



**KDB 865664 D01 SAR Measurement 100MHz to 6GHz  
FCC 47 CFR part 2 (2.1093)**

**SAR EVALUATION REPORT**

*For*

**Sony**

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**ISSUE DATE: 26 February 2015**

*Prepared for*

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**REVISION HISTORY**

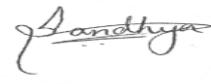
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1	24 February 2015	The following amendments were made in the report: <ol style="list-style-type: none"> <li>1. SAR retesting was performed on 5GHz Head using alternative sample and test results updated.</li> <li>2. Simultaneous transmission tables were updated with the new 5.0GHz test run measurements.</li> </ol>	Sandhya Menon
2	26 February 2015	The following amendments were made in the report: <ol style="list-style-type: none"> <li>1. Section 4.2 updated to include the 2600 MHz Dipole kit used for LTE Band 7 SAR test.</li> <li>2. Section 5, 6 updated to include LTE Band 7 details.</li> <li>3. Section 7 updated to include LTE Band 7 conducted power measurements.</li> <li>4. Section 10.1 updated to include LTE Band 7 Measured SAR Results.</li> <li>5. Section 11 updated to include the Repeated Measurement Results.</li> <li>6. Section 12.3 updated to include the simultaneous transmission analysis combination for LTE Band 7</li> </ol>	Sandhya Menon
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# 1. Attestation of Test Results

Applicant Name:	Sony Mobile Communications Inc				
Application Purpose	<input checked="" type="checkbox"/> Class II Permissive Change				
DUT Description	The EUT is a GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac + NFC & ANT+				
Test Device is	Mass Production sample				
Device category	Portable				
Exposure Category	General Population/Uncontrolled Exposure (1g SAR limit: 1.6 W/kg)				
Date Tested	05 January 2015 to 19 February 2015				
The highest reported SAR values	RF Exposure Conditions	Equipment Class			
		Licensed	DTS	DSS	UNII
	Head	0.886 W/kg	0.646 W/kg	N/A	0.633 W/kg
	Body-worn Accessory	1.157 W/kg	0.088 W/kg	0.022 W/kg	0.273 W/kg
	Wireless Router (Hotspot)	1.240 W/kg	0.088 W/kg	0.022 W/kg	0.273 W/kg
Simultaneous Transmission	1.532 W/kg	1.532 W/kg	1.499 W/kg	1.519 W/kg	
Applicable Standards	FCC 47 CFR part 2 (2.1093) KDB publication IEEE Std 1528-2013				
Test Results	Pass				
<p>UL Verification Services Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties are in accordance with the above standard 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(s), 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 Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by UKAS. This report is written to support regulatory compliance of the applicable standards stated above.</p>					
Approved & Released By:			Prepared By:		
					
Naseer Mirza Project Lead UL Verification Services Ltd.			Sandhya Menon Senior Engineer UL Verification Services Ltd.		

## 2. Test Specification, Methods and Procedures

### 2.1. Test Specification

<b>Reference:</b>	KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03
<b>Title:</b>	SAR Measurement Requirements for 100 MHz to 6 GHz
<b>Purpose of Test:</b>	Field probes, tissue dielectric properties, SAR scans, measurement accuracy and variability of the measured results are discussed. The field probe and SAR scan requirements are derived from criteria considered in draft standard IEEE P1528-2011.
The Equipment Under Test complied with the Specific Absorption Rate for general population/uncontrolled exposure limit of 1.6 W/kg as specified in FCC 47 CFR part 2 (2.1093) and ANSI C95.1-1992 has been tested in accordance with the reference documents in section 2.2 of this report.	

### 2.2. Methods and Procedures Reference Documentation

The methods and procedures used were as detailed in:

**IEEE 1528 - 2013**

IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques

Thomas Schmid, Oliver Egger and Neils Kuster, "Automated E-field scanning system for dosimetric assessments", IEEE Transaction on microwave theory and techniques, Vol. 44, pp. 105-113, January 1996.

Neils Kuster, Ralph Kastle and Thomas Schmid, "Dosimetric evaluation of mobile communications equipment with known precision", IEICE Transactions of communications, Vol. E80-B, No.5, pp. 645-652, May 1997.

**FCC KDB Publication:**

- 248227 D01 SAR meas for 802 11 a b g v01r02
- 447498 D01 General RF Exposure Guidance v05r02
- 648474 D04 Handset SAR v01r02
- 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 D05A LTE Rel.10 KDB Inquiry Sheet v01r01
- 941225 D06 Hotspot Mode v02

### 2.3. Definition of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the methods & procedures section above. Section 4.2 contains a list of the test equipment used.

### **3. Facilities and Accreditation**

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

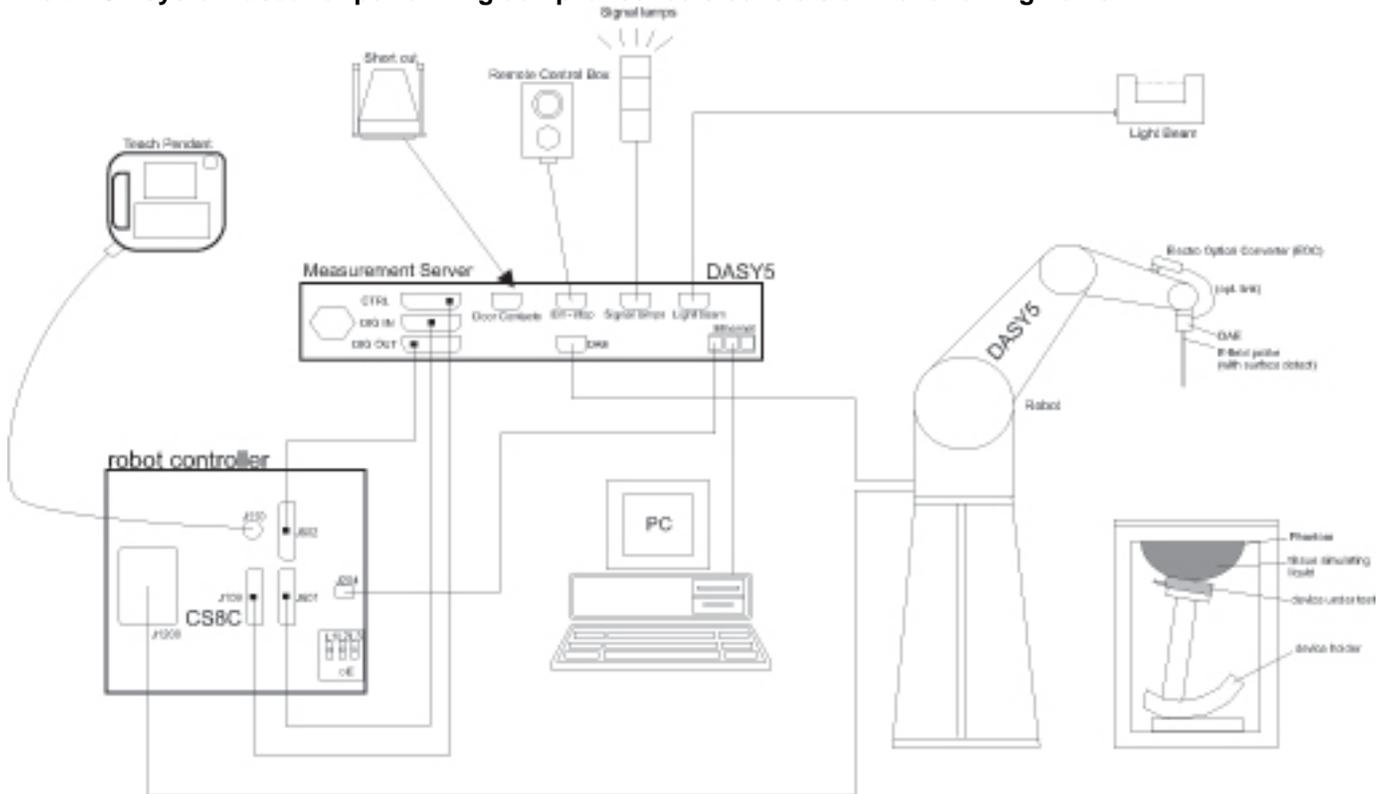
Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire, RG23 8BG UK	Facility Type
SAR Lab 56	Controlled Environment Chamber
SAR Lab 57	Controlled Environment Chamber
SAR Lab 58	Controlled Environment Chamber
SAR Lab 59	Controlled Environment Chamber
SAR Lab 60	Controlled Environment Chamber
SAR Lab 61	Controlled Environment Chamber

UL Verification Services Ltd, is accredited by UKAS (United Kingdom Accreditation Service), Laboratory UKAS Code 0644.

## 4. SAR Measurement System & Test Equipment

### 4.1. SAR Measurement System

The DASY 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 DASY 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. 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 & System Check

UL No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A1184	Data Acquisition Electronics	SPEAG	DAE3	394	16 May 2014	12
A1234	Data Acquisition Electronics	SPEAG	DAE3	450	16 Sept 2014	12
A2547	Data Acquisition Electronics	SPEAG	DAE4	1438	12 May 2014	12
A2110	Data Acquisition Electronics	SPEAG	DAE3	431	04 Nov 2014	12
A2111	Data Acquisition Electronics	SPEAG	DAE3	432	20 Aug 2014	12
A2546	Data Acquisition Electronics	SPEAG	DAE4	1435	15 Apr 2014	12
A1186	Probe	SPEAG	ET3 DV6	1529	22 May 2014	12
A2544	Probe	SPEAG	EX3 DV4	3994	07 May 2014	12
A2436	Probe	SPEAG	ES3 DV3	3335	29 Aug 2014	12
A1185	Probe	SPEAG	ET3 DV6	1528	16 Apr 2014	12
A2243	Probe	SPEAG	ES3 DV3	3304	21 Aug 2014	12
A2545	Probe	SPEAG	EX3 DV4	3995	09 May 2014	12
L1161	750 MHz Dipole Kit	SPEAG	D750V3	1024	16 May 2014	12
A2588	900 MHz Dipole Kit	SPEAG	D900V2	1d168	14 May 2014	12
A1190	1800 MHz Dipole Kit	SPEAG	D1800V2	264	18 Aug 2014	12
A2200	1900 MHz Dipole Kit <sup>#</sup>	SPEAG	D1900V2	537	22 Jan 2014	12
A1237	1900 MHz Dipole Kit	SPEAG	D1900V2	540	08 Dec 2014	12
A2202	2440 MHz Dipole Kit <sup>#</sup>	SPEAG	D2440V2	701	14 Jan 2014	12
A1322	2450 MHz Dipole Kit	SPEAG	D2450V2	725	08 Dec 2014	12
A2244	2600 MHz Dipole Kit	SPEAG	D2600V2	1046	18 Aug 2014	12
A1377	5.0 GHz Dipole Kit	SPEAG	D5GHzV2	1016	26 Mar 2014	12
G0528	Robot Power Supply	SPEAG	DASY4	None	Calibrated before use	-
GO591	Robot Power Supply	SPEAG	DASY4	None	Calibrated before use	-
G0592	Robot Power Supply	SPEAG	DASY52	None	Calibrated before use	-
G0610	Robot Power Supply	SPEAG	DASY52	None	Calibrated before use	-
G0611	Robot Power Supply	SPEAG	DASY52	None	Calibrated before use	-
G0612	Robot Power Supply	SPEAG	DASY52	None	Calibrated before use	-
M1047	Robot Arm	Staubli	RX908 L	F00/SD89A1/A/01	Calibrated before use	-
M1653	Robot Arm	Staubli	RX908 L	F01/5J86A1/C/01	Calibrated before use	-
M1680	Robot Arm	Staubli	TX60 L	F12/5MZ7A1/A/01	Calibrated before use	-
M1875	Robot Arm	Staubli	TX60 L	F13/5SC6F1/A/01	Calibrated before use	-
M1876	Robot Arm	Staubli	TX60 L	F14/5T5ZA1/A/01	Calibrated before use	-
M1877	Robot Arm	Staubli	TX60 L	F14/5UA6A1/A/01	Calibrated before use	-
A1328	Handset Positioner	SPEAG	Modification	SD 000 H01 DA	-	-
A1182	Handset Positioner	SPEAG	V3.0	None	-	-
A2443	Handset Positioner	SPEAG	MD4HHTV5	None	-	-
A172	Handset Positioner	SPEAG	MD4HHTV5	None	-	-

UL No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
M1755	DAK Fluid Probe	SPEAG	SM DAK 040 CA	1089	Calibrated before use	-
M1565	Communication Test Set	Agilent	8960 Series 10 (E5515C)	GB46311280	10 Dec 2014	12
M1775	Communication Test Set <sup>#</sup>	Agilent	8960 Series 10 (E5515C)	GB46200666	31 Jan 2014	12
M1866	Communication Test Set	R & S	CMW500 1201.0002K50	145922	24 Apr 2014	12
M1864	Communication Test Set	R & S	CMW500 1201.0002K50	145921	23 Apr 2014	12
M1855	Power Sensor	R & S	NRP-Z51	103246	06 May 2014	12
M1015	Network Analyser	Agilent Technologies	8753ES	US39172406	26 Oct 2014	12
A2621	Digital Camera	Nikon	S3600	41010357	-	-
M1908	Signal Generator	R&S	SMIQ03B	1125555503	02 Dec 2014	12
M1839	Signal Generator	R&S	SME06	837633/001	15 Apr 2014	12
M1838	Signal Generator	R&S	SME06	831377/005	14 Apr 2014	12
M1841	Dual Channel Power Meter	R & S	NRVD	834501/069	16 Apr 2014	12
M1023	Dual Channel Power Meter	R & S	NRVD	863715/030	01 May 2014	12
M1840	Dual Channel Power Meter	R & S	NRVD	844860/040	16 Apr 2014	12
M1044	Power Sensor	R & S	ZRPZ1	893350/0019	03 Sep 2014	12
M1842	Power Sensor	R & S	ZRPZ1	890212/015	16 Apr 2014	12
M1634	Power Sensor	R & S	NRVZ1	860462/016	02 May 2014	12
M1635	Power Sensor	R & S	ZRPZ1	826515/015	02 May 2014	12
M1848	Power Sensor	R & S	ZRPZ1	831430/004	16 Apr 2014	12
M1847	Power Sensor	R & S	ZRPZ1	831430/003	16 Apr 2014	12
A2100	Directional Coupler	RF-Lambda	11101300748	None	Calibrated as part of system	-
A2099	Directional Coupler	RF-Lambda	11101300747	None	Calibrated as part of system	-
A1097	Directional Coupler	MiDISCO	MDC6223-30	None	Calibrated as part of system	-
A1938	Amplifier	Mini-Circuits	ZHL-42	QA0826002	Calibrated as part of system	-
A1474	Amplifier	Mini-Circuits	ZVE-8G	638700305	Calibrated as part of system	-
A2403	Amplifier	Mini-Circuits	ZHL-42W	15542	Calibrated as part of system	-
S0566	SAR Lab	UL	Site 56	N/A	Calibrated before use	-
S0567	SAR Lab	UL	Site 57	N/A	Calibrated before use	-
S0568	SAR Lab	UL	Site 58	N/A	Calibrated before use	-
S0569	SAR Lab	UL	Site 59	N/A	Calibrated before use	-
S0570	SAR Lab	UL	Site 60	N/A	Calibrated before use	-
S0571	SAR Lab	UL	Site 61	N/A	Calibrated before use	-
A1566	SAM Phantom	SPEAG	SAM a	002	Calibrated before use	-
A1238	SAM Phantom	SPEAG	SAM b	001	Calibrated before use	-
A2125	SAM Phantom	SPEAG	SAM b	TP-1031	Calibrated before use	-
A2124	SAM Phantom	SPEAG	SAM a	TP-1030	Calibrated before use	-
A2438	SAM Phantom	SPEAG	SAM a	1805	Calibrated before use	-
A2551	SAM Phantom	SPEAG	SAM a	1832	Calibrated before use	-
A2552	SAM Phantom	SPEAG	SAM a	1836	Calibrated before use	-

UL No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A2437	2mm Oval Phantom	SPEAG	Eli5	1235	Calibrated before use	-
A2252	2mm Oval Phantom	SPEAG	Eli5	1177	Calibrated before use	-
A2549	2mm Oval Phantom	SPEAG	Eli5	00T01 DA	Calibrated before use	-
A2550	2mm Oval Phantom	SPEAG	Eli5	00T01 DA	Calibrated before use	-

**Note:** # The assets number A2200, A2202 and M1775 were not used beyond its annual re-calibration date.

### 4.3. SAR System Specifications

Robot System	
Positioner:	Stäubli Unimation Corp. Robot Model: RX90L
Repeatability:	0.025 mm
No. of Axis:	6
Serial Number(s):	F00/SD89A1/A/01 F01/5J86A1/A/01
Reach:	1185 mm
Payload:	3.5 kg
Control Unit:	CS7
Programming Language:	V+
Robot System	
Positioner:	Stäubli Unimation Corp. Robot Model: TX60L
Repeatability:	±0.030 mm
No. of Axis:	6
Serial Number:	F12/5MZ7A1/A/01 F13/5SC6F1/A/01 F14/5T5ZA1/A/01 F14/5UA6A1/A/01
Reach:	920 mm
Payload:	2.0 kg
Control Unit:	CS8C
Programming Language:	V+
Data Acquisition Electronic (DAE) System	
Serial Number:	DAE3 SN: 394, 450, 431, 432
Serial Number:	DAE4 SN: 1438, 1435
PC Controller	
PC:	Dell Precision 340
Operating System:	Windows 2000
Data Card:	DASY4 Measurement Server
Serial Number:	1080

**SAR System Specifications (Continued)**

<b>Data Converter</b>	
<b>Features:</b>	Signal Amplifier, multiplexer, A/D converted and control logic.
<b>Software:</b>	DASY4 Software
<b>Connecting Lines:</b>	Optical downlink for data and status info. Optical uplink for commands and clock.
<b>PC Interface Card</b>	
<b>Function:</b>	24 bit (64 MHz) DSP for real time processing Link to DAE3 16 nit A/D converter for surface detection system serial link to robot direct emergency stop output for robot.
<b>E-Field Probe</b>	
<b>Model:</b>	EX3DV4
<b>Serial No:</b>	3994; 3995
<b>Construction:</b>	Triangular core
<b>Frequency:</b>	10 MHz to >6 GHz
<b>Linearity:</b>	±0.2 dB (30 MHz to 6 GHz)
<b>Probe Length (mm):</b>	337
<b>Probe Diameter (mm):</b>	10
<b>Tip Length (mm):</b>	9
<b>Tip Diameter (mm):</b>	2.5
<b>Sensor X Offset (mm):</b>	1
<b>Sensor Y Offset (mm):</b>	1
<b>Sensor Z Offset (mm):</b>	1
<b>E-Field Probe</b>	
<b>Model:</b>	ES3DV3
<b>Serial No:</b>	3304; 3335
<b>Construction:</b>	Triangular core
<b>Frequency:</b>	10 MHz to >4 GHz
<b>Linearity:</b>	±0.2 dB (30 MHz to 4 GHz)
<b>Probe Length (mm):</b>	337
<b>Probe Diameter (mm):</b>	10
<b>Tip Length (mm):</b>	10
<b>Tip Diameter (mm):</b>	4
<b>Sensor X Offset (mm):</b>	2
<b>Sensor Y Offset (mm):</b>	2
<b>Sensor Z Offset (mm):</b>	2

**SAR System Specifications (Continued)**

<b>E-Field Probe</b>	
<b>Model:</b>	ET3DV6
<b>Serial No:</b>	1529; 1528
<b>Construction:</b>	Triangular core
<b>Frequency:</b>	10 MHz to 2.55GHz
<b>Linearity:</b>	±0.2 dB (30 MHz to 2.55GHz)
<b>Probe Length (mm):</b>	337
<b>Probe Diameter (mm):</b>	10
<b>Tip Length (mm):</b>	10
<b>Tip Diameter (mm):</b>	6.8
<b>Sensor X Offset (mm):</b>	2.7
<b>Sensor Y Offset (mm):</b>	2.7
<b>Sensor Z Offset (mm):</b>	2.7
<b>Phantom</b>	
<b>Phantom:</b>	SAM Phantom, Eli Phantom
<b>Shell Material:</b>	Fibreglass
<b>Thickness:</b>	2.0 ±0.1 mm

#### 4.4. SAR Measurement Procedure

##### 4.4.1. Normal SAR Measurement Procedure

###### Step 1: Power Reference Measurement

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

###### Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209-1 / IEC 62209-2 standards. 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 v01r03

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

**Step 3: Zoom Scan**

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03

		$\leq 3$ GHz	$> 3$ GHz	
Maximum zoom scan spatial resolution: $\Delta x_{Zoom}, \Delta y_{Zoom}$		$\leq 2$ 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: $\Delta z_{Zoom}(n)$	$\leq 5$ mm	3 – 4 GHz: $\leq 4$ mm 4 – 5 GHz: $\leq 3$ mm 5 – 6 GHz: $\leq 2$ mm	
	graded grid	$\Delta z_{Zoom}(1)$ : 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
		$\Delta z_{Zoom}(n>1)$ : between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
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	
<p>Note: <math>\delta</math> is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.</p> <p>* When zoom scan is required and the <i>reported</i> SAR from the area scan based <i>I-g SAR estimation</i> procedures of KDB 447498 is <math>\leq 1.4</math> W/kg, <math>\leq 8</math> mm, <math>\leq 7</math> mm and <math>\leq 5</math> 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.</p>				

**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.

## **4.5. Volumetric Scan Procedure**

### **Step 1: Repeat Step 1-4 in Section 4.3**

### **Step 2: Volume Scan**

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

### **Step 3: Power drift measurement**

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

## **5. Measurement Uncertainty**

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

<b>Test Name</b>	<b>Confidence Level</b>	<b>Calculated Uncertainty</b>
Specific Absorption Rate-GSM 850 / WCDMA FDD 5 / LTE Band 5 / LTE Band 13 / LTE Band 17 Head Configuration 1g	95%	±18.77%
Specific Absorption Rate-GSM / GPRS / EDGE 850 / WCDMA FDD 5 / LTE Band 5 / LTE Band 13 / LTE Band 17 Body Configurations 1g	95%	±18.36%
Specific Absorption Rate-WCDMA FDD 4 / LTE Band 4 Head Configuration 1g	95%	±18.45%
Specific Absorption Rate-WCDMA FDD 4 / LTE Band 4 Body Configuration 1g	95%	±18.45%
Specific Absorption Rate-PCS 1900 / WCDMA FDD 2/ LTE Band 2 Head Configuration 1g	95%	±18.88%
Specific Absorption Rate-GSM / GPRS / EDGE 1900 / WCDMA FDD 2 / LTE Band 2 Body Configuration 1g	95%	±18.26%
Specific Absorption Rate- LTE Band 7 / Wi-Fi 2450 MHz Head Configuration 1g	95%	±18.13%
Specific Absorption Rate-LTE Band 7 / Wi-Fi 2450 MHz Body Configuration 1g	95%	±18.35%
Specific Absorption Rate-Wi-Fi 5GHz Head Configuration 1g	95%	±21.25%
Specific Absorption Rate-Wi-Fi 5GHz Body Configuration 1g	95%	±19.90%

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the appropriate accreditation body is followed.

### 5.1. Uncertainty -GSM 850 / WCDMA FDD 5 / LTE Band 5 / LTE Band 13 / LTE Band 17 Head Configuration 1g

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C <sub>i</sub> (1g)	Standard Uncertainty		U <sub>i</sub> or U <sub>eff</sub>
							+ u (%)	- u (%)	
B	Probe calibration	6.000	6.000	normal (k=1)	1.0000	1.0000	6.000	6.000	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	1.730	1.730	Rectangular	1.7321	1.0000	0.999	0.999	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration / Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.510	2.510	normal (k=1)	1.0000	1.0000	2.510	2.510	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	2.950	2.950	normal (k=1)	1.0000	0.6400	1.888	1.888	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	2.840	2.840	normal (k=1)	1.0000	0.6000	1.704	1.704	5
	Combined standard uncertainty			t-distribution			9.58	9.58	>500
	Expanded uncertainty			k = 1.96			18.77	18.77	>500

## 5.2. Uncertainty Rate-GSM / GPRS / EDGE 850 / WCDMA FDD 5 / LTE Band 5 / LTE Band 13 / LTE Band 17 Body Configuration 1g

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C <sub>i</sub> (1g)	Standard Uncertainty		U <sub>i</sub> or U <sub>eff</sub>
							+ u (%)	- u (%)	
B	Probe calibration	6.000	6.000	normal (k=1)	1.0000	1.0000	6.000	6.000	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	1.730	1.730	Rectangular	1.7321	1.0000	0.999	0.999	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration /Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.510	2.510	normal (k=1)	1.0000	1.0000	2.510	2.510	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	2.000	2.000	normal (k=1)	1.0000	0.6400	1.280	1.280	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	1.560	1.560	normal (k=1)	1.0000	0.6000	0.936	0.936	5
	Combined standard uncertainty			t-distribution			9.37	9.37	>500
	Expanded uncertainty			k = 1.96			18.36	18.36	>500

**5.3. Uncertainty – WCDMA FDD 4 / LTE Band 4 Head Configuration 1g**

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C <sub>i</sub> (1g)	Standard Uncertainty		U <sub>i</sub> OR U <sub>eff</sub>
							+ u (%)	- u (%)	
B	Probe calibration	6.000	6.000	normal (k=1)	1.0000	1.0000	6.000	6.000	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	1.730	1.730	Rectangular	1.7321	1.0000	0.999	0.999	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration/ Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.440	2.440	normal (k=1)	1.0000	1.0000	2.440	2.440	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	2.120	2.120	normal (k=1)	1.0000	0.6400	1.357	1.357	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	2.270	2.270	normal (k=1)	1.0000	0.6000	1.362	1.362	5
	Combined standard uncertainty			t-distribution			9.41	9.41	>500
	Expanded uncertainty			k = 1.96			18.45	18.45	>500

**5.4. Uncertainty -WCDMA FDD 4 / LTE Band 4 Body Configuration 1g**

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C <sub>i</sub> (1g)	Standard Uncertainty		U <sub>i</sub> OR U <sub>eff</sub>
							+ u (%)	- u (%)	
B	Probe calibration	6.000	6.000	normal (k=1)	1.0000	1.0000	6.000	6.000	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	1.730	1.730	Rectangular	1.7321	1.0000	0.999	0.999	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration/ Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.460	2.460	normal (k=1)	1.0000	1.0000	2.460	2.460	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	2.210	2.210	normal (k=1)	1.0000	0.6400	1.414	1.414	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	2.150	2.150	normal (k=1)	1.0000	0.6000	1.290	1.290	5
	Combined standard uncertainty			t-distribution			9.42	9.42	>500
	Expanded uncertainty			k = 1.96			18.45	18.45	>500

**5.5. Uncertainty -PCS 1900 / WCDMA FDD 2 / LTE Band 2 Head Configuration 1g**

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C <sub>i</sub> (1g)	Standard Uncertainty		U <sub>i</sub> or U <sub>eff</sub>
							+ u (%)	- u (%)	
B	Probe calibration	6.000	6.000	normal (k=1)	1.0000	1.0000	6.000	6.000	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	1.730	1.730	Rectangular	1.7321	1.0000	0.999	0.999	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with Regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration / Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.490	2.490	normal (k=1)	1.0000	1.0000	2.490	2.490	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	3.560	3.560	normal (k=1)	1.0000	0.6400	2.278	2.278	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	2.620	2.620	normal (k=1)	1.0000	0.6000	1.572	1.572	5
	Combined standard uncertainty			t-distribution			9.63	9.63	>500
	Expanded uncertainty			k = 1.96			18.88	18.88	>500

**5.6. Uncertainty -PCS / GPRS / EDGE 1900 / WCDMA FDD 2 / LTE Band 2 Body Configuration 1g**

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C <sub>i</sub> (1g)	Standard Uncertainty		U <sub>i</sub> or U <sub>eff</sub>
							+ u (%)	- u (%)	
B	Probe calibration	6.000	6.000	normal (k=1)	1.0000	1.0000	6.000	6.000	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	1.730	1.730	Rectangular	1.7321	1.0000	0.999	0.999	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration / Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	1.860	1.860	normal (k=1)	1.0000	1.0000	1.860	1.860	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	2.610	2.610	normal (k=1)	1.0000	0.6400	1.670	1.670	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	2.140	2.140	normal (k=1)	1.0000	0.6000	1.284	1.284	5
	Combined standard uncertainty			t-distribution			9.32	9.32	>500
	Expanded uncertainty			k = 1.96			18.26	18.26	>500

**5.7. Uncertainty – LTE Band 7 / Wi-Fi 2450 MHz Head Configuration 1g**

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C <sub>i</sub> (1g)	Standard Uncertainty		U <sub>i</sub> or U <sub>eff</sub>
							+ u (%)	- u (%)	
B	Probe calibration	6.000	6.000	normal (k=1)	1.0000	1.0000	6.000	6.000	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration / Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.180	2.180	normal (k=1)	1.0000	1.0000	2.180	2.180	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	1.840	1.840	normal (k=1)	1.0000	0.6400	1.178	1.178	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	2.030	2.030	normal (k=1)	1.0000	0.6000	1.218	1.218	5
	Combined standard uncertainty			t-distribution			9.25	9.25	>500
	Expanded uncertainty			k = 1.96			18.13	18.13	>500

