.3
		1	3	20.7	21.0	21.0	3.0	22.3
		1	5	20.7	21.0	21.0	3.0	22.3
		3	0	20.1	21.0	21.1	3.0	22.3
		3	1	20.5	21.0	21.1	3.0	22.3
		3	3	20.7	21.0	21.1	3.0	22.3
		6	0	20.4	20.7	20.8	4.0	21.3

**Note(s):**

15 MHz Bandwidths does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE Devices

**LTE Band 66 Measured Results**

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				132072	132322	132572		
				1720 MHz	1745 MHz	1770 MHz		
20 MHz	QPSK	1	0	23.8	24.3	23.6	0.0	25
		1	49	23.5	24.0	23.3	0.0	25
		1	99	23.5	24.0	23.5	0.0	25
		50	0	21.9	22.2	21.6	2.0	23
		50	24	21.8	22.2	21.6	2.0	23
		50	50	21.7	22.1	21.6	2.0	23
	16QAM	100	0	21.7	22.2	21.6	2.0	23
		1	0	22.3	22.5	21.9	2.0	23
		1	49	22.0	22.2	21.7	2.0	23
		1	99	22.0	22.4	21.8	2.0	23
		50	0	20.9	21.3	20.8	3.0	22
		50	24	20.8	21.2	20.7	3.0	22
	64QAM	50	50	20.7	21.2	20.6	3.0	22
		100	0	20.8	21.2	20.6	3.0	22
		1	0	21.1	21.6	20.9	3.0	22
		1	49	20.9	21.3	20.7	3.0	22
		1	99	20.7	21.5	20.6	3.0	22
		50	0	19.8	20.2	19.7	4.0	21
		50	24	19.7	20.2	19.6	4.0	21
		50	50	19.7	20.1	19.6	4.0	21
	100	0	19.7	20.1	19.6	4.0	21	
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				132047	132322	132597		
				1717.5 MHz	1745 MHz	1772.5 MHz		
15 MHz	QPSK	1	0	23.8	24.1	23.6	0.0	25
		1	37	23.9	24.0	23.7	0.0	25
		1	74	23.6	24.0	23.4	0.0	25
		36	0	21.9	22.2	21.7	2.0	23
		36	20	21.8	22.2	21.6	2.0	23
		36	39	21.7	22.1	21.6	2.0	23
		75	0	21.9	22.2	21.7	2.0	23
	16QAM	1	0	22.0	22.6	22.1	2.0	23
		1	37	22.0	22.7	22.2	2.0	23
		1	74	21.8	22.5	21.9	2.0	23
		36	0	20.8	21.3	20.8	3.0	22
		36	20	20.8	21.2	20.7	3.0	22
		36	39	20.7	21.2	20.6	3.0	22
		75	0	20.9	21.2	20.7	3.0	22
	64QAM	1	0	20.9	21.5	21.1	3.0	22
		1	37	20.8	21.6	21.1	3.0	22
		1	74	20.6	21.4	21.0	3.0	22
		36	0	19.8	20.1	19.6	4.0	21
		36	20	19.7	20.1	19.6	4.0	21
		36	39	19.7	20.0	19.6	4.0	21
		75	0	19.8	20.2	19.7	4.0	21

**LTE Band 66 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				132022	132322	132622		
				1715 MHz	1745 MHz	1775 MHz		
10 MHz	QPSK	1	0	23.7	24.1	23.7	0.0	25
		1	25	23.6	24.0	23.6	0.0	25
		1	49	23.6	24.0	23.6	0.0	25
		25	0	21.8	22.2	21.7	2.0	23
		25	12	21.8	22.2	21.6	2.0	23
		25	25	21.7	22.1	21.6	2.0	23
		50	0	21.8	22.2	21.7	2.0	23
	16QAM	1	0	22.2	22.7	21.7	2.0	23
		1	25	22.3	22.7	21.9	2.0	23
		1	49	22.1	22.5	21.6	2.0	23
		25	0	20.9	21.3	20.8	3.0	22
		25	12	20.8	21.2	20.7	3.0	22
		25	25	20.8	21.2	20.7	3.0	22
		50	0	20.8	21.2	20.7	3.0	22
	64QAM	1	0	21.0	21.4	21.0	3.0	22
		1	25	20.7	21.2	20.7	3.0	22
		1	49	20.8	21.3	20.8	3.0	22
		25	0	19.7	20.2	19.7	4.0	21
		25	12	19.7	20.2	19.6	4.0	21
		25	25	19.7	20.1	19.6	4.0	21
		50	0	19.7	20.2	19.6	4.0	21
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				131997	132322	132647		
				1712.5 MHz	1745 MHz	1777.5 MHz		
5 MHz	QPSK	1	0	23.7	24.1	24.1	0.0	25
		1	12	23.8	24.2	24.2	0.0	25
		1	24	23.7	24.2	24.2	0.0	25
		12	0	21.8	22.2	21.7	2.0	23
		12	7	21.7	22.1	21.7	2.0	23
		12	13	21.7	22.1	21.7	2.0	23
		25	0	21.7	22.1	21.7	2.0	23
	16QAM	1	0	22.3	22.5	22.1	2.0	23
		1	12	22.1	22.4	22.1	2.0	23
		1	24	22.1	22.6	22.1	2.0	23
		12	0	20.9	21.3	20.8	3.0	22
		12	7	20.8	21.3	20.7	3.0	22
		12	13	20.8	21.3	20.7	3.0	22
		25	0	20.8	21.2	20.7	3.0	22
	64QAM	1	0	21.2	21.4	20.9	3.0	22
		1	12	21.0	21.5	20.7	3.0	22
		1	24	21.0	21.4	21.0	3.0	22
		12	0	19.7	20.2	19.7	4.0	21
		12	7	19.7	20.1	19.7	4.0	21
		12	13	19.7	20.1	19.7	4.0	21
		25	0	19.7	20.1	19.7	4.0	21

**LTE Band 66 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				131987	132322	132657		
				1711.5 MHz	1745 MHz	1778.5 MHz		
3 MHz	QPSK	1	0	23.7	24.2	23.8	0.0	25
		1	8	24.0	24.0	23.9	0.0	25
		1	14	23.8	24.1	23.8	0.0	25
		8	0	21.7	22.1	21.7	2.0	23
		8	4	21.7	22.1	21.7	2.0	23
		8	7	21.7	22.1	21.7	2.0	23
		15	0	21.7	22.1	21.7	2.0	23
	16QAM	1	0	22.1	22.6	22.0	2.0	23
		1	8	22.4	22.5	22.1	2.0	23
		1	14	22.3	22.4	21.8	2.0	23
		8	0	20.8	21.2	20.8	3.0	22
		8	4	20.8	21.2	20.7	3.0	22
		8	7	20.8	21.1	20.7	3.0	22
		15	0	20.7	21.2	20.7	3.0	22
	64QAM	1	0	21.0	21.3	21.0	3.0	22
		1	8	21.1	21.3	20.6	3.0	22
		1	14	20.9	21.4	20.6	3.0	22
		8	0	19.8	20.1	19.6	4.0	21
		8	4	19.7	20.1	19.6	4.0	21
		8	7	19.7	20.1	19.6	4.0	21
		15	0	19.7	20.1	19.6	4.0	21
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				131979	132322	132665		
				1710.7 MHz	1745 MHz	1779.3 MHz		
1.4 MHz	QPSK	1	0	23.7	24.2	24.0	0.0	25
		1	3	23.6	24.1	23.9	0.0	25
		1	5	23.7	24.1	23.9	0.0	25
		3	0	23.6	24.0	23.9	0.0	25
		3	1	23.6	24.0	24.0	0.0	25
		3	3	23.6	24.0	23.9	0.0	25
		6	0	21.6	22.1	21.9	2.0	23
	16QAM	1	0	22.3	22.5	22.3	2.0	23
		1	3	22.2	22.2	22.0	2.0	23
		1	5	22.3	22.3	22.2	2.0	23
		3	0	21.7	22.1	22.1	2.0	23
		3	1	21.8	22.1	22.0	2.0	23
		3	3	21.8	22.1	22.0	2.0	23
		6	0	20.6	21.1	21.0	3.0	22
	64QAM	1	0	21.0	21.4	21.5	3.0	22
		1	3	21.0	21.5	21.5	3.0	22
		1	5	21.1	21.5	21.5	3.0	22
		3	0	20.8	21.4	21.4	3.0	22
		3	1	20.8	21.4	21.4	3.0	22
		3	3	20.9	21.4	21.4	3.0	22
		6	0	19.8	20.1	20.0	4.0	21

## 2. Reduced power Results

### LTE Band 7 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Reduced Average Power (dBm)					Reduced Average Power (dBm)				
				Hotspot back-off			MPR	Tune-up Limit	Proximity sensor back-off			MPR	Tune-up Limit
				Measured Pwr (dBm)					Measured Pwr (dBm)				
				20850	21100	21350			20850	21100	21350		
2510 MHz	2535 MHz	2560 MHz	2510 MHz	2535 MHz	2560 MHz								
20 MHz	QPSK	1	0	21.3	21.4	21.3	0.0	22	21.3	21.5	21.2	0.0	22
		1	49	21.1	21.1	21.1	0.0	22	21.2	21.3	21.0	0.0	22
		1	99	21.1	21.1	21.0	0.0	22	21.1	21.1	21.1	0.0	22
		50	0	21.3	21.3	21.2	0.0	22	21.3	21.4	21.2	0.0	22
		50	24	21.2	21.2	21.2	0.0	22	21.2	21.3	21.2	0.0	22
		50	50	21.2	21.2	21.1	0.0	22	21.2	21.2	21.1	0.0	22
		100	0	21.2	21.2	21.2	0.0	22	21.2	21.3	21.1	0.0	22
	16QAM	1	0	21.7	21.8	21.6	0.0	22	21.7	21.8	21.6	0.0	22
		1	49	21.5	21.5	21.3	0.0	22	21.4	21.6	21.5	0.0	22
		1	99	21.5	21.6	21.4	0.0	22	21.6	21.6	21.5	0.0	22
		50	0	21.3	21.3	21.2	0.0	22	21.3	21.4	21.2	0.0	22
		50	24	21.2	21.3	21.2	0.0	22	21.2	21.3	21.2	0.0	22
		50	50	21.2	21.2	21.1	0.0	22	21.2	21.2	21.1	0.0	22
		100	0	21.1	21.2	21.1	0.0	22	21.2	21.2	21.1	0.0	22
	64QAM	1	0	21.5	21.7	21.6	0.0	22	21.7	21.8	21.5	0.0	22
		1	49	21.4	21.4	21.4	0.0	22	21.4	21.5	21.2	0.0	22
		1	99	21.4	21.3	21.2	0.0	22	21.4	21.5	21.1	0.0	22
		50	0	20.2	20.3	20.2	0.0	22	20.3	20.3	20.2	0.0	22
		50	24	20.2	20.3	20.1	0.0	22	20.2	20.3	20.1	0.0	22
		50	50	20.1	20.2	20.1	0.0	22	20.2	20.2	20.1	0.0	22
		100	0	20.2	20.2	20.1	0.0	22	20.2	20.3	20.1	0.0	22
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				20825	21100	21375			20825	21100	21375		
				2507.5 MHz	2535 MHz	2562.5 MHz			2507.5 MHz	2535 MHz	2562.5 MHz		
				20825	21100	21375	20825	21100	21375				
15 MHz	QPSK	1	0	21.3	21.3	21.2	0.0	22	21.3	21.4	21.2	0.0	22
		1	37	21.5	21.2	21.3	0.0	22	21.5	21.2	21.2	0.0	22
		1	74	21.2	21.1	21.0	0.0	22	21.1	21.1	21.1	0.0	22
		36	0	21.2	21.3	21.1	0.0	22	21.2	21.3	21.2	0.0	22
		36	20	21.2	21.2	21.1	0.0	22	21.2	21.2	21.1	0.0	22
		36	39	21.1	21.1	21.1	0.0	22	21.2	21.2	21.1	0.0	22
		75	0	21.2	21.3	21.2	0.0	22	21.3	21.3	21.2	0.0	22
	16QAM	1	0	21.6	21.8	21.3	0.0	22	21.6	21.7	21.3	0.0	22
		1	37	21.5	21.6	21.3	0.0	22	21.6	21.5	21.1	0.0	22
		1	74	21.4	21.5	21.2	0.0	22	21.5	21.4	21.2	0.0	22
		36	0	21.2	21.3	21.1	0.0	22	21.2	21.3	21.2	0.0	22
		36	20	21.2	21.2	21.1	0.0	22	21.2	21.3	21.1	0.0	22
		36	39	21.1	21.2	21.0	0.0	22	21.2	21.2	21.1	0.0	22
		75	0	21.2	21.3	21.1	0.0	22	21.3	21.3	21.2	0.0	22
	64QAM	1	0	21.4	21.7	21.5	0.0	22	21.4	21.8	21.5	0.0	22
		1	37	21.3	21.5	21.4	0.0	22	21.5	21.7	21.4	0.0	22
		1	74	21.2	21.4	21.4	0.0	22	21.2	21.5	21.4	0.0	22
		36	0	20.2	20.3	20.2	0.0	22	20.3	20.3	20.2	0.0	22
		36	20	20.2	20.2	20.1	0.0	22	20.2	20.3	20.1	0.0	22
		36	39	20.1	20.2	20.1	0.0	22	20.2	20.2	20.1	0.0	22
		75	0	20.2	20.3	20.1	0.0	22	20.2	20.3	20.2	0.0	22

**LTE Band 7 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				20800	21100	21400			20800	21100	21400		
				2505 MHz	2535 MHz	2565 MHz			2505 MHz	2535 MHz	2565 MHz		
10 MHz	QPSK	1	0	21.2	21.4	21.2	0.0	22	21.2	21.4	21.2	0.0	22
		1	25	21.1	21.1	21.1	0.0	22	21.1	21.2	21.1	0.0	22
		1	49	21.2	21.1	21.1	0.0	22	21.2	21.2	21.1	0.0	22
		25	0	21.1	21.3	21.1	0.0	22	21.2	21.3	21.2	0.0	22
		25	12	21.1	21.2	21.1	0.0	22	21.1	21.3	21.1	0.0	22
		25	25	21.1	21.2	21.1	0.0	22	21.2	21.2	21.1	0.0	22
		50	0	21.1	21.2	21.1	0.0	22	21.2	21.3	21.2	0.0	22
	16QAM	1	0	21.6	21.7	21.4	0.0	22	21.6	21.8	21.4	0.0	22
		1	25	21.5	21.4	21.2	0.0	22	21.5	21.5	21.2	0.0	22
		1	49	21.6	21.4	21.3	0.0	22	21.5	21.5	21.3	0.0	22
		25	0	21.2	21.3	21.1	0.0	22	21.2	21.3	21.1	0.0	22
		25	12	21.1	21.2	21.1	0.0	22	21.2	21.3	21.1	0.0	22
		25	25	21.1	21.2	21.1	0.0	22	21.1	21.2	21.1	0.0	22
		50	0	21.1	21.2	21.1	0.0	22	21.1	21.2	21.2	0.0	22
	64QAM	1	0	21.1	21.7	21.5	0.0	22	21.2	21.7	21.6	0.0	22
		1	25	21.0	21.5	21.3	0.0	22	21.1	21.4	21.4	0.0	22
		1	49	21.1	21.5	21.3	0.0	22	21.2	21.5	21.4	0.0	22
		25	0	20.1	20.3	20.2	0.0	22	20.2	20.4	20.2	0.0	22
		25	12	20.1	20.3	20.2	0.0	22	20.2	20.3	20.1	0.0	22
		25	25	20.1	20.2	20.2	0.0	22	20.1	20.3	20.2	0.0	22
		50	0	20.1	20.2	20.1	0.0	22	20.1	20.3	20.2	0.0	22
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				20775	21100	21425			20775	21100	21425		
				2502.5 MHz	2535 MHz	2567.5 MHz			2502.5 MHz	2535 MHz	2567.5 MHz		
5 MHz	QPSK	1	0	21.1	21.2	21.2	0.0	22	21.2	21.3	21.2	0.0	22
		1	12	21.3	21.3	21.3	0.0	22	21.3	21.4	21.2	0.0	22
		1	24	21.1	21.2	21.2	0.0	22	21.2	21.3	21.2	0.0	22
		12	0	21.1	21.2	21.2	0.0	22	21.2	21.3	21.2	0.0	22
		12	7	21.1	21.2	21.2	0.0	22	21.1	21.2	21.2	0.0	22
		12	13	21.1	21.2	21.2	0.0	22	21.1	21.3	21.2	0.0	22
		25	0	21.1	21.2	21.2	0.0	22	21.2	21.3	21.2	0.0	22
	16QAM	1	0	21.6	21.6	21.6	0.0	22	21.4	21.6	21.7	0.0	22
		1	12	21.6	21.6	21.5	0.0	22	21.4	21.5	21.2	0.0	22
		1	24	21.6	21.6	21.6	0.0	22	21.5	21.5	21.6	0.0	22
		12	0	21.2	21.3	21.3	0.0	22	21.2	21.3	21.3	0.0	22
		12	7	21.1	21.2	21.2	0.0	22	21.1	21.3	21.2	0.0	22
		12	13	21.1	21.2	21.2	0.0	22	21.1	21.3	21.3	0.0	22
		25	0	21.2	21.2	21.2	0.0	22	21.2	21.2	21.2	0.0	22
	64QAM	1	0	21.5	21.7	21.4	0.0	22	21.4	21.8	21.4	0.0	22
		1	12	21.3	21.6	21.3	0.0	22	21.3	21.7	21.2	0.0	22
		1	24	21.5	21.6	21.4	0.0	22	21.5	21.6	21.4	0.0	22
		12	0	20.2	20.3	20.2	0.0	22	20.2	20.3	20.3	0.0	22
		12	7	20.2	20.3	20.2	0.0	22	20.2	20.3	20.2	0.0	22
		12	13	20.2	20.3	20.2	0.0	22	20.2	20.3	20.3	0.0	22
		25	0	20.1	20.2	20.2	0.0	22	20.2	20.3	20.2	0.0	22

**LTE Band 25 Measured Results**

BW (MHz)	Mode	RB Allocation	RB offset	Reduced Average Power (dBm)					Reduced Average Power (dBm)				
				Hotspot back-off			MPR	Tune-up Limit	Proximity sensor back-off			MPR	Tune-up Limit
				Measured Pwr (dBm)					Measured Pwr (dBm)				
				26140	26365	26590			26140	26365	26590		
1860 MHz	1882.5 MHz	1905 MHz	1860 MHz	1882.5 MHz	1905 MHz								
20 MHz	QPSK	1	0	20.7	20.5	21.1	0.0	21.5	20.7	20.5	21.1	0.0	21.5
		1	49	20.6	20.4	20.8	0.0	21.5	20.6	20.4	20.9	0.0	21.5
		1	99	20.5	20.3	20.9	0.0	21.5	20.5	20.3	20.9	0.0	21.5
		50	0	20.7	20.5	21.1	0.0	21.5	20.7	20.5	21.1	0.0	21.5
		50	24	20.7	20.4	21.1	0.0	21.5	20.6	20.4	21.1	0.0	21.5
		50	50	20.6	20.4	21.0	0.0	21.5	20.6	20.4	21.0	0.0	21.5
		100	0	20.6	20.4	21.0	0.0	21.5	20.6	20.4	21.0	0.0	21.5
	16QAM	1	0	21.1	21.1	21.5	0.0	21.5	21.1	21.0	21.5	0.0	21.5
		1	49	20.7	20.8	21.3	0.0	21.5	20.8	20.7	21.4	0.0	21.5
		1	99	20.9	20.8	21.3	0.0	21.5	20.9	20.7	21.4	0.0	21.5
		50	0	20.7	20.5	21.2	0.0	21.5	20.7	20.5	21.2	0.0	21.5
		50	24	20.7	20.5	21.1	0.0	21.5	20.7	20.5	21.1	0.0	21.5
		50	50	20.6	20.4	21.1	0.0	21.5	20.6	20.4	21.0	0.0	21.5
		100	0	20.6	20.4	21.1	0.0	21.5	20.6	20.4	21.1	0.0	21.5
	64QAM	1	0	21.0	20.9	21.3	0.0	21.5	20.9	21.1	21.4	0.0	21.5
		1	49	20.8	20.6	21.0	0.0	21.5	20.8	20.8	21.1	0.0	21.5
		1	99	20.7	20.7	21.0	0.0	21.5	20.7	20.9	21.0	0.0	21.5
		50	0	20.2	20.0	20.7	0.0	21.5	20.2	20.0	20.6	0.0	21.5
		50	24	20.1	20.0	20.6	0.0	21.5	20.1	20.0	20.6	0.0	21.5
		50	50	20.1	19.9	20.6	0.0	21.5	20.1	19.9	20.5	0.0	21.5
		100	0	20.1	19.9	20.6	0.0	21.5	20.1	19.9	20.6	0.0	21.5
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				26115	26365	26615			26115	26365	26615		
				1857.5 MHz	1882.5 MHz	1907.5 MHz			1857.5 MHz	1882.5 MHz	1907.5 MHz		
15 MHz	QPSK	1	0	20.8	20.5	21.1	0.0	21.5	20.8	20.5	21.1	0.0	21.5
		1	37	20.9	20.3	21.2	0.0	21.5	21.0	20.2	21.1	0.0	21.5
		1	74	20.6	20.4	20.9	0.0	21.5	20.6	20.3	20.9	0.0	21.5
		36	0	20.7	20.4	21.1	0.0	21.5	20.7	20.4	21.1	0.0	21.5
		36	20	20.6	20.4	21.0	0.0	21.5	20.6	20.4	21.0	0.0	21.5
		36	39	20.6	20.4	21.0	0.0	21.5	20.6	20.3	21.0	0.0	21.5
		75	0	20.7	20.5	21.1	0.0	21.5	20.7	20.4	21.1	0.0	21.5
	16QAM	1	0	21.2	20.9	21.5	0.0	21.5	21.3	20.8	21.5	0.0	21.5
		1	37	21.2	20.9	21.5	0.0	21.5	21.3	20.9	21.5	0.0	21.5
		1	74	21.0	20.8	21.3	0.0	21.5	21.1	20.7	21.3	0.0	21.5
		36	0	20.7	20.5	21.1	0.0	21.5	20.7	20.5	21.1	0.0	21.5
		36	20	20.7	20.4	21.0	0.0	21.5	20.7	20.4	21.0	0.0	21.5
		36	39	20.6	20.4	21.0	0.0	21.5	20.6	20.4	21.0	0.0	21.5
		75	0	20.7	20.5	21.1	0.0	21.5	20.7	20.4	21.1	0.0	21.5
	64QAM	1	0	21.0	20.7	21.4	0.0	21.5	20.9	20.8	21.3	0.0	21.5
		1	37	20.9	20.7	21.5	0.0	21.5	20.9	20.7	21.2	0.0	21.5
		1	74	20.7	20.5	21.3	0.0	21.5	20.7	20.6	21.1	0.0	21.5
		36	0	20.2	19.9	20.6	0.0	21.5	20.2	19.9	20.6	0.0	21.5
		36	20	20.2	19.9	20.6	0.0	21.5	20.1	19.9	20.5	0.0	21.5
		36	39	20.1	19.9	20.5	0.0	21.5	20.1	19.9	20.5	0.0	21.5
		75	0	20.1	20.0	20.6	0.0	21.5	20.1	20.0	20.6	0.0	21.5

**LTE Band 25 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				26090	26365	26640			26090	26365	26640		
				1855 MHz	1882.5 MHz	1910 MHz			1855 MHz	1882.5 MHz	1910 MHz		
10 MHz	QPSK	1	0	20.8	20.5	21.0	0.0	21.5	20.8	20.4	21.0	0.0	21.5
		1	25	20.6	20.3	20.9	0.0	21.5	20.7	20.2	20.9	0.0	21.5
		1	49	20.7	20.3	20.9	0.0	21.5	20.7	20.2	20.9	0.0	21.5
		25	0	20.7	20.4	21.0	0.0	21.5	20.8	20.4	21.0	0.0	21.5
		25	12	20.7	20.4	21.0	0.0	21.5	20.7	20.4	21.0	0.0	21.5
		25	25	20.7	20.4	21.0	0.0	21.5	20.7	20.4	20.9	0.0	21.5
		50	0	20.7	20.4	21.0	0.0	21.5	20.7	20.4	21.0	0.0	21.5
	16QAM	1	0	21.3	21.0	21.4	0.0	21.5	20.8	20.9	21.2	0.0	21.5
		1	25	21.1	20.7	21.2	0.0	21.5	20.6	20.6	20.9	0.0	21.5
		1	49	21.2	20.8	21.3	0.0	21.5	20.8	20.7	21.0	0.0	21.5
		25	0	20.8	20.5	21.1	0.0	21.5	20.8	20.5	21.1	0.0	21.5
		25	12	20.8	20.5	21.0	0.0	21.5	20.8	20.5	21.0	0.0	21.5
		25	25	20.8	20.5	21.0	0.0	21.5	20.7	20.4	21.0	0.0	21.5
		50	0	20.7	20.4	21.0	0.0	21.5	20.7	20.4	21.0	0.0	21.5
	64QAM	1	0	20.9	20.7	21.2	0.0	21.5	21.0	20.6	21.4	0.0	21.5
		1	25	20.8	20.5	20.9	0.0	21.5	20.9	20.4	21.1	0.0	21.5
		1	49	20.9	20.7	21.0	0.0	21.5	20.9	20.5	21.2	0.0	21.5
		25	0	20.2	20.0	20.6	0.0	21.5	20.2	20.0	20.5	0.0	21.5
		25	12	20.2	20.0	20.5	0.0	21.5	20.2	20.0	20.5	0.0	21.5
		25	25	20.2	19.9	20.5	0.0	21.5	20.2	20.0	20.5	0.0	21.5
		50	0	20.2	19.9	20.5	0.0	21.5	20.2	19.9	20.5	0.0	21.5
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				26065	26365	26665			26065	26365	26665		
				1852.5 MHz	1882.5 MHz	1912.5 MHz			1852.5 MHz	1882.5 MHz	1912.5 MHz		
5 MHz	QPSK	1	0	20.8	20.4	21.0	0.0	21.5	20.7	20.4	20.9	0.0	21.5
		1	12	20.8	20.3	21.1	0.0	21.5	20.9	20.4	20.8	0.0	21.5
		1	24	20.8	20.4	21.0	0.0	21.5	20.8	20.4	20.9	0.0	21.5
		12	0	20.8	20.4	21.0	0.0	21.5	20.7	20.4	21.0	0.0	21.5
		12	7	20.8	20.4	20.9	0.0	21.5	20.7	20.4	20.9	0.0	21.5
		12	13	20.8	20.4	20.9	0.0	21.5	20.7	20.4	20.9	0.0	21.5
		25	0	20.8	20.4	21.0	0.0	21.5	20.7	20.4	21.0	0.0	21.5
	16QAM	1	0	21.0	20.9	21.3	0.0	21.5	21.2	20.7	21.4	0.0	21.5
		1	12	21.1	21.0	21.3	0.0	21.5	20.9	20.6	21.4	0.0	21.5
		1	24	21.1	20.8	21.4	0.0	21.5	21.2	20.8	21.3	0.0	21.5
		12	0	20.8	20.5	21.1	0.0	21.5	20.9	20.5	21.0	0.0	21.5
		12	7	20.8	20.5	21.0	0.0	21.5	20.9	20.5	21.0	0.0	21.5
		12	13	20.8	20.5	21.0	0.0	21.5	20.8	20.5	21.0	0.0	21.5
		25	0	20.8	20.4	21.0	0.0	21.5	20.8	20.4	21.0	0.0	21.5
	64QAM	1	0	20.9	20.7	21.4	0.0	21.5	20.9	20.7	21.4	0.0	21.5
		1	12	21.0	20.7	21.2	0.0	21.5	21.1	20.4	21.3	0.0	21.5
		1	24	21.0	20.8	21.3	0.0	21.5	20.9	20.8	21.3	0.0	21.5
		12	0	20.3	20.0	20.5	0.0	21.5	20.2	20.0	20.5	0.0	21.5
		12	7	20.3	20.0	20.5	0.0	21.5	20.2	20.0	20.5	0.0	21.5
		12	13	20.3	20.0	20.5	0.0	21.5	20.2	20.0	20.5	0.0	21.5
		25	0	20.3	20.0	20.5	0.0	21.5	20.3	20.0	20.5	0.0	21.5

