



**SAR EVALUATION REPORT**  
**CLASS II PERMISSIVE CHANGE**

**FCC 47 CFR § 2.1093**  
**IEEE Std 1528-2013**

*For*

**GSM/CDMA/WCDMA/LTE PHONE + BLUETOOTH, with DTS/UNII a/b/g/n/ac & NFC**

**FCC ID: ZNFLS991**  
**Model Name: LG-LS991, LS991, LGLS991, LG-AS991, AS991, LGAS991**

**Report Number: 15I20514-S1C**  
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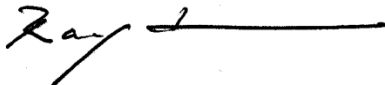
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# 1. Attestation of Test Results

Applicant Name	LG ELECTRONICS MOBILECOMM U.S.A., INC.			
FCC ID	ZNFLS991			
Model Name	LG-LS991, LS991, LGLS991, LG-AS991, AS991, LGAS991			
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)			
General population / Uncontrolled exposure	1.6			
<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	1.180	0.318	0.427	N/A
Body-worn	0.926	0.159	0.147	
Hotspot & Wi-Fi Direct	0.977		0.117	
Simultaneous Tx	1.498	1.498	1.348	
Date Tested	4/9/2015 to 4/22/2015			
Test Results	Pass			
<p>UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.</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 Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.</p>				
Approved & Released By:			Prepared By:	
				
Bobby Bayani Senior Engineer UL Verification Services Inc.			Ray Su Laboratory Technician UL Verification Services Inc.	

## 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, the following FCC Published RF exposure [KDB](#) procedures:

- 248227 D01 SAR meas for 802.11 v02
- 447498 D01 General RF Exposure Guidance v05r02
- 447498 D03 Supplement C Cross-Reference
- 648474 D04 Handset SAR v01r02
- 690783 D01 SAR Listings on Grants v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03
- 865664 D02 RF Exposure Reporting v01r01
- 941225 D01 3G SAR Procedures v03
- 941225 D05 SAR for LTE Devices v02r03
- 941225 D06 Hotspot Mode v02

## 3. Facilities and Accreditation

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

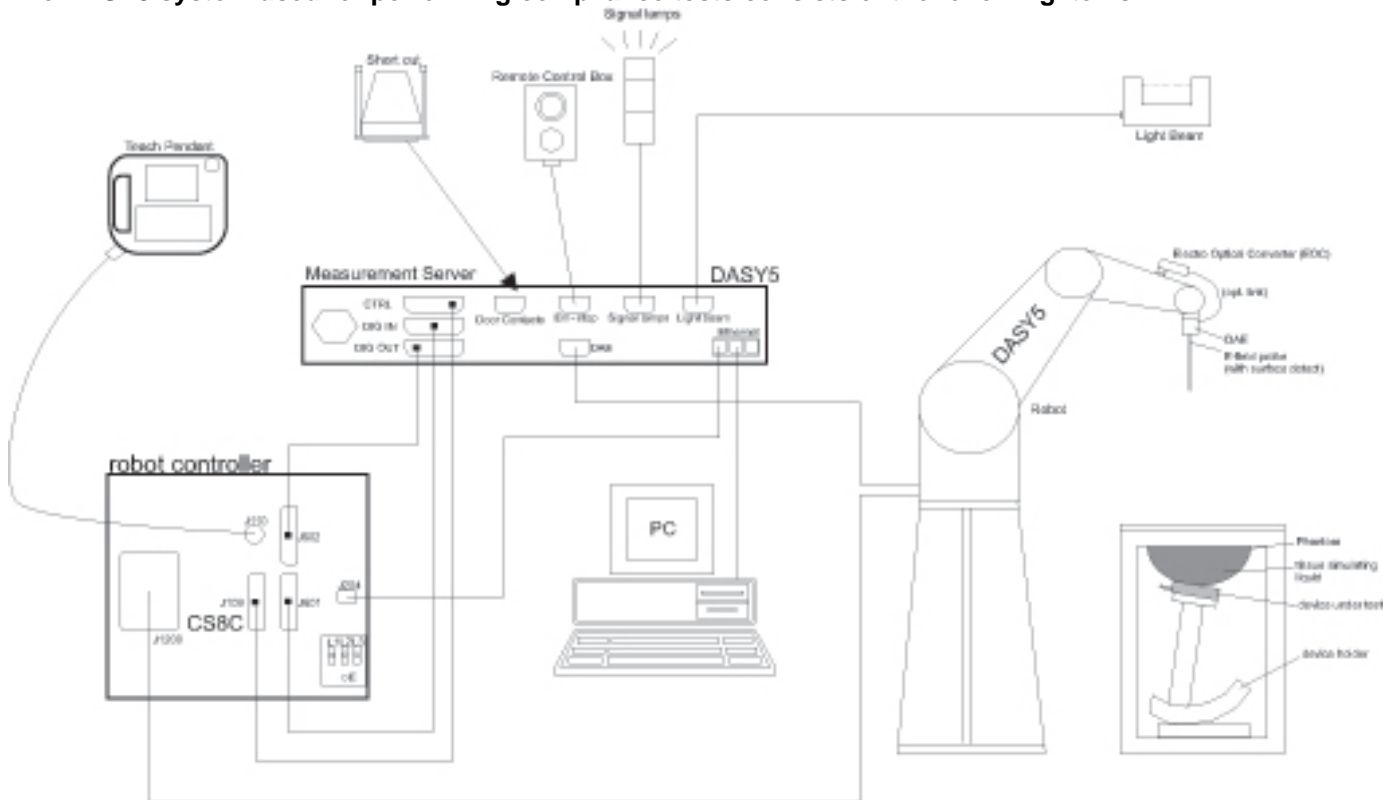
47173 Benicia Street	47266 Benicia Street
SAR Lab A	SAR Lab 1
SAR Lab B	SAR Lab 2
SAR Lab C	SAR Lab 3
SAR Lab D	SAR Lab 4
SAR Lab E	SAR Lab 5
SAR Lab F	
SAR Lab G	
SAR Lab H	

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

## 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

		$\leq 3$ GHz	$> 3$ GHz	
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$		$\leq 2$ GHz: $\leq 8$ mm 2 – 3 GHz: $\leq 5$ mm *	3 – 4 GHz: $\leq 5$ mm* 4 – 6 GHz: $\leq 4$ mm*	
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{\text{Zoom}}(n)$	$\leq 5$ mm	3 – 4 GHz: $\leq 4$ mm 4 – 5 GHz: $\leq 3$ mm 5 – 6 GHz: $\leq 2$ mm	
	graded grid	$\Delta z_{\text{Zoom}}(1)$ : between 1 <sup>st</sup> two points closest to phantom surface	$\leq 4$ mm	3 – 4 GHz: $\leq 3$ mm 4 – 5 GHz: $\leq 2.5$ mm 5 – 6 GHz: $\leq 2$ mm
		$\Delta z_{\text{Zoom}}(n>1)$ : between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
Minimum zoom scan volume	x, y, z	$\geq 30$ mm	3 – 4 GHz: $\geq 28$ mm 4 – 5 GHz: $\geq 25$ mm 5 – 6 GHz: $\geq 22$ 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 area scan based <i>1-g SAR estimation</i> procedures of KDB 447498 is $\leq 1.4$ W/kg, $\leq 8$ mm, $\leq 7$ mm and $\leq 5$ 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	8753ES	MY40001647	7/17/2015
Dielectronic Probe kit	SPEAG	DAK-3.5	1087	11/11/2015
Dielectronic Probe kit	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	Traceable Calibration Control Co.	4242	122529162	10/8/2015

#### System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Synthesized Signal Generator	Agilent	8665B	3438A00633	7/10/2015
Power Meter	HP	437B	3125U11347	8/27/2015
Power Meter	HP	437B	3125U16345	6/16/2015
Power Sensor	HP	8481A	2702A60780	6/16/2015
Power Sensor	HP	8481A	1926A16917	10/10/2015
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1808938	N/A
Bi-directional coupler	Werlatone, Inc.	C8060-102	2710	N/A
DC Power Supply	HP	6296A	2841A-05955	N/A
E-Field Probe (SAR Lab A)	SPEAG	EX3DV4	3901	1/27/2016
E-Field Probe (SAR Lab B)	SPEAG	EX3DV4	3751	11/14/2015
E-Field Probe (SAR Lab G)	SPEAG	EX3DV4	3686	2/23/2016
E-Field Probe (SAR Lab H)	SPEAG	EX3DV4	3871	8/26/2015
E-Field Probe (SAR Lab H)	SPEAG	EX3DV4	7335	3/13/2016
Data Acquisition Electronics (SAR Lab A)	SPEAG	DAE3	1357	2/20/2016
Data Acquisition Electronics (SAR Lab B)	SPEAG	DAE3	500	5/15/2015
Data Acquisition Electronics (SAR Lab G)	SPEAG	DAE4	1433	3/12/2016
Data Acquisition Electronics (SAR Lab H)	SPEAG	DAE4	1258	5/15/2015
System Validation Dipole	SPEAG	D750V3	1071	11/13/2015
System Validation Dipole	SPEAG	D835V2	4d002	11/13/2015
System Validation Dipole	SPEAG	D1750V2	1053	8/18/2015
System Validation Dipole	SPEAG	D1900V2	5d043	11/7/2015
System Validation Dipole	SPEAG	D2450V2	706	5/20/2015
System Validation Dipole	SPEAG	D2600V2	1036	3/15/2016
System Validation Dipole	SPEAG	D5GHzV2	1138	9/18/2015
System Validation Dipole	SPEAG	D5GHzV2	1003	2/20/2016

#### Other

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Power Meter	Agilent	N1912A	MY53060016	8/7/2015
Power Sensor	Agilent	N1921A	MY52020011	5/6/2015
Base Station Simulator	R & S	CMW500	135393	7/3/2015

## 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, the 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): 148.9 mm x 76.2 mm Overall Diagonal: 161 mm Display Diagonal: 139 mm
Battery Back Cover	<input checked="" type="checkbox"/> Normal Battery Cover <input checked="" type="checkbox"/> Smart Cover
Battery Options	<input checked="" type="checkbox"/> Standard – Lithium-ion battery, Rating 3.85Vdc, 11.6Wh
Accessory	Headset
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 GHz) (UNII-3 only)
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) (UNII-3 only)

## 6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode	Duty Cycle used for SAR testing
GSM	850 1900	Voice (GMSK) GPRS (GMSK) EGPRS (8PSK)	GSM Voice: 12.5%; (E)GPRS: 1 Slot: 12.5%; 2 Slots: 25%;
	GPRS Multi-Slot Class: <input type="checkbox"/> Class 8 - One Up <input checked="" type="checkbox"/> Class 10 - Two Up <input type="checkbox"/> Class 12 - Four Up <input type="checkbox"/> Class 33 - Four Up DTM (Dual Transfer Mode): Not support		
W-CDMA (UMTS)	Band II Band V	UMTS Rel. 99 (Voice & Data) HSDPA (Rel. 7) HSUPA (Rel. 6) HSPA+ (Rel. 6)	100%
CDMA2000	BC0 BC1 BC10	1xRTT (Voice & Data) 1xEV-DO Rel. 0 1xEV-DO Rev. A	100%
	Does this device SV-DO (1xRTT-1xEVDO)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
LTE (FDD)	Band 2 Band 4 Band 5 Band 12 Band 25 Band 26	QPSK 16QAM	100%
	Does this device SV-LTE (1xRTT-LTE)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
LTE (TDD)	Band 41	QPSK 16QAM	63.3%
	Does this device 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) 802.11ac (VHT20)	100%
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80)	100%
	TDWR (Terminal Doppler Weather Radar): Supported.		
	Band gap channel : Not supported		
Bluetooth	2.4 GHz	Version 4.0 LE	N/A

### 6.3. Nominal and Maximum Output Power

KDB 447498 sec.4.1.(3) 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

Upper limit (dB): -1.5 ~ 0.5		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
GSM850	Voice	32.7	33.2
	GPRS 1 slot	32.7	33.2
	GPRS 2 slots	31.2	31.7
	EGPRS 1 slot	27.2	27.7
	EGPRS 2 slots	27.2	27.7
GSM1900	Voice	28.9	29.4
	GPRS 1 slot	28.9	29.4
	GPRS 2 slots	27.2	27.7
	EGPRS 1 slot	26.2	26.7
	EGPRS 2 slots	26.2	26.7
W-CDMA Band V	R99	23.2	23.7
	HSDPA	23.2	23.7
	HSUPA	23.2	23.7
W-CDMA Band II	R99	23.2	23.7
	HSDPA	23.2	23.7
	HSUPA	23.2	23.7
CDMA BC0	1xRTT	24.7	25.2
	1xEVDO Rel. 0	24.7	25.2
	1xEVDO Rev. A	24.7	25.2
CDMA BC1	1xRTT	24.4	24.9
	1xEVDO Rel. 0	24.4	24.9
	1xEVDO Rev. A	24.4	24.9
CDMA BC10	1xRTT	24.7	25.2
	1xEVDO Rel. 0	24.7	25.2
	1xEVDO Rev. A	24.7	25.2
LTE Band 2	QPSK	23.2	23.7
LTE Band 4	QPSK	23.2	23.7
LTE Band 5	QPSK	23.2	23.7
LTE Band 12	QPSK	23.2	23.7
LTE Band 25	QPSK	23.2	23.7
LTE Band 26	QPSK	23.2	23.7
LTE Band 41	QPSK	23.2	23.7

Upper limit (dB): -1.0 ~ 1.0		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
WiFi 2.4 GHz	802.11b	15.0	<b>16.0</b>
	802.11g	14.0	<b>15.0</b>
	802.11n HT20	14.0	<b>15.0</b>
	802.11acVHT20	12.0	<b>13.0</b>
WiFi 5 GHz	802.11a	13.0	<b>14.0</b>
	802.11n HT20	13.0	<b>14.0</b>
	802.11n HT40	11.0	<b>12.0</b>
	802.11ac VHT20	12.0	<b>13.0</b>
	802.11ac VHT40	11.0	<b>12.0</b>
	802.11ac VHT80	11.0	<b>12.0</b>
Bluetooth		9.5	<b>11.0</b>
Bluetooth LE		4.5	<b>6.0</b>

### 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 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 25	Frequency range: 699 – 716 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		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	
High		20325/1747.5	20350/1750	20375/1752.5	20385/1753.5	20393/1754.3	



Item	Description																																														
Frequency range, Channel Bandwidth, Numbers and Frequencies	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	39725/ 2503.5	39700/ 2501	39675/ 2498.5																																										
	Low Mid	40185/ 2549.5	40173/ 2548.3	40160/ 2547.0	40148/ 2545.8																																										
	Mid	40620/ 2593.0	40620/ 2593.0	40620/ 2593.0	40620/ 2593.0																																										
	High Mid	41055/ 2636.5	41068/ 2547.8	41080/ 2639.0	41093/ 2640.3																																										
High	41490/ 2680.0	41515/ 2682.5	41540/ 2685.0	41565/ 2687.5																																											
LTE transmitter and antenna implementation	LTE Bands have one (2) Tx/Rx antenna Refer to Appendix A.																																														
Maximum power reduction (MPR)	<p align="center"><b>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3</b></p> <table border="1"> <thead> <tr> <th data-bbox="586 625 722 674">Modulation</th> <th colspan="6" data-bbox="722 625 1284 674">Channel bandwidth / Transmission bandwidth (RB)</th> <th data-bbox="1284 625 1395 674">MPR (dB)</th> </tr> <tr> <td data-bbox="586 674 722 722"></td> <th data-bbox="722 674 820 722">1.4 MHz</th> <th data-bbox="820 674 917 722">3.0 MHz</th> <th data-bbox="917 674 1015 722">5 MHz</th> <th data-bbox="1015 674 1112 722">10 MHz</th> <th data-bbox="1112 674 1209 722">15 MHz</th> <th data-bbox="1209 674 1307 722">20 MHz</th> <td data-bbox="1284 674 1395 722"></td> </tr> </thead> <tbody> <tr> <td data-bbox="586 722 722 751">QPSK</td> <td data-bbox="722 722 820 751">&gt; 5</td> <td data-bbox="820 722 917 751">&gt; 4</td> <td data-bbox="917 722 1015 751">&gt; 8</td> <td data-bbox="1015 722 1112 751">&gt; 12</td> <td data-bbox="1112 722 1209 751">&gt; 16</td> <td data-bbox="1209 722 1307 751">&gt; 18</td> <td data-bbox="1284 722 1395 751">≤ 1</td> </tr> <tr> <td data-bbox="586 751 722 781">16 QAM</td> <td data-bbox="722 751 820 781">≤ 5</td> <td data-bbox="820 751 917 781">≤ 4</td> <td data-bbox="917 751 1015 781">≤ 8</td> <td data-bbox="1015 751 1112 781">≤ 12</td> <td data-bbox="1112 751 1209 781">≤ 16</td> <td data-bbox="1209 751 1307 781">≤ 18</td> <td data-bbox="1284 751 1395 781">≤ 1</td> </tr> <tr> <td data-bbox="586 781 722 810">16 QAM</td> <td data-bbox="722 781 820 810">&gt; 5</td> <td data-bbox="820 781 917 810">&gt; 4</td> <td data-bbox="917 781 1015 810">&gt; 8</td> <td data-bbox="1015 781 1112 810">&gt; 12</td> <td data-bbox="1112 781 1209 810">&gt; 16</td> <td data-bbox="1209 781 1307 810">&gt; 18</td> <td data-bbox="1284 781 1395 810">≤ 2</td> </tr> </tbody> </table> <p>MPR Built-in by design A-MPR (additional MPR) was disabled during SAR testing</p>							Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)		1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz		QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)																																								
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																																									
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1																																								
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16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																								
Power reduction	No																																														
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.																																														

