



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

(Class II Permissive Change)

SAR EVALUATION REPORT

For

GSM/CDMA/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac and NFC

**Model: VS985, LG-VS985, LGVS985, AS985, LG-AS985, and LGAS985
FCC ID: ZNFVS985**

**Report Number: 14U17777-S7A
Issue Date: 6/17/2014**

Prepared for

**LG ELECTRONICS MOBILECOMM U.S.A., INC.
1000 SYLVAN AVE.
ENGLEWOOD CLIFFS, NJ 07632**

Prepared by

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



NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	6/5/2014	Initial Issue	--
A	6/17/2014	1. Sec. 7.3, 7.5, 9.4, 9.5, & 12.9: Updated LTE Band 13 output power	Kenneth Mak

Table of Contents

1. Attestation of Test Results..... 7

2. Test Methodology 8

3. Facilities and Accreditation 8

4. Calibration and Uncertainty 9

 4.1. *Measuring Instrument Calibration 9*

 4.2. *Measurement Uncertainty..... 10*

5. Measurement System Description and Setup..... 11

6. SAR Measurement Procedure..... 12

 6.1. *Normal SAR Measurement Procedure..... 12*

 6.2. *Volume Scan Procedures 14*

7. Device Under Test..... 15

 7.1. *General Information 15*

 7.2. *Wireless Technologies..... 16*

 7.3. *RF Output Power Tolerance 17*

 7.4. *Simultaneous Transmission Condition 18*

 7.5. *General LTE SAR Test and Reporting Considerations..... 19*

8. RF Exposure Conditions 20

 8.1. *Head Exposure Conditions 20*

 8.2. *Body-worn Accessory Exposure Conditions..... 20*

 8.3. *Hotspot Exposure Conditions..... 21*

 8.4. *Wi-Fi Direct Exposure Conditions 22*

9. RF Output Power Measurement..... 23

 9.1. *GSM 23*

 9.2. *CDMA..... 24*

 9.3. *W-CDMA 25*

 9.4. *LTE Band..... 29*

 9.5. *SV-LTE..... 36*

 9.5.1. *CDMA BC0 + LTE Band 4 36*

 9.5.2. *CDMA BC1 + LTE Band 4 37*

 9.5.3. *CDMA BC0 + LTE Band 13 38*

 9.5.4. *CDMA BC1 + LTE Band 13 39*

 9.6. *Wi-Fi (2.4 GHz Band)..... 40*

9.7.	<i>Wi-Fi (5 GHz Bands)</i>	41
9.8.	<i>Bluetooth</i>	46
10.	Tissue Dielectric Properties	47
10.1.	<i>Composition of Ingredients for the Tissue Material Used in the SAR Tests</i>	48
10.2.	<i>Tissue Dielectric Parameter Check Results</i>	49
11.	System Performance Check	52
11.1.	<i>System Performance Check Measurement Conditions</i>	52
11.2.	<i>Reference SAR Values for System Performance Check</i>	53
11.3.	<i>System Performance Check Results</i>	54
12.	SAR Test Results	56
12.1.	<i>GSM850</i>	57
12.2.	<i>GSM1900</i>	57
12.3.	<i>CDMA BC0</i>	58
12.3.1.	<i>Maximum Power</i>	58
12.3.2.	<i>Power Reduction</i>	58
12.4.	<i>CDMA BC1</i>	59
12.4.1.	<i>Maximum Power</i>	59
12.4.2.	<i>Power Reduction</i>	59
12.5.	<i>W-CDMA Band V</i>	60
12.6.	<i>W-CDMA Band II</i>	60
12.7.	<i>LTE Band 4 (20MHz Bandwidth)</i>	61
12.7.1.	<i>Maximum Power</i>	61
12.7.2.	<i>Power Reduction</i>	61
12.8.	<i>LTE Band 7 (20MHz Bandwidth)</i>	62
12.9.	<i>LTE Band 13 (10MHz Bandwidth)</i>	63
12.9.1.	<i>Maximum Power</i>	63
12.9.2.	<i>Power Reduction</i>	63
12.10.	<i>Wi-Fi (DTS Band)</i>	64
12.10.1.	<i>2.4 GHz Band</i>	64
12.10.2.	<i>5.8 GHz Band</i>	64
12.11.	<i>Wi-Fi (UNII Band)</i>	65
12.12.	<i>Additional Testing in 802.11ac Mode for Highest 802.11a mode</i>	66
12.12.1.	<i>5 GHz Bands</i>	66
12.13.	<i>Bluetooth</i>	67
12.13.1.	<i>Standalone SAR Test Exclusion Considerations</i>	67

12.13.2. Estimated SAR..... 67

13. SAR Measurement Variability..... 68

13.1. The Highest Measured SAR Configuration in Each Frequency Band 68

13.2. Repeated Measurement Results 69

14. Simultaneous Transmission SAR Analysis..... 70

14.1. Sum of the SAR for GSM 850 & Wi-Fi 2.4 GHz Band & BT..... 71

14.2. Sum of the SAR for GSM 850 & Wi-Fi 5 GHz Bands & BT 71

14.3. Sum of the SAR for GSM 1900 & Wi-Fi 2.4 GHz Band & BT..... 72

14.4. Sum of the SAR for GSM 1900 & Wi-Fi 5 GHz Bands & BT 72

14.5. Sum of the SAR for CDMA BC0 & Wi-Fi 2.4 GHz Band & BT..... 73

14.6. Sum of the SAR for CDMA BC0 & Wi-Fi 5 GHz Bands & BT..... 73

14.7. Sum of the SAR for CDMA BC1 & Wi-Fi 2.4 GHz & BT..... 74

14.8. Sum of the SAR for CDMA BC1 & Wi-Fi 5 GHz Bands & BT..... 74

14.9. Sum of the SAR for W-CDMA Band V & Wi-Fi 2.4 GHz & BT..... 75

14.10. Sum of the SAR for W-CDMA Band V & Wi-Fi 5 GHz Bands & BT..... 75

14.11. Sum of the SAR for W-CDMA Band II & Wi-Fi 2.4 GHz & BT 76

14.12. Sum of the SAR for W-CDMA Band II & Wi-Fi 5 GHz Bands & BT 76

14.13. Sum of the SAR for LTE Band 4 & Wi-Fi 2.4 GHz & BT 77

14.14. Sum of the SAR for LTE Band 4 & Wi-Fi 5 GHz Bands & BT 77

14.15. Sum of the SAR for LTE Band 7 & Wi-Fi 2.4 GHz & BT 78

14.16. Sum of the SAR for LTE Band 7 & Wi-Fi 5 GHz Bands & BT 78

14.17. Sum of the SAR for LTE Band 13 & Wi-Fi 2.4 GHz & BT..... 79

14.18. Sum of the SAR for LTE Band 13 & Wi-Fi 5 GHz Bands & BT..... 79

14.19. Sum of the SAR for SV-LTE..... 80

14.19.1. CDMA (Maximum Power), LTE (Power Reduction), Wi-Fi 2.4 GHz Band, & BT 80

14.19.2. CDMA (Maximum Power), LTE (Power Reduction), Wi-Fi 5 GHz Bands, & BT 81

14.19.3. CDMA (Power Reduction), LTE (Maximum Power), Wi-Fi 2.4 GHz Band, & BT 82

14.19.4. CDMA (Power Reduction), LTE (Maximum Power), Wi-Fi 5 GHz Bands, & BT 83

15. Appendixes..... 84

15.1. Photos and Antenna Locations..... 84

15.2. System Performance Check Plots 84

15.3. Highest SAR Test Plots..... 84

15.4. Calibration Certificate for E-Field Probe EX3DV4 - SN 3885..... 84

15.5. Calibration Certificate for E-Field Probe EX3DV4 - SN 3749..... 84

15.6. Calibration Certificate for E-Field Probe EX3DV4 - SN 3901..... 84

15.7.	Calibration Certificate for E-Field Probe EX3DV4 - SN 3686.....	84
15.8.	Calibration Certificate for E-Field Probe EX3DV4 - SN 3989.....	84
15.9.	Calibration Certificate for E-Field Probe EX3DV4 - SN 3990.....	84
15.10.	Calibration Certificate for D750V3 - SN 1019.....	84
15.11.	Calibration Certificate for D835V2 - SN 4d002.....	84
15.12.	Calibration Certificate for D1750V2- SN 1053.....	84
15.13.	Calibration Certificate for D1750V2- SN 1077.....	84
15.14.	Calibration Certificate for D1900V2- SN 5d043.....	84
15.15.	Calibration Certificate for D2450V2 - SN 748.....	84
15.16.	Calibration Certificate for D2600V2 - SN 1036.....	84
15.17.	Calibration Certificate for D5GHzV2 – SN 1003.....	84

1. Attestation of Test Results


Applicant	LG ELECTRONICS MOBILECOMM U.S.A., INC.			
DUT description	GSM/CDMA/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac and NFC			
Model	VS985, LG-VS985, LGVS985, AS985, LG-AS985, and LGAS985			
Test device is	An identical prototype			
Device category	Portable			
Exposure category	General Population/Uncontrolled Exposure			
Date tested	5/12/2014 – 5/23/2014			
The highest reported SAR values	RF exposure condition	Licensed	DTS	UNII
	Head	0.561 W/kg	0.278 W/kg	0.284 W/kg
	Body-worn Accessory	0.964 W/kg	0.180 W/kg	0.196 W/kg
	Wireless Router (Hotspot)	0.964 W/kg	0.180 W/kg	N/A
	Wi-Fi Direct	N/A	0.180 W/kg	N/A
	Simultaneous Transmission	1.341 W/kg	1.325 W/kg	1.341 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.

Approved & Released By:

Prepared By:

Bobby Bayani
 WiSE Senior Engineer
 UL Verification Services Inc.

Kenneth Mak
 WiSE Laboratory Engineer
 UL Verification Services Inc.

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 v05r02
- 648474 D03 Wireless Chargers Battery Cover v01r02
- 648474 D04 Handset SAR v01r02
- 941225 D01 SAR test for 3G devices v02
- 941225 D02 HSPA and 1x Advanced v02r02
- 941225 D03 SAR Test Reduction GSM GPRS EDGE v01
- 941225 D04 SAR for GSM E GPRS Dual Xfer Mode v01
- 941225 D05 SAR for LTE Devices v02r03
- 941225 D06 Hotspot Mode SAR v01r01
- 248227 D01 SAR Meas for 802 11abg v01r02
- 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03
- 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 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	
SAR Lab G	
SAR Lab H	

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	MY40001647	7/11/2014
Dielectronic Probe kit	SPEAG	DAK-3.5	1082	9/10/2014
Dielectronic 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	HP	8665B	3744A01155	3/12/2015
Power Meter	HP	437B	3125U11364	8/26/2014
Power Meter	HP	437B	3125U12345	7/29/2014
Power Sensor	HP	8481A	1926A27048	7/29/2014
Power Sensor	HP	8481A	2702A76223	9/17/2014
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1795092	N/A
Directional coupler	Werlatone	C8060-102	2141	N/A
DC Power Supply	BK Precision	1611	215-02292	N/A
E-Field Probe	SPEAG	EX3DV4	3885	9/18/2014
E-Field Probe	SPEAG	EX3DV4	3749	1/29/2015
E-Field Probe	SPEAG	EX3DV4	3901	2/25/2015
E-Field Probe	SPEAG	EX3DV4	3686	3/18/2015
E-Field Probe	SPEAG	EX3DV4	3989	4/15/2015
E-Field Probe	SPEAG	EX3DV4	3990	4/15/2015
Data Acquisition Electronics	SPEAG	DAE4	1343	7/24/2014
Data Acquisition Electronics	SPEAG	DAE4	1352	9/11/2014
Data Acquisition Electronics	SPEAG	DAE4	1357	2/17/2015
Data Acquisition Electronics	SPEAG	DAE4	1433	4/14/2015
Data Acquisition Electronics	SPEAG	DAE4	1434	4/14/2015
Data Acquisition Electronics	SPEAG	DAE4	1239	4/15/2015
System Validation Dipole	SPEAG	D750V3	1019	3/17/2015
System Validation Dipole	SPEAG	D835V2	4d002	11/15/2014
System Validation Dipole	SPEAG	D1750V2	1053	8/27/2014
System Validation Dipole	SPEAG	D1750V2	1077	9/12/2014
System Validation Dipole	SPEAG	D1900V2	5d043	11/12/2014
System Validation Dipole	SPEAG	D2450V2	748	2/18/2015
System Validation Dipole	SPEAG	D2600V2	1036	3/12/2015
System Validation Dipole	SPEAG	D5GHzV2	1003	2/26/2015