**LTE Band 25 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				26055	26365	26675			26055	26365	26675		
				1851.5 MHz	1882.5 MHz	1913.5 MHz			1851.5 MHz	1882.5 MHz	1913.5 MHz		
3 MHz	QPSK	1	0	20.8	20.5	20.9	0.0	21.5	20.8	20.5	20.9	0.0	21.5
		1	8	21.1	20.3	21.0	0.0	21.5	21.1	20.4	21.2	0.0	21.5
		1	14	20.8	20.3	21.0	0.0	21.5	20.9	20.4	21.0	0.0	21.5
		8	0	20.7	20.4	20.9	0.0	21.5	20.7	20.4	20.9	0.0	21.5
		8	4	20.7	20.4	20.9	0.0	21.5	20.7	20.3	20.8	0.0	21.5
		8	7	20.7	20.3	20.8	0.0	21.5	20.7	20.4	20.8	0.0	21.5
		15	0	20.7	20.4	20.8	0.0	21.5	20.7	20.4	20.8	0.0	21.5
	16QAM	1	0	21.2	20.9	21.1	0.0	21.5	21.3	21.0	21.1	0.0	21.5
		1	8	21.4	21.0	21.2	0.0	21.5	21.4	20.9	21.1	0.0	21.5
		1	14	21.3	20.8	21.1	0.0	21.5	21.3	20.7	21.1	0.0	21.5
		8	0	20.7	20.4	20.9	0.0	21.5	20.8	20.4	20.9	0.0	21.5
		8	4	20.8	20.4	20.9	0.0	21.5	20.8	20.4	20.9	0.0	21.5
		8	7	20.8	20.4	20.9	0.0	21.5	20.8	20.4	20.9	0.0	21.5
		15	0	20.8	20.4	20.9	0.0	21.5	20.7	20.5	20.9	0.0	21.5
	64QAM	1	0	20.9	20.6	21.2	0.0	21.5	20.7	20.7	21.3	0.0	21.5
		1	8	21.1	20.6	21.2	0.0	21.5	21.0	20.7	21.1	0.0	21.5
		1	14	21.0	20.7	21.1	0.0	21.5	20.9	20.7	21.1	0.0	21.5
		8	0	20.2	19.9	20.3	0.0	21.5	20.3	20.0	20.3	0.0	21.5
		8	4	20.2	19.9	20.4	0.0	21.5	20.3	19.9	20.3	0.0	21.5
		8	7	20.2	19.9	20.3	0.0	21.5	20.3	20.0	20.3	0.0	21.5
		15	0	20.2	20.0	20.4	0.0	21.5	20.2	20.0	20.4	0.0	21.5
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				26047	26365	26683			26047	26365	26683		
				1850.7 MHz	1882.5 MHz	1914.3 MHz			1850.7 MHz	1882.5 MHz	1914.3 MHz		
1.4 MHz	QPSK	1	0	20.8	20.5	21.0	0.0	21.5	20.8	20.5	20.9	0.0	21.5
		1	3	20.7	20.4	20.9	0.0	21.5	20.7	20.3	20.8	0.0	21.5
		1	5	20.7	20.3	20.8	0.0	21.5	20.7	20.4	20.8	0.0	21.5
		3	0	20.6	20.3	20.8	0.0	21.5	20.6	20.3	20.7	0.0	21.5
		3	1	20.6	20.2	20.8	0.0	21.5	20.5	20.4	20.8	0.0	21.5
		3	3	20.7	20.3	20.8	0.0	21.5	20.6	20.3	20.8	0.0	21.5
		6	0	20.7	20.3	20.8	0.0	21.5	20.6	20.3	20.8	0.0	21.5
	16QAM	1	0	21.4	20.6	21.0	0.0	21.5	21.0	20.5	21.2	0.0	21.5
		1	3	21.4	20.5	20.9	0.0	21.5	20.9	20.3	21.2	0.0	21.5
		1	5	21.2	20.7	21.0	0.0	21.5	20.9	20.4	21.3	0.0	21.5
		3	0	20.8	20.4	21.0	0.0	21.5	20.8	20.4	20.9	0.0	21.5
		3	1	20.9	20.4	20.9	0.0	21.5	20.6	20.4	21.0	0.0	21.5
		3	3	20.9	20.4	20.9	0.0	21.5	20.8	20.4	21.0	0.0	21.5
		6	0	20.7	20.4	20.9	0.0	21.5	20.6	20.5	20.8	0.0	21.5
	64QAM	1	0	21.1	20.8	21.2	0.0	21.5	20.7	20.9	21.4	0.0	21.5
		1	3	21.1	20.8	21.0	0.0	21.5	20.6	20.7	21.5	0.0	21.5
		1	5	21.0	20.7	21.3	0.0	21.5	20.9	20.6	21.0	0.0	21.5
		3	0	20.7	20.6	20.8	0.0	21.5	20.9	20.4	21.1	0.0	21.5
		3	1	20.8	20.6	20.9	0.0	21.5	20.8	20.5	21.0	0.0	21.5
		3	3	20.8	20.6	20.9	0.0	21.5	20.9	20.4	21.1	0.0	21.5
		6	0	20.3	19.9	20.3	0.0	21.5	20.3	19.9	20.3	0.0	21.5

**LTE Band 66 Measured Results**

BW (MHz)	Mode	RB Allocation	RB offset	Reduced Average Power (dBm)					Reduced Average Power (dBm)				
				Hotspot back-off			MPR	Tune-up Limit	Proximity sensor back-off			MPR	Tune-up Limit
				Measured Pwr (dBm)					Measured Pwr (dBm)				
				132072	132322	132572			132072	132322	132572		
1720 MHz	1745 MHz	1770 MHz	1720 MHz	1745 MHz	1770 MHz								
20 MHz	QPSK	1	0	20.9	21.2	20.7	0.0	22	21.0	21.2	20.7	0.0	22
		1	49	20.7	21.1	20.4	0.0	22	20.8	21.1	20.4	0.0	22
		1	99	20.6	21.0	20.5	0.0	22	20.7	21.0	20.5	0.0	22
		50	0	20.8	21.2	20.7	0.0	22	20.8	21.2	20.7	0.0	22
		50	24	20.8	21.1	20.6	0.0	22	20.8	21.2	20.6	0.0	22
		50	50	20.7	21.1	20.5	0.0	22	20.6	21.1	20.5	0.0	22
	100	0	20.7	21.1	20.6	0.0	22	20.7	21.1	20.6	0.0	22	
	16QAM	1	0	21.0	21.7	21.1	0.0	22	21.2	21.7	21.2	0.0	22
		1	49	20.9	21.5	20.8	0.0	22	20.9	21.5	21.0	0.0	22
		1	99	20.8	21.5	20.8	0.0	22	20.9	21.5	21.0	0.0	22
		50	0	20.9	21.2	20.7	0.0	22	20.9	21.2	20.7	0.0	22
		50	24	20.8	21.2	20.7	0.0	22	20.8	21.2	20.7	0.0	22
		50	50	20.7	21.1	20.6	0.0	22	20.7	21.2	20.6	0.0	22
	100	0	20.8	21.1	20.6	0.0	22	20.8	21.1	20.6	0.0	22	
	64QAM	1	0	21.3	21.6	21.0	0.0	22	21.1	21.6	20.9	0.0	22
		1	49	21.1	21.5	20.7	0.0	22	21.1	21.4	20.6	0.0	22
		1	99	20.9	21.5	20.7	0.0	22	20.9	21.5	20.7	0.0	22
		50	0	19.9	20.2	19.7	0.0	22	20.9	21.2	20.8	0.0	22
50		24	19.8	20.2	19.7	0.0	22	20.8	21.2	20.7	0.0	22	
50		50	19.7	20.1	19.6	0.0	22	20.7	21.1	20.6	0.0	22	
100	0	19.7	20.2	19.6	0.0	22	20.7	21.2	20.6	0.0	22		
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				132047	132322	132597			132047	132322	132597		
				1717.5 MHz	1745 MHz	1772.5 MHz			1717.5 MHz	1745 MHz	1772.5 MHz		
15 MHz	QPSK	1	0	20.9	21.2	20.8	0.0	22	20.9	21.2	20.7	0.0	22
		1	37	21.1	20.9	20.7	0.0	22	21.1	20.9	20.8	0.0	22
		1	74	20.7	21.1	20.5	0.0	22	20.7	21.1	20.5	0.0	22
		36	0	20.8	21.2	20.7	0.0	22	20.8	21.1	20.6	0.0	22
		36	20	20.7	21.1	20.6	0.0	22	20.7	21.1	20.6	0.0	22
		36	39	20.7	21.1	20.6	0.0	22	20.7	21.1	20.5	0.0	22
	75	0	20.8	21.2	20.7	0.0	22	20.8	21.2	20.7	0.0	22	
	16QAM	1	0	21.3	21.6	21.0	0.0	22	21.4	21.7	21.0	0.0	22
		1	37	21.3	21.5	21.0	0.0	22	21.5	21.7	21.2	0.0	22
		1	74	21.0	21.5	20.8	0.0	22	21.1	21.6	20.9	0.0	22
		36	0	20.9	21.2	20.7	0.0	22	20.8	21.2	20.7	0.0	22
		36	20	20.8	21.2	20.6	0.0	22	20.8	21.1	20.6	0.0	22
		36	39	20.8	21.1	20.6	0.0	22	20.7	21.1	20.6	0.0	22
	75	0	20.8	21.2	20.7	0.0	22	20.8	21.2	20.7	0.0	22	
	64QAM	1	0	21.2	21.6	21.0	0.0	22	20.9	21.4	21.1	0.0	22
		1	37	21.1	21.7	21.1	0.0	22	20.9	21.5	21.0	0.0	22
		1	74	20.9	21.4	20.8	0.0	22	20.7	21.2	20.9	0.0	22
		36	0	19.8	20.2	19.7	0.0	22	20.9	21.2	20.7	0.0	22
36		20	19.8	20.2	19.7	0.0	22	20.8	21.1	20.7	0.0	22	
36		39	19.7	20.1	19.6	0.0	22	20.7	21.1	20.6	0.0	22	
75	0	19.8	20.2	19.7	0.0	22	20.8	21.2	20.7	0.0	22		

**LTE Band 66 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				132022	132322	132622			132022	132322	132622		
				1715 MHz	1745 MHz	1775 MHz			1715 MHz	1745 MHz	1775 MHz		
10 MHz	QPSK	1	0	20.8	21.2	20.7	0.0	22	20.8	21.2	20.7	0.0	22
		1	25	20.7	20.9	20.6	0.0	22	20.7	21.0	20.6	0.0	22
		1	49	20.7	21.0	20.6	0.0	22	20.7	21.0	20.6	0.0	22
		25	0	20.8	21.2	20.7	0.0	22	20.8	21.1	20.7	0.0	22
		25	12	20.7	21.1	20.6	0.0	22	20.8	21.1	20.6	0.0	22
		25	25	20.7	21.1	20.6	0.0	22	20.7	21.1	20.6	0.0	22
		50	0	20.7	21.1	20.6	0.0	22	20.8	21.1	20.6	0.0	22
	16QAM	1	0	21.3	21.4	20.9	0.0	22	21.3	21.6	20.9	0.0	22
		1	25	21.2	21.2	20.7	0.0	22	21.2	21.4	20.7	0.0	22
		1	49	21.2	21.2	20.8	0.0	22	21.2	21.4	20.8	0.0	22
		25	0	20.9	21.2	20.7	0.0	22	20.8	21.2	20.7	0.0	22
		25	12	20.8	21.2	20.7	0.0	22	20.8	21.2	20.7	0.0	22
		25	25	20.8	21.2	20.7	0.0	22	20.7	21.2	20.7	0.0	22
		50	0	20.8	21.2	20.6	0.0	22	20.8	21.1	20.7	0.0	22
	64QAM	1	0	21.2	21.4	20.9	0.0	22	20.9	21.3	21.0	0.0	22
		1	25	21.0	21.2	20.7	0.0	22	20.8	21.1	20.8	0.0	22
		1	49	21.2	21.3	20.8	0.0	22	20.9	21.2	20.7	0.0	22
		25	0	19.8	20.2	19.7	0.0	22	20.8	21.2	20.7	0.0	22
		25	12	19.8	20.1	19.7	0.0	22	20.8	21.2	20.7	0.0	22
		25	25	19.8	20.1	19.6	0.0	22	20.7	21.2	20.6	0.0	22
		50	0	19.8	20.2	19.6	0.0	22	20.7	21.2	20.7	0.0	22
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				131997	132322	132647			131997	132322	132647		
				1712.5 MHz	1745 MHz	1777.5 MHz			1712.5 MHz	1745 MHz	1777.5 MHz		
5 MHz	QPSK	1	0	20.7	21.1	20.7	0.0	22	20.7	21.1	20.7	0.0	22
		1	12	20.7	21.3	20.8	0.0	22	20.7	21.2	20.6	0.0	22
		1	24	20.7	21.1	20.7	0.0	22	20.7	21.2	20.7	0.0	22
		12	0	20.7	21.1	20.7	0.0	22	20.8	21.1	20.7	0.0	22
		12	7	20.7	21.1	20.7	0.0	22	20.7	21.1	20.7	0.0	22
		12	13	20.7	21.1	20.7	0.0	22	20.7	21.1	20.7	0.0	22
		25	0	20.7	21.1	20.7	0.0	22	20.7	21.1	20.7	0.0	22
	16QAM	1	0	21.3	21.7	21.0	0.0	22	21.2	21.4	21.2	0.0	22
		1	12	21.3	21.6	21.1	0.0	22	21.3	21.4	21.2	0.0	22
		1	24	21.2	21.7	21.0	0.0	22	21.1	21.5	21.1	0.0	22
		12	0	20.7	21.2	20.7	0.0	22	20.8	21.2	20.7	0.0	22
		12	7	20.7	21.2	20.7	0.0	22	20.8	21.2	20.8	0.0	22
		12	13	20.8	21.3	20.7	0.0	22	20.8	21.2	20.8	0.0	22
		25	0	20.7	21.2	20.7	0.0	22	20.8	21.1	20.7	0.0	22
	64QAM	1	0	20.9	21.3	21.0	0.0	22	20.9	21.5	21.1	0.0	22
		1	12	20.9	21.1	20.8	0.0	22	21.0	21.3	20.8	0.0	22
		1	24	21.0	21.3	20.8	0.0	22	20.9	21.6	20.9	0.0	22
		12	0	19.8	20.1	19.8	0.0	22	20.7	21.2	20.8	0.0	22
		12	7	19.7	20.2	19.7	0.0	22	20.7	21.2	20.7	0.0	22
		12	13	19.7	20.2	19.7	0.0	22	20.7	21.2	20.8	0.0	22
		25	0	19.8	20.2	19.7	0.0	22	20.7	21.2	20.7	0.0	22

**LTE Band 66 Measured Results (Continued)**

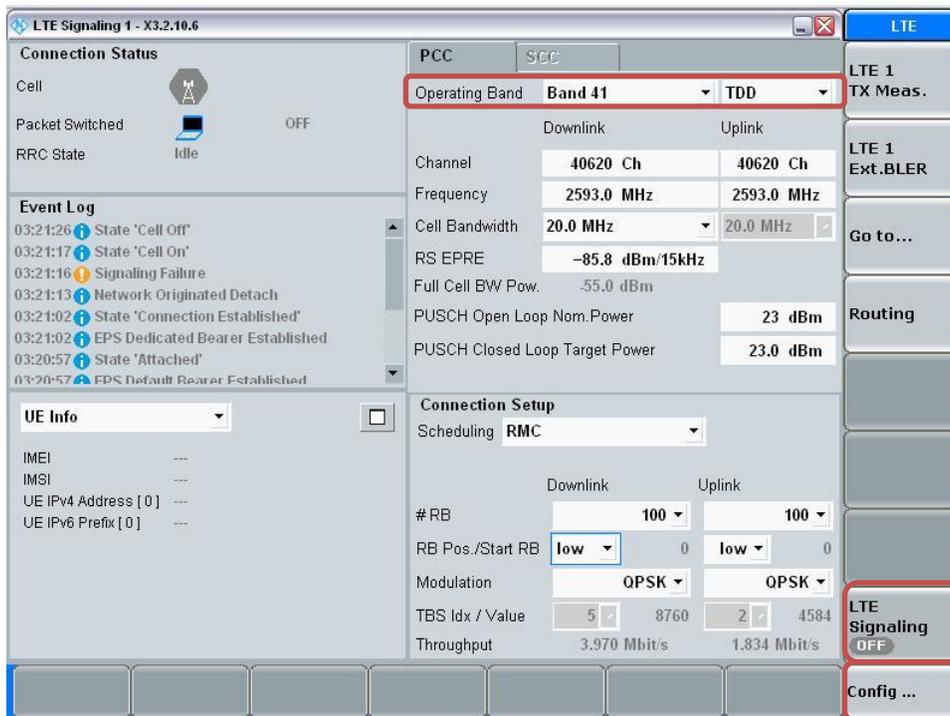
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				131987	132322	132657			131987	132322	132657		
				1711.5 MHz	1745 MHz	1778.5 MHz			1711.5 MHz	1745 MHz	1778.5 MHz		
3 MHz	QPSK	1	0	20.8	21.2	20.7	0.0	22	20.8	21.2	20.7	0.0	22
		1	8	21.0	21.0	20.9	0.0	22	21.1	21.0	20.9	0.0	22
		1	14	20.8	21.1	20.7	0.0	22	20.9	21.1	20.7	0.0	22
		8	0	20.7	21.1	20.7	0.0	22	20.7	21.1	20.7	0.0	22
		8	4	20.7	21.1	20.6	0.0	22	20.7	21.1	20.6	0.0	22
		8	7	20.7	21.1	20.6	0.0	22	20.7	21.1	20.6	0.0	22
		15	0	20.7	21.1	20.6	0.0	22	20.7	21.1	20.7	0.0	22
	16QAM	1	0	21.3	21.4	21.0	0.0	22	21.1	21.7	20.9	0.0	22
		1	8	21.1	21.6	21.1	0.0	22	21.3	21.4	21.1	0.0	22
		1	14	21.0	21.3	21.1	0.0	22	21.2	21.5	21.0	0.0	22
		8	0	20.7	21.1	20.7	0.0	22	20.7	21.2	20.7	0.0	22
		8	4	20.7	21.1	20.7	0.0	22	20.7	21.2	20.7	0.0	22
		8	7	20.7	21.1	20.7	0.0	22	20.7	21.2	20.7	0.0	22
		15	0	20.7	21.1	20.7	0.0	22	20.7	21.1	20.7	0.0	22
	64QAM	1	0	20.8	21.4	21.1	0.0	22	20.7	21.3	20.9	0.0	22
		1	8	20.9	21.6	20.6	0.0	22	20.8	21.5	20.9	0.0	22
		1	14	20.9	21.5	20.9	0.0	22	20.9	21.4	20.7	0.0	22
		8	0	19.7	20.2	19.6	0.0	22	20.7	21.2	20.7	0.0	22
		8	4	19.7	20.1	19.6	0.0	22	20.7	21.2	20.7	0.0	22
		8	7	19.7	20.2	19.6	0.0	22	20.7	21.2	20.7	0.0	22
		15	0	19.7	20.2	19.6	0.0	22	20.7	21.2	20.7	0.0	22
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				131979	132322	132665			131979	132322	132665		
				1710.7 MHz	1745 MHz	1779.3 MHz			1710.7 MHz	1745 MHz	1779.3 MHz		
1.4 MHz	QPSK	1	0	20.8	21.2	21.1	0.0	22	20.8	21.2	21.1	0.0	22
		1	3	20.8	21.1	21.2	0.0	22	20.8	21.2	21.2	0.0	22
		1	5	20.8	21.2	21.1	0.0	22	20.8	21.1	21.2	0.0	22
		3	0	20.9	21.2	21.3	0.0	22	20.9	21.3	21.3	0.0	22
		3	1	20.9	21.2	21.3	0.0	22	20.9	21.3	21.3	0.0	22
		3	3	20.9	21.2	21.2	0.0	22	20.9	21.3	21.3	0.0	22
		6	0	20.8	21.1	21.1	0.0	22	20.8	21.2	21.2	0.0	22
	16QAM	1	0	21.0	21.7	21.7	0.0	22	21.0	21.7	21.7	0.0	22
		1	3	21.1	21.7	21.7	0.0	22	21.1	21.7	21.7	0.0	22
		1	5	21.1	21.7	21.7	0.0	22	21.1	21.7	21.7	0.0	22
		3	0	20.9	21.4	21.4	0.0	22	21.0	21.4	21.3	0.0	22
		3	1	20.9	21.4	21.4	0.0	22	21.0	21.4	21.3	0.0	22
		3	3	20.9	21.5	21.4	0.0	22	21.0	21.3	21.4	0.0	22
		6	0	20.9	21.3	21.3	0.0	22	21.0	21.3	21.3	0.0	22
	64QAM	1	0	21.1	21.2	21.2	0.0	22	21.1	21.4	21.1	0.0	22
		1	3	21.1	21.1	21.1	0.0	22	21.2	21.3	21.3	0.0	22
		1	5	21.0	21.3	21.0	0.0	22	21.2	21.3	21.4	0.0	22
		3	0	20.8	21.1	21.0	0.0	22	21.1	21.4	21.4	0.0	22
		3	1	20.8	21.2	21.1	0.0	22	21.1	21.4	21.4	0.0	22
		3	3	20.8	21.2	21.1	0.0	22	21.1	21.4	21.4	0.0	22
		6	0	19.8	20.1	20.0	0.0	22	20.8	21.3	21.3	0.0	22

**LTE Band TDD Measured Results**

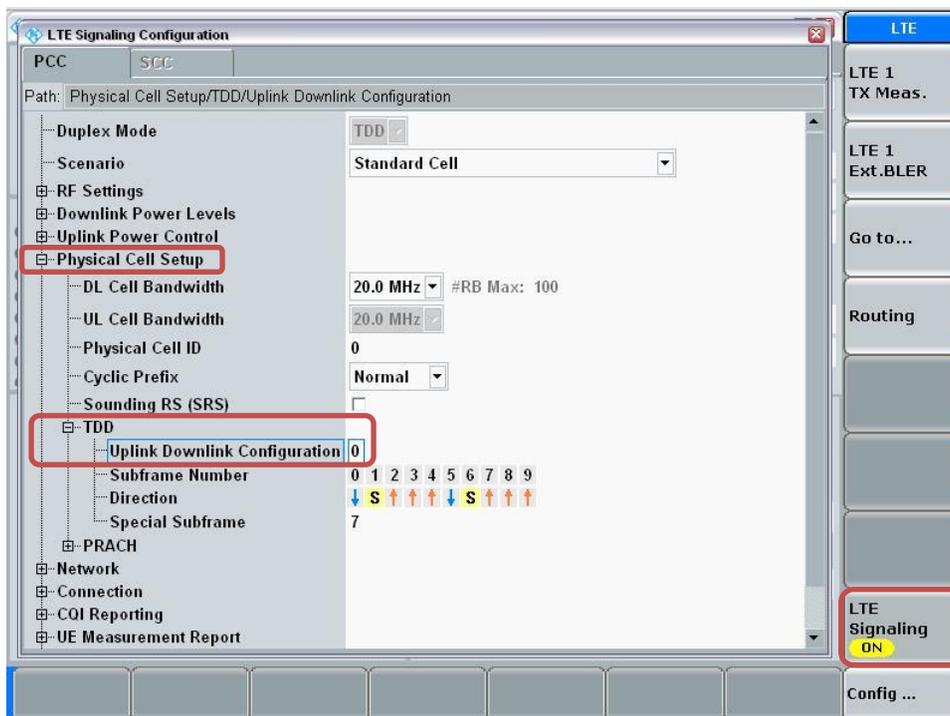
**Procedure used to establish SAR test signal for LTE TDD Band**

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...”

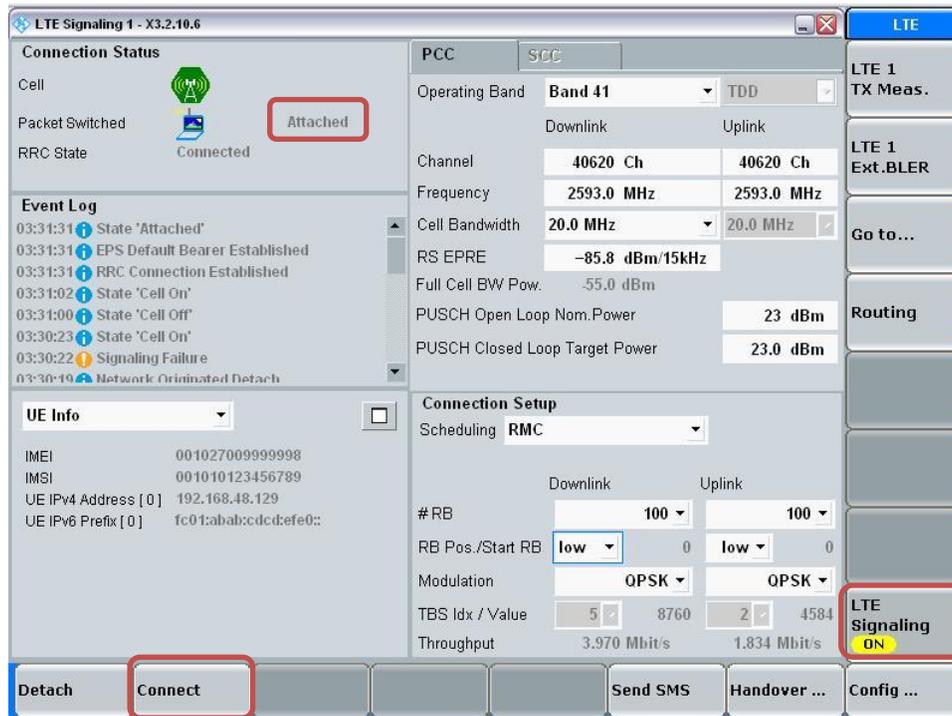


- Go to “Physical Cell Setup”
- Select “TDD” and Set “Uplink Downlink Configuration” to “0”
- Turn the cell on using “ON | OFF” key



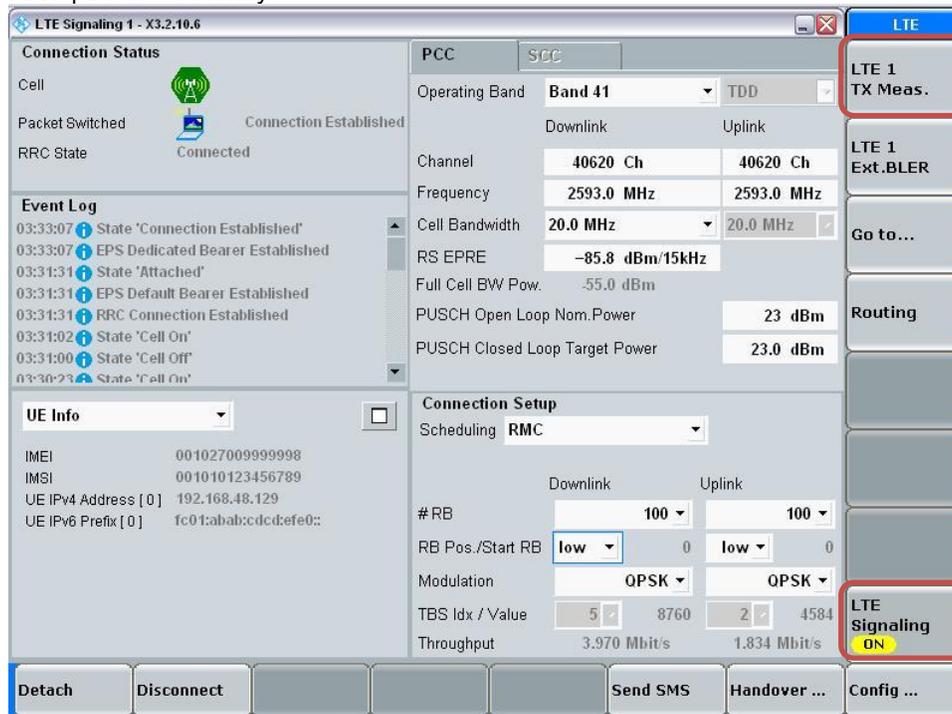
**Connect to EUT**

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

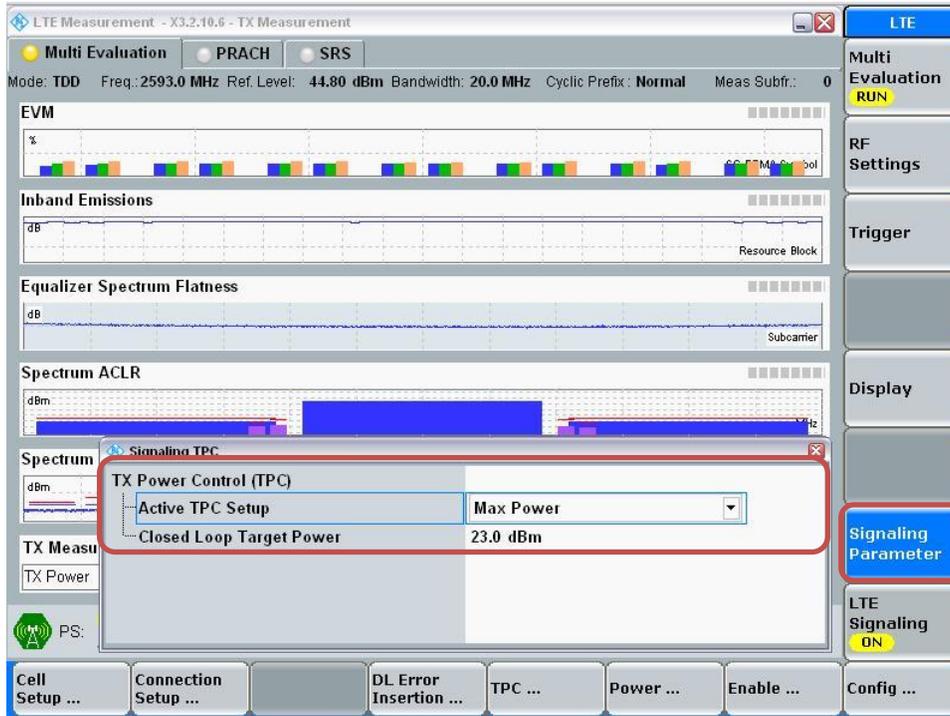


**Max Power Setting**

- 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”



# 1. Max power Results

## LTE Band 38 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				37850	38000	38150		
				2580 MHz	2595 MHz	2610 MHz		
20 MHz	QPSK	1	0	22.7	22.9	22.7	0.0	24
		1	49	22.5	22.8	22.7	0.0	24
		1	99	23.0	22.7	22.6	0.0	24
		50	0	21.8	21.9	21.8	1.0	23
		50	24	21.8	21.9	21.7	1.0	23
		50	50	21.7	21.8	21.7	1.0	23
		100	0	21.7	21.9	21.7	1.0	23
	16QAM	1	0	22.1	22.0	22.0	1.0	23
		1	49	21.6	21.8	21.6	1.0	23
		1	99	21.7	21.9	21.8	1.0	23
		50	0	20.8	21.0	20.9	2.0	22
		50	24	20.8	21.0	20.8	2.0	22
		50	50	20.7	20.9	20.7	2.0	22
		100	0	20.8	20.9	20.8	2.0	22
	64QAM	1	0	20.8	20.9	20.9	2.0	22
		1	49	20.7	20.9	20.9	2.0	22
		1	99	20.7	20.9	20.5	2.0	22
		50	0	19.9	20.0	19.8	3.0	21
		50	24	19.9	20.0	19.8	3.0	21
		50	50	19.8	19.9	19.8	3.0	21
		100	0	19.8	19.9	19.7	3.0	21
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				37825	38000	38175		
				2577.5 MHz	2595 MHz	2612.5 MHz		
15 MHz	QPSK	1	0	22.8	22.9	22.8	0.0	24
		1	37	22.7	22.8	22.6	0.0	24
		1	74	22.6	22.7	22.6	0.0	24
		36	0	21.8	21.9	21.7	1.0	23
		36	20	21.7	21.8	21.7	1.0	23
		36	39	21.6	21.8	21.6	1.0	23
		75	0	21.8	21.9	21.8	1.0	23
	16QAM	1	0	21.6	21.7	21.8	1.0	23
		1	37	21.6	21.5	21.6	1.0	23
		1	74	21.4	21.6	21.9	1.0	23
		36	0	20.8	20.9	20.7	2.0	22
		36	20	20.7	20.8	20.6	2.0	22
		36	39	20.7	20.8	20.7	2.0	22
		75	0	20.8	20.9	20.7	2.0	22
	64QAM	1	0	20.9	20.5	20.6	2.0	22
		1	37	20.7	20.5	20.7	2.0	22
		1	74	20.6	20.3	20.6	2.0	22
		36	0	19.8	19.9	19.6	3.0	21
		36	20	19.7	19.8	19.7	3.0	21
		36	39	19.7	19.8	19.6	3.0	21
		75	0	19.7	19.9	19.7	3.0	21