**5.8. Uncertainty – LTE Band 7 / Wi-Fi 2450 MHz Body Configuration 1g**

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C <sub>i</sub> (1g)	Standard Uncertainty		U <sub>i</sub> or U <sub>eff</sub>
							+ u (%)	- u (%)	
B	Probe calibration	6.000	6.000	normal (k=1)	1.0000	1.0000	6.000	6.000	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration / Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.440	2.440	normal (k=1)	1.0000	1.0000	2.440	2.440	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	2.260	2.260	normal (k=1)	1.0000	0.6400	1.446	1.446	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	2.150	2.150	normal (k=1)	1.0000	0.6000	1.290	1.290	5
	Combined standard uncertainty			t-distribution			9.36	9.36	>500
	Expanded uncertainty			k = 1.96			18.35	18.35	>500

**5.9. Uncertainty - Wi-Fi 5GHz Head Configuration 1g**

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C <sub>i</sub> (1g)	Standard Uncertainty		U <sub>i</sub> or U <sub>eff</sub>
							+ u (%)	- u (%)	
B	Probe calibration	6.550	6.550	normal (k=1)	1.0000	1.0000	6.550	6.550	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration / Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.380	2.380	normal (k=1)	1.0000	1.0000	2.380	2.380	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	6.220	6.220	normal (k=1)	1.0000	0.6400	3.981	3.981	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	5.580	5.580	normal (k=1)	1.0000	0.6000	3.348	3.348	5
	Combined standard uncertainty			t-distribution			10.84	10.84	>150
	Expanded uncertainty			k = 1.96			21.25	21.25	>150

**5.10. Uncertainty - Wi-Fi 5GHz Body Configuration 1g**

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C <sub>i</sub> (1g)	Standard Uncertainty		U <sub>i</sub> or U <sub>eff</sub>
							+ u (%)	- u (%)	
B	Probe calibration	6.550	6.550	normal (k=1)	1.0000	1.0000	6.550	6.550	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration / Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	1.960	1.960	normal (k=1)	1.0000	1.0000	1.960	1.960	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	4.370	4.370	normal (k=1)	1.0000	0.6400	2.797	2.797	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	4.270	4.270	normal (k=1)	1.0000	0.6000	2.562	2.562	5
	Combined standard uncertainty			t-distribution			10.15	10.15	>450
	Expanded uncertainty			k = 1.96			19.90	19.90	>450

## 6. Equipment Under Test (EUT)

### 6.1. Identification of Equipment Under Test (EUT)

<b>Serial Number/ IMEI Number:</b>	<p><b>Cellular Radiated Samples:</b> BH908QZD1L; 355188065615076 - used to perform GSM850 Head, WCDMA 2 Body, WCDMA 4, WCDMA 5 Head, LTE 2 Body-worn, LTE 4, LTE 13, LTE 17 SAR measurements only. BH908R021L; 355188065615258 - used to perform GSM850 Body, PCS1900, WCDMA 2 Head, WCDMA 5 Body, LTE 2 Head and Hotspot Mode, LTE 5 SAR measurements only.</p> <p><b>Cellular Conducted Sample:</b> BH909GPR1L; 355188065615035 - used to perform all Cellular conducted power measurements only.</p> <p><b>WLAN/WPAN Radiated Sample:</b> CB5A20L14K; 355188060002296 - used to perform SAR measurements on WLAN 5.0 GHz Head only. CB5A20L133; 355188060002262 - used to perform SAR measurement on WLAN 5.0 GHz Body and WPAN only.</p> <p><b>WLAN/WPAN Conducted Sample:</b> CB5A20L14E; 355188060000266 - used to perform all WLAN and WPAN conducted power measurements only.</p>
<b>Hardware Version Number:</b>	Cellular Sample: A WLAN Sample: A
<b>Software Version Number:</b>	Cellular Sample: 23.0.1.A.5.77 WLAN Sample: 0_25_3_16_A
<b>Country of Manufacture:</b>	China
<b>Date of Receipt:</b>	23 Dec 2014

<b>DUT Descriptions</b>	<p>The EUT supports GSM 850/1900MHz bands, WCDMA FDD bands 2/4/5, LTE FDD bands 2/4/5/7/13/17 bands. It also supports Dual Transfer Mode Class 11 (DTM ~Voice +Data), GPRS service with multi-slots class 33, EGPRS service with multi-slots class 33, HSPA with HSDPA (Category 24) and HSUPA (Category 6) features are also supported. It has MP3, camera, FM radio, USB memory, GPS receiver, NFC, Mobile High-Definition Link (MHL), Bluetooth (EDR and Bluetooth 4.0), WLAN (802.11 a/b/g/n/ac), Antenna Tuner and Wi-Fi hotspot functions with 'Auto RF Power Back-Off' mode capabilities.</p> <p>Note: A Wi-Fi hotspot function with 'Auto RF Power Back-Off' works on PCS1900, WCDMA FDD 2/4, and LTE Band 2/4/7 bands only.</p>
<b>Operating Configurations</b>	Held to head Hotspot Mode Body-worn (Voice call)
<b>Device dimension</b>	Overall (Length x Width): 72.40 mm x 146.46mm Overall Diagonal: 159.381mm Display Diagonal: 132.00mm
<b>Back Cover</b>	<input checked="" type="checkbox"/> Normal Battery Cover <input type="checkbox"/> Normal Battery Cover with NFC <input type="checkbox"/> Wireless Charger Battery Cover <input type="checkbox"/> Wireless Charger Battery Cover with NFC
<b>Accessory</b>	<input checked="" type="checkbox"/> Headset
<b>Battery Options</b>	<input checked="" type="checkbox"/> Standard – Lithium-ion battery, Rating 4.2Vdc <input type="checkbox"/> Extended (large capacity)
<b>Mobile Hotspot</b>	<p>Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi -enabled devices.</p> <input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 2.4 GHz) <input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 5 GHz) <input checked="" type="checkbox"/> Mobile Hotspot (Bluetooth 2.4 GHz)
<b>Wi-Fi Direct</b>	<p>Wi-Fi Direct enabled devices transfer data directly between each other</p> <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 2.4 GHz) <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 5 GHz)

### 6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode	Duty Cycle
GSM	850, 1900	Voice (GMSK), GPRS (GMSK) and EGPRS (GMSK / 8PSK) DTM (GMSK / 8PSK)	GSM Voice: 12.0%; GPRS 1 Slot: 12.0%; 2 Slots: 25%, 3 Slots: 37.5%, 4 Slots: 50% DTM 1 Slot: 12.0%; 2 Slots: 25%, 3 Slots: 37.5%
	GPRS Multi-Slot Class: <input type="checkbox"/> Class 8 - One Up <input type="checkbox"/> Class 10 - Two Up <input checked="" type="checkbox"/> Class 12 - Four Up <input checked="" type="checkbox"/> DTM (Dual Transfer Mode)		
W-CDMA (FDD)	Band 2 / 4 / 5	WCDMA Rel. 99 (Voice & Data) HSDPA (Rel. 5) HSUPA (Rel. 6) DC-HSDPA (Rel. 7) HSPA+ (Rel. 9)	Rel. 99: 100%
LTE (FDD)	Band 2 / 4 / 5 / 7 / 13 / 17	QPSK, 16QAM Rel. 10 Carrier Aggregation (1 Uplink and 2 Downlinks)	100%
	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) 802.11n (HT40)	100%
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80)	100%
Bluetooth 4.0	-	BR EDR BLE	<100%

### 6.3. Nominal and Maximum Output Power

(From customer)

RF Air interface	Mode	RF Output Power (dBm)	
		Target	Max. tune-up tolerance limit
GSM850 (Power Back-off Not Supported)	Voice	32.5	-0.9~+0.6
	GPRS / EGPRS 1 slot (GMSK)	32.5	-0.9~+0.6
	GPRS / EGPRS 2 slots (GMSK)	31.0	-1.5~+0.6
	GPRS / EGPRS 3 slots (GMSK)	29.0	-1.5~+0.6
	GPRS / EGPRS 4 slots (GMSK)	28.0	-1.5~+0.6
	EGPRS 1 slot (8PSK)	27.0	-1.5~+1.0
	EGPRS 2 slots (8PSK)	25.0	-1.5~+1.0
	EGPRS 3 slots (8PSK)	24.0	-1.5~+1.0
	EGPRS 4 slots (8PSK)	22.0	-1.5~+1.0
	DTM Class 5 GPRS + Voice (CS_GMSK)	31.0	-1.5~+0.6
	DTM Class 5 GPRS + Voice (PS_GMSK)	31.0	-1.5~+0.6
	DTM Class 9 GPRS + Voice (CS_GMSK)	31.0	-1.5~+0.6
	DTM Class 9 GPRS + Voice (PS_GMSK)	31.0	-1.5~+0.6
	DTM Class 11 GPRS + Voice (CS_GMSK)	29.0	-1.5~+0.6
	DTM Class 11 GPRS + Voice (PS_GMSK)	29.0	-1.5~+0.6
	DTM Class 5 EGPRS + Voice (CS_GMSK)	31.0	-1.5~+0.6
	DTM Class 5 EGPRS + Voice (PS_8PSK)	25.0	-1.5~+1.0
	DTM Class 9 EGPRS + Voice (CS_GMSK)	31.0	-1.5~+0.6
	DTM Class 9 EGPRS + Voice (PS_8PSK)	25.0	-1.5~+1.0
	DTM Class 11 EGPRS + Voice (CS_GMSK)	29.0	-1.5~+0.6
DTM Class 11 EGPRS + Voice (PS_8PSK)	24.0	-1.5~+1.0	
GSM1900 (Power Back-off Disabled)	Voice	30.0	-0.9~+0.6
	GPRS / EGPRS 1 slot (GMSK)	30.0	-0.9~+0.6
	GPRS / EGPRS 2 slots (GMSK)	28.0	-1.5~+0.6
	GPRS / EGPRS 3 slots (GMSK)	27.0	-1.5~+0.6
	GPRS / EGPRS 4 slots (GMSK)	26.0	-1.5~+1.0
	EGPRS 1 slot (8PSK)	26.0	-1.5~+1.0
	EGPRS 2 slots (8PSK)	24.0	-1.5~+1.0
	EGPRS 3 slots (8PSK)	23.0	-1.5~+1.0
	EGPRS 4 slots (8PSK)	22.2	-1.5~+0.6
	DTM Class 5 GPRS + Voice (CS_GMSK)	28.0	-1.5~+0.6
	DTM Class 5 GPRS + Voice (PS_GMSK)	28.0	-1.5~+0.6
	DTM Class 9 GPRS + Voice (CS_GMSK)	28.0	-1.5~+0.6
	DTM Class 9 GPRS + Voice (PS_GMSK)	28.0	-1.5~+0.6
	DTM Class 11 GPRS + Voice (CS_GMSK)	27.0	-1.5~+0.6
	DTM Class 11 GPRS + Voice (PS_GMSK)	27.0	-1.5~+0.6
	DTM Class 5 EGPRS + Voice (CS_GMSK)	28.0	-1.5~+0.6
	DTM Class 5 EGPRS + Voice (PS_8PSK)	24.0	-1.5~+1.0
	DTM Class 9 EGPRS + Voice (CS_GMSK)	28.0	-1.5~+0.6
	DTM Class 9 EGPRS + Voice (PS_8PSK)	24.0	-1.5~+1.0
	DTM Class 11 EGPRS + Voice (CS_GMSK)	27.0	-1.5~+0.6
DTM Class 11 EGPRS + Voice (PS_8PSK)	23.0	-1.5~+1.0	

**Nominal and Maximum Output Power (Continued)**

RF Air interface	Mode	RF Output Power (dBm)	
		Target	Max. tune-up tolerance limit
GSM1900 (Power Back-off Enabled)	Voice	24.0	-0.9~+0.6
	GPRS / EGPRS 1 slot (GMSK)	24.0	-1.5~+1.5
	GPRS / EGPRS 2 slots (GMSK)	22.0	-1.5~+1.5
	GPRS / EGPRS 3 slots (GMSK)	21.0	-1.5~+1.5
	GPRS / EGPRS 4 slots (GMSK)	20.0	-1.5~+1.5
	EGPRS 1 slot (8PSK)	23.5	-1.5~+1.5
	EGPRS 2 slots (8PSK)	21.5	-1.5~+1.5
	EGPRS 3 slots (8PSK)	20.5	-1.5~+1.5
	EGPRS 4 slots (8PSK)	19.5	-1.5~+1.5
	DTM Class 5 GPRS + Voice (CS_GMSK)	22.0	-1.5~+1.5
	DTM Class 5 GPRS + Voice (PS_GMSK)	22.0	-1.5~+1.5
	DTM Class 9 GPRS + Voice (CS_GMSK)	22.0	-1.5~+1.5
	DTM Class 9 GPRS + Voice (PS_GMSK)	22.0	-1.5~+1.5
	DTM Class 11 GPRS + Voice (CS_GMSK)	21.0	-1.5~+1.5
	DTM Class 11 GPRS + Voice (PS_GMSK)	21.0	-1.5~+1.5
	DTM Class 5 EGPRS + Voice (CS_GMSK)	22.0	-1.5~+1.5
	DTM Class 5 EGPRS + Voice (PS_8PSK)	21.5	-1.5~+1.5
	DTM Class 9 EGPRS + Voice (CS_GMSK)	22.0	-1.5~+1.5
	DTM Class 9 EGPRS + Voice (PS_8PSK)	21.5	-1.5~+1.5
	DTM Class 11 EGPRS + Voice (CS_GMSK)	21.0	-1.5~+1.5
DTM Class 11 EGPRS + Voice (PS_8PSK)	20.5	-1.5~+1.5	

**Nominal and Maximum Output Power (Continued)**

RF Air interface	Mode	RF Output Power (dBm)	
		Target	Max. tune-up tolerance limit
UMTS FDD 2 (Power Back-off Disabled)	R99	23.5	-0.7~+0.5
	HSDPA	23.5	-0.7~+0.5
	HSUPA	23.5	-0.7~+0.5
	DC-HSDPA	23.5	-0.7~+0.5
UMTS FDD 2 (Power Back-off Enabled)	R99	17.0	-0.7~+0.5
	HSDPA	17.0	-0.7~+0.5
	HSUPA	17.0	-0.7~+0.5
	DC-HSDPA	17.0	-0.7~+0.5
UMTS FDD 4 (Power Back-off Disabled)	R99	23.5	-0.7~+0.5
	HSDPA	23.5	-0.7~+0.5
	HSUPA	23.5	-0.7~+0.5
	DC-HSDPA	23.5	-0.7~+0.5
UMTS FDD 4 (Power Back-off Disabled)	R99	22.0	-0.7~+0.5
	HSDPA	22.0	-0.7~+0.5
	HSUPA	22.0	-0.7~+0.5
	DC-HSDPA	22.0	-0.7~+0.5
UMTS FDD 5 (Power Back-off Not Supported)	R99	24.0	-0.7~+0.5
	HSDPA	24.0	-0.7~+0.5
	HSUPA	24.0	-0.7~+0.5
	DC-HSDPA	24.0	-0.7~+0.5
LTE Band 2 (Power Back off Disabled)	QPSK (1RB)	23.2	-1.0 ~ +1.0
	QPSK (50%RB)	22.2	-1.0 ~ +1.0
	QPSK (100%RB)	22.2	-1.0 ~ +1.0
	16QAM (1RB)	22.2	-1.0 ~ +1.0
	16QAM (50%RB)	21.2	-1.0 ~ +1.0
	16QAM (100%RB)	21.2	-1.0 ~ +1.0
LTE Band 2 (Power Back off Enabled)	QPSK (1RB)	17.0	-1.0 ~ +1.0
	QPSK (50%RB)	17.0	-1.0 ~ +1.0
	QPSK (100%RB)	17.0	-1.0 ~ +1.0
	16QAM (1RB)	17.0	-1.0 ~ +1.0
	16QAM (50%RB)	17.0	-1.0 ~ +1.0
	16QAM (100%RB)	17.0	-1.0 ~ +1.0
LTE Band 4 (Power Back off Disabled)	QPSK (1RB)	23.3	-1.0 ~ +1.0
	QPSK (50%RB)	22.3	-1.0 ~ +1.0
	QPSK (100%RB)	22.3	-1.0 ~ +1.0
	16QAM (1RB)	22.3	-1.0 ~ +1.0
	16QAM (50%RB)	21.3	-1.0 ~ +1.0
	16QAM (100%RB)	21.3	-1.0 ~ +1.0
LTE Band 4 (Power Back off Enabled)	QPSK (1RB)	21.0	-1.0 ~ +1.0
	QPSK (50%RB)	21.0	-1.0 ~ +1.0
	QPSK (100%RB)	21.0	-1.0 ~ +1.0
	16QAM (1RB)	21.0	-1.0 ~ +1.0
	16QAM (50%RB)	21.0	-1.0 ~ +1.0
	16QAM (100%RB)	21.0	-1.0 ~ +1.0

**Nominal and Maximum Output Power (Continued)**

RF Air interface	Mode	RF Output Power (dBm)	
		Target	Tolerance ± (dB)
LTE Band 5 (Power Back-off Not Supported)	QPSK (1RB)	23.0	-1.0 ~ +1.0
	QPSK (50%RB)	22.0	-1.0 ~ +1.0
	QPSK (100%RB)	22.0	-1.0 ~ +1.0
	16QAM (1RB)	22.0	-1.0 ~ +1.0
	16QAM (50%RB)	21.0	-1.0 ~ +1.0
	16QAM (100%RB)	21.0	-1.0 ~ +1.0
LTE Band 7 (Power Back off Disabled)	QPSK (1RB)	23.5	-1.0 ~ +1.0
	QPSK (50%RB)	22.5	-1.0 ~ +1.0
	QPSK (100%RB)	22.5	-1.0 ~ +1.0
	16QAM (1RB)	22.5	-1.0 ~ +1.0
	16QAM (50%RB)	21.5	-1.0 ~ +1.0
	16QAM (100%RB)	21.5	-1.0 ~ +1.0
LTE Band 7 (Power Back off Enabled)	QPSK (1RB)	23.0	-1.0 ~ +1.0
	QPSK (50%RB)	22.0	-1.0 ~ +1.0
	QPSK (100%RB)	22.0	-1.0 ~ +1.0
	16QAM (1RB)	22.0	-1.0 ~ +1.0
	16QAM (50%RB)	21.0	-1.0 ~ +1.0
	16QAM (100%RB)	21.0	-1.0 ~ +1.0
LTE Band 13 (Power Back-off Not Supported)	QPSK (1RB)	23.0	-1.0 ~ +1.0
	QPSK (50%RB)	22.0	-1.0 ~ +1.0
	QPSK (100%RB)	22.0	-1.0 ~ +1.0
	16QAM (1RB)	22.0	-1.0 ~ +1.0
	16QAM (50%RB)	21.0	-1.0 ~ +1.0
	16QAM (100%RB)	21.0	-1.0 ~ +1.0
LTE Band 17 (Power Back-off Not Supported)	QPSK (1RB)	23.0	-1.0 ~ +1.0
	QPSK (50%RB)	22.0	-1.0 ~ +1.0
	QPSK (100%RB)	22.0	-1.0 ~ +1.0
	16QAM (1RB)	22.0	-1.0 ~ +1.0
	16QAM (50%RB)	21.0	-1.0 ~ +1.0
	16QAM (100%RB)	21.0	-1.0 ~ +1.0

**Nominal and Maximum Output Power (Continued)**

RF Air interface	Mode	RF Output Power (dBm) Maximum Power
WiFi 2.4 GHz	802.11b	13.5
	802.11g	13.4
	802.11n HT20	13.4
WiFi 5.2 GHz	802.11a	16.3
	802.11n HT20	16.3
	802.11n HT40	14.3
	802.11ac 20MHz	16.3
	802.11ac 40MHz	14.3
	802.11ac 80MHz	14.2
WiFi 5.3 GHz	802.11a	16.3
	802.11n HT20	16.3
	802.11n HT40	14.3
	802.11ac 20MHz	16.3
	802.11ac 40MHz	14.3
	802.11ac 80MHz	14.2
WiFi 5.5 GHz	802.11a	16.5
	802.11n HT20	16.5
	802.11n HT40	14.7
	802.11ac 20MHz	16.6
	802.11ac 40MHz	14.7
	802.11ac 80MHz	14.5
WiFi 5.8 GHz	802.11a	16.5
	802.11n HT20	16.5
	802.11n HT40	14.7
	802.11ac 20MHz	16.6
	802.11ac 40MHz	14.7
	802.11ac 80MHz	14.5
Bluetooth	BR (Low Channel)	7.9
	BR (Mid Channel)	10.0
	BR (High Channel)	7.9
	EDR (Low Channel)	5.9
	EDR (Mid Channel)	7.9
	EDR (High Channel)	4.9
	BLE (Low Channel)	2.4
	BLE (Mid Channel)	2.4
	BLE (High Channel)	2.4

### 6.4. Simultaneous Transmission Conditions

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna.

#	Simultaneous transmission conditions					
	WWAN			WLAN		WPAN
	GSM Voice / Data / Dual Transfer Mode (DTM)	LTE BAND Data	WCDMA Voice / Data	Wi-Fi 802.11b/g/n	Wi-Fi 802.11a/n/ac	Bluetooth
1	X			X		
2		X		X		
3			X	X		
4	X				X	
5		X			X	
6			X		X	
7	X					X
8		X				X
9			X			X
10					X	X
11	X				X	X
12		X			X	X
13			X		X	X

**Note:**

Based on the customer declaration, the following are the possible combination of the Simultaneous Transmission possibilities in the EUT:

1. WWAN + WLAN 2.4 GHz
2. WWAN + WLAN 5.0 GHz
3. WWAN + WPAN
4. WPAN + WLAN 5.0 GHz
5. WWAN + WPAN + WLAN 5.0 GHz

**6.5.Additional Information Related to Testing**

<b>Equipment Category</b>	2G GSM PCS	TDMA 850/ 1900	Voice GPRS (Data) EDGE (Data) DTM (Voice + Data)
	3G WCDMA Band	FDD 2 / 4 / 5	RMC12.2 Kbps HSDPA Rel 5 HSUPA Rel 6 DC-HSDPA Rel 8
	4G LTE Band	FDD 2 / 4 / 5 / 7 / 13 / 17	QPSK Data
	Wi-Fi Band	(2.4 / 5.0) GHz	Data 802.11a/b/g/n/ac
	Bluetooth	2.4 GHz	BR EDR BLE
<b>Type of Unit</b>	Portable Transceiver		
<b>Intended Operating Environment:</b>	Within GSM, UMTS, LTE , Wi-Fi and <i>Bluetooth</i> Coverage		
<b>Transmitter Maximum Output Power Characteristics:</b>	GSM850	Communication Test Set was configured to allow the EUT to transmit at a maximum power using Power Control Level (PCL) setting of 5.	
	PCS1900	Communication Test Set was configured to allow the EUT to transmit at a maximum power using Power Control Level (PCL) setting of 0.	
	UMTS FDD 2	Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D01.	
	UMTS FDD 4	Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D01.	
	UMTS FDD 5	Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D01.	
	LTE Band 2	Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D05.	
	LTE Band 4	Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D05.	
	LTE Band 5	Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D05.	
	LTE Band 7	Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D05.	
	LTE Band 13	Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D05.	
	LTE Band 17	Communication Test Set configured to allow to EUT to transmit at a maximum power as per KDB 941225 D05.	
	2.4 GHz Wi-Fi 802.11b/g/n	Test Software was used to configure the EUT to transmit at a maximum measured power as per section 8.4	
	5.0 GHz Wi-Fi 802.11a	Test Software was used to configure the EUT to transmit at a maximum measured power as per section 8.4	
	5.0 GHz Wi-Fi 802.11n (HT20 / HT40)	Test Software was used to configure the EUT to transmit at a maximum measured power as per section 8.4	
5.0 GHz Wi-Fi 802.11ac (VHT20 / VHT40 / VHT80)	Test Software was used to configure the EUT to transmit at a maximum measured power as per section 8.4		
<i>Bluetooth</i>	Test Software was used to configure the EUT to transmit at a maximum measured power as per section 8.4		

**Additional Information Related to Testing (Continued):**

<b>Transmitter Frequency Range:</b>	GSM850	(824 to 849) MHz
	PCS1900	(1850 to 1910) MHz
	WCDMA FDD 2	(1852 to 1908) MHz
	WCDMA FDD 4	(1712 to 1753) MHz
	WCDMA FDD 5	(826 to 847) MHz
	LTE Band 2	(1850 to 1910) MHz
	LTE Band 4	(1710 to 1755) MHz
	LTE Band 5	(820 to 850) MHz
	LTE Band 7	(2505 to 2570) MHz
	LTE Band 13	(775 to 790) MHz
	LTE Band 17	(705 to 715) MHz
	2.4 GHz Wi-Fi 802.11b/g/n	(2412 to 2462) MHz
	5.0 GHz Sub band 1 Wi-Fi 802.11a/n/ac	(5180 to 5240) MHz
	5.0 GHz Sub band 2 Wi-Fi 802.11a/n/ac	(5260 to 5320) MHz
	5.0 GHz Sub band 3 Wi-Fi 802.11a/n/ac	(5500 to 5700) MHz
5.0 GHz Sub band 4 Wi-Fi 802.11a/n/ac	(5745 to 5825) MHz	

**Additional Information Related to Testing (Continued):**

Transmitter Frequency Allocation of EUT When Under Test:	Bands	Channel Number	Channel Description	Frequency (MHz)
	GSM850	128	Low	824.2
		190	Middle	836.6
		251	High	848.8
	PCS1900	512	Low	1850.2
		661	Middle	1880.0
		810	High	1909.8
	WCDMA FDD 2	9262	Low	1852.4
		9400	Middle	1880.0
		9538	High	1907.6
	WCDMA FDD 4	1312	Low	1712.4
		1412	Middle	1732.6
		1513	High	1752.6
	WCDMA FDD 5	4132	Low	826.4
		4183	Middle	836.6
		4233	High	846.6
	LTE Band 2	18700	Low	1860.0
		18900	Middle	1880.0
		19100	High	1900.0
	LTE Band 4	20050	Low	1720.0
		20175	Middle	1732.5
		20300	High	1745.0
	LTE Band 5	20450	Low	829.0
		20525	Middle	836.5
		20625	High	844.0
	LTE Band 7	20850	Low	2510.0
		21100	Middle	2535.0
		21350	High	2560.0
	LTE Band 13	23780	Low	709.0
		23790	Middle	710.0
		23800	High	711.0
LTE Band 17	24250	Low	842.0	
	24300	Middle	847.0	
	24350	High	852.0	

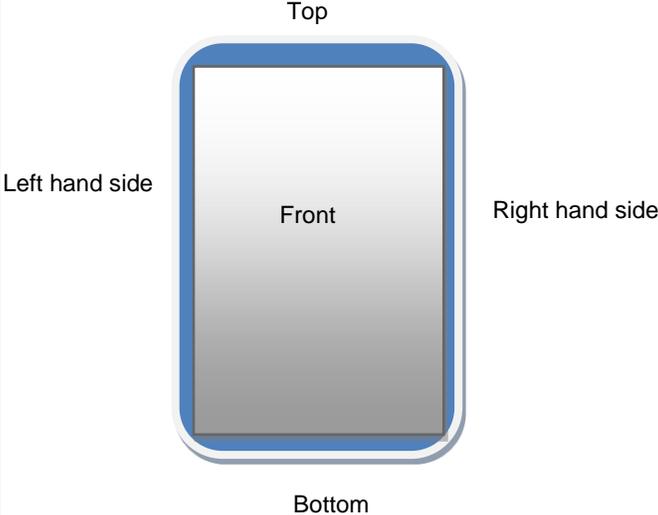
**Additional Information Related to Testing (Continued):**

Transmitter Frequency Allocation of EUT When Under Test:	Band: 2.4 / 5.0 GHz Wi-Fi 802.11a/n/ac (HT20 / HT40/HT80)						
	Rule	20 MHz BW Ch.#	Frq. (MHz)	40 MHz BW Ch.#	Frq. (MHz)	80 MHz BW Ch.#	Frq. (MHz)
	15.247	1	2412.0				
		6	2436.0				
		11	2462.0				
	5.2 U-NII-1	36	5180.0	38	5190.0		
		40	5200.0			42	5210.0
		44	5220.0	46	5230.0		
		48	5240.0				
	5.3 U-NII-2A	52	5260.0	54	5270.0		
		56	5280.0			58	5290.0
		60	5300.0	62	5310.0		
		64	5320.0				
	5.6 U-NII-2C	100	5500.0	102	5510.0		
		104	5520.0			106	5530.0
		108	5540.0	110	5550.0		
		112	5560.0				
		116	5580.0	118	5590.0		
		120	5600.0			122	5610.0
		124	5620.0	126	5630.0		
		128	5640.0				
		132	5660.0	134	5670.0		
136		5680.0					
5.8 UNII-3	140	5700.0					
	149	5745.0	151	5755.0			
	153	5765.0			155	5775.0	
	157	5785.0	159	5795.0			
	161	5805.0					
165	5825.0						
<b>Antenna Type:</b>	Internal integral						
<b>Antenna Length:</b>	As specified in Appendix A.1						
<b>Number of Antenna Positions:</b>	WWAN ~ LTE / WCDMA / GSM					1 fixed	
	WLAN/ BT					1 fixed	
	Felica/NFC					1 fixed	
	Sub/GPS					1 fixed	

**6.6.Additional Information Related to LTE Test parameter**

#	Description	Parameter
1	Identify the operating frequency range of each LTE transmission FCC band used by the device	Band 2: frequency range – 1850 MHz to1910 MHz Band 4: frequency range – 1710 MHz to1755 MHz Band 5: frequency range – 820 MHz to 850 MHz Band 7: frequency range – 2505 MHz to 2570 MHz Band 13: frequency range – 704 to 711 MHz Band 17: frequency range – 705 MHz to 715MHz
2	Identify the channel bandwidths used in each frequency band; e.g.: 1.4, 3, 5, 10, 15, 20 MHz etc.	Channel Bandwidths used are: B2 (1.4, 3, 5, 10, 15, 20) MHz B4 (1.4, 3, 5, 10, 15, 20) MHz B5 (1.4, 3, 5, 10) MHz B7 ( 5, 10, 15, 20) MHz B13 (5, 10) MHz B17 ( 5, 10) MHz
3	Identify the high, middle and low (L, M, H) channel numbers and frequencies tested in each LTE frequency band	B2 -20 MHz (H,M,L)= CH (19100,18900,18700); Freq (1900, 1880, 1860) MHz B4 -20 MHz (H,M,L)= CH (20300, 20175, 20050); Freq (1745, 1732.5, 1720) MHz B5 -10 MHz (H,M,L)= CH (20625, 20525, 20450); Freq (844, 836.5, 829) MHz B7 -20 MHz (H,M,L)= CH (21350, 21100, 20850); Freq (2560, 2535, 2510) MHz B13 -10MHz (M)= CH (23230); Freq (782) MHz B17 -10 MHz (H,M,L)= CH (23800, 23790, 23780); Freq (711, 710, 709) MHz
4	Specify the UE category and uplink modulations used	The UE Category is 4 and the Uplink modulations used are QPSK, 16QAM.
5	Descriptions of the LTE transmitter and antenna implementation & identify whether it is a standalone transmitter operating independently of other wireless transmitters in the device or sharing hardware components and/or antenna(s) with other transmitters etc.	This model has only one main antenna for LTE/WCDMA/GSM bands (as pictured in APPENDIX A.1).