Others

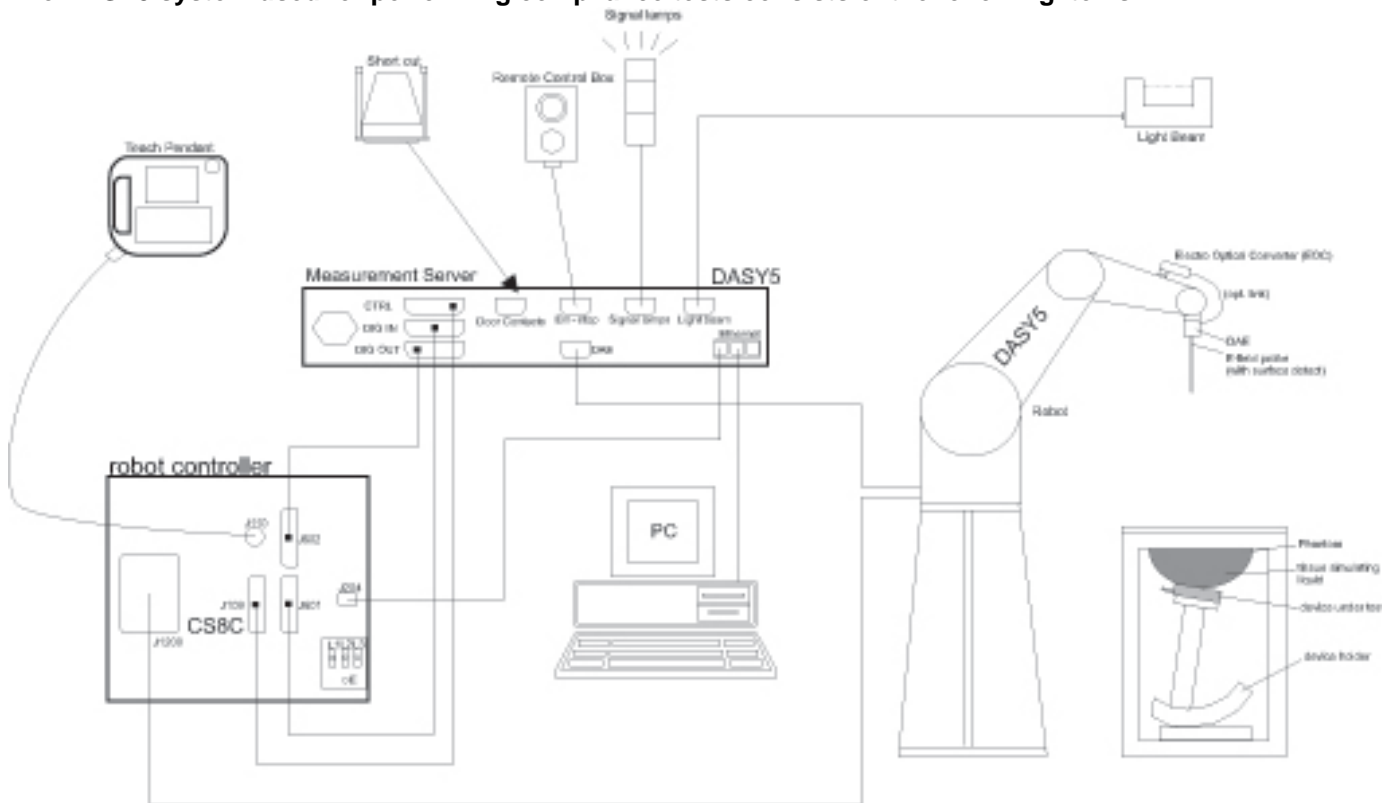
Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Power Sensor	Agilent	N1921A	MY52260009	12/12/2014
Power Meter	Agilent	N1912A	MY50001018	8/23/2014
Base Station Simulator	Agilent	8960 Series 10	MY53211024	9/11/2014
Base Station Simulator	R & S	CMU200	106301	7/3/2014
Base Station Simulator	R & S	CMW500	132910-cp	4/25/2015
Base Station Simulator	R & S	CMW500	132909-bp	2/20/2015

4.2. Measurement Uncertainty

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

5. Measurement System Description and Setup

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



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

6. SAR Measurement Procedure

6.1. Normal SAR Measurement Procedure

Step 1: Power Reference Measurement

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

Step 2: Area Scan

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

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

	≤ 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: Δx_{Area} , Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 3: Zoom Scan

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

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

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

Step 4: Power drift measurement

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

Step 5: Z-Scan (FCC only)

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

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. <input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 2.4 GHz) <input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 5.8 GHz)
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 2.4 GHz) <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 5.8 GHz)
Device dimension	Overall (Length x Width): 146.3 mm x 74.6 mm Overall Diagonal: 157.5 mm Display Diagonal: 140.0 mm
Back Cover	<input checked="" type="checkbox"/> Normal Battery Cover with NFC <input checked="" type="checkbox"/> Wireless Charger Battery Cover with Front Screen Cover <input checked="" type="checkbox"/> Normal Battery Cover with Front Screen Cover (SAR testing was deemed unnecessary. Normal test procedures were performed. Additional testing was performed on the Wireless Charger Battery Cover with Front Screen Cover)
Accessory	<input checked="" type="checkbox"/> Headset
Battery Options	<input checked="" type="checkbox"/> Standard – Lithium-ion battery, Rating 3.8Vdc, 3000mAh <input type="checkbox"/> Extended (large capacity)

7.2. Wireless Technologies

Wireless Technology and Frequency Bands	GSM: 850 / 1900 CDMA BC 0 / 1 W-CDMA Band: V / II LTE (FDD) Band: 4 / 7 / 13 Wi-Fi : 2.4 / 5 GHz Bluetooth: 2.4 GHz.
Mode	GSM - <input checked="" type="checkbox"/> Voice (GMSK) - <input checked="" type="checkbox"/> GPRS (GMSK) - <input checked="" type="checkbox"/> EGPRS (8PSK) CDMA2000 - <input checked="" type="checkbox"/> 1xRTT (Voice & Data) - <input checked="" type="checkbox"/> 1xEVDO Rel. 0 - <input checked="" type="checkbox"/> 1xEVDO Rev. A W-CDMA - <input checked="" type="checkbox"/> UMTS Rel. 99 (Voice & Data) - <input checked="" type="checkbox"/> HSDPA (Rel. 5) - <input checked="" type="checkbox"/> HSUPA (Rel. 6) - <input checked="" type="checkbox"/> HSPA+ (Rel. 7) LTE - <input checked="" type="checkbox"/> QPSK - <input checked="" type="checkbox"/> 16QAM Wi-Fi 2.4GHz (802.11b/g/n) - <input checked="" type="checkbox"/> 802.11b - <input checked="" type="checkbox"/> 802.11g - <input checked="" type="checkbox"/> 802.11n (HT20) Wi-Fi 5GHz (802.11a/n/ac) - <input checked="" type="checkbox"/> 802.11a - <input checked="" type="checkbox"/> 802.11n (HT20) - <input checked="" type="checkbox"/> 802.11n (HT40) - <input checked="" type="checkbox"/> 802.11ac (HT20) - <input checked="" type="checkbox"/> 802.11ac (HT40) - <input checked="" type="checkbox"/> 802.11ac (HT80) Bluetooth - <input checked="" type="checkbox"/> Version 4.0 LE
Duty Cycle (Used for SAR testing)	GSM Voice: 12.5%; GPRS 1 Slot: 12.5%; 2 Slots: 25% CDMA: 100% W-CDMA: 100% LTE (FDD): 100% Wi-Fi 802.11a/b/g/n/ac: 100%
GPRS Multi-Slot Class	<input type="checkbox"/> Class 8 - One Up <input checked="" type="checkbox"/> Class 10 - Two Up <input type="checkbox"/> Class 12 - Four Up <input type="checkbox"/> Class 33 - Four Up
VoIP	<input checked="" type="checkbox"/> Supported
SV-LTE	<input checked="" type="checkbox"/> Supported

7.3. RF Output Power Tolerance

Upper limit (dB): 0.5 ~ -1.5		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
GSM850	Voice	32.7	33.2
	GPRS 1 slot	32.7	33.2
	GPRS 2 slots	30.7	31.2
	EGPRS 1 slot	27.2	27.7
	EGPRS 2 slots	27.2	27.7
GSM1900	Voice	30.2	30.7
	GPRS 1 slot	30.2	30.7
	GPRS 2 slots	28.2	28.7
	EGPRS 1 slot	26.2	26.7
	EGPRS 2 slots	26.2	26.7
CDMA BC0	1xRTT	24.2	24.7
	1xEVDO Rel. 0	24.2	24.7
	1xEVDO Rev. A	24.2	24.7
CDMA BC1	1xRTT	24.2	24.7
	1xEVDO Rel. 0	24.2	24.7
	1xEVDO Rev. A	24.2	24.7
W-CDMA Band V	R99	23.2	23.7
	HSDPA	23.2	23.7
	HSUPA	23.2	23.7
W-CDMA Band II	R99	23.2	23.7
	HSDPA	23.2	23.7
	HSUPA	23.2	23.7
LTE Band 4	QPSK	23.7	24.2
LTE Band 7	QPSK	21.7	22.2
LTE Band 13	QPSK	24.0	24.5

Upper limit (dB): 1.0		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
WiFi 2.4 GHz	802.11b	16.0	17.0
	802.11g	12.5	13.5
	802.11n HT20	11.5	12.5
WiFi 5 GHz	802.11a	11.0	12.0
	802.11n HT20	10.0	11.0
	802.11n HT40	9.5	10.5
	802.11ac HT20	10.0	11.0
	802.11ac HT40	9.5	10.5
	802.11ac HT80	10.0	11.0

Upper limit (dB): 1.0		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
Bluetooth		6.5	7.5

Upper limit (dB): 1.0		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
Bluetooth LE		2.5	3.5