**LTE Band 38 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				37800	38000	38200		
				2575 MHz	2595 MHz	2615 MHz		
10 MHz	QPSK	1	0	22.8	22.9	22.7	0.0	24
		1	25	22.7	22.8	22.5	0.0	24
		1	49	22.6	22.8	22.6	0.0	24
		25	0	21.7	21.9	21.7	1.0	23
		25	12	21.7	21.8	21.6	1.0	23
		25	25	21.7	21.8	21.6	1.0	23
		50	0	21.7	21.8	21.7	1.0	23
	16QAM	1	0	21.7	22.0	21.9	1.0	23
		1	25	21.5	21.8	21.7	1.0	23
		1	49	21.5	21.9	21.8	1.0	23
		25	0	20.8	20.9	20.7	2.0	22
		25	12	20.7	20.8	20.7	2.0	22
		25	25	20.7	20.8	20.7	2.0	22
		50	0	20.7	20.9	20.6	2.0	22
	64QAM	1	0	20.9	20.8	20.6	2.0	22
		1	25	20.7	20.7	20.5	2.0	22
		1	49	20.7	20.7	20.6	2.0	22
		25	0	19.8	19.9	19.7	3.0	21
		25	12	19.8	19.9	19.7	3.0	21
		25	25	19.7	19.9	19.7	3.0	21
		50	0	19.8	19.9	19.6	3.0	21
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				37775	38000	38225		
				2572.5 MHz	2595 MHz	2617.5 MHz		
5 MHz	QPSK	1	0	22.7	22.9	22.7	0.0	24
		1	12	22.6	22.7	22.6	0.0	24
		1	24	22.6	22.8	22.6	0.0	24
		12	0	21.7	21.8	21.7	1.0	23
		12	7	21.7	21.8	21.6	1.0	23
		12	13	21.7	21.8	21.6	1.0	23
		25	0	21.7	21.8	21.6	1.0	23
	16QAM	1	0	21.7	22.0	21.6	1.0	23
		1	12	21.6	21.8	21.4	1.0	23
		1	24	21.6	21.9	21.6	1.0	23
		12	0	20.7	20.9	20.7	2.0	22
		12	7	20.7	20.8	20.7	2.0	22
		12	13	20.7	20.8	20.7	2.0	22
		25	0	20.7	20.8	20.7	2.0	22
	64QAM	1	0	20.9	20.9	20.8	2.0	22
		1	12	20.8	20.6	20.6	2.0	22
		1	24	20.8	20.8	20.6	2.0	22
		12	0	19.7	19.8	19.7	3.0	21
		12	7	19.7	19.8	19.7	3.0	21
		12	13	19.7	19.8	19.7	3.0	21
		25	0	19.7	19.8	19.7	3.0	21

**LTE Band 41 – Power Class 3 - Measured Results**

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)						
				Measured Pwr (dBm)					MPR	Tune-up Limit
				39750 2506 MHz	40185 2549.5 MHz	40620 2593 MHz	41055 2636.5 MHz	41490 2680 MHz		
20 MHz	QPSK	1	0	22.7	22.3	22.1	22.0	21.7	0.0	23
		1	49	22.6	22.0	21.9	21.9	21.6	0.0	23
		1	99	22.7	21.8	21.9	21.8	21.5	0.0	23
		50	0	21.7	21.2	21.0	20.9	20.7	1.0	22
		50	24	21.6	21.1	21.0	20.9	20.6	1.0	22
		50	50	21.6	20.9	20.9	20.9	20.6	1.0	22
	16QAM	100	0	21.6	21.1	21.0	20.9	20.6	1.0	22
		1	0	21.9	21.5	20.8	21.1	21.1	1.0	22
		1	49	21.5	21.1	21.0	21.0	20.6	1.0	22
		1	99	21.6	20.8	21.0	20.7	20.9	1.0	22
		50	0	20.7	20.2	20.0	20.0	19.7	2.0	21
		50	24	20.6	20.1	20.0	19.9	19.6	2.0	21
	64QAM	50	50	20.6	20.0	19.9	19.8	19.6	2.0	21
		100	0	20.6	20.0	19.9	19.9	19.6	2.0	21
		1	0	21.0	20.5	19.9	19.9	19.7	2.0	21
		1	49	20.9	20.0	19.4	20.2	19.4	2.0	21
		1	99	20.3	20.1	19.5	19.6	19.8	2.0	21
		50	0	19.7	19.3	19.0	18.9	18.7	3.0	20
15 MHz	QPSK	50	24	19.6	19.1	19.1	18.9	18.7	3.0	20
		50	50	19.5	19.0	19.0	18.9	18.6	3.0	20
		100	0	19.6	19.1	18.9	18.9	18.6	3.0	20
		1	0	22.7	22.2	22.0	22.0	21.7	0.0	23
		1	37	22.4	22.0	21.9	21.7	21.6	0.0	23
		1	74	22.6	22.0	21.8	21.9	21.5	0.0	23
	16QAM	36	0	21.7	21.2	21.0	20.9	20.6	1.0	22
		36	20	21.6	21.1	21.0	20.9	20.6	1.0	22
		36	39	21.6	21.0	20.9	20.8	20.6	1.0	22
		75	0	21.7	21.1	21.0	20.9	20.7	1.0	22
		1	0	21.8	21.3	21.0	20.8	20.6	1.0	22
		1	37	21.1	21.1	20.9	20.6	20.5	1.0	22
	64QAM	1	74	21.6	20.7	20.6	20.7	20.7	1.0	22
		36	0	20.7	20.2	20.0	19.9	19.7	2.0	21
		36	20	20.6	20.1	19.9	19.9	19.6	2.0	21
		36	39	20.6	20.0	19.9	19.8	19.6	2.0	21
		75	0	20.7	20.1	20.0	19.9	19.6	2.0	21
		1	0	20.7	20.0	20.2	19.9	19.7	2.0	21
64QAM	1	37	20.2	20.0	19.7	19.7	19.5	2.0	21	
	1	74	21.0	19.2	20.0	19.8	18.9	2.0	21	
	36	0	19.7	19.1	19.0	18.9	18.6	3.0	20	
	36	20	19.5	19.0	18.9	18.8	18.5	3.0	20	
	36	39	19.5	19.0	19.0	18.8	18.5	3.0	20	
	75	0	19.7	19.1	19.0	18.9	18.6	3.0	20	

**LTE Band 41 – Power Class 3 - Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
10 MHz	QPSK	1	0	22.7	22.2	22.1	21.9	21.7	0.0	23
		1	25	22.5	22.1	22.0	21.8	21.6	0.0	23
		1	49	22.5	22.0	21.9	21.8	21.6	0.0	23
		25	0	21.7	21.1	21.0	20.9	20.7	1.0	22
		25	12	21.6	21.1	21.0	20.9	20.6	1.0	22
		25	25	21.6	21.0	20.9	20.9	20.6	1.0	22
		50	0	21.6	21.1	20.9	20.9	20.6	1.0	22
	16QAM	1	0	21.8	21.1	20.9	21.0	20.5	1.0	22
		1	25	21.6	20.9	20.7	20.9	20.3	1.0	22
		1	49	21.7	20.8	20.8	21.0	20.4	1.0	22
		25	0	20.7	20.1	20.0	19.9	19.6	2.0	21
		25	12	20.6	20.1	19.9	19.9	19.6	2.0	21
		25	25	20.6	20.0	19.9	19.9	19.6	2.0	21
		50	0	20.6	20.1	19.9	19.8	19.6	2.0	21
	64QAM	1	0	20.6	20.3	19.9	19.9	19.5	2.0	21
		1	25	20.4	20.1	19.8	19.7	19.4	2.0	21
		1	49	20.4	20.1	19.8	19.8	19.5	2.0	21
		25	0	19.7	19.2	19.0	18.9	18.7	3.0	20
		25	12	19.6	19.1	18.9	18.9	18.6	3.0	20
		25	25	19.6	19.1	18.9	18.9	18.6	3.0	20
		50	0	19.6	19.1	18.9	18.9	18.7	3.0	20
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
5 MHz	QPSK	1	0	22.7	22.2	22.0	21.9	21.7	0.0	23
		1	12	22.6	22.0	21.9	21.8	21.6	0.0	23
		1	24	22.6	22.0	22.0	21.9	21.6	0.0	23
		12	0	21.7	21.1	21.0	20.9	20.6	1.0	22
		12	7	21.6	21.1	20.9	20.9	20.6	1.0	22
		12	13	21.6	21.1	20.9	20.9	20.6	1.0	22
		25	0	21.7	21.1	21.0	20.9	20.6	1.0	22
	16QAM	1	0	21.5	21.3	21.0	20.8	20.8	1.0	22
		1	12	21.4	21.1	20.9	20.7	20.6	1.0	22
		1	24	21.5	21.2	20.9	20.8	20.8	1.0	22
		12	0	20.7	20.1	20.0	19.9	19.6	2.0	21
		12	7	20.6	20.1	20.0	19.8	19.6	2.0	21
		12	13	20.6	20.1	20.0	19.9	19.6	2.0	21
		25	0	20.6	20.1	19.9	19.9	19.6	2.0	21
	64QAM	1	0	20.8	20.3	20.0	20.1	19.7	2.0	21
		1	12	20.6	20.2	19.8	19.8	19.7	2.0	21
		1	24	20.7	20.2	19.9	20.0	19.8	2.0	21
		12	0	19.7	19.1	19.0	18.9	18.6	3.0	20
		12	7	19.6	19.1	18.9	18.8	18.6	3.0	20
		12	13	19.6	19.1	18.9	18.9	18.6	3.0	20
		25	0	19.6	19.0	18.9	18.8	18.6	3.0	20

**LTE Band 41 – Power Class 2 - Measured Results**

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)						
				Measured Pwr (dBm)					MPR	Tune-up Limit
				39750 2506 MHz	40185 2549.5 MHz	40620 2593 MHz	41055 2636.5 MHz	41490 2680 MHz		
20 MHz	QPSK	1	0	25.7	25.2	25.0	25.0	24.7	0.0	26
		1	49	25.6	25.0	24.9	24.9	24.5	0.0	26
		1	99	25.8	24.7	24.9	24.8	24.5	0.0	26
		50	0	24.7	24.2	24.0	24.0	23.7	1.0	25
		50	24	24.6	24.1	24.0	24.0	23.7	1.0	25
		50	50	24.6	24.0	24.0	23.9	23.6	1.0	25
	16QAM	1	0	24.6	24.4	24.3	23.9	23.9	1.0	25
		1	49	24.6	24.1	23.8	23.6	23.8	1.0	25
		1	99	24.3	23.8	24.1	23.7	23.7	1.0	25
		50	0	23.7	23.2	23.0	23.0	22.7	2.0	24
		50	24	23.6	23.1	23.0	22.9	22.7	2.0	24
		50	50	23.5	22.9	22.9	22.9	22.6	2.0	24
	64QAM	1	0	24.0	23.8	23.4	23.3	23.0	2.0	24
		1	49	23.7	23.5	23.2	23.1	22.9	2.0	24
		1	99	23.7	23.4	23.2	23.1	22.8	2.0	24
		50	0	22.7	22.2	22.0	21.9	21.6	3.0	23
		50	24	22.7	22.1	22.0	21.9	21.6	3.0	23
		50	50	22.6	21.9	22.0	21.9	21.5	3.0	23
15 MHz	QPSK	1	0	25.6	25.1	25.0	24.9	24.7	0.0	26
		1	37	25.4	25.0	25.0	24.9	24.6	0.0	26
		1	74	25.4	25.0	24.9	24.8	24.5	0.0	26
		36	0	24.7	24.2	24.1	24.0	23.7	1.0	25
		36	20	24.6	24.1	24.0	24.0	23.7	1.0	25
		36	39	24.6	24.0	24.0	23.9	23.6	1.0	25
	16QAM	75	0	24.7	24.2	24.1	24.0	23.7	1.0	25
		1	0	24.8	24.2	24.2	23.6	23.7	1.0	25
		1	37	24.2	23.7	23.9	23.6	23.6	1.0	25
		1	74	24.3	23.9	23.4	23.7	23.5	1.0	25
		36	0	23.6	23.2	23.1	23.0	22.7	2.0	24
		36	20	23.6	23.1	23.0	22.9	22.6	2.0	24
	64QAM	36	39	23.5	23.0	23.0	22.9	22.5	2.0	24
		75	0	23.7	23.2	23.0	23.0	22.7	2.0	24
		1	0	23.9	23.5	23.3	23.1	23.1	2.0	24
		1	37	23.8	23.4	23.4	23.0	23.1	2.0	24
		1	74	23.6	23.1	23.2	23.0	23.0	2.0	24
		36	0	22.7	22.0	22.0	21.9	21.6	3.0	23
15 MHz	64QAM	36	20	22.6	21.9	21.9	21.9	21.5	3.0	23
		36	39	22.6	21.9	21.9	21.8	21.5	3.0	23
		75	0	22.6	22.1	22.0	21.9	21.6	3.0	23

**LTE Band 41 – Power Class 2 - Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
10 MHz	QPSK	1	0	25.7	25.1	25.0	25.0	24.6	0.0	26
		1	25	25.5	25.0	24.8	24.8	24.6	0.0	26
		1	49	25.5	24.9	24.8	24.8	24.6	0.0	26
		25	0	24.7	24.1	24.0	24.0	23.7	1.0	25
		25	12	24.7	24.1	24.0	23.9	23.6	1.0	25
		25	25	24.6	24.0	24.0	23.9	23.6	1.0	25
		50	0	24.6	24.0	24.0	23.9	23.7	1.0	25
	16QAM	1	0	24.7	24.0	24.2	24.0	23.6	1.0	25
		1	25	24.6	23.8	24.0	23.9	23.4	1.0	25
		1	49	24.6	23.7	24.1	24.0	23.5	1.0	25
		25	0	23.7	23.1	23.0	22.9	22.7	2.0	24
		25	12	23.6	23.1	23.0	22.9	22.6	2.0	24
		25	25	23.6	23.0	23.0	22.9	22.6	2.0	24
		50	0	23.6	23.1	23.0	22.9	22.6	2.0	24
	64QAM	1	0	23.7	23.6	23.3	23.1	23.0	2.0	24
		1	25	23.6	23.5	23.2	23.0	23.0	2.0	24
		1	49	23.5	23.4	23.2	23.0	23.0	2.0	24
		25	0	22.6	22.1	21.9	21.9	21.7	3.0	23
		25	12	22.6	22.0	21.9	21.9	21.6	3.0	23
		25	25	22.6	22.0	21.9	21.9	21.7	3.0	23
		50	0	22.7	22.0	22.0	21.9	21.6	3.0	23
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
5 MHz	QPSK	1	0	25.6	25.1	25.0	25.0	24.7	0.0	26
		1	12	25.5	24.9	24.9	24.8	24.6	0.0	26
		1	24	25.5	24.9	24.9	24.9	24.6	0.0	26
		12	0	24.7	24.1	24.0	23.9	23.7	1.0	25
		12	7	24.6	24.0	24.0	23.9	23.6	1.0	25
		12	13	24.6	24.0	24.0	23.9	23.6	1.0	25
		25	0	24.6	24.1	24.0	23.9	23.6	1.0	25
	16QAM	1	0	24.4	24.2	24.0	23.8	23.6	1.0	25
		1	12	24.3	24.0	23.9	23.7	23.5	1.0	25
		1	24	24.4	24.1	23.9	23.8	23.5	1.0	25
		12	0	23.6	23.1	22.9	22.9	22.6	2.0	24
		12	7	23.6	23.0	22.9	22.9	22.6	2.0	24
		12	13	23.6	23.0	22.9	22.9	22.6	2.0	24
		25	0	23.7	23.0	22.9	22.9	22.6	2.0	24
	64QAM	1	0	23.8	23.3	23.5	23.4	22.9	2.0	24
		1	12	23.6	23.4	23.8	23.3	23.0	2.0	24
		1	24	23.6	23.1	23.6	23.3	22.8	2.0	24
		12	0	22.6	22.1	21.9	21.9	21.7	3.0	23
		12	7	22.6	22.1	21.8	21.9	21.7	3.0	23
		12	13	22.6	22.1	21.8	21.8	21.6	3.0	23
		25	0	22.6	22.1	21.9	21.8	21.6	3.0	23

## 2. Reduced power Results

### LTE Band 38 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Reduced Average Power (dBm)				
				Hotspot back-off			MPR	Tune-up Limit
				Measured Pwr (dBm)				
				37850 2580 MHz	38000 2595 MHz	38150 2610 MHz		
20 MHz	QPSK	1	0	20.8	20.9	20.8	0.0	22
		1	49	20.7	20.9	20.6	0.0	22
		1	99	20.9	20.7	20.6	0.0	22
		50	0	20.9	21.0	20.8	0.0	22
		50	24	20.8	20.9	20.8	0.0	22
		50	50	20.8	20.9	20.7	0.0	22
		100	0	20.8	20.9	20.8	0.0	22
	16QAM	1	0	20.8	21.3	20.9	0.0	22
		1	49	20.8	21.1	20.7	0.0	22
		1	99	20.7	20.9	20.9	0.0	22
		50	0	20.8	21.1	20.9	0.0	22
		50	24	20.8	21.0	20.9	0.0	22
		50	50	20.8	21.0	20.9	0.0	22
		100	0	20.8	20.9	20.8	0.0	22
	64QAM	1	0	20.9	21.3	20.8	0.0	22
		1	49	20.6	20.7	20.7	0.0	22
		1	99	20.1	20.9	20.6	0.0	22
		50	0	20.0	20.1	19.8	0.0	22
		50	24	19.9	20.0	19.8	0.0	22
		50	50	19.8	20.0	19.8	0.0	22
		100	0	19.8	19.9	19.8	0.0	22
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				37825	38000	38175		
				2577.5 MHz	2595 MHz	2612.5 MHz		
15 MHz	QPSK	1	0	20.9	21.0	20.8	0.0	22
		1	37	20.7	20.7	20.7	0.0	22
		1	74	20.7	20.8	20.6	0.0	22
		36	0	20.8	20.9	20.7	0.0	22
		36	20	20.7	20.9	20.7	0.0	22
		36	39	20.7	20.8	20.7	0.0	22
		75	0	20.8	20.9	20.8	0.0	22
	16QAM	1	0	20.7	20.9	21.0	0.0	22
		1	37	20.4	21.1	20.4	0.0	22
		1	74	20.3	20.9	20.8	0.0	22
		36	0	20.8	20.9	20.8	0.0	22
		36	20	20.7	20.9	20.7	0.0	22
		36	39	20.7	20.8	20.7	0.0	22
		75	0	20.9	21.0	20.8	0.0	22
	64QAM	1	0	20.9	21.0	20.7	0.0	22
		1	37	20.8	20.6	20.6	0.0	22
		1	74	20.9	20.4	20.5	0.0	22
		36	0	19.8	19.9	19.7	0.0	22
		36	20	19.7	19.8	19.7	0.0	22
		36	39	19.7	19.8	19.6	0.0	22
		75	0	19.8	19.9	19.7	0.0	22

**LTE Band 38 Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				37800	38000	38200		
				2575 MHz	2595 MHz	2615 MHz		
10 MHz	QPSK	1	0	20.8	20.9	20.7	0.0	22
		1	25	20.7	20.8	20.5	0.0	22
		1	49	20.6	20.8	20.6	0.0	22
		25	0	20.8	20.9	20.7	0.0	22
		25	12	20.7	20.8	20.7	0.0	22
		25	25	20.7	20.8	20.7	0.0	22
		50	0	20.7	20.8	20.7	0.0	22
	16QAM	1	0	20.7	20.9	20.9	0.0	22
		1	25	20.6	20.7	20.7	0.0	22
		1	49	20.6	20.7	20.8	0.0	22
		25	0	20.8	20.9	20.8	0.0	22
		25	12	20.8	20.9	20.7	0.0	22
		25	25	20.7	20.9	20.7	0.0	22
		50	0	20.7	20.9	20.7	0.0	22
	64QAM	1	0	20.9	21.0	20.7	0.0	22
		1	25	20.7	20.8	20.6	0.0	22
		1	49	20.7	20.9	20.7	0.0	22
		25	0	19.8	19.9	19.8	0.0	22
		25	12	19.8	19.9	19.8	0.0	22
		25	25	19.8	19.9	19.7	0.0	22
		50	0	19.8	19.9	19.7	0.0	22
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				37775	38000	38225		
				2572.5 MHz	2595 MHz	2617.5 MHz		
5 MHz	QPSK	1	0	20.8	20.9	20.6	0.0	22
		1	12	20.6	20.7	20.6	0.0	22
		1	24	20.7	20.8	20.6	0.0	22
		12	0	20.7	20.9	20.7	0.0	22
		12	7	20.7	20.8	20.6	0.0	22
		12	13	20.7	20.8	20.6	0.0	22
		25	0	20.7	20.8	20.7	0.0	22
	16QAM	1	0	20.8	21.0	20.7	0.0	22
		1	12	20.7	20.8	20.6	0.0	22
		1	24	20.7	21.0	20.7	0.0	22
		12	0	20.8	20.8	20.7	0.0	22
		12	7	20.8	20.8	20.7	0.0	22
		12	13	20.8	20.8	20.7	0.0	22
		25	0	20.7	20.9	20.6	0.0	22
	64QAM	1	0	20.8	21.1	20.7	0.0	22
		1	12	20.6	21.0	20.6	0.0	22
		1	24	20.6	21.1	20.6	0.0	22
		12	0	19.8	19.9	19.7	0.0	22
		12	7	19.8	19.9	19.7	0.0	22
		12	13	19.8	19.9	19.7	0.0	22
		25	0	19.8	19.9	19.7	0.0	22

**LTE Band 41 – Power Class 2 - Measured Results**

BW (MHz)	Mode	RB Allocation	RB offset	Reduced Average Power (dBm)							MPR	Tune-up Limit
				Hotspot back-off								
				Measured Pwr (dBm)								
				39750	40185	40620	41055	41490				
2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz								
20 MHz	QPSK	1	0	23.7	23.3	23.1	23.0	22.7	0.0	24		
		1	49	23.5	22.9	22.8	22.8	22.6	0.0	24		
		1	99	23.8	22.8	22.8	22.8	22.5	0.0	24		
		50	0	23.7	23.2	23.0	22.9	22.7	0.0	24		
		50	24	23.6	23.1	23.0	22.9	22.6	0.0	24		
		50	50	23.5	23.0	22.9	22.9	22.6	0.0	24		
	16QAM	100	0	23.6	23.1	23.0	22.9	22.6	0.0	24		
		1	0	24.0	23.8	23.6	23.3	23.0	0.0	24		
		1	49	23.9	23.5	23.5	23.2	22.9	0.0	24		
		1	99	23.8	23.3	23.4	23.2	22.9	0.0	24		
		50	0	23.7	23.2	23.0	22.9	22.6	0.0	24		
		50	24	23.7	23.1	22.9	22.9	22.6	0.0	24		
	64QAM	50	50	23.6	23.0	22.9	22.9	22.5	0.0	24		
		100	0	23.6	23.0	22.9	22.9	22.6	0.0	24		
		1	0	24.0	23.9	23.2	23.1	23.0	0.0	24		
		1	49	23.8	23.6	23.0	23.0	22.8	0.0	24		
		1	99	23.9	23.5	22.9	22.9	22.8	0.0	24		
		50	0	22.7	22.2	22.0	21.9	21.6	0.0	24		
15 MHz	QPSK	50	24	22.6	22.0	22.0	21.9	21.5	0.0	24		
		50	50	22.6	21.9	21.9	21.9	21.6	0.0	24		
		100	0	22.6	22.0	21.9	21.8	21.5	0.0	24		
		1	0	23.8	23.2	23.1	23.0	22.6	0.0	24		
		1	37	23.2	22.7	23.1	22.7	22.4	0.0	24		
		1	74	23.5	22.8	22.9	22.9	22.5	0.0	24		
	16QAM	36	0	23.7	23.1	23.0	23.0	22.7	0.0	24		
		36	20	23.6	23.0	23.0	22.9	22.6	0.0	24		
		36	39	23.5	23.0	22.9	22.9	22.6	0.0	24		
		75	0	23.7	23.1	23.0	23.0	22.7	0.0	24		
		1	0	24.0	23.4	23.3	23.4	22.9	0.0	24		
		1	37	23.8	23.4	23.1	23.2	23.0	0.0	24		
	64QAM	1	74	23.7	23.0	23.1	23.2	22.7	0.0	24		
		36	0	23.6	23.2	23.0	22.9	22.7	0.0	24		
		36	20	23.6	23.1	23.0	22.9	22.6	0.0	24		
		36	39	23.5	23.0	22.9	22.8	22.6	0.0	24		
		75	0	23.7	23.1	23.0	23.0	22.6	0.0	24		
		1	0	23.9	23.6	23.4	22.9	23.0	0.0	24		
QPSK	1	37	23.8	23.3	23.4	22.9	22.8	0.0	24			
	1	74	23.7	23.2	23.3	22.8	22.8	0.0	24			
	36	0	22.7	22.1	21.9	21.9	21.6	0.0	24			
	36	20	22.6	22.0	21.9	21.8	21.5	0.0	24			
	36	39	22.6	21.9	21.9	21.8	21.5	0.0	24			
	75	0	22.6	22.0	22.0	21.9	21.6	0.0	24			

**LTE Band 41 – Power Class 2 - Measured Results (Continued)**

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
10 MHz	QPSK	1	0	23.8	23.2	23.1	23.0	22.6	0.0	24
		1	25	23.6	22.9	22.9	22.8	22.5	0.0	24
		1	49	23.6	23.0	22.9	22.8	22.6	0.0	24
		25	0	23.7	23.1	23.0	22.9	22.6	0.0	24
		25	12	23.6	23.1	23.0	22.9	22.6	0.0	24
		25	25	23.6	23.0	22.9	22.9	22.6	0.0	24
		50	0	23.6	23.1	23.0	22.9	22.6	0.0	24
	16QAM	1	0	23.9	23.6	23.4	23.5	23.0	0.0	24
		1	25	24.0	23.6	23.3	23.4	22.9	0.0	24
		1	49	23.9	23.5	23.3	23.4	23.0	0.0	24
		25	0	23.7	23.1	23.0	23.0	22.6	0.0	24
		25	12	23.6	23.0	23.0	22.9	22.6	0.0	24
		25	25	23.6	23.0	23.0	23.0	22.5	0.0	24
		50	0	23.6	23.1	22.9	22.9	22.6	0.0	24
	64QAM	1	0	23.9	23.3	23.0	22.9	22.8	0.0	24
		1	25	23.9	23.1	22.8	22.8	22.7	0.0	24
		1	49	24.0	23.1	22.9	22.8	22.7	0.0	24
		25	0	22.7	22.2	22.0	21.8	21.7	0.0	24
		25	12	22.6	22.2	21.9	21.8	21.6	0.0	24
		25	25	22.6	22.1	21.9	21.8	21.6	0.0	24
		50	0	22.7	22.1	21.9	21.9	21.6	0.0	24
5 MHz	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
5 MHz	QPSK	1	0	23.7	23.1	23.1	23.0	22.7	0.0	24
		1	12	23.8	23.1	23.1	23.1	22.9	0.0	24
		1	24	23.6	23.0	23.0	22.9	22.6	0.0	24
		12	0	23.6	23.1	23.0	22.9	22.6	0.0	24
		12	7	23.6	23.0	22.9	22.9	22.6	0.0	24
		12	13	23.6	23.0	22.9	22.9	22.6	0.0	24
		25	0	23.6	23.1	22.9	22.9	22.6	0.0	24
	16QAM	1	0	23.8	23.5	23.5	23.2	22.9	0.0	24
		1	12	23.9	23.1	23.6	23.3	22.6	0.0	24
		1	24	23.8	23.3	23.4	23.3	22.8	0.0	24
		12	0	23.7	23.1	22.9	22.9	22.6	0.0	24
		12	7	23.6	23.0	22.8	22.8	22.6	0.0	24
		12	13	23.6	23.0	22.9	22.8	22.6	0.0	24
		25	0	23.6	23.0	22.9	22.9	22.7	0.0	24
	64QAM	1	0	23.8	23.6	23.4	23.5	22.9	0.0	24
		1	12	23.7	23.6	23.5	23.6	22.8	0.0	24
		1	24	23.8	23.4	23.2	23.3	22.7	0.0	24
		12	0	22.7	22.1	21.9	21.9	21.5	0.0	24
		12	7	22.7	22.0	21.9	21.9	21.5	0.0	24
		12	13	22.7	22.1	22.0	21.9	21.5	0.0	24
		25	0	22.6	22.0	21.9	21.9	21.6	0.0	24

### 9.3.1 LTE Rel. 11 Carrier Aggregation

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

For inter-band carrier aggregation with uplink assigned to one E-UTRA band (Table 5.6A-1), the requirement in subclause 6.2.3 apply.

For inter-band carrier aggregation with one component carrier per operating band and the uplink active in two E-UTRA bands, the requirements in subclause 6.2.3 apply for each uplink component carrier.

For inter-band contiguous carrier aggregation the allowed Maximum Power Reduction (MPR) for the maximum output power applicable to the DUT in the table below. In case the modulation format is different on different component carriers the MPR is determined by the rules applied to higher order of those modulations.

Modulation	CA bandwidth Class B and C / Smallest Component Carrier Transmission Bandwidth Configuration				MPR (dB)
	25 RB	50 RB	75 RB	100 RB	
QPSK	> 8 and ≤ 25	> 12 and ≤ 50	> 16 and ≤ 75	> 18 and ≤ 100	≤ 1
QPSK	> 25	> 50	> 75	> 100	≤ 2
16 QAM	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 8 and ≤ 25	> 12 and ≤ 50	> 16 and ≤ 75	> 18 and ≤ 100	≤ 2
16 QAM	> 25	> 50	> 75	> 100	≤ 3
64 QAM	≤ 8 and allocation wholly contained within a single CC	≤ 12 and allocation wholly contained within a single CC	≤ 16 and allocation wholly contained within a single CC	≤ 18 and allocation wholly contained within a single CC	≤ 2
64 QAM	> 8 or allocation extends across two CC's	> 12 or allocation extends across two CC's	> 16 or allocation extends across two CC's	> 18 or allocation extends across two CC's	≤ 3

For PUCCH and SRS transmissions, the allowed MPR is according to that specified for PUSCH QPSK modulation for the corresponding transmission bandwidth.