**Additional Information Related to LTE Test parameter (Continued):**

#	Description	Parameter
6	Identify the LTE Band Voice/data requirements in each operating mode and exposure condition with respect to head and body test configurations, antenna locations, handset flip-cover or slide positions, antenna diversity conditions, etc.	<p>The following exposure condition with respect to head and body test are required for both voice and data modes due to EUT functionality and antenna locations.</p> <ol style="list-style-type: none"> <li>1) Head SAR is required on DTM in 2G; RMC Rel. 99 in WCDMA; LTE Data Mode (QPSK) as this model does not supports SVLTE operation; Data Mode in WiFi 2.4 / 5.0 GHz.</li> <li>2) Mobile Hotspot Mode will be tested by positioning the smart phone with 10 mm separation distance.</li> </ol> <p>- Wireless Personal Hotspot mode with consideration for the Front Display of EUT, Back of EUT, Left Hand side of EUT, Right Hand side of EUT, Top Edge of EUT and Bottom Edge of EUT with respect to the antenna location. The test separation distance between the EUT edge and phantom flat surface for this mode will be 10mm as the dimensions of the device is &gt; 9cm x 5cm.</p> <ol style="list-style-type: none"> <li>3) Body-worn SAR is required at 15 mm separation distance</li> </ol> <div style="text-align: center;">  <p>The diagram shows a smartphone with a blue border and a white-to-grey gradient. It is surrounded by orientation labels: 'Top' at the top, 'Bottom' at the bottom, 'Left hand side' on the left, 'Right hand side' on the right, and 'Front' in the center of the device.</p> </div>

**Additional Information Related to LTE Test parameter (Continued):**

#	Description	Parameter
7	Identify if Maximum Power Reduction (MPR) is optional or mandatory, i.e. built-in by design: a) only mandatory MPR may be considered during SAR testing, when the maximum output power is permanently limited by the MPR implemented within the UE; and only for the applicable RB (resource block) configurations specified in LTE standards b) A-MPR (additional MPR) must be disabled.	The EUT incorporates MPR as per 36.101 as shown in the section 8. MPR cannot be disabled after the phone is manufactured, MPR is mandatory. * Target MPR
8	Include the maximum average conducted output power measured on the required test channels for each channel bandwidth and UL modulation used in each frequency band: a) using 1 RB allocated at the low edge, centered and high edge of a channel b) using 50% RB allocated at the low edge, centered and high edge of a channel c) using 100% RB allocation	This is included in the section 6.3 of this report.
9	Identify all other U.S. wireless operating modes (3G, Wi-Fi, WiMax, Bluetooth etc), device/exposure configurations (head and body, antenna and handset flip-cover or slide positions, antenna diversity conditions etc.) and frequency bands used for these modes	The following bands are supported for the exposure conditions 1) GSM (850/1900) and WCDMA FDD (850, 1700, 1900) - Exposure conditions: Head/Body worn SAR required for GSM / WCDMA FDD and wireless personal hotspot. DTM is not supported. 2) Bluetooth 2.4GHz (Basic Rate & EDR) - Exposure conditions: Body SAR required for wireless personal hotspot. No power reduction is supported. 3) Wi-Fi 2.4GHz - Exposure conditions: Head/Body SAR required for wireless personal hotspot. No Power reduction is supported. 4) Wi-Fi 5 GHz - Exposure conditions: Head/Body SAR required for wireless personal hotspot. No power reduction is supported.

**Additional Information Related to LTE Test parameter (Continued):**

#	Description	Parameter
10	Include the maximum average conducted output power measured for the other wireless mode and frequency bands	This is included in the section 6 of this report.
11	Identify the simultaneous transmission conditions for the voice and data configurations supported by all wireless modes, device configurations and frequency bands, for the head and body exposure conditions and device operating configurations (handset flip or cover positions, antenna diversity conditions etc.)	Bluetooth average power measurement is below the rated threshold therefore Individual SAR will not be tested. Sim_Tx consideration will be based on the estimated SAR level. All simultaneous transmission combinations are identified and summarised in Section 12 of the report.
12	When power reduction is applied to certain wireless modes to satisfy SAR compliance for simultaneous transmission conditions, other equipment certification or operating requirements, include the maximum average conducted output power measured in each power reduction mode applicable to the simultaneous voice/data transmission configurations for such wireless configurations and frequency bands; and also include details of the power reduction implementation and measurement setup	Not applicable.
13	Include descriptions of the test equipment, test software, built-in test firmware etc. required to support testing the device when power reduction is applied to one or more transmitters/antennas for simultaneous voice/data transmission	R&S CMW500 communication simulator Communication tester which support LTE modes (Data) were used for testing.
14	When appropriate, include a SAR test plan proposal with respect to the above.	Not Applicable
15	If applicable, include preliminary SAR test data and/or supporting information in laboratory testing inquiries to address specific issues and concerns or for requesting further test reduction considerations appropriate for the device; for example simultaneous transmission configurations.	Not Applicable

## 7. RF Exposure Conditions (Test Configurations)

Refer to Appendix A.1 “Antenna Locations and Separation Distances” for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

### 7.1. Head

#### For WWAN (GSM, WCDMA, LTE) and Wi-Fi

Test Configurations	SAR Required	Note
Touch Left	Yes	
Tilt Left (15°)	Yes	
Touch Right	Yes	
Tilt Right (15°)	Yes	

### 7.2. Wireless Router (Hotspot)

#### For WWAN (GSM, WCDMA, LTE)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	<25 mm	Yes	
Front	<25 mm	Yes	
Edge 1 (Top)	>25 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 648474 D04, Handset SAR v01r02
Edge 2 (Right)	<25 mm	Yes	
Edge 3 (Bottom)	<25 mm	Yes	
Edge 4 (Left)	<25 mm	Yes	

#### For Wi-Fi and Bluetooth<sup>#</sup>

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	<25 mm	Yes	
Front	<25 mm	Yes	
Edge 1 (Top)	<25 mm	Yes	
Edge 2 (Right)	>25 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 648474 D04, Handset SAR v01r02
Edge 3 (Bottom)	>25 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 648474 D04, Handset SAR v01r02
Edge 4 (Left)	<25 mm	Yes	

**7.3. Body-worn Accessory  
For WWAN (GSM, WCDMA, LTE), WiFi and Bluetooth#**

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	<25 mm	Yes	
Front	<25 mm	Yes	

**Note:**

1. As per KDB 447498 D01 General RF Exposure Guidance v05r02, The Frequency Bands with Rated Power including Upper tolerance, which qualify for **Standalone SAR Test Exclusion**, are as per the above table.

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

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

- $f_{(\text{GHz})}$  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 ≤ 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.

Applying the above formula for **Bluetooth Hotspot Mode** we get:

➤ For 2450MHz,  $[(10)/10] * [\sqrt{2.45}] = 1.6 \leq 3.0$

Applying the above formula for **Bluetooth Body-worn** we get:

➤ For 2450MHz,  $[(10)/15] * [\sqrt{2.45}] = 1.1 \leq 3.0$

# Although *Bluetooth* qualifies for Low Power Exemption, testing was performed on Hotspot Mode and Body-Worn to give the exact SAR levels.

## 8. Conducted Output Power Measurements

### 8.1.RF Output Average Power Measurement: 2G

#### 8.1.1.GSM850

Power Back-Off NOT Supported

#### Voice Mode GSM (GMSK)

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)	Frame Power (dBm)
128	824.2	32.9	23.9
190	836.6	32.9	23.9
251	848.8	32.9	23.9

#### GPRS (GMSK) – Coding Scheme: CS1

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)				Frame Power (dBm)			
		1Uplink	2Uplink	3Uplink	4Uplink	1Uplink	2Uplink	3Uplink	4Uplink
128	824.2	32.9	30.9	28.7	27.6	23.9	24.9	24.4	24.6
190	836.6	32.9	30.9	28.8	27.7	23.9	24.9	24.5	24.7
251	848.8	32.9	30.8	28.7	27.7	23.9	24.8	24.4	24.7

#### EDGE (GMSK) – Coding Scheme: MCS4

128	824.2	32.8	30.8	28.7	27.6	23.8	24.8	24.4	24.6
190	836.6	32.9	30.8	28.7	27.6	23.9	24.8	24.4	24.6
251	848.8	32.8	30.8	28.7	27.7	23.8	24.8	24.4	24.7

#### EDGE (8PSK) – Coding Scheme: MCS9

128	824.2	27.5	25.4	24.3	22.2	18.5	19.4	20.0	19.2
190	836.6	27.5	25.4	24.3	22.2	18.5	19.4	20.0	19.2
251	848.8	27.5	25.4	24.3	22.2	18.5	19.4	20.0	19.2

#### DTM - Voice Mode GSM (GMSK) + GPRS (GMSK) – Coding Scheme: CS1

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)						Frame Power (dBm)					
		Class 5		Class 9		Class 11		Class 5		Class 9		Class 11	
		GSM 1 Uplink	GPRS 1 Uplink	GSM 1 Uplink	GPRS 1 Uplink	GSM 1 Uplink	GPRS 2 Uplink	GSM 1 Uplink	GPRS 1 Uplink	GSM 1 Uplink	GPRS 1 Uplink	GSM 1 Uplink	GPRS 2 Uplink
128	824.2	31.4	31.3	31.5	31.4	29.2	29.1	25.4	25.3	<b>25.5</b>	<b>25.4</b>	24.9	24.8
190	836.6	31.5	31.3	31.5	31.4	29.2	29.2	25.5	25.3	<b>25.5</b>	<b>25.4</b>	24.9	24.9
251	848.8	31.3	31.2	31.4	31.3	29.3	29.4	25.3	25.2	<b>25.4</b>	<b>25.3</b>	25.0	25.1

#### DTM - Voice Mode GSM (GMSK) + EDGE (GMSK) – Coding Scheme: MCS4

128	824.2	31.4	31.3	31.4	31.3	29.2	29.2	25.4	25.3	25.4	25.3	24.9	24.9
190	836.6	31.4	31.4	31.5	31.3	29.3	29.2	25.4	25.4	25.5	25.3	25.0	24.9
251	848.8	31.4	31.4	31.3	31.3	29.3	29.3	25.4	25.4	25.3	25.3	25.0	25.0

#### DTM - Voice Mode GSM (GMSK) + EDGE (8PSK) – Coding Scheme: MCS9

128	824.2	31.3	25.5	31.3	25.5	28.6	24.7	25.3	19.5	25.3	19.5	24.3	20.4
190	836.6	31.3	25.5	31.4	25.5	28.7	24.7	25.3	19.5	25.4	19.5	24.4	20.4
251	848.8	31.2	25.5	31.3	25.5	28.6	24.7	25.2	19.5	25.3	19.5	24.3	20.4

**GSM850 (Continued)****Note:****Scale factor for uplink time slot:**

1. 1 Uplink: time slot ratio = 8:1 =>  $10 \cdot \log(8/1) = 9.03 \text{ dB}$
2. 2 Uplink: time slot ratio = 8:2 =>  $10 \cdot \log(8/2) = 6.02 \text{ dB}$
3. 3 Uplink: time slot ratio = 8:3 =>  $10 \cdot \log(8/3) = 4.26 \text{ dB}$
4. 4 Uplink: time slot ratio = 8:4 =>  $10 \cdot \log(8/4) = 3.01 \text{ dB}$

**Conclusions:**

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

- For Head SAR Testing, GSM and DTM should be evaluated; therefore the EUT was set in **DTM Multi-slot class 9** due its highest Frame Average Power (dBm)
- For Hotspot Mode SAR Testing, GPRS and DTM should be evaluated; therefore the EUT was set in **DTM Multi-slot class 9** due its highest Frame Average Power (dBm)
- For Body worn SAR Testing, GSM and DTM should be evaluated, therefore the EUT was set in **DTM Multi-slot class 9** due its highest Frame Average Power (dBm)

8.1.2.PCS1900

Power Back-Off Supported & Disabled

Voice Mode GSM (GMSK)

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)	Frame Power (dBm)
512	1850.2	30.2	21.1
661	1880.0	30.2	21.2
810	1909.8	30.3	21.3

GPRS (GMSK) – Coding Scheme: CS1

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)				Frame Power (dBm)			
		1Uplink	2Uplink	3Uplink	4Uplink	1Uplink	2Uplink	3Uplink	4Uplink
512	1850.2	30.2	28.2	27.1	26.1	21.2	22.2	22.8	23.1
661	1880.0	30.2	28.2	27.1	26.1	21.2	22.2	22.8	23.1
810	1909.8	30.2	28.3	27.2	26.2	21.2	22.3	22.9	23.2

EDGE (GMSK) – Coding Scheme: MCS4

512	1850.2	30.2	28.2	27.1	26.1	21.2	22.2	22.8	23.1
661	1880.0	30.2	28.1	27.1	26.1	21.2	22.1	22.8	23.1
810	1909.8	30.2	28.2	27.1	26.1	21.2	22.2	22.8	23.1

EDGE (8PSK) – Coding Scheme: MCS9

512	1850.2	26.3	24.3	23.3	21.8	17.6	18.6	19.3	19.1
661	1880.0	26.4	24.3	23.4	21.9	17.7	18.6	19.4	19.2
810	1909.8	26.5	24.3	23.4	21.9	17.8	18.6	19.4	19.2

DTM - Voice Mode GSM (GMSK) + GPRS (GMSK) – Coding Scheme: CS1

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)						Frame Power (dBm)					
		Class 5		Class 9		Class 11		Class 5		Class 9		Class 11	
		GSM 1 Uplink	GPRS 1 Uplink	GSM 1 Uplink	GPRS 1 Uplink	GSM 1 Uplink	GPRS 2 Uplink	GSM 1 Uplink	GPRS 1 Uplink	GSM 1 Uplink	GPRS 1 Uplink	GSM 1 Uplink	GPRS 2 Uplink
512	1850.2	27.9	27.9	27.9	27.8	26.6	26.5	21.9	21.9	21.9	21.9	22.3	22.2
661	1880.0	27.9	27.9	27.8	27.8	26.6	26.5	21.9	21.9	21.8	21.8	22.3	22.2
810	1909.8	27.9	27.8	27.9	27.9	26.6	26.5	21.9	21.8	21.9	21.9	22.3	22.2

DTM - Voice Mode GSM (GMSK) + EDGE (GMSK) – Coding Scheme: MCS4

512	1850.2	27.9	27.8	27.9	27.8	26.6	26.5	21.9	21.8	21.9	21.8	22.3	22.2
661	1880.0	27.8	27.8	27.8	27.8	26.5	26.5	21.8	21.8	21.8	21.8	22.2	22.2
810	1909.8	27.9	27.9	27.9	27.9	26.6	26.6	21.9	21.9	21.9	21.9	22.3	22.3

DTM - Voice Mode GSM (GMSK) + EDGE (8PSK) – Coding Scheme: MCS9

512	1850.2	27.8	24.5	27.9	24.5	26.4	23.4	21.8	18.5	21.9	18.5	22.1	19.1
661	1880.0	27.8	24.6	27.8	24.5	26.5	23.4	21.8	18.6	21.8	18.5	22.2	19.1
810	1909.8	27.8	24.6	27.8	24.5	26.5	23.4	21.8	18.6	21.8	18.5	22.2	19.1

**PCS1900 (Continued):****Note:****Scale factor for uplink time slot:**

1. 1 Uplink: time slot ratio = 8:1 =>  $10 \cdot \log(8/1) = \mathbf{9.03 \text{ dB}}$
2. 2 Uplink: time slot ratio = 8:2 =>  $10 \cdot \log(8/2) = \mathbf{6.02 \text{ dB}}$
3. 3 Uplink: time slot ratio = 8:3 =>  $10 \cdot \log(8/3) = \mathbf{4.26 \text{ dB}}$
4. 4 Uplink: time slot ratio = 8:4 =>  $10 \cdot \log(8/4) = \mathbf{3.01 \text{ dB}}$

**Conclusions:**

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

- For Head SAR Testing, GSM and DTM should be evaluated; therefore the EUT was set in **DTM Multi-slot class 11, Power Back-Off Disabled Mode** due its highest Frame Average Power (dBm)
- For Body-Worn SAR Testing, GPRS and DTM should be evaluated; therefore the EUT was set in **DTM Multi-slot class 11, Power Back-Off Disabled Mode** slots due its highest Frame Average Power (dBm)

8.1.3.PCS1900

Power Back-Off Supported & Enabled

Voice Mode GSM (GMSK)

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)	Frame Power (dBm)
512	1850.2	24.8	15.8
661	1880.0	24.7	15.7
810	1909.8	24.8	15.8

GPRS (GMSK) – Coding Scheme: CS1

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)				Frame Power (dBm)			
		1Uplink	2Uplink	3Uplink	4Uplink	1Uplink	2Uplink	3Uplink	4Uplink
512	1850.2	24.8	22.6	21.8	20.8	15.8	16.6	17.5	17.8
661	1880.0	24.7	22.6	21.8	20.8	15.7	16.6	17.5	17.8
810	1909.8	24.8	22.7	21.8	20.9	15.8	16.7	17.5	17.9

EDGE (GMSK) – Coding Scheme: MCS4

512	1850.2	24.7	22.6	21.7	20.8	15.7	16.6	17.4	17.8
661	1880.0	24.7	22.6	21.7	20.8	15.7	16.6	17.4	17.8
810	1909.8	24.8	22.6	21.8	20.8	15.8	16.6	17.5	17.8

EDGE (8PSK) – Coding Scheme: MCS9

512	1850.2	24.1	22.2	21.2	20.3	15.1	16.2	16.9	17.3
661	1880.0	24.1	22.3	21.2	20.4	15.1	16.3	16.9	17.4
810	1909.8	24.2	22.3	21.3	20.5	15.2	16.3	17.0	17.5

DTM - Voice Mode GSM (GMSK) + GPRS (GMSK) – Coding Scheme: CS1

Channel Number	Frequency (MHZ)	Avg Burst Power (dBm)						Frame Power (dBm)					
		Class 5		Class 9		Class 11		Class 5		Class 9		Class 11	
		GSM 1 Uplink	GPRS 1 Uplink	GSM 1 Uplink	GPRS 1 Uplink	GSM 1 Uplink	GPRS 2 Uplink	GSM 1 Uplink	GPRS 1 Uplink	GSM 1 Uplink	GPRS 1 Uplink	GSM 1 Uplink	GPRS 2 Uplink
512	1850.2	22.4	22.4	22.4	22.4	21.7	21.7	16.4	16.4	16.4	16.4	17.4	17.4
661	1880.0	22.4	22.4	22.4	22.4	21.7	21.7	16.4	16.4	16.4	16.4	17.4	17.4
810	1909.8	22.5	22.4	22.5	22.5	21.7	21.7	16.5	16.4	16.5	16.5	17.4	17.4

DTM - Voice Mode GSM (GMSK) + EDGE (GMSK) – Coding Scheme: MCS4

512	1850.2	22.4	22.4	22.4	22.4	21.6	21.6	16.4	16.4	16.4	16.4	17.3	17.3
661	1880.0	22.4	22.4	22.5	22.4	21.7	21.6	16.4	16.4	16.5	16.4	17.4	17.3
810	1909.8	22.4	22.4	22.5	22.5	21.7	21.7	16.4	16.4	16.5	16.5	17.4	17.4

DTM - Voice Mode GSM (GMSK) + EDGE (8PSK) – Coding Scheme: MCS9

512	1850.2	22.5	21.8	22.4	21.7	21.0	21.0	16.5	15.8	16.4	15.7	16.7	16.7
661	1880.0	22.5	21.9	22.5	21.7	21.1	21.0	16.5	15.9	16.5	15.7	16.8	16.7
810	1909.8	22.5	21.9	22.5	21.8	21.0	21.0	16.5	15.9	16.5	15.8	16.7	16.7

**PCS1900 (Continued):****Note:****Scale factor for uplink time slot:**

1. 1 Uplink: time slot ratio = 8:1 =>  $10 \cdot \log(8/1) = \mathbf{9.03 \text{ dB}}$
2. 2 Uplink: time slot ratio = 8:2 =>  $10 \cdot \log(8/2) = \mathbf{6.02 \text{ dB}}$
3. 3 Uplink: time slot ratio = 8:3 =>  $10 \cdot \log(8/3) = \mathbf{4.26 \text{ dB}}$
4. 4 Uplink: time slot ratio = 8:4 =>  $10 \cdot \log(8/4) = \mathbf{3.01 \text{ dB}}$

**Conclusions:**

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

- For Hotspot Mode SAR Testing, GPRS and DTM should be evaluated, therefore the EUT was set in GPRS 4Tx, **Power Back-Off Enabled Mode** due its highest Frame Average Power (dBm)

### 8.2.RF Output Average Power Measurement: 3G

#### Release 99

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
UMTS General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	$\beta_c/\beta_d$	8/15

#### HSDPA

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121-1. A summary of these settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm 2			
	$\beta_c$	2/15	12/15	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)**

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
WCMDA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps 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	11/15	15/9	2/15	15/0
	$\beta_{hs}$	22/15	12/15	30/15	4/15	5/15
	$\beta_{ed}$	1309/225	94/75	47/15 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				
	Ahs = $\beta_{hs}/\beta_c$	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	

**DC-HSDPA**

The following 4 Sub-tests were completed according to Release 7 procedures in section 5.2 of 3GPP TS34.121-1, since DC-HSDPA has only one transmitting uplink. A summary of these settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm 2			
	$\beta_c$	2/15	11/15	15/15	15/15
	$\beta_d$	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	$\beta_c/\beta_d$	2/15	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				

**8.2.1.WCDMA Band 2, Band 4 and Band 5 on RMC / HSDPA / HSUPA modes  
Power Back-Off NOT Supported**

Modes		HSDPA				HSUPA					WCDMA
Sets		1	2	3	4	1	2	3	4	5	Voice / RMC 12.2kbps
Band	Channel	Power [dBm]									
850 (Band 5)	4132 4357	24.1	24.1	23.7	23.7	23.6	22.0	23.2	22.1	23.7	24.1
	4183 4408	24.0	24.2	23.7	23.7	23.6	21.9	23.0	22.0	23.7	24.0
	4233 4458	24.1	24.2	23.8	23.7	23.6	22.0	23.0	22.0	23.6	24.1

**Power Back-Off Supported & Disabled**

1900 (Band 2)	9262 9662	23.3	23.3	23.3	23.3	22.7	21.6	22.8	21.6	22.8	23.7
	9400 9800	23.1	23.1	23.2	23.2	22.9	21.5	22.7	21.6	22.9	23.6
	9538 9938	23.1	23.1	23.1	23.2	22.6	21.5	22.6	21.5	22.9	23.5
1700 (Band 4)	1312 1537	23.2	23.3	23.4	23.4	22.8	21.6	22.8	21.7	22.9	23.8
	1412 1637	23.1	23.1	23.2	23.3	23.0	21.6	22.8	21.6	23.0	23.7
	1513 1738	23.3	23.3	23.3	23.3	22.7	21.7	22.8	21.7	22.9	23.7
βc		2	12	15	15	11	6	15	2	15	
βd		15	15	8	4	15	15	9	15	15	
ΔACK, ΔNACK, ΔCQI		8	8	8	8	8	8	8	8	8	
AGV		-	-	-	-	20	12	15	17	21	

**8.2.2.WCDMA Band 2 and Band 4 on RMC / HSDPA / HSUPA:  
Power Back-Off Supported & Enabled**

Modes		HSDPA				HSUPA					WCDMA
Sets		1	2	3	4	1	2	3	4	5	Voice / RMC 12.2kbps
Band	Channel	Power [dBm]									
1900 (Band 2)	9262 9662	16.9	16.8	16.8	16.8	16.6	15.8	16.2	15.8	16.7	17.3
	9400 9800	16.8	16.8	16.7	16.7	16.8	15.9	16.3	15.7	16.8	17.2
	9538 9938	16.7	16.7	16.7	16.7	16.1	15.6	16.1	15.7	16.6	17.1
1700 (Band 4)	1312 1537	21.6	21.6	21.8	21.7	21.7	20.7	21.2	20.6	21.7	22.2
	1412 1637	21.5	21.6	21.6	21.6	21.1	20.3	20.9	20.3	21.5	22.0
	1513 1738	21.6	21.6	21.6	21.6	21.7	20.2	20.9	20.3	21.7	22.2

8.2.3.WCDMA Band 2, Band 4 and Band 5 on DC-HSDPA (Cat 24)

Power Back-Off NOT Supported

Modes		DC HSDPA (Cat 24)				WCDMA
Sets		1	2	3	4	Voice / RMC 12.2kbps
Band	Channel	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]
850 (Band 5)	4132 4357	21.0	21.3	21.2	21.4	24.1
	4183 4408	21.1	21.3	21.2	21.3	24.0
	4233 4458	21.0	21.2	21.2	21.3	24.1
<b>Power Back-Off Supported &amp; Disabled</b>						
1900 (Band 2)	9262 9662	20.8	21.2	21.1	20.8	23.7
	9400 9800	21.0	21.3	21.2	21.2	23.6
	9538 9938	20.9	20.0	21.0	20.9	23.5
1700 (Band 4)	1312 1537	21.3	21.3	21.2	21.2	23.8
	1412 1637	21.1	21.0	21.2	21.2	23.7
	1513 1738	21.2	21.2	21.2	21.2	23.7
βc		2	12	15	15	
βd		15	15	8	4	
ΔACK, ΔNACK, ΔCQI		8	8	8	8	
AGV		-	-	-	-	

Power Back-Off Supported & Enabled

Modes		DC HSDPA (Cat 24)				WCDMA
Sets		1	2	3	4	Voice / RMC 12.2kbps
Band	Channel	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]	Power [dBm]
1900 (Band 2)	9262 9662	16.2	16.1	16.1	16.1	17.3
	9400 9800	16.2	16.2	16.1	16.2	17.2
	9538 9938	16.1	16.2	16.0	16.1	17.1
1700 (Band 4)	1312 1537	21.1	21.0	21.0	21.2	22.2
	1412 1637	21.1	20.9	21.1	20.9	22.0
	1513 1738	21.2	21.0	21.1	20.9	22.2
βc		2	12	15	15	
βd		15	15	8	4	
ΔACK, ΔNACK, ΔCQI		8	8	8	8	
AGV		-	-	-	-	

Note: The measured power on HSDPA subsets did not follow the trend as per 3GPP specification. But, RMC is most conservative measured power than the HSDPA.

The module power levels were measured in both HSPA and 3G RMC 12.2kbps modes and compared to ensure the correct mode of operation had been established.

The following tables taken from FCC 3G SAR procedures (KDB 941225 D01 SAR Procedures v03) below were applied using an wireless communications test set which supports 3G / HSDPA release 5 / HSUPA release 6.

**Sub-test Setup for Release 5 HSDPA**

Sub-test	$\beta_c$	$\beta_d$	$B_d$ (SF)	$\beta_c/\beta_d$	$\beta_{hs}^{(1)}$	SM (dB) <sup>(2)</sup>
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 <sup>(3)</sup>	15/15 <sup>(3)</sup>	64	12/15 <sup>(3)</sup>	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$

Note 2: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $B_{hs}/\beta_c = 24/15$

Note 3: For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$

**Sub-test Setup for Release 6 HSUPA**

Sub-test	$\beta_c$	$\beta_d$	$B_d$ (SF)	$\beta_c/\beta_d$	$\beta_{hs}^{(1)}$	$B_{oc}$	$B_{od}$	$B_{od}$ (SF)	$B_{od}$ (codes)	CM <sup>(2)</sup> (dB)	Power Back-Off (dB)	AG <sup>(4)</sup> Index	E-TFCI
1	11/15 <sup>(3)</sup>	15/15 <sup>(3)</sup>	64	11/15 <sup>(3)</sup>	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	31/15	B <sub>al1</sub> : 47/15 B <sub>al2</sub> : 47/15	4	1	2.0	1.0	15	92
4	2/15	15/15	64	2/15	2/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 <sup>(4)</sup>	15/15 <sup>(4)</sup>	64	15/15 <sup>(4)</sup>	24/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$

Note 2: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $B_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH AND E-DPCCH for the Power Back-Off is based on the relative CM difference.