7.4. Simultaneous Transmission Condition

RF Exposure Condition	Capable Transmit Configurations
Head	<ol style="list-style-type: none"> 1. GSM 850 / 1900 Voice + Wi-Fi 2.4 / 5GHz 2. GSM 850 / 1900 (GPRS / EDGE) + Wi-Fi 2.4 / 5 GHz (VoIP) 3. CDMA 1xRTT BC0 / BC1 + Wi-Fi 2.4 / 5 GHz 4. CDMA 1xEVDO BC0 / BC1 + Wi-Fi 2.4 / 5 GHz (VoIP) 5. WCDMA Band V / II + Wi-Fi 2.4 / 5 GHz 6. LTE Band 4 / 7 / 13 + Wi-Fi 2.4 / 5 GHz 7. CDMA 1x BC0 / BC1 + LTE B4 / B13 + Wi-Fi 2.4 / 5 GHz (SV-LTE + Wi-Fi)
Body-worn Accessory	<ol style="list-style-type: none"> 1. GSM 850 / 1900 Voice + Wi-Fi 2.4 / 5 GHz 2. GSM 850 / 1900 Voice + BT 3. GSM 850 / 1900 (GPRS/EDGE) + Wi-Fi 2.4 / 5 GHz (VoIP) 4. GSM 850 / 1900 (GPRS/EDGE) + BT(VoIP) 5. CDMA 1xRTT BC0 / BC1 + Wi-Fi 2.4 / 5 GHz 6. CDMA 1xRTT BC0 / BC1 + BT 7. CDMA 1xEVDO BC0 / BC1 + Wi-Fi 2.4 / 5 GHz (VoIP) 8. CDMA 1xEVDO BC0 / BC1 + BT (VoIP) 9. WCDMA Band V / II + Wi-Fi 2.4 / 5 GHz 10. WCDMA Band V / II + BT 11. LTE Band 4 / 7 / 13 + Wi-Fi 2.4 / 5 GHz 12. LTE Band 4 / 7 / 13 + BT 13. CDMA 1x BC0 / BC1 + LTE B4 / B13 + Wi-Fi 2.4 / 5 GHz (SV-LTE + Wi-Fi) 14. CDMA 1x BC0 / BC1 + LTE B4 / B13 + BT (SV-LTE + BT)
Wireless Router (Hotspot)	<ol style="list-style-type: none"> 1. GSM 850 / 1900 (GPRS / EDGE) + Wi-Fi 2.4 / 5.8 GHz 2. CDMA 1xEVDO BC0 / BC1 + Wi-Fi 2.4 / 5.8 GHz 3. WCDMA Band V / II + Wi-Fi 2.4 / 5.8 GHz 4. LTE Band 4 / 7 / 13 + Wi-Fi 2.4 / 5.8 GHz 5. CDMA 1x BC0 / BC1 + LTE B4 / B13 + Wi-Fi 2.4 / 5.8 GHz (SV-LTE + Wi-Fi)
Wi-Fi Direct	<ol style="list-style-type: none"> 1. GSM 850 / 1900 (GPRS / EDGE) + Wi-Fi 2.4 / 5.8 GHz (GO / GC) 2. CDMA 1xEVDO BC0 / BC1 + Wi-Fi 2.4 / 5.8 GHz (GO / GC) 3. WCDMA Band V / II + Wi-Fi 2.4 / 5.8 GHz (GO / GC) 4. LTE Band 4 / 7 / 13 + Wi-Fi 2.4 / 5.8 GHz (GO / GC) 5. CDMA 1x BC0 / BC1 + LTE B4 / B13 + Wi-Fi 2.4 / 5.8 GHz (SV-LTE + Wi-Fi) (GO / GC)
<p>Notes:</p> <ol style="list-style-type: none"> 1. GPRS/EDGE, CDMA, W-CDMA, and LTE support VoIP and Hotspot. 2. Wi-Fi 2.4 GHz supports Hotspot and Wi-Fi Direct (GO/GC). 3. Wi-Fi 5 GHz supports Hotspot and Wi-Fi Direct: <ul style="list-style-type: none"> UNII I (5.2 GHz): Wi-Fi Direct GC is only supported (SAR Exclusion), Hotspot is not supported UNII II (5.3 GHz): Wi-Fi Direct/Hotspot is not supported UNII III (5.5 GHz): Wi-Fi Direct/Hotspot is not supported UNII IV (5.8 GHz): Wi-Fi Direct GO/GC and Hotspot are supported (except channel 165: Wi-Fi direct/Hotspot not supported) 4. 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	<table border="1"> <tr> <td rowspan="3">Band 4</td> <td colspan="6">Frequency range: 1710 - 1755 MHz</td> </tr> <tr> <td colspan="6">Channel Bandwidth</td> </tr> <tr> <td>20 MHz</td> <td>15 MHz</td> <td>10 MHz</td> <td>5 MHz</td> <td>3 MHz</td> <td>1.4 MHz</td> </tr> <tr> <td>Low</td> <td>20050</td> <td>20025</td> <td>20000</td> <td>19975</td> <td></td> <td></td> </tr> <tr> <td>Mid</td> <td>20175</td> <td>20175</td> <td>20175</td> <td>20175</td> <td></td> <td></td> </tr> <tr> <td>High</td> <td>20300</td> <td>20325</td> <td>20350</td> <td>20375</td> <td></td> <td></td> </tr> <tr> <td rowspan="3">Band 7</td> <td colspan="6">Frequency range: 2502.5 - 2682.5MHz</td> </tr> <tr> <td colspan="6">Channel Bandwidth</td> </tr> <tr> <td>20 MHz</td> <td>15 MHz</td> <td>10 MHz</td> <td>5 MHz</td> <td>3 MHz</td> <td>1.4 MHz</td> </tr> <tr> <td>Low</td> <td>20850</td> <td>20825</td> <td>20800</td> <td>20775</td> <td></td> <td></td> </tr> <tr> <td>Mid</td> <td>21100</td> <td>21100</td> <td>21100</td> <td>21100</td> <td></td> <td></td> </tr> <tr> <td>High</td> <td>21350</td> <td>21375</td> <td>21400</td> <td>21425</td> <td></td> <td></td> </tr> <tr> <td rowspan="3">Band 13</td> <td colspan="6">Frequency range: 777 - 787 MHz</td> </tr> <tr> <td colspan="6">Channel Bandwidth</td> </tr> <tr> <td>20 MHz</td> <td>15 MHz</td> <td>10 MHz</td> <td>5 MHz</td> <td>3 MHz</td> <td>1.4 MHz</td> </tr> <tr> <td>Low</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mid</td> <td></td> <td></td> <td>23230</td> <td></td> <td></td> <td></td> </tr> <tr> <td>High</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Band 4	Frequency range: 1710 - 1755 MHz						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 7	Frequency range: 2502.5 - 2682.5MHz						Channel Bandwidth						20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz	Low	20850	20825	20800	20775			Mid	21100	21100	21100	21100			High	21350	21375	21400	21425			Band 13	Frequency range: 777 - 787 MHz						Channel Bandwidth						20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz	Low							Mid			23230				High						
	Band 4		Frequency range: 1710 - 1755 MHz																																																																																																																						
			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 7	Frequency range: 2502.5 - 2682.5MHz																																																																																																																							
		Channel Bandwidth																																																																																																																							
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																																																																																																		
	Low	20850	20825	20800	20775																																																																																																																				
	Mid	21100	21100	21100	21100																																																																																																																				
	High	21350	21375	21400	21425																																																																																																																				
	Band 13	Frequency range: 777 - 787 MHz																																																																																																																							
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 two TX/RX antennas and one RX only antenna. Refer to Appendix "Antenna Locations and Separation Distances" for antenna locations																																																																																																																								
Maximum power reduction (MPR)	<p>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3</p> <table border="1"> <thead> <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> </thead> <tbody> <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> </tbody> </table> <p>MPR Built-in by design A-MPR (additional MPR) was disabled during SAR testing</p>	Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																																																																		
Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)																																																																																																																		
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																																																																																																																			
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1																																																																																																																		
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1																																																																																																																		
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																																																																																																		
Power reduction	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <table border="1"> <thead> <tr> <th>Mode</th> <th>CDMA Current Voice Power for BC0 & BC1</th> <th>LTE B4 & B13 Max Power</th> </tr> </thead> <tbody> <tr> <td rowspan="2">SV-LTE</td> <td>P ≤ 17.5 dBm</td> <td>B4: 24.2 dBm (Limited) B13: 24.5 dBm (Limited)</td> </tr> <tr> <td>P > 17.5 dBm</td> <td>B4: 20.2 dBm (Limited) B13: 20.5 dBm (Limited)</td> </tr> </tbody> </table>	Mode	CDMA Current Voice Power for BC0 & BC1	LTE B4 & B13 Max Power	SV-LTE	P ≤ 17.5 dBm	B4: 24.2 dBm (Limited) B13: 24.5 dBm (Limited)	P > 17.5 dBm	B4: 20.2 dBm (Limited) B13: 20.5 dBm (Limited)																																																																																																																
Mode	CDMA Current Voice Power for BC0 & BC1	LTE B4 & B13 Max Power																																																																																																																							
SV-LTE	P ≤ 17.5 dBm	B4: 24.2 dBm (Limited) B13: 24.5 dBm (Limited)																																																																																																																							
	P > 17.5 dBm	B4: 20.2 dBm (Limited) B13: 20.5 dBm (Limited)																																																																																																																							
Spectrum plots for RB configurations	A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																																																																																																								

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 WWAN, WLAN 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 GSM, CDMA, and W-CDMA (①)

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

For LTE Band 4/13(②)

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

For LTE Band 7(③)

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

For Wi-Fi/Bluetooth (⑤)

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

8.3. Hotspot Exposure Conditions

For GSM, CDMA, and W-CDMA (①)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	<25 mm	Yes	
Front	<25 mm	Yes	
Edge 1 (Top)	126.3 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
Edge 2 (Right)	1.5 mm	Yes	
Edge 3 (Bottom)	1.5 mm	Yes	
Edge 4 (Left)	23.1 mm	Yes	

For LTE Band 4/13(②)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	<25 mm	Yes	
Front	<25 mm	Yes	
Edge 1 (Top)	111.7 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
Edge 2 (Right)	56.5 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
Edge 3 (Bottom)	1.5 mm	Yes	
Edge 4 (Left)	1.5 mm	Yes	

For LTE Band 7(③)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	<25 mm	Yes	
Front	<25 mm	Yes	
Edge 1 (Top)	1.5 mm	Yes	
Edge 2 (Right)	41.6 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
Edge 3 (Bottom)	115.3 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
Edge 4 (Left)	1.5 mm	Yes	

For Wi-Fi/Bluetooth (⑤)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	<25 mm	Yes	
Front	<25 mm	Yes	
Edge 1 (Top)	1.5 mm	Yes	
Edge 2 (Right)	22.5 mm	Yes	
Edge 3 (Bottom)	136.1 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
Edge 4 (Left)	38.4 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

8.4. Wi-Fi Direct Exposure Conditions

For Wi-Fi (S)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	<25 mm	Yes	
Front	<25 mm	Yes	
Edge 1 (Top)	1.5 mm	Yes	
Edge 2 (Right)	22.5 mm	Yes	
Edge 3 (Bottom)	136.1 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
Edge 4 (Left)	38.4 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

9. RF Output Power Measurement

9.1. GSM

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Burst Pwr (dBm)	Frame Pwr (dBm)
850	GSM (Voice)	CS1	1	128	824.2	32.7	23.7
				190	836.6	32.7	23.7
				251	848.8	32.9	23.9
	GPRS (GMSK)	CS1	1	128	824.2	32.7	23.7
				190	836.6	32.7	23.7
				251	848.8	32.9	23.9
			2	128	824.2	30.9	24.9
				190	836.6	30.9	24.9
				251	848.8	31.2	25.2
	EGPRS (8PSK)	MCS5	1	128	824.2	27.7	18.6
				190	836.6	27.6	18.6
				251	848.8	27.7	18.6
2			128	824.2	27.5	21.5	
			190	836.6	27.5	21.5	
			251	848.8	27.6	21.5	

Notes:

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

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

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Burst Pwr (dBm)	Frame Pwr (dBm)
1900	GSM (Voice)	CS1	1	512	1850.2	30.2	21.2
				661	1880.0	30.3	21.2
				810	1909.8	30.3	21.3
	GPRS (GMSK)	CS1	1	512	1850.2	30.3	21.2
				661	1880.0	30.3	21.2
				810	1909.8	30.3	21.3
			2	512	1850.2	28.4	22.4
				661	1880.0	28.5	22.4
				810	1909.8	28.4	22.4
	EGPRS (8PSK)	MCS5	1	512	1850.2	26.4	17.4
				661	1880.0	26.5	17.4
				810	1909.8	26.4	17.4
			2	512	1850.2	26.2	20.2
				661	1880.0	26.3	20.2
				810	1909.8	26.3	20.2

Notes:

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

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

9.2. CDMA

1xRTT Measured Results

Band	Mode	Ch	Freq. (MHz)	Avg Pwr (dBm)	Power Reduction (dBm)
BC 0	RC1 SO55 (Loopback)	1013	824.70	24.4	17.0
		384	836.52	24.5	17.1
		777	848.31	24.5	17.3
	RC3 SO55 (Loopback)	1013	824.70	24.3	16.9
		384	836.52	24.5	17.1
		777	848.31	24.5	17.2
	RC3 SO32 (+F-SCH)	1013	824.70	24.3	16.8
		384	836.52	24.5	16.9
		777	848.31	24.4	17.0
BC 1	RC1 SO55 (Loopback)	25	1851.25	24.6	17.0
		600	1880.00	24.6	17.5
		1175	1908.75	24.5	17.5
	RC3 SO55 (Loopback)	25	1851.25	24.6	17.1
		600	1880.00	24.6	17.4
		1175	1908.75	24.6	17.5
	RC3 SO32 (+F-SCH)	25	1851.25	24.6	17.3
		600	1880.00	24.6	17.4
		1175	1908.75	24.6	17.5