For intra-band contiguous carrier aggregation bandwidth class C with non-contiguous resource allocation, the allowed Maximum Power Reduction (MPR) for the maximum output power in Table 6.2.2A-1 is specified as follows

$$\text{MPR} = \text{CEIL} \{ \min(M_A, M_{\text{IMS}}), 0.5 \}$$

Where  $M_A$  is defined as follows

$M_A =$	8.2	; $0 \leq A < 0.025$
	$9.2 - 40A$	; $0.025 \leq A < 0.05$
	$8 - 16A$	; $0.05 \leq A < 0.25$
	$4.83 - 3.33A$	; $0.25 \leq A \leq 0.4$
	$3.83 - 0.83A$	; $0.4 \leq A \leq 1$

and  $M_{\text{IMS}}$  is defined as follows

$M_{\text{IMS}} =$	4.5	; $\Delta_{\text{IMS}} < 1.5 * \text{BW}_{\text{Channel\_CA}}$
	6.0	; $1.5 * \text{BW}_{\text{Channel\_CA}} \leq \Delta_{\text{IMS}} < \text{BW}_{\text{Channel\_CA}}/2 + \Delta f_{\text{00B}}$
$M_A$		; $\Delta_{\text{IMS}} \geq \text{BW}_{\text{Channel\_CA}}/2 + \Delta f_{\text{00B}}$

Where

$$A = N_{\text{RB\_alloc}} / N_{\text{RB\_agg}}$$

$$\Delta_{\text{IMS}} = \max \left( \left| F_{\text{C\_agg}} - (3 * F_{\text{agg\_alloc\_low}} - 2 * F_{\text{agg\_alloc\_high}}) \right|, \left| F_{\text{C\_agg}} - (3 * F_{\text{agg\_alloc\_high}} - 2 * F_{\text{agg\_alloc\_low}}) \right| \right)$$

CEIL $\{M_A, 0.5\}$  means rounding upwards to closest 0.5dB, i.e.  $\text{MPR} \in [3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5]$

For intra-band carrier aggregation, the MPR is evaluated per slot and given by the maximum value taken over the transmission(s) on all component carriers within the slot; the maximum MPR over the two slots is then applied for the entire subframe.

For intra-band non-contiguous carrier aggregation with one uplink carrier on the PCC, the requirements in the subclause 6.2.3 apply. For intra-band non-contiguous aggregation with two uplink carriers the MPR is defined for those E-UTRA bands where maximum possible  $W_{\text{GAP}} \leq 42.2$  MHz as follows

$$\text{MPR} = \text{CEIL} \{ M_N, 0.5 \}$$

Where  $M_N$  is defined as follows

$M_N =$	$-0.125N + 18.25$	; $2 \leq N \leq 50$
	$-0.0333 N + 13.67$	; $50 < N \leq 200$

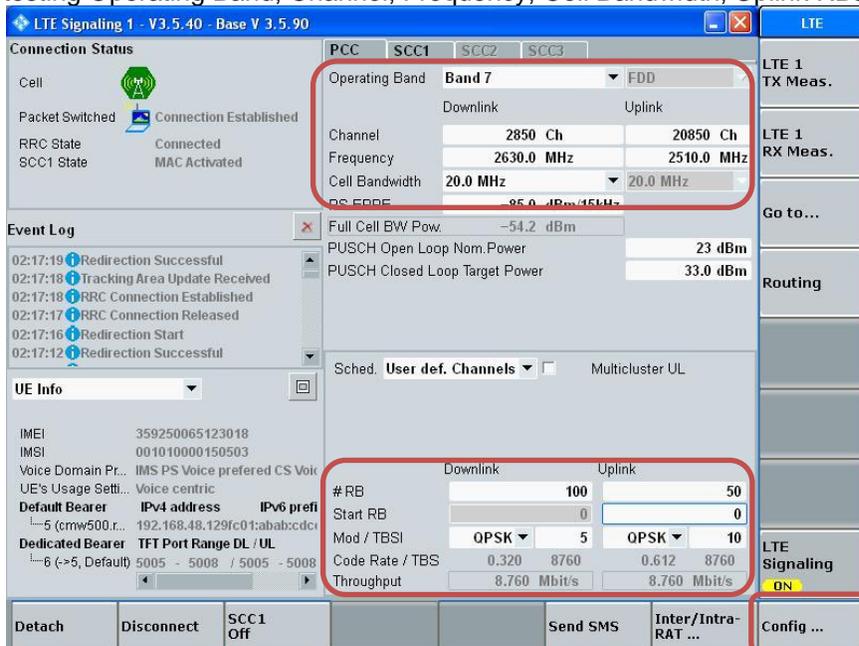
Where  $N = N_{\text{RB\_alloc}}$  is the number of allocated resource blocks.

For the UE maximum output power modified by MPR, the power limits specified in subclause 6.2.5A apply.

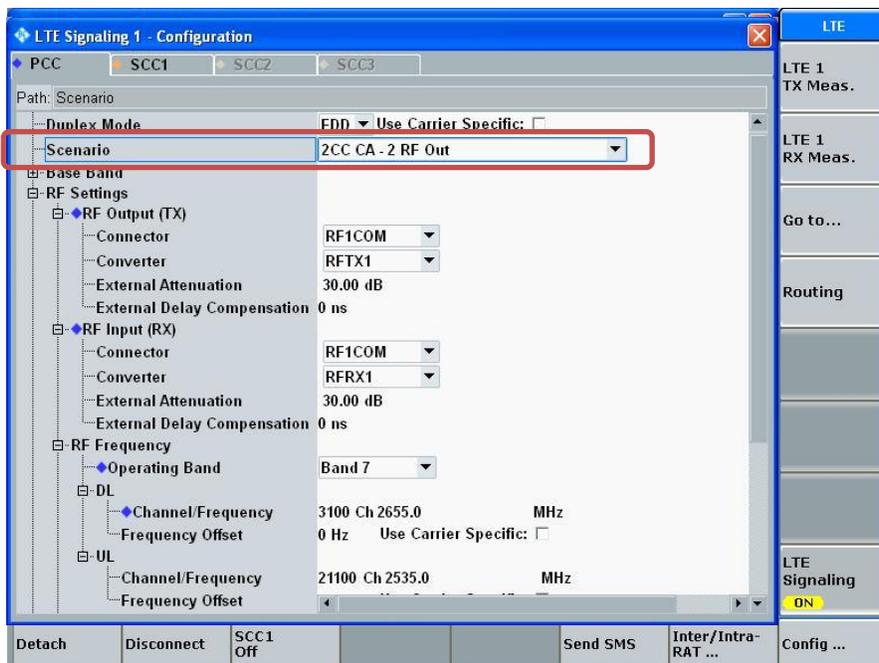
**LTE Carrier Aggregation Test Signal Set-up Procedure**  
 (Use normal LTE set-up procedure in addition with the following steps)

Set to CMW-500 with following parameters:

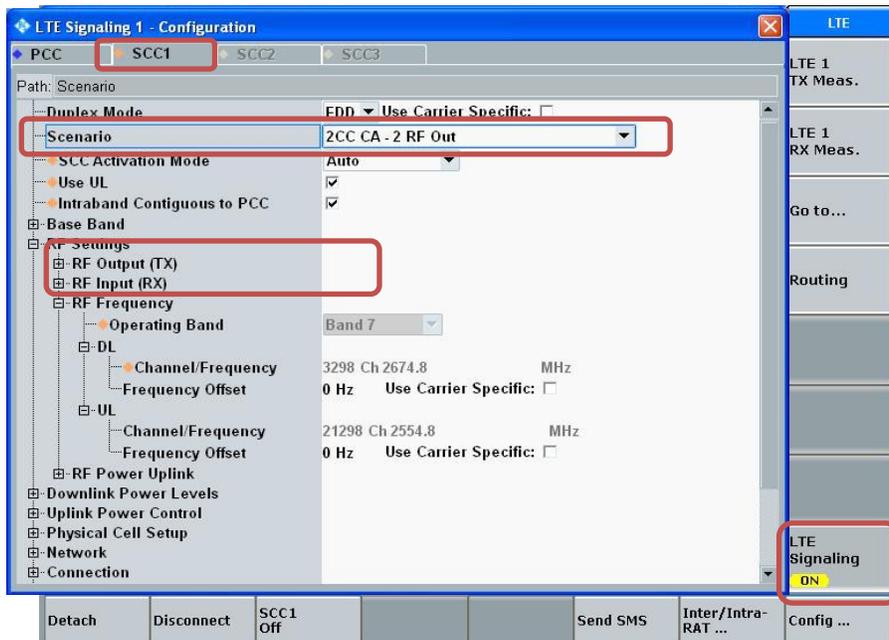
- PCC tab:
  - Select the testing Operating Band, Channel, Frequency, Cell Bandwidth, Uplink RBs



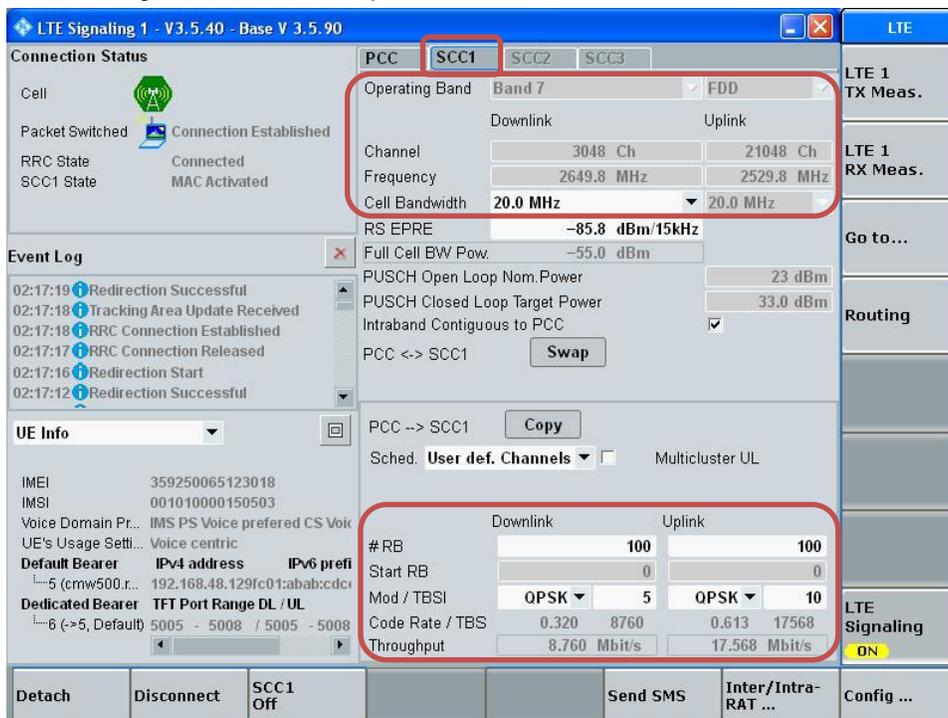
- Go to “Config...”
- Go to “Scenario”
- Set to “2CC CA – 2 RF Out”



- Select “SCC1” tab
- Go to “Scenario”
- Set to “2CC CA – 2 RF Out”
- Enable “Use UL”
- Enable “Intraband Contiguous to PCC”
- Select “LTE Signaling” button

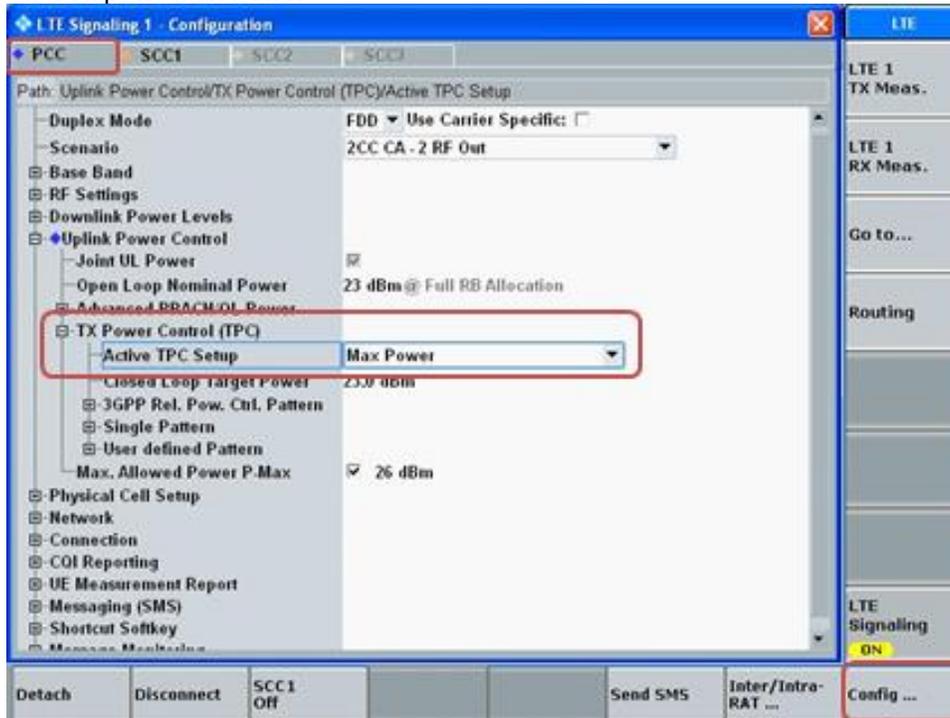


- Select “SCC1” tab
  - Select the testing Cell Bandwidth, Uplink RBs

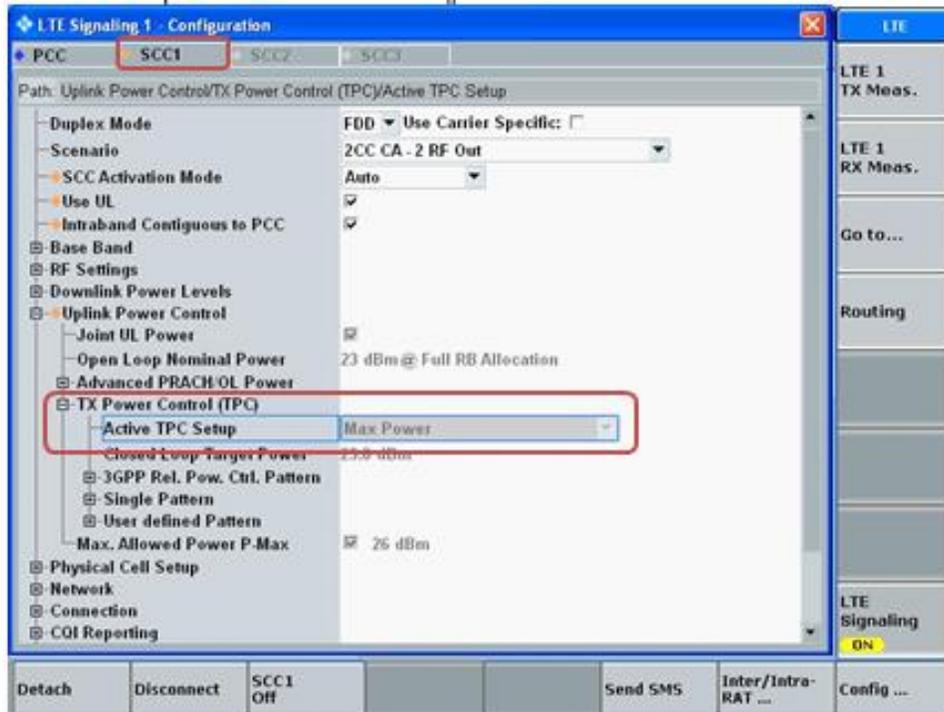


**Max Power Setting**

- Select “Config ...” button
- Select PCC tab
- Set “Active TPC Setup” to “Max Power”



- Select SCC1 tab
- Verify that “Active TPC Setup” is set to “Max Power”



**View TX Power**

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



**LTE Carrier Aggregation Up Link Combinations:**

**Maximum Output Power (Tune-up Limit) for LTE UL Carrier Aggregation**

UL CA shall be tested based on the worst-case SAR configuration determined from non-CA SAR testing result. The channel BW, channel number, RB allocation, etc. would be selected to allow contiguous CA of PCC and SCC. Uplink output power for UL CA is the total power measured across the PCC and SCC.

UL CA power measurements were performed with QPSK modulation based on the worst-case standalone SAR. The tune-up limits are provided in table below.

The UL CA mode power measurements represent the total power across both carriers. Measurements were made for all supported PCC bandwidths using the channel/RB combination resulting in the highest standalone output power at the least MPR (0 dB). SCCs were set to use configurations similar to the PCC to establish conservative or worst case equivalent SAR test conditions (highest maximum power with MPR of 0 dB).

The standalone power measurement is the power for the PCC in the non-CA mode (i.e. single carrier power). In all cases the UL CA power is less than or equal to the standalone power, which is in accordance with the tune-up limits in table below.

According to November 2017 TCB workshop, Uplink CA SAR Test Guidance as follows:

- a) When the maximum output for UL CA is ≤ standalone LTE mode (without CA)
  - PCC is configured according to the highest standalone SAR configuration tested
  - SCC and subsequent CCs are configured according to procedures used for power measurement and parameters (BW, RB etc.) similar to that used for the PCC.
- b) When the Reported SAR for UL CA configuration, described above, is > 1.2 W/kg, UL CA SAR is also required for all required test channels(PCC based).
- c) UL CA SAR is also required for standalone SAR configurations > 1.2 W/kg when they are scaled to the UL CA power level.

SAR measurement is not required for the 16QAM and 64QAM. When the highest maximum output power for 16QAM and 64QAM is ≤ ½ dB higher than the QPSK or when the reported SAR for the QPSK configuration is ≤ 1.45 W/kg.

LTE-uplink 2CA Band 7 for SAR testing

E-UTRA CA configurations	RF exposure conditions	Bands		UL																LTE Rel.8 Power (dBm)	Delta									
		PCC	SCC	PCC				SCC				MPR	PCC+SCC																	
		1st	2nd	Mod	RB	Offset	BW	Freq	Ch	Mod	RB		Offset	BW	Freq	Ch	Aggregated BW	Tune-Up Limit	CA power (total PCC+SCC)			3GPP Rel.#								
CA_7C (0),(1),(2)	Head & Body-worn	7C	7C	QPSK	1	99	20	2510.0	20850	QPSK	1	0	20	2529.8	21048	0	40	25.0	23.1	14	24.0	-0.9								
						0		2535.0	21100			99		2515.2	20902								0	40	25.0	23.3	14	24.3	-0.9	
						0		2560.0	21350			99		2540.2	21152								0	40	25.0	23.2	14	24.0	-0.8	
		Hotspot	7C	7C	QPSK	1	99	20	2510.0	20850	QPSK	1	0	20	2529.8	21048	0	40	22.0	20.2	14	21.1	-0.9							
							0		2535.0	21100			99		2515.2	20902								0	40	22.0	20.5	14	21.4	-0.9
							0		2560.0	21350			99		2540.2	21152								0	40	22.0	20.2	14	21.3	-1.1
	Phablet 10-g SAR	7C	7C	QPSK	1	99	20	2510.0	20850	QPSK	1	0	20	2529.8	21048	0	40	22.0	20.2	14	21.1	-1.0								
						0		2535.0	21100			99		2515.2	20902								0	40	22.0	20.4	14	21.5	-1.1	
						0		2560.0	21350			99		2540.2	21152								0	40	22.0	20.2	14	21.2	-1.0	

**Note(s):**

Standalone output power & SAR are reference from Sec.9.3 & Sec.10.7.

LTE-uplink 2CA Band 38 for SAR testing

E-UTRA CA configurations	RF exposure conditions	Bands		UL																	LTE Rel.8 Power (dBm)	Delta
		PCC	SCC	PCC				SCC				MPR	PCC+SCC									
		1st	2nd	Mod	RB	Offset	BW	Freq	Ch	Mod	RB		Offset	BW	Freq	Ch	Aggregated BW	Tune-Up Limit	CA power (total PCC+SCC)	3GPP Rel.#		
CA_38C (0)	Head & Body-worn	38C	38C	QPSK	1	99	20	2580.0	37850	QPSK	1	0	20	2599.8	38048	0	40	24.0	22.5	14	23.0	-0.5
						99		2590.0	37950			0		40	24.0	22.3	14	22.3	0.0			
						0		2610.0	38150			0		40	24.0	22.7	14	22.7	0.0			
	Hotspot	38C	38C	QPSK	1	99	20	2580.0	37850	QPSK	1	0	20	2599.8	38048	0	40	22.0	20.6	14	20.9	-0.3
						99		2590.0	37950			0		40	22.0	20.1	14	20.2	-0.1			
						0		2610.0	38150			0		40	22.0	20.7	14	20.8	-0.1			

**Note(s):**

Standalone output power & SAR are reference from Sec.9.3 & Sec.10.12.

**LTE Carrier Aggregation Down Link Combinations:**

The DL CA power measurement conditions for various CC's combinations were determined according LTE DL CA SAR Test Exclusion guidance in TCB workshop note (April 2018). Only yellow highlighted cells need power measurement. The following power measurements were performed with a single carrier uplink; CA for this particular project only supports one (1) uplink and up to four (4) downlinks.

**LTE Release 10 Carrier Aggregation**

Index	2CC	Restriction	Completely Covered	Reverse
2CC #1	2A-2A			
2CC #2	2C			
2CC #3	2A-4A		3CC #1	
2CC #4	2A-5A		3CC #1	
2CC #5	2A-7A		3CC #4	
2CC #6	2A-12A			
2CC #7	2A-13A		3CC #3	
2CC #8	2A-17A			
2CC #9	2A-66A			
2CC #10	4A-4A		3CC #6	
2CC #11	4A-5A		3CC #1	
2CC #12	4A-7A		3CC #2	
2CC #13	4A-12A		3CC #6	
2CC #14	4A-13A		3CC #3	
2CC #15	4A-17A		3CC #7	
2CC #16	5A-7A		3CC #9	
2CC #17	5A-41A			
2CC #18	7A-7A		3CC #4	
2CC #19	7C		3CC #5	
2CC #20	12A-66A		3CC #12	
2CC #21	38C			
2CC #22	41A-41A			
2CC #23	41C		4CC #2	
2CC #24	66A-66A		4CC #1	
2CC #25	66B			
2CC #26	66C			

Index	3CC	Restriction	Completely Covered	Reverse
3CC #1	2A-4A-5A			
3CC #2	2A-4A-7A			
3CC #3	2A-4A-13A			
3CC #4	2A-7A-7A			
3CC #5	2A-7C			
3CC #6	4A-4A-12A			
3CC #7	4A-4A-17A			
3CC #8	4A-7C			
3CC #9	5A-7A-7A			
3CC #10	5A-7C			
3CC #11	7A-66A-66A			
3CC #12	12A-66A-66A			
3CC #13	41A-41C			
3CC #14	41D		4CC #3	

Index	4CC	Restriction	Completely Covered	Reverse
4CC #1	7C-66A-66A			
4CC #2	41C-41C			
4CC #3	41A-41D			

**Note:**

Only yellow highlight cells need power measurement according to LTE DL CA SAR test Exclusion in TCB workshop (April.2018).

**LTE Release 10 Carrier Aggregation with 4x4 MIMO**

Index	2CC	Restriction	Completely Covered	Reverse
2CC #1	2A-[4A]		3CC #1	
2CC #2	2A-[7A]		3CC #4	
2CC #3	2A-[66A]			
2CC #4	[4A]-[4A]			
2CC #5	[4A]-5A		3CC #1	
2CC #6	[4A]-[7A]		3CC #2	
2CC #7	[4A]-12A			
2CC #8	[4A]-13A		3CC #3	
2CC #9	[4A]-17A			
2CC #10	5A-[7A]		3CC #7	
2CC #11	[7A]-[7A]		3CC #7	
2CC #12	[7C]		3CC #8	
2CC #13	12A-[66A]		3CC #10	
2CC #14	[66A]-[66A]		4CC #1	

Index	3CC	Restriction	Completely Covered	Reverse
3CC #1	2A-[4A]-5A			
3CC #2	2A-[4A]-[7A]			
3CC #3	2A-[4A]-13A			
3CC #4	2A-[7A]-[7A]			
3CC #5	2A-[7C]			
3CC #6	[4A]-[7C]			
3CC #7	5A-[7A]-[7A]			
3CC #8	5A-[7C]			
3CC #9	[7A]-[66A]-[66A]			
3CC #10	12A-[66A]-[66A]			

Index	4CC	Restriction	Completely Covered	Reverse
4CC#1	[7C]-[66A]-[66A]			

[\*] is 4X4 MIMO configuration.

**Note:**

Only yellow highlight cells need power measurement according to LTE DL CA SAR test Exclusion in TCB workshop (April.2018).

**1. Single Carrier 4x4 Downlink MIMO**

LTE Band	Bandwidth (MHz)	Channel	Frequency (MHz)	Modulation	RB/Offset	LTE Rel 8 Tx. Power [dBm]	4x4 DL MIMO LTE Rel 8 Tx. Power [dBm]	Delta
LTE Band 4	QPSK	20	20300	1745	1/0	24.4	24.3	-0.1
LTE Band 7	QPSK	20	21100	2535	1/0	24.3	24.2	-0.1
LTE Band 66	QPSK	20	132322	1745	1/0	24.3	24.3	0.0

**Note:**

1. According to LTE Test Conditions in TCB workshop (May, 2017), SAR is excluded for LTE downlink 4x4 MIMO operation when uplink output with DL MIMO does not exceed highest uplink output power configuration without DL MIMO by more than a 1/4 dB. And for DL MIMO with carrier aggregation, the same SAR test exclusion procedure is considered.

**2. DL CA output power results**

E-UTRA CA configuration (BCS)	Bands				UL				DL												LTE Rel 8 Tx. Power [dBm]	LTE Rel 10 Tx. Power [dBm]	Delta				
	PCC	SCC1	SCC2	SCC3	PCC				PCC				SCC1				SCC2							SCC3			
	1st	2nd	3rd	4th	Mode	BW (MHz)	Channel	Freq. (MHz)	RB/Offset	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel				Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)
2A-12A	2A	12A			QPSK	20	19100	1900	1/0	20	1100	1980	10	5095	737.5										23.3	23.2	-0.1
	12A	2A			QPSK	10	23095	707.5	1/0	10	5095	737.5	20	900	1960										24.1	24.0	0.0
2A-17A	2A	17A			QPSK	10	19150	1905	1/0	10	1150	1985	10	5790	740										23.3	23.3	0.0
	17A	2A			QPSK	10	23790	710	1/0	10	5790	740	20	900	1960										24.0	24.0	-0.1
2A-66A	2A	66A			QPSK	20	19100	1900	1/0	20	1100	1980	20	66786	2145										23.3	23.3	0.0
	66A	2A			QPSK	20	132322	1745	1/0	20	66786	2145	20	900	1960										24.3	24.3	0.0
5A-41A	5A	41A			QPSK	10	20525	836.5	1/0	10	2525	881.5	20	40620	2593										25.2	25.2	0.0
	41A	5A			QPSK	20	39750	2506	1/99	20	39750	2506	10	2525	881.5										22.7	22.8	0.0
2A-4A-5A	2A	4A	5A		QPSK	20	19100	1900	1/0	20	1100	1980	20	2175	2132.5	10	2525	881.5	20	900	1960				23.3	23.3	0.0
	4A	5A	2A		QPSK	20	20300	1745	1/0	20	2300	2145	10	2525	881.5	20	900	1960							24.4	24.3	0.0
	5A	2A	4A		QPSK	10	20525	836.5	1/0	10	2525	881.5	20	900	1960	20	2175	2132.5							25.2	25.2	0.0
2A-4A-7A	2A	4A	7A		QPSK	20	19100	1900	1/0	20	1100	1980	20	2175	2132.5	20	3100	2655	20	900	1960				23.3	23.3	0.0
	4A	7A	2A		QPSK	20	20300	1745	1/0	20	2300	2145	20	3100	2655	20	900	1960							24.4	24.4	0.0
2A-4A-13A	7A	2A	4A		QPSK	20	21100	2535	1/0	20	3100	2655	20	900	1960	20	2175	2132.5							24.3	24.2	0.0
	2A	4A	13A		QPSK	20	19100	1900	1/0	20	1100	1980	20	2175	2132.5	10	5230	751	20	900	1960				23.3	23.4	0.1
	4A	13A	2A		QPSK	20	20300	1745	1/0	20	2300	2145	10	5230	751	20	900	1960							24.4	24.4	0.0
2A-7A-7A	13A	2A	4A		QPSK	10	23230	782	1/0	10	5230	751	20	900	1960	20	2175	2132.5							24.4	24.4	-0.1
	2A	7A	7A		QPSK	20	19100	1900	1/0	20	1100	1980	20	3100	2655	20	3350	2680	20	900	1960				23.3	23.4	0.1
2A-7C	7A	7A	2A		QPSK	20	21100	2535	1/0	20	3100	2655	20	3350	2680	20	900	1960							24.3	24.4	0.2
	2A	7C	7C		QPSK	20	19100	1900	1/0	20	1100	1980	20	3100	2655	20	3298	2674.8	20	3298	2674.8				23.3	23.3	0.0
4A-4A-12A	7C	7C	2A		QPSK	20	21100	2535	1/0	20	3100	2655	20	3298	2674.8	20	900	1960							24.3	24.3	0.0
	4A	4A	12A		QPSK	20	20300	1745	1/0	20	2300	2145	20	2050	2120	10	5095	737.5							24.4	24.4	0.0
4A-4A-17A	12A	4A	4A		QPSK	10	23095	707.5	1/0	10	5095	737.5	20	2175	2132.5	20	2300	2145							24.1	24.1	0.0
	4A	4A	17A		QPSK	20	20300	1745	1/0	20	2300	2145	20	2050	2120	10	5790	740	20	2300	2145				24.4	24.4	0.0
4A-7C	17A	4A	4A		QPSK	10	23790	710	1/0	10	5790	740	20	2175	2132.5	20	2300	2145							24.0	24.1	0.0
	4A	7C	7C		QPSK	20	20300	1745	1/0	20	2300	2145	20	3100	2655	20	3298	2674.8	20	3298	2674.8				24.4	24.4	0.1
5A-7A-7A	7C	7C	4A		QPSK	20	21100	2535	1/0	20	3100	2655	20	3298	2674.8	20	2300	2145							24.3	24.3	0.1
	5A	7A	7A		QPSK	10	20525	836.5	1/0	10	2525	881.5	20	3100	2655	20	3350	2680	20	3350	2680				25.2	25.2	0.0
5A-7C	7A	7A	5A		QPSK	20	21100	2535	1/0	20	3100	2655	20	3350	2680	10	2525	881.5							24.3	24.3	0.0
	5A	7C	7C		QPSK	10	20525	836.5	1/0	10	2525	881.5	20	3100	2655	20	3298	2674.8	20	3298	2674.8				25.2	25.1	-0.1
7A-66A-66A	7C	7C	5A		QPSK	20	21100	2535	1/0	20	3100	2655	20	3298	2674.8	10	2525	881.5							24.3	24.4	0.1
	7A	66A	66A		QPSK	20	21100	2535	1/0	20	3100	2655	20	66786	2145	20	67036	2170							24.3	24.4	0.1
12A-66A-66A	66A	66A	7A		QPSK	20	132322	1745	1/0	20	66786	2145	20	67036	2170	20	3100	2655							24.3	24.3	0.0
	12A	66A	66A		QPSK	10	23095	707.5	1/0	10	5095	737.5	20	66786	2145	20	67036	2170	20	67036	2170				24.1	24.0	-0.1
7C-66A-66A	66A	66A	12A		QPSK	20	132322	1745	1/0	20	66786	2145	20	67036	2170	10	5095	737.5							24.3	24.4	0.0
	7C	7C	66A	66A	QPSK	20	21100	2535	1/0	20	3100	2655	20	3298	2674.8	20	66786	2145	20	66786	2145	20	67036	2170	24.3	24.3	0.0
2A-2A	66A	66A	7C	7C	QPSK	20	132322	1745	1/0	20	66786	2145	20	67036	2170	20	3100	2655	20	3298	2674.8				24.3	24.3	0.0
2A-2A	2A	2A			QPSK	20	19100	1900	1/0	20	1100	1980	20	700	1940										23.3	23.3	0.0
41A-41A	41A	41A			QPSK	20	39750	2506	1/99	20	39750	2506	20	41490	2680										22.7	22.7	0.0
41A-41C	41A	41C	41C		QPSK	20	39750	2506	1/99	20	39750	2506	20	40620	2593	20	40818	2612.8							22.7	22.7	-0.1
	41C	41C	41A		QPSK	20	39750	2506	1/99	20	39750	2506	20	39948	2525.8	20	40620	2593							22.7	22.7	-0.1
41C-41C	41C	41C	41C	41C	QPSK	20	39750	2506	1/99	20	39750	2506	20	39948	2525.8	20	40620	2593	20	40818	2612.8	20	40818	2612.8	22.7	22.7	-0.1
41A-41D	41A	41D	41D	41D	QPSK	20	39750	2506	1/99	20	39750	2506	20	40620	2593	20	40818	2612.8	20	41016	2632.6				22.7	22.7	-0.1
	41D	41D	41D	41A	QPSK	20	39750	2506	1/99	20	39750	2506	20	39948	2525.8	20	40146	2545.6	20	40620	2593				22.7	22.7	0.0
2C	2C	2C			QPSK	20	19100	1900	1/0	20	1100	1980	20	902	1960.2										23.3	23.3	0.0
38C	38C	38C			QPSK	20	37850	2580	1/99	20	37850	2580	20	38048	2599.8										23.0	22.9	0.0
66B	66B	66B			QPSK	15	132322	1745	1/0	15	66786	2145	5	66879	2154.3										24.1	24.1	0.0
66C	66C	66C			QPSK	20	132322	1745	1/0	20	66786	2145	20	66984	2164.8										24.3	24.4	0.0

**Note:**

1\_Per KDB 941225 D05A LTE Rel. 10 KDB Inquiry Sheet: SAR is excluded for Carrier Aggregation when measured power does not exceed LTE Release 8 by more than a 1/4 dB.