## 7. RF Exposure Conditions (Test Configurations)

Refer to “SAR Photos and Ant locations” Appendix for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

Wireless technologies	RF Exposure Conditions	DUT-to-User Separation	Test Position	Antenna-to-edge/surface	SAR Required	Note
WWAN ANT. 1	Head	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	10 mm	Rear	N/A	Yes	
			Front	N/A	Yes	
	Hotspot	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	
			Edge 4 (Left)	< 25 mm	Yes	
WWAN ANT. 2	Head	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	10 mm	Rear	N/A	Yes	
			Front	N/A	Yes	
	Hotspot	10 mm	Rear	< 25 mm	Yes	
			Front	< 25 mm	Yes	
			Edge 1 (Top)	> 25 mm	No	1
			Edge 2 (Right)	> 25 mm	No	1
			Edge 3 (Bottom)	< 25 mm	Yes	
			Edge 4 (Left)	< 25 mm	Yes	
WLAN ANT. 5	Head	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	10 mm	Rear	N/A	Yes	
			Front	N/A	Yes	
	Wi-Fi Direct	10 mm	Rear	< 25 mm	Yes	
			Front	< 25 mm	Yes	
			Edge 1 (Top)	< 25 mm	Yes	
			Edge 2 (Right)	< 25 mm	Yes	
			Edge 3 (Bottom)	> 25 mm	No	1
			Edge 4 (Left)	> 25 mm	No	1

### 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.

## 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 Standard 1528-2013

Refer to Table 3 within the IEEE Standard 1528-2013

**Dielectric Property Measurements Results:**

**SAR Lab A**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
4/20/2015	Head 835	e'	39.8800	Relative Permittivity ( $\epsilon_r$ ):	39.88	41.50	-3.90	5
		e"	19.0000	Conductivity ( $\sigma$ ):	0.88	0.90	-1.98	5
	Head 820	e'	40.0000	Relative Permittivity ( $\epsilon_r$ ):	40.00	41.60	-3.85	5
		e"	19.0300	Conductivity ( $\sigma$ ):	0.87	0.90	-3.43	5
	Head 850	e'	39.7200	Relative Permittivity ( $\epsilon_r$ ):	39.72	41.50	-4.29	5
		e"	19.0300	Conductivity ( $\sigma$ ):	0.90	0.92	-1.70	5
4/21/2015	Body 835	e'	53.5600	Relative Permittivity ( $\epsilon_r$ ):	53.56	55.20	-2.97	5
		e"	21.7300	Conductivity ( $\sigma$ ):	1.01	0.97	4.01	5
	Body 820	e'	53.7100	Relative Permittivity ( $\epsilon_r$ ):	53.71	55.28	-2.83	5
		e"	21.7800	Conductivity ( $\sigma$ ):	0.99	0.97	2.54	5
	Body 850	e'	53.3500	Relative Permittivity ( $\epsilon_r$ ):	53.35	55.16	-3.28	5
		e"	21.6300	Conductivity ( $\sigma$ ):	1.02	0.99	3.56	5

**SAR Lab B**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
4/9/2015	Body 2600	e'	52.6600	Relative Permittivity ( $\epsilon_r$ ):	52.66	52.51	0.28	5
		e"	14.7900	Conductivity ( $\sigma$ ):	2.14	2.16	-1.05	5
	Body 2500	e'	52.8800	Relative Permittivity ( $\epsilon_r$ ):	52.88	52.64	0.46	5
		e"	14.5100	Conductivity ( $\sigma$ ):	2.02	2.02	-0.16	5
	Body 2700	e'	52.3700	Relative Permittivity ( $\epsilon_r$ ):	52.37	52.38	-0.03	5
		e"	15.1200	Conductivity ( $\sigma$ ):	2.27	2.30	-1.36	5
4/13/2015	Head 2600	e'	38.3200	Relative Permittivity ( $\epsilon_r$ ):	38.32	39.01	-1.77	5
		e"	14.1700	Conductivity ( $\sigma$ ):	2.05	1.96	4.40	5
	Head 2500	e'	38.6800	Relative Permittivity ( $\epsilon_r$ ):	38.68	39.14	-1.17	5
		e"	13.9500	Conductivity ( $\sigma$ ):	1.94	1.85	4.59	5
	Head 2700	e'	37.9400	Relative Permittivity ( $\epsilon_r$ ):	37.94	38.88	-2.43	5
		e"	14.3800	Conductivity ( $\sigma$ ):	2.16	2.07	4.28	5
4/13/2015	Body 2600	e'	50.5100	Relative Permittivity ( $\epsilon_r$ ):	50.51	52.51	-3.81	5
		e"	14.7400	Conductivity ( $\sigma$ ):	2.13	2.16	-1.38	5
	Body 2500	e'	50.8900	Relative Permittivity ( $\epsilon_r$ ):	50.89	52.64	-3.32	5
		e"	14.5800	Conductivity ( $\sigma$ ):	2.03	2.02	0.32	5
	Body 2700	e'	50.2000	Relative Permittivity ( $\epsilon_r$ ):	50.20	52.38	-4.17	5
		e"	14.8700	Conductivity ( $\sigma$ ):	2.23	2.30	-3.00	5
4/14/2015	Head 2450	e'	39.4600	Relative Permittivity ( $\epsilon_r$ ):	39.46	39.20	0.66	5
		e"	13.8200	Conductivity ( $\sigma$ ):	1.88	1.80	4.59	5
	Head 2410	e'	39.5800	Relative Permittivity ( $\epsilon_r$ ):	39.58	39.28	0.77	5
		e"	13.7300	Conductivity ( $\sigma$ ):	1.84	1.76	4.51	5
	Head 2475	e'	39.3800	Relative Permittivity ( $\epsilon_r$ ):	39.38	39.17	0.54	5
		e"	13.8800	Conductivity ( $\sigma$ ):	1.91	1.83	4.55	5
4/14/2014	Body 2450	e'	51.7700	Relative Permittivity ( $\epsilon_r$ ):	51.77	52.70	-1.76	5
		e"	14.8700	Conductivity ( $\sigma$ ):	2.03	1.95	3.88	5
	Body 2410	e'	51.8600	Relative Permittivity ( $\epsilon_r$ ):	51.86	52.76	-1.70	5
		e"	14.7800	Conductivity ( $\sigma$ ):	1.98	1.91	3.83	5
	Body 2475	e'	51.7200	Relative Permittivity ( $\epsilon_r$ ):	51.72	52.67	-1.80	5
		e"	14.9200	Conductivity ( $\sigma$ ):	2.05	1.99	3.43	5
4/16/2015	Head 835	e'	42.0000	Relative Permittivity ( $\epsilon_r$ ):	42.00	41.50	1.20	5
		e"	19.8700	Conductivity ( $\sigma$ ):	0.92	0.90	2.50	5
	Head 820	e'	42.2600	Relative Permittivity ( $\epsilon_r$ ):	42.26	41.60	1.58	5
		e"	19.9000	Conductivity ( $\sigma$ ):	0.91	0.90	0.99	5
	Head 850	e'	41.8100	Relative Permittivity ( $\epsilon_r$ ):	41.81	41.50	0.75	5
		e"	19.8400	Conductivity ( $\sigma$ ):	0.94	0.92	2.48	5

**SAR Lab B**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
4/17/2015	Body 1750	e'	54.9200	Relative Permittivity ( $\epsilon_r$ ):	54.92	53.44	2.77	5
		e"	15.6800	Conductivity ( $\sigma$ ):	1.53	1.49	2.66	5
	Body 1710	e'	55.0600	Relative Permittivity ( $\epsilon_r$ ):	55.06	53.54	2.83	5
		e"	15.4500	Conductivity ( $\sigma$ ):	1.47	1.46	0.51	5
	Body 1755	e'	54.9000	Relative Permittivity ( $\epsilon_r$ ):	54.90	53.43	2.75	5
		e"	15.7000	Conductivity ( $\sigma$ ):	1.53	1.49	2.88	5
4/20/2015	Head 750	e'	41.1200	Relative Permittivity ( $\epsilon_r$ ):	41.12	41.96	-2.01	5
		e"	21.6400	Conductivity ( $\sigma$ ):	0.90	0.89	1.05	5
	Head 700	e'	41.7900	Relative Permittivity ( $\epsilon_r$ ):	41.79	42.22	-1.01	5
		e"	22.0500	Conductivity ( $\sigma$ ):	0.86	0.89	-3.49	5
	Head 790	e'	40.5800	Relative Permittivity ( $\epsilon_r$ ):	40.58	41.76	-2.82	5
		e"	21.3800	Conductivity ( $\sigma$ ):	0.94	0.90	4.80	5
4/20/2015	Body 750	e'	54.9100	Relative Permittivity ( $\epsilon_r$ ):	54.91	55.55	-1.15	5
		e"	23.3600	Conductivity ( $\sigma$ ):	0.97	0.96	1.15	5
	Body 700	e'	55.4400	Relative Permittivity ( $\epsilon_r$ ):	55.44	55.74	-0.54	5
		e"	23.8700	Conductivity ( $\sigma$ ):	0.93	0.96	-3.14	5
	Body 790	e'	54.4500	Relative Permittivity ( $\epsilon_r$ ):	54.45	55.39	-1.70	5
		e"	22.9600	Conductivity ( $\sigma$ ):	1.01	0.97	4.39	5
4/21/2015	Body 1750	e'	52.5200	Relative Permittivity ( $\epsilon_r$ ):	52.52	53.44	-1.72	5
		e"	15.1900	Conductivity ( $\sigma$ ):	1.48	1.49	-0.54	5
	Body 1710	e'	52.6700	Relative Permittivity ( $\epsilon_r$ ):	52.67	53.54	-1.63	5
		e"	15.1400	Conductivity ( $\sigma$ ):	1.44	1.46	-1.51	5
	Body 1755	e'	52.5300	Relative Permittivity ( $\epsilon_r$ ):	52.53	53.43	-1.68	5
		e"	15.2100	Conductivity ( $\sigma$ ):	1.48	1.49	-0.33	5

**SAR Lab G**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
4/13/2015	Head 5180	e'	35.8400	Relative Permittivity ( $\epsilon_r$ ):	35.84	36.01	-0.48	5
		e"	15.6900	Conductivity ( $\sigma$ ):	4.52	4.63	-2.41	5
	Head 5200	e'	35.8300	Relative Permittivity ( $\epsilon_r$ ):	35.83	35.99	-0.45	5
		e"	15.8600	Conductivity ( $\sigma$ ):	4.59	4.65	-1.40	5
	Head 5600	e'	35.3700	Relative Permittivity ( $\epsilon_r$ ):	35.37	35.53	-0.46	5
		e"	16.0700	Conductivity ( $\sigma$ ):	5.00	5.06	-1.11	5
	Head 5800	e'	35.0200	Relative Permittivity ( $\epsilon_r$ ):	35.02	35.30	-0.79	5
		e"	16.3700	Conductivity ( $\sigma$ ):	5.28	5.27	0.18	5
	Head 5825	e'	35.1200	Relative Permittivity ( $\epsilon_r$ ):	35.12	35.30	-0.51	5
		e"	16.3000	Conductivity ( $\sigma$ ):	5.28	5.27	0.18	5
4/16/2015	Head 5180	e'	36.5300	Relative Permittivity ( $\epsilon_r$ ):	36.53	36.01	1.44	5
		e"	15.9800	Conductivity ( $\sigma$ ):	4.60	4.63	-0.60	5
	Head 5200	e'	36.5100	Relative Permittivity ( $\epsilon_r$ ):	36.51	35.99	1.44	5
		e"	15.9900	Conductivity ( $\sigma$ ):	4.62	4.65	-0.60	5
	Head 5600	e'	35.9800	Relative Permittivity ( $\epsilon_r$ ):	35.98	35.53	1.26	5
		e"	16.2500	Conductivity ( $\sigma$ ):	5.06	5.06	-0.01	5
	Head 5800	e'	35.6700	Relative Permittivity ( $\epsilon_r$ ):	35.67	35.30	1.05	5
		e"	16.3900	Conductivity ( $\sigma$ ):	5.29	5.27	0.30	5
	Head 5825	e'	35.6600	Relative Permittivity ( $\epsilon_r$ ):	35.66	35.30	1.02	5
		e"	16.4100	Conductivity ( $\sigma$ ):	5.32	5.27	0.85	5
4/16/2015	Body 5180	e'	48.6200	Relative Permittivity ( $\epsilon_r$ ):	48.62	49.05	-0.87	5
		e"	18.1700	Conductivity ( $\sigma$ ):	5.23	5.27	-0.72	5
	Body 5200	e'	48.6200	Relative Permittivity ( $\epsilon_r$ ):	48.62	49.02	-0.82	5
		e"	18.1400	Conductivity ( $\sigma$ ):	5.24	5.29	-0.94	5
	Body 5600	e'	48.0400	Relative Permittivity ( $\epsilon_r$ ):	48.04	48.48	-0.90	5
		e"	18.2100	Conductivity ( $\sigma$ ):	5.67	5.76	-1.58	5
	Body 5800	e'	47.7600	Relative Permittivity ( $\epsilon_r$ ):	47.76	48.20	-0.91	5
		e"	18.4200	Conductivity ( $\sigma$ ):	5.94	6.00	-0.99	5
	Body 5825	e'	47.7400	Relative Permittivity ( $\epsilon_r$ ):	47.74	48.20	-0.95	5
		e"	18.4200	Conductivity ( $\sigma$ ):	5.97	6.00	-0.57	5

