



**FCC 47 CFR Parts 1 & 2
Published RF Exposure KDB Procedures
IEEE Standard 1528-2013**

SAR EVALUATION REPORT

For
CDMA/LTE Phone with Bluetooth & WLAN (2.4GHz/5GHz) and NFC
Model: LG-VS876, VS876, LGVS876, LG-AS876, AS876, and LGAS876
FCC ID: ZNFVS876

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A	01/22/2014	Made the following modifications: 1. Sec. 12.4. - 12.5.: Updated tables to clarify Wi-Fi Direct SAR 2. Sec 14.1. - 14.5.2: Updated tables to clarify, and justify, Wi-Fi Direct SAR. Also added tables to differentiate between 2.4 GHz and 5.8 GHz DTS	Nathan Sousa
B	01/28/2014	Made the following modification: 1. Sec. 7.2.: Updated table 2. Sec. 9.5.: Added HT40 output power measurements	Kenneth Mak

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1. Attestation of Test Results

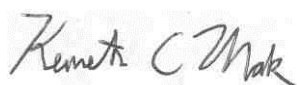
Applicant	LG ELECTRONICS MOBILECOMM U.S.A., INC.			
DUT description	CDMA/LTE Phone with Bluetooth & WLAN (2.4 / 5GHz) and NFC			
Model	LG-VS876, VS876, LGVS876, LG-AS876, AS876, and LGAS876			
Test device is	An identical prototype			
Device category	Portable			
Exposure category	General Population/Uncontrolled Exposure			
Date tested	12/10/2013 – 12/20/2013			
The highest reported SAR values	RF exposure conditions	Licensed	DTS	UNII
	Head	0.780 W/kg	0.248 W/kg (2.4 GHz) 0.261 W/kg (5.8 GHz)	0.264 W/kg
	Body-worn Accessory	1.090 W/kg	0.102 W/kg (2.4 GHz) 0.104 W/kg (5.8 GHz)	0.105 W/kg
	Wireless Router (Hotspot)	1.090 W/kg	0.102 W/kg (2.4 GHz)	N/A
	Wi-Fi Direct	N/A	0.102 W/kg (2.4 GHz) 0.129 W/kg (5.8 GHz)	N/A
	Simultaneous Transmission	1.499 W/kg	1.499 W/kg	1.500 W/kg
Applicable Standards	FCC 47 CFR Parts 1 & 2 Published RF Exposure KDB Procedures, and TCB workshop updates IEEE Std 1528-2013			
Test Results	Pass			

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

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

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2. Test Methodology

The tests documented in this report were performed in accordance with FCC 47 CFR Parts 1 & 2, IEEE STD 1528-2013, the following FCC Published RF exposure KDB procedures, and TCB workshop updates:

- 447498 D01 General RF Exposure Guidance v05r01
- 648474 D04 Handset SAR v01r01
- 941225 D01 SAR test for 3G devices v02
- 941225 D02 HSPA and 1x Advanced v02r02
- 941225 D05 SAR for LTE Devices v02r02
- 941225 D06 Hot Spot SAR v01r01
- 248227 D01 SAR Meas for 802 11abg v01r02
- 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01
- 865664 D02 SAR Reporting v01r01
- 690783 D01 SAR Listings on Grants v01r03

3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at 47173 & 47266 Benicia Street, Fremont, California, USA.

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

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

4. Calibration and Uncertainty

4.1. Measuring Instrument Calibration

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

Tissue Dielectric Properties

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	Agilent	8753ES	MY40000980	2/20/2014
Dielectric Probe kit	SPEAG	DAK-3.5	1082	9/10/2014
Dielectric Probe kit	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	Control Company	4242	122529162	9/19/2014

System Performance Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Synthesized Signal Generator	Agilent	8665B	3438A00633	6/13/2014
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1808939	N/A
Directional coupler	Werlatone	C8060-102	2710	N/A
DC Power Supply	Sorensen Ametek	XT15-4	1319A02778	N/A
Power Meter	HP	438A	2822A05684	10/10/2014
Power Sensor	Agilent	8481A	2237A31744	10/2/2014
Power Sensor	Agilent	8481A	2349A36506	9/30/2014
Synthesized Signal Generator	HP	8665B	3546A00784	3/26/2014
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1795093	N/A
Bidirectional coupler	Werlatone	C8060-102	2711	N/A
DC Power Supply	Sorensen Ametek	XT20-3	1318A00529	N/A
Power Meter	Agilent	N1912A (P-Series)	MY50001018	8/23/2014
Power Sensor	Agilent	E9323A	MY53070009	4/3/2014
Power Sensor	Agilent	E9323A	US40411556	8/9/2014
E-Field Probe	SPEAG	EX3DV4	3749	1/15/2014
Data Acquisition Electronics	SPEAG	DAE4	1239	4/9/2014
E-Field Probe	SPEAG	EX3DV4	3772	2/20/2014
Data Acquisition Electronics	SPEAG	DAE3	472	1/9/2014
E-Field Probe	SPEAG	EX3DV4	3686	3/11/2014
Data Acquisition Electronics	SPEAG	DAE4	1360	2/7/2014
E-Field Probe	SPEAG	EX3DV4	3885	9/18/2014
Data Acquisition Electronics	SPEAG	DAE4	1343	7/24/2014
System Validation Dipole	SPEAG	D750V2	1071	11/15/2014
System Validation Dipole	SPEAG	D835V2	4d002	11/15/2014
System Validation Dipole	SPEAG	D1900V2	5d043	11/12/2014
System Validation Dipole	SPEAG	D1750V2	1077	9/12/2014
System Validation Dipole	SPEAG	D2450V2	748	2/11/2014
System Validation Dipole	SPEAG	D5GHzV2	1138	11/19/2014

Others

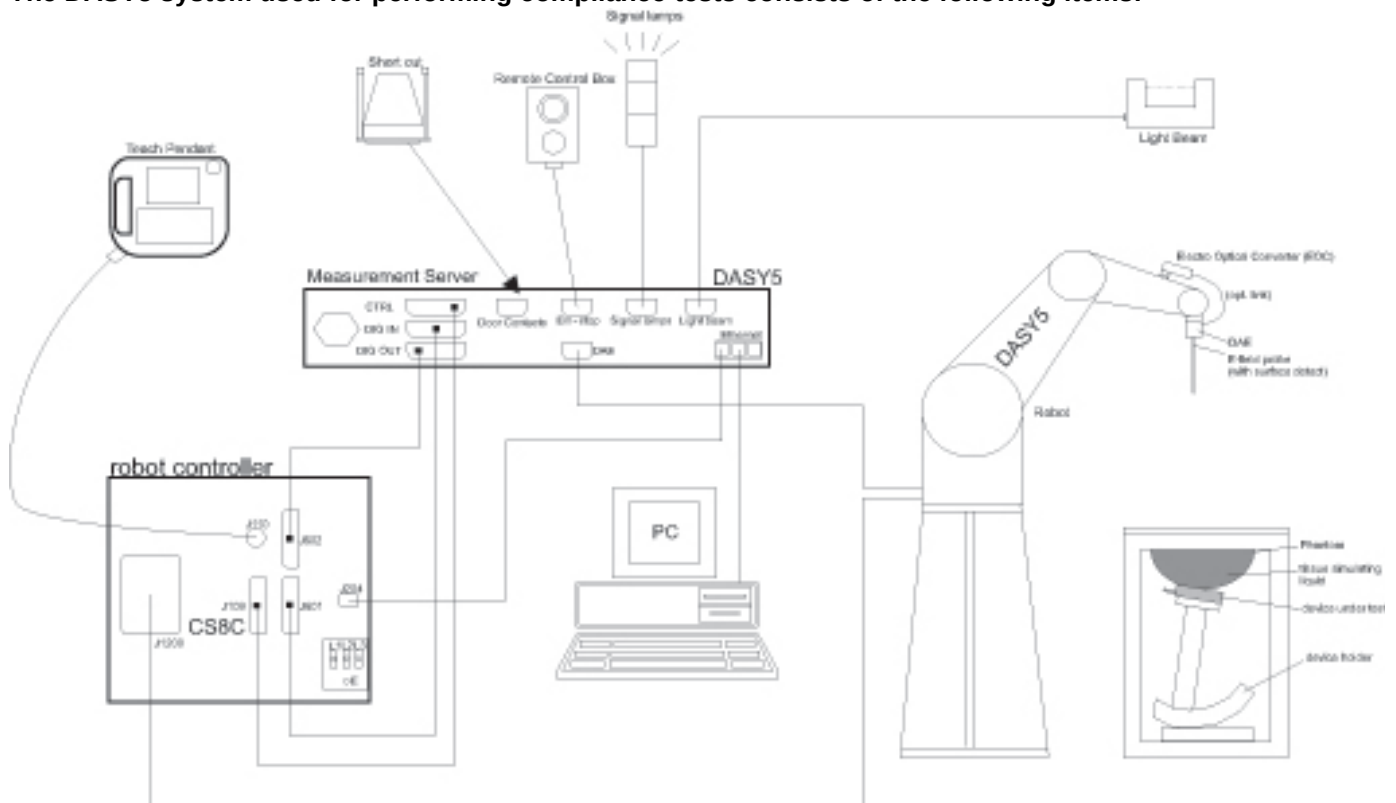
Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Power Meter	Agilent	N1912A	MY53040016	4/4/2014
Power Sensor	Agilent	N1921A	MY52020011	5/13/2014
Base Station Simulator	R & S	CMW500	132909	2/20/2014

4.2. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01 Section 2.8.1., when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

5. Measurement System Description and Setup

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



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An Isotropic Field probe optimized and calibrated for the targeted measurement.
- A Data Acquisition Electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-Optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Windows XP/7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

6. SAR Measurement Procedure

6.1. Normal SAR Measurement Procedure

Step 1: Power Reference Measurement

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

Step 2: Area Scan

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

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

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

Step 3: Zoom Scan

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

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

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{\text{Zoom}}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.				
* When zoom scan is required and the <i>reported</i> SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

Step 4: Power drift measurement

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

Step 5: Z-Scan (FCC only)

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

6.2. Volume Scan Procedures

Step 1: Repeat Step 1-4 in Section 6.1

Step 2: Volume Scan

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

Step 3: Power drift measurement

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

7. Device Under Test

7.1. General Information

Operating Configuration(s)	Held to head, Body-worn (Voice call)
Mobile Hotspot	Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices. ☒ Mobile Hotspot (Wi-Fi 2.4 GHz) ☐ Mobile Hotspot (Wi-Fi 5 GHz)
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other ☒ Wi-Fi Direct (Wi-Fi 2.4 GHz) ☒ Wi-Fi Direct (Wi-Fi 5.8 GHz)
VoIP	☒ Supported
Device dimensions	Overall (Length x Width): 131.6 mm x 66 mm Overall Diagonal: 138.9 mm Display Diagonal: 118.9 mm
Back Cover	☐ Normal Battery Cover ☐ Wireless Charger Battery Cover ☒ Normal Battery Cover with NFC
Accessory	☒ Headset
Battery Options	☒ Standard – Lithium-ion battery, Rating 3.8 Vdc, 3000 mAh ☐ Extended (large capacity)

7.2. Wireless Technologies

Wireless Technology and Frequency Bands	CDMA BC 0 / 1 LTE Band 4 / 13 (FDD) Wi-Fi: 2.4 GHz and 5 GHz Bluetooth: 2.4 GHz.
Mode	CDMA2000 - ☒ 1xRTT (Voice & Data) - ☐ 1xAdvanced - ☒ 1xEVDO Rel. 0 - ☒ 1xEVDO Rev. A - ☐ 1xEVDO Rev. B LTE: - ☒ QPSK - ☒ 16QAM Wi-Fi 2.4GHz (802.11b/g/n/ac) - ☒ 802.11b - ☒ 802.11g - ☒ 802.11n (20MHz) - ☐ 802.11n (40MHz) - ☐ 802.11ac Wi-Fi 5GHz (802.11a/n/ac) - ☒ 802.11b - ☒ 802.11g - ☒ 802.11n (20MHz) - ☒ 802.11n (40MHz) - ☐ 802.11ac Bluetooth Ver. 4.0 (LE)
Duty Cycle (Used for SAR testing)	CDMA: 100% LTE (FDD): 100% Wi-Fi 802.11a/b/g/n: 100%
SV-LTE	☒ Supported