2\_When the same frequency band is used for both contiguous and non-contiguous in DL CA Intra band, power was measured using the configuration with the largest aggregated bandwidth and maximum output power among the contiguous and non-contiguous in DL CA Intra band configurations

**3. DL CA with downlink 4X4 MIMO output power results**

E-UTRA CA configuration (BCS)	Bands				UL				DL											LTE Rel 8 Tx. Power [dBm]	LTE Rel 10 Tx. Power [dBm]	Delta		
	PCC	SCC1	SCC2	SCC3	PCC				PCC			SCC1		SCC2			SCC3							
	1st	2nd	3rd	4th	Mode	BW (MHz)	Channel	Freq. (MHz)	RB/Offset	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)				Channel	Freq. (MHz)
2A-[66A]	2A	[66A]			QPSK	20	19100	1900	1/0	20	1100	1980	20	66786	2145							23.3	23.2	-0.1
	[66A]	2A			QPSK	20	132322	1745	1/0	20	66786	2145	20	900	1960							24.3	24.3	-0.1
[4A]-12A	[4A]	12A			QPSK	20	20300	1745	1/0	20	2300	2145	10	5095	737.5							24.4	24.3	-0.1
		12A	[4A]		QPSK	10	23095	707.5	1/0	10	5095	737.5	20	2175	2132.5							24.1	24.0	0.0
[4A]-17A	[4A]	17A			QPSK	20	20300	1745	1/0	20	2300	2145	10	5790	740							24.4	24.3	0.0
		17A	[4A]		QPSK	10	23790	710	1/0	10	5790	740	20	2175	2132.5							24.0	24.0	0.0
2A-[4A]-5A	2A	[4A]	5A		QPSK	20	19100	1900	1/0	20	1100	1980	20	2175	2132.5	10	2525	881.5				23.3	23.3	0.0
	[4A]	5A	2A		QPSK	20	20300	1745	1/0	20	2300	2145	10	2525	881.5	20	900	1960				24.4	24.3	-0.1
	5A	2A	[4A]		QPSK	10	20525	836.5	1/0	10	2525	881.5	20	900	1960	20	2175	2132.5				25.2	25.2	0.0
2A-[4A]-[7A]	2A	[4A]	[7A]		QPSK	20	19100	1900	1/0	20	1100	1980	20	2175	2132.5	20	3100	2655				23.3	23.3	-0.1
	[4A]	[7A]	2A		QPSK	20	20300	1745	1/0	20	2300	2145	20	3100	2655	20	900	1960				24.4	24.3	0.0
	[7A]	2A	[4A]		QPSK	20	21100	2535	1/0	20	3100	2655	20	900	1960	20	2175	2132.5				23.9	23.8	-0.1
2A-[4A]-13A	2A	[4A]	13A		QPSK	20	19100	1900	1/0	20	1100	1980	20	2175	2132.5	10	5230	751				23.3	23.3	0.0
	[4A]	13A	2A		QPSK	20	20300	1745	1/0	20	2300	2145	10	5230	751	20	900	1960				24.4	24.4	0.0
	13A	2A	[4A]		QPSK	10	23230	782	1/0	10	5230	751	20	900	1960	20	2175	2132.5				24.4	24.4	-0.1
2A-[7A]-[7A]	2A	[7A]	[7A]		QPSK	20	19100	1900	1/0	20	1100	1980	20	3100	2655	20	3350	2680				23.3	23.2	-0.1
	[7A]	[7A]	2A		QPSK	20	21100	2535	1/0	20	3100	2655	20	3350	2680	20	900	1960				23.9	23.8	-0.1
2A-[7C]	2A	[7C]	[7C]		QPSK	20	19100	1900	1/0	20	1100	1980	20	3100	2655	20	3298	2674.8				23.3	23.2	-0.1
	[7C]	[7C]	2A		QPSK	20	21100	2535	1/0	20	3100	2655	20	3298	2674.8	20	900	1960				23.9	23.8	-0.1
[4A]-[7C]	[4A]	[7C]	[7C]		QPSK	20	20300	1745	1/0	20	2300	2145	20	3100	2655	20	3298	2674.8				24.4	24.2	-0.2
	[7C]	[7C]	[4A]		QPSK	20	21100	2535	1/0	20	3100	2655	20	3298	2674.8	20	2300	2145				23.9	23.8	0.0
5A-[7A]-[7A]	5A	[7A]	[7A]		QPSK	10	20525	836.5	1/0	10	2525	881.5	20	3100	2655	20	3350	2680				25.2	25.2	0.0
	[7A]	[7A]	5A		QPSK	20	21100	2535	1/0	20	3100	2655	20	3350	2680	10	2525	881.5				23.9	23.9	0.0
5A-[7C]	5A	[7C]	[7C]		QPSK	10	20525	836.5	1/0	10	2525	881.5	20	3100	2655	20	3298	2674.8				25.2	25.2	0.0
	[7C]	[7C]	5A		QPSK	20	21100	2535	1/0	20	3100	2655	20	3298	2674.8	10	2525	881.5				23.9	23.9	0.0
[7A]-[66A]-[66A]	[7A]	[66A]	[66A]		QPSK	20	21100	2535	1/0	20	3100	2655	20	66786	2145	20	67036	2170				23.9	23.9	0.0
	[66A]	[66A]	[7A]		QPSK	20	132322	1745	1/0	20	66786	2145	20	67036	2170	20	3100	2655				24.3	24.2	-0.1
12A-[66A]-[66A]	12A	[66A]	[66A]		QPSK	10	23095	707.5	1/0	10	5095	737.5	20	66786	2145	20	67036	2170				24.1	24.0	-0.1
	[66A]	[66A]	12A		QPSK	20	132322	1745	1/0	20	66786	2145	20	67036	2170	10	5095	737.5				24.3	24.3	-0.1
[7C]-[66A]-[66A]	[7C]	[7C]	[66A]	[66A]	QPSK	20	21100	2535	1/0	20	3100	2655	20	3298	2674.8	20	66786	2145	20	67036	2170	23.9	23.8	0.0
	[66A]	[66A]	[7C]	[7C]	QPSK	20	132322	1745	1/0	20	66786	2145	20	67036	2170	20	3100	2655	20	3298	2674.8	24.3	24.3	-0.1
[4A]-[4A]	[4A]	[4A]			QPSK	20	20300	1745	1/0	20	2300	2145	20	2050	2120							24.4	24.4	0.0

**Note:**

1\_Per KDB 941225 D05A LTE Rel. 10 KDB Inquiry Sheet: SAR is excluded for Carrier Aggregation when measured power does not exceed LTE Release 8 by more than a 1/4 dB.

2\_When the same frequency band is used for both contiguous and non-contiguous in DL CA Intra band, power was measured using the configuration with the largest aggregated bandwidth and maximum output power among the contiguous and non-contiguous in DL CA Intra band configurations

### 9.4 Wi-Fi 2.4 GHz (DTS Band)

When the RCV is active in a held-to-ear user scenario, the output power level is reduced. The maximum allowed output powers in all conditions are included in the maximum power document.

Refer to Operational Description for WLAN explanation.

#### Measured Results of Normal WLAN mode

Antenna	Mode	Data Rate	Ch #	Freq. (MHz)	Meas. Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Meas. Avg Pwr (dBm)	Reduced. Output Power (dBm)	SAR Test (Yes/No)	
SISO Ant.1	802.11b	1 Mbps	1	2412.0	18.7	19.0	Yes	15.7	16.0	Yes	
			6	2437.0	18.4			15.4			
			11	2462.0	18.9			15.7			
			12	2467.0	3.2			3.2			No
			13	2472.0	0.9			1.5			
	802.11g	6 Mbps	1	2412.0	Not Required	16.0	No	Not Required	16.0	No	
			6	2437.0							
			11	2462.0							
			12	2467.0							3.5
			13	2472.0							1.5
	802.11n (HT20)	6.5 Mbps	1	2412.0	Not Required	16.0	No	Not Required	16.0	No	
			6	2437.0							
			11	2462.0							
			12	2467.0							3.5
			13	2472.0							1.5
	802.11ax (HE20)	7.3 Mbps	1	2412.0	Not Required	16.0	No	Not Required	16.0	No	
6			2437.0								
11			2462.0								
12			2467.0	3.5							
13			2472.0	1.5							
Antenna	Mode	Data Rate	Ch #	Freq. (MHz)	Meas. Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Meas. Avg Pwr (dBm)	Reduced. Output Power (dBm)	SAR Test (Yes/No)	
SISO Ant.2	802.11b	1 Mbps	1	2412.0	18.3	19.0	Yes	14.9	16.0	Yes	
			6	2437.0	17.9			14.7			
			11	2462.0	17.7			14.6			
			12	2467.0	2.5			2.5			No
			13	2472.0	1.1			1.5			
	802.11g	6 Mbps	1	2412.0	Not Required	16.0	No	Not Required	16.0	No	
			6	2437.0							
			11	2462.0							
			12	2467.0							3.5
			13	2472.0							1.5
	802.11n (HT20)	6.5 Mbps	1	2412.0	Not Required	16.0	No	Not Required	16.0	No	
			6	2437.0							
			11	2462.0							
			12	2467.0							3.5
			13	2472.0							1.5
	802.11ax (HE20)	7.3 Mbps	1	2412.0	Not Required	16.0	No	Not Required	16.0	No	
6			2437.0								
11			2462.0								
12			2467.0	3.5							
13			2472.0	1.5							

#### Note(s):

- SAR is not required for 802.11g/n/ax modes when the adjusted SAR for 802.11b is < 1.2 W/kg.
- For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11n/g/ax mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band. Additional output power measurements were not deemed necessary.
- Additionally, SAR is not required for Channels 12 and 13 because the tune-up limit and the measured output power for these two channels are no greater than those for the default test channels. Refer to §6.3.
- MIMO SAR test is not required for all RF exposure conditions. Because the summations are not over FCC limit, when each SISO SAR values are used.

### 9.5 Wi-Fi 5GHz (U-NII Bands)

When the RCV is active in a held-to-ear user scenario, the output power level is reduced. The maximum allowed output powers in all conditions are included in the maximum power document.

Refer to Operational Description for WLAN explanation.

#### Measured Results of SISO Ant.1 of Normal WLAN mode

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduction Pwr.		
						Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
SISO Ant.1	5.3 (U-NII 2A)	802.11a	6 Mbps	52	5260.0	16.0	16.0	Yes	Not Required	13.0	No
				56	5280.0	16.0					
				60	5300.0	16.0					
				64	5320.0	16.0					
		802.11n (HT20)	6.5 Mbps	52	5260.0	15.9	16.0	No	Not Required	13.0	No
				56	5280.0	15.9					
				60	5300.0	16.0					
				64	5320.0	16.0					
		802.11n (HT40)	13.5 Mbps	54	5270.0	Not Required	15.0	No	Not Required	13.0	No
				62	5310.0	Not Required					
		802.11ac (VHT20)	6.5 Mbps	52	5260.0	15.8	16.0	No	Not Required	13.0	No
				56	5280.0	15.9					
				60	5300.0	15.8					
				64	5320.0	15.9					
		802.11ac (VHT40)	13.5 Mbps	54	5270.0	Not Required	15.0	No	Not Required	13.0	No
				62	5310.0	Not Required					
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	14.0	No	11.9	13.0	Yes
	802.11ax (HE20)	7.3 Mbps	52	5260.0	15.3	16.0	No	Not Required	13.0	No	
			56	5280.0	15.4						
			60	5300.0	15.4						
			64	5320.0	15.4						
	802.11ax (HE40)	14.6 Mbps	54	5270.0	Not Required	15.0	No	Not Required	13.0	No	
			62	5310.0	Not Required						
	802.11ax (HE80)	30.6 Mbps	58	5290.0	Not Required	14.0	No	11.9	13.0	No	
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	15.3	16.0	Yes	Not Required	13.0	No
				120	5600.0	15.6					
				124	5620.0	15.6					
				144	5720.0	15.5					
		802.11n (HT20)	6.5 Mbps	100	5500.0	15.3	16.0	No	Not Required	13.0	No
				120	5600.0	15.5					
				124	5620.0	15.6					
				144	5720.0	15.4					
		802.11n (HT40)	13.5 Mbps	102	5510.0	Not Required	15.0	No	Not Required	13.0	No
				118	5590.0						
126				5630.0							
142				5710.0							
802.11ac (VHT20)		6.5 Mbps	100	5500.0	15.3	16.0	No	Not Required	13.0	No	
			120	5600.0	15.5						
			124	5620.0	15.5						
			144	5720.0	15.4						
802.11ac (VHT40)		13.5 Mbps	102	5510.0	Not Required	15.0	No	Not Required	13.0	No	
			118	5590.0							
	126		5630.0								
	142		5710.0								
802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	14.0	No	12.6	13.0	Yes		
		122	5610.0				12.6				
		138	5690.0				12.7				
802.11ax (HE20)	7.3 Mbps	100	5500.0	14.6	16.0	No	Not Required	13.0	No		
		120	5600.0	14.9							
		124	5620.0	14.9							
		144	5720.0	14.8							
802.11ax (HE40)	14.6 Mbps	102	5510.0	Not Required	15.0	No	Not Required	13.0	No		
		118	5590.0								
		126	5630.0								
		142	5710.0								
802.11ax (HE80)	30.6 Mbps	106	5530.0	Not Required	14.0	No	12.3	13.0	No		
		122	5610.0				12.3				
		138	5690.0				12.3				
5.8 (U-NII 3)	802.11a	6 Mbps	149	5745.0	15.4	16.0	Yes	Not Required	13.0	No	
			157	5785.0	15.4						
			165	5825.0	15.1						
	802.11n (HT20)	6.5 Mbps	149	5745.0	15.4	16.0	No	Not Required	13.0	No	
			157	5785.0	15.3						
			165	5825.0	15.1						
	802.11n (HT40)	13.5 Mbps	151	5755.0	Not Required	15.0	No	Not Required	13.0	No	
			159	5795.0	Not Required						
	802.11ac (VHT20)	6.5 Mbps	149	5745.0	15.4	16.0	No	Not Required	13.0	No	
			157	5785.0	15.2						
			165	5825.0	15.0						
	802.11ac (VHT40)	13.5 Mbps	151	5755.0	Not Required	15.0	No	Not Required	13.0	No	
			159	5795.0	Not Required						
	802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	14.0	No	12.5	13.0	Yes	
			149	5745.0	14.7						
	802.11ax (HE20)	7.3 Mbps	157	5785.0	14.6	16.0	No	Not Required	13.0	No	
			165	5825.0	14.5						
			151	5755.0	14.5						
802.11ax (HE40)	14.6 Mbps	151	5755.0	Not Required	15.0	No	Not Required	13.0	No		
		159	5795.0	Not Required							
802.11ax (HE80)	30.6 Mbps	155	5775.0	Not Required	14.0	No	12.1	13.0	No		

**Measured Results of SISO Ant.2 of Normal WLAN mode**

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduction Pwr.		
						Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
SISO Ant.2	5.3 (U-NII 2A)	802.11a	6 Mbps	52	5260.0	15.7	16.0	Yes	Not Required	13.0	No
				56	5280.0	15.7					
				60	5300.0	15.7					
				64	5320.0	15.7					
		802.11n (HT20)	6.5 Mbps	52	5260.0	15.6	16.0	No	Not Required	13.0	No
				56	5280.0	15.6					
				60	5300.0	15.6					
				64	5320.0	15.7					
		802.11n (HT40)	13.5 Mbps	54	5270.0	Not Required	15.0	No	Not Required	13.0	No
				62	5310.0						
		802.11ac (VHT20)	6.5 Mbps	52	5260.0	15.5	16.0	No	Not Required	13.0	No
				56	5280.0	15.6					
				60	5300.0	15.6					
				64	5320.0	15.6					
		802.11ac (VHT40)	13.5 Mbps	54	5270.0	Not Required	15.0	No	Not Required	13.0	No
				62	5310.0						
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	14.0	No	12.7	13.0	Yes
		802.11ax (HE20)	7.3 Mbps	52	5260.0	14.9	16.0	No	Not Required	13.0	No
				56	5280.0	14.9					
				60	5300.0	14.9					
				64	5320.0	14.8					
		802.11ax (HE40)	14.6 Mbps	54	5270.0	Not Required	15.0	No	Not Required	13.0	No
				62	5310.0						
802.11ax (HE80)	30.6 Mbps	58	5290.0	Not Required	14.0	No	11.9	13.0	No		
SISO Ant.2	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	15.6	16.0	Yes	Not Required	13.0	No
				120	5600.0	15.6					
				124	5620.0	15.5					
				144	5720.0	15.4					
		802.11n (HT20)	6.5 Mbps	100	5500.0	15.5	16.0	No	Not Required	13.0	No
				120	5600.0	15.6					
				124	5620.0	15.6					
				144	5720.0	15.3					
		802.11n (HT40)	13.5 Mbps	102	5510.0	Not Required	15.0	No	Not Required	13.0	No
				118	5590.0						
				126	5630.0						
				142	5710.0						
		802.11ac (VHT20)	6.5 Mbps	100	5500.0	15.4	16.0	No	Not Required	13.0	No
				120	5600.0	15.5					
				124	5620.0	15.5					
				144	5720.0	15.3					
		802.11ac (VHT40)	13.5 Mbps	102	5510.0	Not Required	15.0	No	Not Required	13.0	No
				118	5590.0						
				126	5630.0						
				142	5710.0						
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	14.0	No	12.7	13.0	Yes
				122	5610.0				12.6		
				138	5690.0				12.5		
		802.11ax (HE20)	7.3 Mbps	100	5500.0	14.8	16.0	No	Not Required	13.0	No
120	5600.0			14.8							
124	5620.0			14.7							
144	5720.0			14.6							
802.11ax (HE40)	14.6 Mbps	102	5510.0	Not Required	15.0	No	Not Required	13.0	No		
		118	5590.0								
		126	5630.0								
		142	5710.0								
802.11ax (HE80)	30.6 Mbps	106	5530.0	Not Required	14.0	No	12.7	13.0	No		
		122	5610.0				12.7				
		138	5690.0				12.7				
SISO Ant.2	5.8 (U-NII 3)	802.11a	6 Mbps	149	5745.0	15.4	16.0	Yes	Not Required	13.0	No
				157	5785.0	15.4					
				165	5825.0	15.3					
		802.11n (HT20)	6.5 Mbps	149	5745.0	15.4	16.0	No	Not Required	13.0	No
				157	5785.0	15.4					
				165	5825.0	15.3					
		802.11n (HT40)	13.5 Mbps	151	5755.0	Not Required	15.0	No	Not Required	13.0	No
				159	5795.0						
		802.11ac (VHT20)	6.5 Mbps	149	5745.0	15.3	16.0	No	Not Required	13.0	No
				157	5785.0	15.3					
				165	5825.0	15.2					
		802.11ac (VHT40)	13.5 Mbps	151	5755.0	Not Required	15.0	No	Not Required	13.0	No
				159	5795.0						
		802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	14.0	No	12.2	13.0	Yes
		802.11ax (HE20)	7.3 Mbps	149	5745.0	14.7	16.0	No	Not Required	13.0	No
				157	5785.0	14.7					
				165	5825.0	14.6					
		802.11ax (HE40)	14.6 Mbps	151	5755.0	Not Required	15.0	No	Not Required	13.0	No
				159	5795.0						
		802.11ax (HE80)	30.6 Mbps	155	5775.0	Not Required	14.0	No	11.6	13.0	No

**Measured Results of MIMO Ant.1 of Normal WLAN mode**

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduction Pwr.		
						Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
MIMO Ant.1	5.3 (U-NII 2A)	802.11n (HT20)	6.5 Mbps	52	5260.0	15.9	16.0	Yes	Not Required	13.0	No
				56	5280.0	15.9					
				60	5300.0	16.0					
				64	5320.0	16.0					
		802.11n (HT40)	13.5 Mbps	54	5270.0	Not Required	15.0	No	Not Required	13.0	No
				62	5310.0						
		802.11ac (VHT20)	6.5 Mbps	52	5260.0	15.8	16.0	No	Not Required	13.0	No
				56	5280.0	15.8					
				60	5300.0	15.9					
				64	5320.0	15.9					
		802.11ac (VHT40)	13.5 Mbps	54	5270.0	Not Required	15.0	No	Not Required	13.0	No
				62	5310.0						
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	14.0	No	11.7	13.0	Yes
		802.11ax (HE20)	7.3 Mbps	52	5260.0	15.2	16.0	No	Not Required	13.0	No
				56	5280.0	15.3					
				60	5300.0	15.3					
				64	5320.0	15.4					
		802.11ax (HE40)	14.6 Mbps	54	5270.0	Not Required	15.0	No	Not Required	13.0	No
				62	5310.0						
	802.11ax (HE80)	30.6 Mbps	58	5290.0	Not Required	14.0	No	11.7	13.0	No	
	5.5 (U-NII 2C)	802.11n (HT20)	6.5 Mbps	100	5500.0	15.3	16.0	Yes	Not Required	13.0	No
				120	5600.0	15.5					
				124	5620.0	15.5					
				144	5720.0	15.4					
		802.11n (HT40)	13.5 Mbps	102	5510.0	Not Required	15.0	No	Not Required	13.0	No
				118	5590.0						
				126	5630.0						
				142	5710.0						
		802.11ac (VHT20)	6.5 Mbps	100	5500.0	15.2	16.0	No	Not Required	13.0	No
				120	5600.0	15.4					
				124	5620.0	15.5					
				144	5720.0	15.3					
		802.11ac (VHT40)	13.5 Mbps	102	5510.0	Not Required	15.0	No	Not Required	13.0	No
				118	5590.0						
				126	5630.0						
				142	5710.0						
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	14.0	No	12.5	13.0	Yes
				122	5610.0				12.6		
138				5690.0							
802.11ax (HE20)		7.3 Mbps	100	5500.0	14.9	16.0	No	Not Required	13.0	No	
	120		5600.0	15.2							
	124		5620.0	15.3							
	144		5720.0	15.4							
802.11ax (HE40)	14.6 Mbps	102	5510.0	Not Required	15.0	No	Not Required	13.0	No		
		118	5590.0								
		126	5630.0								
		142	5710.0								
802.11ax (HE80)	30.6 Mbps	106	5530.0	Not Required	14.0	No	12.1	13.0	No		
		122	5610.0				12.1				
		138	5690.0				12.0				

**Measured Results of MIMO Ant.2 of Normal WLAN mode**

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Max Pwr.			Reduction Pwr.		
						Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
MIMO Ant.2	5.3 (U-NII 2A)	802.11n (HT20)	6.5 Mbps	52	5260.0	15.6	16.0	Yes	Not Required	13.0	No
				56	5280.0	15.5					
				60	5300.0	15.4					
				64	5320.0	15.5					
		802.11n (HT40)	13.5 Mbps	54	5270.0	Not Required	15.0	No	Not Required	13.0	No
				62	5310.0						
		802.11ac (VHT20)	6.5 Mbps	52	5260.0	15.5	16.0	No	Not Required	13.0	No
				56	5280.0	15.4					
				60	5300.0	15.4					
				64	5320.0	15.4					
		802.11ac (VHT40)	13.5 Mbps	54	5270.0	Not Required	15.0	No	Not Required	13.0	No
				62	5310.0						
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	14.0	No	11.5	13.0	Yes
		802.11ax (HE20)	7.3 Mbps	52	5260.0	14.7	16.0	No	Not Required	13.0	No
				56	5280.0	14.6					
	60			5300.0	14.5						
	64			5320.0	14.5						
	802.11ax (HE40)	14.6 Mbps	54	5270.0	Not Required	15.0	No	Not Required	13.0	No	
			62	5310.0							
	802.11ax (HE80)	30.6 Mbps	58	5290.0	Not Required	14.0	No	11.5	13.0	No	
	5.5 (U-NII 2C)	802.11n (HT20)	6.5 Mbps	100	5500.0	14.5	16.0	Yes	Not Required	13.0	No
				120	5600.0	14.4					
				124	5620.0	14.4					
				144	5720.0	14.2					
		802.11n (HT40)	13.5 Mbps	102	5510.0	Not Required	15.0	No	Not Required	13.0	No
				118	5590.0						
				126	5630.0						
				142	5710.0						
		802.11ac (VHT20)	6.5 Mbps	100	5500.0	14.5	16.0	No	Not Required	13.0	No
				120	5600.0	14.4					
124				5620.0	14.3						
144				5720.0	14.2						
802.11ac (VHT40)		13.5 Mbps	102	5510.0	Not Required	15.0	No	Not Required	13.0	No	
			118	5590.0							
			126	5630.0							
			142	5710.0							
802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	14.0	No	11.6	13.0	Yes		
		122	5610.0				11.4				
		138	5690.0				11.2				
802.11ax (HE20)	7.3 Mbps	100	5500.0	14.9	16.0	No	Not Required	13.0	No		
		120	5600.0	14.9							
		124	5620.0	14.8							
		144	5720.0	14.7							
802.11ax (HE40)	14.6 Mbps	102	5510.0	Not Required	15.0	No	Not Required	13.0	No		
		118	5590.0								
		126	5630.0								
		142	5710.0								
802.11ax (HE80)	30.6 Mbps	106	5530.0	Not Required	14.0	No	11.6	13.0	No		
		122	5610.0				11.6				
		138	5690.0				11.6				

**Note(s):**

- For "Not required", SAR Test reduction was applied from KDB 248227 guidance and TCB workshop guidance when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/n/ac/ax mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.
- When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/n/ac/ax modes, the channel in the lower order/sequence 802.11 mode (i.e. a, n, ac, ax) is selected.
- When UNII band 2A's specified maximum output power is higher or same than UNII band 1, begin SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is
  - ≤ 1.2 W/kg, SAR is not required for UNII band 1
  - > 1.2 W/kg, both bands should be tested independently for SAR.
- MIMO SAR test is required for UNII-2A & UNII-2C in product specific 10-g exposure condition. Because the summations are over FCC limit in product specific exposure 10-g condition, when each SISO SAR values are used.