Note 3: For subtest 1 the  $\beta_c/\beta_d$  ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 10/15$  and  $\beta_d = 15/15$ .

Note 4: For subtest 5 the  $\beta_c/\beta_d$  ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 14/15$  and  $\beta_d = 15/15$ .

Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Tavle 5.1g.

Note 6:  $B_{od}$  can not be set directly; it is set by Absolute Grant Value.

### 8.3.RF Output Average Power Measurement: LTE

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

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

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

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

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

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

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks ( $N_{RB}$ )	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3	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
NS_09	6.6.3.3.4	21	10, 15	> 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.

**8.3.1.LTE Band 2 (1900 MHz)  
Power Back-Off Supported & Disabled**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1860.0 MHz (Low)	Frequency 1880.0 MHz (Middle)	Frequency 1900.0 MHz (High)
20 MHz	QPSK	1	Low	0	(0)	23.2	23.4	23.4	23.4
		1	Mid	49	(0)	23.2	23.4	23.4	23.4
		1	High	99	(0)	23.2	23.4	23.4	23.4
		50	low	0	(1)	22.2	22.4	22.5	22.5
		50	Mid	25	(1)	22.2	22.5	22.5	22.4
		50	High	50	(1)	22.2	22.4	22.5	22.4
	16QAM	100	-	0	(1)	22.2	22.5	22.5	22.4
		1	Low	0	(1)	22.2	22.3	22.3	22.8
		1	Mid	49	(1)	22.2	22.2	22.3	22.7
		1	High	99	(1)	22.2	22.3	22.3	22.7
		50	low	0	(2)	21.2	21.4	21.4	21.4
		50	Mid	25	(2)	21.2	21.3	21.4	21.3
		50	High	50	(2)	21.2	21.4	21.4	21.3
100	-	0	(2)	21.2	21.4	21.4	21.5		
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1857.5 MHz (Low)	Frequency 1880.0 MHz (Middle)	Frequency 1902.5 MHz (High)
15 MHz	QPSK	1	Low	0	(0)	23.2	23.5	23.4	23.3
		1	Mid	37	(0)	23.2	23.4	23.4	23.2
		1	High	74	(0)	23.2	23.4	23.4	23.4
		36	low	0	(1)	22.2	22.4	22.5	22.6
		36	Mid	19	(1)	22.2	22.5	22.5	22.4
		36	High	39	(1)	22.2	22.4	22.5	22.4
	16QAM	75	-	0	(1)	22.2	22.6	22.6	22.6
		1	Low	0	(1)	22.2	22.6	22.5	22.5
		1	Mid	37	(1)	22.2	22.5	22.5	22.4
		1	High	74	(1)	22.2	22.6	22.5	22.6
		36	low	0	(2)	21.2	21.4	21.6	21.5
		36	Mid	19	(2)	21.2	21.5	21.5	21.4
		36	High	39	(2)	21.2	21.5	21.6	21.5
75	-	0	(2)	21.2	21.6	21.5	21.6		

**LTE Band 2 (1900 MHz)  
Power Back-Off Supported & Disabled (Continued)**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1855.0 MHz (Low)	Frequency 1880.0 MHz (Middle)	Frequency 1905.0 MHz (High)
10 MHz	QPSK	1	Low	0	(0)	23.2	23.4	23.5	23.4
		1	Mid	24	(0)	23.2	23.3	23.4	23.4
		1	High	49	(0)	23.2	23.5	23.5	23.4
		25	Low	0	(1)	22.2	22.4	22.6	22.4
		25	Mid	12	(1)	22.2	22.5	22.5	22.4
		25	High	25	(1)	22.2	22.5	22.5	22.5
		50	-	0	(1)	22.2	22.5	22.6	22.5
	16QAM	1	Low	0	(1)	22.2	22.4	22.6	22.5
		1	mid	24	(1)	22.2	22.5	22.4	22.4
		1	High	49	(1)	22.2	22.6	22.6	22.5
		25	Low	0	(2)	21.2	21.5	21.5	21.4
		25	Mid	12	(2)	21.2	21.5	21.5	21.4
		25	High	25	(2)	21.2	21.5	21.5	21.6
50	-	0	(2)	21.2	21.5	21.5	21.4		
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1852.5 MHz (Low)	Frequency 1880.0 MHz (Middle)	Frequency 1907.5 MHz (High)
5 MHz	QPSK	1	Low	0	(0)	23.2	23.6	23.4	23.4
		1	Mid	12	(0)	23.2	23.5	23.4	23.4
		1	High	24	(0)	23.2	23.5	23.4	23.5
		12	low	0	(1)	22.2	22.5	22.5	22.5
		12	Mid	6	(1)	22.2	22.6	22.6	22.5
		12	High	13	(1)	22.2	22.5	22.5	22.5
		25	-	0	(1)	22.2	22.6	22.5	22.5
	16QAM	1	Low	0	(1)	22.2	22.5	22.7	22.5
		1	Mid	12	(1)	22.2	22.4	22.7	22.5
		1	High	24	(1)	22.2	22.3	22.7	22.6
		12	low	0	(2)	21.2	21.4	21.5	21.5
		12	Mid	6	(2)	21.2	21.5	21.4	21.5
		12	High	13	(2)	21.2	21.4	21.4	21.5
25	-	0	(2)	21.2	21.6	21.5	21.5		

**LTE Band 2 (1900 MHz)**  
**Power Back-Off Supported & Disabled (Continued)**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1851.5 MHz (Low)	Frequency 1880 MHz (Middle)	Frequency 1908.5 MHz (High)
3 MHz	QPSK	1	Low	0	(0)	23.2	23.6	23.5	23.4
		1	Mid	7	(0)	23.2	23.6	23.5	23.4
		1	High	14	(0)	23.2	23.6	23.5	23.5
		8	Low	0	(1)	22.2	22.5	22.5	22.5
		8	Mid	4	(1)	22.2	22.5	22.5	22.5
		8	High	7	(1)	22.2	22.5	22.5	22.5
		15	-	0	(1)	22.2	22.6	22.6	22.5
	16QAM	1	Low	0	(1)	22.2	22.7	22.6	22.4
		1	Mid	7	(1)	22.2	22.6	22.6	22.4
		1	High	14	(1)	22.2	22.7	22.6	22.5
		8	Low	0	(2)	21.2	21.5	21.5	21.5
		8	Mid	4	(2)	21.2	21.6	21.4	21.5
		8	High	7	(2)	21.2	21.6	21.5	21.6
		15	-	0	(2)	21.2	21.6	21.5	21.5
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1850.7 MHz (Low)	Frequency 1880 MHz (Middle)	Frequency 1909.3 MHz (High)
1.4 MHz	QPSK	1	Low	0	(0)	23.2	23.5	23.6	23.5
		1	Mid	3	(0)	23.2	23.6	23.4	23.5
		1	High	5	(0)	23.2	23.5	23.5	23.5
		3	Low	0	(0)	23.2	23.5	23.5	23.5
		3	Mid	1	(0)	23.2	23.5	23.4	23.5
		3	high	3	(0)	23.2	23.5	23.6	23.5
		6	-	0	(1)	22.2	22.6	22.6	22.6
	16QAM	1	Low	0	(1)	22.2	22.6	22.7	22.5
		1	Mid	3	(1)	22.2	22.7	22.5	22.6
		1	High	5	(1)	22.2	22.6	22.4	22.6
		3	Low	0	(1)	22.2	22.3	22.6	22.4
		3	Mid	1	(1)	22.2	22.2	22.6	22.4
		3	high	3	(1)	22.2	22.3	22.4	22.6
		6	-	0	(2)	21.2	21.6	21.5	21.6

**8.3.2.LTE Band 2 (1900 MHz)  
Power Back-Off Supported & Enabled**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1860.0 MHz (Low)	Frequency 1880.0 MHz (Middle)	Frequency 1900.0 MHz (High)
20 MHz	QPSK	1	Low	0	(0)	17.0	17.3	17.3	17.4
		1	Mid	49	(0)	17.0	17.3	17.3	17.3
		1	High	99	(0)	17.0	17.4	17.4	17.3
		50	low	0	(0)	17.0	17.3	17.4	17.4
		50	Mid	25	(0)	17.0	17.3	17.4	17.3
		50	High	50	(0)	17.0	17.4	17.4	17.3
		100	-	0	(0)	17.0	17.3	17.5	17.4
	16QAM	1	Low	0	(0)	17.0	17.2	17.7	17.3
		1	Mid	49	(0)	17.0	17.2	17.7	17.3
		1	High	99	(0)	17.0	17.3	17.7	17.3
		50	low	0	(0)	17.0	17.3	17.4	17.4
		50	Mid	25	(0)	17.0	17.3	17.4	17.4
		50	High	50	(0)	17.0	17.4	17.4	17.4
		100	-	0	(0)	17.0	17.5	17.5	17.4
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1857.5 MHz (Low)	Frequency 1880.0 MHz (Middle)	Frequency 1902.5 MHz (High)
15 MHz	QPSK	1	Low	0	(0)	17.0	17.4	17.4	17.4
		1	Mid	37	(0)	17.0	17.4	17.3	17.1
		1	High	74	(0)	17.0	17.5	17.4	17.3
		36	low	0	(0)	17.0	17.3	17.5	17.5
		36	Mid	19	(0)	17.0	17.3	17.5	17.3
		36	High	39	(0)	17.0	17.4	17.5	17.4
		75	-	0	(0)	17.0	17.3	17.5	17.5
	16QAM	1	Low	0	(0)	17.0	17.4	17.4	17.5
		1	Mid	37	(0)	17.0	17.3	17.5	17.3
		1	High	74	(0)	17.0	17.4	17.5	17.5
		36	low	0	(0)	17.0	17.3	17.5	17.5
		36	Mid	19	(0)	17.0	17.3	17.5	17.3
		36	High	39	(0)	17.0	17.4	17.5	17.4
		75	-	0	(0)	17.0	17.5	17.5	17.4

**LTE Band 2 (1900 MHz)  
Power Back-Off Supported & Enabled (Continued)**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1855.0 MHz (Low)	Frequency 1880.0 MHz (Middle)	Frequency 1905.0 MHz (High)
10 MHz	QPSK	1	Low	0	(0)	17.0	17.2	17.5	17.2
		1	Mid	24	(0)	17.0	17.1	17.3	17.2
		1	High	49	(0)	17.0	17.4	17.3	17.3
		25	Low	0	(0)	17.0	17.3	17.4	17.3
		25	Mid	12	(0)	17.0	17.3	17.4	17.3
		25	High	25	(0)	17.0	17.3	17.5	17.4
		50	-	0	(0)	17.0	17.3	17.4	17.3
	16QAM	1	Low	0	(0)	17.0	17.3	17.4	17.3
		1	mid	24	(0)	17.0	17.3	17.2	17.4
		1	High	49	(0)	17.0	17.5	17.4	17.3
		25	Low	0	(0)	17.0	17.4	17.4	17.3
		25	Mid	12	(0)	17.0	17.4	17.5	17.4
		25	High	25	(0)	17.0	17.4	17.5	17.5
50	-	0	(0)	17.0	17.3	17.4	17.3		
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1852.5 MHz (Low)	Frequency 1880.0 MHz (Middle)	Frequency 1907.5 MHz (High)
5 MHz	QPSK	1	Low	0	(0)	17.0	17.3	17.3	17.2
		1	Mid	12	(0)	17.0	17.3	17.3	17.2
		1	High	24	(0)	17.0	17.3	17.3	17.3
		12	low	0	(0)	17.0	17.4	17.4	17.3
		12	Mid	6	(0)	17.0	17.4	17.4	17.4
		12	High	13	(0)	17.0	17.3	17.4	17.3
		25	-	0	(0)	17.0	17.4	17.4	17.4
	16QAM	1	Low	0	(0)	17.0	17.5	17.5	17.4
		1	Mid	12	(0)	17.0	17.2	17.5	17.4
		1	High	24	(0)	17.0	17.2	17.5	17.5
		12	low	0	(0)	17.0	17.3	17.4	17.4
		12	Mid	6	(0)	17.0	17.3	17.4	17.3
		12	High	13	(0)	17.0	17.2	17.4	17.4
25	-	0	(0)	17.0	17.4	17.4	17.4		

**LTE Band 2 (1900 MHz)**  
**Power Back-Off Supported & Enabled (Continued)**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1851.5 MHz (Low)	Frequency 1880 MHz (Middle)	Frequency 1908.5 MHz (High)
3 MHz	QPSK	1	Low	0	(0)	17.0	17.4	17.4	17.2
		1	Mid	7	(0)	17.0	17.4	17.3	17.2
		1	High	14	(0)	17.0	17.4	17.4	17.3
		8	Low	0	(0)	17.0	17.4	17.4	17.4
		8	Mid	4	(0)	17.0	17.3	17.4	17.4
		8	High	7	(0)	17.0	17.4	17.4	17.4
		15	-	0	(0)	17.0	17.4	17.5	17.4
	16QAM	1	Low	0	(0)	17.0	17.4	17.5	17.3
		1	Mid	7	(0)	17.0	17.4	17.4	17.3
		1	High	14	(0)	17.0	17.5	17.5	17.3
		8	Low	0	(0)	17.0	17.4	17.4	17.4
		8	Mid	4	(0)	17.0	17.4	17.4	17.4
		8	High	7	(0)	17.0	17.4	17.4	17.4
		15	-	0	(0)	17.0	17.4	17.4	17.4
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1850.7 MHz (Low)	Frequency 1880 MHz (Middle)	Frequency 1909.3 MHz (High)
1.4 MHz	QPSK	1	Low	0	(0)	17.0	17.3	17.5	17.3
		1	Mid	3	(0)	17.0	17.3	17.4	17.3
		1	High	5	(0)	17.0	17.3	17.4	17.3
		3	Low	0	(0)	17.0	17.4	17.4	17.4
		3	Mid	1	(0)	17.0	17.3	17.4	17.3
		3	high	3	(0)	17.0	17.4	17.4	17.3
		6	-	0	(0)	17.0	17.4	17.4	17.4
	16QAM	1	Low	0	(0)	17.0	17.3	17.5	17.3
		1	Mid	3	(0)	17.0	17.3	17.5	17.3
		1	High	5	(0)	17.0	17.4	17.5	17.3
		3	Low	0	(0)	17.0	17.2	17.2	17.4
		3	Mid	1	(0)	17.0	17.2	17.1	17.4
		3	high	3	(0)	17.0	17.3	17.2	17.5
		6	-	0	(0)	17.0	17.4	17.4	17.5

**8.3.3.LTE Band 4 (1700 MHz)  
Power Back-Off Supported & Disabled**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1720.0 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1745.0 MHz (High)
20 MHz	QPSK	1	Low	0	(0)	23.3	23.5	23.6	23.5
		1	Mid	49	(0)	23.3	23.5	23.6	23.5
		1	High	99	(0)	23.3	23.6	23.6	23.5
		50	low	0	(1)	22.3	22.7	22.7	22.7
		50	Mid	25	(1)	22.3	22.6	22.7	22.6
		50	High	50	(1)	22.3	22.6	22.6	22.7
		100	-	0	(1)	22.3	22.6	22.7	22.6
	16QAM	1	Low	0	(1)	22.3	22.5	22.9	22.5
		1	Mid	49	(1)	22.3	22.5	23.0	22.5
		1	High	99	(1)	22.3	22.6	23.0	22.5
		50	low	0	(2)	21.3	21.6	21.6	21.7
		50	Mid	25	(2)	21.3	21.6	21.6	21.6
		50	High	50	(2)	21.3	21.6	21.6	21.6
		100	-	0	(2)	21.3	21.7	21.7	21.6
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1717.5 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1747.5 MHz (High)
15 MHz	QPSK	1	Low	0	(0)	23.3	23.6	23.6	23.5
		1	Mid	37	(0)	23.3	23.6	23.4	23.4
		1	High	74	(0)	23.3	23.6	23.5	23.4
		36	low	0	(1)	22.3	22.7	22.7	22.6
		36	Mid	19	(1)	22.3	22.6	22.7	22.7
		36	High	39	(1)	22.3	22.6	22.6	22.7
		75	-	0	(1)	22.3	22.7	22.6	22.7
	16QAM	1	Low	0	(1)	22.3	22.6	22.7	22.7
		1	Mid	37	(1)	22.3	22.6	22.6	22.7
		1	High	74	(1)	22.3	22.6	22.6	22.6
		36	low	0	(2)	21.3	21.6	21.7	21.6
		36	Mid	19	(2)	21.3	21.6	21.7	21.6
		36	High	39	(2)	21.3	21.6	21.6	21.6
		75	-	0	(2)	21.3	21.6	21.6	21.7

**LTE Band 4 (1700 MHz)**

**Power Back-Off Supported & Disabled (Continued)**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1715.0 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1750 MHz (High)
10 MHz	QPSK	1	Low	0	(0)	23.3	23.6	23.5	23.4
		1	Mid	24	(0)	23.3	23.6	23.5	23.4
		1	High	49	(0)	23.3	23.6	23.4	23.4
		25	Low	0	(1)	22.3	22.6	22.6	22.6
		25	Mid	12	(1)	22.3	22.5	22.6	22.6
		25	High	25	(1)	22.3	22.6	22.5	22.5
		50	-	0	(1)	22.3	22.6	22.7	22.6
	16QAM	1	Low	0	(1)	22.3	22.6	22.5	22.6
		1	mid	24	(1)	22.3	22.6	22.5	22.6
		1	High	49	(1)	22.3	22.6	22.5	22.5
		25	Low	0	(2)	21.3	21.6	21.7	21.6
		25	Mid	12	(2)	21.3	21.6	21.7	21.6
		25	High	25	(2)	21.3	21.6	21.6	21.5
50	-	0	(2)	21.3	21.5	21.6	21.6		
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1712.5 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1752.5 MHz (High)
5 MHz	QPSK	1	Low	0	(0)	23.3	23.5	23.4	23.5
		1	Mid	12	(0)	23.3	23.5	23.3	23.4
		1	High	24	(0)	23.3	23.5	23.3	23.5
		12	low	0	(1)	22.3	22.6	22.6	22.5
		12	Mid	6	(1)	22.3	22.5	22.6	22.5
		12	High	13	(1)	22.3	22.5	22.5	22.5
		25	-	0	(1)	22.3	22.6	22.5	22.6
	16QAM	1	Low	0	(1)	22.3	22.5	22.8	22.7
		1	Mid	12	(1)	22.3	22.4	22.7	22.6
		1	High	24	(1)	22.3	22.5	22.7	22.6
		12	low	0	(2)	21.3	21.5	21.5	21.6
		12	Mid	6	(2)	21.3	21.5	21.5	21.6
		12	High	13	(2)	21.3	21.5	21.5	21.6
25	-	0	(2)	21.3	21.6	21.5	21.6		

**LTE Band 4 (1700 MHz)**  
**Power Back-Off Supported & Disabled (Continued)**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1711.5 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1753.5 MHz (High)
3 MHz	QPSK	1	Low	0	(0)	23.3	23.6	23.6	23.4
		1	Mid	7	(0)	23.3	23.6	23.4	23.4
		1	High	14	(0)	23.3	23.6	23.5	23.4
		8	Low	0	(1)	22.3	22.6	22.6	22.6
		8	Mid	4	(1)	22.3	22.6	22.5	22.6
		8	High	7	(1)	22.3	22.6	22.5	22.6
		15	-	0	(1)	22.3	22.6	22.6	22.6
	16QAM	1	Low	0	(1)	22.3	22.6	22.6	22.6
		1	Mid	7	(1)	22.3	22.5	22.6	22.6
		1	High	14	(1)	22.3	22.5	22.6	22.6
		8	Low	0	(2)	21.3	21.6	21.7	21.5
		8	Mid	4	(2)	21.3	21.6	21.6	21.5
		8	High	7	(2)	21.3	21.6	21.6	21.5
		15	-	0	(2)	21.3	21.6	21.6	21.6
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1710.7 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1754.3 MHz (High)
1.4 MHz	QPSK	1	Low	0	(0)	23.0	23.5	23.7	23.5
		1	Mid	3	(0)	23.0	23.4	23.5	23.4
		1	High	5	(0)	23.0	23.6	23.5	23.6
		3	Low	0	(0)	23.0	23.5	23.6	23.5
		3	Mid	1	(0)	23.0	23.5	23.5	23.4
		3	high	3	(0)	23.0	23.5	23.4	23.5
		6	-	0	(1)	22.0	22.6	22.6	22.5
	16QAM	1	Low	0	(1)	22.0	22.5	22.7	22.4
		1	Mid	3	(1)	22.0	22.6	22.4	22.5
		1	High	5	(1)	22.0	22.6	22.4	22.6
		3	Low	0	(1)	22.0	22.3	22.6	22.3
		3	Mid	1	(1)	22.0	22.6	22.5	22.3
		3	high	3	(1)	22.0	22.6	22.4	22.2
		6	-	0	(2)	21.0	21.6	21.6	21.6

**8.3.4.LTE Band 4 (1700 MHz)  
Power Back-Off Supported & Enabled**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1720.0 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1745.0 MHz (High)
20 MHz	QPSK	1	Low	0	(0)	21.0	21.0	20.9	20.9
		1	Mid	49	(0)	21.0	20.9	20.9	20.8
		1	High	99	(0)	21.0	20.9	20.9	20.9
		50	low	0	(0)	21.0	21.0	21.0	21.0
		50	Mid	25	(0)	21.0	20.9	20.9	20.9
		50	High	50	(0)	21.0	20.9	20.9	21.0
		100	-	0	(0)	21.0	21.0	21.0	20.9
	16QAM	1	Low	0	(0)	21.0	20.9	21.3	20.8
		1	Mid	49	(0)	21.0	20.8	21.3	20.7
		1	High	99	(0)	21.0	20.9	21.3	20.8
		50	low	0	(0)	21.0	21.0	21.0	21.0
		50	Mid	25	(0)	21.0	21.0	21.0	21.0
		50	High	50	(0)	21.0	21.0	20.9	21.0
		100	-	0	(0)	21.0	21.1	21.1	20.9
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1717.5 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1747.5 MHz (High)
15 MHz	QPSK	1	Low	0	(0)	21.0	21.0	20.9	20.8
		1	Mid	37	(0)	21.0	21.0	20.8	20.8
		1	High	74	(0)	21.0	21.0	20.8	20.8
		36	low	0	(0)	21.0	21.0	21.0	20.9
		36	Mid	19	(0)	21.0	21.0	21.0	21.0
		36	High	39	(0)	21.0	21.0	21.0	21.0
		75	-	0	(0)	21.0	21.0	21.0	21.0
	16QAM	1	Low	0	(0)	21.0	21.0	21.0	21.0
		1	Mid	37	(0)	21.0	21.0	20.9	21.0
		1	High	74	(0)	21.0	21.0	20.9	21.0
		36	low	0	(0)	21.0	21.1	21.0	20.9
		36	Mid	19	(0)	21.0	21.0	21.0	21.0
		36	High	39	(0)	21.0	21.0	21.0	21.0
		75	-	0	(0)	21.0	21.0	21.0	21.0

**LTE Band 4 (1700 MHz)**  
**Power Back-Off Supported & Enabled (Continued)**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1715.0 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1750 MHz (High)
10 MHz	QPSK	1	Low	0	(0)	21.0	21.0	20.9	20.7
		1	Mid	24	(0)	21.0	21.0	20.9	20.8
		1	High	49	(0)	21.0	21.0	20.8	20.8
		25	Low	0	(0)	21.0	21.0	21.0	20.9
		25	Mid	12	(0)	21.0	21.0	21.0	20.9
		25	High	25	(0)	21.0	21.0	20.9	20.9
		50	-	0	(0)	21.0	21.0	21.0	20.9
	16QAM	1	Low	0	(0)	21.0	21.1	20.9	20.9
		1	mid	24	(0)	21.0	21.0	20.8	20.9
		1	High	49	(0)	21.0	21.0	20.8	20.9
		25	Low	0	(0)	21.0	21.0	21.1	20.9
		25	Mid	12	(0)	21.0	21.0	21.0	20.9
		25	High	25	(0)	21.0	21.0	21.0	20.9
50	-	0	(0)	21.0	21.0	21.0	20.9		
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1712.5 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1752.5 MHz (High)
5 MHz	QPSK	1	Low	0	(0)	21.0	21.0	20.8	20.9
		1	Mid	12	(0)	21.0	20.9	20.7	20.8
		1	High	24	(0)	21.0	20.9	20.7	20.8
		12	low	0	(0)	21.0	21.0	20.9	20.8
		12	Mid	6	(0)	21.0	21.0	20.9	20.8
		12	High	13	(0)	21.0	21.0	20.9	20.9
		25	-	0	(0)	21.0	21.0	20.9	20.9
	16QAM	1	Low	0	(0)	21.0	21.1	20.9	21.1
		1	Mid	12	(0)	21.0	21.0	20.7	21.0
		1	High	24	(0)	21.0	21.0	20.8	21.0
		12	low	0	(0)	21.0	21.0	20.9	20.8
		12	Mid	6	(0)	21.0	21.0	20.9	20.8
		12	High	13	(0)	21.0	21.0	20.8	20.8
25	-	0	(0)	21.0	21.0	21.0	20.9		

**LTE Band 4 (1700 MHz)**  
**Power Back-Off Supported & Enabled (Continued)**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1711.5 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1753.5 MHz (High)
3 MHz	QPSK	1	Low	0	(0)	21.0	21.1	20.9	20.8
		1	Mid	7	(0)	21.0	21.0	20.8	20.7
		1	High	14	(0)	21.0	21.0	20.8	20.8
		8	Low	0	(0)	21.0	21.0	20.9	20.9
		8	Mid	4	(0)	21.0	20.9	20.8	20.8
		8	High	7	(0)	21.0	20.9	20.9	20.9
		15	-	0	(0)	21.0	21.0	20.9	20.9
	16QAM	1	Low	0	(0)	21.0	21.1	21.0	20.8
		1	Mid	7	(0)	21.0	21.0	20.9	20.8
		1	High	14	(0)	21.0	21.1	20.9	20.8
		8	Low	0	(0)	21.0	21.0	20.9	20.9
		8	Mid	4	(0)	21.0	21.0	20.8	20.9
		8	High	7	(0)	21.0	21.0	20.8	20.9
		15	-	0	(0)	21.0	21.0	20.8	20.9
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 1710.7 MHz (Low)	Frequency 1732.5 MHz (Middle)	Frequency 1754.3 MHz (High)
1.4 MHz	QPSK	1	Low	0	(0)	21.0	20.9	21.0	20.9
		1	Mid	3	(0)	21.0	20.9	20.8	20.8
		1	High	5	(0)	21.0	21.0	20.8	20.9
		3	Low	0	(0)	21.0	21.0	21.0	20.9
		3	Mid	1	(0)	21.0	21.0	20.9	20.9
		3	high	3	(0)	21.0	21.0	20.8	20.9
		6	-	0	(0)	21.0	21.0	21.0	20.9
	16QAM	1	Low	0	(0)	21.0	20.9	20.9	21.0
		1	Mid	3	(0)	21.0	20.8	20.9	21.0
		1	High	5	(0)	21.0	20.9	20.9	21.1
		3	Low	0	(0)	21.0	21.1	20.9	20.6
		3	Mid	1	(0)	21.0	21.0	20.8	20.6
		3	high	3	(0)	21.0	21.0	20.7	20.6
		6	-	0	(0)	21.0	21.0	21.1	20.9

**8.3.5.LTE Band 5 (850 MHz)**

**Power Back-Off NOT Supported**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 829.0 MHz (Low)	Frequency 836.5 MHz (Middle)	Frequency 844.0 MHz (High)
10 MHz	QPSK	1	Low	0	(0)	23.0	23.1	23.2	23.3
		1	Mid	24	(0)	23.0	23.1	23.2	23.2
		1	High	49	(0)	23.0	23.1	23.4	23.2
		25	Low	0	(1)	22.0	22.3	22.3	22.3
		25	Mid	12	(1)	22.0	22.3	22.2	22.2
		25	High	25	(1)	22.0	22.3	22.3	22.2
		50	-	0	(1)	22.0	22.3	22.3	22.3
	16QAM	1	Low	0	(1)	22.0	22.3	22.3	22.2
		1	mid	24	(1)	22.0	22.3	22.3	22.2
		1	High	49	(1)	22.0	22.2	22.4	22.2
		25	Low	0	(2)	21.0	21.2	21.2	21.4
		25	Mid	12	(2)	21.0	21.2	21.2	21.3
		25	High	25	(2)	21.0	21.2	21.2	21.2
50	-	0	(2)	21.0	21.2	21.2	21.2		
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 826.5 MHz (Low)	Frequency 836.5 MHz (Middle)	Frequency 846.5 MHz (High)
5 MHz	QPSK	1	Low	0	(0)	23.0	23.2	23.1	23.2
		1	Mid	12	(0)	23.0	23.2	23.1	23.1
		1	High	24	(0)	23.0	23.3	23.1	23.3
		12	low	0	(1)	22.0	22.3	22.2	22.2
		12	Mid	6	(1)	22.0	22.2	22.3	22.2
		12	High	13	(1)	22.0	22.3	22.3	22.3
		25	-	0	(1)	22.0	22.3	22.2	22.2
	16QAM	1	Low	0	(1)	22.0	22.2	22.5	22.4
		1	Mid	12	(1)	22.0	22.2	22.4	22.3
		1	High	24	(1)	22.0	22.1	22.4	22.5
		12	low	0	(2)	21.0	21.2	21.1	21.2
		12	Mid	6	(2)	21.0	21.2	21.2	21.2
		12	High	13	(2)	21.0	21.2	21.2	21.3
25	-	0	(2)	21.0	21.3	21.2	21.2		