7.3. RF Output Power Tune-up Tolerance

Upper limit (dB): 0.5		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
CDMA BC0	1xRTT	24.5	25.0
	1xEVDO Rel. 0	24.5	25.0
	1xEVDO Rev. A	24.5	25.0
CDMA BC1	1xRTT	24.5	25.0
	1xEVDO Rel. 0	24.5	25.0
	1xEVDO Rev. A	24.5	25.0
Upper limit (dB): 0.5		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
LTE Band 4	QPSK	23.5	24.0
LTE Band 13	QPSK	23.7	24.2
Upper limit (dB): 0.5		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
WiFi 2.4 GHz	802.11b	14.8	15.3
	802.11g	10.8	11.3
	802.11n HT20	9.9	10.4
Upper limit (dB): 0.5		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
WiFi 5 GHz	802.11a	12.6	13.1
	802.11n HT20	11.8	12.3
Upper limit (dB): 0.5		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
Bluetooth		8.8	9.3

7.4. Simultaneous Transmission Condition

RF Exposure Condition	Capable Transmit Configurations
Head	1. CDMA 1xRTT BC0 / BC1 + Wi-Fi 2.4 / 5 GHz 2. CDMA 1xEVDO BC0 / BC1 + Wi-Fi 2.4 / 5 GHz (VoIP) 3. LTE Band 4 / 13 + Wi-Fi 2.4 / 5 GHz 4. CDMA 1x BC0 / BC1 + LTE B4 / B13 + Wi-Fi 2.4 / 5 GHz (SV-LTE + Wi-Fi)
Body-worn Accessory	1. CDMA 1xRTT BC0 / BC1 + Wi-Fi 2.4 / 5 GHz 2. CDMA 1xRTT BC0 / BC1 + BT 3. CDMA 1xEVDO BC0 / BC1 + Wi-Fi 2.4 / 5 GHz (VoIP) 4. CDMA 1xEVDO BC0 / BC1 + BT 5. LTE Band 4 / 13 + Wi-Fi 2.4 / 5 GHz 6. LTE Band 4 / 13 + BT 7. CDMA 1x BC0 / BC1 + LTE B4 / B13 + Wi-Fi 2.4 / 5 GHz (SV-LTE + Wi-Fi) 8. CDMA 1x BC0 / BC1 + LTE B4 / B13 + BT (SV-LTE + BT)
Wireless Router (Hotspot)	1. CDMA 1xEVDO BC0 / BC1 + Wi-Fi 2.4 / 5 GHz 2. LTE Band 4 / 13 + Wi-Fi 2.4 / 5 GHz 3. CDMA 1x BC0 / BC1 + LTE B4 / B13 + Wi-Fi 2.4 / 5 GHz (SV-LTE + Wi-Fi)
Wi-Fi Direct	1. CDMA 1xEVDO BC0 / BC1 + Wi-Fi 2.4 / 5.8 GHz (GO / GC) 2. LTE Band 4 / 13 + Wi-Fi 2.4 / 5.8 GHz (GO / GC) 3. CDMA 1x BC0 / BC1 + LTE B4 / B13 + Wi-Fi 2.4 / 5.8 GHz (SV-LTE + Wi-Fi) (GO / GC)
Note: 1. CDMA, LTE, and Wi-Fi 2.4 GHz support Hotspot. 2. CDMA and LTE support VoIP. 3. Wi-Fi 2.4 GHz also supports Wi-Fi Direct 4. Wi-Fi 5 GHz does not support Hotspot, but does support Wi-Fi Direct: - UNII I (5.2 GHz): GC Wi-Fi Direct is only supported (SAR Exclusion) - UNII III (5.5 GHz): Wi-Fi Direct is not supported - UNII II (5.3 GHz): Wi-Fi Direct is not supported - UNII IV (5.8 GHz): Wi-Fi Direct GC and GO is supported 5. Wi-Fi and Bluetooth cannot transmit simultaneously because they share the same chip.	

7.5. General LTE SAR Test and Reporting Considerations

Item	Description																																												
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 4																																												
	Tx: 1710 to 1755 MHz				Rx: 2110 to 2155 MHz																																								
	Band 13																																												
	Tx: 777 to 787 MHz				Rx: 746 to 756 MHz																																								
	Band 4	Channel Bandwidth																																											
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																						
	Low	20050	20025	20000	19975																																								
	Mid	20175	20175	20175	20175																																								
	High	20300	20325	20350	20375																																								
	Band 13	Channel Bandwidth																																											
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																						
	Low																																												
	Mid			23230																																									
High																																													
LTE transmitter and antenna implementation	LTE has one TX/RX antenna and one RX only antenna. Refer to Appendix “Antenna Locations and Separation Distances” for antenna locations																																												
Maximum power reduction (MPR)	Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3 <table><tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th><th rowspan="2">MPR (dB)</th></tr><tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr><tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr></table> MPR Built-in by design A-MPR (additional MPR) was disabled during SAR testing							Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)																																						
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																																							
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1																																						
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1																																						
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																						
Power reduction	☒ Yes ☐ No <table><tr><td>Mode</td><td>CDMA Current Voice Power for BC0 & BC1</td><td>LTE B4 & B13 Max Power</td></tr><tr><td rowspan="2">SV-LTE</td><td>P ≤ 19 dBm</td><td>B4: 24 dBm (Limited) B13: 24.2 (Limited)</td></tr><tr><td>P > 19 dBm</td><td>B4: 19 dBm (Limited) B13: 20.2 dBm (Limited)</td></tr></table>							Mode	CDMA Current Voice Power for BC0 & BC1	LTE B4 & B13 Max Power	SV-LTE	P ≤ 19 dBm	B4: 24 dBm (Limited) B13: 24.2 (Limited)	P > 19 dBm	B4: 19 dBm (Limited) B13: 20.2 dBm (Limited)																														
Mode	CDMA Current Voice Power for BC0 & BC1	LTE B4 & B13 Max Power																																											
SV-LTE	P ≤ 19 dBm	B4: 24 dBm (Limited) B13: 24.2 (Limited)																																											
	P > 19 dBm	B4: 19 dBm (Limited) B13: 20.2 dBm (Limited)																																											
Spectrum plots for RB configurations	A properly configured basestation simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																												

8. RF Exposure Conditions

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

8.1. Head Exposure Conditions

For CDMA, LTE, Wi-Fi and Bluetooth

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

8.2. Body-worn Accessory Exposure Conditions

For CDMA (②)

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

For LTE Bands 4 and 13 (③)

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

For Wi-Fi and Bluetooth (④)

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

8.3. Hotspot Exposure Conditions

For CDMA (②)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	< 25 mm	Yes	
Front	< 25 mm	Yes	
Edge 1 (Top)	90.6 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01
Edge 2 (Right)	29 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01
Edge 3 (Bottom)	2 mm	Yes	
Edge 4 (Left)	2 mm	Yes	

For LTE Bands 4 and 13 (③)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	< 25 mm	Yes	
Front	< 25 mm	Yes	
Edge 1 (Top)	108.6 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01
Edge 2 (Right)	2 mm	Yes	
Edge 3 (Bottom)	2 mm	Yes	
Edge 4 (Left)	37 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01

For Wi-Fi and Bluetooth (④)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	< 25 mm	Yes	
Front	< 25 mm	Yes	
Edge 1 (Top)	2 mm	Yes	
Edge 2 (Right)	16 mm	Yes	
Edge 3 (Bottom)	98.6 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01
Edge 4 (Left)	32 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01

8.4. Wi-Fi Direct Exposure Conditions

For Wi-Fi (⑤)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	< 25 mm	Yes	
Front	< 25 mm	Yes	
Edge 1 (Top)	2 mm	Yes	
Edge 2 (Right)	16 mm	Yes	
Edge 3 (Bottom)	98.6 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01
Edge 4 (Left)	32 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01

9. RF Output Power Measurement

9.1. CDMA

1xRTT Measured Results

Band	Mode	Ch	Freq. (MHz)	Avg Pwr (dBm)	Power Reduction (dBm)
BC 0	RC1 SO55 (Loopback)	1013	824.70	24.8	18.9
		384	836.52	24.9	18.9
		777	848.31	24.8	18.8
	RC3 SO55 (Loopback)	1013	824.70	24.8	18.9
		384	836.52	24.9	18.9
		777	848.31	24.8	18.8
	RC3 SO32 (+F-SCH)	1013	824.70	24.8	18.9
		384	836.52	24.9	18.9
		777	848.31	24.8	18.8
BC 1	RC1 SO55 (Loopback)	25	1851.25	24.9	18.8
		600	1880.00	24.9	18.8
		1175	1908.75	24.8	18.8
	RC3 SO55 (Loopback)	25	1851.25	24.8	18.9
		600	1880.00	24.8	18.9
		1175	1908.75	24.8	18.9
	RC3 SO32 (+F-SCH)	25	1851.25	25.0	18.9
		600	1880.00	25.0	18.9
		1175	1908.75	25.0	18.9

1xEv-Do Rel. 0 Measured Results

Band	FTAP Rate	Channel	Freq. (MHz)	Avg Pwr (dBm)
BC 0	307.2 kbps (2 slot, QPSK)	1013	824.70	24.9
		384	836.52	25.0
		777	848.31	24.9
BC1	307.2 kbps (2 slot, QPSK)	25	1851.25	25.0
		600	1880.00	25.0
		1175	1908.75	25.0

1xEv-Do Rev. A Measured Results

Band	FETAP Traffic Format	Channel	Freq. (MHz)	Avg Pwr (dBm)
BC 0	307.2k, QPSK/ ACK channel is transmitted at all the slots	1013	824.70	24.9
		384	836.52	24.9
		777	848.31	24.9
BC1	307.2k, QPSK/ ACK channel is transmitted at all the slots	25	1851.25	24.9
		600	1880.00	24.9
		1175	1908.75	24.8

9.2. LTE Bands

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

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

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

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

The allowed A-MPR values specified below in Table 6.2.4-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signalling Value of "NS_01".