**SAR Lab H**

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
4/9/2015	Head 1900	e'	40.8000	Relative Permittivity ( $\epsilon_r$ ):	40.80	40.00	2.00	5
		e"	13.6500	Conductivity ( $\sigma$ ):	1.44	1.40	3.00	5
	Head 1850	e'	40.9000	Relative Permittivity ( $\epsilon_r$ ):	40.90	40.00	2.25	5
		e"	13.5500	Conductivity ( $\sigma$ ):	1.39	1.40	-0.44	5
	Head 1910	e'	40.7200	Relative Permittivity ( $\epsilon_r$ ):	40.72	40.00	1.80	5
		e"	13.7000	Conductivity ( $\sigma$ ):	1.45	1.40	3.93	5
4/9/2015	Body 1900	e'	53.3800	Relative Permittivity ( $\epsilon_r$ ):	53.38	53.30	0.15	5
		e"	14.3700	Conductivity ( $\sigma$ ):	1.52	1.52	-0.12	5
	Body 1850	e'	53.5400	Relative Permittivity ( $\epsilon_r$ ):	53.54	53.30	0.45	5
		e"	14.1800	Conductivity ( $\sigma$ ):	1.46	1.52	-4.04	5
	Body 1910	e'	53.3800	Relative Permittivity ( $\epsilon_r$ ):	53.38	53.30	0.15	5
		e"	14.3800	Conductivity ( $\sigma$ ):	1.53	1.52	0.47	5
4/13/2015	Head 1900	e'	38.8900	Relative Permittivity ( $\epsilon_r$ ):	38.89	40.00	-2.78	5
		e"	13.7300	Conductivity ( $\sigma$ ):	1.45	1.40	3.61	5
	Head 1850	e'	39.0700	Relative Permittivity ( $\epsilon_r$ ):	39.07	40.00	-2.33	5
		e"	13.6300	Conductivity ( $\sigma$ ):	1.40	1.40	0.15	5
	Head 1910	e'	38.8900	Relative Permittivity ( $\epsilon_r$ ):	38.89	40.00	-2.78	5
		e"	13.7600	Conductivity ( $\sigma$ ):	1.46	1.40	4.38	5
4/13/2015	Body 1900	e'	52.5700	Relative Permittivity ( $\epsilon_r$ ):	52.57	53.30	-1.37	5
		e"	14.8000	Conductivity ( $\sigma$ ):	1.56	1.52	2.87	5
	Body 1850	e'	52.7000	Relative Permittivity ( $\epsilon_r$ ):	52.70	53.30	-1.13	5
		e"	14.5700	Conductivity ( $\sigma$ ):	1.50	1.52	-1.40	5
	Body 1910	e'	52.6100	Relative Permittivity ( $\epsilon_r$ ):	52.61	53.30	-1.29	5
		e"	14.8300	Conductivity ( $\sigma$ ):	1.57	1.52	3.62	5
4/14/2015	Body 835	e'	54.1400	Relative Permittivity ( $\epsilon_r$ ):	54.14	55.20	-1.92	5
		e"	21.7600	Conductivity ( $\sigma$ ):	1.01	0.97	4.15	5
	Body 820	e'	54.3300	Relative Permittivity ( $\epsilon_r$ ):	54.33	55.28	-1.71	5
		e"	21.8000	Conductivity ( $\sigma$ ):	0.99	0.97	2.63	5
	Body 850	e'	53.9500	Relative Permittivity ( $\epsilon_r$ ):	53.95	55.16	-2.19	5
		e"	21.7000	Conductivity ( $\sigma$ ):	1.03	0.99	3.90	5
4/20/2015	Head 1750	e'	40.1800	Relative Permittivity ( $\epsilon_r$ ):	40.18	40.08	0.24	5
		e"	14.3700	Conductivity ( $\sigma$ ):	1.40	1.37	2.14	5
	Head 1710	e'	40.3400	Relative Permittivity ( $\epsilon_r$ ):	40.34	40.15	0.48	5
		e"	14.3600	Conductivity ( $\sigma$ ):	1.37	1.35	1.41	5
	Head 1755	e'	40.1600	Relative Permittivity ( $\epsilon_r$ ):	40.16	40.08	0.21	5
		e"	14.3900	Conductivity ( $\sigma$ ):	1.40	1.37	2.36	5
4/21/2015	Head 1900	e'	38.7800	Relative Permittivity ( $\epsilon_r$ ):	38.78	40.00	-3.05	5
		e"	13.6300	Conductivity ( $\sigma$ ):	1.44	1.40	2.85	5
	Head 1850	e'	38.9900	Relative Permittivity ( $\epsilon_r$ ):	38.99	40.00	-2.53	5
		e"	13.5500	Conductivity ( $\sigma$ ):	1.39	1.40	-0.44	5
	Head 1910	e'	38.8000	Relative Permittivity ( $\epsilon_r$ ):	38.80	40.00	-3.00	5
		e"	13.6600	Conductivity ( $\sigma$ ):	1.45	1.40	3.62	5
4/21/2015	Body 1900	e'	51.3500	Relative Permittivity ( $\epsilon_r$ ):	51.35	53.30	-3.66	5
		e"	14.8300	Conductivity ( $\sigma$ ):	1.57	1.52	3.07	5
	Body 1850	e'	51.6100	Relative Permittivity ( $\epsilon_r$ ):	51.61	53.30	-3.17	5
		e"	14.5900	Conductivity ( $\sigma$ ):	1.50	1.52	-1.26	5
	Body 1910	e'	51.3500	Relative Permittivity ( $\epsilon_r$ ):	51.35	53.30	-3.66	5
		e"	14.9200	Conductivity ( $\sigma$ ):	1.58	1.52	4.25	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  $\pm$ 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  $\geq$  15.0 cm for SAR measurements  $\leq$  3 GHz and  $\geq$  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 3 mm.  
For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was 100 mW.
- The results are normalized to 1 W input power.

**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	1071	11/13/2014	750	1g	8.22	8.52
				10g	5.39	5.64
D835V2	4d002	11/13/2014	835	1g	9.23	9.33
				10g	5.99	6.12
D1750V2	1053	8/18/2014	1750	1g	36.9	38.0
				10g	19.6	20.4
D1900V2	5d043	11/7/2014	1900	1g	40.6	40.0
				10g	21.1	21.3
D2450V2	706	5/20/2014	2450	1g	53.0	50.2
				10g	24.5	23.4
D2600V2	1036	3/15/2015	2600	1g	56.1	56.2
				10g	25.0	25.0
D5GHzV2	1138	9/18/2014	5200	1g	81.4	75.4
				10g	22.3	21.0
			5600	1g	85.1	81.9
				10g	24.2	22.6
			5800	1g	80.6	75.2
				10g	23.0	20.8
D5GHzV2	1003	2/20/2015	5200	1g	76.4	72.7
				10g	21.9	20.4
			5600	1g	79.6	77.0
				10g	22.8	21.3
			5800	1g	76.1	75.0
				10g	21.7	20.6



**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 Lab A**

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta $\pm 10\%$	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
4/20/2014	835v2	4d002	Head	1g	0.885	8.85	9.23	-4.12	
				10g	0.580	5.80	5.99	-3.17	
4/21/2015	835v2	4d002	Body	1g	0.987	9.87	9.33	5.79	1,2
				10g	0.648	6.48	6.12	5.88	

**SAR Lab B**

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta $\pm 10\%$	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
4/9/2015	D2600V2	1036	Head	1g	5.87	58.7	56.2	4.45	3,4
				10g	2.57	25.7	25.0	2.80	
4/13/2015	D2600V2	1036	Head	1g	5.55	55.5	56.1	-1.07	
				10g	2.44	24.4	25.0	-2.40	
4/13/2015	D2600V2	1036	Body	1g	5.83	58.3	56.2	3.74	
				10g	2.56	25.6	25.0	2.40	
4/14/2015	D2450V2	706	Head	1g	5.76	57.6	53.0	8.68	5,6
				10g	2.65	26.5	24.5	8.16	
4/14/2015	D2450V2	706	Body	1g	5.32	53.2	50.2	5.98	
				10g	2.45	24.5	23.4	4.70	
4/16/2015	D835V2	4d002	Head	1g	0.935	9.35	9.23	1.30	7,8
				10g	0.612	6.12	5.99	2.17	
4/17/2015	D1750V2	1053	Body	1g	4.01	40.1	38.0	5.53	9,10
				10g	2.12	21.2	20.4	3.92	
4/20/2015	D750V3	1071	Head	1g	0.800	8.00	8.22	-2.68	11,12
				10g	0.524	5.24	5.39	-2.78	
4/20/2015	D750V3	1071	Body	1g	0.863	8.63	8.52	1.29	
				10g	0.573	5.73	5.64	1.60	
4/21/2015	D1750V2	1053	Body	1g	3.94	39.4	38.0	3.68	
				10g	2.06	20.6	20.4	0.98	

**SAR Lab G**

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				
4/13/2015	D5GHzv2 (5.2GHz)	1138	Head	1g	8.13	81.3	81.4	-0.12	
				10g	2.32	23.2	23.3	-0.43	
	D5GHzv2 (5.6GHz)			1g	8.73	87.3	85.1	2.59	
				10g	2.44	24.4	24.2	0.83	
	D5GHzv2 (5.8GHz)			1g	8.16	81.6	80.6	1.24	
				10g	2.29	22.9	23.0	-0.43	
4/16/2015	D5GHzv2 (5.2GHz)	1003	Head	1g	7.58	75.8	76.4	-0.79	
				10g	2.15	21.5	21.9	-1.83	
	D5GHzv2 (5.6GHz)			1g	7.90	79.0	79.6	-0.75	
				10g	2.23	22.3	22.8	-2.19	
	D5GHzv2 (5.8GHz)			1g	8.09	80.9	76.1	6.31	
				10g	2.29	22.9	21.7	5.53	
4/16/2015	D5GHzv2 (5.2GHz)	1003	Body	1g	6.86	68.6	72.7	-5.64	13,14
				10g	1.91	19.1	20.4	-6.37	
	D5GHzv2 (5.6GHz)			1g	7.30	73.0	77.0	-5.19	
				10g	2.02	20.2	21.3	-5.16	
	D5GHzv2 (5.8GHz)			1g	7.37	73.7	75.0	-1.73	
				10g	2.03	20.3	20.6	-1.46	

**SAR Lab H**

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				
4/9/2014	D1900V2	5d043	Head	1g	4.33	43.3	40.6	6.65	
				10g	2.22	22.2	21.1	5.21	
4/9/2014	D1900V2	5d043	Body	1g	3.94	39.4	40.0	-1.50	
				10g	2.05	20.5	21.3	-3.76	
4/10/2015	D1900V2	5d043	Head	1g	4.18	41.8	40.6	2.96	
				10g	2.15	21.5	21.1	1.90	
4/10/2015	D1900V2	5d043	Body	1g	3.81	38.1	40.0	-4.75	15,16
				10g	1.97	19.7	21.3	-7.51	
4/13/2015	D1900V2	5d043	Head	1g	4.03	40.3	40.6	-0.74	
				10g	2.07	20.7	21.1	-1.90	
4/13/2015	D1900V2	5d043	Body	1g	3.99	39.9	40.0	-0.25	
				10g	2.08	20.8	21.3	-2.35	
4/14/2015	D835V2	4d002	Body	1g	0.989	9.89	9.33	6.00	17,18
				10g	0.653	6.53	6.12	6.70	
4/20/015	D1750V2	1053	Head	1g	3.45	34.5	36.9	-6.50	19,20
				10g	1.85	18.5	19.6	-5.61	
4/13/2015	D1900V2	5d043	Head	1g	4.02	40.2	40.6	-0.99	
				10g	2.06	20.6	21.1	-2.37	
4/13/2015	D1900V2	5d043	Body	1g	4.05	40.5	40.0	1.25	
				10g	2.10	21.0	21.3	-1.41	

## 9. Conducted Output Power Measurements

### 9.1. GSM

#### GSM850 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Burst Pwr (dBm)	Frame Pwr (dBm)	
850	GSM (Voice)	CS1	1	128	824.2	33.2	24.2	
				190	836.6	33.2	24.2	
				251	848.8	33.2	24.2	
	GPRS (GMSK)	CS1	1	1	128	824.2	33.2	24.2
					190	836.6	33.2	24.2
					251	848.8	33.2	24.2
			2	1	128	824.2	31.5	25.5
					190	836.6	31.5	25.5
					251	848.8	31.1	25.1
	EGPRS (8PSK)	MCS5	1	1	128	824.2	27.7	18.7
					190	836.6	27.7	18.7
					251	848.8	27.7	18.7
2			1	128	824.2	27.7	18.7	
				190	836.6	27.6	18.6	
				251	848.8	27.6	18.6	

#### Notes:

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

- Head & Body-worn Accessory: GMSK Voice Mode
- Hotspot mode: GMSK (GPRS) mode with 2 time slots, based on the output power measurements above
- SAR is not required for EGPRS (8PSK) mode because its output power is less than that of GPRS Mode

#### GSM1900 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Burst Pwr (dBm)	Frame Pwr (dBm)	
1900	GSM (Voice)	CS1	1	512	1850.2	29.4	20.4	
				661	1880.0	29.4	20.4	
				810	1909.8	29.4	20.4	
	GPRS (GMSK)	CS1	1	1	512	1850.2	29.4	20.4
					661	1880.0	29.4	20.4
					810	1909.8	29.4	20.4
			2	1	512	1850.2	27.7	21.7
					661	1880.0	27.7	21.7
					810	1909.8	27.7	21.7
	EGPRS (8PSK)	MCS5	1	1	512	1850.2	26.7	17.7
					661	1880.0	26.7	17.7
					810	1909.8	26.7	17.7
2			1	512	1850.2	26.6	17.6	
				661	1880.0	26.5	17.5	
				810	1909.8	26.6	17.6	

#### Notes:

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

- Head & Body-worn Accessory: GMSK Voice Mode
- Hotspot mode: GMSK (GPRS) mode with 2 time slots, based on the output power measurements above
- SAR is not required for EGPRS (8PSK) mode because its output power is less than that of GPRS Mode

## 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 7 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

Mode	Subtest	HSDPA	HSDPA	HSDPA	HSDPA
		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	12/15	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 section 5.2 of 3GPP TS34.121. 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	15/1
	$\beta_{hs}$	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	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E-TFCIs	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	

**HSPA+**

Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., CAT 6 Rel 6. Therefore, the RF conducted power is not measured.

**Measured Results**

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Avg Pwr (dBm)	
W-CDMA Band II	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	23.7	
			9400	1880.0	N/A	23.7	
			9538	1907.6	N/A	23.7	
	HSDPA	Subtest 1	9262	1852.4	0	23.7	
			9400	1880.0	0	23.7	
			9538	1907.6	0	23.7	
		Subtest 2	9262	1852.4	0	23.7	
			9400	1880.0	0	23.7	
			9538	1907.6	0	23.7	
		Subtest 3	9262	1852.4	0.5	22.4	
			9400	1880.0	0.5	22.3	
			9538	1907.6	0.5	22.6	
		Subtest 4	9262	1852.4	0.5	21.8	
			9400	1880.0	0.5	22.6	
			9538	1907.6	0.5	21.8	
		HSUPA	Subtest 1	9262	1852.4	0	21.8
				9400	1880.0	0	21.8
				9538	1907.6	0	21.8
	Subtest 2		9262	1852.4	2	21.7	
			9400	1880.0	2	21.7	
			9538	1907.6	2	21.7	
	Subtest 3		9262	1852.4	1	21.5	
			9400	1880.0	1	21.0	
			9538	1907.6	1	21.9	
	Subtest 4		9262	1852.4	2	21.7	
			9400	1880.0	2	21.7	
			9538	1907.6	2	21.7	
	Subtest 5		9262	1852.4	0	23.7	
			9400	1880.0	0	23.7	
			9538	1907.6	0	23.7	

**Measured Results**

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Avg Pwr (dBm)	
W-CDMA Band V	Rel 99	RMC, 12.2 kbps	4132	826.4	N/A	23.7	
			4183	836.6	N/A	23.7	
			4233	846.6	N/A	23.7	
	HSDPA	Subtest 1	4132	826.4	0	23.7	
			4183	836.6	0	23.7	
			4233	846.6	0	23.7	
		Subtest 2	4132	826.4	0	23.7	
			4183	836.6	0	23.7	
			4233	846.6	0	23.7	
		Subtest 3	4132	826.4	0.5	23.3	
			4183	836.6	0.5	23.3	
			4233	846.6	0.5	23.2	
		Subtest 4	4132	826.4	0.5	23.3	
			4183	836.6	0.5	23.2	
			4233	846.6	0.5	23.2	
		HSUPA	Subtest 1	4132	826.4	0	21.7
				4183	836.6	0	21.7
				4233	846.6	0	21.7
	Subtest 2		4132	826.4	2	21.7	
			4183	836.6	2	21.7	
			4233	846.6	2	21.7	
	Subtest 3		4132	826.4	1	21.5	
			4183	836.6	1	21.4	
			4233	846.6	1	21.8	
	Subtest 4		4132	826.4	2	21.7	
			4183	836.6	2	21.7	
			4233	846.6	2	21.7	
	Subtest 5		4132	826.4	0	23.7	
			4183	836.6	0	23.7	
			4233	846.6	0	23.7	

### 9.3. CDMA

#### Call box setup procedure

- Protocol Rev > 6 (IS-2000-0)
- System ID: 331; NID: 65535, Reg. Ch. #.:
- Radio Config (RC) > Fwd11,Rvs8
- Service Option (SO) Setup > SO75 (Loopback)
- Traffic Data Rate > Full
- Rvs Power Ctrl > All Up bits (Maximum TxPout)
- Reverse Power Control Mode: 00-200 to 400 bps
- Smart blanking was disabled.