**LTE Band 5 (850 MHz)**

**Power Back-Off NOT Supported (Continued):**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 825.5 MHz (Low)	Frequency 836.5 MHz (Middle)	Frequency 847.5 MHz (High)
3 MHz	QPSK	1	Low	0	(0)	23.0	23.3	23.2	23.3
		1	Mid	7	(0)	23.0	23.2	23.1	23.3
		1	High	14	(0)	23.0	23.2	23.2	23.4
		8	Low	0	(1)	22.0	22.3	22.2	22.2
		8	Mid	4	(1)	22.0	22.3	22.2	22.3
		8	High	7	(1)	22.0	22.3	22.2	22.3
		15	-	0	(1)	22.0	22.3	22.3	22.3
	16QAM	1	Low	0	(1)	22.0	22.4	22.2	22.4
		1	Mid	7	(1)	22.0	22.3	22.2	22.3
		1	High	14	(1)	22.0	22.3	22.2	22.4
		8	Low	0	(2)	21.0	21.2	21.2	21.2
		8	Mid	4	(2)	21.0	21.3	21.2	21.3
		8	High	7	(2)	21.0	21.2	21.2	21.4
		15	-	0	(2)	21.0	21.3	21.2	21.3
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 824.7 MHz (Low)	Frequency 836.5 MHz (Middle)	Frequency 848.3 MHz (High)
1.4 MHz	QPSK	1	Low	0	(0)	23.0	23.4	23.3	22.4
		1	Mid	3	(0)	23.0	23.2	23.2	23.4
		1	High	5	(0)	23.0	23.3	23.4	23.4
		3	Low	0	(0)	23.0	23.3	23.3	23.4
		3	Mid	1	(0)	23.0	23.3	23.3	23.3
		3	high	3	(0)	23.0	23.3	23.2	23.3
		6	-	0	(1)	22.0	22.3	22.3	22.4
	16QAM	1	Low	0	(1)	22.0	22.3	22.4	22.3
		1	Mid	3	(1)	22.0	22.4	22.3	22.2
		1	High	5	(1)	22.0	22.2	22.2	22.3
		3	Low	0	(1)	22.0	22.3	22.2	22.1
		3	Mid	1	(1)	22.0	22.3	22.1	22.1
		3	high	3	(1)	22.0	22.2	22.3	22.2
		6	-	0	(2)	21.0	21.4	21.3	21.4

**8.3.6.LTE Band 7 (2600 MHz)  
Power Back-Off Supported & Disabled**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 2510.0 MHz (Low)	Frequency 2535.0 MHz (Middle)	Frequency 2560.0 MHz (High)
20 MHz	QPSK	1	Low	0	(0)	23.5	23.3	23.2	23.3
		1	Mid	49	(0)	23.5	23.1	23.2	23.1
		1	High	99	(0)	23.5	23.2	23.1	23.2
		50	low	0	(1)	22.5	22.4	22.3	22.2
		50	Mid	25	(1)	22.5	22.1	22.4	22.2
		50	High	50	(1)	22.5	22.0	22.3	22.1
		100	-	0	(1)	22.5	22.1	22.2	22.2
	16QAM	1	Low	0	(1)	22.5	22.4	22.5	22.1
		1	Mid	49	(1)	22.5	22.2	22.6	22.0
		1	High	99	(1)	22.5	22.1	22.2	22.1
		50	low	0	(2)	21.5	22.1	21.1	21.1
		50	Mid	25	(2)	21.5	21.1	21.2	21.1
		50	High	50	(2)	21.5	21.1	21.1	21.1
		100	-	0	(2)	21.5	21.3	21.3	21.2
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 2507.5 MHz (Low)	Frequency 2535.0 MHz (Middle)	Frequency 2562.5 MHz (High)
15 MHz	QPSK	1	Low	0	(0)	23.5	23.3	23.1	23.0
		1	Mid	37	(0)	23.5	23.2	23.2	23.0
		1	High	74	(0)	23.5	23.2	23.1	23.1
		36	low	0	(1)	22.5	22.1	22.2	22.1
		36	Mid	19	(1)	22.5	22.1	22.3	22.1
		36	High	39	(1)	22.5	22.1	22.2	22.1
		75	-	0	(1)	22.5	22.1	22.2	22.2
	16QAM	1	Low	0	(1)	22.5	22.3	22.2	22.2
		1	Mid	37	(1)	22.5	22.2	22.2	22.2
		1	High	74	(1)	22.5	22.1	22.1	22.2
		36	low	0	(2)	21.5	21.2	21.2	21.1
		36	Mid	19	(2)	21.5	21.2	21.3	21.2
		36	High	39	(2)	21.5	21.2	21.2	21.2
		75	-	0	(2)	21.5	21.2	21.2	21.1

**LTE Band 7 (2600 MHz)**  
**Power Back-Off Supported & Disabled (Continued):**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 2505.0 MHz (Low)	Frequency 2535.0 MHz (Middle)	Frequency 2565.0 MHz (High)
10 MHz	QPSK	1	Low	0	(0)	23.5	23.4	23.1	23.0
		1	Mid	24	(0)	23.5	23.3	23.1	23.0
		1	High	49	(0)	23.5	23.3	23.1	23.2
		25	Low	0	(1)	22.5	22.1	22.1	22.1
		25	Mid	12	(1)	22.5	22.1	22.3	22.2
		25	High	25	(1)	22.5	22.1	22.2	22.2
		50	-	0	(1)	22.5	22.1	22.3	22.2
	16QAM	1	Low	0	(1)	22.5	22.3	22.1	22.2
		1	mid	24	(1)	22.5	22.2	22.2	22.2
		1	High	49	(1)	22.5	22.3	22.2	22.2
		25	Low	0	(2)	21.5	21.2	21.2	21.1
		25	Mid	12	(2)	21.5	21.2	21.3	21.1
		25	High	25	(2)	21.5	21.2	21.3	21.2
5 MHz	QPSK	1	Low	0	(0)	23.5	23.3	23.1	23.1
		1	Mid	12	(0)	23.5	23.2	23.1	23.2
		1	High	24	(0)	23.5	23.2	23.1	23.2
		12	low	0	(1)	22.5	22.2	22.2	22.2
		12	Mid	6	(1)	22.5	22.2	22.3	22.2
		12	High	13	(1)	22.5	22.0	22.3	22.3
		25	-	0	(1)	22.5	22.0	22.3	22.2
	16QAM	1	Low	0	(1)	22.5	22.4	22.3	22.1
		1	Mid	12	(1)	22.5	22.3	22.3	22.1
		1	High	24	(1)	22.5	22.3	22.3	22.2
		12	low	0	(2)	21.5	21.2	21.2	21.1
		12	Mid	6	(2)	21.5	21.2	21.3	21.2
		12	High	13	(2)	21.5	21.1	21.3	21.2
25	-	0	(2)	21.5	21.2	21.2	21.2		

**8.3.7.LTE Band 7 (2600 MHz)  
Power Back-Off Supported & Enabled**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 2510.0 MHz (Low)	Frequency 2535.0 MHz (Middle)	Frequency 2560.0 MHz (High)
20 MHz	QPSK	1	Low	0	(0)	23.0	23.4	23.3	23.3
		1	Mid	49	(0)	23.0	23.2	23.3	23.2
		1	High	99	(0)	23.0	23.3	23.3	23.4
		50	low	0	(1)	22.0	22.2	22.3	22.3
		50	Mid	25	(1)	22.0	22.2	22.4	22.3
		50	High	50	(1)	22.0	22.1	22.4	22.3
		100	-	0	(1)	22.0	22.2	22.3	22.3
	16QAM	1	Low	0	(1)	22.0	22.2	22.6	22.3
		1	Mid	49	(1)	22.0	22.1	22.7	22.2
		1	High	99	(1)	22.0	22.2	22.8	22.3
		50	low	0	(2)	21.0	21.3	21.3	21.3
		50	Mid	25	(2)	21.0	21.3	21.3	21.3
		50	High	50	(2)	21.0	21.3	21.3	21.3
		100	-	0	(2)	21.0	21.3	21.3	21.3
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 2507.5 MHz (Low)	Frequency 2535.0 MHz (Middle)	Frequency 2562.5 MHz (High)
15 MHz	QPSK	1	Low	0	(0)	23.0	23.5	23.3	23.2
		1	Mid	37	(0)	23.0	23.4	23.3	23.3
		1	High	74	(0)	23.0	23.3	23.2	23.4
		36	low	0	(1)	22.0	22.2	22.3	22.3
		36	Mid	19	(1)	22.0	22.2	22.4	22.4
		36	High	39	(1)	22.0	22.2	22.4	22.4
		75	-	0	(1)	22.0	22.2	22.3	22.4
	16QAM	1	Low	0	(1)	22.0	22.4	22.3	22.4
		1	Mid	37	(1)	22.0	22.3	22.4	22.4
		1	High	74	(1)	22.0	22.3	22.3	22.5
		36	low	0	(2)	21.0	21.3	21.3	21.3
		36	Mid	19	(2)	21.0	21.4	21.4	21.3
		36	High	39	(2)	21.0	21.4	21.3	21.4
		75	-	0	(2)	21.0	21.3	21.3	21.3

**LTE Band 7 (2600 MHz)**  
**Power Back-Off Supported & Enabled (Continued):**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 2505.0 MHz (Low)	Frequency 2535.0 MHz (Middle)	Frequency 2565.0 MHz (High)
10 MHz	QPSK	1	Low	0	(0)	23.0	23.5	23.2	23.2
		1	Mid	24	(0)	23.0	23.4	23.3	23.2
		1	High	49	(0)	23.0	23.4	23.3	23.4
		25	Low	0	(1)	22.0	22.2	22.3	22.3
		25	Mid	12	(1)	22.0	22.2	22.4	22.3
		25	High	25	(1)	22.0	22.2	22.4	22.4
		50	-	0	(1)	22.0	22.3	22.4	22.4
	16QAM	1	Low	0	(1)	22.0	22.5	22.2	22.4
		1	mid	24	(1)	22.0	22.3	22.3	22.4
		1	High	49	(1)	22.0	22.4	22.3	22.5
		25	Low	0	(2)	21.0	21.3	21.3	21.3
		25	Mid	12	(2)	21.0	21.3	21.4	21.3
		25	High	25	(2)	21.0	21.4	21.4	21.4
		50	-	0	(2)	21.0	21.2	21.4	21.3
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 2510.0 MHz (Low)	Frequency 2535.0 MHz (Middle)	Frequency 2567.5 MHz (High)
5 MHz	QPSK	1	Low	0	(0)	23.0	23.4	23.2	23.3
		1	Mid	12	(0)	23.0	23.3	23.2	23.3
		1	High	24	(0)	23.0	23.3	23.2	23.4
		12	low	0	(1)	22.0	22.2	22.3	22.3
		12	Mid	6	(1)	22.0	22.3	22.4	22.3
		12	High	13	(1)	22.0	22.1	22.4	22.4
		25	-	0	(1)	22.0	22.2	22.4	22.4
	16QAM	1	Low	0	(1)	22.0	22.4	22.6	22.4
		1	Mid	12	(1)	22.0	22.2	22.5	22.4
		1	High	24	(1)	22.0	22.1	22.5	22.5
		12	low	0	(2)	21.0	21.2	21.3	21.4
		12	Mid	6	(2)	21.0	21.2	21.4	21.4
		12	High	13	(2)	21.0	21.1	21.3	21.5
		25	-	0	(2)	21.0	21.3	21.4	21.4

**8.3.8.LTE Band 13 (750 MHz)**

**Power Back-Off NOT Supported**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Band Edge	Frequency 782.0 MHz (Middle)	Band Edge
10 MHz	QPSK	1	Low	0	(0)	23.0	Not Supported	23.3	Not Supported
		1	Mid	24	(0)	23.0		23.2	
		1	High	49	(0)	23.0		23.3	
		25	Low	0	(1)	22.0		22.3	
		25	Mid	12	(1)	22.0		22.1	
		25	High	25	(1)	22.0		22.2	
		50	-	0	(1)	22.0		22.1	
	16QAM	1	Low	0	(1)	22.0		22.0	
		1	mid	24	(1)	22.0		21.9	
		1	High	49	(1)	22.0		21.9	
		25	Low	0	(2)	21.0		21.2	
		25	Mid	12	(2)	21.0		21.1	
		25	High	25	(2)	21.0		21.1	
		50	-	0	(2)	21.0		21.1	
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 779.5 MHz (Low)	Frequency 782.0 MHz (Middle)	Frequency 784.5 MHz (High)
5 MHz	QPSK	1	Low	0	(0)	23.0	23.2	23.1	22.9
		1	Mid	12	(0)	23.0	23.2	23.0	22.9
		1	High	24	(0)	23.0	23.0	23.0	23.0
		12	low	0	(1)	22.0	22.4	22.1	22.1
		12	Mid	6	(1)	22.0	22.2	22.1	22.1
		12	High	13	(1)	22.0	22.2	22.1	22.2
		25	-	0	(1)	22.0	22.2	22.1	22.2
	16QAM	1	Low	0	(1)	22.0	22.2	22.1	22.3
		1	Mid	12	(1)	22.0	22.2	22.0	22.3
		1	High	24	(1)	22.0	22.1	22.0	22.4
		12	low	0	(2)	21.0	21.3	21.1	21.1
		12	Mid	6	(2)	21.0	21.2	21.1	21.2
		12	High	13	(2)	21.0	21.1	21.1	21.1
		25	-	0	(2)	21.0	21.2	21.2	21.2

**8.3.9.LTE Band 17 (700 MHz)**  
**Power Back-Off NOT Supported**

Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 709.0 MHz (Low)	Frequency 710.0 MHz (Middle)	Frequency 711.0 MHz (High)
10 MHz	QPSK	1	Low	0	(0)	23.0	23.0	22.8	22.8
		1	Mid	24	(0)	23.0	23.0	22.7	22.8
		1	High	49	(0)	23.0	22.9	22.9	22.8
		25	Low	0	(1)	22.0	21.9	21.9	21.9
		25	Mid	12	(1)	22.0	21.9	21.9	21.9
		25	High	25	(1)	22.0	21.9	21.9	22.0
		50	-	0	(1)	22.0	21.9	21.9	22.0
	16QAM	1	Low	0	(1)	22.0	21.7	21.9	21.8
		1	mid	24	(1)	22.0	21.7	21.9	21.8
		1	High	49	(1)	22.0	21.7	22.0	21.9
		25	Low	0	(2)	21.0	21.0	21.0	21.0
		25	Mid	12	(2)	21.0	21.0	21.0	21.0
		25	High	25	(2)	21.0	21.0	21.0	21.0
		50	-	0	(2)	21.0	20.9	20.9	20.9
Ch. BW	Modulations	RB Config	Start RB Offset		Power Back-Off	Actual Target Power (dBm)	Measured Avg Power (dBm).		
							Frequency 706.5 MHz (Low)	Frequency 710.0 MHz (Middle)	Frequency 713.5 MHz (High)
5 MHz	QPSK	1	Low	0	(0)	23.0	22.7	22.8	22.8
		1	Mid	12	(0)	23.0	22.7	22.8	22.9
		1	High	24	(0)	23.0	22.7	22.8	22.8
		12	low	0	(1)	22.0	21.8	21.9	21.9
		12	Mid	6	(1)	22.0	21.8	21.9	21.8
		12	High	13	(1)	22.0	21.9	22.0	21.9
		25	-	0	(1)	22.0	21.8	21.9	21.9
	16QAM	1	Low	0	(1)	22.0	21.9	21.9	21.8
		1	Mid	12	(1)	22.0	21.8	21.9	21.8
		1	High	24	(1)	22.0	21.9	21.9	21.8
		12	low	0	(2)	21.0	20.8	20.9	20.7
		12	Mid	6	(2)	21.0	20.9	20.9	20.7
		12	High	13	(2)	21.0	20.7	20.9	20.8
		25	-	0	(2)	21.0	20.8	20.9	20.8

### 8.4.RF Output Average Power Measurement: Wi-Fi (2.4 GHz Band)

#### 8.4.1.Wi-Fi 802.11b/g/n (2.4 GHz)

Required Test Channels per KDB 248227 D01

Mode	Band	GHz	Channel	“Default Test Channels”	
				802.11b	802.11g
802.11b/g	2.4 GHz	<b>2.412</b>	1 <sup>#</sup>	√	∇
		<b>2.437</b>	6	√	∇
		<b>2.462</b>	11 <sup>#</sup>	√	∇

**Notes:**  
 √ = “default test channels”  
 ∇ = possible 802.11g channels with maximum average output ¼ dB ≥ the “default test channels”  
 # = when output power is reduced for channel 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested.

#### Power Back-Off NOT Supported

		Avg Power (dBm)		
Channel Number	Frequency (MHZ)	(1Mbps)	Operating Mode	
1	2412.0	12.8	<b>802.11b</b>	
6	2437.0	13.0		
11	2462.0	13.0		
Channel Number	Frequency (MHZ)	(6Mbps)	Operating Mode	
1	2412.0	12.6	<b>802.11g</b>	
6	2437.0	12.9		
11	2462.0	12.9		
Channel Number	Frequency (MHZ)	(6.5Mbps)	Operating Mode	
1	2412.0	12.6	<b>802.11n HT20</b>	
6	2437.0	12.9		
11	2462.0	12.8		

### 8.5.RF Output Average Power Measurement: Wi-Fi (5.0 GHz Band)

#### Required Test Channels per KDB 248227 D01

Mode		Band	GHz	Channel	"Default Test Channels"	
					802.11a	
802.11a	UNII (15.407)	5.2 GHz	5.180	36	√	
			5.200	40		*
			2.220	44		*
			5.240	48	√	
		5.3 GHz	5.260	52	√	
			5.280	56		*
			5.300	60		*
			5.320	64	√	
		5.5 GHz	5.500	100		
			5.520	104	√	
			5.540	108		*
			5.560	112		*
	5.580		116	√		
	5.600		120		*	
	5.620		124	√		
	5.640		128		*	
	DTS (15.247)	5.8 GHz	5.660	132		*
			5.680	136	√	
			5.700	140		*
			5.745	149	√	
5.765	153			*		
		5.785	157	√		
		5.805	161		*	
		5.825	165	√		

√ = "default test channels"

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

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

**8.5.1.Wi-Fi802.11a/n/ac (5.0 GHz) –Sub Band 1 (5.2 GHz UNII)  
Power Back-Off NOT Supported**

		Avg Power (dBm)	
Channel Number	Frequency (MHZ)	6 Mbps	Operating Mode
36	5180.0	15.9	<b>802.11a</b>
40	5200.0	15.8	
44	5220.0	15.9	
48	5240.0	16.0	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
36	5180.0	15.9	<b>802.11n, HT20</b>
40	5200.0	15.9	
44	5220.0	15.8	
48	5240.0	15.9	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
36	5180.0	15.9	<b>802.11ac, VHT20</b>
40	5200.0	15.8	
44	5220.0	15.5	
48	5240.0	15.9	
Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
38	5190.0	13.8	<b>802.11n, HT40</b>
46	5230.0	13.9	
Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
38	5190.0	13.8	<b>802.11ac, VHT40</b>
46	5230.0	13.9	
Channel Number	Frequency (MHZ)	29.3 Mbps	Operating Mode
42	5210.0	14.0	<b>802.11ac, VHT80</b>

**8.5.2.Wi-Fi802.11a/n/ac (5.0 GHz) –Sub Band 2 (5.3 GHz UNII)  
Power Back-Off NOT Supported**

		Avg Power (dBm)	
Channel Number	Frequency (MHZ)	6 Mbps	Operating Mode
52	5260.0	15.9	<b>802.11a</b>
56	5280.0	15.7	
60	5300.0	15.6	
64	5320.0	16.0	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
52	5260.0	15.9	<b>802.11n, HT20</b>
56	5280.0	15.9	
60	5300.0	16.0	
64	5320.0	15.9	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
52	5260.0	16.0	<b>802.11ac, VHT20</b>
56	5280.0	16.0	
60	5300.0	15.6	
64	5320.0	16.0	
Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
54	5270.0	13.7	<b>802.11n, HT40</b>
62	5310.0	13.8	
Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
54	5270.0	13.9	<b>802.11ac, VHT40</b>
62	5310.0	14.0	
Channel Number	Frequency (MHZ)	29.3 Mbps	Operating Mode
58	5290.0	14.2	<b>802.11ac, VHT80</b>

**8.5.3.Wi-Fi802.11a/n/ac (5.0 GHz) –Sub Band 3 (5.5 GHz UNII)  
Power Back-Off NOT Supported**

		Avg Power (dBm)	
Channel Number	Frequency (MHZ)	6 Mbps	Operating Mode
100	5500.0	16.2	<b>802.11a</b>
104	5520.0	15.7	
108	5540.0	15.9	
112	5560.0	15.9	
116	5580.0	15.9	
132	5660.0	15.9	
136	5680.0	15.9	
140	5700.0	15.9	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
100	5500.0	16.2	<b>802.11n, HT20</b>
104	5520.0	15.9	
108	5540.0	16.0	
112	5560.0	16.0	
116	5580.0	16.0	
132	5660.0	16.1	
136	5680.0	16.0	
140	5700.0	15.7	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
100	5500.0	16.0	<b>802.11ac, VHT20</b>
104	5520.0	15.9	
108	5540.0	15.9	
112	5560.0	16.0	
116	5580.0	16.0	
132	5660.0	16.0	
136	5680.0	16.0	
140	5700.0	16.0	

**Wi-Fi802.11a/n/ac (5.0 GHz) –Sub Band 3 (5.5 GHz UNII)  
Power Back-Off NOT Supported (Continued)**

Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
102	5510.0	13.9	<b>802.11n, HT40</b>
110	5550.0	13.9	
134	5670.0	14.0	
Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
102	5510.0	14.2	<b>802.11ac, VHT40</b>
110	5550.0	13.9	
134	5670.0	14.0	
Channel Number	Frequency (MHZ)	29.3 Mbps	Operating Mode
106	5530.0	14.0	<b>802.11ac, VHT80</b>
122	5610.0	13.9	

**8.5.4.Wi-Fi802.11a/n/ac (5.0 GHz) –Sub Band 4 (5.8 GHz UNII)  
Power Back-Off NOT Supported**

		Avg Power (dBm)	
Channel Number	Frequency (MHZ)	6 Mbps	Operating Mode
149	5745.0	15.7	<b>802.11a</b>
153	5765.0	15.8	
157	5785.0	15.9	
161	5805.0	16.0	
165	5825.0	15.8	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
149	5745.0	15.9	<b>802.11n, HT20</b>
153	5765.0	15.9	
157	5785.0	15.7	
161	5805.0	15.7	
165	5825.0	15.7	
Channel Number	Frequency (MHZ)	6.5 Mbps	Operating Mode
149	5745.0	16.0	<b>802.11ac, VHT20</b>
153	5765.0	15.9	
157	5785.0	15.7	
161	5805.0	15.8	
165	5825.0	15.7	
Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
151	5755.0	13.8	<b>802.11n, HT40</b>
159	5795.0	13.9	
Channel Number	Frequency (MHZ)	13.5 Mbps	Operating Mode
151	5755.0	14.0	<b>802.11ac, VHT40</b>
159	5795.0	13.9	
Channel Number	Frequency (MHZ)	29.3 Mbps	Operating Mode
155	5775.0	14.0	<b>802.11ac, VHT80</b>

**8.6.RF Output Average Power Measurement: Bluetooth****8.6.1. Bluetooth (2.4 GHz)****Power Back-Off NOT Supported**

		Avg Power (dBm)	
Channel Number	Frequency (MHZ)	(1Mbps)	Operating Mode
0	2402.0	5.9	BR
39	2441.0	8.9	
78	2480.0	6.9	
Channel Number	Frequency (MHZ)	(2Mbps)	Operating Mode
0	2402.0	4.0	EDR
39	2441.0	6.4	
78	2480.0	4.5	
Channel Number	Frequency (MHZ)	(3Mbps)	Operating Mode
0	2402.0	4.0	EDR
39	2441.0	6.4	
78	2480.0	4.5	

## 9. Dielectric Property Measurements & System Check

### 9.1. Tissue Dielectric Parameters

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

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

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

#### FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz; IEEE1528:2013 & IEC 62209-1:2005

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
750	41.9	0.89		
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
1500	40.4	1.23		
1610	40.3	1.29	53.8	1.40
1640	40.2	1.31		
1750	40.1	1.37		
1800	40.0	1.40	53.3	1.52
1900	40.0	1.40	53.3	1.52
2000	40.0	1.40	53.3	1.52
2100	39.8	1.49		
2300	39.5	1.67		
2450	39.2	1.80	52.7	1.95
2600	39.0	1.96		
3000	38.5	2.40	52.0	2.73
3500	37.9	2.91		
4000	37.4	3.43		
4500	36.8	3.94		
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
6000	35.1	5.48		

**NOTE:** For convenience, permittivity and conductivity values at some frequencies that are not part of the original data from Drossos et al. [B60] or the extension to 5800 MHz are provided (i.e., the values shown in italics). These values were linearly interpolated between the values in this table that are immediately above and below these values, except the values at 6000 MHz that were linearly extrapolated from the values at 3000 MHz and 5800 MHz.

### 9.2. 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.

### 9.3. Reference Target SAR Values

The reference SAR values are obtained from the calibration certificate of system validation dipoles. The measured values are normalised to 1 Watt.

System Dipole	Serial No.	Cal. Date	Freq. (MHz)	Target SAR Values (mW/g)		
				1g/10g	Head	Body
D750V3	1024	16/05/2014	750	1g	8.12	8.77
				10g	5.26	5.79
D900V2	1d168	14/05/2014	900	1g	10.30	10.60
				10g	6.60	6.87
D1800V2	264	18/08/2014	1800	1g	38.60	37.80
				10g	20.30	20.10
D1900V2	537	22/01/2014	1900	1g	39.80	40.20
				10g	20.70	21.10
D1900V2	540	08/12/2014	1900	1g	40.10	40.00
				10g	20.90	21.10
D2440V2	701	14/01/2014	2450	1g	53.40	51.40
				10g	24.70	23.90
D2450V2	725	08/12/2014	2450	1g	50.80	23.70
				10g	49.90	23.20
D2600V2	1046	18/08/2014	2600	1g	58.30	57.70
				10g	26.10	25.60
D5GHzV2	1016	26/03/2014	5200	1g	77.40	73.10
				10g	22.30	20.40
			5500	1g	84.40	79.00
				10g	24.10	21.90
			5800	1g	76.90	73.20
				10g	22.00	20.20

#### **9.4. Dielectric Property Measurements & System Check Results**

The 1-g SAR 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. The internal limit is set to 5%.