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

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10, 15, 20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

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

LTE Band 4 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							20050	20175	20300
							1720 MHz	1732.5 MHz	1745 MHz
LTE Band 4	20	QPSK	1	0	0	0	23.8	23.9	24.0
			1	49	0	0	23.7	23.8	23.8
			1	99	0	0	23.8	23.9	23.9
			50	0	1	1	22.7	22.9	23.0
			50	25	1	1	22.8	22.9	22.9
			50	50	1	1	22.9	22.9	22.8
			100	0	1	1	22.9	22.9	22.9
		16QAM	1	0	1	1	22.5	22.8	22.5
			1	49	1	1	22.2	22.8	22.4
			1	99	1	1	22.4	22.9	22.5
			50	0	2	2	21.8	21.9	22.0
			50	25	2	2	21.9	21.8	21.8
			50	50	2	2	21.9	21.9	21.8
			100	0	2	2	21.9	22.0	21.9
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							20050	20175	20300
							1720 MHz	1732.5 MHz	1745 MHz
LTE Band 4 Power Reduction	20	QPSK	1	0	MPR is disabled when Power Reduction is enabled		18.7	18.6	18.6
			1	49			18.5	18.6	18.7
			1	99			18.5	18.6	18.7
			50	0			18.6	18.6	18.7
			50	25			18.5	18.7	18.6
			50	50			18.6	18.7	18.7
			100	0			18.6	18.5	18.7
		16QAM	1	0			18.5	18.9	18.5
			1	49			18.4	18.9	18.4
			1	99			18.4	18.9	18.5
			50	0			18.6	18.6	18.6
			50	25			18.6	18.6	18.7
			50	50			18.6	18.6	18.8
			100	0			18.6	18.6	18.6

LTE Band 4 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							20025	20175	20325
							1717.5 MHz	1732.5 MHz	1747.5 MHz
LTE Band 4	15	QPSK	1	0	0	0	24.0	23.9	24.0
			1	36	0	0	23.8	23.9	23.8
			1	74	0	0	23.9	23.9	23.8
			36	0	1	1	22.8	22.9	22.8
			36	18	1	1	22.7	22.8	22.8
			36	37	1	1	22.8	22.9	22.9
			75	0	1	1	22.8	22.9	22.9
		16QAM	1	0	1	1	22.6	22.6	23.0
			1	36	1	1	22.5	22.6	22.8
			1	74	1	1	22.6	22.8	22.9
			36	0	2	2	21.8	21.9	21.9
			36	18	2	2	21.8	21.8	21.9
			36	37	2	2	21.8	21.9	21.9
			75	0	2	2	21.9	21.9	22.0
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							20025	20175	20325
							1717.5 MHz	1732.5 MHz	1747.5 MHz
LTE Band 4 Power Reduction	15	QPSK	1	0	MPR is disabled when Power Reduction is enabled		18.7	18.7	18.6
			1	36			18.6	18.7	18.6
			1	74			18.6	18.7	18.6
			36	0			18.7	18.6	18.7
			36	18			18.6	18.6	18.6
			36	37			18.5	18.7	18.8
			75	0			18.6	18.6	18.7
		16QAM	1	0			18.7	18.7	19.0
			1	36			18.7	18.7	19.0
			1	74			18.7	18.7	19.0
			36	0			18.7	18.6	18.7
			36	18			18.6	18.6	18.7
			36	37			18.6	18.6	18.8
			75	0			18.7	18.5	18.8

LTE Band 4 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							20000	20175	20350
							1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4	10	QPSK	1	0	0	0	24.0	23.8	23.8
			1	25	0	0	23.9	23.9	23.9
			1	49	0	0	23.9	23.9	23.8
			25	0	1	1	22.8	22.8	22.8
			25	12	1	1	22.7	22.8	22.9
			25	25	1	1	22.7	22.9	22.9
			50	0	1	1	22.9	22.8	22.9
		16QAM	1	0	1	1	22.6	22.6	22.9
			1	25	1	1	22.5	22.6	22.9
			1	49	1	1	22.5	22.6	22.9
			25	0	2	2	21.9	21.9	21.8
			25	12	2	2	21.8	21.9	21.9
			25	25	2	2	21.8	22.0	21.9
			50	0	2	2	21.9	21.8	21.9
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							20000	20175	20350
							1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4 Power Reduction	10	QPSK	1	0	MPR is disabled when Power Reduction is enabled		18.8	18.7	18.6
			1	25			18.7	18.6	18.7
			1	49			18.6	18.7	18.7
			25	0			18.6	18.6	18.7
			25	12			18.6	18.7	18.8
			25	25			18.7	18.7	18.8
			50	0			18.7	18.7	18.8
		16QAM	1	0			18.8	18.7	19.0
			1	25			18.7	18.6	19.0
			1	49			18.7	18.7	19.0
			25	0			18.7	18.7	18.8
			25	12			18.7	18.7	18.8
			25	25			18.7	18.7	18.8
			50	0			18.7	18.6	18.8

LTE Band 4 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							19975	20175	20375
							1712.5 MHz	1732.5 MHz	1752.5 MHz
LTE Band 4	5	QPSK	1	0	0	0	23.8	23.9	24.0
			1	12	0	0	23.7	24.0	23.9
			1	24	0	0	23.7	24.0	23.8
			12	0	1	1	22.8	22.9	23.0
			12	6	1	1	22.9	22.9	22.9
			12	13	1	1	22.9	23.0	22.9
			25	0	1	1	22.9	22.9	22.9
		16QAM	1	0	1	2	22.7	22.5	22.7
			1	12	1	1	22.6	22.6	22.7
			1	24	1	1	22.5	22.7	22.5
			12	0	2	2	21.8	21.9	21.9
			12	6	2	2	21.8	21.9	21.9
			12	13	2	2	21.8	22.0	21.9
			25	0	2	2	21.9	21.9	21.9
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							19975	20175	20375
							1712.5 MHz	1732.5 MHz	1752.5 MHz
LTE Band 4 Power Reduction	5	QPSK	1	0	MPR is disabled when Power Reduction is enabled		18.6	18.7	18.8
			1	12			18.5	18.6	18.8
			1	24			18.5	18.6	18.7
			12	0			18.7	18.7	18.8
			12	6			18.7	18.6	18.8
			12	13			18.7	18.6	18.8
			25	0			18.6	18.7	18.7
		16QAM	1	0			18.9	18.5	18.8
			1	12			18.7	18.4	18.8
			1	24			18.8	18.5	18.8
			12	0			18.6	18.6	18.8
			12	6			18.5	18.6	18.7
			12	13			18.6	18.6	18.7
			25	0			18.6	18.6	18.8

LTE Band 13 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)
							23230
							782 MHz
LTE Band 13	10	QPSK	1	0	0	0	24.1
			1	25	0	0	24.1
			1	49	0	0	24.1
			25	0	1	1	23.0
			25	12	1	1	23.0
			25	25	1	1	23.0
			50	0	1	1	23.0
		16QAM	1	0	1	1	23.0
			1	25	1	1	23.2
			1	49	1	1	23.1
			25	0	2	2	22.1
			25	12	2	2	22.0
			25	25	2	2	22.0
			50	0	2	2	22.0
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)
							23230
							782 MHz
LTE Band 13 Power Reduction	10	QPSK	1	0	MPR is disabled when Power Reduction is enabled		19.8
			1	25			19.7
			1	49			19.8
			25	0			19.8
			25	12			19.7
			25	25			19.7
			50	0			19.8
		16QAM	1	0			20.0
			1	25			20.0
			1	49			20.1
			25	0			19.9
			25	12			19.8
			25	25			19.8
			50	0			19.8

9.3. SV-LTE

9.3.1. CDMA BC0 + LTE Band 4

Agilent 8960		R&S CMW 500				
CDMA BC0 (1xRTT) P > 19.0 dBm		LTE Band 4 (20MHz) Limit = 19.0 dBm				
Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)	
1013		20175	QPSK	1 0	18.9	
				1 49	18.9	
				1 99	18.9	
				50 0	18.8	
				50 25	18.8	
				50 50	18.9	
				100 0	18.9	
			16QAM	1 0	18.9	
				1 49	18.8	
				1 99	18.9	
				50 0	18.9	
				50 25	18.9	
				50 50	19.0	
384		20175	QPSK	1 0	18.9	
				1 49	18.8	
				1 99	18.9	
				50 0	18.9	
				50 25	18.8	
				50 50	18.9	
				100 0	18.8	
			16QAM	1 0	18.8	
				1 49	18.9	
				1 99	18.8	
				50 0	18.9	
				50 25	18.9	
				50 50	19.0	
777		20175	QPSK	1 0	18.9	
				1 49	18.8	
				1 99	18.9	
				50 0	18.9	
				50 25	18.8	
				50 50	18.9	
				100 0	18.9	
			16QAM	1 0	18.8	
				1 49	18.8	
				1 99	18.9	
				50 0	18.9	
				50 25	18.9	
				50 50	19.0	
				100 0	18.9	

Agilent 8960		R&S CMW 500				
CDMA BC0 (1xRTT) P ≤ 19.0 dBm		LTE Band 4 (20MHz) Limit = 24.0 dBm				
Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)	
1013		20175	QPSK	1 0	23.9	
				1 49	23.9	
				1 99	24.0	
				50 0	22.9	
				50 25	22.9	
				50 50	22.9	
				100 0	22.9	
			16QAM	1 0	22.5	
				1 49	22.4	
				1 99	22.6	
				50 0	22.0	
				50 25	21.9	
				50 50	22.0	
384		20175	QPSK	1 0	23.8	
				1 49	23.7	
				1 99	23.8	
				50 0	23.0	
				50 25	22.9	
				50 50	22.9	
				100 0	22.9	
			16QAM	1 0	22.4	
				1 49	22.3	
				1 99	22.5	
				50 0	21.9	
				50 25	21.9	
				50 50	22.0	
777		20175	QPSK	1 0	23.8	
				1 49	23.8	
				1 99	23.9	
				50 0	22.9	
				50 25	22.9	
				50 50	23.0	
				100 0	23.0	
			16QAM	1 0	22.9	
				1 49	22.8	
				1 99	22.9	
				50 0	21.9	
				50 25	21.9	
				50 50	22.0	
				100 0	22.0	

9.3.2. CDMA BC1 + LTE Band 4

Agilent 8960		R&S CMW 500				
CDMA BC1 (1xRTT) P > 19.0 dBm		LTE Band 4 (20MHz) Limit = 19.0 dBm				
Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)	
25		20175	QPSK	1 0	18.8	
				1 49	18.7	
				1 99	18.8	
				50 0	18.8	
				50 25	18.7	
				50 50	18.8	
			16QAM	100 0	18.7	
				1 0	18.7	
				1 49	18.6	
				1 99	18.7	
				50 0	18.8	
				50 25	18.7	
600		20175	QPSK	50 50	18.8	
				100 0	18.8	
				1 0	18.7	
				1 49	18.6	
				1 99	18.8	
				50 0	18.8	
			16QAM	50 25	18.7	
				50 50	18.8	
				100 0	18.8	
				1 0	18.7	
				1 49	19.0	
				1 99	18.7	
1175		20175	QPSK	50 0	18.8	
				50 25	18.7	
				50 50	18.8	
				100 0	18.7	
			16QAM	1 0	18.7	
				1 49	18.7	
				1 99	18.8	
				50 0	18.8	
				50 25	18.8	
				50 50	18.8	
				100 0	18.7	

Agilent 8960		R&S CMW 500				
CDMA BC1 (1xRTT) P ≤ 19.0 dBm		LTE Band 4 (20MHz) Limit = 24.0 dBm				
Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)	
25		20175	QPSK	1 0	24.0	
				1 49	23.8	
				1 99	24.0	
				50 0	23.0	
				50 25	22.9	
				50 50	23.0	
			16QAM	100 0	22.9	
				1 0	22.5	
				1 49	22.5	
				1 99	22.6	
				50 0	21.9	
				50 25	21.9	
600		20175	QPSK	50 50	22.0	
				100 0	22.0	
				1 0	23.8	
				1 49	23.8	
				1 99	23.9	
				50 0	22.9	
			16QAM	50 25	22.9	
				50 50	23.0	
				100 0	22.9	
				1 0	22.9	
				1 49	22.8	
				1 99	22.9	
1175		20175	QPSK	50 0	21.9	
				50 25	21.9	
				50 50	21.9	
				100 0	22.0	
			16QAM	1 0	23.8	
				1 49	23.7	
				1 99	23.8	
				50 0	22.9	
				50 25	22.9	
				50 50	22.9	

9.3.3. CDMA BC0 + LTE Band 13

Agilent 8960		R&S CMW 500			
CDMA BC0 (1xRTT) P > 19.0 dBm		LTE Band 13 (10 MHz) Limit = 20.2 dBm			
Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)
1013		23230	QPSK	1 0	19.8
				1 25	19.8
				1 49	19.9
				25 0	20.0
				25 12	19.8
				25 25	19.9
			16QAM	50 0	19.9
				1 0	19.7
				1 25	19.8
				1 49	19.8
				25 0	20.0
				25 12	19.9
384		23230	QPSK	25 25	19.9
				50 0	19.9
			16QAM	1 0	19.8
				1 25	19.8
				1 49	19.8
				25 0	20.0
777		23230	QPSK	25 12	19.9
				25 25	19.8
				50 0	19.9
			16QAM	1 0	19.7
				1 25	19.7
				1 49	19.7