#### Measured Results

Band	Mode	Ch No.	Freq. (MHz)	Avg Pwr (dBm)	
BC 0	1xRTT	RC1 SO55 (Loopback)	1013	824.70	25.2
			384	836.52	25.2
			777	848.31	25.2
		RC3 SO55 (Loopback)	1013	824.70	25.2
			384	836.52	25.2
			777	848.31	25.2
		RC3 SO32 (+F-SCH)	1013	824.70	25.2
			384	836.52	25.2
			777	848.31	25.2
	1xEVDO Rel. 0	FTAP Rate: 307.2 kbps(2 slot, QPSK) RTAP Rate: 153.6 kbps	1013	824.70	25.0
			384	836.52	24.9
			777	848.31	24.9
			1013	824.70	24.9
			384	836.52	24.9
			777	848.31	24.8



**Measured Results**

Band	Mode		Ch No.	Freq. (MHz)	Avg Pwr (dBm)
BC 1	1xRTT	RC1 SO55 (Loopback)	25	1851.25	24.9
			600	1880.00	24.9
			1175	1908.75	24.9
		RC3 SO55 (Loopback)	25	1851.25	24.9
			600	1880.00	24.9
			1175	1908.75	24.9
		RC3 SO32 (+F-SCH)	25	1851.25	24.9
			600	1880.00	24.9
			1175	1908.75	24.9
	1xEVDO Rel. 0	FTAP Rate: 307.2 kbps(2 slot, QPSK) RTAP Rate: 153.6 kbps	25	1851.25	24.9
			600	1880.00	24.9
			1175	1908.75	24.9
	1xEVDO Rev. A	FETAP: 307.2k, QPSK/ ACK RETAP: 4096	25	1851.25	24.9
			600	1880.00	24.9
			1175	1908.75	24.8
Band	Mode		Ch No.	Freq. (MHz)	Avg Pwr (dBm)
BC 10	1xRTT	RC1 SO55 (Loopback)	476	817.9	25.2
			580	820.5	25.2
			684	823.1	25.2
		RC3 SO55 (Loopback)	476	817.9	25.2
			580	820.5	25.2
			684	823.1	25.2
		RC3 SO32 (+F-SCH)	476	817.9	25.2
			580	820.5	25.2
			684	823.1	25.2
	1xEVDO Rel. 0	FTAP Rate: 307.2 kbps(2 slot, QPSK) RTAP Rate: 153.6 kbps	476	817.9	25.1
			580	820.5	25.1
			684	823.1	25.1
	1xEVDO Rev. A	FETAP: 307.2k, QPSK/ ACK RETAP: 4096	476	817.9	25.0
			580	820.5	25.0
			684	823.1	25.0

### 9.4. LTE

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

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

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

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

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS\_01".

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

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks ( $N_{RB}$ )	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
				> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 <sup>1</sup>	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

**LTE Band 2 Measured Results**

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							18700	18900	19100
							1860 MHz	1880 MHz	1900 MHz
LTE Band 2	20	QPSK	1	0	0	0	23.7	23.7	23.6
			1	49	0	0	23.7	23.7	23.5
			1	99	0	0	23.7	22.7	23.6
			50	0	1	1	22.7	22.7	22.6
			50	24	1	1	22.7	22.7	22.6
			50	50	1	1	22.7	22.6	22.6
			100	0	1	1	22.7	22.6	22.6
		16QAM	1	0	1	1	22.7	22.7	22.4
			1	49	1	1	22.7	22.6	22.1
			1	99	1	1	22.7	22.5	22.1
			50	0	2	2	21.7	21.7	21.6
			50	24	2	2	21.7	21.6	21.5
			50	50	2	2	21.7	21.6	21.5
			100	0	2	2	21.7	21.6	21.7
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							18675	18900	19125
							1857.5 MHz	1880 MHz	1902.5 MHz
LTE Band 2	15	QPSK	1	0	0	0	23.6	23.6	23.6
			1	37	0	0	23.4	23.5	23.6
			1	74	0	0	23.6	23.5	23.6
			36	0	1	1	22.7	22.7	22.5
			36	20	1	1	22.7	22.6	22.6
			36	39	1	1	22.7	22.6	22.6
			75	0	1	1	22.7	22.6	22.6
		16QAM	1	0	1	1	22.2	22.1	22.2
			1	37	1	2	22.1	22.0	22.0
			1	74	1	2	22.1	22.0	22.0
			36	0	2	2	21.7	21.7	21.5
			36	20	2	2	21.7	21.7	21.6
			36	39	2	2	21.7	21.7	21.6
			75	0	2	2	21.7	21.7	21.6
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							18650	18900	19150
							1855 MHz	1880 MHz	1905 MHz
LTE Band 2	10	QPSK	1	0	0	0	23.7	23.7	23.7
			1	25	0	0	23.7	23.7	23.7
			1	49	0	0	23.7	23.7	23.5
			25	0	1	1	22.7	22.7	22.6
			25	12	1	1	22.7	22.7	22.6
			25	25	1	1	22.6	22.7	22.5
			50	0	1	1	22.7	22.7	22.6
		16QAM	1	0	1	1	22.4	22.3	22.0
			1	25	1	2	22.2	22.1	22.0
			1	49	1	2	22.2	22.2	21.8
			25	0	2	2	21.7	21.7	21.7
			25	12	2	2	21.7	21.7	21.7
			25	25	2	2	21.7	21.7	21.6
			50	0	2	2	21.7	21.7	21.6

**LTE Band 2 Measured Results (continued)**

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							18625	18900	19175
							1852.5 MHz	1880 MHz	1907.5 MHz
LTE Band 2	5	QPSK	1	0	0	0	23.7	23.7	23.6
			1	12	0	0	23.6	23.7	23.4
			1	24	0	0	23.7	23.7	23.5
			12	0	1	1	22.7	22.7	22.5
			12	7	1	1	22.7	22.7	22.6
			12	13	1	1	22.7	22.6	22.5
			25	0	1	1	22.7	22.6	22.5
		16QAM	1	0	1	1	22.0	22.0	22.5
			1	12	1	1	21.9	22.0	22.5
			1	24	1	1	21.9	22.0	22.4
			12	0	2	2	21.7	21.7	21.6
			12	7	2	2	21.7	21.7	21.6
			12	13	2	2	21.7	21.7	21.6
			25	0	2	2	21.7	21.7	21.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							18615	18900	19185
							1851.5 MHz	1880 MHz	1908.5 MHz
LTE Band 2	3	QPSK	1	0	0	0	23.7	23.6	23.7
			1	8	0	0	23.7	23.6	23.6
			1	14	0	0	23.7	23.6	23.7
			8	0	1	1	22.7	22.6	22.6
			8	4	1	1	22.7	22.7	22.5
			8	7	1	1	22.6	22.6	22.5
			15	0	1	1	22.7	22.6	22.5
		16QAM	1	0	1	2	22.1	22.0	21.9
			1	8	1	2	22.1	22.0	21.7
			1	14	1	2	22.1	22.1	21.9
			8	0	2	2	21.7	21.7	21.5
			8	4	2	2	21.7	21.7	21.5
			8	7	2	2	21.7	21.7	21.4
			15	0	2	2	21.7	21.7	21.4
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							18607	18900	19193
							1850.7 MHz	1880 MHz	1909.3 MHz
LTE Band 2	1.4	QPSK	1	0	0	0	23.7	23.7	23.6
			1	3	0	0	23.7	23.7	23.7
			1	5	0	0	23.7	23.7	23.7
			3	0	0	0	23.6	23.6	23.4
			3	1	0	0	23.6	23.6	23.7
			3	3	0	0	23.6	23.6	23.5
			6	0	1	1	22.6	22.6	22.5
		16QAM	1	0	1	2	22.1	21.9	21.7
			1	3	1	2	22.1	22.1	22.0
			1	5	1	2	22.1	22.0	21.7
			3	0	1	2	22.2	22.1	21.9
			3	1	1	1	22.3	22.2	22.0
			3	3	1	2	22.2	22.2	22.0
			6	0	2	2	21.7	21.7	21.6

**LTE Band 4 Measured Results**

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							20050	20175	20300
							1720 MHz	1732.5 MHz	1745 MHz
LTE Band 4	20	QPSK	1	0	0	0	23.7	23.7	23.7
			1	49	0	0	23.7	23.7	23.7
			1	99	0	0	23.7	23.7	23.6
			50	0	1	1	22.7	22.7	22.7
			50	24	1	1	22.7	22.6	22.7
			50	50	1	1	22.7	22.6	22.7
			100	0	1	1	22.7	22.7	22.7
		16QAM	1	0	1	1	22.7	22.7	22.7
			1	49	1	1	22.7	22.7	22.4
			1	99	1	1	22.7	22.7	22.3
			50	0	2	2	21.7	21.7	21.7
			50	24	2	2	21.7	21.6	21.6
			50	50	2	2	21.6	21.6	21.6
			100	0	2	2	21.7	21.7	21.7
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							20025	20175	20325
							1717.5 MHz	1732.5 MHz	1747.5 MHz
LTE Band 4	15	QPSK	1	0	0	0	23.7	23.7	23.7
			1	37	0	0	23.7	23.6	23.6
			1	74	0	0	23.6	23.6	23.5
			36	0	1	1	22.6	22.7	22.6
			36	20	1	1	22.6	22.6	22.6
			36	39	1	1	22.6	22.6	22.6
			75	0	1	1	22.6	22.6	22.6
		16QAM	1	0	1	1	22.2	22.4	22.3
			1	37	1	2	22.1	22.2	22.2
			1	74	1	2	22.1	22.1	22.0
			36	0	2	2	21.6	21.7	21.7
			36	20	2	2	21.7	21.6	21.7
			36	39	2	2	21.7	21.6	21.6
			75	0	2	2	21.7	21.6	21.7
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							20000	20175	20350
							1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4	10	QPSK	1	0	0	0	23.7	23.7	23.7
			1	25	0	0	23.7	23.7	23.7
			1	49	0	0	23.7	23.7	23.6
			25	0	1	1	22.7	22.6	22.5
			25	12	1	1	22.6	22.6	22.5
			25	25	1	1	22.6	22.6	22.5
			50	0	1	1	22.6	22.6	22.5
		16QAM	1	0	1	1	22.6	22.6	22.3
			1	25	1	1	22.3	22.3	22.1
			1	49	1	1	22.3	22.3	22.1
			25	0	2	2	21.7	21.7	21.7
			25	12	2	2	21.7	21.7	21.7
			25	25	2	2	21.7	21.7	21.6
			50	0	2	2	21.7	21.7	21.6

**LTE Band 4 Measured Results (continued)**

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							19975	20175	20375
							1712.5 MHz	1732.5 MHz	1752.5 MHz
LTE Band 4	5	QPSK	1	0	0	0	23.7	23.7	23.6
			1	12	0	0	23.7	23.6	23.5
			1	24	0	0	23.7	23.7	23.5
			12	0	1	1	22.6	22.6	22.6
			12	7	1	1	22.6	22.6	22.5
			12	13	1	1	22.6	22.6	22.5
			25	0	1	1	22.6	22.6	22.5
		16QAM	1	0	1	1	22.1	22.1	22.7
			1	12	1	1	22.1	22.1	22.7
			1	24	1	1	22.0	22.1	22.7
			12	0	2	2	21.6	21.6	21.7
			12	7	2	2	21.6	21.7	21.6
			12	13	2	2	21.7	21.7	21.6
			25	0	2	2	21.7	21.7	21.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							19965	20175	20385
							1711.5 MHz	1732.5 MHz	1753.5 MHz
LTE Band 4	3	QPSK	1	0	0	0	23.7	23.7	23.7
			1	8	0	0	23.7	23.7	23.7
			1	14	0	0	23.7	23.7	23.7
			8	0	1	1	22.6	22.6	22.5
			8	4	1	1	22.6	22.6	22.5
			8	7	1	1	22.6	22.6	22.5
			15	0	1	1	22.6	22.6	22.6
		16QAM	1	0	1	1	22.2	22.3	22.1
			1	8	1	1	22.3	22.3	22.0
			1	14	1	2	22.2	22.2	22.0
			8	0	2	2	21.6	21.6	21.5
			8	4	2	2	21.7	21.7	21.5
			8	7	2	2	21.7	21.6	21.5
			15	0	2	2	21.7	21.7	21.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							19957	20175	20393
							1710.7 MHz	1732.5 MHz	1754.3 MHz
LTE Band 4	1.4	QPSK	1	0	0	0	23.7	23.7	23.7
			1	3	0	0	23.7	23.7	23.7
			1	5	0	0	23.7	23.7	23.7
			3	0	0	0	23.6	23.6	23.6
			3	1	0	0	23.7	23.7	23.7
			3	3	0	0	23.7	23.6	23.6
			6	0	1	1	22.5	22.6	22.7
		16QAM	1	0	1	2	22.1	22.1	22.0
			1	3	1	1	22.3	22.3	22.2
			1	5	1	2	22.2	22.2	22.0
			3	0	1	1	22.3	22.3	22.2
			3	1	1	1	22.4	22.4	22.2
			3	3	1	1	22.3	22.4	22.2
			6	0	2	2	21.7	21.7	21.7

**LTE Band 5 Measured Results**

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)					
							20450	20525	20600			
							829 MHz	836.5 MHz	844 MHz			
LTE Band 5	10	QPSK	1	0	0	0	23.6	23.6	23.5			
			1	25	0	0	23.5	23.6	23.5			
			1	49	0	0	23.5	23.4	23.4			
			25	0	1	1	22.5	22.6	22.5			
			25	12	1	1	22.5	22.6	22.5			
			25	25	1	1	22.5	22.5	22.5			
			50	0	1	1	22.5	22.5	22.5			
		16QAM	1	0	1	1	22.3	22.5	22.1			
			1	25	1	1	22.0	22.4	22.0			
			1	49	1	1	22.2	22.3	21.8			
			25	0	2	2	21.6	21.7	21.6			
			25	12	2	2	21.6	21.6	21.6			
			25	25	2	2	21.6	21.5	21.6			
			50	0	2	2	21.7	21.5	21.6			
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)					
							20425	20525	20625			
							826.5 MHz	836.5 MHz	846.5 MHz			
LTE Band 5	5	QPSK	1	0	0	0	23.6	23.6	23.5			
			1	12	0	0	23.5	23.6	23.3			
			1	24	0	0	23.5	23.5	23.4			
			12	0	1	1	22.4	22.5	22.5			
			12	7	1	1	22.5	22.5	22.6			
			12	13	1	1	22.5	22.5	22.5			
			25	0	1	1	22.4	22.4	22.5			
		16QAM	1	0	1	1	21.7	21.8	22.6			
			1	12	1	1	21.8	21.8	22.6			
			1	24	1	1	21.7	21.8	22.5			
			12	0	2	2	21.5	21.5	21.6			
			12	7	2	2	21.6	21.5	21.6			
			12	13	2	2	21.5	21.5	21.6			
			25	0	2	2	21.5	21.6	21.4			
			Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
										20415	20525	20635
825.5 MHz	836.5 MHz	847.5 MHz										
LTE Band 5	3	QPSK	1	0	0	0	23.5	23.5	23.5			
			1	8	0	0	23.5	23.5	23.5			
			1	14	0	0	23.5	23.5	23.6			
			8	0	1	1	22.5	22.5	22.4			
			8	4	1	1	22.5	22.5	22.5			
			8	7	1	1	22.4	22.5	22.5			
			15	0	1	1	22.5	22.5	22.4			
		16QAM	1	0	1	2	22.0	22.0	21.8			
			1	8	1	2	22.0	21.9	21.8			
			1	14	1	2	22.0	22.1	21.9			
			8	0	2	2	21.5	21.5	21.4			
			8	4	2	2	21.5	21.6	21.5			
			8	7	2	2	21.5	21.5	21.5			
			15	0	2	2	21.5	21.5	21.4			

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

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							20407	20525	20643
							824.7 MHz	836.5 MHz	848.3 MHz
LTE Band 5	1.4	QPSK	1	0	0	0	23.5	23.5	23.4
			1	3	0	0	23.5	23.5	23.5
			1	5	0	0	23.5	23.5	23.5
			3	0	0	0	23.4	23.4	23.4
			3	1	0	0	23.5	23.5	23.4
			3	3	0	0	23.4	23.4	23.4
			6	0	1	1	22.5	22.4	22.5
		16QAM	1	0	1	2	21.9	21.8	21.8
			1	3	1	2	22.0	22.0	22.0
			1	5	1	2	21.9	22.0	22.0
			3	0	1	1	22.1	22.1	22.0
			3	1	1	1	22.2	22.2	22.1
			3	3	1	1	22.1	22.1	22.1
			6	0	2	2	21.7	21.6	21.7