**SAR Lab 56**

**System Check 750 Head**

Date: 27/01/2015

Validation Dipole and Serial Number: D750V3 SN: 1024

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	750	23.0	21.0	$\epsilon_r$	43.19	41.96	2.93	5.00
				$\sigma$	0.89	0.88	-1.17	5.00
				1g SAR	8.12	8.16	0.49	5.00
				10g SAR	5.26	5.48	4.18	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
23230	Middle	782.0		$\epsilon_r$	43.00	$\sigma$	0.90	
Channel Number	Channel Description	Frequency (MHz)		Parameters				
23780	Low	709.0		$\epsilon_r$	43.50	$\sigma$	0.86	
23790	Middle	710.0		$\epsilon_r$	43.50	$\sigma$	0.86	
23800	High	711.0		$\epsilon_r$	43.50	$\sigma$	0.86	

**System Check 750 Body**

Date: 26/01/2015

Validation Dipole and Serial Number: D750V3 SN: 1024

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	750	23.0	21.0	$\epsilon_r$	55.55	54.06	-2.68	5.00
				$\sigma$	1.05	0.94	-1.69	5.00
				1g SAR	8.77	8.56	-2.39	5.00
				10g SAR	5.79	5.72	-1.21	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
23230	Middle	782.0		$\epsilon_r$	54.00	$\sigma$	0.96	
Channel Number	Channel Description	Frequency (MHz)		Parameters				
23780	Low	709.0		$\epsilon_r$	54.30	$\sigma$	0.92	
23790	Middle	710.0		$\epsilon_r$	54.30	$\sigma$	0.92	
23800	High	711.0		$\epsilon_r$	54.30	$\sigma$	0.92	

**SAR Lab 56 (Continued)****System Check 900 Head**

Date: 22/01/2015

Validation Dipole and Serial Number: D900V2 SN: 1d168

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	900	23.0	22.5	$\epsilon_r$	41.50	41.15	-0.84	5.00
				$\sigma$	0.97	0.94	-3.58	5.00
				1g SAR	10.30	10.36	0.58	5.00
				10g SAR	6.6	6.72	1.82	5.00
Channel Number	Channel Description	Frequency (MHz)	Parameters					
4132	Low	826.4	$\epsilon_r$	41.60				
			$\sigma$	0.89				
4183	Middle	836.6	$\epsilon_r$	41.50				
			$\sigma$	0.90				
4233	High	846.6	$\epsilon_r$	41.50				
			$\sigma$	0.90				
Channel Number	Channel Description	Frequency (MHz)	Parameters					
20450	Low	829.0	$\epsilon_r$	41.60				
			$\sigma$	0.89				
20525	Middle	836.5	$\epsilon_r$	41.50				
			$\sigma$	0.900				
20600	High	844.0	$\epsilon_r$	41.5				
			$\sigma$	0.90				
Channel Number	Channel Description	Frequency (MHz)	Parameters					
128	Low	842.2	$\epsilon_r$	41.60				
			$\sigma$	0.89				
190	Middle	836.6	$\epsilon_r$	41.50				
			$\sigma$	0.90				
251	High	848.8	$\epsilon_r$	41.50				
			$\sigma$	0.90				

**SAR Lab 56 (Continued)**

**System Check 900 Body**

Date: 19/01/2015

Validation Dipole and Serial Number: D900V2 SN: 1d168

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	23.0	23.0	$\epsilon_r$	55.00	52.70	-4.18	5.00
				$\sigma$	1.05	1.02	-2.57	5.00
				1g SAR	10.60	10.80	2.7	5.00
				10g SAR	6.87	7.12	3.64	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
4132	Low	826.4		$\epsilon_r$	53.70	$\sigma$	1.00	
4183	Middle	836.6		$\epsilon_r$	53.00	$\sigma$	0.99	
4233	High	846.6		$\epsilon_r$	53.60	$\sigma$	1.01	
Channel Number	Channel Description	Frequency (MHz)		Parameters				
20450	Low	829.0		$\epsilon_r$	53.00	$\sigma$	0.98	
20525	Middle	836.5		$\epsilon_r$	53.00	$\sigma$	0.99	
20600	High	844.0		$\epsilon_r$	53.00	$\sigma$	0.99	

**System Check 900 Body**

Date: 22/01/2015

Validation Dipole and Serial Number: D900V2 SN: 1d168

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	23.0	22.5	$\epsilon_r$	55.00	53.27	-3.15	5.00
				$\sigma$	1.05	1.04	-1.01	5.00
				1g SAR	10.60	10.76	1.51	5.00
				10g SAR	6.87	7.12	3.64	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
4132	Low	826.4		$\epsilon_r$	53.70	$\sigma$	1.00	
4183	Middle	836.6		$\epsilon_r$	53.60	$\sigma$	1.00	
4233	High	846.6		$\epsilon_r$	53.60	$\sigma$	1.01	

**SAR Lab 57****System Check 2450 Head**

Date: 05/01/2015

Validation Dipole and Serial Number: D2440V2 SN: 701

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	2450	24.0	23.0	$\epsilon_r$	39.20	40.24	2.65	5.00
				$\sigma$	1.80	1.85	2.69	5.00
				1g SAR	53.40	52.80	-1.12	5.00
				10g SAR	24.70	23.76	-3.81	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
1	Low	2412		$\epsilon_r$	40.37			
				$\sigma$	1.80			
6	Middle	2437		$\epsilon_r$	40.28			
				$\sigma$	1.83			
11	High	2462		$\epsilon_r$	40.19			
				$\sigma$	1.86			

**System Check 2450 Body**

Date: 22/01/2015

Validation Dipole and Serial Number: D2450V2 SN: 725

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	2450	24.0	23.0	$\epsilon_r$	52.70	50.50	-4.17	5.00
				$\sigma$	1.95	2.01	+2.96	5.00
				1g SAR	49.90	50.40	+1.00	5.00
				10g SAR	23.20	23.04	-0.86	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
1	Low	2412		$\epsilon_r$	50.70			
				$\sigma$	1.96			
6	Middle	2437		$\epsilon_r$	50.60			
				$\sigma$	1.99			
11	High	2462		$\epsilon_r$	50.48			
				$\sigma$	2.02			

**SAR Lab 57 (Continued)**

**System Check 2450 Body**

Date: 26/01/2015

Validation Dipole and Serial Number: D2450V2 SN: 725

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	2450	24.0	23.0	$\epsilon_r$	52.70	51.23	-2.79	5.00
				$\sigma$	1.95	1.91	-2.07	5.00
				1g SAR	50.00	49.90	+0.20	5.00
				10g SAR	23.04	23.20	-0.69	5.00
Channel Number		Channel Description		Frequency		Parameters		
				(MHz)				
1		Low		2412	$\epsilon_r$	51.20		
					$\sigma$	1.89		
6		Middle		2437	$\epsilon_r$	51.14		
					$\sigma$	1.93		
11		High		2462	$\epsilon_r$	51.1		
					$\sigma$	1.95		
Channel Number		Channel Description		Frequency		Parameters		
				(MHz)				
0		Low		2403	$\epsilon_r$	51.20		
					$\sigma$	1.88		
39		Middle		2441	$\epsilon_r$	51.10		
					$\sigma$	1.93		
78		High		2480	$\epsilon_r$	51.00		
					$\sigma$	1.97		

**System Check 2600 Head**

Date: 26/01/2015

Validation Dipole and Serial Number: D2600V2 SN: 1046

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	2600	24.0	24.0	$\epsilon_r$	39.00	38.64	-0.92	5.00
				$\sigma$	1.96	1.92	0.08	5.00
				1g SAR	58.30	56.80	-2.57	5.00
				10g SAR	26.1	25.20	-3.45	5.00
Channel Number		Channel Description		Frequency		Parameters		
				(MHz)				
20850		Low		2510	$\epsilon_r$	38.90		
					$\sigma$	1.86		
21100		Middle		2535	$\epsilon_r$	38.80		
					$\sigma$	1.89		
21350		High		2560	$\epsilon_r$	38.80		
					$\sigma$	1.92		

**SAR Lab 57 (Continued)**

**System Check 2600 Body**

Date: 13/01/2015

Validation Dipole and Serial Number: D2600V2 SN: 1046

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	2600	22.0	21.0	$\epsilon_r$	52.50	49.98	-4.80	5.00
				$\sigma$	2.16	2.21	2.52	5.00
				1g SAR	57.70	59.20	2.60	5.00
				10g SAR	25.60	26.16	2.19	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
20850	Low	2510		$\epsilon_r$	50.40			
				$\sigma$	2.10			
21100	Middle	2535		$\epsilon_r$	50.20			
				$\sigma$	2.17			
21350	High	2560		$\epsilon_r$	50.20			
				$\sigma$	2.17			

**System Check 2600 Body**

Date: 16/01/2015

Validation Dipole and Serial Number: D2600V2 SN: 1046

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	2600	23.0	22.0	$\epsilon_r$	52.50	50.63	-3.56	5.00
				$\sigma$	2.16	2.18	0.71	5.00
				1g SAR	57.70	57.70	-0.17	5.00
				10g SAR	25.60	25.24	-1.41	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
20850	Low	2510		$\epsilon_r$	50.94			
				$\sigma$	2.07			
21100	Middle	2535		$\epsilon_r$	50.80			
				$\sigma$	2.11			
21350	High	2560		$\epsilon_r$	50.70			
				$\sigma$	2.14			

**SAR Lab 57 (Continued)**

**System Check 2600 Body**

Date: 19/01/2015

Validation Dipole and Serial Number: D2600V2 SN: 1046

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	2600	22.0	20.0	$\epsilon_r$	52.50	50.70	-3.43	5.00
				$\sigma$	2.16	2.22	2.78	5.00
				1g SAR	57.70	59.60	3.29	5.00
				10g SAR	25.60	25.72	0.47	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
20850	Low	2510		$\epsilon_r$	51.00			
				$\sigma$	2.10			
21100	Middle	2535		$\epsilon_r$	50.90			
				$\sigma$	2.14			
21350	High	2560		$\epsilon_r$	50.80			
				$\sigma$	2.17			

**SAR Lab 58****System Check 1800 Head**

Date: 20/01/2015

Validation Dipole and Serial Number: D1800V2 SN: 264

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	1800	22.0	19.0	$\epsilon_r$	40.00	38.85	-2.88	5.00
				$\sigma$	1.40	1.43	2.36	5.00
				1g SAR	38.60	39.04	1.14	5.00
				10g SAR	20.30	19.80	-2.46	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
1312	Low	1712.4		$\epsilon_r$	39.20	$\sigma$	1.35	
1412	Middle	1732.4		$\epsilon_r$	39.13	$\sigma$	1.37	
1513	High	1752.6		$\epsilon_r$	39.05	$\sigma$	1.39	
Channel Number	Channel Description	Frequency (MHz)		Parameters				
20050	Low			$\epsilon_r$	39.18	$\sigma$	1.36	
20175	Middle	1732.5		$\epsilon_r$	39.13	$\sigma$	1.37	
20300	High	1745.0		$\epsilon_r$	39.08	$\sigma$	1.38	

**SAR Lab 58 (Continued)****System Check 1800 Body**

Date: 22/01/2015

Validation Dipole and Serial Number: D1800V2 SN: 264

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1800	24.0	23.0	$\epsilon_r$	53.30	51.57	-3.25	5.00
				$\sigma$	1.52	1.57	3.03	5.00
				1g SAR	37.80	38.00	0.53	5.00
				10g SAR	20.10	20.36	1.29	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
1312	Low	1712.4		$\epsilon_r$	51.83	$\sigma$	1.49	
1412	Middle	1732.4		$\epsilon_r$	51.75	$\sigma$	1.51	
1513	High	1752.6		$\epsilon_r$	51.68	$\sigma$	1.52	
Channel Number	Channel Description	Frequency (MHz)		Parameters				
20050	Low	1720.0		$\epsilon_r$	51.80	$\sigma$	1.50	
20175	Middle	1732.5		$\epsilon_r$	51.75	$\sigma$	1.51	
20300	High	1745.0		$\epsilon_r$	51.71	$\sigma$	1.52	

**SAR Lab 59**

**System Check 900 Body**

Date: 27/01/2015

Validation Dipole and Serial Number: D900V2 SN: 1d168

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	23.0	23.0	$\epsilon_r$	55.00	54.50	-0.91	5.00
				$\sigma$	1.05	1.01	-3.62	5.00
				1g SAR	10.60	10.44	-1.51	5.00
				10g SAR	6.87	7.00	1.89	5.00
Channel Number	Channel Description	Frequency (MHz)	Parameters					
128	Low	842.2	$\epsilon_r$	54.89				
			$\sigma$	0.964				
190	Middle	836.6	$\epsilon_r$	54.83				
			$\sigma$	0.97				
251	High	848.8	$\epsilon_r$	54.77				
			$\sigma$	0.98				

**System Check 5.2/5.5/5.8 GHz Head**

Date: 06/02/2015

Validation Dipole and Serial Number: D1016V2 SN: 1016

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	5200	23.0	23.0	$\epsilon_r$	35.99	35.62	-1.03	5.00
				$\sigma$	4.66	4.66	0.06	5.00
				1g SAR	77.40	79.10	2.20	5.00
				10g SAR	22.30	22.10	-0.90	5.00
Head	5500	23.0	23.0	$\epsilon_r$	35.60	35.11	-1.38	5.00
				$\sigma$	4.96	4.97	0.29	5.00
				1g SAR	84.80	85.80	1.18	5.00
				10g SAR	24.10	24.20	0.41	5.00
Head	5800	23.0	23.0	$\epsilon_r$	35.30	34.68	-1.76	5.00
				$\sigma$	5.27	5.28	0.27	5.00
				1g SAR	76.90	79.00	2.73	5.00
				10g SAR	22.00	21.90	-0.45	5.00
Channel Number	Frequency (MHz)	Parameters						
48	5240	$\epsilon_r$	34.97					
		$\sigma$	4.84					
64	5320	$\epsilon_r$	34.97					
		$\sigma$	4.84					

**SAR Lab 59 (Continued)**

**System Check 5.2/5.5/5.8 GHz Head**

**Date: 16/02/2015**

**Validation Dipole and Serial Number: D1016V2 SN: 1016**

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	5200	23.0	23.0	$\epsilon_r$	35.99	35.21	-2.17	5.00
				$\sigma$	4.66	4.60	-1.24	5.00
				1g SAR	77.40	75.80	-2.07	5.00
				10g SAR	22.30	21.50	-3.59	5.00
Head	5500	23.0	23.0	$\epsilon_r$	35.60	34.87	-2.05	5.00
				$\sigma$	4.96	4.90	-1.13	5.00
				1g SAR	84.80	84.40	-0.47	5.00
				10g SAR	24.10	23.50	-2.49	5.00
Head	5800	23.0	23.0	$\epsilon_r$	35.30	34.44	-2.44	5.00
				$\sigma$	5.27	5.24	-0.58	5.00
				1g SAR	76.90	80.20	4.29	5.00
				10g SAR	22.00	22.00	0.00	5.00
Channel Number		Frequency		Parameters				
		(MHz)						
42	5210	$\epsilon_r$	35.21					
		$\sigma$	4.63					
46	5230	$\epsilon_r$	35.20					
		$\sigma$	4.66					
58	5290	$\epsilon_r$	35.10					
		$\sigma$	4.70					
62	5310	$\epsilon_r$	35.06					
		$\sigma$	4.72					
64	5320	$\epsilon_r$	35.05					
		$\sigma$	4.73					
100	5500	$\epsilon_r$	34.87					
		$\sigma$	4.91					
102	5510	$\epsilon_r$	34.83					
		$\sigma$	4.92					
106	5530	$\epsilon_r$	34.76					
		$\sigma$	4.95					
151	5755	$\epsilon_r$	34.48					
		$\sigma$	5.17					
155	5775	$\epsilon_r$	34.46					
		$\sigma$	5.20					
161	5805	$\epsilon_r$	34.43					
		$\sigma$	5.25					

**SAR Lab 60**

**System Check 1900 Head**

Date: 29/12/2014

Validation Dipole and Serial Number: D1900V2 SN: 537

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	1900	22.0	21.0	$\epsilon_r$	40.00	39.71	-0.72	5.00
				$\sigma$	1.40	1.40	0.20	5.00
				1g SAR	39.80	41.60	4.52	5.00
				10g SAR	20.70	21.04	1.64	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
9262	Low	1852.4		$\epsilon_r$	39.91			
				$\sigma$	1.35			
9400	Middle	1880.0		$\epsilon_r$	39.97			
				$\sigma$	1.38			
9538	High	1907.6		$\epsilon_r$	39.68			
				$\sigma$	1.41			
Channel Number	Channel Description	Frequency (MHz)		Parameters				
18700	Low	1860.0		$\epsilon_r$	39.88			
				$\sigma$	1.36			
18900	Middle	1880.0		$\epsilon_r$	39.79			
				$\sigma$	1.38			
19100	High	1900.0		$\epsilon_r$	39.71			
				$\sigma$	1.40			

**System Check 1900 Head**

Date: 26/01/2015

Validation Dipole and Serial Number: D1900V2 SN: 540

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	1900	23.0	23.0	$\epsilon_r$	40.00	38.59	-3.52	5.00
				$\sigma$	1.40	1.41	0.65	5.00
				1g SAR	40.10	41.60	3.74	5.00
				10g SAR	20.90	21.84	4.50	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
512	Low	1850.2		$\epsilon_r$	38.84			
				$\sigma$	1.36			
661	Middle	1880		$\epsilon_r$	38.69			
				$\sigma$	1.39			
810	High	1909.8		$\epsilon_r$	38.55			
				$\sigma$	1.42			

**SAR Lab 60 (Continued)**

**System Check 1900 Body**

Date: 22/12/2014

Validation Dipole and Serial Number: D1900V2 SN: 537

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	24.0	23.0	$\epsilon_r$	53.30	51.31	-3.73	5.00
				$\sigma$	1.52	1.56	2.64	5.00
				1g SAR	40.00	39.44	-1.40	5.00
				10g SAR	21.1	20.64	-2.18	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
9262	Low	1852.4		$\epsilon_r$	51.15			
				$\sigma$	1.52			
9400	Middle	1880.0		$\epsilon_r$	51.06			
				$\sigma$	1.55			
9538	High	1907.6		$\epsilon_r$	50.97			
				$\sigma$	1.58			
Channel Number	Channel Description	Frequency (MHz)		Parameters				
18700	Low	1860.0		$\epsilon_r$	51.12			
				$\sigma$	1.53			
18900	Middle	1880.0		$\epsilon_r$	51.06			
				$\sigma$	1.55			
19100	High	1900.0		$\epsilon_r$	50.99			
				$\sigma$	1.57			

**SAR Lab 60 (Continued)**

**System Check 1900 Body**

Date: 15/01/2015

Validation Dipole and Serial Number: D1900V2 SN: 540

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	24.0	23.0	$\epsilon_r$	53.30	52.10	-2.25	5.00
				$\sigma$	1.52	1.54	1.39	5.00
				1g SAR	40.00	39.48	-1.79	5.00
				10g SAR	21.10	20.68	-1.99	5.00
Channel Number		Channel Description		Frequency (MHz)		Parameters		
9262	Low	1852.4	$\epsilon_r$	52.22	$\sigma$	1.49		
9400	Middle	1880.0	$\epsilon_r$	52.15	$\sigma$	1.52		
9538	High	1907.6	$\epsilon_r$	52.09	$\sigma$	1.55		
Channel Number		Channel Description		Frequency (MHz)		Parameters		
18700	Low	1860.0	$\epsilon_r$	51.06	$\sigma$	1.54		
18900	Middle	1880.0	$\epsilon_r$	51.12	$\sigma$	1.53		
19100	High	1900.0	$\epsilon_r$	50.99	$\sigma$	1.57		

**System Check 1900 Body**

Date: 19/01/2015

Validation Dipole and Serial Number: D1900V2 SN: 540

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	24.0	23.0	$\epsilon_r$	53.30	51.62	-3.15	5.00
				$\sigma$	1.52	1.49	-2.08	5.00
				1g SAR	40.00	39.04	-2.40	5.00
				10g SAR	21.10	20.16	-4.45	5.00
Channel Number		Channel Description		Frequency (MHz)		Parameters		
9262	Low	1852.4	$\epsilon_r$	51.75	$\sigma$	1.44		
9400	Middle	1880.0	$\epsilon_r$	51.68	$\sigma$	1.47		
9538	High	1907.6	$\epsilon_r$	51.60	$\sigma$	1.50		

**SAR Lab 60 (Continued)**

**System Check 1900 Body**

Date: 22/01/2015

Validation Dipole and Serial Number: D1900V2 SN: 540

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	24.0	23.0	$\epsilon_r$	53.30	51.74	-2.93	5.00
				$\sigma$	1.52	1.55	1.67	5.00
				1g SAR	40.00	39.44	-1.40	5.00
				10g SAR	21.10	21.84	-2.18	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
512	Low	1850.2		$\epsilon_r$	51.89			
				$\sigma$	1.50			
661	Middle	1880		$\epsilon_r$	51.80			
				$\sigma$	1.53			
810	High	1909.8		$\epsilon_r$	51.72			
				$\sigma$	1.56			

**System Check 1900 Body**

Date: 26/01/2015

Validation Dipole and Serial Number: D1900V2 SN: 540

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	24.0	23.0	$\epsilon_r$	53.30	51.31	-3.73	5.00
				$\sigma$	1.52	1.56	1.52	5.00
				1g SAR	40.00	41.60	4.00	5.00
				10g SAR	21.10	21.84	3.51	5.00
Channel Number	Channel Description	Frequency (MHz)		Parameters				
512	Low	1850.2		$\epsilon_r$	51.49			
				$\sigma$	1.51			
661	Middle	1880		$\epsilon_r$	51.38			
				$\sigma$	1.54			
810	High	1909.8		$\epsilon_r$	51.28			
				$\sigma$	1.57			

**SAR Lab 61**

**System Check 5.2/5.5/5.8 GHz Body**

Date: 21/01/2015

Validation Dipole and Serial Number: D1016V2 SN: 1016

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	5200	23.0	24.0	$\epsilon_r$	49.01	49.32	0.63	5.00
				$\sigma$	5.30	5.12	-3.41	5.00
				1g SAR	73.10	72.50	-0.82	5.00
				10g SAR	20.40	19.90	-2.45	5.00
Body	5500	23.0	24.0	$\epsilon_r$	48.60	48.63	0.06	5.00
				$\sigma$	5.65	5.49	-2.87	5.00
				1g SAR	79.00	82.80	4.81	5.00
				10g SAR	21.90	22.50	2.74	5.00
Body	5800	23.0	24.0	$\epsilon_r$	48.20	48.01	-0.39	5.00
				$\sigma$	6.00	6.02	0.32	5.00
				1g SAR	73.20	72.70	-0.68	5.00
				10g SAR	20.20	19.90	-1.49	5.00
Channel Number		Frequency		Parameters				
		(MHz)						
36	5180	$\epsilon_r$	49.47					
		$\sigma$	5.08					
42	5210	$\epsilon_r$	49.33					
		$\sigma$	5.14					
46	5230	$\epsilon_r$	49.34					
		$\sigma$	5.16					
48	5240	$\epsilon_r$	49.34					
		$\sigma$	5.17					
58	5290	$\epsilon_r$	49.05					
		$\sigma$	5.24					
62	5310	$\epsilon_r$	48.99					
		$\sigma$	5.27					
64	5320	$\epsilon_r$	49.01					
		$\sigma$	5.29					
100	5500	$\epsilon_r$	48.63					
		$\sigma$	5.50					
102	5510	$\epsilon_r$	48.58					
		$\sigma$	5.52					
106	5530	$\epsilon_r$	48.48					
		$\sigma$	5.57					
151	5755	$\epsilon_r$	47.96					
		$\sigma$	5.88					
155	5775	$\epsilon_r$	47.98					
		$\sigma$	5.95					
165	5825	$\epsilon_r$	47.89					
		$\sigma$	6.02					

## **10.Measured 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.

#### **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.

Prior to testing the Industry Canada Bureau was contacted for LTE Release 10 SAR evaluations on the EUT and testing was performed as per KDB 941225 after their confirmation.

Prior to testing the Industry Canada Bureau was contacted for Antenna Tuner SAR evaluations and testing was performed as per Industry Canada Bureau response.

**10.1. Specific Absorption Rate - Test Results**

**For All SAR measurement in this report the 1g-SAR limit tested to is 1.6 W/Kg**

**10.1.1. GSM 850 - Head - Power Back-Off Not Supported**

**Max Reported SAR = 0.276 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
GMSK (DTM Class 9)	0	Touch Left	190	836.6	N/A	N/A	31.6	31.5	0.236	0.241	1	1
	0	Tilt Left	190	836.6	N/A	N/A	31.6	31.5	0.133	0.136	1	2
	0	Touch Right	190	836.6	N/A	N/A	31.6	31.5	0.243	0.249	1	3
	0	Tilt Right	190	836.6	N/A	N/A	31.6	31.5	0.140	0.143	1	4
	0	Touch Right	128	824.2	N/A	N/A	31.6	31.5	0.212	0.217	1	5
	0	Touch Right	251	848.8	N/A	N/A	31.6	31.4	0.264	0.276	1	6

**Note(s):**

- DTM Multi-slot Class 9 - Tested using 2 Uplink time slots (with 1 time slots set as CS1 for GPRS and 1 time slot set for voice).

**10.1.2. GSM 850 Hotspot Mode - Power Back-Off Not Supported**

**Max Reported SAR = 0.448 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
GMSK (DTM Class 9)	10	Front	190	836.6	N/A	N/A	31.6	31.5	0.318	0.325	1	7
	10	Back	190	836.6	N/A	N/A	31.6	31.5	0.337	0.345	1	8
	10	Left Hand Side	190	836.6	N/A	N/A	31.6	31.5	0.255	0.261	1	9
	10	Right Hand Side	190	836.6	N/A	N/A	31.6	31.5	0.360	0.368	1	10
	10	Bottom	190	836.6	N/A	N/A	31.6	31.5	0.063	0.064	1	11
	10	Right Hand Side	128	824.2	N/A	N/A	31.6	31.5	0.438	0.448	1	12
	10	Right Hand Side	251	848.8	N/A	N/A	31.6	31.4	0.377	0.395	1	13

**Note(s):**

- DTM Multi-slot Class 9 - Tested using 2 Uplink time slots (with 1 time slots set as CS1 for GPRS and 1 time slot set for voice).

**10.1.3. GSM 850 - Body-Worn - Power Back-Off Not Supported**  
**Max Reported SAR = 0.385 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
GMSK (DTM Class 9)	15	Front	190	836.6	N/A	N/A	31.6	31.5	0.325	0.333	1	14
	15	Back	190	836.6	N/A	N/A	31.6	31.5	0.350	0.358	1	15
	15	Back	128	824.2	N/A	N/A	31.6	31.5	0.376	0.385	1	16
	15	Back	251	848.8	N/A	N/A	31.6	31.4	0.330	0.346	1	17

**Note(s):**

- DTM Multi-slot Class 9 - Tested using 2 Uplink time slots (with 1 time slots set as CS1 for GPRS and 1 time slot set for voice).

**10.1.4. PCS 1900 - Head - Power Back-Off Supported and Disabled**  
**Max Reported SAR = 0.447 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
GMSK (DTM Class 11)	0	Touch Left	661	1880.0	N/A	N/A	27.6	26.6	0.247	0.311	1	18
	0	Tilt Left	661	1880.0	N/A	N/A	27.6	26.6	0.102	0.128	1	19
	0	Touch Right	661	1880.0	N/A	N/A	27.6	26.6	0.266	0.335	1	20
	0	Tilt Right	661	1880.0	N/A	N/A	27.6	26.6	0.066	0.083	1	21
	0	Touch Right	512	1850.2	N/A	N/A	27.6	26.6	0.355	0.447	1	22
	0	Touch Right	810	1909.8	N/A	N/A	27.6	26.6	0.202	0.254	1	23

**Note(s):**

- DTM Multi-slot Class 11 - Tested using 3 Uplink time slots (with 2 time slots set as CS1 for GPRS and 1 time slot set for voice).

**10.1.5. PCS 1900 - Hotspot Mode - Power Back-Off Supported and Enabled**  
**Max Reported SAR = 1.240 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
GMSK (Data 4 Slot)	10	Front	661	1880.0	N/A	N/A	21.5	20.8	0.735	0.864	-	24
	10	Front	512	1850.2	N/A	N/A	21.5	20.8	0.607	0.713	-	25
	10	Front	810	1909.8	N/A	N/A	21.5	20.9	0.710	0.815	-	26
	10	Back	661	1880.0	N/A	N/A	21.5	20.8	0.587	0.690	-	27
	10	Left Hand Side	661	1880.0	N/A	N/A	21.5	20.8	0.075	0.088	-	28
	10	Right Hand Side	661	1880.0	N/A	N/A	21.5	20.8	0.037	0.044	-	29
	10	Bottom	661	1880.0	N/A	N/A	21.5	20.8	0.990	1.163	-	30
	10	Bottom	512	1850.2	N/A	N/A	21.5	20.8	0.751	0.882	-	31
	10	Bottom	810	1909.8	N/A	N/A	21.5	20.9	1.080	1.240	1	32

**Note(s):**

- As per 865664 D01, the highest SAR measured > 0.8 W/kg has been re-measured and included in the report in section 9.3 under **SAR Measurement Variability and Measurement Uncertainty Analysis Results** Table.

**10.1.6. PCS 1900 - Body-Worn - Power Back-Off Supported and Disabled**  
**Max Reported SAR = 1.157 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
GMSK (DTM Class 11)	15	Front	661	1880.0	N/A	N/A	27.6	26.6	0.919	1.157	-	33
	15	Front	512	1850.2	N/A	N/A	27.6	26.6	0.797	1.003	-	34
	15	Front	810	1909.8	N/A	N/A	27.6	26.6	0.840	1.057	-	35
	15	Back	661	1880.0	N/A	N/A	27.6	26.6	0.902	1.136	-	36
	15	Back	512	1850.2	N/A	N/A	27.6	26.6	0.800	1.007	-	37
	15	Back	810	1909.8	N/A	N/A	27.6	26.6	0.868	1.093	-	38

**10.1.7. UMTS FDD 2 - Head - Power Back-Off Supported and Disabled**  
**Max Reported SAR = 0.437 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	0	Touch Left	9400	1880.0	N/A	N/A	24.0	23.6	0.297	0.326	1	39
	0	Tilt Left	9400	1880.0	N/A	N/A	24.0	23.6	0.139	0.152	1	40
	0	Touch Right	9400	1880.0	N/A	N/A	24.0	23.6	0.324	0.355	1	41
	0	Tilt Right	9400	1880.0	N/A	N/A	24.0	23.6	0.072	0.079	1	42
	0	Touch Right	9262	1852.4	N/A	N/A	24.0	23.7	0.408	0.437	1	43
	0	Touch Right	9538	1907.6	N/A	N/A	24.0	23.5	0.312	0.350	1	44

**Note(s):**

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"

**10.1.8. UMTS FDD 2 - Hotspot Mode - Power Back-Off Supported and Enabled**  
**Max Reported SAR = 0.929 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	10	Front	9400	1880.0	N/A	N/A	17.5	17.2	0.450	0.482	1	45
	10	Back	9400	1880.0	N/A	N/A	17.5	17.2	0.455	0.488	1	46
	10	Left Hand Side	9400	1880.0	N/A	N/A	17.5	17.2	0.066	0.071	1	47
	10	Right Hand Side	9400	1880.0	N/A	N/A	17.5	17.2	0.037	0.040	1	48
	10	Bottom	9400	1880.0	N/A	N/A	17.5	17.2	0.677	0.725	1	49
	10	Bottom	9262	1852.4	N/A	N/A	17.5	17.3	0.580	0.607	1	50
	10	Bottom	9538	1907.6	N/A	N/A	17.5	17.1	0.847	0.929	1	51

**Note(s):**

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's".