1xEv-Do Rel. 0 Measured Results

Band	FTAP Rate	RTAP Rate	Channel	Freq. (MHz)	Avg Pwr (dBm)
BC 0	307.2 kbps (2 slot, QPSK)	153.6 kbps	1013	824.70	24.4
			384	836.52	24.6
			777	848.31	24.5
BC1	307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	24.6
			600	1880.00	24.6
			1175	1908.75	24.6

1xEv-Do Rev. A Measured Results

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	Freq. (MHz)	Avg Pwr (dBm)
BC 0	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	24.4
			384	836.52	24.5
			777	848.31	24.5
BC1	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	24.6
			600	1880.00	24.6
			1175	1908.75	24.6

9.3. W-CDMA

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
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
W-CDMA Band V	Rel 99 (RMC, 12.2 kbps)	4132	826.4	23.6
		4183	836.6	23.5
		4233	846.6	23.7
W-CDMA Band II	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	23.6
		9400	1880.0	23.7
		9538	1907.6	23.7

HSDPA

The following 4 Sub-tests were completed according to Release 5 / 6 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			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{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			
Ahs= β_{hs}/β_c	30/15				

Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
W-CDMA Band V	Subtest 1	4132	826.4	23.4
		4183	836.6	23.4
		4233	846.6	23.6
	Subtest 2	4132	826.4	23.4
		4183	836.6	23.4
		4233	846.6	23.5
	Subtest 3	4132	826.4	22.9
		4183	836.6	22.9
		4233	846.6	23.0
	Subtest 4	4132	826.4	22.9
		4183	836.6	22.9
		4233	846.6	23.0
W-CDMA Band II	Subtest 1	9262	1852.4	23.4
		9400	1880.0	23.4
		9538	1907.6	23.4
	Subtest 2	9262	1852.4	23.4
		9400	1880.0	23.4
		9538	1907.6	23.5
	Subtest 3	9262	1852.4	22.8
		9400	1880.0	23.0
		9538	1907.6	23.0
	Subtest 4	9262	1852.4	22.9
		9400	1880.0	23.0
		9538	1907.6	23.1

Maximum output power levels that are possible for all subtests reported.

HSPA (HSDPA & HSUPA)

The following 5 Sub-tests were completed according to Release 7 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSPA				
	Subtest	1	2	3	4	5
WCDMA 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
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30/15	2/15	5/15
	β_c/β_d	11/15	11/15	15/9	2/15	15/0
	β_{hs}	22/15	12/15	30/15	4/15	5/15
	β_{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				
	A _{hs} = β_{hs}/β_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 Channelisation Codes	2xSF2				SF4	

Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
W-CDMA Band V	Subtest 1	4132	826.4	23.1
		4183	836.6	23.3
		4233	846.6	23.5
	Subtest 2	4132	826.4	21.7
		4183	836.6	21.3
		4233	846.6	21.4
	Subtest 3	4132	826.4	23.1
		4183	836.6	22.7
		4233	846.6	22.9
	Subtest 4	4132	826.4	22.1
		4183	836.6	21.4
		4233	846.6	21.6
	Subtest 5	4132	826.4	23.7
		4183	836.6	23.2
		4233	846.6	23.2
W-CDMA Band II	Subtest 1	9262	1852.4	23.1
		9400	1880.0	23.1
		9538	1907.6	23.5
	Subtest 2	9262	1852.4	21.6
		9400	1880.0	21.7
		9538	1907.6	21.8
	Subtest 3	9262	1852.4	22.5
		9400	1880.0	23.1
		9538	1907.6	23.0
	Subtest 4	9262	1852.4	22.1
		9400	1880.0	22.2
		9538	1907.6	22.1
	Subtest 5	9262	1852.4	23.0
		9400	1880.0	22.9
		9538	1907.6	23.2

9.4. LTE Band

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
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)		
							1720 MHz	1732.5 MHz	1745 MHz
LTE Band 4	20	QPSK	1	0	0	0	24.2	24.1	24.2
			1	50	0	0	24.1	24.1	24.1
			1	99	0	0	24.2	24.1	24.0
			50	0	1	1	23.1	23.1	23.1
			50	25	1	1	23.1	23.1	23.1
			50	50	1	1	23.1	23.1	23.0
			100	0	1	1	23.1	23.1	23.0
		16QAM	1	0	1	1	22.7	22.8	22.9
			1	50	1	1	22.7	22.8	22.7
			1	99	1	1	22.9	22.8	22.7
			50	0	2	2	22.0	22.0	22.0
			50	25	2	2	22.1	22.0	22.0
			50	50	2	2	22.1	22.0	21.8
			100	0	2	2	22.0	22.1	21.9
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1717.5 MHz	1732.5 MHz	1747.5 MHz
LTE Band 4	15	QPSK	1	0	0	0	24.0	24.1	24.1
			1	36	0	0	24.0	24.1	24.1
			1	74	0	0	23.9	24.0	24.0
			36	0	1	1	23.1	23.1	23.1
			36	18	1	1	23.1	23.1	22.9
			36	37	1	1	23.1	23.1	22.9
			75	0	1	1	23.1	23.2	22.9
		16QAM	1	0	1	1	22.5	22.8	23.1
			1	36	1	1	22.5	22.9	23.1
			1	74	1	1	22.5	22.8	23.0
			36	0	2	2	21.9	22.0	21.8
			36	18	2	2	21.9	22.0	21.7
			36	37	2	2	21.9	21.9	21.7
			75	0	2	2	22.0	22.0	21.8
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4	10	QPSK	1	0	0	0	24.0	24.2	24.1
			1	25	0	0	24.0	24.2	24.1
			1	49	0	0	24.0	24.2	24.1
			25	0	1	1	23.0	23.1	23.1
			25	12	1	1	23.0	23.1	23.0
			25	25	1	1	23.1	23.1	23.0
			50	0	1	1	23.1	23.2	23.1
		16QAM	1	0	1	1	22.5	23.0	22.9
			1	25	1	1	22.5	23.0	22.8
			1	49	1	1	22.5	23.0	22.8
			25	0	2	2	21.9	22.1	22.1
			25	12	2	2	22.0	22.1	21.9
			25	25	2	2	21.9	22.1	21.8
			50	0	2	2	22.0	22.1	22.0

LTE Band 4 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1712.5 MHz	1732.5 MHz	1752.5 MHz
LTE Band 4	5	QPSK	1	0	0	0	24.1	24.1	24.2
			1	12	0	0	24.1	24.0	24.2
			1	24	0	0	24.1	24.1	24.1
			12	0	1	1	23.1	23.2	23.0
			12	6	1	1	23.1	23.1	23.0
			12	11	1	1	23.1	23.1	23.0
		16QAM	25	0	1	1	23.1	23.1	23.0
			1	0	1	1	22.6	22.9	23.1
			1	12	1	1	22.6	22.8	23.0
			1	24	1	1	22.6	22.8	23.0
			12	0	2	2	22.0	22.1	21.9
			12	6	2	2	22.0	22.1	21.8
			12	11	2	2	22.1	22.0	21.8
			25	0	2	2	22.1	22.0	21.8

LTE Band 4 Power Reduction Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1720 MHz	1732.5 MHz	1745 MHz
LTE Band 4	20	QPSK	1	0	MPR is disabled when Power Reduction is enabled		20.2	20.2	20.2
			1	50			20.2	20.2	20.2
			1	99			20.1	20.1	20.2
			50	0			20.1	20.2	20.2
			50	25			20.2	20.2	20.2
			50	50			20.2	20.2	20.2
		16QAM	100	0			20.2	20.1	20.2
			1	0			20.0	20.2	19.8
			1	50			19.8	20.2	19.8
			1	99			19.9	20.2	19.8
			50	0			19.9	20.0	20.2
			50	25			19.9	19.9	20.1
			50	50			19.9	20.2	20.2
			100	0			19.9	19.9	20.2
LTE Band 4	15	QPSK	1	0	MPR is disabled when Power Reduction is enabled		20.1	20.2	20.1
			1	36			20.0	20.2	20.1
			1	74			20.1	20.1	20.1
			36	0			20.2	20.2	20.1
			36	18			20.1	20.2	20.2
			36	37			20.2	20.0	20.2
		16QAM	75	0			20.1	19.9	20.2
			1	0			20.0	19.8	19.9
			1	36			20.0	19.6	19.9
			1	74			20.0	19.6	19.9
			36	0			20.2	19.6	20.1
			36	18			20.1	19.6	20.1
			36	37			20.1	19.6	20.1
			75	0			20.2	19.6	20.2

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4	10	QPSK	1	0	MPR is disabled when Power Reduction is enabled		19.9	20.2	20.0
			1	25			20.0	20.2	20.0
			1	49			20.1	20.1	20.0
			25	0			20.2	20.0	20.2
			25	12			19.8	20.2	20.2
			25	25			20.2	20.1	20.1
		16QAM	50	0			20.2	20.0	20.1
			1	0			19.8	19.7	19.9
			1	25			19.9	19.6	19.9
			1	49			20.0	19.6	19.9
			25	0			20.2	19.6	20.2
			25	12			20.2	19.7	20.2
			25	25			20.1	19.7	20.2
			50	0			19.7	19.7	20.2
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1712.5 MHz	1732.5 MHz	1752.5 MHz
LTE Band 4	5	QPSK	1	0	MPR is disabled when Power Reduction is enabled		19.9	20.1	20.2
			1	12			20.0	20.0	20.2
			1	24			20.0	20.2	20.2
			12	0			20.2	19.9	20.1
			12	6			20.1	20.2	20.2
			12	11			20.2	20.1	20.1
		16QAM	25	0			20.2	19.9	20.2
			1	0			19.8	20.1	19.9
			1	12			19.9	20.1	19.8
			1	24			19.9	20.0	19.9
			12	0			20.2	20.0	20.1
			12	6			20.2	19.7	20.1
			12	11			19.7	20.1	20.1
			25	0			19.7	20.0	20.2

LTE Band 7 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							2510 MHz	2535 MHz	2560 MHz
LTE Band 7	20	QPSK	1	0	0	0	22.0	22.2	21.9
			1	49	0	0	22.0	22.0	21.8
			1	99	0	0	22.0	22.2	21.8
			50	0	1	1	20.8	20.9	20.7
			50	24	1	1	20.9	20.8	20.7
			50	50	1	1	20.8	20.9	20.8
			100	0	1	1	20.8	20.9	20.8
		16QAM	1	0	1	1	20.8	21.0	20.8
			1	49	1	1	20.7	20.8	20.7
			1	99	1	1	20.7	21.0	20.8
			50	0	2	2	19.7	19.8	19.7
			50	24	2	3	19.7	19.7	19.7
			50	50	2	2	19.7	19.7	19.8
			100	0	2	2	19.7	19.8	19.7
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							2507.5 MHz	2535 MHz	2562.5 MHz
LTE Band 7	15	QPSK	1	0	0	0	22.1	22.2	22.0
			1	37	0	0	22.0	22.0	22.0
			1	74	0	0	22.0	22.0	22.1
			36	0	1	1	20.8	20.9	20.7
			36	20	1	1	20.8	20.9	20.8
			36	39	1	1	20.9	20.9	20.8
			75	0	1	1	20.8	20.9	20.8
		16QAM	1	0	1	1	20.9	20.7	20.8
			1	37	1	1	20.8	20.5	20.8
			1	74	1	1	20.7	20.5	20.8
			36	0	2	2	19.8	19.8	19.7
			36	20	2	2	19.7	19.8	19.7
			36	39	2	2	19.8	19.8	19.8
			75	0	2	2	19.7	19.8	19.7
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							2505 MHz	2535 MHz	2565 MHz
LTE Band 7	10	QPSK	1	0	0	0	22.1	22.1	22.2
			1	25	0	0	22.0	22.1	22.2
			1	49	0	0	22.1	22.1	22.2
			25	0	1	0	20.8	21.0	21.0
			25	12	1	0	20.7	21.0	20.9
			25	25	1	0	20.7	20.9	20.9
			50	0	1	0	20.7	21.0	20.9
		16QAM	1	0	1	0	20.6	20.9	20.7
			1	25	1	0	20.6	20.9	20.6
			1	49	1	0	20.7	20.9	20.7
			25	0	2	0	19.7	19.8	19.8
			25	12	2	0	19.7	19.7	19.7
			25	25	2	0	19.7	19.8	19.7
			50	0	2	0	19.7	19.8	19.7