## 9.6 Bluetooth

### Measured Results

Band (GHz)	Mode	Ch #	Freq. (MHz)	Maximum Average Power (dBm)	
				Meas Pwr	Tune-up Limit
2.4	GFSK	0	2402	14.7	17.0
		39	2441	16.2	
		78	2480	15.0	
	EDR, 8-DPSK	0	2402	9.9	12.0
		39	2441	10.9	
		78	2480	9.9	
	LE, GFSK-1M	0	2402	5.7	7.5
		19	2440	6.3	
		39	2480	5.9	
	LE, GFSK-2M	0	2402	6.6	9.0
		19	2440	7.1	
		39	2480	6.8	

#### Note(s):

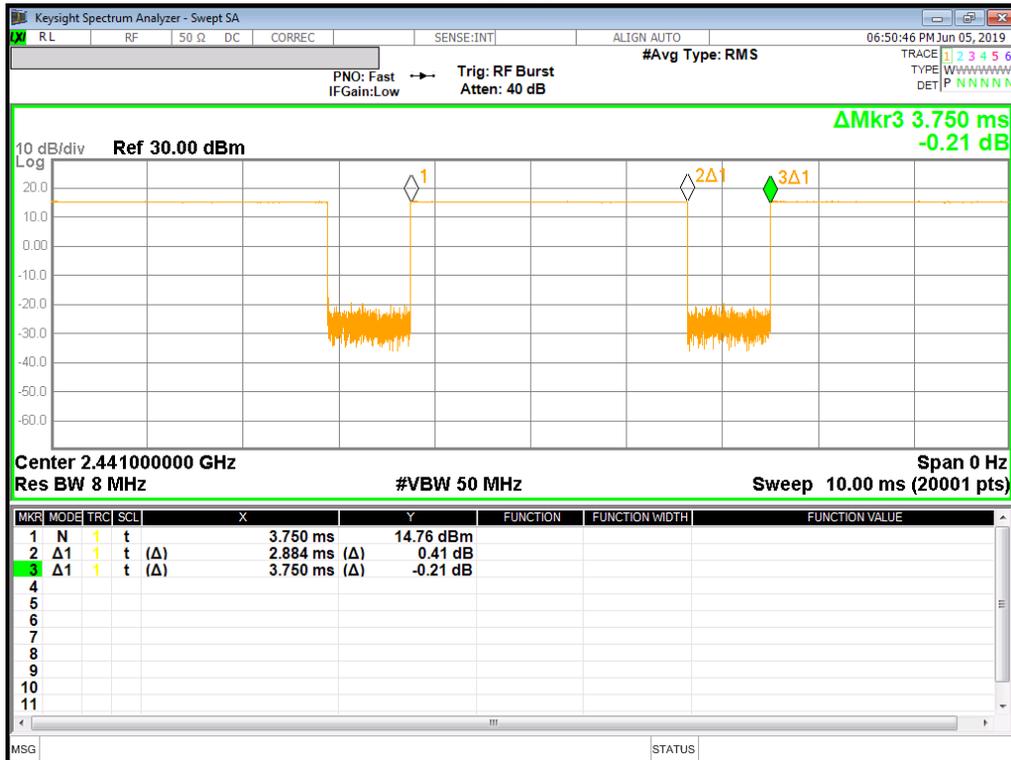
SAR test is evaluated at GFSK mode in Bluetooth

### Duty Factor Measured Results

Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
GFSK	DH5	2.884	3.750	76.9%	1.30

### Duty Cycle plots

#### GFSK



## 10. Measured and Reported (Scaled) SAR Results

### SAR Test Reduction criteria are as follows:

Reported SAR(W/kg) for WWAN= Measured SAR \*Tune-up Scaling Factor

Reported SAR(W/kg) for Wi-Fi and Bluetooth= Measured SAR \* Tune-up scaling factor \* Duty Cycle scaling factor

### KDB 447498 D01 General RF Exposure Guidance:

Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

- $\leq 0.8$  W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\leq 100$  MHz
- $\leq 0.6$  W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
- $\leq 0.4$  W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\geq 200$  MHz

### KDB 648474 D04 Handset SAR:

With headset attached, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is  $> 1.2$  W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

### KDB 648474 D04 Handset SAR (Phablet Only):

When hotspot mode does not apply, 10-g Extremity SAR is required for all surfaces and edges with an antenna located at  $\leq 25$  mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR  $> 1.2$  W/kg .

Additional 1-g SAR testing at 5 mm is not required when hotspot mode 10-g extremity SAR is not required for the surfaces and edges; since all 1-g reported SAR  $< 1.2$  W/kg.

### KDB 941225 D01 SAR test for 3G devices:

When the maximum output power and tune-up tolerance specified for production units in a secondary mode is  $\leq \frac{1}{4}$  dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for the secondary mode.

### KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

- Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel.
- When the reported SAR is  $> 0.8$  W/kg, testing for other Channels 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  $> 0.8$  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.
- For LTE bands that do not support at least three non-overlapping channels in certain channel bandwidths, test the available non-overlapping channels instead. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing; therefore, the requirement for H, M and L channels may not fully apply.

**KDB 248227 D01 SAR meas for 802.11:**

SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions. An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements. For 2.4 GHz DSSS, either the initial test position or DSSS procedure is applied to reduce the number of SAR tests; these are mutually exclusive. For OFDM, an initial test position is only applicable to next to the ear, UMPC mini-tablet and hotspot mode configurations, which is tested using the initial test configuration to facilitate test reduction. For other exposure conditions with a fixed test position, SAR test reduction is determined using only the initial test configuration.

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the initial test position(s) by applying the DSSS or OFDM SAR measurement procedures in the required wireless mode test configuration(s). The initial test position(s) is measured using the highest measured maximum output power channel in the required wireless mode test configuration(s). When the reported SAR for the initial test position is:

- $\leq 0.4$  W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.
- $> 0.4$  W/kg, SAR is repeated using the same wireless mode test configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the reported SAR is  $\leq 0.8$  W/kg or all required test positions are tested.
  - For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
  - When it is unclear, all equivalent conditions must be tested.
- For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is  $> 0.8$  W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is  $\leq 1.2$  W/kg or all required test channels are considered.
  - The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.
- When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is  $\leq 1.2$  W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.
- When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is  $\leq 1.2$  W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.

To determine the initial test position, Area Scans were performed to determine the position with the *Maximum Value of SAR (measured)*. The position that produced the highest *Maximum Value of SAR* is considered the worst case position; thus used as the initial test position.

### 10.1 GSM 850

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Main 1-1	Head	Voice	N/A	0	Left Touch	190	836.6	35.0	34.0	0.108	0.137	1
					Left Tilt	190	836.6	35.0	34.0	0.069	0.088	
					Right Touch	190	836.6	35.0	34.0	0.154	0.195	
					Right Tilt	190	836.6	35.0	34.0	0.068	0.087	
		GPRS 4 Slot	N/A	0	Left Touch	190	836.6	29.6	28.8	0.084	0.101	
					Left Tilt	190	836.6	29.6	28.8	0.050	0.060	
					Right Touch	190	836.6	29.6	28.8	0.117	0.141	
					Right Tilt	190	836.6	29.6	28.8	0.049	0.059	
	Body-worn	GPRS 4 Slot	N/A	15	Rear	190	836.6	29.6	28.8	0.262	0.316	2
					Front	190	836.6	29.6	28.8	0.201	0.242	
	Hotspot	GPRS 4 Slot	N/A	10	Rear	190	836.6	29.6	28.8	0.655	0.789	3
					Front	190	836.6	29.6	28.8	0.388	0.468	
					Edge 2	190	836.6	29.6	28.8	0.162	0.195	
					Edge 3	190	836.6	29.6	28.8	0.353	0.425	
Edge 4					190	836.6	29.6	28.8	0.052	0.063		

### 10.2 GSM1900

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Main 1-1	Head	Voice	Off	0	Left Touch	810	1909.8	31.0	30.8	0.049	0.051	4
					Left Tilt	810	1909.8	31.0	30.8	0.020	0.021	
					Right Touch	810	1909.8	31.0	30.8	0.039	0.040	
					Right Tilt	810	1909.8	31.0	30.8	0.030	0.031	
		GPRS 4 Slot	Off	0	Left Touch	810	1909.8	25.0	24.7	0.040	0.043	
					Left Tilt	810	1909.8	25.0	24.7	0.015	0.015	
					Right Touch	810	1909.8	25.0	24.7	0.031	0.033	
					Right Tilt	810	1909.8	25.0	24.7	0.023	0.025	
	Body-worn	GPRS 4 Slot	Off	15	Rear	810	1909.8	25.0	24.7	0.315	0.336	5
					Front	810	1909.8	25.0	24.7	0.244	0.260	
	Hotspot	GPRS 4 Slot	On	10	Rear	810	1909.8	24.0	23.8	0.497	0.518	
					Front	810	1909.8	24.0	23.8	0.338	0.352	
					Edge 2	810	1909.8	24.0	23.8	0.047	0.049	
						512	1850.2	24.0	22.7	0.517	0.697	
661						1880.0	24.0	23.4	0.828	0.952	6	
Edge 3					810	1909.8	24.0	23.8	0.859	0.895		
Edge 4	810	1909.8	24.0	23.8	0.053	0.055						

### 10.3 W-CDMA Band II

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Main 1-1	Head	Rel 99 RMC	Off	0	Left Touch	9538	1907.6	24.0	23.8	0.061	0.064	7
					Left Tilt	9538	1907.6	24.0	23.8	0.028	0.029	
					Right Touch	9538	1907.6	24.0	23.8	0.049	0.051	
					Right Tilt	9538	1907.6	24.0	23.8	0.024	0.025	
	Bod-worn	Rel 99 RMC	Off	15	Rear	9538	1907.6	24.0	23.8	0.322	0.339	8
					Front	9538	1907.6	24.0	23.8	0.199	0.210	
	Hotspot	Rel 99 RMC	On	10	Rear	9538	1907.6	21.0	20.7	0.455	0.491	
					Front	9538	1907.6	21.0	20.7	0.316	0.341	
					Edge 2	9538	1907.6	21.0	20.7	0.035	0.038	
					Edge 3	9262	1852.4	21.0	20.4	0.709	0.813	
						9400	1880.0	21.0	19.9	0.829	1.075	9
					Edge 4	9538	1907.6	21.0	20.7	0.877	0.946	
Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		10-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Main 1-1	Product Specific 10-g	Rel 99 RMC	Off	12	Edge 3	9400	1880.0	24.0	23.0	0.716	0.910	
			On	0	Edge 3	9400	1880.0	21.0	19.8	0.945	1.243	10

### 10.4 W-CDMA Band IV

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Main 1-1	Head	Rel 99 RMC	Off	0	Left Touch	1413	1732.6	25.0	24.3	0.116	0.136	11
					Left Tilt	1413	1732.6	25.0	24.3	0.039	0.045	
					Right Touch	1413	1732.6	25.0	24.3	0.081	0.095	
					Right Tilt	1413	1732.6	25.0	24.3	0.043	0.050	
	Bod-worn	Rel 99 RMC	Off	15	Rear	1413	1732.6	25.0	24.3	0.628	0.738	12
					Front	1413	1732.6	25.0	24.3	0.455	0.535	
	Hotspot	Rel 99 RMC	On	10	Rear	1413	1732.6	22.0	21.3	0.638	0.745	
					Front	1413	1732.6	22.0	21.3	0.491	0.574	
					Edge 2	1413	1732.6	22.0	21.3	0.074	0.086	
					Edge 3	1312	1712.4	22.0	21.0	0.852	1.070	
						1413	1732.6	22.0	21.3	0.934	1.091	
					Edge 4	1413	1732.6	22.0	21.3	1.000	1.214	13
Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		10-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Main 1-1	Product Specific 10-g	Rel 99 RMC	Off	9	Rear	1413	1732.6	25.0	24.3	0.917	1.078	
				12	Edge 3	1513	1752.6	25.0	24.1	0.759	0.924	
			On	0	Rear	1312	1712.4	22.0	21.0	1.820	2.285	
						1413	1732.6	22.0	21.3	2.050	2.389	
				0	Edge 3	1513	1752.6	22.0	21.2	2.130	2.579	14
			0	Edge 3	1513	1752.6	22.0	21.2	1.470	1.780		

### 10.5 W-CDMA Band V

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Main 1-1	Head	Rel 99 RMC	N/A	0	Left Touch	4183	836.6	25.7	25.2	0.103	0.115	
					Left Tilt	4183	836.6	25.7	25.2	0.063	0.070	
					Right Touch	4183	836.6	25.7	25.2	0.138	0.154	15
					Right Tilt	4183	836.6	25.7	25.2	0.063	0.070	
	Bod-worn	Rel 99 RMC	N/A	15	Rear	4183	836.6	25.7	25.2	0.300	0.335	16
					Front	4183	836.6	25.7	25.2	0.234	0.261	
	Hotspot	Rel 99 RMC	N/A	10	Rear	4183	836.6	25.7	25.2	0.689	0.769	17
					Front	4183	836.6	25.7	25.2	0.455	0.508	
					Edge 2	4183	836.6	25.7	25.2	0.203	0.226	
					Edge 3	4183	836.6	25.7	25.2	0.430	0.480	
					Edge 4	4183	836.6	25.7	25.2	0.052	0.058	

### 10.6 LTE Band 5 (10MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Main 1-1	Head	QPSK	N/A	0	Left Touch	20525	836.5	1	0	25.7	25.2	0.100	0.112	
								25	0	23.7	22.7	0.057	0.072	
					Left Tilt	20525	836.5	1	0	25.7	25.2	0.070	0.079	
								25	0	23.7	22.7	0.037	0.047	
					Right Touch	20525	836.5	1	0	25.7	25.2	0.149	0.167	18
								25	0	23.7	22.7	0.087	0.110	
					Right Tilt	20525	836.5	1	0	25.7	25.2	0.075	0.084	
								25	0	23.7	22.7	0.041	0.052	
	Body-worn	QPSK	N/A	15	Rear	20525	836.5	1	0	25.7	25.2	0.285	0.320	19
								25	0	23.7	22.7	0.162	0.206	
					Front	20525	836.5	1	0	25.7	25.2	0.210	0.236	
								25	0	23.7	22.7	0.121	0.153	
	Hotspot	QPSK	N/A	10	Rear	20525	836.5	1	0	25.7	25.2	0.632	0.710	20
								25	0	23.7	22.7	0.362	0.459	
					Front	20525	836.5	1	0	25.7	25.2	0.544	0.611	
								25	0	23.7	22.7	0.306	0.388	
					Edge 2	20525	836.5	1	0	25.7	25.2	0.165	0.185	
								25	0	23.7	22.7	0.096	0.121	
					Edge 3	20525	836.5	1	0	25.7	25.2	0.475	0.534	
								25	0	23.7	22.7	0.266	0.337	
					Edge 4	20525	836.5	1	0	25.7	25.2	0.071	0.080	
								25	0	23.7	22.7	0.042	0.053	

### 10.7 LTE Band 7 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Main 1-2	Head	QPSK	Off	0	Left Touch	21100	2535.0	1	0	25.0	24.3	0.085	0.101	21
								50	0	24.0	22.3	0.054	0.080	
					Left Tilt	21100	2535.0	1	0	25.0	24.3	0.037	0.044	
								50	0	24.0	22.3	0.021	0.030	
					Right Touch	21100	2535.0	1	0	25.0	24.3	0.083	0.098	
								50	0	24.0	22.3	0.048	0.071	
					Right Tilt	21100	2535.0	1	0	25.0	24.3	0.068	0.080	
								50	0	24.0	22.3	0.041	0.060	
	Body-worn	QPSK	Off	15	Rear	21100	2535.0	1	0	25.0	24.3	0.362	0.429	
								50	0	24.0	22.3	0.227	0.337	
					Front	21100	2535.0	1	0	25.0	24.3	0.387	0.459	22
								50	0	24.0	22.3	0.239	0.355	
	Hotspot	QPSK	On	10	Rear	21100	2535.0	1	0	22.0	21.4	0.406	0.468	
								50	0	22.0	21.3	0.406	0.475	
					Front	21100	2535.0	1	0	22.0	21.4	0.303	0.350	
								50	0	22.0	21.3	0.302	0.354	
					Edge 3	21100	2535.0	1	0	22.0	21.4	0.591	0.682	
								50	0	22.0	21.3	0.585	0.685	23
Edge 4					21100	2535.0	1	0	22.0	21.4	0.181	0.209		
							50	0	22.0	21.3	0.178	0.208		
Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		10-g SAR (W/kg)		Plot No.
Main 1-2	Product Specific 10-g	QPSK	Off	12	Edge 3	21100	2535.0	1	0	25.0	24.3	0.431	0.511	
								50	0	24.0	22.3	0.276	0.410	
			On	0	Edge 3	20850	2510.0	1	0	22.0	21.3	1.870	2.186	
								50	0	22.0	21.3	1.870	2.210	
						21100	2535.0	1	0	22.0	21.5	1.860	2.094	
								50	0	22.0	21.4	1.840	2.132	
						21350	2560.0	100	0	22.0	21.3	1.770	2.090	
								1	0	22.0	21.2	1.860	2.215	24
			50	0	22.0	21.2	1.820	2.203						

### 10.8 LTE Band 12 (10MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Main 1-1	Head	QPSK	N/A	0	Left Touch	23095	707.5	1	0	25.5	24.1	0.110	0.152	25
								25	0	23.5	21.5	0.059	0.094	
					Left Tilt	23095	707.5	1	0	25.5	24.1	0.062	0.086	
								25	0	23.5	21.5	0.034	0.054	
					Right Touch	23095	707.5	1	0	25.5	24.1	0.107	0.148	
								25	0	23.5	21.5	0.061	0.096	
	Right Tilt	23095	707.5	1	0	25.5	24.1	0.058	0.080					
				25	0	23.5	21.5	0.033	0.052					
	Body-worn	QPSK	N/A	15	Rear	23095	707.5	1	0	25.5	24.1	0.162	0.224	26
								25	0	23.5	21.5	0.092	0.145	
					Front	23095	707.5	1	0	25.5	24.1	0.141	0.195	
								25	0	23.5	21.5	0.082	0.129	
	Hotspot	QPSK	N/A	10	Rear	23095	707.5	1	0	25.5	24.1	0.250	0.346	27
								25	0	23.5	21.5	0.148	0.233	
					Front	23095	707.5	1	0	25.5	24.1	0.151	0.209	
								25	0	23.5	21.5	0.089	0.140	
					Edge 2	23095	707.5	1	0	25.5	24.1	0.132	0.183	
								25	0	23.5	21.5	0.076	0.120	
					Edge 3	23095	707.5	1	0	25.5	24.1	0.111	0.154	
								25	0	23.5	21.5	0.064	0.101	
	Edge 4	23095	707.5	1	0	25.5	24.1	0.112	0.155					
25				0	23.5	21.5	0.064	0.101						

### 10.9 LTE Band 13 (10MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Main 1-1	Head	QPSK	N/A	0	Left Touch	23230	782.0	1	0	25.5	24.4	0.079	0.100	
								25	0	23.5	22.0	0.043	0.060	
					Left Tilt	23230	782.0	1	0	25.5	24.4	0.062	0.079	
								25	0	23.5	22.0	0.036	0.051	
					Right Touch	23230	782.0	1	0	25.5	24.4	0.088	0.112	28
								25	0	23.5	22.0	0.050	0.071	
	Right Tilt	23230	782.0	1	0	25.5	24.4	0.064	0.082					
				25	0	23.5	22.0	0.036	0.051					
	Body-worn	QPSK	N/A	15	Rear	23230	782.0	1	0	25.5	24.4	0.142	0.181	29
								25	0	23.5	22.0	0.084	0.119	
					Front	23230	782.0	1	0	25.5	24.4	0.107	0.136	
								25	0	23.5	22.0	0.059	0.083	
	Hotspot	QPSK	N/A	10	Rear	23230	782.0	1	0	25.5	24.4	0.356	0.454	30
								25	0	23.5	22.0	0.210	0.297	
					Front	23230	782.0	1	0	25.5	24.4	0.199	0.254	
								25	0	23.5	22.0	0.118	0.167	
					Edge 2	23230	782.0	1	0	25.5	24.4	0.092	0.117	
								25	0	23.5	22.0	0.051	0.072	
					Edge 3	23230	782.0	1	0	25.5	24.4	0.129	0.164	
								25	0	23.5	22.0	0.076	0.107	
	Edge 4	23230	782.0	1	0	25.5	24.4	0.062	0.079					
25				0	23.5	22.0	0.034	0.048						

### 10.10 LTE Band 25 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Main 1-1	Head	QPSK	Off	0	Left Touch	26590	1905.0	1	0	24.5	24.0	0.099	0.110	31
								50	0	23.5	22.6	0.070	0.086	
					Left Tilt	26590	1905.0	1	0	24.5	24.0	0.044	0.049	
								50	0	23.5	22.6	0.032	0.039	
					Right Touch	26590	1905.0	1	0	24.5	24.0	0.079	0.088	
								50	0	23.5	22.6	0.053	0.065	
					Right Tilt	26590	1905.0	1	0	24.5	24.0	0.049	0.054	
								50	0	23.5	22.6	0.030	0.037	
	Body-worn	QPSK	Off	15	Rear	26590	1905.0	1	0	24.5	24.0	0.573	0.636	32
								50	0	23.5	22.6	0.406	0.497	
					Front	26590	1905.0	1	0	24.5	24.0	0.418	0.464	
								50	0	23.5	22.6	0.295	0.361	
	Hotspot	QPSK	On	10	Rear	26590	1905.0	1	0	21.5	21.1	0.544	0.599	
								50	0	21.5	21.1	0.539	0.586	
					Front	26590	1905.0	1	0	21.5	21.1	0.422	0.465	
								50	0	21.5	21.1	0.413	0.449	
					Edge 2	26590	1905.0	1	0	21.5	21.1	0.049	0.054	
								50	0	21.5	21.1	0.052	0.056	
					Edge 3	26140	1860.0	1	0	21.5	20.7	0.985	1.173	
								50	0	21.5	20.7	0.980	1.178	
						26365	1882.5	1	0	21.5	20.5	0.998	1.249	33
								50	0	21.5	20.5	0.990	1.243	
						26590	1905.0	1	0	21.5	21.1	0.957	1.054	
								50	0	21.5	21.1	0.941	1.022	
100					0	21.5	21.0	0.922	1.023					
Edge 4					26590	1905.0	1	0	21.5	21.1	0.079	0.087		
							50	0	21.5	21.1	0.077	0.084		
Antenna					RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)
Main 1-1	Product Specific 10-g	QPSK	Off	12	Edge 3	26365	1882.5	1	0	24.5	23.5	0.776	0.972	
			On	0	Edge 3	26365	1882.5	50	0	23.5	22.0	0.544	0.764	
								1	0	21.5	20.5	1.310	1.638	
			50	0	21.5	20.5	1.310	1.649	34					

### 10.11 LTE Band 26 (15MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Main 1-1	Head	QPSK	N/A	0	Left Touch	26865	831.5	1	37	25.3	24.2	0.056	0.072	
								36	0	23.3	21.5	0.026	0.039	
					Left Tilt	26865	831.5	1	37	25.3	24.2	0.035	0.046	
								36	0	23.3	21.5	0.018	0.028	
					Right Touch	26865	831.5	1	37	25.3	24.2	0.078	0.101	35
								36	0	23.3	21.5	0.037	0.056	
					Right Tilt	26865	831.5	1	37	25.3	24.2	0.037	0.048	
								36	0	23.3	21.5	0.019	0.029	
	Body-worn	QPSK	N/A	15	Rear	26865	831.5	1	37	25.3	24.2	0.199	0.257	36
								36	0	23.3	21.5	0.079	0.119	
					Front	26865	831.5	1	37	25.3	24.2	0.125	0.161	
								36	0	23.3	21.5	0.068	0.103	
	Hotspot	QPSK	N/A	10	Rear	26865	831.5	1	37	25.3	24.2	0.470	0.607	37
								36	0	23.3	21.5	0.217	0.326	
					Front	26865	831.5	1	37	25.3	24.2	0.228	0.294	
								36	0	23.3	21.5	0.126	0.190	
					Edge 2	26865	831.5	1	37	25.3	24.2	0.102	0.132	
								36	0	23.3	21.5	0.050	0.075	
					Edge 3	26865	831.5	1	37	25.3	24.2	0.307	0.396	
								36	0	23.3	21.5	0.152	0.229	
					Edge 4	26865	831.5	1	37	25.3	24.2	0.032	0.041	
								36	0	23.3	21.5	0.015	0.022	

### 10.12 LTE Band 38 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Main 1-2	Head	QPSK	Off	0	Left Touch	37850	2580.0	1	99	24.0	23.0	0.052	0.066	38
								50	0	23.0	21.8	0.038	0.050	
					Left Tilt	37850	2580.0	1	99	24.0	23.0	0.023	0.030	
								50	0	23.0	21.8	0.016	0.020	
					Right Touch	37850	2580.0	1	99	24.0	23.0	0.038	0.049	
								50	0	23.0	21.8	0.030	0.039	
					Right Tilt	37850	2580.0	1	99	24.0	23.0	0.048	0.061	
								50	0	23.0	21.8	0.035	0.046	
	Body-worn	QPSK	Off	15	Rear	37850	2580.0	1	99	24.0	23.0	0.235	0.299	39
								50	0	23.0	21.8	0.187	0.244	
					Front	37850	2580.0	1	99	24.0	23.0	0.209	0.266	
								50	0	23.0	21.8	0.165	0.215	
	Hotspot	QPSK	On	10	Rear	37850	2580.0	1	99	22.0	21.0	0.288	0.365	
								50	0	22.0	21.0	0.282	0.355	
					Front	37850	2580.0	1	99	22.0	21.0	0.236	0.299	
								50	0	22.0	21.0	0.230	0.290	
					Edge 3	37850	2580.0	1	99	22.0	21.0	0.499	0.632	40
								50	0	22.0	21.0	0.500	0.630	
					Edge 4	37850	2580.0	1	99	22.0	21.0	0.114	0.144	
								50	0	22.0	21.0	0.111	0.140	

### 10.13 LTE Band 41 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.		
										Tune-up limit	Meas.	Meas.	Scaled				
Main 1-2	Head	QPSK	N/A	0	Left Touch	39750	2506.0	1	99	23.0	22.7	0.041	0.043		41		
			50	0	22.0	21.7	0.039	0.042									
			Off	0	Left Touch	39750	2506.0	1	99	26.0	25.8	0.038	0.040	1			
			N/A	0	Left Tilt	39750	2506.0	1	99	23.0	22.7	0.016	0.017				
					50	0	22.0	21.7	0.016	0.017							
					Right Touch	39750	2506.0	1	99	23.0	22.7	0.029	0.030				
					50	0	22.0	21.7	0.020	0.021							
					Right Tilt	39750	2506.0	1	99	23.0	22.7	0.025	0.027				
					50	0	22.0	21.7	0.019	0.021							
			Body-worn	QPSK	N/A	15	Rear	39750	2506.0	1	99	23.0	22.7	0.136	0.144		
					50	0	22.0	21.7	0.106	0.114							
					Off	15	Rear	39750	2506.0	1	99	26.0	25.8	0.156	0.164	1	42
	N/A	15			Front	39750	2506.0	1	99	23.0	22.7	0.136	0.144				
					50	0	22.0	21.7	0.107	0.115							
	Hotspot	QPSK			N/A	10	Rear	39750	2506.0	1	99	23.0	22.7	0.297	0.315		
			50	0			22.0	21.7	0.231	0.247							
			Front	39750			2506.0	1	99	23.0	22.7	0.232	0.246				
			50	0			22.0	21.7	0.182	0.195							
			Edge 3	39750			2506.0	1	99	23.0	22.7	0.465	0.493		43		
			50	0			22.0	21.7	0.371	0.397							
			On	10	Edge 3	39750	2506.0	1	99	24.0	23.8	0.316	0.333	1			
			N/A	10	Edge 4	39750	2506.0	1	99	23.0	22.7	0.138	0.146				
					50	0	22.0	21.7	0.112	0.120							

**LTE Band 41 HPUE (Power Class 2) consideration**

**Head exposure condition**

	LTE Band 41 - Power class 3	LTE Band 41 - Power class 2
<i>Reported</i> 1-g SAR (W/kg)	0.043	0.040
Maximum output power (dBm)	23.0	26.0
Maximum output power (mW)	199.5	398.1
Duty Cycle (%)	63.3	43.3
Frame averaged output power (mW)	126.3	172.4
<i>Reported</i> 1-g SAR VS. Frame averaged output power	0.00034	0.00023
Deviation from expected linearity (%)		<b>-31.88</b>

**Body-worn exposure condition**

	LTE Band 41 - Power class 3	LTE Band 41 - Power class 2
<i>Reported</i> 1-g SAR (W/kg)	0.144	0.164
Maximum output power (dBm)	23.0	26.0
Maximum output power (mW)	199.5	398.1
Duty Cycle (%)	63.3	43.3
Frame averaged output power (mW)	126.3	172.4
<i>Reported</i> 1-g SAR VS. Frame averaged output power	0.00114	0.00095
Deviation from expected linearity (%)		<b>-16.62</b>

**Hotspot exposure condition**

	LTE Band 41 - Power class 3	LTE Band 41 - Power class 2
<i>Reported</i> 1-g SAR (W/kg)	0.493	0.333
Maximum output power (dBm)	23.0	24.0
Maximum output power (mW)	199.5	251.2
Duty Cycle (%)	63.3	43.3
Frame averaged output power (mW)	126.3	108.8
<i>Reported</i> 1-g SAR VS. Frame averaged output power	0.00390	0.00306
Deviation from expected linearity (%)		<b>-21.53</b>

**Note(s):**

- SAR test result of HPUE (power class 2)
- According to TCB workshop (May.2017), Separate SAR testing for LTE HPUE (Power class 2) is not required when reported SAR vs. maximum output power (time average) can be linearly scaled with < 10% discrepancy between power classes and all reported SAR are < 1.4 W/kg.