Agilent 8960		R&S CMW 500			
CDMA BC0 (1xRTT) P ≤ 19.0 dBm		LTE Band 13 (10MHz) Limit = 24.2 dBm			
Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)
1013		23230	QPSK	1 0	24.0
				1 25	23.9
				1 49	23.9
				25 0	22.9
				25 12	22.9
				25 25	22.8
			16QAM	50 0	22.7
				1 0	22.9
				1 25	23.0
				1 49	23.0
				25 0	22.0
				25 12	21.9
384		23230	QPSK	25 25	21.9
				50 0	21.9
			16QAM	1 0	24.0
				1 25	23.9
				1 49	23.9
				25 0	23.0
777		23230	QPSK	25 12	22.8
				25 25	22.9
				50 0	22.9
			16QAM	1 0	22.9
				1 25	23.0
				1 49	22.9

9.3.4. CDMA BC1 + LTE Band 13

Agilent 8960		R&S CMW 500			
CDMA BC1 (1xRTT) P > 19.0 dBm		LTE Band 13 (10 MHz) Limit = 20.2 dBm			
Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)
25		23230	QPSK	1 0	19.7
				1 25	19.7
				1 49	19.7
				25 0	19.7
				25 12	19.7
				25 25	19.7
			16QAM	50 0	19.7
				1 0	20.1
				1 25	20.2
				1 49	20.2
				25 0	19.8
				25 12	19.8
600		23230	QPSK	25 25	19.7
				50 0	19.7
			16QAM	1 0	19.7
				1 25	19.6
				1 49	19.7
				25 0	19.7
1175		23230	QPSK	25 12	19.7
				25 25	19.7
				50 0	19.7
			16QAM	1 0	20.2
				1 25	20.2
				1 49	20.2
		23230	QPSK	25 0	19.8
				25 12	19.8
				25 25	19.7
			16QAM	50 0	19.8
				1 0	19.7
				1 25	19.7
				1 49	19.7
				25 0	19.9
				25 12	19.9
				25 25	19.8
				50 0	19.8

Agilent 8960		R&S CMW 500			
CDMA BC1 (1xRTT) P ≤ 19.0 dBm		LTE Band 13 (10 MHz) Limit = 24.2 dBm			
Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)
25		23230	QPSK	1 0	24.0
				1 25	24.0
				1 49	24.0
				25 0	23.0
				25 12	22.9
				25 25	22.9
			16QAM	50 0	23.0
				1 0	23.0
				1 25	23.0
				1 49	23.1
				25 0	22.0
				25 12	22.0
600		23230	QPSK	25 25	22.0
				50 0	22.0
			16QAM	1 0	24.1
				1 25	24.0
				1 49	24.0
				25 0	23.0
1175		23230	QPSK	25 12	22.9
				25 25	22.9
				50 0	23.0
			16QAM	1 0	23.0
				1 25	23.0
				1 49	23.0
		23230	QPSK	25 0	22.0
				25 12	21.9
				25 25	22.0
			16QAM	50 0	22.0
				1 0	24.0
				1 25	23.9
				1 49	24.0
				25 0	23.0
				25 12	22.9
				25 25	22.9
				50 0	23.0

9.4. Wi-Fi 2.4 GHz Band

Required Test Channels per KDB 248227 D01

Mode	Band	GHz	Channel	"Default Test Channels"	
				802.11b	802.11g
802.11b/g	2.4 GHz	2.412	1 [#]	√	▽
		2.437	6	√	▽
		2.462	11 [#]	√	▽

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.

Measured Results

Band (GHz)	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)	SAR test (Yes/No)
2.4 (DTS)	802.11b	1	2412	14.4	Yes
		6	2437	14.9	
		11	2462	14.7	
	802.11g	1	2412	9.9	No
		6	2437	10.1	
		11	2462	10.0	
	802.11n (HT20)	1	2412	8.7	No
		6	2437	9.2	
		11	2462	9.0	

Power measurements to determine worst-case data rates

Mode	Ch #	Freq. (MHz)	Data Rate	Avg Pwr (dBm)	SAR test (Yes/No)
802.11b	6	2437	1 Mbps	14.9	Yes
			2 Mbps	14.8	No
			5.5 Mbps	14.8	No
			11 Mbps	14.8	No

Note(s):

Per KDB 248227 D01, SAR is not required for 802.11g/HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.

9.5. Wi-Fi 5 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		*
			5.660	132		*
			5.680	136	√	
			5.700	140		*
	DTS (15.247)	5.8 GHz	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.

Measured Results

Band (GHz)	Mode	Mode	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)	SAR Test (Yes/No)
5.2 (UNII)	1 Tx	802.11a	6 Mbps	36	5180	12.5	Yes
				40	5200	12.6	
				44	5220	12.7	
				48	5240	12.6	
	1 Tx	802.11n (HT20)	MCS0	36	5180	11.5	No
				40	5200	11.8	
				48	5240	11.8	
	1 Tx	802.11n (HT40)	MCS0	38	5190	10.0	No
				46	5230	10.7	
5.3 (UNII)	1 Tx	802.11a	6 Mbps	52	5260	12.6	Yes
				56	5280	13.1	
				60	5300	13.0	
				64	5320	12.8	
	1 Tx	802.11n (HT20)	MCS0	52	5260	11.8	No
				60	5300	12.0	
				64	5320	11.8	
	1 Tx	802.11n (HT40)	MCS0	54	5270	10.2	No
				62	5310	10.2	
5.5 (UNII)	1 Tx	802.11a	6 Mbps	100	5500	12.7	Yes
				104	5520	12.7	
				108	5540	13.0	
				112	5560	13.0	
				116	5580	12.8	
				120	5600	n/a	
				124	5620	n/a	
				128	5640	n/a	
				132	5660	12.3	
				136	5680	12.6	
				140	5700	12.5	
	1 Tx	802.11n (HT20)	MCS0	100	5500	11.9	No
				120	5600	n/a	
				140	5700	11.6	
	1 Tx	802.11n (HT40)	MCS0	102	5510	10.5	No
				118	5590	n/a	
				134	5670	10.0	
5.8 (DTS)	1 Tx	802.11a	6 Mbps	149	5745	12.4	Yes
				153	5765	12.4	
				157	5785	12.5	
				161	5805	12.5	
				165	5825	12.4	
	1 Tx	802.11n (HT20)	MCS0	149	5745	11.4	No
				157	5785	11.6	
				161	5805	11.7	
	1 Tx	802.11n (HT40)	MCS0	151	5755	9.8	No
				159	5795	10.3	

Power measurements to determine worst-case data rates

Band	Mode	Ch #	Freq. (MHz)	Data Rate	Avg Pwr (dBm)	SAR test (Yes/No)
5.2 GHz (UNII)	802.11a	36	5180	6 Mbps	12.5	Yes
				9 Mbps	12.4	No
				12 Mbps	12.4	No
				18 Mbps	12.4	No
				24 Mbps	12.4	No
				36 Mbps	12.3	No
				48 Mbps	12.3	No
				54 Mbps	12.2	No
5.3 GHz (UNII)	802.11a	56	5280	6 Mbps	13.1	Yes
				9 Mbps	13.0	No
				12 Mbps	13.0	No
				18 Mbps	13.0	No
				24 Mbps	13.0	No
				36 Mbps	13.0	No
				48 Mbps	13.0	No
				54 Mbps	12.9	No
5.5 GHz (UNII)	802.11a	116	5580	6 Mbps	12.8	Yes
				9 Mbps	12.8	No
				12 Mbps	12.7	No
				18 Mbps	12.7	No
				24 Mbps	12.7	No
				36 Mbps	12.7	No
				48 Mbps	12.6	No
				54 Mbps	12.6	No
5.8 GHz (DTS)	802.11a	149	5745	6 Mbps	12.4	Yes
				9 Mbps	12.4	No
				12 Mbps	12.4	No
				18 Mbps	12.3	No
				24 Mbps	12.3	No
				36 Mbps	12.2	No
				48 Mbps	12.3	No
				54 Mbps	12.3	No

9.6. Bluetooth

Maximum tune-up tolerance limit is **9.3 dBm** from the rated nominal maximum output power. This power level qualifies for exclusion of SAR testing.

Refer to Standalone SAR Test Exclusion Considerations Section.

10. Tissue Dielectric Properties

IEEE Std 1528-2013

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

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01

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

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

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

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

Salt: 99+% Pure Sodium Chloride

Sugar: 98+% Pure Sucrose

Water: De-ionized, 16 MΩ+ resistivity

HEC: Hydroxyethyl Cellulose

DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]

Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

MSL/HSL750 (Body and Head liquids for 700 – 800 MHz)

Item	Head Tissue Simulation Liquids HSL750 Muscle (body) Tissue Simulation Liquids MSL750
Type No	SL AAH 075
Manufacturer	SPEAG
The item is composed of the following ingredients:	
H ² O	Water, 35 – 58%
Sucrose	Sugar, white, refined, 40-60%
NaCl	Sodium Chloride, 0-6%
Hydroxyethyl-cellulose	Medium Viscosity (CAS# 9004-62-0), <0.3%
Preventol-D7	Preservative: aqueous preparation, (CAS# 55965-84-9), containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyl-3(2H)-isothiazolone, 0.1-0.7%

MSL/HSL1750 (Body and Head liquids for 1700 – 1800 MHz)

Item	Head Tissue Simulation Liquids HSL1750 Muscle (body) Tissue Simulation Liquids MSL1750
Type No	SL AAM 175
Manufacturer	SPEAG
-The item is composed of the following ingredients:	
H ² O	Water, 52 – 75%
C8H18O3	Diethylene glycol monobutyl ether (DGBE), 25-48%
NaCl	Sodium Chloride, <1.0%

Simulating Liquids for 5 GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	78
Mineral oil	11
Emulsifiers	9
Additives and Salt	2

10.2. Tissue Dielectric Parameter Check Results

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

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

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

SAR Lab A

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit $\pm$ (%)
12/14/2013	Body 1900	e'	54.9500	Relative Permittivity (ϵ_r):	54.95	53.30	3.10	5
		e''	14.8900	Conductivity (σ):	1.57	1.52	3.49	5
	Body 1850	e'	55.2000	Relative Permittivity (ϵ_r):	55.20	53.30	3.56	5
		e''	14.7700	Conductivity (σ):	1.52	1.52	-0.04	5
	Body 1910	e'	54.8800	Relative Permittivity (ϵ_r):	54.88	53.30	2.96	5
		e''	14.9000	Conductivity (σ):	1.58	1.52	4.11	5
12/14/2013	Head 1900	e'	38.1400	Relative Permittivity (ϵ_r):	38.14	40.00	-4.65	5
		e''	13.6400	Conductivity (σ):	1.44	1.40	2.93	5
	Head 1850	e'	38.0600	Relative Permittivity (ϵ_r):	38.06	40.00	-4.85	5
		e''	13.7500	Conductivity (σ):	1.41	1.40	1.03	5
	Head 1910	e'	38.1100	Relative Permittivity (ϵ_r):	38.11	40.00	-4.73	5
		e''	13.7800	Conductivity (σ):	1.46	1.40	4.53	5