**LTE Band 12 Measured Results**

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)					
							23060	23095	23130			
							704 MHz	707.5 MHz	711 MHz			
LTE Band 12	10	QPSK	1	0	0	0	23.4	23.4	23.4			
			1	25	0	0	23.4	23.3	23.3			
			1	49	0	0	23.3	23.2	23.2			
			25	0	1	1	22.2	22.3	22.3			
			25	12	1	1	22.2	22.2	22.3			
			25	25	1	1	22.1	22.1	22.3			
			50	0	1	1	22.1	22.1	22.1			
		16QAM	1	0	1	1	22.0	22.2	22.0			
			1	25	1	1	22.0	21.9	21.8			
			1	49	1	2	21.8	21.9	21.8			
			25	0	2	2	21.3	21.4	21.3			
			25	12	2	2	21.2	21.3	21.4			
			25	25	2	2	21.2	21.2	21.3			
			50	0	2	2	21.1	21.1	21.1			
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)					
							23035	23095	23155			
							701.5 MHz	707.5 MHz	713.5 MHz			
LTE Band 12	5	QPSK	1	0	0	0	23.3	23.4	23.3			
			1	12	0	0	23.2	23.2	23.2			
			1	24	0	0	23.3	23.3	23.2			
			12	0	1	1	22.2	22.2	22.2			
			12	6	1	1	22.2	22.2	22.2			
			12	11	1	1	22.2	22.1	22.2			
			25	0	1	1	22.1	22.1	22.1			
		16QAM	1	0	1	1	21.7	21.8	22.0			
			1	12	1	1	21.8	21.8	22.2			
			1	24	1	1	21.7	21.7	22.0			
			12	0	2	2	21.2	21.1	21.4			
			12	6	2	2	21.2	21.1	21.3			
			12	11	2	2	21.1	21.0	21.2			
			25	0	2	2	21.2	21.1	21.1			
			Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
										23025	23095	23165
700.5 MHz	707.5 MHz	714.5 MHz										
LTE Band 12	3	QPSK	1	0	0	0	23.30	23.40	23.40			
			1	7	0	0	23.30	23.30	23.40			
			1	14	0	0	23.30	23.30	23.30			
			8	0	1	1	22.20	22.20	22.20			
			8	4	1	1	22.20	22.20	22.30			
			8	7	1	1	22.20	22.10	22.20			
			15	0	1	1	22.20	22.10	22.20			
		16QAM	1	0	1	2	21.70	21.70	21.80			
			1	7	1	2	21.70	21.70	21.70			
			1	14	1	2	21.70	21.70	21.70			
			8	0	2	2	21.20	21.20	21.10			
			8	4	2	2	21.20	21.10	21.20			
			8	7	2	2	21.30	21.10	21.10			
			15	0	2	2	21.20	21.10	21.10			

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

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							23017	23095	23173
							699.7 MHz	707.5 MHz	715.3 MHz
LTE Band 12	1.4	QPSK	1	0	0	0	23.4	23.4	23.4
			1	2	0	0	23.4	23.4	23.4
			1	5	0	0	23.4	23.3	23.4
			3	0	0	0	23.3	23.2	23.3
			3	1	0	0	23.3	23.3	23.3
			3	2	0	0	23.3	23.3	23.3
			6	0	1	1	22.2	22.1	22.1
		16QAM	1	0	1	1	22.0	21.8	21.7
			1	2	1	2	21.8	21.7	21.7
			1	5	1	2	21.7	21.7	21.7
			3	0	1	2	21.8	21.8	21.8
			3	1	1	2	21.9	21.9	21.7
			3	2	1	2	21.8	21.8	21.7
			6	0	2	2	21.3	21.2	21.3

**LTE Band 25 Measured Results**

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							26140	26365	26590
							1860 MHz	1882.5 MHz	1905 MHz
LTE Band 25	20	QPSK	1	0	0	0	23.7	23.7	23.7
			1	50	0	0	23.7	23.6	23.6
			1	99	0	0	23.7	23.6	23.5
			50	0	1	1	22.5	22.5	22.5
			50	25	1	1	22.5	22.5	22.5
			50	50	1	1	22.5	22.4	22.5
			100	0	1	1	22.5	22.5	22.5
		16QAM	1	0	1	1	22.7	22.7	22.5
			1	50	1	1	22.7	22.7	22.4
			1	99	1	1	22.7	22.7	22.3
			50	0	2	2	21.7	21.5	21.5
			50	25	2	2	21.6	21.5	21.5
			50	50	2	2	21.7	21.5	21.5
			100	0	2	2	21.7	21.5	21.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							26115	26365	26615
							1857.5 MHz	1882.5 MHz	1907.5 MHz
LTE Band 25	15	QPSK	1	0	0	0	23.7	23.5	23.7
			1	36	0	0	23.7	23.5	23.7
			1	74	0	0	23.6	23.5	23.7
			36	0	1	1	22.5	22.4	22.5
			36	18	1	1	22.5	22.5	22.5
			36	37	1	1	22.5	22.4	22.5
			75	0	1	1	22.5	22.4	22.6
		16QAM	1	0	1	2	22.2	22.2	22.2
			1	36	1	2	22.1	22.0	22.2
			1	74	1	2	22.1	22.1	22.1
			36	0	2	2	21.6	21.5	21.5
			36	18	2	2	21.5	21.5	21.5
			36	37	2	2	21.5	21.4	21.6
			75	0	2	2	21.6	21.4	21.6
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							26090	26365	26640
							1855 MHz	1882.5 MHz	1910 MHz
LTE Band 25	10	QPSK	1	0	0	0	23.7	23.7	23.7
			1	25	0	0	23.7	23.7	23.7
			1	49	0	0	23.7	23.7	23.7
			25	0	1	1	22.7	22.7	22.7
			25	12	1	1	22.7	22.7	22.7
			25	25	1	1	22.7	22.7	22.7
			50	0	1	1	22.7	22.7	22.7
		16QAM	1	0	1	1	22.5	22.5	22.3
			1	25	1	1	22.4	22.3	22.6
			1	49	1	1	22.3	22.3	22.2
			25	0	2	2	21.7	21.7	21.7
			25	12	2	2	21.7	21.7	21.7
			25	25	2	2	21.7	21.7	21.7
			50	0	2	2	21.7	21.7	21.7

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

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							26065	26365	26665
							1852.5 MHz	1882.5 MHz	1912.5 MHz
LTE Band 25	5	QPSK	1	0	0	0	23.7	23.7	23.7
			1	12	0	0	23.7	23.7	23.7
			1	24	0	0	23.7	23.7	23.7
			12	0	1	1	22.7	22.6	22.7
			12	6	1	1	22.7	22.6	22.7
			12	11	1	1	22.7	22.7	22.6
			25	0	1	1	22.6	22.7	22.7
		16QAM	1	0	1	1	22.1	22.1	22.7
			1	12	1	1	22.1	22.2	22.7
			1	24	1	1	22.1	22.2	22.7
			12	0	2	2	21.7	21.6	21.7
			12	6	2	2	21.6	21.6	21.7
			12	11	2	2	21.7	21.6	21.7
			25	0	2	2	21.7	21.7	21.7
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							26055	26365	26675
							1851.5 MHz	1882.5 MHz	1913.5 MHz
LTE Band 25	3	QPSK	1	0	0	0	23.7	23.7	23.7
			1	7	0	0	23.7	23.7	23.7
			1	14	0	0	23.7	23.7	23.7
			8	0	1	1	22.6	22.6	22.6
			8	4	1	1	22.7	22.6	22.6
			8	7	1	1	22.6	22.7	22.6
			15	0	1	1	22.6	22.7	22.6
		16QAM	1	0	1	1	22.3	22.2	22.3
			1	7	1	1	22.3	22.4	22.2
			1	14	1	1	22.3	22.3	22.1
			8	0	2	2	21.7	21.7	21.7
			8	4	2	2	21.7	21.7	21.7
			8	7	2	2	21.7	21.7	21.7
			15	0	2	2	21.7	21.7	21.7
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							26047	26365	26683
							1850.7 MHz	1882.5 MHz	1914.3 MHz
LTE Band 25	1.4	QPSK	1	0	0	0	23.7	23.7	23.7
			1	2	0	0	23.7	23.7	23.7
			1	5	0	0	23.7	23.7	23.7
			3	0	0	0	23.6	23.6	23.6
			3	1	0	0	23.7	23.6	23.7
			3	2	0	0	23.7	23.7	23.7
			6	0	1	1	22.6	22.5	22.6
		16QAM	1	0	1	2	22.2	22.1	22.1
			1	2	1	1	22.2	22.2	22.3
			1	5	1	1	22.2	22.3	22.1
			3	0	1	1	22.3	22.3	22.3
			3	1	1	1	22.5	22.4	22.4
			3	2	1	1	22.4	22.5	22.3
			6	0	2	2	21.7	21.7	21.7

**LTE Band 26 Measured Results**

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							26765	26865	26965
							821.5 MHz	831.5 MHz	841.5 MHz
LTE Band 26	15	QPSK	1	0	0	0	23.6	23.6	23.6
			1	37	0	0	23.3	23.4	23.6
			1	74	0	0	23.4	23.4	23.5
			36	0	1	1	22.5	22.6	22.5
			36	20	1	1	22.5	22.5	22.5
			36	39	1	1	22.4	22.4	22.5
		16QAM	75	0	1	1	22.4	22.4	22.4
			1	0	1	2	22.1	22.1	22.1
			1	37	1	2	22.0	22.1	22.1
			1	74	1	2	21.9	22.0	22.0
			36	0	2	2	21.5	21.6	21.5
			36	20	2	2	21.5	21.6	21.5
			36	39	2	2	21.5	21.5	21.5
			75	0	2	2	21.4	21.4	21.4
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							26740	26865	26990
							819 MHz	831.5 MHz	844 MHz
LTE Band 26	10	QPSK	1	0	0	0	23.6	23.6	23.6
			1	25	0	0	23.6	23.6	23.6
			1	49	0	0	23.6	23.5	23.5
			25	0	1	1	22.5	22.6	22.5
			25	12	1	1	22.5	22.6	22.6
			25	25	1	1	22.5	22.5	22.6
		16QAM	50	0	1	1	22.5	22.4	22.5
			1	0	1	1	22.3	22.3	21.9
			1	25	1	2	22.0	22.1	21.9
			1	49	1	1	22.2	22.1	21.9
			25	0	2	2	21.7	21.7	21.7
			25	12	2	2	21.7	21.7	21.7
			25	25	2	2	21.7	21.6	21.7
			50	0	2	2	21.6	21.6	21.7
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							26715	26865	27015
							816.5 MHz	831.5 MHz	846.5 MHz
LTE Band 26	5	QPSK	1	0	0	0	23.6	23.6	23.5
			1	12	0	0	23.6	23.5	23.4
			1	24	0	0	23.6	23.5	23.4
			12	0	1	1	22.6	22.5	22.6
			12	7	1	1	22.6	22.6	22.6
			12	13	1	1	22.5	22.4	22.6
		16QAM	25	0	1	1	22.6	22.6	22.6
			1	0	1	1	21.8	21.8	22.3
			1	12	1	1	21.8	21.8	22.3
			1	24	1	1	21.9	21.7	22.4
			12	0	2	2	21.6	21.6	21.7
			12	7	2	2	21.6	21.6	21.7
			12	13	2	2	21.6	21.5	21.7
			25	0	2	2	21.7	21.7	21.6

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

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							26705	26865	27025
							815.5 MHz	831.5 MHz	847.5 MHz
LTE Band 26	3	QPSK	1	0	0	0	23.5	23.5	23.6
			1	8	0	0	23.6	23.5	23.3
			1	14	0	0	23.5	23.4	23.6
			8	0	1	1	22.5	22.5	22.5
			8	4	1	1	22.5	22.5	22.5
			8	7	1	1	22.4	22.4	22.5
			15	0	1	1	22.5	22.5	22.5
		16QAM	1	0	1	2	22.1	22.1	21.9
			1	8	1	1	22.2	22.2	21.8
			1	14	1	2	22.1	22.0	21.9
			8	0	2	2	21.6	21.5	21.4
			8	4	2	2	21.6	21.5	21.5
			8	7	2	2	21.5	21.4	21.5
			15	0	2	2	21.5	21.5	21.4
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							26697	26865	27033
							814.7 MHz	831.5 MHz	848.3 MHz
LTE Band 26	1.4	QPSK	1	0	0	0	23.6	23.6	23.6
			1	3	0	0	23.6	23.6	23.6
			1	5	0	0	23.6	23.6	23.6
			3	0	1	0	23.5	23.5	23.6
			3	1	1	0	23.5	23.5	23.6
			3	3	1	0	23.4	23.6	23.6
			6	0	1	1	22.4	22.4	22.3
		16QAM	1	0	1	2	22.0	22.0	21.9
			1	3	1	1	22.2	22.2	22.1
			1	5	1	2	21.9	21.9	22.0
			3	0	2	2	22.1	22.1	22.1
			3	1	2	1	22.3	22.3	22.1
			3	3	2	1	22.2	22.2	22.2
			6	0	2	2	21.6	21.6	21.5

**LTE Band 41 Measured Results**

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)				
							39750	40185	40620	41055	41490
							2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz
LTE Band 41	20	QPSK	1	0	0	0	23.3	23.4	23.7	23.6	23.7
			1	50	0	0	23.4	23.4	23.6	23.5	23.6
			1	99	0	0	23.4	23.4	23.5	23.4	23.5
			50	0	1	1	22.2	22.2	22.5	22.5	22.5
			50	25	1	1	22.2	22.2	22.5	22.4	22.5
			50	50	1	1	22.2	22.2	22.5	22.4	22.5
		16QAM	100	0	1	1	22.2	22.2	22.5	22.4	22.5
			1	0	1	1	22.0	22.0	22.5	22.6	22.5
			1	50	1	1	22.0	22.0	22.5	22.4	22.4
			1	99	1	1	21.9	22.0	22.5	22.3	22.3
			50	0	2	2	21.2	21.3	21.5	21.4	21.6
			50	25	2	2	21.1	21.2	21.5	21.4	21.5
LTE Band 41	15	QPSK	1	0	0	0	23.3	23.3	23.6	23.6	23.6
			1	36	0	0	23.1	23.2	23.3	23.5	23.3
			1	74	0	0	23.3	23.3	23.6	23.5	23.5
			36	0	1	1	22.2	22.2	22.5	22.3	22.5
			36	18	1	1	22.2	22.3	22.5	22.4	22.6
			36	37	1	1	22.2	22.3	22.5	22.3	22.6
		16QAM	75	0	1	1	22.2	22.3	22.5	22.3	22.5
			1	0	1	1	22.0	21.7	22.4	21.7	22.6
			1	36	1	1	22.1	21.7	22.2	21.7	22.5
			1	74	1	1	21.8	21.7	22.3	21.7	22.4
			36	0	2	2	21.2	21.3	21.5	21.3	21.5
			36	18	2	2	21.2	21.3	21.5	21.4	21.7
LTE Band 41	10	QPSK	1	0	0	0	23.4	23.3	23.6	23.6	23.7
			1	25	0	0	23.6	23.3	23.5	23.6	23.7
			1	49	0	0	23.6	23.3	23.6	23.5	23.7
			25	0	1	1	22.3	22.1	22.5	22.3	22.4
			25	12	1	1	22.4	22.2	22.5	22.3	22.6
			25	25	1	1	22.4	22.2	22.5	22.3	22.5
		16QAM	50	0	1	1	22.3	22.2	22.4	22.3	22.5
			1	0	1	1	22.4	22.1	22.3	22.0	22.5
			1	25	1	1	22.2	22.0	22.2	22.0	22.5
			1	49	1	1	22.2	22.1	22.3	22.0	22.5
			25	0	2	2	21.3	21.1	21.5	21.3	21.5
			25	12	2	2	21.3	21.2	21.5	21.3	21.6
LTE Band 41	10	16QAM	25	25	2	2	21.3	21.1	21.5	21.3	21.5
			50	0	2	2	21.3	21.2	21.5	21.3	21.6
			50	0	2	2	21.3	21.2	21.5	21.3	21.6

**LTE Band 41 Measured Results (continued)**

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)				
							39675	40148	40620	41093	41565
							2498.5 MHz	2545.8 MHz	2593 MHz	2640.3 MHz	2687.5 MHz
LTE Band 41	5	QPSK	1	0	0	0	23.6	23.5	23.7	23.3	23.7
			1	12	0	0	23.5	23.5	23.5	23.2	23.5
			1	24	0	0	23.7	23.5	23.6	23.3	23.7
			12	0	1	1	22.3	22.2	22.5	22.2	22.4
			12	7	1	1	22.3	22.2	22.4	22.3	22.5
			12	13	1	1	22.3	22.2	22.4	22.3	22.5
			25	0	1	1	22.6	22.2	22.4	22.3	22.4
		16QAM	1	0	1	1	22.6	22.0	22.3	22.1	22.2
			1	12	1	1	22.5	22.3	22.3	22.1	22.2
			1	24	1	1	22.6	22.0	22.5	22.1	22.2
			12	0	2	2	21.3	21.1	21.5	21.2	21.5
			12	7	2	2	21.5	21.2	21.5	21.2	21.5
			12	13	2	2	21.5	21.2	21.5	21.2	21.5
			25	0	2	2	21.4	21.2	21.5	21.2	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



### 9.5. Wi-Fi DTS (2.4 GHz) Band

#### Measured Results

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Note(s)
2.4	802.11b	1 Mbps	1	2412	16.0	16.0	Yes	
			6	2437	16.0			
			11	2462	16.0			
	802.11g	6 Mbps	1	2412	Not Required	15.0	No	1
			6	2437				
			11	2462				
	802.11n (HT20)	MCS0	1	2412	Not Required	15.0	No	1
			6	2437				
			11	2462				
	802.11ac (HT20)	MCS0	1	2412	Not Required	13.0	No	1
			6	2437				
			11	2462				

#### Note(s):

- Output Power and SAR is not required for 802.11g/n/ac HT20 channels 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.