### 10.14 LTE Band 66 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Main 1-1	Head	QPSK	Off	0	Left Touch	132322	1745.0	1	0	25.0	24.3	0.113	0.131	44
								50	0	23.0	22.2	0.073	0.087	
					Left Tilt	132322	1745.0	1	0	25.0	24.3	0.044	0.052	
								50	0	23.0	22.2	0.025	0.030	
					Right Touch	132322	1745.0	1	0	25.0	24.3	0.092	0.107	
								50	0	23.0	22.2	0.061	0.072	
					Right Tilt	132322	1745.0	1	0	25.0	24.3	0.056	0.065	
								50	0	23.0	22.2	0.035	0.042	
	Body-worn	QPSK	Off	15	Rear	132322	1745.0	1	0	25.0	24.3	0.622	0.723	45
								50	0	23.0	22.2	0.399	0.476	
					Front	132322	1745.0	1	0	25.0	24.3	0.473	0.550	
								50	0	23.0	22.2	0.300	0.358	
	Hotspot	QPSK	On	10	Rear	132322	1745.0	1	0	22.0	21.2	0.596	0.708	
								50	0	22.0	21.2	0.604	0.723	
					Front	132322	1745.0	1	0	22.0	21.2	0.481	0.572	
								50	0	22.0	21.2	0.488	0.584	
					Edge 2	132322	1745.0	1	0	22.0	21.2	0.080	0.095	
								50	0	22.0	21.2	0.079	0.094	
					Edge 3	132072	1720.0	1	0	22.0	20.9	0.736	0.954	
								50	0	22.0	20.8	0.741	0.969	
						132322	1745.0	1	0	22.0	21.2	0.859	1.021	
								50	0	22.0	21.2	0.885	1.059	
					132572	1770.0	1	0	22.0	20.7	0.889	1.205		
							50	0	22.0	20.7	0.910	1.238	46	
Edge 4	132322	1745.0	1	0	22.0	21.2	0.100	0.119						
			50	0	22.0	21.2	0.099	0.119						
Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		10-g SAR (W/kg)		Plot No.
Main 1-1	Product	QPSK	Off	9	Rear	132322	1745.0	1	0	25.0	24.3	0.722	0.839	
								50	0	23.0	22.2	0.464	0.554	
				12	Edge 3	132572	1770.0	1	0	25.0	23.6	0.709	0.982	
								50	0	23.0	21.6	0.465	0.637	
			On	0	Rear	132072	1720.0	1	0	22.0	21.0	1.550	1.968	
								50	0	22.0	20.8	1.580	2.073	
					132322	1745.0	1	0	22.0	21.2	1.800	2.139		
							50	0	22.0	21.2	1.840	2.214		
				Edge 3	132572	1770.0	1	0	22.0	20.7	1.790	2.426		
							50	0	22.0	20.7	1.810	2.454	47	
					132572	1770.0	1	0	22.0	20.7	1.370	1.857		
							50	0	22.0	20.7	1.390	1.885		

### 10.15 Wi-Fi (DTS Band)

Antenna	Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.			
											Tune-up limit	Meas.	Meas.	Scaled					
SISO (WiFi Ant.1)	2.4GHz	802.11b 1 Mbps	Head	On	0	Left Touch	1	2412.0	0.089	99.7	16.0	15.7							
						Left Tilt	1	2412.0	0.101	99.7	16.0	15.7							
						Right Touch	1	2412.0	0.424	99.7	16.0	15.7	0.308	0.331	2				
						Right Tilt	1	2412.0	0.603	99.7	16.0	15.7	0.400	0.430		48			
			Body-worn	Off	15	Rear	11	2462.0	0.095	99.7	19.0	18.9	0.072	0.074	1	49			
						Front	11	2462.0	0.029	99.7	19.0	18.9							
			Hotspot	Off	10	Rear	11	2462.0	0.223	99.7	19.0	18.9	0.169	0.173	1	50			
						Front	11	2462.0	0.065	99.7	19.0	18.9	0.053	0.054	4				
						Edge 1	11	2462.0	0.136	99.7	19.0	18.9							
						Edge 4	11	2462.0	0.030	99.7	19.0	18.9							
			SISO (WiFi Ant.2)	2.4GHz	802.11b 1 Mbps	Head	On	0	Left Touch	1	2412.0	0.010	99.7	16.0	14.9				
									Left Tilt	1	2412.0	0.008	99.7	16.0	14.9				
Right Touch	1	2412.0							0.041	99.7	16.0	14.9	0.028	0.037	1				
Right Tilt	1	2412.0							0.024	99.7	16.0	14.9							
Body-worn	Off	15				Rear	1	2412.0	0.054	99.7	19.0	18.3	0.043	0.051	1				
						Front	1	2412.0	0.006	99.7	19.0	18.3							
Hotspot	Off	10				Rear	1	2412.0	0.178	99.7	19.0	18.3	0.140	0.167	1				
						Front	1	2412.0	0.012	99.7	19.0	18.3	0.008	0.010	4				
						Edge 1	1	2412.0	0.017	99.7	19.0	18.3							
						Edge 4	1	2412.0	0.062	99.7	19.0	18.3							

**Note(s):**

1. When the Highest reported SAR is  $\leq 0.4$  or  $1.0$  W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is  $> 0.4$  or  $1.0$  W/kg (1-g or 10-g respectively). Due to the highest reported SAR for this test position, other test positions in this exposure condition were evaluated until a SAR  $\leq 0.8$  or  $2.0$  W/kg (1-g or 10-g respectively) was reported.
3. Testing for a second channel was required because the reported SAR for this test position was  $> 0.8$  or  $2.0$  W/kg (1-g or 10-g respectively).
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.
5. SAR testing is not required for OFDM mode(s) when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is  $\leq 1.2$  W/kg.

### 10.16 Wi-Fi (U-NII Bands)

#### U-NII 2A Results

Antenna	Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Note	Plot No.								
											Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled										
SISO (WiFi Ant.1)	5.3 GHz U-NII 2A	802.11ac VHT 80 29.3 Mbps	Head	On	0	Left Touch	58	5290.0	0.049	98.1	13.0	11.9														
						Left Tilt	58	5290.0	0.058	98.1	13.0	11.9														
						Right Touch	58	5290.0	0.160	98.1	13.0	11.9														
						Right Tilt	58	5290.0	0.190	98.1	13.0	11.9	0.089	0.116					1	51						
		802.11a 6 Mbps	Body-worn	Off	15	Rear	64	5320.0	0.246	98.2	16.0	16.0	0.125	0.128					1							
						Front	64	5320.0	0.062	98.2	16.0	16.0														
			Product Specific 10-g	Off	0	Rear	64	5320.0	7.300	98.2	16.0	16.0			0.640	0.653	1									
						Front	64	5320.0	0.780	98.2	16.0	16.0														
	Edge 1	64	5320.0	1.631	98.2	16.0	16.0																			
								Edge 4	64	5320.0	6.170	98.2	16.0	16.0												
								SISO (WiFi Ant.2)	5.3 GHz U-NII 2A	802.11ac VHT 80 29.3 Mbps	Head	On	0	Left Touch	58	5290.0	0.009	98.1	13.0	12.7						
														Left Tilt	58	5290.0	0.014	98.1	13.0	12.7						
Right Touch	58	5290.0	0.019	98.1	13.0	12.7	<0.001							<0.001					1							
Right Tilt	58	5290.0	0.016	98.1	13.0	12.7																				
802.11a 6 Mbps	Body-worn	Off	15	Rear	56	5280.0	0.484			98.2	16.0	15.7	0.226	0.246					1	52						
				Front	56	5280.0	0.012			98.2	16.0	15.7														
	Product Specific 10-g	Off	0	Rear	56	5280.0	21.167			98.2	16.0	15.7				1.060	1.154									
				Front	56	5280.0	0.015			98.2	16.0	15.7														
Edge 1	56	5280.0	0.323	98.2	16.0	15.7																				
Edge 4	56	5280.0	1.151	98.2	16.0	15.7							0.208	0.226	2											
MIMO (WiFi Ant.1)	5.3 GHz U-NII 2A	802.11n HT 20 6.5 Mbps	Product Specific 10-g	Off	0	Rear	64		5320.0	15.586	98.1	16.0	16.0													
						Front	64		5320.0	1.231	98.1	16.0	16.0													
						Edge 1	64	5320.0	1.883	98.1	16.0	16.0														
						Edge 4	64	5320.0	3.658	98.1	16.0	16.0				0.496	0.508	2								
MIMO (WiFi Ant.2)	5.3 GHz U-NII 2A	802.11n HT 20 6.5 Mbps	Product Specific 10-g	Off	0	Rear	64	5320.0	15.586	98.1	16.0	15.5				1.190	1.374		53							
						Front	64	5320.0	1.231	98.1	16.0	15.5														
						Edge 1	64	5320.0	1.883	98.1	16.0	15.5														
						Edge 4	64	5320.0	3.658	98.1	16.0	15.5														

**Note(s):**

1. When the Highest reported SAR is ≤ 0.4 or 1.0 W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is > 0.4 or 1.0 W/kg (1-g or 10-g respectively). Due to the highest reported SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 or 2.0 W/kg (1-g or 10-g respectively) was reported.
3. Testing for a second channel was required because the reported SAR for this test position was > 0.8 or 2.0 W/kg (1-g or 10-g respectively).
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.

**U-NII 2C Results**

Antenna	Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Note	Plot No.			
											Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled					
SISO (WiFi Ant.1)	5.5 GHz U-NII 2C	802.11ac VHT 80 29.3 Mbps	Head	On	0	Left Touch	138	5690.0	0.065	98.1	13.0	12.7									
						Left Tilt	138	5690.0	0.069	98.1	13.0	12.7									
						Right Touch	138	5690.0	0.224	98.1	13.0	12.7	0.109	0.120					1	54	
						Right Tilt	138	5690.0	0.205	98.1	13.0	12.7									
		802.11a 6 Mbps	Body-worn	Off	15	Rear	124	5620.0	0.262	98.2	16.0	15.6	0.122	0.136					1	55	
						Front	124	5620.0	0.084	98.2	16.0	15.6									
			Product Specific 10-g	Off	0	Rear	124	5620.0	7.783	98.2	16.0	15.6			0.713	0.796	1				
						Front	124	5620.0	1.022	98.2	16.0	15.6									
						Edge 1	124	5620.0	1.824	98.2	16.0	15.6									
						Edge 4	124	5620.0	7.736	98.2	16.0	15.6									
SISO (WiFi Ant.2)	5.5 GHz U-NII 2C	802.11ac VHT 80 29.3 Mbps	Head	On	0	Left Touch	106	5530.0	0.010	98.1	13.0	12.7									
						Left Tilt	106	5530.0	0.016	98.1	13.0	12.7									
						Right Touch	106	5530.0	0.022	98.1	13.0	12.7									
						Right Tilt	106	5530.0	0.035	98.1	13.0	12.7	0.008	0.009					1		
		802.11a 6 Mbps	Body-worn	Off	15	Rear	120	5600.0	0.246	98.2	16.0	15.6	0.105	0.117					1		
						Front	120	5600.0	0.015	98.2	16.0	15.6									
			Product Specific 10-g	Off	0	Rear	120	5600.0	7.351	98.2	16.0	15.6			0.425	0.476	1				
						Front	120	5600.0	0.014	98.2	16.0	15.6									
						Edge 1	120	5600.0	0.223	98.2	16.0	15.6									
						Edge 4	120	5600.0	0.669	98.2	16.0	15.6									
MIMO (WiFi Ant.1)	5.5 GHz U-NII 2C	802.11n HT 20 6.5 Mbps	Product Specific 10-g	Off	0	Rear	124	5620.0	6.094	98.1	16.0	15.5			0.746	0.852	1	56			
						Front	124	5620.0	0.931	98.1	16.0	15.5									
						Edge 1	124	5620.0	2.659	98.1	16.0	15.5									
						Edge 4	124	5620.0	2.822	98.1	16.0	15.5									
MIMO (WiFi Ant.2)	5.5 GHz U-NII 2C	802.11n HT 20 6.5 Mbps	Product Specific 10-g	Off	0	Rear	124	5620.0	6.094	98.1	16.0	14.4									
						Front	124	5620.0	0.931	98.1	16.0	14.4									
						Edge 1	124	5620.0	2.659	98.1	16.0	14.4									
						Edge 4	124	5620.0	2.822	98.1	16.0	14.4									

**Note(s):**

1. When the Highest reported SAR is  $\leq 0.4$  or  $1.0$  W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is  $> 0.4$  or  $1.0$  W/kg (1-g or 10-g respectively). Due to the highest reported SAR for this test position, other test positions in this exposure condition were evaluated until a SAR  $\leq 0.8$  or  $2.0$  W/kg (1-g or 10-g respectively) was reported.
3. Testing for a second channel was required because the reported SAR for this test position was  $> 0.8$  or  $2.0$  W/kg (1-g or 10-g respectively).
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.

**U-NII 3 Results**

Antenna	Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
											Tune-up limit	Meas.	Meas.	Scaled		
SISO (WiFi Ant.1)	5.8 GHz U-NII 3	802.11ac VHT 80 29.3 Mbps	Head	On	0	Left Touch	155	5775.0	0.131	98.1	13.0	12.5				
						Left Tilt	155	5775.0	0.141	98.1	13.0	12.5				
						Right Touch	155	5775.0	0.231	98.1	13.0	12.5				
						Right Tilt	155	5775.0	0.305	98.1	13.0	12.5	0.156	0.178	1	57
		802.11a 6 Mbps	Body-worn	Off	15	Rear	149	5745.0	0.288	98.2	16.0	15.4	0.138	0.162	1	58
						Front	149	5745.0	0.083	98.2	16.0	15.4				
			Hotspot	Off	10	Rear	149	5745.0	0.476	98.2	16.0	15.4	0.217	0.254	4	
						Front	149	5745.0	0.139	98.2	16.0	15.4	0.062	0.072	4	
						Edge 1	149	5745.0	0.311	98.2	16.0	15.4				
						Edge 4	149	5745.0	0.576	98.2	16.0	15.4	0.232	0.272	1	59
SISO (WiFi Ant.2)	5.8 GHz U-NII 3	802.11ac VHT 80 29.3 Mbps	Head	On	0	Left Touch	155	5775.0	0.005	98.1	13.0	12.2				
						Left Tilt	155	5775.0	0.008	98.1	13.0	12.2				
						Right Touch	155	5775.0	0.012	98.1	13.0	12.2	0.003	0.003	1	
						Right Tilt	155	5775.0	0.011	98.1	13.0	12.2				
		802.11a 6 Mbps	Body-worn	Off	15	Rear	149	5745.0	0.098	98.2	16.0	15.4	0.042	0.050	1	
						Front	149	5745.0	0.013	98.2	16.0	15.4				
			Hotspot	Off	10	Rear	149	5745.0	0.244	98.2	16.0	15.4	0.104	0.123	1	
						Front	149	5745.0	0.018	98.2	16.0	15.4	0.003	0.003	4	
						Edge 1	149	5745.0	0.029	98.2	16.0	15.4				
						Edge 4	149	5745.0	0.045	98.2	16.0	15.4				

**Note(s):**

1. When the Highest reported SAR is  $\leq 0.4$  or  $1.0$  W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is  $> 0.4$  or  $1.0$  W/kg (1-g or 10-g respectively). Due to the highest reported SAR for this test position, other test positions in this exposure condition were evaluated until a SAR  $\leq 0.8$  or  $2.0$  W/kg (1-g or 10-g respectively) was reported.
3. Testing for a second channel was required because the reported SAR for this test position was  $> 0.8$  or  $2.0$  W/kg (1-g or 10-g respectively).
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.

### 10.16 Bluetooth

Antenna	Frequency Band	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
WiFi Ant.1	2.4GHz	GFSK	Head	0	Left Touch	39	2441.0	76.9	17.0	16.2	0.058	0.090	
					Left Tilt	39	2441.0	76.9	17.0	16.2	0.065	0.102	
					Right Touch	39	2441.0	76.9	17.0	16.2	0.205	0.322	
					Right Tilt	39	2441.0	76.9	17.0	16.2	0.251	0.394	60
			Body-worn	15	Rear	39	2441.0	76.9	17.0	16.2	0.022	0.034	61
					Front	39	2441.0	76.9	17.0	16.2	0.009	0.014	
			Hotspot	10	Rear	39	2441.0	76.9	17.0	16.2	0.053	0.082	62
					Front	39	2441.0	76.9	17.0	16.2	0.023	0.036	
					Edge 1	39	2441.0	76.9	17.0	16.2	0.047	0.073	
					Edge 4	39	2441.0	76.9	17.0	16.2	0.030	0.047	

### 10.17 LTE-uplink 2CA Band 7 (20MHz + 20MHz BW)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	PCC UL				SCC UL				Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Plot No.
						Ch #.	Freq. (MHz)	RB Allocation	RB offset	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled	
Main 1-2	Head	QPSK	Off	0	Left touch	21100	2535.0	1	0	20902	2515.2	1	99	25.0	23.3	0.063	0.092			63
	Body-worn	QPSK	Off	15	Front	21100	2535.0	1	0	20902	2515.2	1	99	25.0	23.3	0.260	0.381			64
	Hotspot	QPSK	On	10	Edge 3	21100	2535.0	1	0	20902	2515.2	1	99	22.0	20.5	0.454	0.649			65
	Product Specific 10-g	QPSK	On	0	Edge 3	21350	2560.0	1	0	21152	2540.2	1	99	22.0	20.4			1.430	2.057	66

### 10.18 LTE-uplink 2CA Band 38 (20MHz + 20MHz BW)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	PCC UL				SCC UL				Power (dBm)		1-g SAR (W/kg)		Plot No.
						Ch #.	Freq. (MHz)	RB Allocation	RB offset	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Tune-up limit	Meas.	Meas.	Scaled	
Main 1-2	Head	QPSK	Off	0	Left Touch	37850	2580.0	1	99	38048	2599.8	1	0	24.0	22.5	0.053	0.074	67
	Body-worn	QPSK	Off	15	Rear	37850	2580.0	1	99	38048	2599.8	1	0	24.0	22.5	0.188	0.266	68
	Hotspot	QPSK	On	10	Edge 3	37850	2580.0	1	99	38048	2599.8	1	0	22.0	20.6	0.356	0.490	69

## 11 SAR Measurement Variability

In accordance with published RF Exposure KDB 865664 D01 SAR measurement 100 MHz to 6 GHz. 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  $< 0.8$  or  $2$  W/kg (1-g or 10-g respectively); steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is  $\geq 0.8$  or  $2$  W/kg (1-g or 10-g respectively), 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  $\geq 1.45$  or  $3.6$  W/kg ( $\sim 10\%$  from the 1-g or 10-g respective SAR limit).
- 4) Perform a third repeated measurement only if the original, first, or second repeated measurement is  $\geq 1.5$  or  $3.75$  W/kg (1-g or 10-g respectively) and the ratio of largest to smallest SAR for the original, first and second repeated measurements is  $> 1.20$ .

### Peak spatial-average (1g of tissue)

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Repeated Measured SAR (W/kg)	Largest to Smallest SAR Ratio
700	LTE Band 12	Hotspot	Rear	No	0.250	N/A	N/A
	LTE Band 13	Hotspot	Rear	No	0.356	N/A	N/A
835	GSM 850	Hotspot	Rear	No	0.655	N/A	N/A
	WCDMA Band V	Hotspot	Rear	No	0.689	N/A	N/A
	LTE Band 5	Hotspot	Rear	No	0.632	N/A	N/A
	LTE Band 26	Hotspot	Rear	No	0.470	N/A	N/A
1750	WCDMA Band IV	Hotspot	Edge 3	Yes	1.000	1.000	1.00
	LTE Band 66	Hotspot	Edge 3	No	0.910	N/A	N/A
1900	GSM 1900	Hotspot	Edge 3	No	0.859	N/A	N/A
	WCDMA Band II	Hotspot	Edge 3	No	0.877	N/A	N/A
	LTE Band 25	Hotspot	Edge 3	Yes	0.998	0.996	1.00
2400	Wi-Fi 802.11b/g/n	Head	Right Tilt	No	0.400	N/A	N/A
	Bluetooth	Head	Right Tilt	No	0.251	N/A	N/A
2600	LTE Band 7	Hotspot	Edge 3	No	0.591	N/A	N/A
	LTE Band 38	Hotspot	Edge 3	No	0.500	N/A	N/A
	LTE Band 41	Hotspot	Edge 3	No	0.465	N/A	N/A
5300	Wi-Fi 802.11a/n	Body	Rear	No	0.226	N/A	N/A
5500	Wi-Fi 802.11a/n	Body	Rear	No	0.122	N/A	N/A
5800	Wi-Fi 802.11a/n	Hotspot	Edge 4	No	0.232	N/A	N/A

### Peak spatial-average (10g of tissue)

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Repeated Measured SAR (W/kg)	Largest to Smallest SAR Ratio
1750	WCDMA Band IV	Product specific 10g	Rear	Yes	2.130	2.130	1.00
	LTE Band 66	Product specific 10g	Rear	No	1.840	N/A	N/A
1900	WCDMA Band II	Product specific 10g	Edge 3	No	0.945	N/A	N/A
	LTE Band 25	Product specific 10g	Edge 3	No	1.310	N/A	N/A
2600	LTE Band 7	Product specific 10g	Edge 3	No	1.870	N/A	N/A
5300	Wi-Fi 802.11a/n	Product specific 10g	Rear	No	1.190	N/A	N/A
5500	Wi-Fi 802.11a/n	Product specific 10g	Rear	No	0.746	N/A	N/A

### Note(s):

Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not  $> 1.20$ .

## 12 DUT Holder Perturbations

In accordance with published DUT Holder Perturbations in Oct.2016 TCB workshop,

When Highest reported SAR is over 1.2 or 3.0 W/kg (1-g or 10-g respectively), Holder perturbation verification is required for each antenna, using the highest configuration among all applicable frequency bands. Both Head test and Body test (Edge 1-4 sides) are evaluated with DUT holder. Both Front and Rear sides are evaluated without DUT holder. (Details of test setup are refer to Appendix A.)

So we are only consider about Head test and Body test (Edge 1-4 sides).

### Main Antenna 1- 1

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	DUT Holder Perturbation (Yes/No)	Highest Reported SAR (W/kg)	SAR test without holder Scaled SAR (W/kg)	Deviation (%)
1900	LTE Band 25	Hotspot	Edge 3	Yes	1.249	1.221	1.02

### Note(s):

Both deviation should be within measurement uncertainty (22%).

# 13 Simultaneous Transmission SAR Analysis

## Simultaneous Transmission Condition

RF Exposure Condition	Item	Capable Transmit Configurations				
Head & Body-worn & Phablet-10g	1	GSM(Voice/GPRS)	+	DTS_Ant.1	+	DTS_Ant.2
	2	GSM(Voice/GPRS)	+	U-NI Ant.1	+	U-NI Ant.2
	3	GSM(Voice/GPRS)	+	BT		
	4	GSM(Voice/GPRS)	+	U-NI Ant.1	+	BT
	5	GSM(Voice/GPRS)	+	U-NI Ant.2	+	BT
	6	GSM(Voice/GPRS)	+	UNI Ant.1 + UNI Ant.2	+	BT
	7	GSM(Voice/GPRS)	+	<b>RSDB scenarios</b>		
	8	W-CDMA	+	DTS_Ant.1	+	DTS_Ant.2
	9	W-CDMA	+	U-NI Ant.1	+	U-NI Ant.2
	10	W-CDMA	+	BT		
	11	W-CDMA	+	U-NI Ant.1	+	BT
	12	W-CDMA	+	U-NI Ant.2	+	BT
	13	W-CDMA	+	UNI Ant.1 + UNI Ant.2	+	BT
	14	W-CDMA	+	<b>RSDB scenarios</b>		
	15	LTE	+	DTS_Ant.1	+	DTS_Ant.2
	16	LTE	+	U-NI Ant.1	+	U-NI Ant.2
	17	LTE	+	BT		
	18	LTE	+	U-NI Ant.1	+	BT
	19	LTE	+	U-NI Ant.2	+	BT
	20	LTE	+	UNI Ant.1 + UNI Ant.2	+	BT
	21	LTE	+	<b>RSDB scenarios</b>		
Hotspot	22	GSM(GPRS)	+	DTS_Ant.1	+	DTS_Ant.2
	23	GSM(GPRS)	+	U-NI Ant.1	+	U-NI Ant.2
	24	GSM(GPRS)	+	BT		
	25	GSM(GPRS)	+	U-NI Ant.1	+	BT
	26	GSM(GPRS)	+	U-NI Ant.2	+	BT
	27	GSM(GPRS)	+	UNI Ant.1 + UNI Ant.2	+	BT
	28	GSM(GPRS)	+	<b>RSDB scenarios</b>		
	29	W-CDMA	+	DTS_Ant.1	+	DTS_Ant.2
	30	W-CDMA	+	U-NI Ant.1	+	U-NI Ant.2
	31	W-CDMA	+	BT		
	32	W-CDMA	+	U-NI Ant.1	+	BT
	33	W-CDMA	+	U-NI Ant.2	+	BT
	34	W-CDMA	+	UNI Ant.1 + UNI Ant.2	+	BT
	35	W-CDMA	+	<b>RSDB scenarios</b>		
	36	LTE	+	DTS_Ant.1	+	DTS_Ant.2
	37	LTE	+	U-NI Ant.1	+	U-NI Ant.2
	38	LTE	+	BT		
	39	LTE	+	U-NI Ant.1	+	BT
	40	LTE	+	U-NI Ant.2	+	BT
	41	LTE	+	UNI Ant.1 + UNI Ant.2	+	BT
	42	LTE	+	<b>RSDB scenarios</b>		

Notes:

1. DTS supports Wi-Fi Direct, Hotspot and VoIP.
2. U-NI supports Wi-Fi Direct, Hotspot and VoIP.
3. GPRS, W-CDMA, LTE supports Hotspot and VoIP.
4. U-NI Radio can transmit simultaneously with Bluetooth Radio.
5. DTS Radio cannot transmit simultaneously with Bluetooth Radio.
6. DTS Radio can only transmit simultaneously with U-NI Radio in RSDB scenarios.
7. DTS and UNI Radio can operating both SISO and MIMO modes.
8. BT tethering is consider about each RF exposure conditions

**RSDB scenarios**

Mode	Scenario	# of TX	5GHz		2.4GHz	
			Ant1	Ant2	Ant1	Ant2
2.4GHz+5GHz RSDB Only	1	2	On	-	-	On
	2	2	-	On	On	-
	3	2	On	-	On	-
	4	2	-	On	-	On
2.4GHz+5GHz RSDB&MIMO	5	3	On	On	On	-
	6	3	On	On	-	On
	7	3	On	-	On	On
	8	3	-	On	On	On
2.4GHz+5GHz RSDB MIMO	9	4	On	On	On	On

## Simultaneous transmission SAR test exclusion considerations

KDB 447498 D01 General RF Exposure Guidance provides two procedures for determining simultaneous transmission SAR test exclusion: Sum of SAR and SAR to Peak Location Ratio (SPLSR)

### Sum of SAR

To qualify for simultaneous transmission SAR test exclusion based upon Sum of SAR the sum of the reported standalone SARs for all simultaneously transmitting antennas shall be below the applicable standalone SAR limit. If the sum of the SARs is above the applicable limit then simultaneous transmission SAR test exclusion may still apply if the requirements of the SAR to Peak Location Ratio (SPLSR) evaluation are met.

### SAR to Peak Location Ratio (SPLSR)

KDB 447498 D01 General RF Exposure Guidance explains how to calculate the SAR to Peak Location Ratio (SPLSR) between pairs of simultaneously transmitting antennas:

$$SPLSR = (SAR_1 + SAR_2)^{1.5} / R_i$$

Where:

**SAR<sub>1</sub>** is the highest reported or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

**SAR<sub>2</sub>** is the highest reported or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

**R<sub>i</sub>** is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of

$$[(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2]$$

In order for a pair of simultaneous transmitting antennas with the sum of 1-g SAR > 1.6 W/kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:

$$(SAR_1 + SAR_2)^{1.5} / R_i \leq 0.04$$

When an individual antenna transmits at on two bands simultaneously, the sum of the highest *reported* SAR for the frequency bands should be used to determine **SAR<sub>1</sub>**, or **SAR<sub>2</sub>**. When SPLSR is necessary, the smallest distance between the peak SAR locations for the antenna pair with respect to the peaks from each antenna should be used.

The antennas in all antenna pairs that do not qualify for simultaneous transmission SAR test exclusion must be tested for SAR compliance, according to the enlarged zoom scan and volume scan post-processing procedures in KDB Publication 865664 D01

The antennas for the unlicensed transmitters are closely situated. As a result, the associated SAR hotspots are also closely situated. Some of the sum of SAR calculations yielded results over 1.6 W/kg. The SPLSR calculations for these situations were performed by treating the unlicensed SAR values as a single transmitter. The most conservative distance between all the unlicensed hotspots to the licensed hotspot was used for the value of *d* in the SPLSR calculation.

## Simultaneous transmission SAR measurement

When simultaneous transmission SAR measurements are required in different frequency bands not covered by a single probe calibration point then separate tests for each frequency band are performed. The tests are performed using enlarged zoom scans which are processed, by means of superposition, using the DASY5 volume scan postprocessing procedures to determine the 1-g SAR for the aggregate SAR distribution.

The spatial resolution used for all enlarged zoom scans is the same as used for the most stringent zoom scans. I.E. the scan parameters required for the highest frequency assessed are used for all enlarged zoom scans. The scans cover the complete area of the device to ensure all transmitting antennas and radiating structures are assessed.

DASY5 provides the ability to perform Multiband Evaluations according to the latest standards using the Volume Scan job as well as appropriate routines for the Post-processing.

In order to extract and process measurements within different frequency bands, the SEMCAD X Post-processor performs the combination and subsequent superposition of these measurement data via DASY5= Combined MultiBand Averaged SAR.

Combined Multi Band Averaged SAR allows - in addition to the data extraction - an evaluation of the 1 g, 10 g and/or arbitrary averaged mass SAR.

Power Scaling Factor is used to allow the volume scans to be scaled by a value other than "1", this is important when the results need to be scaled to different maximum power levels. The Power Scaling Factor is applied to each individual point of the scan. When power scaling is used in multi-band combinations the scaling factor is applied to each individual point of the first scan, the second factor is then applied to each individual point of the second scan and so on. The scans are then combined.