SAR Lab B

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
12/16/2013	Body 1750	e'	52.5400	Relative Permittivity (ϵ_r):	52.54	53.44	-1.69	5
		e''	15.8300	Conductivity (σ):	1.54	1.49	3.65	5
	Body 1710	e'	52.6900	Relative Permittivity (ϵ_r):	52.69	53.54	-1.59	5
		e''	15.7000	Conductivity (σ):	1.49	1.46	2.14	5
	Body 1755	e'	52.5200	Relative Permittivity (ϵ_r):	52.52	53.43	-1.70	5
		e''	15.8200	Conductivity (σ):	1.54	1.49	3.66	5
12/17/2013	Head 1750	e'	41.2500	Relative Permittivity (ϵ_r):	41.25	40.08	2.91	5
		e''	14.0500	Conductivity (σ):	1.37	1.37	-0.13	5
	Head 1710	e'	41.4100	Relative Permittivity (ϵ_r):	41.41	40.15	3.15	5
		e''	13.9400	Conductivity (σ):	1.33	1.35	-1.56	5
	Head 1755	e'	41.2100	Relative Permittivity (ϵ_r):	41.21	40.08	2.83	5
		e''	14.0600	Conductivity (σ):	1.37	1.37	0.02	5
12/18/2013	Body 5180	e'	48.5000	Relative Permittivity (ϵ_r):	48.50	49.05	-1.11	5
		e''	18.7900	Conductivity (σ):	5.41	5.27	2.67	5
	Body 5200	e'	48.4600	Relative Permittivity (ϵ_r):	48.46	49.02	-1.14	5
		e''	18.7800	Conductivity (σ):	5.43	5.29	2.55	5
	Body 5600	e'	47.7800	Relative Permittivity (ϵ_r):	47.78	48.48	-1.44	5
		e''	19.1100	Conductivity (σ):	5.95	5.76	3.29	5
	Body 5800	e'	47.4900	Relative Permittivity (ϵ_r):	47.49	48.20	-1.47	5
		e''	19.3200	Conductivity (σ):	6.23	6.00	3.84	5
	Body 5825	e'	47.4400	Relative Permittivity (ϵ_r):	47.44	48.20	-1.58	5
		e''	19.3300	Conductivity (σ):	6.26	6.00	4.35	5
12/18/2013	Head 5180	e'	35.9300	Relative Permittivity (ϵ_r):	35.93	36.01	-0.23	5
		e''	15.7300	Conductivity (σ):	4.53	4.63	-2.16	5
	Head 5200	e'	35.9000	Relative Permittivity (ϵ_r):	35.90	35.99	-0.25	5
		e''	15.7500	Conductivity (σ):	4.55	4.65	-2.09	5
	Head 5600	e'	35.3000	Relative Permittivity (ϵ_r):	35.30	35.53	-0.66	5
		e''	15.9100	Conductivity (σ):	4.95	5.06	-2.10	5
	Head 5800	e'	35.0600	Relative Permittivity (ϵ_r):	35.06	35.30	-0.68	5
		e''	16.0300	Conductivity (σ):	5.17	5.27	-1.90	5
	Head 5825	e'	35.0200	Relative Permittivity (ϵ_r):	35.02	35.30	-0.79	5
		e''	16.0200	Conductivity (σ):	5.19	5.27	-1.54	5

SAR Lab D

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
12/16/2013	Body 2450	e'	50.8400	Relative Permittivity (ϵ_r):	50.84	52.70	-3.53	5
		e''	14.2500	Conductivity (σ):	1.94	1.95	-0.45	5
	Body 2410	e'	50.9500	Relative Permittivity (ϵ_r):	50.95	52.76	-3.43	5
		e''	14.0700	Conductivity (σ):	1.89	1.91	-1.16	5
	Body 2475	e'	50.7200	Relative Permittivity (ϵ_r):	50.72	52.67	-3.70	5
		e''	14.3400	Conductivity (σ):	1.97	1.99	-0.59	5
12/17/2013	Head 2450	e'	38.1000	Relative Permittivity (ϵ_r):	38.10	39.20	-2.81	5
		e''	13.5700	Conductivity (σ):	1.85	1.80	2.70	5
	Head 2410	e'	38.2900	Relative Permittivity (ϵ_r):	38.29	39.28	-2.52	5
		e''	13.4500	Conductivity (σ):	1.80	1.76	2.38	5
	Head 2475	e'	37.9900	Relative Permittivity (ϵ_r):	37.99	39.17	-3.01	5
		e''	13.6200	Conductivity (σ):	1.87	1.83	2.59	5
12/18/2013	Body 835	e'	53.4800	Relative Permittivity (ϵ_r):	53.48	55.20	-3.12	5
		e''	21.3800	Conductivity (σ):	0.99	0.97	2.33	5
	Body 820	e'	53.6400	Relative Permittivity (ϵ_r):	53.64	55.28	-2.96	5
		e''	21.3600	Conductivity (σ):	0.97	0.97	0.56	5
	Body 850	e'	53.2900	Relative Permittivity (ϵ_r):	53.29	55.16	-3.39	5
		e''	21.3500	Conductivity (σ):	1.01	0.99	2.22	5
12/18/2013	Head 835	e'	41.0200	Relative Permittivity (ϵ_r):	41.02	41.50	-1.16	5
		e''	19.6100	Conductivity (σ):	0.91	0.90	1.16	5
	Head 820	e'	41.2300	Relative Permittivity (ϵ_r):	41.23	41.60	-0.90	5
		e''	19.6200	Conductivity (σ):	0.89	0.90	-0.43	5
	Head 850	e'	40.8300	Relative Permittivity (ϵ_r):	40.83	41.50	-1.61	5
		e''	19.6000	Conductivity (σ):	0.93	0.92	1.24	5

SAR Lab F

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
12/18/2013	Body 750	e'	55.1400	Relative Permittivity (ϵ_r):	55.14	55.55	-0.73	5
		e''	23.4100	Conductivity (σ):	0.98	0.96	1.37	5
	Body 700	e'	55.7100	Relative Permittivity (ϵ_r):	55.71	55.74	-0.05	5
		e''	23.8300	Conductivity (σ):	0.93	0.96	-3.31	5
	Body 790	e'	54.7100	Relative Permittivity (ϵ_r):	54.71	55.39	-1.23	5
		e''	23.0500	Conductivity (σ):	1.01	0.97	4.80	5
12/18/2013	Head 750	e'	40.2800	Relative Permittivity (ϵ_r):	40.28	41.96	-4.01	5
		e''	21.5900	Conductivity (σ):	0.90	0.89	0.81	5
	Head 700	e'	40.9500	Relative Permittivity (ϵ_r):	40.95	42.22	-3.00	5
		e''	21.9600	Conductivity (σ):	0.85	0.89	-3.88	5
	Head 790	e'	39.7700	Relative Permittivity (ϵ_r):	39.77	41.76	-4.76	5
		e''	21.3100	Conductivity (σ):	0.94	0.90	4.45	5

11. System Performance Check

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

11.1. System Performance Check Measurement Conditions

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

11.2. Reference SAR Values for System Performance Check

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

System Dipole	Serial No.	Cal. Date	Freq. (MHz)	Target SAR Values (mW/g)		
				1g/10g	Head	Body
D835V2	4d002	11/15/2013	835	1g	9.49	9.43
				10g	6.18	6.21
D1900V2	5d043	11/12/2013	1900	1g	40.1	39.0
				10g	21.1	20.8
D1750V2	1077	9/12/2013	1750	1g	37.6	37.7
				10g	20.0	20.3
D2450V2	748	2/11/2013	2450	1g	52.9	49.9
				10g	24.6	23.2
D750V2	1071	11/15/2013	750	1g	8.46	8.64
				10g	5.51	5.72
D5GHzV2	1138	11/19/2013	5200	1g	78.5	72.9
				10g	22.5	20.4
			5600	1g	82.7	78.3
				10g	23.5	21.7
			5800	1g	78.3	72.8
				10g	22.4	20.1

11.3. System Performance Check Results

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

SAR Lab A

Date Tested	System Dipole		T.S. Liquid		Measured Results			Target (Ref. Value)	Delta ±10 %	Est./Zoom Ratio	Plot No.
	Type	Serial #			Area Scan	Zoom Scan	Normalize to 1 W				
12/14/2013	D1900V2	5d043	Head	1g	4.08	3.99	39.9	40.1	-0.50	2.21	1, 2
				10g	2.14	2.05	20.5	21.1	-2.84		
			Body	1g	4.29	4.16	41.6	39.0	6.67	3.03	
				10g	2.17	2.11	21.1	20.8	1.44		

SAR Lab B

Date Tested	System Dipole		T.S. Liquid		Measured Results			Target (Ref. Value)	Delta ±10 %	Est./Zoom Ratio	Plot No.
	Type	Serial #			Area Scan	Zoom Scan	Normalize to 1 W				
12/16/2013	D1750V2	1077	Head	1g	3.82	3.70	37.0	37.6	-1.60	3.14	3, 4
				10g	1.99	1.96	19.6	20.0	-2.00		
			Body	1g	4.20	4.09	40.9	37.7	8.49	2.62	
				10g	2.18	2.16	21.6	20.3	6.40		
12/18/2013 & 12/19/2013	D5GHzV2	1138	Head	1g	6.96	7.36	73.6	78.5	-6.24	-5.75	5, 6
				10g	1.93	2.14	21.4	22.5	-4.89		
				1g	8.32	8.80	88.0	82.7	6.41	-5.77	
				10g	2.27	2.50	25.0	23.5	6.38		
				1g	7.00	7.54	75.4	78.3	-3.70	-7.71	
				10g	1.91	2.15	21.5	22.4	-4.02		
			Body	1g	7.22	7.68	76.8	72.9	5.35	-6.37	
				10g	1.98	2.17	21.7	20.4	6.37		
				1g	7.78	8.25	82.5	78.3	5.36	-6.04	
				10g	2.10	2.32	23.2	21.7	6.91		
				1g	6.85	7.30	73.0	72.8	0.27	-6.57	
				10g	1.86	2.05	20.5	20.1	1.99		

SAR Lab D

Date Tested	System Dipole		T.S. Liquid		Measured Results			Target (Ref. Value)	Delta ±10 %	Est./Zoom Ratio	Plot No.
	Type	Serial #			Area Scan	Zoom Scan	Normalize to 1 W				
12/16/2013 & 12/17/2013	D2450V2	748	Head	1g	5.54	5.52	55.2	52.9	4.35	0.36	7, 8
				10g	2.40	2.47	24.7	24.6	0.41		
			Body	1g	4.75	4.71	47.1	49.9	-5.61	0.84	
				10g	2.08	2.17	21.7	23.2	-6.47		
12/18/2013	D835V2	4d002	Head	1g	0.978	0.956	9.56	9.49	0.74	2.25	9, 10
				10g	0.659	0.625	6.25	6.18	1.13		
			Body	1g	1.02	0.993	9.93	9.43	5.30	2.65	
				10g	0.685	0.654	6.54	6.21	5.31		

SAR Lab F

Date Tested	System Dipole		T.S. Liquid		Measured Results			Target (Ref. Value)	Delta ±10 %	Est./Zoom Ratio	Plot No.
	Type	Serial #			Area Scan	Zoom Scan	Normalize to 1 W				
12/18/2013	D750V2	1071	Head	1g	0.881	0.855	8.55	8.46	1.06	2.95	11,12
				10g	0.599	0.558	5.58	5.51	1.27		
			Body	1g	0.902	0.884	8.84	8.64	2.31	2.00	
				10g	0.611	0.589	5.89	5.72	2.97		

12. SAR Test Results

SAR Channel Exclusion criteria are as follows:

1. As stated in KDB 447498 D01 General RF Exposure Guidance v05r01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 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
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
 - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
 - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are ≥ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
 - Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
 - Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

12.1. CDMA BC0

12.1.1. Maximum Power

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	1xRTT (RC3 SO55)	0	Left Touch	384	836.52	25.0	24.9	0.550	0.563	1
			Left Tilt	384	836.52	25.0	24.9	0.347	0.355	
			Right Touch	384	836.52	25.0	24.9	0.453	0.464	
			Right Tilt	384	836.52	25.0	24.9	0.314	0.321	
	1xEVDO (Rel. 0)	0	Left Touch	384	836.52	25.0	25.0	0.435	0.435	
			Left Tilt	384	836.52	25.0	25.0	0.266	0.266	
			Right Touch	384	836.52	25.0	25.0	0.365	0.365	
			Right Tilt	384	836.52	25.0	25.0	0.285	0.285	
Body-worn & Hotspot	1xRTT (RC3 SO32)	10	Rear	1013	824.70	25.0	24.8	0.681	0.713	
				384	836.52	25.0	24.9	0.804	0.823	2
				777	848.31	25.0	24.8	0.753	0.788	
	1xEVDO (Rel. 0)	10	Front	384	836.52	25.0	24.9	0.421	0.431	
			Rear	384	836.52	25.0	25.0	0.769	0.769	
			Front	384	836.52	25.0	25.0	0.392	0.392	
Hotspot	1xRTT (RC3 SO32)	10	Edge 3	384	836.52	25.0	24.9	0.244	0.250	
			Edge 4	384	836.52	25.0	24.9	0.657	0.672	
	1xEVDO (Rel. 0)	10	Edge 3	384	836.52	25.0	25.0	0.249	0.249	
			Edge 4	384	836.52	25.0	25.0	0.621	0.621	