LTE Band 7 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							2502.5 MHz	2535 MHz	2567.5 MHz
LTE Band 7	5	QPSK	1	0	0	0	22.0	22.0	22.1
			1	12	0	0	21.9	21.9	22.1
			1	24	0	0	22.0	22.0	22.1
			12	0	1	1	20.8	20.9	21.0
			12	6	1	1	20.7	20.8	21.0
			12	13	1	1	20.8	20.9	21.0
			25	0	1	1	20.8	20.9	21.0
		16QAM	1	0	1	1	20.6	20.7	20.8
			1	12	1	1	20.5	20.5	20.8
			1	24	1	1	20.6	20.6	20.7
			12	0	2	2	19.8	19.8	19.8
			12	6	2	2	19.7	19.7	19.8
			12	13	2	2	19.7	19.7	19.8
			25	0	2	2	19.7	19.7	19.8

LTE Band 13 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)
							782 MHz
LTE Band 13	10	QPSK	1	0	0	0	24.5
			1	25	0	0	24.5
			1	49	0	0	24.5
			25	0	1	1	23.5
			25	12	1	1	23.5
			25	25	1	1	23.4
			50	0	1	1	23.5
		16QAM	1	0	1	1	23.5
			1	25	1	1	23.5
			1	49	1	1	23.5
			25	0	2	2	22.5
			25	12	2	2	22.5
			25	25	2	2	22.5
			50	0	2	2	22.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)
							782 MHz
LTE Band 13	10	QPSK	1	0	MPR is disabled when Power Reduction is enabled		20.4
			1	25			20.4
			1	49			20.4
			25	0			20.4
			25	12			20.4
			25	25			20.4
			50	0			20.4
		16QAM	1	0			20.2
			1	25			20.2
			1	49			20.2
			25	0			20.3
			25	12			20.4
			25	25			20.4
			50	0			20.4

Note(s):

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

9.5. SV-LTE

9.5.1. CDMA BC0 + LTE Band 4

Agilent 8960		R&S CMW 500					Agilent 8960		R&S CMW 500				
CDMA BC0 (1xRTT)		LTE Band 4 (20MHz)					CDMA BC0 (1xRTT)		LTE Band 4 (20MHz)				
P > 17.5 dBm		Limit = 20.2 dBm					P ≤ 17.5 dBm		Limit = 24.2 dBm				
Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)	Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)		
1013		20175	QPSK	1	0	20.1	1013		20175	QPSK	1	0	24.1
				1	49	20.1					1	49	24.1
				1	99	20.0					1	99	24.1
				50	0	20.1					50	0	23.1
				50	25	20.1					50	25	23.1
				50	50	20.1					50	50	23.1
				100	0	20.1					100	0	23.1
			16QAM	1	0	20.2				16QAM	1	0	22.8
				1	49	20.2					1	49	22.8
				1	99	20.1					1	99	22.8
				50	0	20.2					50	0	22.0
				50	25	20.1					50	25	22.0
				50	50	20.1					50	50	22.0
				100	0	20.1					100	0	22.1
			384		20175	QPSK				1	0	20.1	384
1	49	20.0					1	49	24.1				
1	99	20.0					1	99	24.1				
50	0	20.0					50	0	23.1				
50	25	20.0					50	25	23.1				
50	50	20.0					50	50	23.1				
100	0	20.0					100	0	23.1				
16QAM	1	0				20.1	16QAM	1	0	22.8			
	1	49				20.1		1	49	22.8			
	1	99				20.1		1	99	22.8			
	50	0				20.1		50	0	22.0			
	50	25				20.1		50	25	22.0			
	50	50				20.1		50	50	22.0			
	100	0				20.1		100	0	22.1			
777		20175				QPSK	1	0	20.0	777		20175	
			1	49	20.0		1	49	24.1				
			1	99	20.0		1	99	24.1				
			50	0	20.0		50	0	23.1				
			50	25	20.0		50	25	23.1				
			50	50	20.0		50	50	23.1				
			100	0	20.0		100	0	23.1				
			16QAM	1	0	20.1	16QAM	1	0				22.8
				1	49	20.1		1	49				22.8
				1	99	20.1		1	99				22.8
				50	0	20.2		50	0				22.0
				50	25	20.1		50	25				22.0
				50	50	20.1		50	50				22.0
				100	0	20.1		100	0				22.1

9.5.2. CDMA BC1 + LTE Band 4

Agilent 8960		R&S CMW 500					Agilent 8960		R&S CMW 500				
CDMA BC1 (1xRTT)		LTE Band 4 (20MHz)					CDMA BC1 (1xRTT)		LTE Band 4 (20MHz)				
P > 17.5 dBm		Limit = 20.2 dBm					P ≤ 17.5 dBm		Limit = 24.2 dBm				
Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)	Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)		
25		20175	QPSK	1	0	20.2	25	20175	QPSK	1	0	24.1	
				1	49	20.1				1	49	24.1	
				1	99	20.1				1	99	24.1	
				50	0	20.1				50	0	23.1	
				50	25	20.1				50	25	23.1	
				50	50	20.1				50	50	23.1	
			100	0	20.1	100			0	23.1			
			16QAM	1	0	20.2			16QAM	1	0	22.8	
				1	49	20.2				1	49	22.8	
				1	99	20.2				1	99	22.8	
				50	0	20.2				50	0	22.0	
				50	25	20.2				50	25	22.0	
				50	50	20.2				50	50	22.0	
			100	0	20.2	100			0	22.1			
			600		20175	QPSK			1	0	20.2	600	20175
1	49	20.1					1	49	24.1				
1	99	20.1					1	99	24.1				
50	0	20.1					50	0	23.1				
50	25	20.1					50	25	23.1				
50	50	20.1					50	50	23.1				
100	0	20.1				100	0	23.1					
16QAM	1	0				20.2	16QAM	1	0	22.8			
	1	49				20.2		1	49	22.8			
	1	99				20.2		1	99	22.8			
	50	0				20.2		50	0	22.0			
	50	25				20.2		50	25	22.0			
	50	50				20.2		50	50	22.0			
100	0	20.2				100	0	22.1					
1175		20175				QPSK	1	0	20.2	1175	20175		
			1	49	20.1		1	49	24.1				
			1	99	20.1		1	99	24.1				
			50	0	20.1		50	0	23.1				
			50	25	20.1		50	25	23.1				
			50	50	20.1		50	50	23.1				
			100	0	20.1	100	0	23.1					
			16QAM	1	0	20.2	16QAM	1	0			22.8	
				1	49	20.2		1	49			22.8	
				1	99	20.2		1	99			22.8	
				50	0	20.2		50	0			22.0	
				50	25	20.2		50	25			22.0	
				50	50	20.2		50	50			22.0	
			100	0	20.2	100	0	22.1					

9.5.3. CDMA BC0 + LTE Band 13

Agilent 8960		R&S CMW 500					Agilent 8960		R&S CMW 500				
CDMA BC0 (1xRTT)		LTE Band 13 (10 MHz)					CDMA BC0 (1xRTT)		LTE Band 13 (10MHz)				
P > 17.5 dBm		Limit = 20.5 dBm					P ≤ 17.5 dBm		Limit = 24.5 dBm				
Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)	Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)		
1013		23230	QPSK	1	0	20.4	1013	23230	QPSK	1	0	24.5	
				1	25	20.4				1	25	24.5	
				1	49	20.3				1	49	24.5	
				25	0	20.4				25	0	23.5	
				25	12	20.4				25	12	23.5	
				25	25	20.4				25	25	23.4	
				50	0	20.4				50	0	23.5	
			16QAM	1	0	20.4			16QAM	1	0	23.5	
				1	25	20.3				1	25	23.5	
				1	49	20.4				1	49	23.5	
				25	0	20.2				25	0	22.5	
				25	12	20.4				25	12	22.5	
				25	25	20.4				25	25	22.5	
				50	0	20.5				50	0	22.5	
				50	0	20.5				50	0	22.5	
384		23230	QPSK	1	0	20.5	384	23230	QPSK	1	0	24.5	
				1	25	20.4				1	25	24.5	
				1	49	20.4				1	49	24.5	
				25	0	20.4				25	0	23.5	
				25	12	20.4				25	12	23.5	
				25	25	20.5				25	25	23.4	
				50	0	20.5				50	0	23.5	
			16QAM	1	0	20.3			16QAM	1	0	23.5	
				1	25	20.3				1	25	23.5	
				1	49	20.2				1	49	23.5	
				25	0	20.4				25	0	22.5	
				25	12	20.4				25	12	22.5	
				25	25	20.4				25	25	22.5	
				50	0	20.4				50	0	22.5	
				50	0	20.4				50	0	22.5	
777		23230	QPSK	1	0	20.5	777	23230	QPSK	1	0	24.5	
				1	25	20.4				1	25	24.5	
				1	49	20.4				1	49	24.5	
				25	0	20.4				25	0	23.5	
				25	12	20.4				25	12	23.5	
				25	25	20.5				25	25	23.4	
				50	0	20.5				50	0	23.5	
			16QAM	1	0	20.4			16QAM	1	0	23.5	
				1	25	20.2				1	25	23.5	
				1	49	20.1				1	49	23.5	
				25	0	20.4				25	0	22.5	
				25	12	20.4				25	12	22.5	
				25	25	20.4				25	25	22.5	
				50	0	20.5				50	0	22.5	
				50	0	20.5				50	0	22.5	

9.5.4. CDMA BC1 + LTE Band 13

Agilent 8960		R&S CMW 500					Agilent 8960		R&S CMW 500				
CDMA BC1 (1xRTT)		LTE Band 13 (10 MHz)					CDMA BC1 (1xRTT)		LTE Band 13 (10MHz)				
P > 17.5 dBm		Limit = 20.5 dBm					P ≤ 17.5 dBm		Limit = 24.5 dBm				
Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)	Ch. #	Avg Pwr (dBm)	Ch. #	Mod	UL RB Setting	Avg Pwr (dBm)		
25		23230	QPSK	1	0	20.5	25	23230	QPSK	1	0	24.5	
				1	25	20.4				1	25	24.5	
				1	49	20.4				1	49	24.5	
				25	0	20.4				25	0	23.5	
				25	12	20.4				25	12	23.5	
				25	25	20.4				25	25	23.4	
		50	0	20.4	50	0		23.5					
		1	0	20.3	1	0		23.5					
		1	25	20.3	1	25		23.5					
		1	49	20.2	1	49		23.5					
		25	0	20.4	25	0		22.5					
		25	12	20.4	25	12		22.5					
25	25	20.4	25	25	22.5								
50	0	20.4	50	0	22.5								
600		23230	QPSK	1	0	20.5	600	23230	QPSK	1	0	24.5	
				1	25	20.5				1	25	24.5	
				1	49	20.4				1	49	24.5	
				25	0	20.4				25	0	23.5	
				25	12	20.4				25	12	23.5	
				25	25	20.4				25	25	23.4	
		50	0	20.5	50	0		23.5					
		1	0	20.4	1	0		23.5					
		1	25	20.2	1	25		23.5					
		1	49	20.2	1	49		23.5					
		25	0	20.4	25	0		22.5					
		25	12	20.4	25	12		22.5					
25	25	20.4	25	25	22.5								
50	0	20.5	50	0	22.5								
1175		23230	QPSK	1	0	20.5	1175	23230	QPSK	1	0	24.5	
				1	25	20.4				1	25	24.5	
				1	49	20.4				1	49	24.5	
				25	0	20.4				25	0	23.5	
				25	12	20.4				25	12	23.5	
				25	25	20.5				25	25	23.4	
		50	0	20.5	50	0		23.5					
		1	0	20.4	1	0		23.5					
		1	25	20.3	1	25		23.5					
		1	49	20.2	1	49		23.5					
		25	0	20.4	25	0		22.5					
		25	12	20.4	25	12		22.5					
25	25	20.5	25	25	22.5								
50	0	20.5	50	0	22.5								