### 9.6. Wi-Fi U-NII (5 GHz) Bands

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Note(s)
5.2 (U-NII 1)	802.11a	6 Mbps	36	5180	13.7	14.0	No	3
			40	5200	13.7	14.0		
			44	5220	13.7	14.0		
			48	5240	14.0	14.0		
	802.11n (HT20)	6.5 Mbps	36	5180	Not required	14.0	No	1
			40	5200		14.0		
			44	5220		14.0		
			48	5240		14.0		
	802.11n (HT40)	13.5 Mbps	38	5190	Not required	12.0	No	1
			46	5230		12.0		
	802.11ac (VHT20)	6.5 Mbps	36	5180	Not required	13.0	No	1
			40	5200		13.0		
			44	5220		13.0		
			48	5240		13.0		
802.11ac (VHT40)	13.5 Mbps	38	5190	Not required	12.0	No	1	
		46	5230		12.0			
802.11ac (VHT80)	29.3 Mbps	42	5210	Not required	12.0	No	1	
5.3 (U-NII 2A)	802.11a	6 Mbps	52	5260	13.7	14.0	Yes	
			56	5280	13.7	14.0		
			60	5300	13.7	14.0		
			64	5320	14.0	14.0		
	802.11n (HT20)	6.5 Mbps	52	5260	Not required	14.0	No	2
			56	5280		14.0		
			60	5300		14.0		
			64	5320		14.0		
	802.11n (HT40)	13.5 Mbps	54	5270	Not required	12.0	No	1
			62	5310		12.0		
	802.11ac (VHT20)	6.5 Mbps	52	5260	Not required	13.0	No	1
			56	5280		13.0		
			60	5300		13.0		
			64	5320		13.0		
	802.11ac (VHT40)	13.5 Mbps	54	5270	Not required	12.0	No	1
			62	5310		12.0		
802.11ac (VHT80)	29.3 Mbps	58	5290	Not required	12.0	No	1	

**Note(s):**

- Output Power and SAR measurement is not required for 802.11n HT20/HT40 channels when the specified tune-up tolerances for 802.11n HT20/HT40 are lower than 802.11a by more than 1/2 dB and the measured SAR is ≤ 1.2 W/Kg.
- When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n then ac) is selected.
- When the specified maximum output power is the same for both UNII band I and UNII band 2A, 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 I
  - > 1.2 W/kg, both bands should be tested independently for SAR.

**5GHz Bands Continued**

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Note(s)
5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500	13.7	14.0	Yes	
			104	5520	13.7	14.0		
			112	5560	13.7	14.0		
			116	5580	14.0	14.0		
	802.11n (HT20)	6.5 Mbps	100	5500	Not required	14.0	No	2
			104	5520		14.0		
			112	5560		14.0		
			116	5580		14.0		
	802.11n (HT40)	13.5 Mbps	102	5510	Not required	12.0	No	1
			110	5550		12.0		
	802.11ac (VHT20)	6.5 Mbps	100	5500	Not required	13.0	No	1
			104	5520		13.0		
112			5560	13.0				
116			5580	13.0				
802.11ac (VHT40)	13.5 Mbps	102	5510	Not required	12.0	No	1	
		110	5550		12.0			
802.11ac (VHT80)	29.3 Mbps	106	5530	Not required	12.0	No	1	
5.8 (UNII-3 or §15.247)	802.11a	6 Mbps	132	5660	13.7	14.0	Yes	
			157	5785	13.7	14.0		
			165	5825	14.0	14.0		
	802.11n (HT20)	6.5 Mbps	132	5660	Not required	14.0	No	2
			157	5785		14.0		
			165	5825		14.0		
	802.11n (HT40)	13.5 Mbps	134	5670	Not required	12.0	No	1
			151	5755		12.0		
			159	5795		12.0		
	802.11ac (VHT20)	6.5 Mbps	132	5660	Not required	13.0	No	1
			157	5785		13.0		
			165	5825		13.0		
	802.11ac (VHT40)	13.5 Mbps	134	5670	Not required	12.0	No	1
			151	5755		12.0		
			159	5795		12.0		
	802.11ac (VHT80)	29.3 Mbps	138	5790	Not required	12.0	No	1
			155	5775		12.0		

**Note(s):**

- Output Power and SAR measurement is not required for 802.11n HT20/HT40 channels when the specified tune-up tolerances for 802.11n HT20/HT40 are lower than 802.11a by more than ½ dB and the measured SAR is ≤ 1.2 W/Kg.
- When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n then ac) is selected.
- When the specified maximum output power is the same for both UNII band I and UNII band 2A, 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 I
  - > 1.2 W/kg, both bands should be tested independently for SAR.

**9.7. Bluetooth**

Maximum tune-up tolerance limit is 11 dBm from the rated nominal maximum output power. This power level qualifies for exclusion of SAR testing.

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

SAR Test Reduction criteria are as follows:

### 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.

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

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

Body SAR is also measured for HSPA when the maximum average output of each RF channel with HSPA active is at least  $\frac{1}{4}$  dB higher than that measured without HSPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is above 75% of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2.

### 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.

**KDB 248227 D01 SAR Measurements Procedures for 802.11 a/b/g Transmitters v02 (pg.6):**

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. GSM850**

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Voice	0	Left Touch	190	836.6	33.2	33.2	0.257	0.257	1
			Left Tilt	190	836.6	33.2	33.2	0.185	0.185	
			Right Touch	190	836.6	33.2	33.2	0.371	0.371	
			Right Tilt	190	836.6	33.2	33.2	0.202	0.202	
Head (VoIP)	GPRS 2 Slots	0	Left Touch	190	836.6	31.7	31.5	0.152	0.159	
			Left Tilt	190	836.6	31.7	31.5	0.116	0.121	
			Right Touch	190	836.6	31.7	31.5	0.222	0.232	
			Right Tilt	190	836.6	31.7	31.5	0.122	0.128	
Body	Voice	10	Rear	190	836.6	33.2	33.2	0.356	0.356	
			Front	190	836.6	33.2	33.2	0.533	0.533	
Body (VoIP) & Hotspot	GPRS 2 Slots	10	Rear	190	836.6	31.7	31.5	0.377	0.395	2
			Front	190	836.6	31.7	31.5	0.537	0.562	
Hotspot	GPRS 2 Slots	10	Edge 2	190	836.6	31.7	31.5	0.313	0.328	
			Edge 3	190	836.6	31.7	31.5	0.313	0.328	
			Edge 4	190	836.6	31.7	31.5	0.133	0.139	

**Additional Tests with Smart Cover**

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head (VoIP)	GPRS 2 Slots	0	Right Touch	190	836.6	33.2	33.2	0.349	0.349	
Body (VoIP) & Hotspot	GPRS 2 Slots	10	Front	190	836.6	31.7	31.5	0.400	0.419	

**10.2. GSM1900**

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Voice	0	Left Touch	661	1880.0	29.4	29.4	0.313	0.313	
			Left Tilt	661	1880.0	29.4	29.4	0.129	0.129	
			Right Touch	661	1880.0	29.4	29.4	0.167	0.167	
			Right Tilt	661	1880.0	29.4	29.4	0.123	0.123	
Head (VoIP)	GPRS 2 Slots	0	Left Touch	661	1880.0	27.7	27.7	0.472	0.472	3
			Left Tilt	661	1880.0	27.7	27.7	0.187	0.187	
			Right Touch	661	1880.0	27.7	27.7	0.236	0.236	
			Right Tilt	661	1880.0	27.7	27.7	0.175	0.175	
Body	Voice	10	Rear	661	1880.0	29.4	29.4	0.213	0.213	
			Front	661	1880.0	29.4	29.4	0.232	0.232	
Body (VoIP) & Hotspot	GPRS 2 Slots	10	Rear	661	1880.0	27.7	27.7	0.305	0.305	
			Front	661	1880.0	27.7	27.7	0.340	0.340	4
Hotspot	GPRS 2 Slots	10	Edge 3	661	1880.0	27.7	27.7	0.194	0.194	
			Edge 4	661	1880.0	27.7	27.7	0.338	0.338	

**Additional Tests with Smart Cover**

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head (VoIP)	GPRS 2 Slots	0	Left Touch	661	1880.0	27.7	27.7	0.449	0.449	
Body (VoIP) & Hotspot	GPRS 2 Slots	10	Front	661	1880.0	27.7	27.7	0.266	0.266	

### 10.3. W-CDMA Band V

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Rel 99 RMC 12.2 kbps	0	Left Touch	4183	836.6	23.7	23.7	0.262	0.262	5
			Left Tilt	4183	836.6	23.7	23.7	0.184	0.184	
			Right Touch	4183	836.6	23.7	23.7	0.344	0.344	
			Rightt Tilt	4183	836.6	23.7	23.7	0.181	0.181	
Body & Hotspot	Rel 99 RMC 12.2 kbps	10	Rear	4183	836.6	23.7	23.7	0.359	0.359	6
			Front	4183	836.6	23.7	23.7	0.495	0.495	
			Edge 2	4183	836.6	23.7	23.7	0.367	0.367	
			Edge 3	4183	836.6	23.7	23.7	0.315	0.315	
			Edge 4	4183	836.6	23.7	23.7	0.185	0.185	

#### Additional Tests with Smart Cover

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Rel 99 RMC 12.2 kbps	0	Right Touch	4183	836.6	23.7	23.7	0.310	0.310	
Body & Hotspot	Rel 99 RMC 12.2 kbps	10	Front	4183	836.6	23.7	23.7	0.369	0.369	

### 10.4. W-CDMA Band II

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Rel 99 RMC 12.2 kbps	0	Left Touch	9262	1852.4	23.7	23.7	0.921	0.921	7
				9400	1880.0	23.7	23.7	0.838	0.838	
			Left Tilt	9538	1907.6	23.7	23.7	0.824	0.824	
				9400	1880.0	23.7	23.7	0.376	0.376	
				9400	1880.0	23.7	23.7	0.452	0.452	
Body & Hotspot	Rel 99 RMC 12.2 kbps	10	Rightt Tilt	9400	1880.0	23.7	23.7	0.445	0.445	
				9400	1880.0	23.7	23.7	0.563	0.563	
			Rear	9400	1880.0	23.7	23.7	0.683	0.683	8
			Front	9400	1880.0	23.7	23.7	0.371	0.371	
			Edge 3	9400	1880.0	23.7	23.7	0.646	0.646	

#### Additional Tests with Smart Cover

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Rel 99 RMC 12.2 kbps	0	Left Touch	9262	1852.4	23.7	23.7	0.883	0.883	
Body & Hotspot	Rel 99 RMC 12.2 kbps	10	Front	9400	1880.0	23.7	23.7	0.486	0.486	



### 10.5. CDMA BC0

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	1xRTT (RC3 SO55)	0	Left Touch	384	836.5	25.2	25.2	0.397	0.397	9
			Left Tilt	384	836.5	25.2	25.2	0.259	0.259	
			Right Touch	384	836.5	25.2	25.2	0.531	0.531	
			Rightt Tilt	384	836.5	25.2	25.2	0.313	0.313	
	1xEVDO (Rel. 0)	0	Left Touch	384	836.5	25.2	25.2	0.344	0.344	
			Left Tilt	384	836.5	25.2	25.2	0.234	0.234	
			Right Touch	384	836.5	25.2	25.2	0.421	0.421	
			Rightt Tilt	384	836.5	25.2	25.2	0.231	0.231	
Body & Hotspot	1xRTT (RC3 SO32)	10	Rear	384	836.5	25.2	25.2	0.477	0.477	10
			Front	384	836.5	25.2	25.2	0.656	0.656	
Hotspot	1xRTT (RC3 SO32)	10	Edge 2	384	836.5	25.2	25.2	0.477	0.477	
			Edge 3	384	836.5	25.2	25.2	0.370	0.370	
			Edge 4	384	836.5	25.2	25.2	0.207	0.207	

#### Additional Tests with Smart Cover

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	1xEVDO (Rel. 0)	0	Right Touch	384	836.5	25.2	25.2	0.454	0.454	
Body & Hotspot	1xRTT (RC3 SO32)	10	Front	777	848.3	25.2	25.2	0.478	0.478	

**10.6. CDMA BC1**

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	
						Tune-up limit	Meas.	Meas.	Scaled		
Head	1xRTT (RC3 SO55)	0	Left Touch	25	1851.25	24.9	24.9	1.180	1.180	11	
				600	1880.00	24.9	24.9	1.160	1.160		
				1175	1908.75	24.9	24.9	1.120	1.120		
			Left Tilt	600	1880.00	24.9	24.9	0.455	0.455		
				Right Touch	600	1880.00	24.9	24.9	0.647	0.647	
				Right Tilt	600	1880.00	24.9	24.9	0.526	0.526	
	1xEVDO (Rel. 0)	0	Left Touch	25	1851.25	24.9	24.9	1.180	1.180		
				600	1880.00	24.9	24.9	1.160	1.160		
				1175	1908.75	24.9	24.9	1.110	1.110		
			Left Tilt	600	1880.00	24.9	24.9	0.532	0.532		
				Right Touch	600	1880.00	24.9	24.9	0.639	0.639	
				Right Tilt	600	1880.00	24.9	24.9	0.586	0.586	
Body & Hotspot	1xRTT (RC3 SO32)	10	Rear	600	1880.00	24.9	24.9	0.692	0.692		
			Front	25	1851.25	24.9	24.9	0.830	0.830		
				600	1880.00	24.9	24.9	0.926	0.926	12	
				1175	1908.75	24.9	24.9	0.848	0.848		
Hotspot	1xRTT (RC3 SO32)	10	Edge 3	600	1880.00	24.9	24.9	0.465	0.465		
			Edge 4	25	1851.25	24.9	24.9	0.966	0.966		
				600	1880.00	24.9	24.9	0.977	0.977	13	
				1175	1908.75	24.9	24.9	0.963	0.963		

**Additional Tests with Smart Cover**

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	1xEVDO (Rel. 0)	0	Left Touch	25	1851.3	24.9	24.9	1.180	1.180	
Body & Hotspot	1xRTT (RC3 SO32)	10	Rear	600	1880.00	24.9	24.9	0.751	0.751	
Hotspot	1xRTT (RC3 SO32)	10	Edge 4	600	1880.00	24.9	24.9	0.809	0.809	

**10.7. CDMA BC10**

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	1xRTT (RC3 SO55)	0	Left Touch	580	820.50	25.2	25.2	0.328	0.328	14
			Left Tilt	580	820.50	25.2	25.2	0.219	0.219	
			Right Touch	580	820.50	25.2	25.2	0.438	0.438	
			Right Tilt	580	820.50	25.2	25.2	0.235	0.235	
Head	1xEVDO (Rel. 0)	0	Left Touch	580	820.50	25.2	25.2	0.310	0.310	
			Left Tilt	580	820.50	25.2	25.2	0.203	0.203	
			Right Touch	580	820.50	25.2	25.2	0.375	0.375	
			Right Tilt	580	820.50	25.2	25.2	0.200	0.200	
Body & Hotspot	1xRTT (RC3 SO32)	10	Rear	580	820.50	25.2	25.2	0.501	0.501	15
			Front	580	820.50	25.2	25.2	0.601	0.601	
Hotspot	1xRTT (RC3 SO32)	10	Edge 2	580	820.50	25.2	25.2	0.429	0.429	
			Edge 3	580	820.50	25.2	25.2	0.343	0.343	
			Edge 4	580	820.50	25.2	25.2	0.206	0.206	

**Additional Tests with Smart Cover**

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	1xEVDO (Rel. 0)	0	Right Touch	580	820.5	25.2	25.2	0.415	0.415	
Body & Hotspot	1xRTT (RC3 SO32)	10	Front	580	820.5	25.2	25.2	0.430	0.430	

### 10.8. LTE Band 2 (20MHz Bandwidth)

Covered by LTE Band 25 (refer to section 10.12.), due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