12.1.2. Power Reduction

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	1xRTT (RC3 SO55)	0	Left Touch	384	836.52	19.5	18.9	0.100	0.115	
			Left Tilt	384	836.52	19.5	18.9	0.066	0.076	
			Right Touch	384	836.52	19.5	18.9	0.084	0.096	
			Right Tilt	384	836.52	19.5	18.9	0.061	0.070	
Body-worn & Hotspot	1xRTT (RC3 SO32)	10	Rear	384	836.52	19.5	18.9	0.185	0.212	
			Front	384	836.52	19.5	18.9	0.102	0.117	
Hotspot	1xRTT (RC3 SO32)	10	Edge 3	384	836.52	19.5	18.9	0.061	0.070	
			Edge 4	384	836.52	19.5	18.9	0.187	0.215	

12.2. CDMA BC1

12.2.1. Maximum Power

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	1xRTT (RC3 SO55)	0	Left Touch	600	1880.00	25.0	25.0	0.780	0.780	3
			Left Tilt	600	1880.00	25.0	25.0	0.198	0.198	
			Right Touch	600	1880.00	25.0	25.0	0.433	0.433	
			Right Tilt	600	1880.00	25.0	25.0	0.214	0.214	
	1xEVDO (Rel. 0)	0	Left Touch	600	1880.00	25.0	25.0	0.717	0.717	
			Left Tilt	600	1880.00	25.0	25.0	0.191	0.191	
			Right Touch	600	1880.00	25.0	25.0	0.434	0.434	
			Right Tilt	600	1880.00	25.0	25.0	0.234	0.234	
Body- worn & Hotspot	1xRTT (RC3 SO55)	10	Rear	25	1851.25	25.0	25.0	1.060	1.060	
				600	1880.00	25.0	25.0	1.080	1.080	
				1175	1908.75	25.0	25.0	1.030	1.030	
			Front	600	1880.00	25.0	25.0	0.740	0.740	
	1xEVDO (Rel. 0)	10	Rear	25	1851.25	25.0	25.0	1.090	1.090	4
				600	1880.00	25.0	25.0	1.050	1.050	
				1175	1908.75	25.0	25.0	1.080	1.080	
			Front	600	1880.00	25.0	25.0	0.751	0.751	
Hotspot	1xRTT (RC3 SO32)	10	Edge 3	600	1880.00	25.0	25.0	0.123	0.123	
			Edge 4	600	1880.00	25.0	25.0	0.566	0.566	
	1xEVDO (Rel. 0)	10	Edge 3	600	1880.00	25.0	25.0	0.127	0.127	
			Edge 4	600	1880.00	25.0	25.0	0.565	0.565	

12.2.2. Power Reduction

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	1xRTT (RC3 SO55)	0	Left Touch	600	1880.00	19.0	18.9	0.199	0.204	
			Left Tilt	600	1880.00	19.0	18.9	0.052	0.053	
			Right Touch	600	1880.00	19.0	18.9	0.100	0.102	
			Right Tilt	600	1880.00	19.0	18.9	0.057	0.058	
Body-worn & Hotspot	1xRTT (RC3 SO32)	10	Rear	600	1880.00	19.0	18.9	0.270	0.276	
			Front	600	1880.00	19.0	18.9	0.187	0.191	
Hotspot	1xRTT (RC3 SO32)	10	Edge 3	600	1880.00	19.0	18.9	0.032	0.033	
			Edge 4	600	1880.00	19.0	18.9	0.140	0.143	

12.3. LTE Band 4 (20 MHz Bandwidth)

12.3.1. Maximum Power

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	20175	1732.5	1	0	24.0	23.9	0.332	0.340	
						50	0	23.0	22.9	0.258	0.264	
			Left Tilt	20175	1732.5	1	0	24.0	23.9	0.217	0.222	
						50	0	23.0	22.9	0.164	0.168	
			Right Touch	20175	1732.5	1	0	24.0	23.9	0.439	0.449	5
						50	0	23.0	22.9	0.360	0.368	
			Right Tilt	20175	1732.5	1	0	24.0	23.9	0.191	0.195	
						50	0	23.0	22.9	0.154	0.158	
Body-worn & Hotspot	QPSK	10	Rear	20050	1720.0	1	0	24.0	23.8	0.883	0.925	
						50	50	23.0	22.9	0.824	0.843	
				20175	1732.5	1	0	24.0	23.9	1.050	1.074	6
						50	0	23.0	22.9	0.867	0.887	
			Front	20300	1745.0	1	0	24.0	24.0	1.000	1.000	
						50	0	23.0	23.0	0.804	0.804	
				20175	1732.5	1	0	24.0	23.9	0.751	0.768	
						50	0	23.0	22.9	0.625	0.640	
Hotspot	QPSK	10	Edge 2	20175	1732.5	1	0	24.0	23.9	0.261	0.267	
						50	0	23.0	22.9	0.177	0.181	
			Edge 3	20175	1732.5	1	0	24.0	23.9	0.495	0.507	
						50	0	23.0	22.9	0.394	0.403	

12.3.2. Power Reduction

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	20175	1732.5	1	0	19.0	18.6	0.084	0.092	
						50	0	19.0	18.6	0.083	0.091	
			Left Tilt	20175	1732.5	1	0	19.0	18.6	0.056	0.061	
						50	0	19.0	18.6	0.053	0.058	
			Right Touch	20175	1732.5	1	0	19.0	18.6	0.124	0.136	
						50	0	19.0	18.6	0.125	0.137	
			Right Tilt	20175	1732.5	1	0	19.0	18.6	0.052	0.057	
						50	0	19.0	18.6	0.051	0.056	
Body-worn & Hotspot	QPSK	10	Rear	20175	1732.5	1	0	19.0	18.6	0.287	0.315	
						50	0	19.0	18.6	0.285	0.312	
			Front	20175	1732.5	1	0	19.0	18.6	0.305	0.334	
						50	0	19.0	18.6	0.263	0.288	
Hotspot	QPSK	10	Edge 3	20175	1732.5	1	0	19.0	18.6	0.103	0.113	
						50	0	19.0	18.6	0.105	0.115	
			Edge 4	20175	1732.5	1	0	19.0	18.6	0.124	0.136	
						50	0	19.0	18.6	0.120	0.132	

12.4. LTE Band 13 (10 MHz Bandwidth)

12.4.1. Maximum Power

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	23230	782.0	1	0	24.2	24.1	0.182	0.186	7
						25	0	23.2	23.0	0.146	0.153	
			Left Tilt	23230	782.0	1	0	24.2	24.1	0.120	0.123	
						25	0	23.2	23.0	0.095	0.099	
			Right Touch	23230	782.0	1	0	24.2	24.1	0.210	0.215	
						25	0	23.2	23.0	0.166	0.174	
Body-worn & Hotspot	QPSK	10	Rear	23230	782.0	1	0	24.2	24.1	0.435	0.445	8
						25	0	23.2	23.0	0.355	0.372	
			Front	23230	782.0	1	0	24.2	24.1	0.249	0.255	
						25	0	23.2	23.0	0.201	0.210	
Hotspot	QPSK	10	Edge 2	23230	782.0	1	0	24.2	24.1	0.412	0.422	
						25	0	23.2	23.0	0.332	0.348	
			Edge 3	23230	782.0	1	0	24.2	24.1	0.127	0.130	
						25	0	23.2	23.0	0.103	0.108	

12.4.2. Power Reduction

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	23230	782.0	1	0	20.2	19.8	0.061	0.067	
						25	0	20.2	19.8	0.057	0.062	
			Left Tilt	23230	782.0	1	0	20.2	19.8	0.039	0.043	
						25	0	20.2	19.8	0.037	0.040	
			Right Touch	23230	782.0	1	0	20.2	19.8	0.069	0.076	
						25	0	20.2	19.8	0.066	0.072	
Body-worn & Hotspot	QPSK	10	Rear	23230	782.0	1	0	20.2	19.8	0.163	0.179	
						25	0	20.2	19.8	0.163	0.179	
			Front	23230	782.0	1	0	20.2	19.8	0.086	0.094	
						25	0	20.2	19.8	0.086	0.094	
Hotspot	QPSK	10	Edge 3	23230	782.0	1	0	20.2	19.8	0.138	0.151	
						25	0	20.2	19.8	0.139	0.152	
			Edge 4	23230	782.0	1	0	20.2	19.8	0.045	0.049	
						25	0	20.2	19.8	0.046	0.050	

12.5. Wi-Fi (DTS Bands)

12.5.1. 2.4 GHz Band

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	802.11b	0	Left Touch	6	2437	15.3	14.9	0.226	0.248	9
			Left Tilt	6	2437	15.3	14.9	0.189	0.207	
			Right Touch	6	2437	15.3	14.9	0.129	0.141	
			Right Tilt	6	2437	15.3	14.9	0.126	0.138	
Body-worn, Hotspot, and Wi-Fi Direct	802.11b	10	Rear	6	2437	15.3	14.9	0.093	0.102	10
			Front	6	2437	15.3	14.9	0.040	0.044	
Hotspot and Wi-Fi Direct	802.11b	10	Edge 1	6	2437	15.3	14.9	0.051	0.056	
			Edge 2	6	2437	15.3	14.9	0.031	0.034	

12.5.2. 5.8 GHz Band

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	802.11a	0	Left Touch	157	5785	13.1	12.5	0.227	0.261	11
			Left Tilt	157	5785	13.1	12.5	0.221	0.254	
			Right Touch	157	5785	13.1	12.5	0.190	0.218	
			Right Tilt	157	5785	13.1	12.5	0.222	0.255	
Body-worn & Wi-Fi Direct	802.11a	10	Rear	157	5785	13.1	12.5	0.091	0.104	
			Front	157	5785	13.1	12.5	0.038	0.044	
Wi-Fi Direct	802.11a	10	Edge 1	157	5785	13.1	12.5	0.112	0.129	12
			Edge 2	157	5785	13.1	12.5	0.014	0.016	

12.5.3. Wi-Fi (UNII Bands)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	802.11a	0	Left Touch	44	5220	13.1	12.7	0.140	0.154	
				56	5280	13.1	13.1	0.153	0.153	
				112	5560	13.1	13.0	0.258	0.264	13
		0	Left Tilt	44	5220	13.1	12.7	0.130	0.143	
				56	5280	13.1	13.1	0.151	0.151	
				112	5560	13.1	13.0	0.227	0.232	
		0	Right Touch	44	5220	13.1	12.7	0.075	0.083	
				56	5280	13.1	13.1	0.110	0.110	
				112	5560	13.1	13.0	0.194	0.199	
		0	Right Tilt	44	5220	13.1	12.7	0.079	0.087	
				56	5280	13.1	13.1	0.107	0.107	
				112	5560	13.1	13.0	0.194	0.199	
Body	802.11a	10	Rear	44	5220	13.1	12.7	0.069	0.076	
				56	5280	13.1	13.1	0.087	0.087	
				112	5560	13.1	13.0	0.103	0.105	14
		10	Front	44	5220	13.1	12.7	0.020	0.022	
				56	5280	13.1	13.1	0.028	0.028	
				112	5560	13.1	13.0	0.044	0.045	

12.6. Bluetooth

12.6.1. Standalone SAR Test Exclusion Considerations

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:

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

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

The test exclusions are applicable only when the minimum test separation distance is ≤ 5 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.