### 13.1 Sum of the SAR for GSM 850 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)						Σ SAR (W/kg)										
		WWAN	DTS Ant.1	DTS Ant.2	UNII Ant.1	UNII Ant.2	BT	WWAN + DTS Ant.1	WWAN + DTS Ant.2	WWAN + DTS Ant.1 + DTS Ant.2	WWAN + U-NII Ant.1	WWAN + U-NII Ant.2	WWAN + U-NII Ant.1 + U-NII Ant.2	WWAN + BT	WWAN + UNII Ant.1 + BT	WWAN + UNII Ant.2 + BT	WWAN + UNII Ant.1 + UNII Ant.2 + BT	WWAN + UNII Ant.1 + DTS Ant.1 + UNII Ant.2 + DTS Ant.2
		1	2	3	4	5	6	1+2	1+3	1+2+3	1+4	1+5	1+4+5	1+6	1+4+6	1+5+6	1+4+5+6	1+2+3+4+5
Head (1g-SAR)	All position	0.195	0.430	0.037	0.178	0.009	0.394	0.625	0.232	0.662	0.373	0.204	0.382	0.589	0.767	0.598	0.776	0.849
Body-Worn (1g-SAR)	All position	0.316	0.074	0.051	0.162	0.246	0.034	0.390	0.367	0.441	0.478	0.562	0.724	0.350	0.512	0.596	0.758	0.849
Hotspot (1g-SAR)	Rear	0.789	0.173	0.167	0.254	0.123	0.082	0.962	0.956	1.129	1.043	0.912	1.166	0.871	1.125	0.994	1.248	1.506
	Front	0.468	0.054	0.010	0.072	0.003	0.036	0.522	0.478	0.532	0.540	0.471	0.543	0.504	0.576	0.507	0.579	0.607
	Edge 1		0.173	0.167	0.272	0.123	0.073											
	Edge 2	0.195																
	Edge 3	0.425																
	Edge 4	0.063	0.173	0.167	0.272	0.123	0.047	0.236	0.230	0.403	0.335	0.186	0.458	0.110	0.382	0.233	0.505	0.798

**Note(s):**

- The green box is the worst scenario in WWAN + RSDB scenarios. Other RSDB scenarios were covered by the worst scenario.
- Blue values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

### 13.2 Sum of the SAR for GSM 1900 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)						Σ SAR (W/kg)										
		WWAN	DTS Ant.1	DTS Ant.2	UNII Ant.1	UNII Ant.2	BT	WWAN + DTS Ant.1	WWAN + DTS Ant.2	WWAN + DTS Ant.1 + DTS Ant.2	WWAN + U-NII Ant.1	WWAN + U-NII Ant.2	WWAN + U-NII Ant.1 + U-NII Ant.2	WWAN + BT	WWAN + UNII Ant.1 + BT	WWAN + UNII Ant.2 + BT	WWAN + UNII Ant.1 + UNII Ant.2 + BT	WWAN + UNII Ant.1 + DTS Ant.1 + UNII Ant.2 + DTS Ant.2
		1	2	3	4	5	6	1+2	1+3	1+2+3	1+4	1+5	1+4+5	1+6	1+4+6	1+5+6	1+4+5+6	1+2+3+4+5
Head (1g-SAR)	All position	0.051	0.430	0.037	0.178	0.009	0.394	0.481	0.088	0.518	0.229	0.060	0.238	0.445	0.623	0.454	0.632	0.705
Body-Worn (1g-SAR)	All position	0.336	0.074	0.051	0.162	0.246	0.034	0.410	0.387	0.461	0.498	0.582	0.744	0.370	0.532	0.616	0.778	0.869
Hotspot (1g-SAR)	Rear	0.518	0.173	0.167	0.254	0.123	0.082	0.691	0.685	0.858	0.772	0.641	0.895	0.600	0.854	0.723	0.977	1.235
	Front	0.352	0.054	0.010	0.072	0.003	0.036	0.406	0.362	0.416	0.424	0.355	0.427	0.388	0.460	0.391	0.463	0.491
	Edge 1		0.173	0.167	0.272	0.123	0.073											
	Edge 2	0.049																
	Edge 3	0.952																
	Edge 4	0.055	0.173	0.167	0.272	0.123	0.047	0.228	0.222	0.395	0.327	0.178	0.450	0.102	0.374	0.225	0.497	0.790

**Note(s):**

- The green box is the worst scenario in WWAN + RSDB scenarios. Other RSDB scenarios were covered by the worst scenario.
- Blue values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

### 13.3 Sum of the SAR for WCDMA Band II & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)						Σ SAR (W/kg)										
		WWAN	DTS Ant.1	DTS Ant.2	UNII Ant.1	UNII Ant.2	BT	WWAN + DTS Ant.1	WWAN + DTS Ant.2	WWAN + DTS Ant.1 + DTS Ant.2	WWAN + U-NII Ant.1	WWAN + U-NII Ant.2	WWAN + U-NII Ant.1 + U-NII Ant.2	WWAN + BT	WWAN + UNII Ant.1 + BT	WWAN + UNII Ant.2 + BT	WWAN + UNII Ant.1 + UNII Ant.2 + BT	WWAN + UNII Ant.1 + DTS Ant.1 + UNII Ant.2 + DTS Ant.2
		1	2	3	4	5	6	1+2	1+3	1+2+3	1+4	1+5	1+4+5	1+6	1+4+6	1+5+6	1+4+5+6	1+2+3+4+5
Head (1g-SAR)	All position	0.064	0.430	0.037	0.178	0.009	0.394	0.494	0.101	0.531	0.242	0.073	0.251	0.458	0.636	0.467	0.645	0.718
Body-Worn (1g-SAR)	All position	0.339	0.074	0.051	0.162	0.246	0.034	0.413	0.390	0.464	0.501	0.585	0.747	0.373	0.535	0.619	0.781	0.872
Hotspot (1g-SAR)	Rear	0.491	0.173	0.167	0.254	0.123	0.082	0.664	0.658	0.831	0.745	0.614	0.868	0.573	0.827	0.696	0.950	1.208
	Front	0.341	0.054	0.010	0.072	0.003	0.036	0.395	0.351	0.405	0.413	0.344	0.416	0.377	0.449	0.380	0.452	0.480
	Edge 1		0.173	0.167	0.272	0.123	0.073											
	Edge 2	0.038																
	Edge 3	1.075																
	Edge 4	0.060	0.173	0.167	0.272	0.123	0.047	0.233	0.227	0.400	0.332	0.183	0.455	0.107	0.379	0.230	0.502	0.795
Product Specific 10-g	Rear				0.796	1.154												
	Front				0.796	1.154												
	Edge 1				0.796	1.154												
	Edge 2																	
	Edge 3	1.243																
	Edge 4				0.796	0.226												

**Note(s):**

- The green box is the worst scenario in WWAN + RSDB scenarios. Other RSDB scenarios were covered by the worst scenario.
- Blue values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

### 13.4 Sum of the SAR for WCDMA Band IV & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)							Σ SAR (W/kg)											
		WWAN	DTS Ant.1	DTS Ant.2	UNII Ant.1	UNII Ant.2	BT	UNII MIMO	WWAN + DTS Ant.1	WWAN + DTS Ant.2	WWAN + DTS Ant.1 + DTS Ant.2	WWAN + U-NI Ant.1	WWAN + U-NI Ant.2	WWAN + U-NI Ant.1 + U-NI Ant.2	WWAN + MIMO	WWAN + BT	WWAN + UNII Ant.1 + BT	WWAN + UNII Ant.2 + BT	WWAN + UNII Ant.1 + UNII Ant.2 + BT	WWAN + UNII Ant.1 + DTS Ant.1 + UNII Ant.2 + DTS Ant.2
		1	2	3	4	5	6	7	1+2	1+3	1+2+3	1+4	1+5	1+4+5	1+7	1+6	1+4+6	1+5+6	1+4+5+6	1+2+3+4+5
Head (1g-SAR)	All position	0.136	0.430	0.037	0.178	0.009	0.394		0.566	0.173	0.603	0.314	0.145	0.323		0.530	0.708	0.539	0.717	0.790
Body-Worn (1g-SAR)	All position	0.738	0.074	0.051	0.162	0.246	0.034		0.812	0.789	0.863	0.900	0.984	1.146		0.772	0.934	1.018	1.180	1.271
Hotspot (1-g SAR)	Rear	0.745	0.173	0.167	0.254	0.123	0.082		0.918	0.912	1.085	0.999	0.868	1.122		0.827	1.081	0.950	1.204	1.462
	Front	0.574	0.054	0.010	0.072	0.003	0.036		0.628	0.584	0.638	0.646	0.577	0.649		0.610	0.682	0.613	0.685	0.713
	Edge 1		0.173	0.167	0.272	0.123	0.073													
	Edge 2	0.086																		
	Edge 3	1.214																		
Product Specific 10-g	Edge 4	0.117	0.173	0.167	0.272	0.123	0.047		0.290	0.284	0.457	0.389	0.240	0.512		0.164	0.436	0.287	0.559	0.852
	Rear	2.579			0.796	1.154	1.374					3.375	3.733	Note.3	3.953					
	Front				0.796	1.154	1.374													
	Edge 1				0.796	1.154	1.374													
	Edge 2																			
Edge 3	1.780																			
Edge 4				0.796	0.226	0.508														

**Note(s):**

- The green box is the worst scenario in WWAN + RSDB scenarios. Other RSDB scenarios were covered by the worst scenario.
- Blue values are reference from highest SAR value of *initial test position* procedure in each RF exposure of each bands.
- “UNII Ant.1 + UNII Ant.2” were replaced by UNII MIMO in Product Specific 10-g condition.

### 13.5 Sum of the SAR for WCDMA Band V & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)						Σ SAR (W/kg)												
		WWAN	DTS Ant.1	DTS Ant.2	UNII Ant.1	UNII Ant.2	BT	WWAN + DTS Ant.1	WWAN + DTS Ant.2	WWAN + DTS Ant.1 + DTS Ant.2	WWAN + U-NI Ant.1	WWAN + U-NI Ant.2	WWAN + U-NI Ant.1 + U-NI Ant.2	WWAN + BT	WWAN + UNII Ant.1 + BT	WWAN + UNII Ant.2 + BT	WWAN + UNII Ant.1 + UNII Ant.2 + BT	WWAN + UNII Ant.1 + DTS Ant.1 + UNII Ant.2 + DTS Ant.2		
		1	2	3	4	5	6	1+2	1+3	1+2+3	1+4	1+5	1+4+5	1+6	1+4+6	1+5+6	1+4+5+6	1+2+3+4+5		
Head (1g-SAR)	All position	0.154	0.430	0.037	0.178	0.009	0.394		0.584	0.191	0.621	0.332	0.163	0.341		0.548	0.726	0.557	0.735	0.808
Body-Worn (1g-SAR)	All position	0.335	0.074	0.051	0.162	0.246	0.034		0.409	0.386	0.460	0.497	0.581	0.743		0.369	0.531	0.615	0.777	0.868
Hotspot (1-g SAR)	Rear	0.769	0.173	0.167	0.254	0.123	0.082		0.942	0.936	1.109	1.023	0.892	1.146		0.851	1.105	0.974	1.228	1.486
	Front	0.508	0.054	0.010	0.072	0.003	0.036		0.562	0.518	0.572	0.580	0.511	0.583		0.544	0.616	0.547	0.619	0.647
	Edge 1		0.173	0.167	0.272	0.123	0.073													
	Edge 2	0.226																		
	Edge 3	0.480																		
Edge 4	0.058	0.173	0.167	0.272	0.123	0.047		0.231	0.225	0.398	0.330	0.181	0.453		0.105	0.377	0.228	0.500	0.793	

**Note(s):**

- The green box is the worst scenario in WWAN + RSDB scenarios. Other RSDB scenarios were covered by the worst scenario.
- Blue values are reference from highest SAR value of *initial test position* procedure in each RF exposure of each bands.

### 13.6 Sum of the SAR for LTE Band 5 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)						Σ SAR (W/kg)												
		WWAN	DTS Ant.1	DTS Ant.2	UNII Ant.1	UNII Ant.2	BT	WWAN + DTS Ant.1	WWAN + DTS Ant.2	WWAN + DTS Ant.1 + DTS Ant.2	WWAN + U-NI Ant.1	WWAN + U-NI Ant.2	WWAN + U-NI Ant.1 + U-NI Ant.2	WWAN + BT	WWAN + UNII Ant.1 + BT	WWAN + UNII Ant.2 + BT	WWAN + UNII Ant.1 + UNII Ant.2 + BT	WWAN + UNII Ant.1 + DTS Ant.1 + UNII Ant.2 + DTS Ant.2		
		1	2	3	4	5	6	1+2	1+3	1+2+3	1+4	1+5	1+4+5	1+6	1+4+6	1+5+6	1+4+5+6	1+2+3+4+5		
Head (1g-SAR)	All position	0.167	0.430	0.037	0.178	0.009	0.394		0.597	0.204	0.634	0.345	0.176	0.354		0.561	0.739	0.570	0.748	0.821
Body-Worn (1g-SAR)	All position	0.320	0.074	0.051	0.162	0.246	0.034		0.394	0.371	0.445	0.482	0.566	0.728		0.354	0.516	0.600	0.762	0.853
Hotspot (1-g SAR)	Rear	0.710	0.173	0.167	0.254	0.123	0.082		0.883	0.877	1.050	0.964	0.833	1.087		0.792	1.046	0.915	1.169	1.427
	Front	0.611	0.054	0.010	0.072	0.003	0.036		0.665	0.621	0.675	0.683	0.614	0.686		0.647	0.719	0.650	0.722	0.750
	Edge 1		0.173	0.167	0.272	0.123	0.073													
	Edge 2	0.185																		
	Edge 3	0.534																		
Edge 4	0.080	0.173	0.167	0.272	0.123	0.047		0.253	0.247	0.420	0.352	0.203	0.475		0.127	0.399	0.250	0.522	0.815	

**Note(s):**

- The green box is the worst scenario in WWAN + RSDB scenarios. Other RSDB scenarios were covered by the worst scenario.
- Blue values are reference from highest SAR value of *initial test position* procedure in each RF exposure of each bands.

### 13.7 Sum of the SAR for LTE Band 7 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)						Σ SAR (W/kg)										
		WWAN	DTS Ant.1	DTS Ant.2	UNII Ant.1	UNII Ant.2	BT	WWAN + DTS Ant.1	WWAN + DTS Ant.2	WWAN + DTS Ant.1 + DTS Ant.2	WWAN + U-NII Ant.1	WWAN + U-NII Ant.2	WWAN + U-NII Ant.1 + U-NII Ant.2	WWAN + BT	WWAN + UNII Ant.1 + BT	WWAN + UNII Ant.2 + BT	WWAN + UNII Ant.1 + UNII Ant.2 + BT	WWAN + UNII Ant.1 + DTS Ant.1 + UNII Ant.2 + DTS Ant.2
		1	2	3	4	5	6	1+2	1+3	1+2+3	1+4	1+5	1+4+5	1+6	1+4+6	1+5+6	1+4+5+6	1+2+3+4+5
Head (1g-SAR)	All position	0.101	0.430	0.037	0.178	0.009	0.394	0.531	0.138	0.568	0.279	0.110	0.288	0.495	0.673	0.504	0.682	0.755
Body-Worn (1g-SAR)	All position	0.459	0.074	0.051	0.162	0.246	0.034	0.533	0.510	0.584	0.621	0.705	0.867	0.493	0.655	0.739	0.901	0.992
Hotspot (1-g SAR)	Rear	0.475	0.173	0.167	0.254	0.123	0.082	0.648	0.642	0.815	0.729	0.598	0.852	0.557	0.811	0.680	0.934	1.192
	Front	0.354	0.054	0.010	0.072	0.003	0.036	0.408	0.364	0.418	0.426	0.357	0.429	0.390	0.462	0.393	0.465	0.493
	Edge 1		0.173	0.167	0.272	0.123	0.073											
	Edge 2																	
	Edge 3	0.685																
	Edge 4	0.209	0.173	0.167	0.272	0.123	0.047	0.382	0.376	0.549	0.481	0.332	0.604	0.256	0.528	0.379	0.651	0.944
Product Specific 10-g	Rear				0.796	1.154												
	Front				0.796	1.154												
	Edge 1				0.796	1.154												
	Edge 2																	
	Edge 3	2.215																
	Edge 4				0.796	0.226												

**Note(s):**

- The green box is the worst scenario in WWAN + RSDB scenarios. Other RSDB scenarios were covered by the worst scenario.
- Blue values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

### 13.8 Sum of the SAR for LTE Band 12 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)						Σ SAR (W/kg)										
		WWAN	DTS Ant.1	DTS Ant.2	UNII Ant.1	UNII Ant.2	BT	WWAN + DTS Ant.1	WWAN + DTS Ant.2	WWAN + DTS Ant.1 + DTS Ant.2	WWAN + U-NII Ant.1	WWAN + U-NII Ant.2	WWAN + U-NII Ant.1 + U-NII Ant.2	WWAN + BT	WWAN + UNII Ant.1 + BT	WWAN + UNII Ant.2 + BT	WWAN + UNII Ant.1 + UNII Ant.2 + BT	WWAN + UNII Ant.1 + DTS Ant.1 + UNII Ant.2 + DTS Ant.2
		1	2	3	4	5	6	1+2	1+3	1+2+3	1+4	1+5	1+4+5	1+6	1+4+6	1+5+6	1+4+5+6	1+2+3+4+5
Head (1g-SAR)	All position	0.152	0.430	0.037	0.178	0.009	0.394	0.582	0.189	0.619	0.330	0.161	0.339	0.546	0.724	0.555	0.733	0.806
Body-Worn (1g-SAR)	All position	0.224	0.074	0.051	0.162	0.246	0.034	0.298	0.275	0.349	0.386	0.470	0.632	0.258	0.420	0.504	0.666	0.757
Hotspot (1-g SAR)	Rear	0.346	0.173	0.167	0.254	0.123	0.082	0.519	0.513	0.686	0.600	0.469	0.723	0.428	0.682	0.551	0.805	1.063
	Front	0.209	0.054	0.010	0.072	0.003	0.036	0.263	0.219	0.273	0.281	0.212	0.284	0.245	0.317	0.248	0.320	0.348
	Edge 1		0.173	0.167	0.272	0.123	0.073											
	Edge 2	0.183																
	Edge 3	0.154																
	Edge 4	0.155	0.173	0.167	0.272	0.123	0.047	0.328	0.322	0.495	0.427	0.278	0.550	0.202	0.474	0.325	0.597	0.890

**Note(s):**

- The green box is the worst scenario in WWAN + RSDB scenarios. Other RSDB scenarios were covered by the worst scenario.
- Blue values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

### 13.9 Sum of the SAR for LTE Band 13 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)						Σ SAR (W/kg)										
		WWAN	DTS Ant.1	DTS Ant.2	UNII Ant.1	UNII Ant.2	BT	WWAN + DTS Ant.1	WWAN + DTS Ant.2	WWAN + DTS Ant.1 + DTS Ant.2	WWAN + U-NII Ant.1	WWAN + U-NII Ant.2	WWAN + U-NII Ant.1 + U-NII Ant.2	WWAN + BT	WWAN + UNII Ant.1 + BT	WWAN + UNII Ant.2 + BT	WWAN + UNII Ant.1 + UNII Ant.2 + BT	WWAN + UNII Ant.1 + DTS Ant.1 + UNII Ant.2 + DTS Ant.2
		1	2	3	4	5	6	1+2	1+3	1+2+3	1+4	1+5	1+4+5	1+6	1+4+6	1+5+6	1+4+5+6	1+2+3+4+5
Head (1g-SAR)	All position	0.112	0.430	0.037	0.178	0.009	0.394	0.542	0.149	0.579	0.290	0.121	0.299	0.506	0.684	0.515	0.693	0.766
Body-Worn (1g-SAR)	All position	0.181	0.074	0.051	0.162	0.246	0.034	0.255	0.232	0.306	0.343	0.427	0.589	0.215	0.377	0.461	0.623	0.714
Hotspot (1-g SAR)	Rear	0.454	0.173	0.167	0.254	0.123	0.082	0.627	0.621	0.794	0.708	0.577	0.831	0.536	0.790	0.659	0.913	1.171
	Front	0.254	0.054	0.010	0.072	0.003	0.036	0.308	0.264	0.318	0.326	0.257	0.329	0.290	0.362	0.293	0.365	0.393
	Edge 1		0.173	0.167	0.272	0.123	0.073											
	Edge 2	0.117																
	Edge 3	0.164																
	Edge 4	0.079	0.173	0.167	0.272	0.123	0.047	0.252	0.246	0.419	0.351	0.202	0.474	0.126	0.398	0.249	0.521	0.814

**Note(s):**

- The green box is the worst scenario in WWAN + RSDB scenarios. Other RSDB scenarios were covered by the worst scenario.
- Blue values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

### 13.10 Sum of the SAR for LTE Band 25 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)						Σ SAR (W/kg)										
		WWAN	DTS Ant.1	DTS Ant.2	UNII Ant.1	UNII Ant.2	BT	WWAN + DTS Ant.1	WWAN + DTS Ant.2	WWAN + DTS Ant.1 + DTS Ant.2	WWAN + U-NII Ant.1	WWAN + U-NII Ant.2	WWAN + U-NII Ant.1 + U-NII Ant.2	WWAN + BT	WWAN + UNII Ant.1 + BT	WWAN + UNII Ant.2 + BT	WWAN + UNII Ant.1 + UNII Ant.2 + BT	WWAN + UNII Ant.1 + DTS Ant.1 + UNII Ant.2 + DTS Ant.2
		1	2	3	4	5	6	1+2	1+3	1+2+3	1+4	1+5	1+4+5	1+6	1+4+6	1+5+6	1+4+5+6	1+2+3+4+5
Head (1g-SAR)	All position	0.110	0.430	0.037	0.178	0.009	0.394	0.540	0.147	0.577	0.288	0.119	0.297	0.504	0.682	0.513	0.691	0.764
Body-Worn (1g-SAR)	All position	0.636	0.074	0.051	0.162	0.246	0.034	0.710	0.687	0.761	0.798	0.882	1.044	0.670	0.832	0.916	1.078	1.169
Hotspot (1-g SAR)	Rear	0.599	0.173	0.167	0.254	0.123	0.082	0.772	0.766	0.939	0.853	0.722	0.976	0.681	0.935	0.804	1.058	1.316
	Front	0.465	0.054	0.010	0.072	0.003	0.036	0.519	0.475	0.529	0.537	0.468	0.540	0.501	0.573	0.504	0.576	0.604
	Edge 1		0.173	0.167	0.272	0.123	0.073											
	Edge 2	0.056																
	Edge 3	1.249																
Product Specific 10-g	Edge 4	0.087	0.173	0.167	0.272	0.123	0.047	0.260	0.254	0.427	0.359	0.210	0.482	0.134	0.406	0.257	0.529	0.822
	Rear				0.796	1.154												
	Front				0.796	1.154												
	Edge 1				0.796	1.154												
	Edge 2																	
Edge 3	1.649																	
Edge 4				0.796	0.226													

**Note(s):**

- The green box is the worst scenario in WWAN + RSDB scenarios. Other RSDB scenarios were covered by the worst scenario.
- Blue values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

### 13.11 Sum of the SAR for LTE Band 26 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)						Σ SAR (W/kg)										
		WWAN	DTS Ant.1	DTS Ant.2	UNII Ant.1	UNII Ant.2	BT	WWAN + DTS Ant.1	WWAN + DTS Ant.2	WWAN + DTS Ant.1 + DTS Ant.2	WWAN + U-NII Ant.1	WWAN + U-NII Ant.2	WWAN + U-NII Ant.1 + U-NII Ant.2	WWAN + BT	WWAN + UNII Ant.1 + BT	WWAN + UNII Ant.2 + BT	WWAN + UNII Ant.1 + UNII Ant.2 + BT	WWAN + UNII Ant.1 + DTS Ant.1 + UNII Ant.2 + DTS Ant.2
		1	2	3	4	5	6	1+2	1+3	1+2+3	1+4	1+5	1+4+5	1+6	1+4+6	1+5+6	1+4+5+6	1+2+3+4+5
Head (1g-SAR)	All position	0.101	0.430	0.037	0.178	0.009	0.394	0.531	0.138	0.568	0.279	0.110	0.288	0.495	0.673	0.504	0.682	0.755
Body-Worn (1g-SAR)	All position	0.257	0.074	0.051	0.162	0.246	0.034	0.331	0.308	0.382	0.419	0.503	0.665	0.291	0.453	0.537	0.699	0.790
Hotspot (1-g SAR)	Rear	0.607	0.173	0.167	0.254	0.123	0.082	0.780	0.774	0.947	0.861	0.730	0.984	0.689	0.943	0.812	1.066	1.324
	Front	0.294	0.054	0.010	0.072	0.003	0.036	0.348	0.304	0.358	0.366	0.297	0.369	0.330	0.402	0.333	0.405	0.433
	Edge 1		0.173	0.167	0.272	0.123	0.073											
	Edge 2	0.132																
	Edge 3	0.396																
Edge 4	0.041	0.173	0.167	0.272	0.123	0.047	0.214	0.208	0.381	0.313	0.164	0.436	0.088	0.360	0.211	0.483	0.776	

**Note(s):**

- The green box is the worst scenario in WWAN + RSDB scenarios. Other RSDB scenarios were covered by the worst scenario.
- Blue values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

### 13.12 Sum of the SAR for LTE Band 38 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)						Σ SAR (W/kg)										
		WWAN	DTS Ant.1	DTS Ant.2	UNII Ant.1	UNII Ant.2	BT	WWAN + DTS Ant.1	WWAN + DTS Ant.2	WWAN + DTS Ant.1 + DTS Ant.2	WWAN + U-NII Ant.1	WWAN + U-NII Ant.2	WWAN + U-NII Ant.1 + U-NII Ant.2	WWAN + BT	WWAN + UNII Ant.1 + BT	WWAN + UNII Ant.2 + BT	WWAN + UNII Ant.1 + UNII Ant.2 + BT	WWAN + UNII Ant.1 + DTS Ant.1 + UNII Ant.2 + DTS Ant.2
		1	2	3	4	5	6	1+2	1+3	1+2+3	1+4	1+5	1+4+5	1+6	1+4+6	1+5+6	1+4+5+6	1+2+3+4+5
Head (1g-SAR)	All position	0.074	0.430	0.037	0.178	0.009	0.394	0.504	0.111	0.541	0.252	0.083	0.261	0.468	0.646	0.477	0.655	0.728
Body-Worn (1g-SAR)	All position	0.299	0.074	0.051	0.162	0.246	0.034	0.373	0.350	0.424	0.461	0.545	0.707	0.333	0.495	0.579	0.741	0.832
Hotspot (1-g SAR)	Rear	0.365	0.173	0.167	0.254	0.123	0.082	0.538	0.532	0.705	0.619	0.488	0.742	0.447	0.701	0.570	0.824	1.082
	Front	0.299	0.054	0.010	0.072	0.003	0.036	0.353	0.309	0.363	0.371	0.302	0.374	0.335	0.407	0.338	0.410	0.438
	Edge 1		0.173	0.167	0.272	0.123	0.073											
	Edge 2																	
	Edge 3	0.632																
Edge 4	0.144	0.173	0.167	0.272	0.123	0.047	0.317	0.311	0.484	0.416	0.267	0.539	0.191	0.463	0.314	0.586	0.879	

**Note(s):**

- The green box is the worst scenario in WWAN + RSDB scenarios. Other RSDB scenarios were covered by the worst scenario.
- Blue values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

### 13.13 Sum of the SAR for LTE Band 41 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)						Σ SAR (W/kg)										
		WWAN	DTS Ant.1	DTS Ant.2	UNII Ant.1	UNII Ant.2	BT	WWAN + DTS Ant.1	WWAN + DTS Ant.2	WWAN + DTS Ant.1 + DTS Ant.2	WWAN + U-NII Ant.1	WWAN + U-NII Ant.2	WWAN + U-NII Ant.1 + U-NII Ant.2	WWAN + BT	WWAN + UNII Ant.1 + BT	WWAN + UNII Ant.2 + BT	WWAN + UNII Ant.1 + UNII Ant.2 + BT	WWAN + UNII Ant.1 + DTS Ant.1 + DTS Ant.2
		1	2	3	4	5	6	1+2	1+3	1+2+3	1+4	1+5	1+4+5	1+6	1+4+6	1+5+6	1+4+5+6	1+2+3+4+5
Head (1g-SAR)	All position	0.043	0.430	0.037	0.178	0.009	0.394	0.473	0.080	0.510	0.221	0.052	0.230	0.437	0.615	0.446	0.624	0.697
Body-Worn (1g-SAR)	All position	0.164	0.074	0.051	0.162	0.246	0.034	0.238	0.215	0.289	0.326	0.410	0.572	0.198	0.360	0.444	0.606	0.697
Hotspot (1g-SAR)	Rear	0.315	0.173	0.167	0.254	0.123	0.082	0.488	0.482	0.655	0.569	0.438	0.692	0.397	0.651	0.520	0.774	1.032
	Front	0.246	0.054	0.010	0.072	0.003	0.036	0.300	0.256	0.310	0.318	0.249	0.321	0.282	0.354	0.285	0.357	0.385
	Edge 1		0.173	0.167	0.272	0.123	0.073											
	Edge 2																	
	Edge 3	0.493																
	Edge 4	0.146	0.173	0.167	0.272	0.123	0.047	0.319	0.313	0.486	0.418	0.269	0.541	0.193	0.465	0.316	0.588	0.881

**Note(s):**

- The green box is the worst scenario in WWAN + RSDB scenarios. Other RSDB scenarios were covered by the worst scenario.
- Blue values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

### 13.14 Sum of the SAR for LTE Band 66 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)							Σ SAR (W/kg)											
		WWAN	DTS Ant.1	DTS Ant.2	UNII Ant.1	UNII Ant.2	BT	UNII MIMO	WWAN + DTS Ant.1	WWAN + DTS Ant.2	WWAN + DTS Ant.1 + DTS Ant.2	WWAN + U-NII Ant.1	WWAN + U-NII Ant.2	WWAN + U-NII Ant.1 + U-NII Ant.2	WWAN + MIMO	WWAN + BT	WWAN + UNII Ant.1 + BT	WWAN + UNII Ant.2 + BT	WWAN + UNII Ant.1 + UNII Ant.2 + BT	WWAN + UNII Ant.1 + DTS Ant.1 + DTS Ant.2
		1	2	3	4	5	6	7	1+2	1+3	1+2+3	1+4	1+5	1+4+5	1+7	1+6	1+4+6	1+5+6	1+4+5+6	1+2+3+4+5
Head (1g-SAR)	All position	0.131	0.430	0.037	0.178	0.009	0.394		0.561	0.168	0.598	0.309	0.140	0.318		0.525	0.703	0.534	0.712	0.785
Body-Worn (1g-SAR)	All position	0.723	0.074	0.051	0.162	0.246	0.034		0.797	0.774	0.848	0.885	0.969	1.131		0.757	0.919	1.003	1.165	1.256
Hotspot (1g-SAR)	Rear	0.723	0.173	0.167	0.254	0.123	0.082		0.896	0.890	1.063	0.977	0.846	1.100		0.805	1.059	0.928	1.182	1.440
	Front	0.584	0.054	0.010	0.072	0.003	0.036		0.638	0.594	0.648	0.656	0.587	0.659		0.620	0.692	0.623	0.695	0.723
	Edge 1		0.173	0.167	0.272	0.123	0.073													
	Edge 2	0.095																		
	Edge 3	1.238																		
	Edge 4	0.119	0.173	0.167	0.272	0.123	0.047		0.292	0.286	0.459	0.391	0.242	0.514		0.166	0.438	0.289	0.561	0.854
Product Specific 10-g	Rear	2.454			0.796	1.154		1.374				3.250	3.608	Note.3	3.828					
	Front				0.796	1.154		1.374												
	Edge 1				0.796	1.154		1.374												
	Edge 2																			
	Edge 3	1.885																		
	Edge 4				0.796	0.226		0.508												

**Note(s):**

- The green box is the worst scenario in WWAN + RSDB scenarios. Other RSDB scenarios were covered by the worst scenario.
- Blue values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.
- "UNII Ant.1 + UNII Ant.2" were replaced by UNII MIMO in Product Specific 10-g condition.

**Conclusion:**

Simultaneous transmission SAR measurement (Volume Scan) is not required because the sum of the 1-g SAR is < 1.6 W/kg in Head / Body-worn / Hotspot and 10-g SAR is < 4.0 in Product Specific 10-g.

## **Appendixes**

**Refer to separated files for the following appendixes.**

**4789009800-S1V3 FCC Report SAR\_App A\_Photos & Ant. Locations**

**4789009800-S1V3 FCC Report SAR\_App B\_Highest SAR Test Plots**

**4789009800-S1V3 FCC Report SAR\_App C\_System Check Plots**

**4789009800-S1V3 FCC Report SAR\_App D\_SAR Tissue Ingredients**

**4789009800-S1V3 FCC Report SAR\_App E\_Probe Cal. Certificates**

**4789009800-S1V3 FCC Report SAR\_App F\_Dipole Cal. Certificates**

**END OF REPORT**