9.6. 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 1/4 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	Data Rate	Ch #	Freq. (MHz)	Avg Pwr (dBm)	SAR Test (Yes/No)
2.4 (DTS)	802.11b	1 Mbps	1	2412	15.8	Yes
			6	2437	15.8	
			11	2462	16.0	
	802.11g	6 Mbps	1	2412	11.8	No
			6	2437	12.0	
			11	2462	12.0	
	802.11n (HT20)	MCS0	1	2412	11.1	No
			6	2437	10.9	
			11	2462	11.2	

Note(s):

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

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	15.8	Yes
			2 Mbps	15.8	No
			5.5 Mbps	15.8	No
			11 Mbps	15.8	No

9.7. Wi-Fi (5 GHz Bands)

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		*	
	5.8 GHz	5.660	132		*	
		5.680	136	√		
		5.700	140		*	
		5.745	149	√		
DTS (15.247)	5.8 GHz	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	Ch #	Freq. (MHz)	Avg Pwr (dBm)	SAR Test (Yes/No)
5.2 (UNII)	802.11a	6 Mbps	36	5180	12.0	Yes
			40	5200	11.9	
			44	5220	12.0	
			48	5240	12.0	
	802.11n (HT20)	MCS0	36	5180	10.7	No
			40	5200	10.8	
			44	5220	10.7	
			48	5240	10.7	
	802.11n (HT40)	MCS0	38	5190	10.2	No
			46	5230	10.1	
	802.11ac (20MHz)	MCS0	36	5180	10.8	Yes
			40	5200	10.6	
			44	5220	10.7	
			48	5240	10.7	
802.11ac (40MHz)	MCS0	38	5190	10.0	No	
		46	5230	10.1		
802.11ac (80MHz)	MCS0	42	5210	10.6	No	
5.3 (UNII)	802.11a	6 Mbps	52	5260	12.0	Yes
			56	5280	11.9	
			60	5300	11.8	
			64	5320	11.9	
	802.11n (HT20)	MCS0	52	5260	10.7	No
			56	5280	10.7	
			60	5300	10.7	
			64	5320	10.6	
	802.11n (HT40)	MCS0	54	5270	10.2	No
			62	5310	10.1	
	802.11ac (20MHz)	MCS0	52	5260	10.6	Yes
			56	5280	10.6	
			60	5300	10.6	
			64	5320	10.5	
802.11ac (40MHz)	MCS0	54	5270	10.0	No	
		62	5310	10.0		
802.11ac (80MHz)	MCS0	58	5290	10.7	No	

Note(s):

Per KDB 248227, SAR is not required for 802.11n HT20/HT40 and 802.11ac (HT40/HT80) channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a channels.

Measured Results (continued)

Band (GHz)	Mode	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)	SAR Test (Yes/No)
5.5 (UNII)	802.11a	6 Mbps	100	5500	11.4	Yes
			104	5520	11.4	
			108	5540	11.4	
			112	5560	11.4	
			116	5580	11.4	
			120	5600	Not Supported	
			124	5620	Not Supported	
			128	5640	Not Supported	
			132	5660	11.4	
			136	5680	11.4	
			140	5700	11.4	
	802.11n (HT20)	MCS0	100	5500	10.4	No
			104	5520	10.4	
			108	5540	10.4	
			112	5560	10.4	
			116	5580	10.5	
			120	5600	Not Supported	
			124	5620	Not Supported	
			128	5640	Not Supported	
			132	5660	10.4	
			136	5680	10.4	
			140	5700	10.3	
	802.11n (HT40)	MCS0	102	5510	9.9	No
			110	5550	9.8	
			134	5670	9.7	
	802.11ac (20MHz)	MCS0	100	5500	10.4	Yes
			104	5520	10.4	
			108	5540	10.4	
			112	5560	10.4	
			116	5580	10.4	
			120	5600	Not Supported	
			124	5620	Not Supported	
			128	5640	Not Supported	
			132	5660	10.4	
			136	5680	10.4	
			140	5700	10.4	
	802.11ac (40MHz)	MCS0	102	5510	9.6	No
			110	5550	9.6	
			142	5710	Not Supported	
	802.11ac (80MHz)	MCS0	106	5530	10.6	No
			138	5690	Not Supported	

Note(s):

Per KDB 248227, SAR is not required for 802.11n HT20/HT40 and 802.11ac (HT40/HT80) channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a channels.

Measured Results (continued)

Band (GHz)	Mode	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)	SAR Test (Yes/No)
5.8 (DTS)	802.11a	6 Mbps	149	5745	11.4	Yes
			153	5765	11.4	
			157	5785	11.3	
			161	5805	11.4	
			165	5825	11.4	
	802.11n (HT20)	MCS0	149	5745	10.4	No
			153	5765	10.4	
			157	5785	10.4	
			161	5805	10.3	
			165	5825	10.4	
	802.11n (HT40)	MCS0	151	5755	9.6	No
			159	5795	9.7	
	802.11ac (20MHz)	MCS0	149	5745	10.3	Yes
			153	5765	10.4	
			157	5785	10.4	
			161	5805	10.4	
			165	5825	10.4	
	802.11ac (40MHz)	MCS0	151	5755	9.7	No
159			5795	9.6		
802.11ac (80MHz)	MCS0	155	5775	10.5	No	

Note(s):

Per KDB 248227, SAR is not required for 802.11n HT20/HT40 and 802.11ac (HT40/HT80) channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a channels.

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	11.7	Yes
				9 Mbps	11.6	No
				12 Mbps	11.6	No
				18 Mbps	11.6	No
				24 Mbps	11.4	No
				36 Mbps	11.5	No
				48 Mbps	11.5	No
				54 Mbps	11.4	No
5.3 GHz (UNII)	802.11a	52	5260	6 Mbps	11.6	Yes
				9 Mbps	11.4	No
				12 Mbps	11.4	No
				18 Mbps	11.5	No
				24 Mbps	11.4	No
				36 Mbps	11.4	No
				48 Mbps	11.3	No
				54 Mbps	11.5	No
5.5 GHz (UNII)	802.11a	116	5580	6 Mbps	11.4	Yes
				9 Mbps	11.2	No
				12 Mbps	11.3	No
				18 Mbps	11.1	No
				24 Mbps	11.2	No
				36 Mbps	11.2	No
				48 Mbps	11.2	No
				54 Mbps	11.3	No
5.8 GHz (DTS)	802.11a	149	5745	6 Mbps	11.3	Yes
				9 Mbps	11.2	No
				12 Mbps	11.1	No
				18 Mbps	11.1	No
				24 Mbps	11.2	No
				36 Mbps	11.1	No
				48 Mbps	11.1	No
				54 Mbps	11.2	No

9.8. Bluetooth

Maximum tune-up tolerance limit is 7.5 dBm from the rated nominal maximum output power. This power level qualifies for exclusion of SAR testing.

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
750	41.9	0.89
835	41.5	0.90
900	41.5	0.97
1450	40.5	1.20
1500	40.4	1.23
1640	40.2	1.31
1750	40.1	1.37
1800	40.0	1.40
1900	40.0	1.40
2000	40.0	1.40
2100	39.8	1.49
2300	39.5	1.67
2450	39.2	1.80
2600	39.0	1.96
3000	38.5	2.40
3500	37.9	2.91
4000	37.4	3.43
4500	36.8	3.94
5000	36.2	4.45
5200	36.0	4.66
5400	35.8	4.86
5600	35.5	5.07
5800	35.3	5.27
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.

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

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%
Hydroxyethel-cellulsoe	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 ± 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.

SAR Lab B

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
5/12/2014	Body 5180	e'	50.7800	Relative Permittivity (ϵ_r):	50.78	49.05	3.53	5
		e"	18.2600	Conductivity (σ):	5.26	5.27	-0.23	5
	Body 5200	e'	50.9400	Relative Permittivity (ϵ_r):	50.94	49.02	3.92	5
		e"	18.4500	Conductivity (σ):	5.33	5.29	0.75	5
	Body 5600	e'	50.4600	Relative Permittivity (ϵ_r):	50.46	48.48	4.09	5
		e"	18.8400	Conductivity (σ):	5.87	5.76	1.83	5
	Body 5800	e'	49.9000	Relative Permittivity (ϵ_r):	49.90	48.20	3.53	5
		e"	18.8300	Conductivity (σ):	6.07	6.00	1.21	5
	Body 5825	e'	49.9800	Relative Permittivity (ϵ_r):	49.98	48.20	3.69	5
		e"	19.0500	Conductivity (σ):	6.17	6.00	2.83	5

SAR Lab D

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
5/12/2014	Body 1900	e'	52.7600	Relative Permittivity (ϵ_r):	52.76	53.30	-1.01	5
		e"	14.8900	Conductivity (σ):	1.57	1.52	3.49	5
	Body 1850	e'	52.9500	Relative Permittivity (ϵ_r):	52.95	53.30	-0.66	5
		e"	14.7800	Conductivity (σ):	1.52	1.52	0.02	5
	Body 1910	e'	52.7200	Relative Permittivity (ϵ_r):	52.72	53.30	-1.09	5
		e"	14.9200	Conductivity (σ):	1.58	1.52	4.25	5
5/14/2014	Body 835	e'	54.4700	Relative Permittivity (ϵ_r):	54.47	55.20	-1.32	5
		e"	21.5900	Conductivity (σ):	1.00	0.97	3.34	5
	Body 820	e'	54.6300	Relative Permittivity (ϵ_r):	54.63	55.28	-1.17	5
		e"	21.6700	Conductivity (σ):	0.99	0.97	2.02	5
	Body 850	e'	54.2800	Relative Permittivity (ϵ_r):	54.28	55.16	-1.59	5
		e"	21.5100	Conductivity (σ):	1.02	0.99	2.99	5
5/15/2014	Head 835	e'	40.6800	Relative Permittivity (ϵ_r):	40.68	41.50	-1.98	5
		e"	19.5700	Conductivity (σ):	0.91	0.90	0.96	5
	Head 820	e'	40.8600	Relative Permittivity (ϵ_r):	40.86	41.60	-1.78	5
		e"	19.6200	Conductivity (σ):	0.89	0.90	-0.43	5
	Head 850	e'	40.4800	Relative Permittivity (ϵ_r):	40.48	41.50	-2.46	5
		e"	19.5100	Conductivity (σ):	0.92	0.92	0.78	5

SAR Lab E

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
5/14/2014	Body 1750	e'	51.2600	Relative Permittivity (ϵ_r):	51.26	53.44	-4.08	5
		e"	15.0900	Conductivity (σ):	1.47	1.49	-1.20	5
	Body 1710	e'	51.3300	Relative Permittivity (ϵ_r):	51.33	53.54	-4.13	5
		e"	15.0300	Conductivity (σ):	1.43	1.46	-2.22	5
	Body 1755	e'	51.2600	Relative Permittivity (ϵ_r):	51.26	53.43	-4.06	5
		e"	15.1300	Conductivity (σ):	1.48	1.49	-0.86	5
5/14/2014	Body 750	e'	54.3400	Relative Permittivity (ϵ_r):	54.34	55.55	-2.17	5
		e"	23.2300	Conductivity (σ):	0.97	0.96	0.59	5
	Body 700	e'	54.8700	Relative Permittivity (ϵ_r):	54.87	55.74	-1.56	5
		e"	23.7200	Conductivity (σ):	0.92	0.96	-3.75	5
	Body 790	e'	53.9000	Relative Permittivity (ϵ_r):	53.90	55.39	-2.69	5
		e"	22.8900	Conductivity (σ):	1.01	0.97	4.07	5
5/16/2014	Head 1900	e'	40.2600	Relative Permittivity (ϵ_r):	40.26	40.00	0.65	5
		e"	13.7200	Conductivity (σ):	1.45	1.40	3.53	5
	Head 1850	e'	40.4700	Relative Permittivity (ϵ_r):	40.47	40.00	1.18	5
		e"	13.6500	Conductivity (σ):	1.40	1.40	0.29	5
	Head 1910	e'	40.2400	Relative Permittivity (ϵ_r):	40.24	40.00	0.60	5
		e"	13.7400	Conductivity (σ):	1.46	1.40	4.23	5