Body-worn Accessory Exposure Conditions

Max. tune-up tolerance limit		Min. test separation distance (mm)	Frequency (GHz)	Result
(dBm)	(mW)			
9.3	9	10	2.480	1.3

Conclusion:

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

12.6.2. Estimated SAR

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

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

Estimated SAR Result for Body-worn Accessory Conditions:

Test Configuration	Max. tune-up tolerance limit (mW)	Min. test separation distance (mm)	Frequency (GHz)	Estimated 1-g SAR (W/kg)
Rear/Front	9	10	2.480	0.189

13. SAR Measurement Variability

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01r01. 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.

13.1. The Highest Measured SAR Configuration in Each Frequency Band

Frequency Band (MHz)	Air Interface	Head (W/kg)	Body-worn Accessory (W/kg)	Hotspot/Wi-Fi Direct (W/kg)
750	LTE Band 13	<0.8 W/kg	<0.8 W/kg	<0.8 W/kg
850	CDMA BC0	<0.8 W/kg	0.804 W/kg	0.804 W/kg
1750	LTE Band 4	<0.8 W/kg	1.05 W/kg	1.05 W/kg
1900	CDMA BC1	<0.8 W/kg	1.09 W/kg	1.09 W/kg
2400	Wi-Fi 802.11b/g/n	<0.8 W/kg	<0.8 W/kg	<0.8 W/kg
5000	802.11a/n	<0.8 W/kg	<0.8 W/kg	<0.8 W/kg
		<0.4 W/kg	<0.4 W/kg	<0.4 W/kg
		<0.6 W/kg	<0.6 W/kg	<0.6 W/kg

13.2. Repeated Measurement Results

Head Exposure Condition

Not Applicable.

Body-worn Accessory and Hotspot Mode Exposure Condition

RF Exposure Conditions	Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio
						Original	Repeated	
Body-worn & Hotspot	Rear	1xRTT (RC3 SO32)	10	384	836.52	0.804	0.793	1.01
Body-worn & Hotspot	Rear	1xEVDO (Rel. 0)	10	25	1851.24	1.090	1.080	1.01
Body-worn & Hotspot	Rear	QPSK	10	20175	1732.5	1.050	1.040	1.01

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.

14. Simultaneous Transmission SAR Analysis

KDB 447498 D01 General RF Exposure Guidance v05, introduces a new formula for calculating the SAR to Peak Location Ratio (SPLSR) between pairs of simultaneously transmitting antennas:

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

Where:

SAR₁ is the highest measured or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

SAR₂ is the highest measured or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

Ri is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$

A new threshold of 0.04 is also introduced in the draft KDB. Thus, in order for a pair of simultaneous transmitting antennas with the sum of 1-g SAR > 1.6 W/kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:

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

14.1. Sum of the SAR for CDMA BC0, Wi-Fi 2.4 GHz Band, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario			Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		CDMA BC0	WiFi DTS Band	Bluetooth		
Head	Left Touch	0.563	0.248		0.811	No
		0.563			0.563	No
	Left Tilt	0.355	0.207		0.562	No
		0.355			0.355	No
	Right Touch	0.464	0.141		0.605	No
		0.464			0.464	No
	Right Tilt	0.321	0.138		0.459	No
		0.321			0.321	No
Body-worn, Hotspot, and Wi-Fi Direct	Rear	0.811	0.102		0.913	No
		0.811			0.811	No
		0.811		0.189	1.000	No
	Front	0.431	0.044		0.475	No
		0.431			0.431	No
		0.431		0.189	0.620	No
Hotspot and Wi-Fi Direct	Edge 1		0.056		0.056	No
	Edge 2		0.034		0.034	No
	Edge 3	0.250			0.250	No
	Edge 4	0.672			0.672	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.2. Sum of the SAR for CDMA BC0, Wi-Fi 5 GHz Bands, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		CDMA BC0	WiFi 5.8 GHz DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.563	0.261			0.824	No
		0.563		0.264		0.827	No
	Left Tilt	0.355	0.254			0.609	No
		0.355		0.232		0.587	No
	Right Touch	0.464	0.218			0.682	No
		0.464		0.199		0.663	No
	Right Tilt	0.321	0.255			0.576	No
		0.321		0.199		0.520	No
Body-worn, Hotspot, and Wi-Fi Direct	Rear	0.811	0.104			0.915	No
		0.811		0.105		0.916	No
		0.811			0.189	1.000	No
	Front	0.431	0.044			0.475	No
		0.431		0.045		0.476	No
		0.431			0.189	0.620	No
Hotspot and Wi-Fi Direct	Edge 1		0.129			0.129	No
	Edge 2		0.016			0.016	No
	Edge 3	0.250				0.250	No
	Edge 4	0.672				0.672	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.3. Sum of the SAR for CDMA BC1, Wi-Fi 2.4 GHz Band, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario			Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		CDMA BC1	WiFi DTS Band	Bluetooth		
Head	Left Touch	0.780	0.248		1.028	No
		0.780			0.780	No
	Left Tilt	0.198	0.207		0.405	No
		0.198			0.198	No
	Right Touch	0.434	0.141		0.575	No
		0.434			0.434	No
	Right Tilt	0.234	0.138		0.372	No
		0.234			0.234	No
Body-worn, Hotspot, and Wi-Fi Direct	Rear	1.090	0.102		1.192	No
		1.090			1.090	No
		1.090		0.189	1.279	No
	Front	0.751	0.044		0.795	No
		0.751			0.751	No
		0.751		0.189	0.940	No
Hotspot and Wi-Fi Direct	Edge 1		0.056		0.056	No
	Edge 2		0.034		0.034	No
	Edge 3	0.127			0.127	No
	Edge 4	0.566			0.566	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.4. Sum of the SAR for CDMA BC1, Wi-Fi 5 GHz Bands, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		CDMA BC1	WiFi 5.8 GHz DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.780	0.261			1.041	No
		0.780		0.264		1.044	No
	Left Tilt	0.198	0.254			0.452	No
		0.198		0.232		0.430	No
	Right Touch	0.434	0.218			0.652	No
		0.434		0.199		0.633	No
	Right Tilt	0.234	0.255			0.489	No
		0.234		0.199		0.433	No
Body-worn, Hotspot, and Wi-Fi Direct	Rear	1.090	0.104			1.194	No
		1.090		0.105		1.195	No
		1.090			0.189	1.279	No
	Front	0.751	0.044			0.795	No
		0.751		0.045		0.796	No
		0.751			0.189	0.940	No
Hotspot and Wi-Fi Direct	Edge 1		0.129			0.129	No
	Edge 2		0.016			0.016	No
	Edge 3	0.127				0.127	No
	Edge 4	0.566				0.566	No

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.5. Sum of the SAR for LTE Band 4, Wi-Fi 2.4 GHz Band, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario			Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 4	WiFi DTS Band	Bluetooth		
Head	Left Touch	0.340	0.248		0.588	No
		0.340			0.340	No
	Left Tilt	0.222	0.207		0.429	No
		0.222			0.222	No
	Right Touch	0.449	0.141		0.590	No
		0.449			0.449	No
	Right Tilt	0.195	0.138		0.333	No
		0.195			0.195	No
Body-worn, Hotspot, and Wi-Fi Direct	Rear	1.074	0.102		1.176	No
		1.074			1.074	No
		1.074		0.189	1.263	No
	Front	0.768	0.044		0.812	No
		0.768			0.768	No
		0.768		0.189	0.957	No
Hotspot and Wi-Fi Direct	Edge 1		0.056		0.056	No
	Edge 2	0.267	0.034		0.301	No
	Edge 3	0.507			0.507	No
	Edge 4					

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.6. Sum of the SAR for LTE Band 4, Wi-Fi 5 GHz Bands, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 4	WiFi 5.8 GHz DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.340	0.261			0.601	No
		0.340		0.264		0.604	No
	Left Tilt	0.222	0.254			0.476	No
		0.222		0.232		0.454	No
	Right Touch	0.449	0.218			0.667	No
		0.449		0.199		0.648	No
	Right Tilt	0.195	0.255			0.450	No
		0.195		0.199		0.394	No
Body-worn, Hotspot, and Wi-Fi Direct	Rear	1.074	0.104			1.178	No
		1.074		0.105		1.179	No
		1.074			0.189	1.263	No
	Front	0.768	0.044			0.812	No
		0.768		0.045		0.813	No
		0.768			0.189	0.957	No
Hotspot and Wi-Fi Direct	Edge 1		0.129			0.129	No
	Edge 2	0.267	0.016			0.283	No
	Edge 3	0.507				0.507	No
	Edge 4						

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.7. Sum of the SAR for LTE Band 13, Wi-Fi 2.4 GHz Band, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario			Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 13	WiFi DTS Band	Bluetooth		
Head	Left Touch	0.186	0.248		0.434	No
		0.186			0.186	No
	Left Tilt	0.123	0.207		0.330	No
		0.123			0.123	No
	Right Touch	0.215	0.141		0.356	No
		0.215			0.215	No
	Right Tilt	0.138	0.138		0.276	No
		0.138			0.138	No
Body-worn, Hotspot, and Wi-Fi Direct	Rear	0.445	0.102		0.547	No
		0.445			0.445	No
		0.445		0.189	0.634	No
	Front	0.255	0.044		0.299	No
		0.255			0.255	No
		0.255		0.189	0.444	No
Hotspot and Wi-Fi Direct	Edge 1		0.056		0.056	No
	Edge 2	0.422	0.034		0.456	No
	Edge 3	0.130			0.130	No
	Edge 4					

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.8. Sum of the SAR for LTE Band 13, Wi-Fi 5 GHz Bands, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 13	WiFi 5.8 GHz DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.186	0.261			0.447	No
		0.186		0.264		0.450	No
	Left Tilt	0.123	0.254			0.377	No
		0.123		0.232		0.355	No
	Right Touch	0.215	0.218			0.433	No
		0.215		0.199		0.414	No
	Right Tilt	0.138	0.255			0.393	No
		0.138		0.199		0.337	No
Body-worn, Hotspot, and Wi-Fi Direct	Rear	0.445	0.104			0.549	No
		0.445		0.105		0.550	No
		0.445			0.189	0.634	No
	Front	0.255	0.044			0.299	No
		0.255		0.045		0.300	No
		0.255			0.189	0.444	No
Hotspot and Wi-Fi Direct	Edge 1		0.129			0.129	No
	Edge 2	0.422	0.016			0.438	No
	Edge 3	0.130				0.130	No
	Edge 4						

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.9. Sum of the SAR for SV-LTE

14.9.1. CDMA (Maximum Power), LTE (Power Reduction), Wi-Fi 2.4 GHz Band, & BT

RF Exposure Conditions	Test Position	Voice (Maximum Power)		Data (Reduced Power)		Data		Σ 1-g SAR (mW/g)
		CDMA BC0	CDMA BC1	LTE Band 4	LTE Band 13	WiFi DTS Band	Bluetooth	
Head	Left Touch	0.563		0.092		0.248		0.903
		0.563		0.092				0.655
		0.563			0.067	0.248		0.878
		0.563			0.067			0.630
			0.780	0.092		0.248		1.120
			0.780	0.092				0.872
			0.780		0.067	0.248		1.095
			0.780		0.067			0.847
	Left Tilt	0.355		0.061		0.207		0.623
		0.355		0.061				0.416
		0.355			0.043	0.207		0.605
		0.355			0.043			0.398
			0.198	0.061		0.207		0.466
			0.198	0.061				0.259
			0.198		0.043	0.207		0.448
			0.198		0.043			0.241
	Right Touch	0.464		0.137		0.141		0.742
		0.464		0.137				0.601
		0.464			0.076	0.141		0.680
		0.464			0.076			0.539
			0.433	0.137		0.141		0.711
			0.433	0.137				0.570
			0.433		0.076	0.141		0.650
			0.433		0.076			0.509
	Right Tilt	0.321		0.057		0.138		0.516
		0.321		0.057				0.378
		0.321			0.049	0.138		0.508
		0.321			0.049			0.370
			0.214	0.057		0.138		0.409
			0.214	0.057				0.271
			0.214		0.049	0.130		0.393
			0.214		0.049			0.263
Body-worn, Hotspot, and Wi-Fi Direct	Rear	0.811		0.315		0.102		1.228
		0.811		0.315				1.126
		0.811		0.315			0.189	1.315
		0.811			0.179	0.102		1.092
		0.811			0.179			0.990
		0.811			0.179		0.189	1.179
			1.080	0.315		0.102		1.497
			1.080	0.315				1.395
			1.080	0.315			0.189	1.584
			1.080		0.179	0.102		1.361
			1.080		0.179			1.259
			1.080		0.179		0.189	1.448
	Front	0.431		0.334		0.044		0.809
		0.431		0.334				0.765
		0.431		0.334			0.189	0.954
		0.431			0.094	0.044		0.569
		0.431			0.094			0.525
		0.431			0.094		0.189	0.714
			0.740	0.334		0.044		1.118
			0.740	0.334				1.074
			0.740	0.334			0.189	1.263
			0.740		0.094	0.044		0.878
			0.740		0.094			0.834
			0.740		0.094		0.189	1.023
Hotspot and Wi-Fi Direct	Edge 1					0.056		0.056
	Edge 2			0.115		0.034		0.149
	Edge 3				0.152	0.034		0.186
		0.250		0.136				0.386
		0.250			0.050			0.300
			0.123	0.136				0.259
	Edge 4		0.123		0.050			0.173
		0.672						0.672
			0.566					0.566