### 10.9. LTE Band 4 (20MHz Bandwidth)

RF Exposure Conditions	Mode	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	
Head	QPSK	0	Left Touch	20175	1732.5	1	0	22.7	22.5	0.648	0.679	
				20175	1732.5	50	0	23.7	23.7	0.496	0.496	
			Left Tilt	20175	1732.5	1	0	23.7	23.7	0.275	0.275	
				20175	1732.5	50	0	22.7	22.5	0.210	0.220	
			Right Touch	20175	1732.5	1	0	23.7	23.7	0.295	0.295	
				20175	1732.5	50	0	22.7	22.5	0.293	0.307	
Right Tilt	20175	1732.5	1	0	23.7	23.7	0.228	0.228				
	20175	1732.5	50	0	22.7	22.5	0.223	0.234				
Body & Hotspot	QPSK	10	Rear	20050	1720.0	1	0	23.7	23.7	0.882	0.882	
				20175	1732.5	1	0	23.7	23.7	0.859	0.859	
				20175	1732.5	50	0	22.7	22.5	0.644	0.674	
			Front	20300	1745.0	1	0	23.7	23.7	0.919	0.919	16
				20050	1720.0	1	0	23.7	23.7	0.863	0.863	
				20175	1732.5	1	0	23.7	23.7	0.881	0.881	
Hotspot	QPSK	10	Edge 3	20175	1732.5	1	0	23.7	23.7	0.389	0.389	
				20175	1732.5	50	0	22.7	22.5	0.300	0.314	
			Edge 4	20175	1732.5	1	0	23.7	23.7	0.603	0.603	
				20175	1732.5	50	0	22.7	22.5	0.459	0.481	

#### Additional Tests with Smart Cover

RF Exposure Conditions	Mode	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	
Head	QPSK	0	Left Touch	20175	1732.5	1	0	23.7	23.7	0.692	0.692	17
Body & Hotspot	QPSK	10	Rear	20175	1732.5	1	0	23.7	23.7	0.919	0.919	

### 10.10. LTE Band 5 (10MHz Bandwidth)

Covered by LTE Band 26 (refer to section 10.13.), due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

### 10.11. LTE Band 12 (10MHz Bandwidth)

RF Exposure Conditions	Mode	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	
Head	QPSK	0	Left Touch	23095	707.5	1	0	23.7	23.4	0.106	0.114	
						25	0	22.7	22.3	0.085	0.093	
			Left Tilt	23095	707.5	1	0	23.7	23.4	0.070	0.075	
						25	0	22.7	22.3	0.055	0.061	
			Right Touch	23095	707.5	1	0	23.7	23.4	0.152	0.163	18
						25	0	22.7	22.3	0.117	0.128	
Right Tilt	23095	707.5	1	0	23.7	23.4	0.086	0.092				
			25	0	22.7	22.3	0.067	0.074				
Body & Hotspot	QPSK	10	Rear	23095	707.5	1	0	23.7	23.4	0.242	0.259	
						25	0	22.7	22.3	0.185	0.203	
			Front	23095	707.5	1	0	23.7	23.4	0.288	0.309	19
						25	0	22.7	22.3	0.222	0.243	
Hotspot	QPSK	10	Edge 2	23095	707.5	1	0	23.7	23.4	0.299	0.320	20
						25	0	22.7	22.3	0.231	0.253	
			Edge 3	23095	707.5	1	0	23.7	23.4	0.104	0.111	
						25	0	22.7	22.3	0.079	0.087	
			Edge 4	23095	707.5	1	0	23.7	23.4	0.135	0.145	
						25	0	22.7	22.3	0.102	0.112	

#### Additional Tests with Smart Cover

RF Exposure Conditions	Mode	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	
Head	QPSK	0	Right Touch	23095	707.5	1	0	23.7	23.4	0.146	0.156	
Body & Hotspot	QPSK	10	Front	23095	707.5	1	0	23.7	23.4	0.222	0.238	
Hotspot	QPSK	10	Edge 2	23095	707.5	1	0	23.7	23.4	0.261	0.280	

**10.12. LTE Band 25 (20MHz Bandwidth)**

RF Exposure Conditions	Mode	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	
Head	QPSK	0	Left Touch	26140	1860.0	1	0	23.7	23.7	0.857	0.857	21
				26365	1882.5	1	0	23.7	23.7	0.872	0.872	
				50	0	22.7	22.5	0.659	0.690			
			26590	1905.0	1	0	23.7	23.7	0.829	0.829		
			Left Tilt	26365	1882.5	1	0	23.7	23.7	0.337	0.337	
				50	0	22.7	22.5	0.257	0.269			
			Right Touch	26365	1882.5	1	0	23.7	23.7	0.389	0.389	
				26365	1882.5	50	0	22.7	22.5	0.296	0.310	
Right Tilt	26365	1882.5	1	0	23.7	23.7	0.361	0.361				
	26365	1882.5	50	0	22.7	22.5	0.276	0.289				
Body & Hotspot	QPSK	10	Rear	26365	1882.5	1	0	23.7	23.7	0.539	0.539	22
				26365	1882.5	50	0	22.7	22.5	0.431	0.451	
			Front	26365	1882.5	1	0	23.7	23.7	0.587	0.587	
				26365	1882.5	50	0	22.7	22.5	0.453	0.474	
Hotspot	QPSK	10	Edge 3	26365	1882.5	1	0	23.7	23.7	0.369	0.369	23
				26365	1882.5	50	0	22.7	22.5	0.285	0.298	
			Edge 4	26365	1882.5	1	0	23.7	23.7	0.609	0.609	
				26365	1882.5	50	0	22.7	22.5	0.472	0.494	

**Additional Tests with Smart Cover**

RF Exposure Conditions	Mode	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	
Head	QPSK	0	Left Touch	26140	1860.0	1	0	23.7	23.7	0.864	0.864	
Body & Hotspot	QPSK	10	Front	26365	1882.5	1	0	23.7	23.7	0.458	0.458	
Hotspot	QPSK	10	Edge 4	26590	1905.0	1	0	23.7	23.7	0.542	0.542	

**10.13. LTE Band 26 (15MHz Bandwidth)**

RF Exposure Conditions	Mode	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				
Head	QPSK	0	Left Touch	26865	831.5	1	0	23.7	23.6	0.253	0.259				
						36	0	22.7	22.6	0.197	0.202				
			Left Tilt	26865	831.5	1	0	23.7	23.6	0.165	0.169				
						36	0	22.7	22.6	0.129	0.132				
			Right Touch	26865	831.5	1	0	23.7	23.6	0.347	0.355	24			
						36	0	22.7	22.6	0.276	0.282				
		Right Tilt	26865	831.5	1	0	23.7	23.6	0.168	0.172					
					36	0	22.7	22.6	0.135	0.138					
		Body & Hotspot	QPSK	10	Rear	26865	831.5	1	0	23.7	23.6	0.374	0.383		
								36	0	22.7	22.6	0.299	0.306		
					Front	26865	831.5	1	0	23.7	23.6	0.601	0.615	25	
								36	0	22.7	22.6	0.398	0.407		
Hotspot	QPSK				10	Edge 2	26865	831.5	1	0	23.7	23.6	0.322	0.330	
									36	0	22.7	22.6	0.236	0.241	
		Edge 3	26865	831.5		1	0	23.7	23.6	0.302	0.309				
						36	0	22.7	22.6	0.245	0.251				
		Edge 4	26865	831.5		1	0	23.7	23.6	0.171	0.175				
						36	0	22.7	22.6	0.119	0.122				

**Additional Tests with Smart Cover**

RF Exposure Conditions	Mode	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	
Head	QPSK	0	Right Touch	26865	831.5	1	0	23.7	23.6	0.328	0.336	
Body	QPSK	0	Front	26865	831.5	1	0	23.7	23.6	0.383	0.392	

### 10.14. LTE Band 41 (20MHz Bandwidth)

RF Exposure Conditions	Mode	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		
Head	QPSK	0	Left Touch	40620	2593.0	1	0	23.7	23.7	0.052	0.052	26	
					2593.0	50	0	22.7	22.5	0.039	0.041		
			Left Tilt	40620	2593.0	1	0	23.7	23.7	0.001	0.001		
					2593.0	50	0	22.7	22.5	0.003	0.003		
			Right Touch	40620	2593.0	1	0	23.7	23.7	0.026	0.026		
					2593.0	50	0	22.7	22.5	0.022	0.023		
Right Tilt	40620	2593.0	1	0	23.7	23.7	0.014	0.014					
		2593.0	50	0	22.7	22.5	0.009	0.009					
Body & Hotspot	QPSK	10	Rear	40620	39750	2506.0	1	0	23.7	23.3	0.317	0.348	27
					40185	2549.5	1	0	23.7	23.4	0.392	0.420	
					2593.0	1	0	23.7	23.7	0.871	0.871		
					50	0	22.7	22.5	0.662	0.693			
					41055	2636.5	1	0	23.7	23.6	0.598	0.612	
			41490	2680.0	1	0	23.7	23.7	0.687	0.687			
			Front	40620	2593.0	1	0	23.7	23.7	0.149	0.149		
					50	0	22.7	22.5	0.116	0.121			
Hotspot	QPSK	10	Edge 2	40620	2593.0	1	0	23.7	23.7	0.115	0.115		
					50	0	22.7	22.5	0.089	0.093			
			Edge 3	40620	2593.0	1	0	23.7	23.7	0.545	0.545		
					50	0	22.7	22.5	0.422	0.442			
			Edge 4	40620	2593.0	1	0	23.7	23.7	0.068	0.068		
					50	0	22.7	22.5	0.052	0.054			

#### Additional Tests with Smart Cover

RF Exposure Conditions	Mode	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	
Body & Hotspot	QPSK	0	Left Touch	40620	2593.0	1	0	23.7	23.7	0.052	0.052	
Body & Hotspot	QPSK	10	Rear	40620	2593.0	1	0	23.7	23.7	0.568	0.568	



### 10.15. Wi-Fi (DTS Band)

Frequency Band	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Notes
								Tune-up limit	Meas.	Meas.	Scaled		
2.4GHz	802.11b 1 Mbps	Head	0	Left Touch	6	2437	0.3440						
				Left Tilt	6	2437	0.454	16.0	16.0	0.318	0.318	28	1
				Right Touch	6	2437	0.209						
				Right Tilt	6	2437	0.212						
	802.11b 1 Mbps	Body & Hotspot	10	Rear	6	2437	0.221	16.0	16.0	0.159	0.159	29	1
				Front	6	2437	0.063						
	802.11b 1 Mbps	Hotspot	10	Edge 1	6	2437	0.135						
				Edge 2	6	2437	0.032						

### Additional Tests with Smart Cover

Frequency Band	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
2.4GHz	802.11b 1 Mbps	Head	0	Left Tilt	6	2437	0.155	16.0	16.0	0.129	0.129	
	802.11b 1 Mbps	Body & Hotspot	10	Rear	6	2437	0.126	16.0	16.0	0.104	0.104	

#### Note(s):

- Highest reported SAR is  $\leq 0.4$  W/kg. Therefore, further SAR measurements within this exposure condition are not required.
- Highest reported SAR is  $> 0.4$  W/kg. Due to the highest reported SAR for this test position, other test positions in Head exposure condition were evaluated until a SAR  $\leq 0.8$  W/kg was reported.
- Testing for a second channel was required because the reported SAR for this test position was  $>0.8$  W/kg.
- Additional testing was required in order to satisfy FCC simultaneous transmission limit criteria.

### 10.16. Wi-Fi (U-NII Band)

Frequency Band	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Notes
								Tune-up limit	Meas.	Meas.	Scaled		
5.3 GHz U-NII 2A	802.11a 6 Mbps	Head	0	Left Touch	64	5320	0.514						
				Left Tilt	64	5320	0.499						
				Right Touch	64	5320	0.474						
				Right Tilt	64	5320	0.540	14.0	14.0	0.312	0.312	30	1
		Body-worn	10	Rear	64	5320	0.238	14.0	14.0	0.114	0.114		1
				Front	64	5320	0.105						

#### Additional Tests with Smart Cover

Frequency Band	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	
5.3 GHz U-NII 2A	802.11a 6 Mbps	Head	0	Left Tilt	64	5320	14.0	14.0	0.297	0.297	
		Body-worn	10	Rear	64	5320	14.0	14.0	0.147	0.147	31

Frequency Band	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Notes
								Tune-up limit	Meas.	Meas.	Scaled		
5.5 GHz U-NII 2C	802.11a 6 Mbps	Head	0	Left Touch	116	5580	0.555						
				Left Tilt	116	5580	0.561						
				Right Touch	116	5580	0.641						
				Right Tilt	116	5580	0.643	14.0	14.0	0.371	0.371	32	1
		Body-worn	10	Rear	116	5580	0.229	14.0	14.0	0.118	0.118		1
				Front	116	5580	0.106						

#### Additional Tests with Smart Cover

Frequency Band	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	
5.5 GHz U-NII 2C	802.11a 6 Mbps	Head	0	Left Tilt	116	5580	14.0	14.0	0.245	0.245	
		Body-worn	10	Rear	116	5580	14.0	14.0	0.124	0.124	33

Frequency Band	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Notes
								Tune-up limit	Meas.	Meas.	Scaled		
5.8 GHz U-NII 3	802.11a 6 Mbps	Head	0	Left Touch	165	5825	0.318						
				Left Tilt	165	5825	0.625	14.0	14.0	0.427	0.427	34	2
				Right Touch	165	5825	0.298						
				Right Tilt	165	5825	0.347	14.0	14.0	0.175	0.175		
		Body-worn & Hotspot	10	Rear	165	5825	0.228	14.0	14.0	0.115	0.115		1
		Front		165	5825	0.061							
		Hotspot	10	Edge 1	157	5785	0.144						
Edge 2	157	5785		0.005									

#### Additional Tests with Smart Cover

Frequency Band	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	
5.8 GHz U-NII 2A	802.11a 6 Mbps	Head	0	Left Tilt	165	5825	14.0	14.0	0.219	0.219	
		Body & Hotspot	10	Rear	157	5785	14.0	14.0	0.117	0.117	35

#### Note(s):

- Highest reported SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.
- Highest reported SAR is > 0.4 W/kg. Due to the highest reported SAR for this test position, other test positions in Head exposure condition were evaluated until a SAR ≤ 0.8 W/kg was reported.
- Testing for a second channel was required because the reported SAR for this test position was >0.8 W/kg.
- Additional testing was required in order to satisfy FCC simultaneous transmission limit criteria.

## 10.17. Bluetooth

### Standalone SAR Test Exclusion Considerations & Estimated SAR

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ , for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR, where

- $f_{(\text{GHz})}$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion.

When the standalone SAR test exclusion is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

- $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f_{(\text{GHz})}/x}] \text{ W/kg}$  for test separation distances  $\leq 50$  mm;  
where  $x = 7.5$  for 1-g SAR, and  $x = 18.75$  for 10-g SAR.
- 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is  $> 50$  mm.

### Body-worn Accessory Exposure Conditions

Max. tune-up tolerance limit		Min. test separation distance (mm)	Frequency (GHz)	SAR test exclusion Result*	Test Configuration	Estimated 1-g SAR (W/kg)
(dBm)	(mW)					
11.0	13	10	2.480	2.0	Rear/Front	0.264

### Conclusion:

\*: The computed value is  $< 3$ ; therefore, Bluetooth qualifies for Standalone SAR test exclusion.