SAR Lab F

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
5/16/2014	Head 1750	e'	40.1200	Relative Permittivity (ϵ_r):	40.12	40.08	0.09	5
		e"	14.3500	Conductivity (σ):	1.40	1.37	2.00	5
	Head 1710	e'	40.2700	Relative Permittivity (ϵ_r):	40.27	40.15	0.31	5
		e"	14.2900	Conductivity (σ):	1.36	1.35	0.91	5
	Head 1755	e'	40.1000	Relative Permittivity (ϵ_r):	40.10	40.08	0.06	5
		e"	14.3600	Conductivity (σ):	1.40	1.37	2.15	5

SAR Lab G

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
5/15/2014	Head 2450	e'	38.5800	Relative Permittivity (ϵ_r):	38.58	39.20	-1.58	5
		e"	13.4000	Conductivity (σ):	1.83	1.80	1.41	5
	Head 2410	e'	38.8400	Relative Permittivity (ϵ_r):	38.84	39.28	-1.12	5
		e"	13.2500	Conductivity (σ):	1.78	1.76	0.86	5
	Head 2475	e'	38.5600	Relative Permittivity (ϵ_r):	38.56	39.17	-1.55	5
		e"	13.5200	Conductivity (σ):	1.86	1.83	1.84	5
5/15/2014	Body 2450	e'	51.1700	Relative Permittivity (ϵ_r):	51.17	52.70	-2.90	5
		e"	14.3600	Conductivity (σ):	1.96	1.95	0.32	5
	Body 2410	e'	51.4300	Relative Permittivity (ϵ_r):	51.43	52.76	-2.52	5
		e"	14.0700	Conductivity (σ):	1.89	1.91	-1.16	5
	Body 2475	e'	51.1900	Relative Permittivity (ϵ_r):	51.19	52.67	-2.81	5
		e"	14.4700	Conductivity (σ):	1.99	1.99	0.31	5
5/15/2014	Head 2600	e'	38.0500	Relative Permittivity (ϵ_r):	38.05	39.01	-2.46	5
		e"	13.7700	Conductivity (σ):	1.99	1.96	1.45	5
	Head 2500	e'	38.6000	Relative Permittivity (ϵ_r):	38.60	39.14	-1.37	5
		e"	13.5700	Conductivity (σ):	1.89	1.85	1.74	5
	Head 2700	e'	37.7100	Relative Permittivity (ϵ_r):	37.71	38.88	-3.02	5
		e"	13.8600	Conductivity (σ):	2.08	2.07	0.51	5
5/15/2014	Body 2600	e'	50.6100	Relative Permittivity (ϵ_r):	50.61	52.51	-3.62	5
		e"	14.9100	Conductivity (σ):	2.16	2.16	-0.25	5
	Body 2500	e'	51.1800	Relative Permittivity (ϵ_r):	51.18	52.64	-2.77	5
		e"	14.5300	Conductivity (σ):	2.02	2.02	-0.02	5
	Body 2700	e'	50.1800	Relative Permittivity (ϵ_r):	50.18	52.38	-4.21	5
		e"	15.1300	Conductivity (σ):	2.27	2.30	-1.30	5
5/19/2014	Head 750	e'	40.5900	Relative Permittivity (ϵ_r):	40.59	41.96	-3.27	5
		e"	21.7600	Conductivity (σ):	0.91	0.89	1.61	5
	Head 700	e'	41.3000	Relative Permittivity (ϵ_r):	41.30	42.22	-2.17	5
		e"	22.1400	Conductivity (σ):	0.86	0.89	-3.09	5
	Head 790	e'	40.0800	Relative Permittivity (ϵ_r):	40.08	41.76	-4.01	5
		e"	21.3700	Conductivity (σ):	0.94	0.90	4.75	5

SAR Lab H

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
5/19/2014	Head 5180	e'	37.7300	Relative Permittivity (ϵ_r):	37.73	36.01	4.77	5
		e"	15.7600	Conductivity (σ):	4.54	4.63	-1.97	5
	Head 5200	e'	37.7200	Relative Permittivity (ϵ_r):	37.72	35.99	4.81	5
		e"	15.8300	Conductivity (σ):	4.58	4.65	-1.59	5
	Head 5600	e'	37.2600	Relative Permittivity (ϵ_r):	37.26	35.53	4.86	5
		e"	15.9400	Conductivity (σ):	4.96	5.06	-1.91	5
	Head 5800	e'	36.9500	Relative Permittivity (ϵ_r):	36.95	35.30	4.67	5
		e"	16.0600	Conductivity (σ):	5.18	5.27	-1.72	5
	Head 5825	e'	36.9600	Relative Permittivity (ϵ_r):	36.96	35.30	4.70	5
		e"	16.1700	Conductivity (σ):	5.24	5.27	-0.62	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
D750V3	1019	3/17/2014	750	1g	8.21	8.64
				10g	5.38	5.69
D835V2	4d002	11/15/2013	835	1g	9.49	9.43
				10g	6.18	6.21
D1750V2	1053	8/27/2013	1750	1g	36.7	37.7
				10g	19.5	20.3
D1750V2	1077	9/12/2013	1750	1g	37.6	37.7
				10g	20.0	20.3
D1900V2	5d043	11/12/2013	1900	1g	40.1	39.0
				10g	21.1	20.8
D2450V2	748	2/18/2014	2450	1g	51.6	50.7
				10g	24.0	23.7
D2600V2	1036	3/12/2014	2600	1g	57.4	56.4
				10g	25.7	25.0
D5GHzV2	1003	2/26/2014	5200	1g	77.7	73.5
				10g	22.2	20.5
			5600	1g	81.8	79.6
				10g	23.2	22.1
			5800	1g	78.3	73.8
				10g	22.1	20.4

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 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					
5/12/2014	D5200V2	1003	Body	1g	6.70	7.23	72.3	73.5	-1.63	-7.91	
				10g	1.87	2.04	20.4	20.5	-0.49		
	D5600V2			1g	5.94	8.09	80.9	79.6	1.63	-36.20	
				10g	1.61	2.27	22.7	22.1	2.71		
	D5800V2			1g	5.07	6.97	69.7	73.8	-5.56	-37.48	1,2
				10g	1.38	1.97	19.7	20.4	-3.43		

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					
5/12/2014	D1900V2	5d043	Body	1g	4.18	4.13	41.3	39.0	5.90	1.20	3,4
				10g	2.06	2.13	21.3	20.8	2.40		
5/14/2014	D835V2	4d002	Body	1g	0.990	0.966	9.66	9.43	2.44	2.42	5,6
				10g	0.664	0.635	6.35	6.21	2.25		
5/15/2014	D835V2	4d002	Head	1g	0.966	0.941	9.41	9.49	-0.84	2.59	
				10g	0.648	0.615	6.15	6.18	-0.49		

SAR Lab E

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					
5/14/2014	D1750V2	1053	Body	1g	3.91	3.79	37.9	37.7	0.53	3.07	7,8
				10g	2.04	2.04	20.4	20.3	0.49		
5/14/2014	D750V3	1019	Body	1g	0.851	0.828	8.28	8.64	-4.17	2.70	9,10
				10g	0.577	0.551	5.51	5.69	-3.16		
5/16/2014	D1900V2	5d043	Head	1g	4.22	4.11	41.1	40.1	2.49	2.61	11,12
				10g	2.17	2.13	21.3	21.1	0.95		

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					
5/16/2014	D1750V2	1077	Head	1g	3.94	3.84	38.4	37.6	2.13	2.54	13,14
				10g	2.11	2.05	20.5	20.0	2.50		

SAR Lab G

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					
5/15/2014	D2450V2	748	Head	1g	5.29	5.32	53.2	51.6	3.10	-0.57	
				10g	2.32	2.46	24.6	24.0	2.50		
5/15/2014	D2450V2	748	Body	1g	5.21	5.32	53.2	50.7	4.93	-2.11	15,16
				10g	2.29	2.50	25.0	23.7	5.49		
5/15/2014	D2600V2	1036	Head	1g	6.18	5.93	59.3	57.4	3.31	4.05	17,18
				10g	2.75	2.61	26.1	25.3	3.28		
5/15/2014	D2600V2	1036	Body	1g	6.40	5.54	55.4	56.4	-1.77	13.44	
				10g	2.59	2.45	24.5	25.0	-2.00		
5/19/2014	D750V3	1019	Head	1g	0.944	0.858	8.58	8.21	4.51	9.11	19,20
				10g	0.642	0.560	5.60	5.38	4.09		

SAR Lab H

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					
5/19/2014	D5200V2	1003	Head	1g	7.53	8.01	80.1	77.7	3.09	-6.37	
				10g	2.08	2.30	23.0	22.2	3.60		
	D5600V2			1g	7.22	7.63	76.3	81.8	-6.72	-5.68	
				10g	1.98	2.16	21.6	23.2	-6.90		
	D5800V2			1g	6.75	7.13	71.3	78.3	-8.94	-5.63	21,22
				10g	1.85	2.02	20.2	22.1	-8.60		

12. SAR Test 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:

- ≤ 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

KDB 648474 D03 Wireless Chargers Battery Cover:

Initially, the handset must be tested according to all applicable SAR test procedures using the normal battery cover (without the wireless charging hardware). The highest SAR measured for each wireless technology (1xRTT, EVDO, WCDMA, GSM, Wi-Fi etc.), frequency band, operating mode (different modes/configurations within each wireless technology) and exposure condition (head, body-worn accessory, hotspot mode etc.) must be repeated using the wireless charging battery cover (Left, right, touch and tilt positions are grouped as a single exposure condition.). In addition, for test cases where the measured SAR for a handset with normal battery cover is greater than 1.2 W/kg, these tests should be repeated with the wireless charging battery cover.

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.

April 2013 TCB Workshop Updates:

Apply usual 802.11 test exclusion considerations, but include 802.11ac SAR for highest 802.11a configuration in each frequency band and each exposure condition.

12.1. GSM850

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Head	Voice	0	Left Touch	190	836.6	33.2	32.7	0.179	0.201		
			Left Tilt	190	836.6	33.2	32.7	0.119	0.134		
			Right Touch	190	836.6	33.2	32.7	0.229	0.257	1	
				190	836.6	33.2	32.7	0.186	0.209		1
			Right Tilt	190	836.6	33.2	32.7	0.134	0.150		
Head VoIP	GPRS 2 Slots	0	Left Touch	190	836.6	31.2	30.9	0.202	0.216		
			Left Tilt	190	836.6	31.2	30.9	0.140	0.150		
			Right Touch	190	836.6	31.2	30.9	0.265	0.284	2	
				190	836.6	31.2	30.9	0.231	0.248		1
			Right Tilt	190	836.6	31.2	30.9	0.160	0.171		
Body-worn	Voice	10	Rear	190	836.6	33.2	32.7	0.344	0.386	3	
				190	836.6	33.2	32.7	0.238	0.267		1
			Front	190	836.6	33.2	32.7	0.264	0.296		
Body-worn(VoIP) & Hotspot	GPRS 2 Slots	10	Rear	190	836.6	31.2	30.9	0.404	0.433	4	
				190	836.6	31.2	30.9	0.280	0.300		1
			Front	190	836.6	31.2	30.9	0.310	0.332		
			Edge 2	190	836.6	31.2	30.9	0.313	0.335		
			Edge 3	190	836.6	31.2	30.9	0.191	0.205		
			Edge 4	190	836.6	31.2	30.9	0.159	0.170		

12.2. GSM1900

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Head	Voice	0	Left Touch	661	1880.0	30.7	30.3	0.102	0.112		
			Left Tilt	661	1880.0	30.7	30.3	0.059	0.064		
			Right Touch	661	1880.0	30.7	30.3	0.116	0.127	5	
				661	1880.0	30.7	30.3	0.084	0.092		1
			Right Tilt	661	1880.0	30.7	30.3	0.049	0.053		
Head VoIP	GPRS 2 Slots	0	Left Touch	661	1880.0	28.7	28.5	0.143	0.150		
			Left Tilt	661	1880.0	28.7	28.5	0.080	0.084		
			Right Touch	661	1880.0	28.7	28.5	0.171	0.179	6	
				661	1880.0	28.7	28.5	0.090	0.094		1
			Right Tilt	661	1880.0	28.7	28.5	0.065	0.068		
Body-worn	Voice	10	Rear	661	1880.0	30.7	30.3	0.454	0.498	7	
				661	1880.0	30.7	30.3	0.262	0.287		1
			Front	661	1880.0	30.7	30.3	0.295	0.323		
Body-worn(VoIP) & Hotspot	GPRS 2 Slots	10	Rear	661	1880.0	28.7	28.5	0.536	0.561	8	
				661	1880.0	28.7	28.5	0.354	0.371		1
			Front	661	1880.0	28.7	28.5	0.346	0.362		
			Edge 2	661	1880.0	28.7	28.5	0.170	0.178		
			Edge 3	661	1880.0	28.7	28.5	0.483	0.506		
			Edge 4	661	1880.0	28.7	28.5	0.085	0.089		

Note:

- Per 648474 D03 Wireless Chargers Battery Cover, SAR test was repeated using wireless charging battery cover from the highest SAR measured for each mode.