14.9.2. CDMA (Maximum Power), LTE (Power Reduction), Wi-Fi 5 GHz Bands, & BT

RF Exposure Conditions	Test Position	Voice (Maximum Power)		Data (Reduced Power)		Data			Σ 1-g SAR (mW/g)
		CDMA BC0	CDMA BC1	LTE Band 4	LTE Band 13	WiFi 5.8 GHz DTS Band	WiFi UNII Band	Bluetooth	
Head	Left Touch	0.563		0.092		0.261			0.916
		0.563		0.092			0.264		0.919
		0.563			0.067	0.261			0.891
		0.563			0.067		0.264		0.894
			0.780	0.092		0.261			1.133
			0.780	0.092			0.264		1.136
			0.780		0.067	0.261			1.108
			0.780		0.067		0.264		1.111
	Left Tilt	0.355		0.061		0.254			0.670
		0.355		0.061			0.232		0.648
		0.355			0.043	0.254			0.652
		0.355			0.043		0.232		0.630
			0.198	0.061		0.254			0.513
			0.198	0.061			0.232		0.491
			0.198		0.043	0.254			0.495
			0.198		0.043		0.232		0.473
	Right Touch	0.464		0.137		0.218			0.819
		0.464		0.137			0.199		0.800
		0.464			0.076	0.218			0.757
		0.464			0.076		0.199		0.738
			0.433	0.137		0.218			0.788
			0.433	0.137			0.199		0.769
			0.433		0.076	0.218			0.727
			0.433		0.076		0.199		0.708
	Right Tilt	0.321		0.057		0.255			0.633
		0.321		0.057			0.199		0.577
		0.321			0.049	0.255			0.625
		0.321			0.049		0.199		0.569
			0.214	0.057		0.255			0.526
			0.214	0.057			0.199		0.470
			0.214		0.049	0.255			0.518
			0.214		0.049		0.199		0.462
Body-worn, Hotspot, and Wi-Fi Direct	Rear	0.811		0.315		0.104			1.230
		0.811		0.315			0.105		1.231
		0.811		0.315				0.189	1.315
		0.811			0.179	0.104			1.094
		0.811			0.179		0.105		1.095
		0.811			0.179			0.189	1.179
			1.080	0.315		0.104			1.499
			1.080	0.315			0.105		1.500
			1.080	0.315				0.189	1.584
			1.080		0.179	0.104			1.363
			1.080		0.179		0.105		1.364
			1.080		0.179			0.189	1.448
	Front	0.431		0.334		0.044			0.809
		0.431		0.334			0.045		0.810
		0.431		0.334				0.189	0.954
		0.431			0.094	0.044			0.569
		0.431			0.094		0.045		0.570
		0.431			0.094			0.189	0.714
			0.740	0.334		0.044			1.118
			0.740	0.334			0.045		1.119
			0.740	0.334				0.189	1.263
			0.740		0.094	0.044			0.878
			0.740		0.094		0.045		0.879
			0.740		0.094			0.189	1.023
Hotspot and Wi-Fi Direct	Edge 1					0.129			0.129
	Edge 2			0.115		0.016			0.131
					0.152	0.016			0.168
	Edge 3	0.250		0.136					0.386
		0.250			0.050				0.300
			0.123	0.136					0.259
			0.123		0.050				0.173
	Edge 4	0.672							0.672
			0.566						0.566

14.9.3. CDMA (Power Reduction), LTE (Maximum Power), Wi-Fi 2.4 GHz Band, & BT

RF Exposure Conditions	Test Position	Voice (Power Reduction)		Data (Maximum Power)		Data		Σ 1-g SAR (mW/g)
		CDMA BC0	CDMA BC1	LTE Band 4	LTE Band 13	WiFi DTS Band	Bluetooth	
Head	Left Touch	0.115		0.340		0.248		0.703
		0.115		0.340				0.455
		0.115			0.192	0.248		0.555
		0.115			0.192			0.307
			0.204	0.340		0.248		0.791
			0.204	0.340				0.543
			0.204		0.192	0.248		0.644
			0.204		0.192			0.396
	Left Tilt	0.076		0.222		0.207		0.505
		0.076		0.222				0.298
		0.076			0.125	0.207		0.408
		0.076			0.125			0.201
			0.053	0.222		0.207		0.482
			0.053	0.222				0.275
			0.053		0.125	0.207		0.385
			0.053		0.125			0.178
	Right Touch	0.096		0.449		0.141		0.686
		0.096		0.449				0.545
		0.096			0.219	0.141		0.456
		0.096			0.219			0.315
			0.102	0.449		0.141		0.693
			0.102	0.449				0.552
			0.102		0.219	0.141		0.462
			0.102		0.219			0.321
	Right Tilt	0.070		0.195		0.138		0.404
		0.070		0.195				0.266
		0.070			0.146	0.138		0.354
		0.070			0.146			0.216
			0.058	0.195		0.138		0.392
			0.058	0.195				0.254
			0.058		0.146	0.130		0.334
			0.058		0.146			0.204
Body-worn, Hotspot, and Wi-Fi Direct	Rear	0.212		1.074		0.102		1.388
		0.212		1.074				1.286
		0.212		1.074			0.189	1.475
		0.212			0.445	0.102		0.759
		0.212			0.445			0.657
		0.212			0.445		0.189	0.846
			0.276	1.074		0.102		1.452
			0.276	1.074				1.350
			0.276	1.074			0.189	1.539
			0.276		0.445	0.102		0.823
			0.276		0.445			0.721
			0.276		0.445		0.189	0.910
	Front	0.117		0.768		0.044		0.929
		0.117		0.768				0.885
		0.117		0.768			0.189	1.074
		0.117			0.255	0.044		0.416
		0.117			0.255			0.372
		0.117			0.255		0.189	0.561
			0.191	0.768		0.044		1.003
			0.191	0.768				0.959
			0.191	0.768			0.189	1.148
			0.191		0.255	0.044		0.490
			0.191		0.255			0.446
			0.191		0.255		0.189	0.635
Hotspot and Wi-Fi Direct	Edge 1					0.056		0.056
	Edge 2			0.267		0.034		0.301
					0.422	0.034		0.456
	Edge 3	0.070		0.507				0.577
		0.070			0.130			0.200
			0.033	0.507				0.540
			0.033		0.130			0.163
	Edge 4	0.215						0.215
			0.143					0.143

14.9.4. CDMA (Power Reduction), LTE (Maximum Power), Wi-Fi 5 GHz Bands, & BT

RF Exposure Conditions	Test Position	Voice (Power Reduction)		Data (Maximum Power)		Data			Σ 1-g SAR (mW/g)
		CDMA BC0	CDMA BC1	LTE Band 4	LTE Band 13	WiFi 5.8 GHz DTS Band	WiFi UNII Band	Bluetooth	
Head	Left Touch	0.115		0.340		0.261			0.716
		0.115		0.340			0.264		0.719
		0.115			0.192	0.261			0.568
		0.115			0.192		0.264		0.571
			0.204	0.340		0.261			0.804
			0.204	0.340			0.264		0.807
			0.204		0.192	0.261			0.657
			0.204		0.192		0.264		0.660
	Left Tilt	0.076		0.222		0.254			0.552
		0.076		0.222			0.232		0.530
		0.076			0.125	0.254			0.455
		0.076			0.125		0.232		0.433
			0.053	0.222		0.254			0.529
			0.053	0.222			0.232		0.507
			0.053		0.125	0.254			0.432
			0.053		0.125		0.232		0.410
	Right Touch	0.096		0.449		0.218			0.763
		0.096		0.449			0.199		0.744
		0.096			0.219	0.218			0.533
		0.096			0.219		0.199		0.514
			0.102	0.449		0.218			0.770
			0.102	0.449			0.199		0.751
			0.102		0.219	0.218			0.539
			0.102		0.219		0.199		0.520
	Right Tilt	0.070		0.195		0.255			0.521
		0.070		0.195			0.199		0.465
		0.070			0.146	0.255			0.471
		0.070			0.146		0.199		0.415
			0.058	0.195		0.255			0.509
			0.058	0.195			0.199		0.453
			0.058		0.146	0.255			0.459
			0.058		0.146		0.199		0.403
Body-worn, Hotspot, and Wi-Fi Direct	Rear	0.212		1.074		0.104			1.390
		0.212		1.074			0.105		1.391
		0.212		1.074				0.189	1.475
		0.212			0.445	0.104			0.761
		0.212			0.445		0.105		0.762
		0.212			0.445			0.189	0.846
			0.276	1.074		0.104			1.454
			0.276	1.074			0.105		1.455
			0.276	1.074				0.189	1.539
			0.276		0.445	0.104			0.825
			0.276		0.445		0.105		0.826
			0.276		0.445			0.189	0.910
	Front	0.117		0.768		0.044			0.929
		0.117		0.768			0.045		0.930
		0.117		0.768				0.189	1.074
		0.117			0.255	0.044			0.416
		0.117			0.255		0.045		0.417
		0.117			0.255			0.189	0.561
			0.191	0.768		0.044			1.003
			0.191	0.768			0.045		1.004
			0.191	0.768				0.189	1.148
			0.191		0.255	0.044			0.490
			0.191		0.255		0.045		0.491
			0.191		0.255			0.189	0.635
Hotspot and Wi-Fi Direct	Edge 1					0.129			0.129
	Edge 2			0.267		0.016			0.283
					0.422	0.016			0.438
	Edge 3	0.070		0.507					0.577
		0.070			0.130				0.200
			0.033	0.507					0.540
			0.033		0.130				0.163
	Edge 4	0.215							0.215
			0.143						0.143

15. Appendixes

Refer to the separated files for the following appendixes:

- 15.1. Photos and Antenna Locations**
- 15.2. System Performance Check Plots**
- 15.3. Highest SAR Test Plots**
- 15.4. Calibration Certificate for E-Field Probe EX3DV4 - SN 3749**
- 15.5. Calibration Certificate for E-Field Probe EX3DV4 - SN 3772**
- 15.6. Calibration Certificate for E-Field Probe EX3DV4 - SN 3686**
- 15.7. Calibration Certificate for E-Field Probe EX3DV4 - SN 3885**
- 15.8. Calibration Certificate for D750V2 - SN 1071**
- 15.9. Calibration Certificate for D835V2 - SN 4d002**
- 15.10. Calibration Certificate for D1750V2 - SN 1077**
- 15.11. Calibration Certificate for D1900V2- SN 5d043**
- 15.12. Calibration Certificate for D2450V2 – SN 748**
- 15.13. Calibration Certificate for D5GHzV2 – SN 1138**

END OF REPORT