**10.1.9. UMTS FDD 2 - Body-Worn - Power Back-Off Supported and Disabled**  
**Max Reported SAR = 1.133 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	15	Front	9400	1880.0	N/A	N/A	24.0	23.6	0.876	0.961	1	52
	15	Front	9262	1852.4	N/A	N/A	24.0	23.7	0.850	0.911	1	53
	15	Front	9538	1907.6	N/A	N/A	24.0	23.5	1.010	1.133	1, 2	54
	15	Back	9400	1880.0	N/A	N/A	24.0	23.6	0.809	0.887	1	55
	15	Back	9262	1852.4	N/A	N/A	24.0	23.7	0.782	0.838	1	56
	15	Back	9538	1907.6	N/A	N/A	24.0	23.5	0.928	1.041	1	57

**Note(s):**

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"
2. As per 865664 D01, the highest SAR measured > 0.8 W/kg has been re-measured and included in the report in section 9.3 under **SAR Measurement Variability and Measurement Uncertainty Analysis Results** Table.

**10.1.10. UMTS FDD 4 Head - Power Back-Off Not Supported**  
**Max Reported SAR = 0.839 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	0	Touch Left	1412	1732.6	N/A	N/A	24.0	23.7	0.518	0.555	1	58
	0	Tilt Left	1412	1732.6	N/A	N/A	24.0	23.7	0.363	0.389	1	59
	0	Touch Right	1412	1732.6	N/A	N/A	24.0	23.7	0.783	0.839	1	60
	0	Touch Right	1312	1712.4	N/A	N/A	24.0	23.7	0.699	0.732	1	61
	0	Touch Right	1513	1752.6	N/A	N/A	24.0	23.8	0.753	0.807	1	62
	0	Tilt Right	1412	1732.6	N/A	N/A	24.0	23.7	0.235	0.252	1	63

**Note(s):**

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"

**10.1.11. UMTS FDD 4 - Hotspot Mode - Power Back-Off Supported and Enabled**  
**Max Reported SAR = 0.771 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	10	Front	1412	1732.6	N/A	N/A	22.5	22.0	0.656	0.736	1	64
	10	Back	1412	1732.6	N/A	N/A	22.5	22.0	0.650	0.729	1	65
	10	Left Hand Side	1412	1732.6	N/A	N/A	22.5	22.0	0.308	0.346	1	66
	10	Right Hand Side	1412	1732.6	N/A	N/A	22.5	22.0	0.253	0.284	1	67
	10	Bottom	1412	1732.6	N/A	N/A	22.5	22.0	0.649	0.728	1	68
	10	Bottom	1312	1712.4	N/A	N/A	22.5	22.2	0.639	0.685	1	69
	10	Bottom	1513	1752.6	N/A	N/A	22.5	22.2	0.720	0.771	1	70

**Note(s):**

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"

**10.1.12. UMTS FDD 4 - Body-Worn- Power Back-Off Supported and Disabled**  
**Max Reported SAR = 0.522 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	15	Front	1412	1732.6	N/A	N/A	24.0	<b>23.7</b>	0.487	0.522	1	71
	15	Back	1412	1732.6	N/A	N/A	24.0	<b>23.7</b>	0.450	0.482	1	72
	15	Back	1312	1712.4	N/A	N/A	24.0	23.8	0.469	0.491	1	73
	15	Back	1513	1752.6	N/A	N/A	24.0	23.7	0.486	0.521	1	74

**Note(s):**

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"

**10.1.13. UMTS FDD 5 - Head - Power Back-Off Not Supported**  
**Max Reported SAR = 0.367 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	0	Touch Left	4183	836.6	N/A	N/A	24.5	24.0	0.323	0.362	1	75
	0	Tilt Left	4183	836.6	N/A	N/A	24.5	24.0	0.182	0.204	1	76
	0	Touch Right	4183	836.6	N/A	N/A	24.5	24.0	0.327	0.367	1	77
	0	Tilt Right	4183	836.6	N/A	N/A	24.5	24.0	0.178	0.200	1	78
	0	Touch Left	4132	826.4	N/A	N/A	24.5	24.1	0.290	0.318	1	79
	0	Touch Left	4233	848.8	N/A	N/A	24.5	24.1	0.302	0.331	1	80

**Note(s):**

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"

**10.1.14. UMTS FDD 5 - Hotspot Mode - Power Back-Off Not Supported**  
**Max Reported SAR = 0.582 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	10	Front	4183	836.6	N/A	N/A	24.5	24.0	0.466	0.523	1	81
	10	Back	4183	836.6	N/A	N/A	24.5	24.0	0.472	0.530	1	82
	10	Left Hand Side	4183	836.6	N/A	N/A	24.5	24.0	0.381	0.427	1	83
	10	Right Hand Side	4183	836.6	N/A	N/A	24.5	24.0	0.514	0.577	1	84
	10	Bottom	4183	836.6	N/A	N/A	24.5	24.0	0.100	0.112	1	85
	10	Back	4132	826.4	N/A	N/A	24.5	24.1	0.531	0.582	1	86
	10	Back	4233	848.8	N/A	N/A	24.5	24.1	0.402	0.441	1	87

**Note(s):**

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"

**10.1.15. UMTS FDD 5 - Body-Worn - Power Back-Off Not Supported**

**Max Reported SAR = 0.582 (W/kg)**

For body-worn configuration indicated below the test position overlap with hotspot and the power back –off was not supported meaning hotspot mode was most conservative.

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	10	Front	4183	836.6	N/A	N/A	24.5	24.0	0.466	0.523	1	81
	10	Back	4183	836.6	N/A	N/A	24.5	24.0	0.472	0.530	1	82
	10	Back	4132	826.4	N/A	N/A	24.5	24.1	0.531	0.582	1	86
	10	Back	4233	848.8	N/A	N/A	24.5	24.1	0.402	0.441	1	87

**Note(s):**

1. Circuit Switch (CS) - RMC 12.2kbps with Test loop mode 1 and TPC bits configured to All "1's"

**10.1.16. LTE Band 2; 20MHz Channel BW Head - Power Back-Off Supported and Disabled**

**Max Reported SAR = 0.280 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	0	Touch Left	18900	1880.0	1	99	24.2	23.4	0.175	0.210	-	88
	0	Touch Left	18900	1880.0	50	25	23.2	22.5	0.136	0.160	-	89
	0	Tilt Left	18900	1880.0	1	99	24.2	23.4	0.003	0.004	-	90
	0	Tilt Left	18900	1880.0	50	25	23.2	22.5	0.073	0.086	-	91
	0	Touch Right	18900	1880.0	1	99	24.2	23.4	0.233	0.280	-	92
	0	Touch Right	18900	1880.0	50	25	23.2	22.5	0.182	0.214	-	93
	0	Tilt Right	18900	1880.0	1	99	24.2	23.4	0.057	0.068	-	94
	0	Tilt Right	18900	1880.0	50	25	23.2	22.5	0.036	0.042	-	95
	0	Touch Right	18700	1860.0	1	99	24.2	23.4	0.218	0.262	-	96
	0	Touch Right	19100	1900.0	1	99	24.2	23.4	0.187	0.225	-	97

**10.1.17. LTE Band 2; 20MHz Channel BW - Hotspot Mode – Power Back-Off Supported and Enabled**

**Max Reported SAR = 0.875 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	10	Front	18900	1880.0	1	99	18.0	17.4	0.423	0.486	-	98
	10	Front	18900	1880.0	50	25	18.0	17.4	0.413	0.474	-	99
	10	Back	18900	1880.0	1	99	18.0	17.4	0.419	0.481	-	100
	10	Back	18900	1880.0	50	25	18.0	17.4	0.398	0.457	-	101
	10	Left	18900	1880.0	1	99	18.0	17.4	0.069	0.079	-	102
	10	Left	18900	1880.0	50	25	18.0	17.4	0.063	0.073	-	103
	10	Right	18900	1880.0	1	99	18.0	17.4	0.023	0.026	-	104
	10	Right	18900	1880.0	50	25	18.0	17.4	0.022	0.025	-	105
	10	Bottom	18900	1880.0	1	99	18.0	17.4	0.657	0.754	-	106
	10	Bottom	18900	1880.0	50	25	18.0	17.4	0.598	0.687	-	107
	10	Bottom	18700	1860.0	1	99	18.0	17.4	0.634	0.728	-	108
	10	Bottom	19100	1900.0	1	99	18.0	17.3	0.745	0.875	-	109
	10	Bottom	18900	1880.0	100	0	18.0	17.5	0.628	0.705	-	110

**10.1.18. LTE Band 2; 20MHz Channel BW - Body-Worn - Power Back-Off Supported and Disabled**  
**Max Reported SAR = 0.940(W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	15	Front	19100	1900.0	1	99	24.2	23.4	0.767	0.922	-	111
	15	Front	18700	1860.0	1	99	24.2	23.4	0.710	0.854	-	112
	15	Front	18900	1880.0	1	99	24.2	23.4	0.764	0.919	-	113
	15	Front	18900	1880.0	50	25	23.2	22.5	0.560	0.658	-	114
	15	Front	18900	1880.0	100	0	23.2	22.5	0.699	0.821	-	115
	15	Back	19100	1900.0	1	99	24.2	23.4	0.773	0.929	-	116
	15	Back	18700	1860.0	1	99	24.2	23.4	0.729	0.876	-	117
	15	Back	18900	1880.0	1	99	24.2	23.4	0.782	0.940	-	118
	15	Back	18900	1880.0	50	25	23.2	22.5	0.579	0.680	-	119
	15	Back	18900	1880.0	100	0	23.2	22.5	0.655	0.770	-	120

**10.1.19. LTE Band 4; 20MHz Channel BW - Head - Power Back-Off Supported and Disabled**

**Max Reported SAR = 0.886 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	0	Touch Left	20175	1732.5	1	49	24.3	23.6	0.500	0.587	-	121
	0	Touch Left	20175	1732.5	50	25	23.3	22.7	0.412	0.473	-	122
	0	Tilt Left	20175	1732.5	1	49	24.3	23.6	0.366	0.430	-	123
	0	Tilt Left	20175	1732.5	50	25	23.3	22.7	0.283	0.325	-	124
	0	Touch Right	20175	1732.5	1	49	24.3	23.6	0.754	0.886	-	125
	0	Touch Right	20050	1720.0	1	49	23.3	23.5	0.661	0.795	-	126
	0	Touch Right	20300	1745.0	1	49	24.3	23.5	0.725	0.872	-	127
	0	Touch Right	20175	1732.5	50	25	23.3	22.7	0.610	0.700	-	128
	0	Touch Right	20175	1732.5	100	0	23.3	22.7	0.601	0.690	-	129
	0	Tilt Right	20175	1732.5	1	49	23.3	23.6	0.228	0.268	-	130
	0	Tilt Right	20175	1732.5	50	25	23.3	22.7	0.181	0.208	-	131

**10.1.20. LTE Band 4; 20MHz Channel BW - Hotspot Mode Power Back-Off Supported and Enabled**

**Max Reported SAR = 0.679 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	10	Front	20050	1720.0	1	0	22.0	21.0	0.480	0.604	-	132
	10	Front	20050	1720.0	50	0	22.0	21.0	0.486	0.612	-	133
	10	Back	20050	1720.0	1	0	22.0	21.0	0.443	0.558	-	134
	10	Back	20050	1720.0	50	0	22.0	21.0	0.448	0.564	-	135
	10	Left Hand Side	20050	1720.0	1	0	22.0	21.0	0.193	0.243	-	136
	10	Left Hand Side	20050	1720.0	50	0	22.0	21.0	0.192	0.242	-	137
	10	Right Hand Side	20050	1720.0	1	0	22.0	21.0	0.135	0.170	-	138
	10	Right Hand Side	20050	1720.0	50	0	22.0	21.0	0.135	0.170	-	139
	10	Bottom	20050	1720.0	1	0	22.0	21.0	0.349	0.439	-	140
	10	Bottom	20050	1720.0	50	0	22.0	21.0	0.368	0.463	-	141
	10	Front	20175	1732.5	50	0	22.0	20.9	0.501	0.645	-	142
	10	Front	20300	1745.0	50	0	22.0	20.9	0.527	0.679	-	143

**10.1.21. LTE Band 4; 20MHz Channel BW - Body-Worn - Power Back-Off Supported and Disabled**

**Max Reported SAR = 0.505 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	15	Front	20175	1732.5	1	49	24.3	23.6	0.398	0.468	-	144
	15	Front	20175	1732.5	50	25	23.3	22.7	0.329	0.378	-	145
	15	Back	20175	1732.5	1	49	24.3	23.6	0.343	0.403	-	146
	15	Back	20175	1732.5	50	25	23.3	22.7	0.282	0.324	-	147
	15	Front	20050	1720.0	1	49	24.3	23.5	0.398	0.479	-	148
	15	Front	20300	1745.0	1	49	24.3	23.5	0.420	0.505	-	149

**10.1.22. LTE Band 5; 10MHz Channel BW Head - Power Back-Off Not Supported**  
**Max Reported SAR = 0.328 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	0	Touch Left	20525	836.5	1	49	24.0	23.4	0.275	0.316	-	150
	0	Touch Left	20450	829.0	25	25	23.0	22.3	0.211	0.248	-	151
	0	Tilt Left	20525	836.5	1	49	24.0	23.4	0.145	0.166	-	152
	0	Tilt Left	20450	829.0	25	25	23.0	22.3	0.103	0.121	-	153
	0	Touch Right	20525	836.5	1	4	24.0	23.4	0.258	0.296	-	154
	0	Touch Right	20450	829.0	25	25	23.0	22.3	0.198	0.233	-	155
	0	Tilt Right	20525	836.5	1	49	24.0	23.4	0.127	0.146	-	156
	0	Tilt Right	20450	829.0	25	25	23.0	22.3	0.099	0.116	-	157
	0	Touch Left	20450	829.0	1	49	24.0	23.1	0.259	0.319	-	158
	0	Touch Left	20600	844.0	1	49	24.0	23.2	0.273	0.328	-	159

**10.1.23. LTE Band 5; 10MHz Channel BW - Hotspot Mode Power Back-Off Not Supported  
Max Reported SAR = 0.559 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	10	Front	20525	836.6	1	49	24.0	23.4	0.412	0.473	-	160
	10	Front	20450	829.0	25	25	23.0	22.3	0.315	0.370	-	161
	10	Back	20525	836.6	1	49	24.0	23.4	0.412	0.473	-	162
	10	Back	20450	829.0	25	25	23.0	22.3	0.327	0.384	-	163
	10	Left Hand Side	20525	836.6	1	49	24.0	23.4	0.340	0.390	-	164
	10	Left Hand Side	20450	829.0	25	25	23.0	22.3	0.248	0.291	-	165
	10	Right Hand Side	20525	836.6	1	49	24.0	23.4	0.431	0.495	-	166
	10	Right Hand Side	20450	829.0	25	25	23.0	22.3	0.266	0.313	-	167
	10	Bottom	20525	836.6	1	49	24.0	23.4	0.074	0.085	-	168
	10	Bottom	20450	829.0	25	25	23.0	22.3	0.055	0.065	-	169
	10	Right Hand Side	20450	829.0	1	49	24.0	23.1	0.387	0.476	-	170
	10	Right Hand Side	20600	844.0	1	49	24.0	23.2	0.465	0.559	-	171

**10.1.24. LTE Band 5; 10MHz Channel BW - Body-Worn - Power Back-Off Not Supported  
Max Reported SAR = 0.489 (W/kg)**

For body-worn configuration indicated below the test position overlap with hotspot and the power back –off was not supported meaning hotspot mode was most conservative.

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	10	Front	20525	836.6	1	49	24.0	23.4	0.412	0.473	-	160
	10	Front	20450	829.0	25	25	23.0	22.3	0.315	0.370	-	161
	10	Back	20525	836.6	1	49	24.0	23.4	0.412	0.473	-	162
	10	Back	20450	829.0	25	25	23.0	22.3	0.327	0.384	-	163
	10	Front	20450	829.0	1	49	24.0	23.1	0.393	0.483	-	172
	10	Front	20600	844.0	1	49	24.0	23.2	0.407	0.489	-	173

**10.1.25. LTE Band 7; 20MHz Channel BW Head - Power Back-Off Supported and Disabled  
Max Reported SAR = 0.488 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	0	Touch Left	20850	2510.0	1	0	24.5	23.3	0.330	0.435	-	174
	0	Touch Left	21100	2535.0	50	25	23.5	22.4	0.270	0.348	-	175
	0	Tilt Left	20850	2510.0	1	0	24.5	23.3	0.063	0.083	-	176
	0	Tilt Left	21100	2535.0	50	25	23.5	22.4	0.048	0.062	-	177
	0	Touch Right	20850	2510.0	1	0	24.5	23.3	0.123	0.162	-	178
	0	Touch Right	21100	2535.0	50	25	23.5	22.4	0.108	0.139	-	179
	0	Tilt Right	20850	2510.0	1	0	24.5	23.3	0.105	0.138	-	180
	0	Tilt Right	21100	2535.0	50	25	23.5	22.4	0.080	0.103	-	181
	0	Touch Left	21100	2535.0	1	0	24.5	23.2	0.345	0.465	-	182
	0	Touch Left	21350	2560.0	1	0	24.5	23.3	0.370	0.488	-	183

**10.1.26. LTE Band 7; 20MHz Channel BW - Hotspot Mode Power Back-Off Supported and Enabled**

**Max Reported SAR = 1.222 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	10	Front	21350	2560.0	1	99	24.0	23.4	0.869	0.998	-	184
	10	Front	20850	2510.0	1	99	24.0	23.3	0.840	0.987	-	185
	10	Front	21100	2535.0	1	99	24.0	23.3	0.971	1.141	-	186
	10	Front	21100	2535.0	50	50	23.0	22.4	0.689	0.791	-	187
	10	Front	21100	2535.0	100	0	23.0	22.3	0.680	0.799	-	188
	10	Back	21350	2560.0	1	99	24.0	23.4	1.030	1.183	-	189
	10	Back	20850	2510.0	1	99	24.0	23.3	0.979	1.150	-	190
	10	Back	21100	2535.0	1	99	24.0	23.3	1.040	1.222	1	191
	10	Back	21100	2535.0	50	50	23.0	22.4	0.834	0.958	-	192
	10	Back	20850	2510.0	50	50	23.0	22.1	0.778	0.957	-	193
	10	Back	21350	2560.0	50	50	23.0	22.3	0.770	0.905	-	194
	10	Back	21100	2535.0	100	0	23.0	22.3	0.781	0.918	-	195
	10	Left	21350	2560.0	1	99	24.0	23.4	0.317	0.364	-	196
	10	Left	21100	2535.0	50	50	23.0	22.4	0.263	0.302	-	197
	10	Right	21350	2560.0	1	99	24.0	23.4	0.131	0.150	-	198
	10	Right	21100	2535.0	50	50	23.0	22.4	0.097	0.111	-	199
	10	Bottom	21350	2560.0	1	99	24.0	23.4	0.669	0.768	-	200
	10	Bottom	20850	2510.0	1	99	24.0	23.3	0.659	0.774	-	201
	10	Bottom	21100	2535.0	1	99	24.0	23.3	0.659	0.774	-	202
	10	Bottom	21100	2535.0	50	50	23.0	22.4	0.547	0.628	-	203
10	Bottom	21100	2535.0	100	0	23.0	22.3	0.548	0.644	-	204	

**Note(s):**

- As per 865664 D01, the highest SAR measured > 0.8 W/kg has been re-measured and included in the report in section 9.3 under **SAR Measurement Variability and Measurement Uncertainty Analysis Results** Table.

**10.1.27. LTE Band 7; 20MHz Channel BW - Body-Worn - Power Back-Off Supported and Disabled**

**Max Reported SAR = 0.689 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	15	Front	21350	2560.0	1	0	24.5	23.3	0.483	0.637	-	205
	15	Front	20850	2510.0	50	0	23.5	22.4	0.342	0.441	-	206
	15	Back	21350	2560.0	1	0	24.5	23.3	0.523	0.689	-	207
	15	Back	20850	2510.0	50	0	23.5	22.4	0.357	0.460	-	208
	15	Back	20850	2510.0	1	0	24.5	23.3	0.478	0.630	-	209
	15	Back	21100	2535.0	1	0	24.5	23.2	0.501	0.676	-	210

**10.1.28. LTE Band 13; 10MHz Channel BW Head - Power Back-Off Not Supported**  
**Max Reported SAR = 0.254 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	0	Touch Left	23230	782.0	1	49	24.0	23.3	0.216	0.254	-	211
	0	Touch Left	23230	782.0	25	0	23.0	22.3	0.188	0.221	-	212
	0	Tilt Left	23230	782.0	1	49	24.0	23.3	0.147	0.173	-	213
	0	Tilt Left	23230	782.0	25	0	23.0	22.3	0.129	0.152	-	214
	0	Touch Right	23230	782.0	1	49	24.0	23.3	0.208	0.244	-	215
	0	Touch Right	23230	782.0	25	0	23.0	22.3	0.174	0.204	-	216
	0	Tilt Right	23230	782.0	1	49	24.0	23.3	0.137	0.161	-	217
	0	Tilt Right	23230	782.0	25	0	23.0	22.3	0.108	0.127	-	218

**10.1.29. LTE Band 13; 10MHz Channel BW - Hotspot Mode Power Back-Off Not Supported**  
**Max Reported SAR = 0.511 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	10	Front	23230	782.0	1	49	24.0	23.3	0.349	0.410	-	219
	10	Front	23230	782.0	25	0	23.0	22.3	0.285	0.335	-	220
	10	Back	23230	782.0	1	49	24.0	23.3	0.381	0.448	-	221
	10	Back	23230	782.0	25	0	23.0	22.3	0.313	0.368	-	222
	10	Left	23230	782.0	1	49	24.0	23.3	0.435	0.511	-	223
	10	Left	23230	782.0	25	0	23.0	22.3	0.305	0.358	-	224
	10	Right	23230	782.0	1	49	24.0	23.3	0.412	0.484	-	225
	10	Right	23230	782.0	25	0	23.0	22.3	0.284	0.334	-	226
	10	Bottom	23230	782.0	1	49	24.0	23.3	0.042	0.049	-	227
	10	Bottom	23230	782.0	25	0	23.0	22.3	0.033	0.039	-	228

### 10.1.30. LTE Band 13; 10MHz Channel BW - Body-Worn - Power Back-Off Not Supported Max Reported SAR = 0.448 (W/kg)

For body-worn configuration indicated below the test position overlap with hotspot and the power back –off was not supported meaning hotspot mode was most conservative.

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	10	Front	23230	782.0	1	49	24.0	23.3	0.349	0.410	-	219
	10	Front	23230	782.0	25	0	23.0	22.3	0.285	0.335	-	220
	10	Back	23230	782.0	1	49	24.0	23.3	0.381	0.448	-	221
	10	Back	23230	782.0	25	0	23.0	22.3	0.313	0.368	-	222

**10.1.31. LTE Band 17; 10MHz Channel BW Head - Power Back-Off Not Supported**  
**Max Reported SAR = 0.290 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	0	Touch Left	23780	709.0	1	24	24.0	23.0	0.216	0.272	-	229
	0	Touch Left	23800	711.0	25	25	23.0	22.0	0.180	0.227	-	230
	0	Tilt Left	23780	709.0	1	24	24.0	23.0	0.117	0.147	-	231
	0	Tilt Left	23800	711.0	25	25	23.0	22.0	0.103	0.130	-	232
	0	Touch Right	23780	709.0	1	24	24.0	23.0	0.200	0.252	-	233
	0	Touch Right	23800	711.0	25	25	23.0	22.0	0.149	0.188	-	234
	0	Tilt Right	23780	709.0	1	24	24.0	23.0	0.126	0.159	-	235
	0	Tilt Right	23800	711.0	25	25	23.0	22.0	0.096	0.121	-	236
	0	Touch Left	23790	710.0	1	24	24.0	22.7	0.215	0.290	-	237
	0	Touch Left	23800	711.0	1	24	24.0	22.8	0.217	0.286	-	238

**10.1.32. LTE Band 17; 10MHz Channel BW - Hotspot Mode Power Back-Off Not Supported**  
**Max Reported SAR = 0.463 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	10	Front	23780	709.0	1	24	24.0	23.0	0.299	0.376	-	239
	10	Front	23800	711.0	25	25	23.0	22.0	0.245	0.308	-	240
	10	Back	23780	709.0	1	24	24.0	23.0	0.342	0.431	-	241
	10	Back	23800	711.0	25	25	23.0	22.0	0.284	0.358	-	242
	10	Left	23780	709.0	1	24	24.0	23.0	0.270	0.340	-	243
	10	Left	23800	711.0	25	25	23.0	22.0	0.224	0.282	-	244
	10	Right	23780	709.0	1	24	24.0	23.0	0.228	0.287	-	245
	10	Right	23800	711.0	25	25	23.0	22.0	0.187	0.235	-	246
	10	Bottom	23780	709.0	1	24	24.0	23.0	0.058	0.073	-	247
	10	Bottom	23800	711.0	25	25	23.0	22.0	0.043	0.054	-	248
	10	Back	23790	710.0	1	24	24.0	22.7	0.343	0.463	-	249
	10	Back	23800	711.0	1	24	24.0	22.8	0.341	0.450	-	250

**10.1.33. LTE Band 17; 10MHz Channel BW - Body-Worn - Power Back-Off Not Supported  
Max Reported SAR = 0.463 (W/kg)**

For body-worn configuration indicated below the test position overlap with hotspot and the power back –off was not supported meaning hotspot mode was most conservative.

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
QPSK	10	Front	23780	709.0	1	24	24.0	23.0	0.299	0.376	-	239
	10	Front	23800	711.0	25	25	23.0	22.0	0.245	0.308	-	240
	10	Back	23780	709.0	1	24	24.0	23.0	0.342	0.431	-	241
	10	Back	23800	711.0	25	25	23.0	22.0	0.284	0.358	-	242
	10	Back	23790	710.0	1	24	24.0	22.7	0.343	0.463	-	243
	10	Back	23800	711.0	1	24	24.0	22.8	0.341	0.450	-	244

**10.1.34. Wi-Fi 2.4 GHz - Head - Power Back-Off Not Supported**  
**Max Reported SAR = 0.646 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
DBPSK (802.11g 6Mbps)	0	Touch Left	6	2436.0	N/A	N/A	13.5	13.0	0.213	0.239	-	251
	0	Tilt Left	6	2436.0	N/A	N/A	13.5	13.0	0.115	0.129	-	252
	0	Touch Right	6	2436.0	N/A	N/A	13.5	13.0	0.507	0.569	-	253
	0	Tilt Right	6	2436.0	N/A	N/A	13.5	13.0	0.199	0.223	-	254
	0	Touch Right	1	2412.0	N/A	N/A	13.5	12.8	0.550	0.646	-	255
	0	Touch Right	11	2462.0	N/A	N/A	13.5	13.0	0.438	0.491	-	256

**10.1.35. Wi-Fi 2.4 GHz - Hotspot Mode - Power Back-Off Not Supported**  
**Max Reported SAR = 0.088 (W/kg)**

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
DBPSK (802.11g 6Mbps)	10	Front	6	2436.0	N/A	N/A	13.5	13.0	0.078	0.088	-	257
	10	Back	6	2436.0	N/A	N/A	13.5	13.0	0.053	0.060	-	258
	10	Left Hand Side	6	2436.0	N/A	N/A	13.5	13.0	0.011	0.012	-	259
	10	Top	6	2436.0	N/A	N/A	13.5	13.0	0.003	0.003	-	260
	10	Front	1	2412.0	N/A	N/A	13.5	12.8	0.070	0.083	-	261
	10	Front	11	2462.0	N/A	N/A	13.5	13.0	0.071	0.080	-	262

**10.1.36. Wi-Fi 2.4 GHz - Body-Worn - Power Back-Off Not Supported**

**Max Reported SAR = 0.088 (W/kg)**

For body-worn configuration indicated below the test position overlap with hotspot and the power back –off was not supported meaning hotspot mode was most conservative.