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

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	Body-Hotspot	Edge 2	No	0.299	N/A	N/A
850	GSM 850	Body-worn (VoIP)	Front	No	0.537	N/A	N/A
	WCDMA Band V	Body & Hotspot	Front	No	0.495	N/A	N/A
	CDMA BC0	Body & Hotspot	Front	No	0.656	N/A	N/A
	CDMA BC10	Body & Hotspot	Front	No	0.601	N/A	N/A
	LTE Band 5/26	Body & Hotspot	Front	No	0.601	N/A	N/A
1700	LTE Band 4	Body & Hotspot	Rear	Yes	0.919	0.914	1.01
1900	GSM 1900	Head (VoIP)	Left Touch	No	0.472	N/A	N/A
	WCDMA Band II	Head	Left Touch	No	0.921	N/A	N/A
	CDMA BC1	Head	Left Touch	Yes	1.180	1.16	1.02
	LTE Band 2/25	Head	Left Touch	No	0.872	N/A	N/A
2400	Wi-Fi 802.11b/g/n/ac	Head	Left Tilt	No	0.318	N/A	N/A
2600	LTE Band 41	Body	Rear	Yes	0.871	0.85	1.02
5300	Wi-Fi 802.11a/n/ac	Head	Left Tilt	No	0.312	N/A	N/A
5500	Wi-Fi 802.11a/n/ac	Head	Left Tilt	No	0.371	N/A	N/A
5800	Wi-Fi 802.11a/n/ac	Head	Left Tilt	No	0.427	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. Simultaneous Transmission SAR Analysis

KDB 447498 D01 General RF Exposure Guidance introduces a new formula for calculating the SAR to Peak Location Ratio (SPLSR) between pairs of simultaneously transmitting antennas:

$$\mathbf{SPLSR} = (\mathbf{SAR}_1 + \mathbf{SAR}_2)^{1.5} / \mathbf{Ri}$$

Where:

**SAR<sub>1</sub>** is the highest measured 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 measured 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

**Ri** 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:

$$(\mathbf{SAR}_1 + \mathbf{SAR}_2)^{1.5} / \mathbf{Ri} < 0.04$$

**Simultaneous Transmission Condition**

RF Exposure Condition	Item	Capable Transmit Configurations				
Head	1	GSM (Voice)	+	DTS		
	2	GSM (Voice)	+	U-NII		
	3	GSM (GPRS/EDGE)	+	DTS		
	4	GSM (GPRS/EDGE)	+	U-NII		
	5	W-CDMA	+	DTS		
	6	W-CDMA	+	U-NII		
	7	CDMA	+	DTS		
	8	CDMA	+	U-NII		
	9	LTE	+	DTS		
	10	LTE	+	U-NII		
Body-w orn	11	GSM(Voice)	+	DTS		
	12	GSM(Voice)	+	U-NII		
	13	GSM(Voice)	+	BT		
	14	GSM(Voice)	+	U-NII	+	BT
	15	GSM(GPRS/EDGE)	+	DTS		
	16	GSM(GPRS/EDGE)	+	U-NII		
	17	GSM(GPRS/EDGE)	+	BT		
	18	GSM(GPRS/EDGE)	+	U-NII	+	BT
	19	W-CDMA	+	DTS		
	20	W-CDMA	+	U-NII		
	21	W-CDMA	+	BT		
	22	W-CDMA	+	U-NII	+	BT
	23	CDMA	+	DTS		
	24	CDMA	+	U-NII		
	25	CDMA	+	BT		
	26	CDMA	+	U-NII	+	BT
	27	LTE	+	DTS		
	28	LTE	+	U-NII		
29	LTE	+	BT			
30	LTE	+	U-NII	+	BT	
Hotspot & Wi-Fi Direct	31	GSM(GPRS/EDGE)	+	DTS		
	32	GSM(GPRS/EDGE)	+	U-NII 3		
	33	W-CDMA	+	DTS		
	34	W-CDMA	+	U-NII 3		
	35	CDMA	+	DTS		
	36	CDMA	+	U-NII 3		
	37	LTE	+	DTS		
	38	LTE	+	U-NII 3		
Notes:						
<ol style="list-style-type: none"> <li>1. Only DTS and U-NII 3 support Hotspot.</li> <li>2. GPRS/EDGE, W-CDMA, CDMA and LTE support Hotspot.</li> <li>3. VoIP is supported in GPRS/EDGE, W-CDMA, CDMA and LTE.</li> <li>4. DTS Radio cannot transmit simultaneously w ith Bluetooth Radio.</li> <li>5. U-NII Radio can transmit simultaneously w ith Bluetooth Radio.</li> </ol>						

### 12.1. Sum of the SAR for GSM850 & Wi-Fi & BT

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+④ WWAN +BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
						Head	Left Touch	0.257	0.318	0.427	
	Left Tilt	0.185	0.318	0.427		0.503	No	0.612	No		
	Right Touch	0.371	0.318	0.427		0.689	No	0.798	No		
	Right Tilt	0.202	0.318	0.371		0.520	No	0.573	No		
Body-worn & Hotspot	Rear	0.395	0.159	0.147	0.264	0.554	No	0.542	No	0.659	No
	Front	0.562	0.159	0.147	0.264	0.721	No	0.709	No	0.826	No
Hotspot	Edge 1		0.159	0.147							
	Edge 2	0.328	0.159	0.147		0.487	No	0.475	No		
	Edge 3	0.328				0.328	No	0.328	No		
	Edge 4	0.139				0.139	No	0.139	No		

### 12.2. Sum of the SAR for GSM1900 & Wi-Fi & BT

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+④ WWAN +BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
						Head	Left Touch	0.472	0.318	0.427	
	Left Tilt	0.187	0.318	0.427		0.505	No	0.614	No		
	Right Touch	0.236	0.318	0.427		0.554	No	0.663	No		
	Right Tilt	0.175	0.318	0.371		0.493	No	0.546	No		
Body-worn & Hotspot	Rear	0.305	0.159	0.147	0.264	0.464	No	0.452	No	0.569	No
	Front	0.340	0.159	0.147	0.264	0.499	No	0.487	No	0.604	No
Hotspot	Edge 1		0.159	0.147							
	Edge 2		0.159	0.147							
	Edge 3	0.194				0.194	No	0.194	No		
	Edge 4	0.338				0.338	No	0.338	No		

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

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN+DTS		①+③ WWAN+U-NII		①+④ WWAN+BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.262	0.318	0.427		0.580	No	0.689	No		
	Left Tilt	0.184	0.318	0.427		0.502	No	0.611	No		
	Right Touch	0.344	0.318	0.427		0.662	No	0.771	No		
	Right Tilt	0.181	0.318	0.371		0.499	No	0.552	No		
Body-worn & Hotspot	Rear	0.359	0.159	0.147	0.264	0.518	No	0.506	No	0.623	No
	Front	0.495	0.159	0.147	0.264	0.654	No	0.642	No	0.759	No
Hotspot	Edge 1		0.159	0.147							
	Edge 2	0.367	0.159	0.147		0.526	No	0.514	No		
	Edge 3	0.315				0.315	No	0.315	No		
	Edge 4	0.185				0.185	No	0.185	No		

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

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN+DTS		①+③ WWAN+U-NII		①+④ WWAN+BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.921	0.318	0.427		1.239	No	1.348	No		
	Left Tilt	0.376	0.318	0.427		0.694	No	0.803	No		
	Right Touch	0.452	0.318	0.427		0.770	No	0.879	No		
	Right Tilt	0.445	0.318	0.371		0.763	No	0.816	No		
Body-worn & Hotspot	Rear	0.563	0.159	0.147	0.264	0.722	No	0.710	No	0.827	No
	Front	0.683	0.159	0.147	0.264	0.842	No	0.830	No	0.947	No
Hotspot	Edge 1		0.159	0.147							
	Edge 2		0.159	0.147							
	Edge 3	0.371				0.371	No	0.371	No		
	Edge 4	0.646				0.646	No	0.646	No		

### 12.5. Sum of the SAR for CDMA BC0 & Wi-Fi & BT

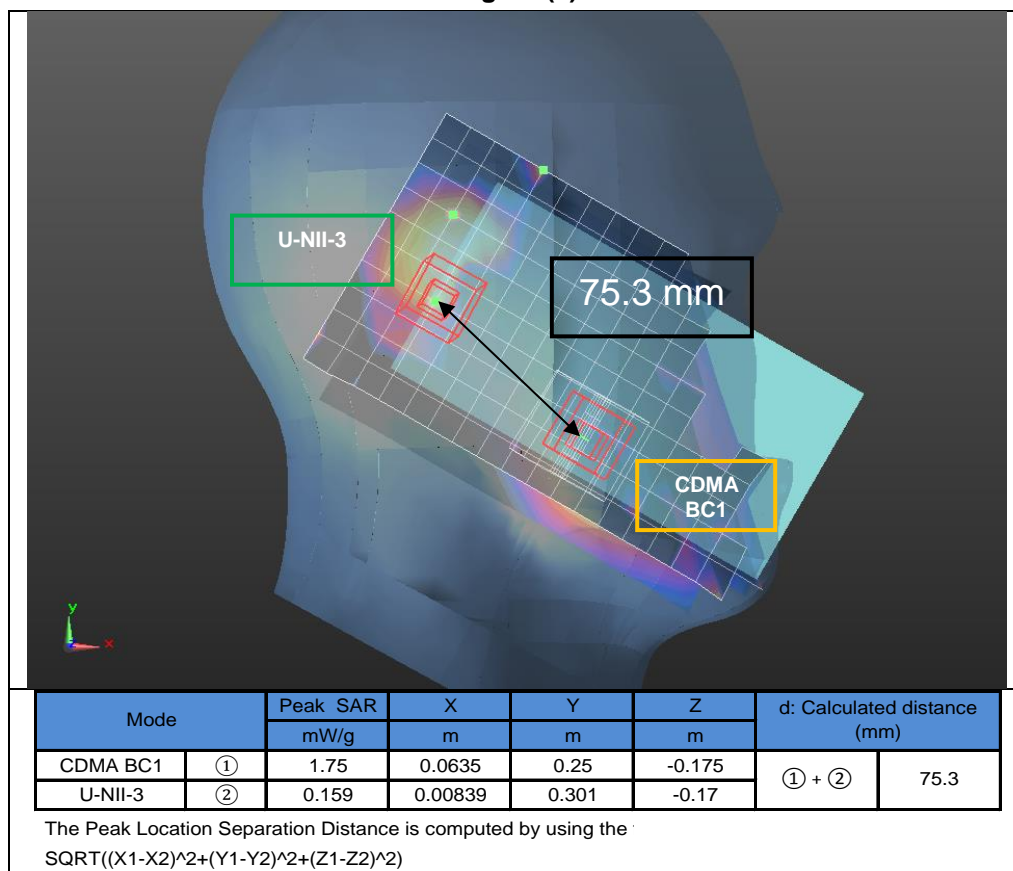
RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN+DTS		①+③ WWAN+U-NII		①+④ WWAN+BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.397	0.318	0.427		0.715	No	0.824	No		
	Left Tilt	0.259	0.318	0.427		0.577	No	0.686	No		
	Right Touch	0.531	0.318	0.427		0.849	No	0.958	No		
	Right Tilt	0.313	0.318	0.371		0.631	No	0.684	No		
Body-worn & Hotspot	Rear	0.477	0.159	0.147	0.264	0.636	No	0.624	No	0.741	No
	Front	0.656	0.159	0.147	0.264	0.815	No	0.803	No	0.920	No
Hotspot	Edge 1		0.159	0.147							
	Edge 2	0.477	0.159	0.147		0.636	No	0.624	No		
	Edge 3	0.370				0.370	No	0.370	No		
	Edge 4	0.207				0.207	No	0.207	No		



### 12.6. Sum of the SAR for CDMA BC1 & Wi-Fi & BT

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	① + ② WWAN + DTS		① + ③ WWAN + U-NII		① + ④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	1.180	0.318	0.427		1.498	No	1.607	Yes		
	Left Tilt	0.532	0.318	0.427		0.850	No	0.959	No		
	Right Touch	0.647	0.318	0.427		0.965	No	1.074	No		
	Right Tilt	0.586	0.318	0.371		0.904	No	0.957	No		
Body-worn & Hotspot	Rear	0.692	0.159	0.147	0.264	0.851	No	0.839	No	0.956	No
	Front	0.926	0.159	0.147	0.264	1.085	No	1.073	No	1.190	No
Hotspot	Edge 1		0.159	0.147							
	Edge 2		0.159	0.147							
	Edge 3	0.465				0.465	No	0.465	No		
	Edge 4	0.977				0.977	No	0.977	No		

Figure (1)



#### SAR to Peak Location Separation Ratio (SPLSR)

Test Position	Worst-case combination		∑ 1-g SAR (mW/g)	Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
	① WWAN	③ UNII					
Rear	1.180	0.427	① + ② 1.607	75.3	0.027	No	1

### 12.7. Sum of the SAR for CDMA BC10 & Wi-Fi & BT

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+④ WWAN +BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.328	0.318	0.427		0.646	No	0.755	No		
	Left Tilt	0.219	0.318	0.427		0.537	No	0.646	No		
	Right Touch	0.438	0.318	0.427		0.756	No	0.865	No		
	Right Tilt	0.235	0.318	0.371		0.553	No	0.606	No		
Body-worn & Hotspot	Rear	0.501	0.159	0.147	0.264	0.660	No	0.648	No	0.765	No
	Front	0.601	0.159	0.147	0.264	0.760	No	0.748	No	0.865	No
Hotspot	Edge 1		0.159	0.147							
	Edge 2	0.429	0.159	0.147		0.588	No	0.576	No		
	Edge 3	0.343				0.343	No	0.343	No		
	Edge 4	0.206				0.206	No	0.206	No		

### 12.8. Sum of the SAR for LTE Band 2 & Wi-Fi & BT

Covered by LTE Band 25 (refer to Section 12.13.) due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

### 12.9. Sum of the SAR for LTE Band 4 & Wi-Fi & BT

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN + DTS		①+③ WWAN + U-NII		①+④ WWAN + BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.692	0.318	0.427		1.010	No	1.119	No		
	Left Tilt	0.275	0.318	0.427		0.593	No	0.702	No		
	Right Touch	0.307	0.318	0.427		0.625	No	0.734	No		
	Right Tilt	0.234	0.318	0.371		0.552	No	0.605	No		
Body-worn & Hotspot	Rear	0.919	0.159	0.147	0.264	1.078	No	1.066	No	1.183	No
	Front	0.881	0.159	0.147	0.264	1.040	No	1.028	No	1.145	No
Hotspot	Edge 1		0.159	0.147							
	Edge 2		0.159	0.147							
	Edge 3	0.389				0.389	No	0.389	No		
	Edge 4	0.603				0.603	No	0.603	No		

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

Covered by LTE Band 26 (refer to Section 12.14.) due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

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

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+④ WWAN +BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.114	0.318	0.427		0.432	No	0.541	No		
	Left Tilt	0.075	0.318	0.427		0.393	No	0.502	No		
	Right Touch	0.163	0.318	0.427		0.481	No	0.590	No		
	Right Tilt	0.092	0.318	0.371		0.410	No	0.463	No		
Body-worn & Hotspot	Rear	0.259	0.159	0.147	0.264	0.418	No	0.406	No	0.523	No
	Front	0.309	0.159	0.147	0.264	0.468	No	0.456	No	0.573	No
Hotspot	Edge 1		0.159	0.147							
	Edge 2	0.320	0.159	0.147		0.479	No	0.467	No		
	Edge 3	0.111				0.111	No	0.111	No		
	Edge 4	0.145				0.145	No	0.145	No		

**12.12. Sum of the SAR for LTE Band 25 & Wi-Fi & BT**

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+④ WWAN +BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.872	0.318	0.427		1.190	No	1.299	No		
	Left Tilt	0.337	0.318	0.427		0.655	No	0.764	No		
	Right Touch	0.389	0.318	0.427		0.707	No	0.816	No		
	Right Tilt	0.361	0.318	0.371		0.679	No	0.732	No		
Body-worn & Hotspot	Rear	0.539	0.159	0.147	0.236	0.698	No	0.686	No	0.775	No
	Front	0.587	0.159	0.147	0.236	0.746	No	0.734	No	0.823	No
Hotspot	Edge 1		0.159	0.147							
	Edge 2		0.159	0.147							
	Edge 3	0.369				0.369	No	0.369	No		
	Edge 4	0.609				0.609	No	0.609	No		

**12.13. Sum of the SAR for LTE Band 26 & Wi-Fi & BT**

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+④ WWAN +BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.259	0.318	0.427		0.577	No	0.686	No		
	Left Tilt	0.169	0.318	0.427		0.487	No	0.596	No		
	Right Touch	0.355	0.318	0.427		0.673	No	0.782	No		
	Right Tilt	0.172	0.318	0.371		0.490	No	0.543	No		
Body-worn & Hotspot	Rear	0.383	0.159	0.147	0.264	0.542	No	0.530	No	0.647	No
	Front	0.615	0.159	0.147	0.264	0.774	No	0.762	No	0.879	No
Hotspot	Edge 1		0.159	0.147							
	Edge 2	0.330	0.159	0.147		0.489	No	0.477	No		
	Edge 3	0.309				0.309	No	0.309	No		
	Edge 4	0.175				0.175	No	0.175	No		

**12.14. Sum of the SAR for LTE Band 41 & Wi-Fi & BT**

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+④ WWAN +BT	
						∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)	∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.052	0.318	0.427		0.370	No	0.479	No		
	Left Tilt	0.003	0.318	0.427		0.321	No	0.430	No		
	Right Touch	0.026	0.318	0.427		0.344	No	0.453	No		
	Right Tilt	0.014	0.318	0.371		0.332	No	0.385	No		
Body-worn & Hotspot	Rear	0.871	0.159	0.147	0.264	1.030	No	1.018	No	1.135	No
	Front	0.149	0.159	0.147	0.264	0.308	No	0.296	No	0.413	No
Hotspot	Edge 1		0.159	0.147							
	Edge 2	0.115	0.159	0.147		0.274	No	0.262	No		
	Edge 3	0.545				0.545	No	0.545	No		
	Edge 4	0.068				0.068	No	0.068	No		

**Conclusion:**

Simultaneous transmission SAR measurement (Volume Scan) is not required because either the sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.

## **Appendixes**

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

**A\_15I20514v0 SAR Photos & Ant. Locations**

**B\_15I20514v0 SAR System Check Plots**

**C\_15I20514v0 SAR Highest SAR Test Plots**

**D\_15I20514v0 SAR Tissue Ingredients**

**E\_15I20514v0 SAR Probe Cal. Certificates**

**F\_15I20514v0 SAR Dipole Cal. Certificates**

**END OF REPORT**