Mode or Modulation	Dist (mm)	EUT Position	Channel No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune up limit	Meas.	Meas. Level (W/kg)	Reported SAR (W/kg)		
DBPSK (802.11g 6Mbps)	10	Front	6	2436.0	N/A	N/A	13.5	13.0	0.078	0.088	-	257
	10	Back	6	2436.0	N/A	N/A	13.5	13.0	0.053	0.060	-	258
	10	Front	1	2412.0	N/A	N/A	13.5	12.8	0.070	0.083	-	261
	10	Front	11	2462.0	N/A	N/A	13.5	13.0	0.071	0.080	-	262

**10.1.37. Wi-Fi 5.0 GHz - Head - Power Back-Off Not Supported**  
**Max Reported SAR =0.633(W/kg)**

Mode or Modulation	Dist (mm)	Test Position	Ch No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
BPSK (802.11a HT20 6Mbps)	0	Touch Left	48	5240.0	N/A	N/A	16.3	16.0	0.375	0.402	-	263
	0	Tilt Left	48	5240.0	N/A	N/A	16.3	16.0	0.201	0.215	-	264
	0	Touch Right	48	5240.0	N/A	N/A	16.3	16.0	0.539	0.578	-	265
	0	Tilt Right	48	5240.0	N/A	N/A	16.3	16.0	0.477	0.511	-	266
	0	Touch Right	64	5320.0	N/A	N/A	16.3	16.0	0.591	0.633	-	267
	0	Touch Right	100	5500.0	N/A	N/A	16.5	16.2	0.334	0.358	-	268
	0	Touch Right	161	5805.0	N/A	N/A	16.5	16.0	0.252	0.283	-	269
BPSK (802.11ac VHT40 13.5Mbps)	0	Touch Right	46	5230.0	N/A	N/A	14.3	13.9	0.548	0.601	-	270
	0	Touch Right	62	5310.0	N/A	N/A	14.3	14.0	0.572	0.613	-	271
	0	Touch Right	102	5510.0	N/A	N/A	14.7	14.2	0.248	0.278	-	272
	0	Touch Right	151	5755.0	N/A	N/A	14.7	14.0	0.245	0.288	-	273
BPSK (802.11ac VHT80 29.3Mbps)	0	Touch Right	42	5210.0	N/A	N/A	14.2	14.0	0.557	0.583	-	274
	0	Touch Right	58	5290.0	N/A	N/A	14.2	14.2	0.456	0.456	-	275
	0	Touch Right	106	5530.0	N/A	N/A	14.5	14.0	0.227	0.255	-	276
	0	Touch Right	155	5775.0	N/A	N/A	14.5	14.0	0.113	0.127	-	277

**10.1.38. Wi-Fi 5.0 GHz Hotspot Mode - Power Back-Off Not Supported**  
**Max Reported SAR = 0.273 (W/kg)**

Mode or Modulation	Dist (mm)	Test Position	Ch No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
BPSK (802.11a HT20 6Mbps)	10	Front	48	5240.0	N/A	N/A	16.3	16.0	0.074	0.079	-	278
	10	Back	48	5240.0	N/A	N/A	16.3	16.0	0.255	0.273	-	279
	10	Left Hand Side	48	5240.0	N/A	N/A	16.3	16.0	0.049	0.052	-	280
	10	Top	48	5240.0	N/A	N/A	16.3	16.0	0.053	0.057	-	281
	10	Back	64	5320.0	N/A	N/A	16.3	16.0	0.249	0.267	-	282
	10	Back	100	5500.0	N/A	N/A	16.5	16.2	0.082	0.088	-	283
	10	Back	161	5805.0	N/A	N/A	16.5	16.0	0.090	0.101	-	284
	10	Back	36	5180.0	N/A	N/A	16.3	15.9	0.217	0.238	-	285
BPSK (802.11ac VHT40 13.5Mbps)	10	Back	46	5230.0	N/A	N/A	14.3	13.9	0.145	0.159	-	286
	10	Back	62	5310.0	N/A	N/A	14.3	14.0	0.210	0.225	-	287
	10	Back	102	5510.0	N/A	N/A	14.7	14.2	0.048	0.054	-	288
	10	Back	151	5755.0	N/A	N/A	14.7	14.0	0.037	0.043	-	289
BPSK (802.11ac VHT80 29.3Mbps)	10	Back	42	5210.0	N/A	N/A	14.2	14.0	0.122	0.128	-	290
	10	Back	58	5290.0	N/A	N/A	14.2	14.2	0.180	0.180	-	291
	10	Back	106	5530.0	N/A	N/A	14.5	14.0	0.046	0.052	-	292
	10	Back	155	5775.0	N/A	N/A	14.5	14.0	0.060	0.067	-	293

**10.1.39. Wi-Fi 5.0 GHz - Body-Worn - Power Back-Off Not Supported**

**Max Reported SAR = 0.273 (W/kg)**

For body-worn configuration indicated below the test position overlap with hotspot and the power back –off was not supported meaning hotspot mode was most conservative.

Mode or Modulation	Dist (mm)	Test Position	Ch No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
BPSK (802.11a HT20 6Mbps)	10	Front	48	5240.0	N/A	N/A	16.3	16.0	0.074	0.079	-	278
	10	Back	48	5240.0	N/A	N/A	16.3	16.0	0.255	0.273	-	279
	10	Back	64	5320.0	N/A	N/A	16.3	16.0	0.249	0.267	-	282
	10	Back	100	5500.0	N/A	N/A	16.5	16.2	0.082	0.088	-	283
	10	Back	161	5805.0	N/A	N/A	16.5	16.0	0.090	0.101	-	284
	10	Back	36	5180.0	N/A	N/A	16.3	15.9	0.217	0.238	-	285
BPSK (802.11ac VHT40 13.5Mbps)	10	Back	46	5230.0	N/A	N/A	14.3	13.9	0.145	0.159	-	286
	10	Back	62	5310.0	N/A	N/A	14.3	14.0	0.210	0.225	-	287
	10	Back	102	5510.0	N/A	N/A	14.7	14.2	0.048	0.054	-	288
	10	Back	151	5755.0	N/A	N/A	14.7	14.0	0.037	0.043	-	289
BPSK (802.11ac VHT80 29.3Mbps)	10	Back	42	5210.0	N/A	N/A	14.2	14.0	0.122	0.128	-	290
	10	Back	58	5290.0	N/A	N/A	14.2	14.2	0.180	0.180	-	291
	10	Back	106	5530.0	N/A	N/A	14.5	14.0	0.046	0.052	-	292
	10	Back	155	5775.0	N/A	N/A	14.5	14.0	0.060	0.067	-	293

**10.1.40. Bluetooth – Hotspot Mode - Power Back-Off Not Supported**  
**Max Reported SAR = 0.022 (W/kg)**

Mode or Modulation	Dist (mm)	Test Position	Ch No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
GFSK (BR 1Mbps)	10	Front	39	2441.0	N/A	N/A	10.0	8.9	0.005	0.007	-	294
	10	Back	39	2441.0	N/A	N/A	10.0	8.9	0.003	0.004	-	295
	10	Left Hand Side	39	2441.0	N/A	N/A	10.0	8.9	0.000	0.000	-	-
	10	Top	39	2441.0	N/A	N/A	10.0	8.9	0.000	0.000	-	-
	10	Front	0	2402.0	N/A	N/A	7.9	5.9	0.014	0.022	-	296
	10	Front	78	2480.0	N/A	N/A	7.9	6.9	0.015	0.019	-	297

**10.1.41. Bluetooth - Body-Worn - Power Back-Off Not Supported**  
**Max Reported SAR = 0.022 (W/kg)**

For body-worn configuration indicated below the test position overlap with hotspot and the power back –off was not supported meaning hotspot mode was most conservative.

Mode or Modulation	Dist (mm)	Test Position	Ch No.	Freq (MHz)	For LTE Only		Power (dBm)		1g: SAR Results (W/kg)		Note(s)	Scan No.
					RB Allocation	RB Offset	Tune-up limit	Meas.	Meas.	Scaled		
GFSK (BR 1Mbps)	10	Front	39	2441.0	N/A	N/A	10.0	8.9	0.005	0.007	-	294
	10	Back	39	2441.0	N/A	N/A	10.0	8.9	0.003	0.004	-	295
	10	Front	0	2402.0	N/A	N/A	7.9	5.9	0.014	0.022	-	296
	10	Front	78	2480.0	N/A	N/A	7.9	6.9	0.015	0.019	-	297

## 11. SAR Measurement Variability

In accordance with published RF Exposure KDB procedure 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 ≥ 0.80 W/kg, repeat that measurement once.
- 3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
- 4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

### 11.1. Repeated Measurement Results

#### Body-worn Accessory Exposure Condition

Frequency band	Test Position	Mode	Ch #.	Freq. (MHz)	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio	Note
					Original	Repeated		
UMTS FDD 2	Front	QPSK	9538	1907.6	1.01	0.981	1.03	1

#### Hotspot Mode Exposure Conditions

Frequency band	Test Position	Mode	Ch #.	Freq. (MHz)	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio	Note
					Original	Repeated		
PCS1900	Bottom	GPRS 4Tx	810	1909.8	1.080	1.070	1.07	1
LTE Band 7	Back	QPSK	21100	2535.0	1.040	1.040	1.00	1

#### Note(s):

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

## **12. Simultaneous Transmission SAR Analysis**

KD 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:

$$\mathbf{SPLSR = (SAR_1 + SAR_2)^{1.5} / Ri}$$

Where:

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

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

**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:

$$\mathbf{[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]}$$

A new threshold of 0.04 is also introduced in the KDB 447498. Thus, in order for a pair of simultaneously 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:

$$\mathbf{(SAR_1 + SAR_2)^{1.5} / Ri < 0.04}$$

### 12.1. Simultaneous consideration for GSM + Wi-Fi + BT

#### 12.1.1. GSM 850 + 2.4 GHz / GSM 850 + BT

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			GSM850 ①	Wi-Fi (DTS) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.236	0.239		0.475	No
	Tilt Left	① + ②	0.133	0.129		0.262	No
	Touch Right	① + ②	0.276	0.646		0.922	No
	Tilt Right	① + ②	0.143	0.223		0.366	No
Body-worn Accessory & Hotspot	Front	① + ②	0.333	0.088		0.421	No
		① + ③	0.333		0.022	0.333	No
	Back	① + ②	0.385	0.060		0.445	No
		① + ③	0.385		0.004	0.389	No
Hotspot	Left	① + ②	0.261	0.012		0.273	No
	Right	① + ②	0.448	-		0.448	No
	Top	① + ②	-	0.003		0.003	No
	Bottom	① + ②	0.064	-		0.064	No

#### 12.1.2. GSM 850 + 5.0 GHz / GSM 850 + 5.0 GHz + BT

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			GSM850 ①	Wi-Fi (UNII) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.236	0.402		0.638	No
	Tilt Left	① + ②	0.133	0.215		0.348	No
	Touch Right	① + ②	0.276	0.633		0.909	No
	Tilt Right	① + ②	0.143	0.511		0.654	No
Body-worn Accessory & Hotspot	Front	① + ②	0.333	0.079		0.412	No
		① + ② + ③	0.333	0.079	0.022	0.434	No
	Back	① + ②	0.385	0.273		0.658	No
		① + ② + ③	0.385	0.273	0.004	0.662	No
Hotspot	Left	① + ②	0.261	0.052		0.313	No
	Right	① + ②	0.448	-		0.448	No
	Top	① + ②	-	0.057		0.057	No
	Bottom	① + ②	0.064	-		0.064	No

**Note:** Simultaneous transmission combinations for Bluetooth Hotspot mode (Left Hand Side and Top Configurations) were not considered since the SAR measured was 0W/kg.

**12.1.3. PCS 1900 + 2.4 GHz / PCS 1900 + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			PCS1900 ①	Wi-Fi (DTS) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.311	0.239		0.550	No
	Tilt Left	① + ②	0.128	0.129		0.257	No
	Touch Right	① + ②	0.447	0.646		1.093	No
	Tilt Right	① + ②	0.083	0.223		0.306	No
Body-worn Accessory & Hotspot	Front	① + ②	1.157	0.088		1.245	No
		① + ③	1.157		0.022	1.157	No
	Back	① + ②	1.136	0.060		1.196	No
		① + ③	1.136		0.004	1.140	No
Hotspot	Left	① + ②	0.088	0.012		0.100	No
	Right	① + ②	0.044	-		0.044	No
	Top	① + ②	-	0.003		0.003	No
	Bottom	① + ②	1.240	-		1.240	No

**12.1.4. PCS 1900 + 5.0 GHz / PCS 1900 + 5.0 GHz + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			PCS1900 ①	Wi-Fi (UNII) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.311	0.402		0.713	No
	Tilt Left	① + ②	0.128	0.215		0.343	No
	Touch Right	① + ②	0.447	0.633		1.080	No
	Tilt Right	① + ②	0.083	0.511		0.594	No
Body-worn Accessory & Hotspot	Front	① + ②	1.157	0.079		1.236	No
		① + ② + ③	1.157	0.079	0.022	1.258	No
	Back	① + ②	1.136	0.273		1.409	No
		① + ② + ③	1.136	0.273	0.004	1.413	No
Hotspot	Left	① + ②	0.088	0.052		0.140	No
	Right	① + ②	0.044	-		0.044	No
	Top	① + ②	-	0.057		0.057	No
	Bottom	① + ②	1.240	-		1.240	No

**Note:** Simultaneous transmission combinations for Bluetooth Hotspot mode (Left Hand Side and Top Configurations) were not considered since the SAR measured was 0W/kg.

**12.2. Simultaneous consideration for UMTS + Wi-Fi + BT**

**12.2.1. UMTS FDD 2 + 2.4 GHz / UMTS FDD 2 + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			UMTS FDD 2 ①	Wi-Fi (DTS) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.326	0.239		0.565	No
	Tilt Left	① + ②	0.152	0.129		0.281	No
	Touch Right	① + ②	0.437	0.646		1.083	No
	Tilt Right	① + ②	0.079	0.223		0.302	No
Body-worn Accessory & Hotspot	Front	① + ②	1.133	0.088		1.221	No
		① + ③	1.133		0.022	1.155	No
	Back	① + ②	1.041	0.060		1.101	No
		① + ③	1.041		0.004	1.045	No
Hotspot	Left	① + ②	0.071	0.012		0.083	No
	Right	① + ②	0.040	-		0.040	No
	Top	① + ②	-	0.003		0.003	No
	Bottom	① + ②	0.929	-		0.929	No

**12.2.2. UMTS FDD 2 + 5.0 GHz / UMTS FDD 2 + 5.0 GHz + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			UMTS FDD 2 ①	Wi-Fi (UNII) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.326	0.402		0.728	No
	Tilt Left	① + ②	0.152	0.215		0.367	No
	Touch Right	① + ②	0.437	0.633		1.070	No
	Tilt Right	① + ②	0.079	0.511		0.590	No
Body-worn Accessory & Hotspot	Front	① + ②	1.133	0.079		1.212	No
		① + ② + ③	1.133	0.079	0.022	1.234	No
	Back	① + ②	1.041	0.273		1.314	No
		① + ② + ③	1.041	0.273	0.004	1.318	No
Hotspot	Left	① + ②	0.071	0.052		0.123	No
	Right	① + ②	0.040	-		0.040	No
	Top	① + ②	-	0.057		0.057	No
	Bottom	① + ②	0.929	-		0.929	No

**Note:** Simultaneous transmission combinations for Bluetooth Hotspot mode (Left Hand Side and Top Configurations) were not considered since the SAR measured was 0W/kg.

**12.2.3. UMTS FDD 4 + 2.4 GHz / UMTS FDD 4 + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			UMTS FDD 4 ①	Wi-Fi (DTS) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.555	0.239		0.794	No
	Tilt Left	① + ②	0.389	0.129		0.518	No
	Touch Right	① + ②	0.839	0.646		1.485	No
	Tilt Right	① + ②	0.252	0.223		0.475	No
Body-worn Accessory & Hotspot	Front	① + ②	0.736	0.088		0.824	No
		① + ③	0.736		0.022	0.758	No
	Back	① + ②	0.729	0.060		0.789	No
		① + ③	0.729		0.004	0.733	No
Hotspot	Left	① + ②	0.346	0.012		0.358	No
	Right	① + ②	0.284	-		0.284	No
	Top	① + ②	-	0.003		0.003	No
	Bottom	① + ②	0.771	-		0.771	No

**12.2.4. UMTS FDD 4 + 5.0 GHz / UMTS FDD 4 + 5.0 GHz + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			UMTS FDD 4 ①	Wi-Fi (UNII) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.555	0.402		0.957	No
	Tilt Left	① + ②	0.389	0.215		0.604	No
	Touch Right	① + ②	0.839	0.633		1.472	No
	Tilt Right	① + ②	0.732	0.511		1.243	No
Body-worn Accessory & Hotspot	Front	① + ②	0.736	0.079		0.815	No
		① + ② + ③	0.736	0.079	0.022	0.837	No
	Back	① + ②	0.729	0.273		1.002	No
		① + ② + ③	0.729	0.273	0.004	1.006	No
Hotspot	Left	① + ②	0.346	0.052		0.398	No
	Right	① + ②	0.284	-		0.284	No
	Top	① + ②	-	0.057		0.057	No
	Bottom	① + ②	0.771	-		0.771	No

**Note:** Simultaneous transmission combinations for Bluetooth Hotspot mode (Left Hand Side and Top Configurations) were not considered since the SAR measured was 0W/kg.

**12.2.5. UMTS FDD 5 + 2.4 GHz / UMTS FDD 5 + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			UMTS FDD 5 ①	Wi-Fi (DTS) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.362	0.239		0.601	No
	Tilt Left	① + ②	0.204	0.129		0.333	No
	Touch Right	① + ②	0.367	0.646		1.013	No
	Tilt Right	① + ②	0.200	0.223		0.423	No
Body-worn Accessory & Hotspot	Front	① + ②	0.523	0.088		0.611	No
		① + ③	0.523		0.022	0.545	No
	Back	① + ②	0.582	0.060		0.642	No
		① + ③	0.582		0.004	0.586	No
Hotspot	Left	① + ②	0.427	0.012		0.439	No
	Right	① + ②	0.577	-		0.577	No
	Top	① + ②	-	0.003		0.003	No
	Bottom	① + ②	0.112	-		0.112	No

**12.2.6. UMTS FDD 5 + 5.0 GHz / UMTS FDD 5 + 5.0 GHz + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			UMTS FDD 5 ①	Wi-Fi (UNII) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.362	0.402		0.764	No
	Tilt Left	① + ②	0.204	0.215		0.419	No
	Touch Right	① + ②	0.367	0.633		1.000	No
	Tilt Right	① + ②	0.200	0.511		0.711	No
Body-worn Accessory & Hotspot	Front	① + ②	0.523	0.079		0.602	No
		① + ② + ③	0.523	0.079	0.022	0.624	No
	Back	① + ②	0.582	0.273		0.855	No
		① + ② + ③	0.582	0.273	0.004	0.859	No
Hotspot	Left	① + ②	0.427	0.052		0.479	No
	Right	① + ②	0.577	-		0.577	No
	Top	① + ②	-	0.057		0.057	No
	Bottom	① + ②	0.112	-		0.112	No

**Note:** Simultaneous transmission combinations for Bluetooth Hotspot mode (Left Hand Side and Top Configurations) were not considered since the SAR measured was 0W/kg.

### 12.3. Simultaneous consideration for LTE + Wi-Fi + BT

#### 12.3.1. LTE Band 2 + 2.4 GHz / LTE Band 2 + BT

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			LTE 2 ①	Wi-Fi (DTS) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.210	0.239		0.449	No
	Tilt Left	① + ②	0.086	0.129		0.215	No
	Touch Right	① + ②	0.280	0.646		0.926	No
	Tilt Right	① + ②	0.068	0.223		0.291	No
Body-worn Accessory & Hotspot	Front	① + ②	0.922	0.088		1.010	No
		① + ③	0.922		0.022	0.944	No
	Back	① + ②	0.940	0.060		1.000	No
		① + ③	0.940		0.004	0.944	No
Hotspot	Left	① + ②	0.079	0.012		0.091	No
	Right	① + ②	0.026	-		0.026	No
	Top	① + ②	-	0.003		0.003	No
	Bottom	① + ②	0.875	-		0.875	No

#### 12.3.2. LTE Band 2 + 5.0 GHz / LTE Band 2 + 5.0 GHz + BT

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			LTE 2 ①	Wi-Fi (UNII) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.210	0.402		0.612	No
	Tilt Left	① + ②	0.086	0.215		0.301	No
	Touch Right	① + ②	0.280	0.633		0.913	No
	Tilt Right	① + ②	0.068	0.511		0.579	No
Body-worn Accessory & Hotspot	Front	① + ②	0.922	0.079		1.001	No
		① + ② + ③	0.922	0.079	0.022	1.023	No
	Back	① + ②	0.940	0.273		1.213	No
		① + ② + ③	0.940	0.273	0.004	1.217	No
Hotspot	Left	① + ②	0.079	0.052		0.131	No
	Right	① + ②	0.026	-		0.026	No
	Top	① + ②	-	0.057		0.057	No
	Bottom	① + ②	0.875	-		0.875	No

**Note:** Simultaneous transmission combinations for Bluetooth Hotspot mode (Left Hand Side and Top Configurations) were not considered since the SAR measured was 0W/kg.

**12.3.3. LTE Band 4 + 2.4 GHz / LTE Band 4 + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			LTE 4 ①	Wi-Fi (DTS) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.587	0.239		0.826	No
	Tilt Left	① + ②	0.430	0.129		0.559	No
	Touch Right	① + ②	0.886	0.646		1.532	No
	Tilt Right	① + ②	0.268	0.223		0.491	No
Body-worn Accessory & Hotspot	Front	① + ②	0.679	0.088		0.767	No
		① + ③	0.679		0.022	0.701	No
	Back	① + ②	0.403	0.060		0.463	No
		① + ③	0.403		0.004	0.407	No
Hotspot	Left	① + ②	0.243	0.012		0.255	No
	Right	① + ②	0.170	-		0.170	No
	Top	① + ②	-	0.003		0.003	No
	Bottom	① + ②	0.463	-		0.463	No

**12.3.4. LTE Band 4 + 5.0 GHz / LTE Band 4 + 5.0 GHz + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			LTE 4 ①	Wi-Fi (UNII) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.587	0.402		0.989	No
	Tilt Left	① + ②	0.430	0.215		0.645	No
	Touch Right	① + ②	0.886	0.633		1.519	No
	Tilt Right	① + ②	0.268	0.511		0.779	No
Body-worn Accessory & Hotspot	Front	① + ②	0.679	0.079		0.758	No
		① + ② + ③	0.679	0.079	0.022	0.780	No
	Back	① + ②	0.403	0.273		0.676	No
		① + ② + ③	0.403	0.273	0.004	0.680	No
Hotspot	Left	① + ②	0.243	0.052		0.295	No
	Right	① + ②	0.170	-		0.170	No
	Top	① + ②	-	0.057		0.057	No
	Bottom	① + ②	0.463	-		0.463	No

**Note:** Simultaneous transmission combinations for Bluetooth Hotspot mode (Left Hand Side and Top Configurations) were not considered since the SAR measured was 0W/kg.

**12.3.5. LTE Band 5 + 2.4 GHz / LTE Band 5 + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			LTE 5 ①	Wi-Fi (DTS) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.328	0.239		0.567	No
	Tilt Left	① + ②	0.121	0.129		0.250	No
	Touch Right	① + ②	0.296	0.646		0.942	No
	Tilt Right	① + ②	0.146	0.223		0.369	No
Body-worn Accessory & Hotspot	Front	① + ②	0.489	0.088		0.577	No
		① + ③	0.489		0.022	0.511	No
	Back	① + ②	0.473	0.060		0.533	No
		① + ③	0.473		0.004	0.477	No
Hotspot	Left	① + ②	0.390	0.012		0.402	No
	Right	① + ②	0.559	-		0.559	No
	Top	① + ②	-	0.003		0.003	No
	Bottom	① + ②	0.085	-		0.085	No

**12.3.6. LTE Band 5 + 5.0 GHz / LTE Band 5 + 5.0 GHz + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			LTE 5 ①	Wi-Fi (UNII) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.328	0.402		0.730	No
	Tilt Left	① + ②	0.121	0.215		0.336	No
	Touch Right	① + ②	0.296	0.633		0.929	No
	Tilt Right	① + ②	0.146	0.511		0.657	No
Body-worn Accessory & Hotspot	Front	① + ②	0.489	0.079		0.568	No
		① + ② + ③	0.489	0.079	0.022	0.590	No
	Back	① + ②	0.473	0.273		0.746	No
		① + ② + ③	0.473	0.273	0.004	0.750	No
Hotspot	Left	① + ②	0.390	0.052		0.442	No
	Right	① + ②	0.559	-		0.559	No
	Top	① + ②	-	0.057		0.057	No
	Bottom	① + ②	0.085	-		0.085	No

**Note:** Simultaneous transmission combinations for Bluetooth Hotspot mode (Left Hand Side and Top Configurations) were not considered since the SAR measured was 0W/kg.

**12.3.7. LTE Band 7 + 2.4 GHz / LTE Band 7 + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			LTE 7 ①	Wi-Fi (DTS) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.488	0.239		0.727	No
	Tilt Left	① + ②	0.083	0.129		0.212	No
	Touch Right	① + ②	0.162	0.646		0.808	No
	Tilt Right	① + ②	0.138	0.223		0.361	No
Body-worn Accessory & Hotspot	Front	① + ②	0.998	0.088		1.086	No
		① + ③	0.998		0.022	1.020	No
	Back	① + ②	1.222	0.060		1.282	No
		① + ③	1.222		0.004	1.226	No
Hotspot	Left	① + ②	0.364	0.012		0.376	No
	Right	① + ②	0.150	-		0.150	No
	Top	① + ②	-	0.003		0.003	No
	Bottom	① + ②	0.803	-		0.803	No

**12.3.8. LTE Band 7 + 5.0 GHz / LTE Band 7 + 5.0 GHz + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			LTE 7 ①	Wi-Fi (UNII) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.488	0.402		0.890	No
	Tilt Left	① + ②	0.083	0.215		0.298	No
	Touch Right	① + ②	0.162	0.633		0.795	No
	Tilt Right	① + ②	0.138	0.511		0.649	No
Body-worn Accessory & Hotspot	Front	① + ②	0.998	0.079		1.077	No
		① + ② + ③	0.998	0.079	0.022	1.099	No
	Back	① + ②	1.222	0.273		1.495	No
		① + ② + ③	1.222	0.273	0.004	1.499	No
Hotspot	Left	① + ②	0.364	0.052		0.416	No
	Right	① + ②	0.150	-		0.150	No
	Top	① + ②	-	0.057		0.057	No
	Bottom	① + ②	0.768	-		0.768	No

**Note:** Simultaneous transmission combinations for Bluetooth Hotspot mode (Left Hand Side and Top Configurations) were not considered since the SAR measured was 0W/kg.

**12.3.9. LTE Band 13 + 2.4 GHz / LTE Band 13 + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			LTE 13 ①	Wi-Fi (DTS) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.254	0.239		0.493	No
	Tilt Left	① + ②	0.173	0.129		0.302	No
	Touch Right	① + ②	0.244	0.646		0.890	No
	Tilt Right	① + ②	0.161	0.223		0.384	No
Body-worn Accessory & Hotspot	Front	① + ②	0.410	0.088		0.498	No
		① + ③	0.410		0.022	0.432	No
	Back	① + ②	0.448	0.060		0.508	No
		① + ③	0.448		0.004	0.452	No
Hotspot	Left	① + ②	0.511	0.012		0.523	No
	Right	① + ②	0.484	-		0.484	No
	Top	① + ②	-	0.003		0.003	No
	Bottom	① + ②	0.049	-		0.049	No

**12.3.10. LTE Band 13 + 5.0 GHz / LTE Band 13 + 5.0 GHz + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			LTE 13 ①	Wi-Fi (UNII) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.254	0.402		0.656	No
	Tilt Left	① + ②	0.173	0.215		0.388	No
	Touch Right	① + ②	0.244	0.633		0.877	No
	Tilt Right	① + ②	0.161	0.511		0.672	No
Body-worn Accessory & Hotspot	Front	① + ②	0.410	0.079		0.489	No
		① + ② + ③	0.410	0.079	0.022	0.511	No
	Back	① + ②	0.448	0.273		0.721	No
		① + ② + ③	0.448	0.273	0.004	0.725	No
Hotspot	Left	① + ②	0.511	0.052		0.563	No
	Right	① + ②	0.484	-		0.484	No
	Top	① + ②	-	0.057		0.057	No
	Bottom	① + ②	0.049	-		0.049	No

**Note:** Simultaneous transmission combinations for Bluetooth Hotspot mode (Left Hand Side and Top Configurations) were not considered since the SAR measured was 0W/kg.

**12.3.11. LTE Band 17 + 2.4 GHz / LTE Band 17 + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			LTE 17 ①	Wi-Fi (DTS) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.290	0.239		0.529	No
	Tilt Left	① + ②	0.147	0.129		0.276	No
	Touch Right	① + ②	0.252	0.646		0.898	No
	Tilt Right	① + ②	0.159	0.223		0.382	No
Body-worn Accessory & Hotspot	Front	① + ②	0.376	0.088		0.464	No
		① + ③	0.376		0.022	0.398	No
	Back	① + ②	0.431	0.060		0.491	No
		① + ③	0.431		0.004	0.435	No
Hotspot	Left	① + ②	0.340	0.012		0.352	No
	Right	① + ②	0.287	-		0.287	No
	Top	① + ②	-	0.003		0.003	No
	Bottom	① + ②	0.073	-		0.073	No

**12.3.12. LTE Band 17 + 5.0 GHz / LTE Band 17 + 5.0 GHz + BT**

RF Exposure Conditions	EUT Position		Simultaneous Transmission Condition				
			LTE 17 ①	Wi-Fi (UNII) ②	Bluetooth ③	Σ 1g SAR (W/kg)	SPLSR (Yes/ No)
Head	Touch Left	① + ②	0.290	0.402		0.692	No
	Tilt Left	① + ②	0.147	0.215		0.362	No
	Touch Right	① + ②	0.252	0.633		0.885	No
	Tilt Right	① + ②	0.159	0.511		0.670	No
Body-worn Accessory & Hotspot	Front	① + ②	0.376	0.079		0.455	No
		① + ② + ③	0.376	0.079	0.022	0.477	No
	Back	① + ②	0.431	0.273		0.704	No
		① + ② + ③	0.431	0.273	0.004	0.708	No
Hotspot	Left	① + ②	0.340	0.052		0.392	No
	Right	① + ②	0.287	-		0.287	No
	Top	① + ②	-	0.057		0.057	No
	Bottom	① + ②	0.073	-		0.073	No

**Note:** Simultaneous transmission combinations for Bluetooth Hotspot mode (Left Hand Side and Top Configurations) were not considered since the SAR measured was 0W/kg.