12.3. CDMA BC0

12.3.1. Maximum Power

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Head	1xRTT (RC3 SO55)	0	Left Touch	384	836.5	24.7	24.5	0.284	0.297		
			Left Tilt	384	836.5	24.7	24.5	0.193	0.202		
			Right Touch	384	836.5	24.7	24.5	0.357	0.374		
				384	836.5	24.7	24.5	0.334	0.350		1
	Right Tilt		384	836.5	24.7	24.5	0.220	0.230			
	1xEVDO (Rel. 0)		Left Touch	384	836.5	24.7	24.6	0.292	0.299		
			Left Tilt	384	836.5	24.7	24.6	0.191	0.195		
			Right Touch	384	836.5	24.7	24.6	0.367	0.376		9
384		836.5		24.7	24.6	0.330	0.338		1		
Right Tilt	384	836.5	24.7	24.6	0.217	0.222					
Body-worn & Hotspot	1xRTT (RC3 SO32)	10	Rear	384	836.5	24.7	24.5	0.467	0.489	10	
				384	836.5	24.7	24.5	0.460	0.482		1
	Front		384	836.5	24.7	24.5	0.356	0.373			
	1xEVDO (Rel. 0)		Rear	384	836.5	24.7	24.6	0.472	0.483		
		384	836.5	24.7	24.6	0.461	0.472		1		
Front	384	836.5	24.7	24.6	0.363	0.371					
Hotspot	1xRTT (RC3 SO32)	10	Edge 2	384	836.5	24.7	24.5	0.360	0.377		
			Edge 3	384	836.5	24.7	24.5	0.249	0.261		
			Edge 4	384	836.5	24.7	24.5	0.180	0.188		
	1xEVDO (Rel. 0)		Edge 2	384	836.5	24.7	24.6	0.455	0.466		
			Edge 3	384	836.5	24.7	24.6	0.251	0.257		
			Edge 4	384	836.5	24.7	24.6	0.237	0.243		

12.3.2. 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	836.5	18.0	17.1	0.052	0.064	
			Left Tilt	384	836.5	18.0	17.1	0.034	0.042	
			Right Touch	384	836.5	18.0	17.1	0.065	0.080	
			Right Tilt	384	836.5	18.0	17.1	0.038	0.047	
Body-worn & Hotspot	1xRTT (RC3 SO32)	10	Rear	384	836.5	18.0	16.9	0.089	0.115	
			Front	384	836.5	18.0	16.9	0.074	0.095	
Hotspot	1xRTT (RC3 SO32)	10	Edge 2	384	836.5	18.0	16.9	0.034	0.044	
			Edge 3	384	836.5	18.0	16.9	0.049	0.063	
			Edge 4	384	836.5	18.0	16.9	0.041	0.053	

Note:

- Per 648474 D03 Wireless Chargers Battery Cover, SAR test was repeated using wireless charging battery cover from the highest SAR measured for each mode.

12.4. CDMA BC1

12.4.1. Maximum Power

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Head	1xRTT (RC3 SO55)	0	Left Touch	600	1880.0	24.7	24.6	0.206	0.213		
			Left Tilt	600	1880.0	24.7	24.6	0.138	0.143		
			Right Touch	600	1880.0	24.7	24.6	0.269	0.278		
				600	1880.0	24.7	24.6	0.232	0.238		1
	Right Tilt		600	1880.0	24.7	24.6	0.100	0.103			
	1xEVDO (Rel. 0)		Left Touch	600	1880.0	24.7	24.6	0.229	0.237		
			Left Tilt	600	1880.0	24.7	24.6	0.141	0.146		
			Right Touch	600	1880.0	24.7	24.6	0.281	0.290	11	
600		1880.0		24.7	24.6	0.261	0.268		1		
Right Tilt	600	1880.0	24.7	24.6	0.096	0.098					
Body-worn & Hotspot	1xRTT (RC3 SO32)	10	Rear	25	1851.3	24.7	24.6	0.798	0.815		
				600	1880.0	24.7	24.6	0.811	0.838		
				1175	1908.8	24.7	24.6	0.854	0.872		
				1175	1908.8	24.7	24.6	0.677	0.691		1
	Front		600	1880.0	24.7	24.6	0.532	0.546			
	1xEVDO (Rel. 0)		Rear	25	1851.3	24.7	24.6	0.870	0.899		
				600	1880.0	24.7	24.6	0.920	0.944		
				1175	1908.8	24.7	24.6	0.944	0.964	12	
			1175	1908.8	24.7	24.6	0.781	0.807		1	
			Front	600	1880.0	24.7	24.6	0.609	0.625		
Edge 2		600	1880.0	24.7	24.6	0.285	0.292				
Edge 3	25	1851.3	24.7	24.6	0.780	0.806					
	600	1880.0	24.7	24.6	0.844	0.866					
	1175	1908.8	24.7	24.6	0.841	0.859					
Edge 4	600	1880.0	24.7	24.6	0.145	0.149					
Hotspot	1xRTT (RC3 SO32)	10	Edge 2	600	1880.0	24.7	24.6	0.308	0.316		
				25	1851.3	24.7	24.6	0.856	0.884		
				600	1880.0	24.7	24.6	0.879	0.902		
	Edge 3		1175	1908.8	24.7	24.6	0.862	0.880			
			600	1880.0	24.7	24.6	0.879	0.902			
			1175	1908.8	24.7	24.6	0.862	0.880			
Edge 4	600	1880.0	24.7	24.6	0.136	0.139					

12.4.2. 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	1880.0	17.5	17.4	0.039	0.040	
			Left Tilt	600	1880.0	17.5	17.4	0.022	0.022	
			Right Touch	600	1880.0	17.5	17.4	0.042	0.043	
			Right Tilt	600	1880.0	17.5	17.4	0.012	0.012	
Body-worn & Hotspot	1xRTT (RC3 SO32)	10	Rear	600	1880.0	17.5	17.4	0.169	0.173	
			Front	600	1880.0	17.5	17.4	0.107	0.109	
Hotspot	1xRTT (RC3 SO32)	10	Edge 2	600	1880.0	17.5	17.4	0.025	0.026	
			Edge 3	600	1880.0	17.5	17.4	0.150	0.153	
			Edge 4	600	1880.0	17.5	17.4	0.020	0.020	

Note:

- Per 648474 D03 Wireless Chargers Battery Cover, SAR test was repeated using wireless charging battery cover from the highest SAR measured for each mode.

12.5. W-CDMA Band V

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Head	Rel 99 RMC	0	Left Touch	4183	836.6	23.7	23.5	0.171	0.179		
			Left Tilt	4183	836.6	23.7	23.5	0.120	0.126		
			Right Touch	4183	836.6	23.7	23.5	0.230	0.241	13	
				4183	836.6	23.7	23.5	0.199	0.209		1
Right Tilt	4183	836.6	23.7	23.5	0.141	0.148					
Body-worn & Hotspot	Rel 99 RMC	10	Rear	4183	836.6	23.7	23.5	0.338	0.355		
				4183	836.6	23.7	23.5	0.306	0.321		1
			Front	4183	836.6	23.7	23.5	0.249	0.261		
Hotspot	Rel 99 RMC	10	Edge 2	4183	836.6	23.7	23.5	0.362	0.380	14	
				4183	836.6	23.7	23.5	0.301	0.316		1
			Edge 3	4183	836.6	23.7	23.5	0.177	0.186		
			Edge 4	4183	836.6	23.7	23.5	0.143	0.150		

12.6. W-CDMA Band II

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Head	Rel 99 RMC	0	Left Touch	9400	1880.0	23.7	23.7	0.146	0.146		
			Left Tilt	9400	1880.0	23.7	23.7	0.118	0.118		
			Right Touch	9400	1880.0	23.7	23.7	0.237	0.237	15	
				9400	1880.0	23.7	23.7	0.159	0.159		1
Right Tilt	9400	1880.0	23.7	23.7	0.082	0.082					
Body-worn & Hotspot	Rel 99 RMC	10	Rear	9400	1880.0	23.7	23.7	0.592	0.592		
				9400	1880.0	23.7	23.7	0.547	0.547		1
			Front	9400	1880.0	23.7	23.7	0.421	0.421		
Hotspot	Rel 99 RMC	10	Edge 2	9400	1880.0	23.7	23.7	0.219	0.219		
			Edge 3	9400	1880.0	23.7	23.7	0.611	0.611	16	
				9400	1880.0	23.7	23.7	0.581	0.581		1
Edge 4	9400	1880.0	23.7	23.7	0.147	0.147					

Note:

- Per 648474 D03 Wireless Chargers Battery Cover, SAR test was repeated using wireless charging battery cover from the highest SAR measured for each mode.

12.7. LTE Band 4 (20MHz Bandwidth)

12.7.1. 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.	Note
								Tune-up limit	Meas.	Meas.	Scaled		
Head	QPSK	0	Left Touch	20175	1732.5	1	0	24.2	24.1	0.207	0.212		
						50	0	23.2	23.1	0.156	0.160		
			Left Tilt	20175	1732.5	1	0	24.2	24.1	0.085	0.087		
						50	0	23.2	23.1	0.064	0.066		
			Right Touch	20175	1732.5	1	0	24.2	24.1	0.245	0.251	17	
						1	0	24.2	24.1	0.144	0.147		1
						50	0	23.2	23.1	0.158	0.162		
						50	0	23.2	23.1	0.091	0.093		
Right Tilt	20175	1732.5	1	0	24.2	24.1	0.117	0.120					
			1	0	24.2	24.1	0.117	0.120					
			50	0	23.2	23.1	0.091	0.093					
			50	0	23.2	23.1	0.091	0.093					
Body-worn & Hotspot	QPSK	10	Rear	20175	1732.5	1	0	24.2	24.1	0.593	0.607	18	
						1	0	24.2	24.1	0.462	0.473		1
						50	0	23.2	23.1	0.468	0.479		
			Front	20175	1732.5	1	0	24.2	24.1	0.333	0.341		
						1	0	24.2	24.1	0.333	0.341		
						50	0	23.2	23.1	0.208	0.213		
Hotspot	QPSK	10	Edge 3	20175	1732.5	1	0	24.2	24.1	0.375	0.384		
						50	0	23.2	23.1	0.271	0.277		
			Edge 4	20175	1732.5	1	0	24.2	24.1	0.361	0.369		
						50	0	23.2	23.1	0.266	0.272		

12.7.2. 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.	Note
								Tune-up limit	Meas.	Meas.	Scaled		
Head	QPSK	0	Left Touch	20175	1732.5	1	0	20.2	20.2	0.072	0.072		
						50	0	20.2	20.2	0.073	0.073		
			Left Tilt	20175	1732.5	1	0	20.2	20.2	0.034	0.034		
						50	0	20.2	20.2	0.035	0.035		
			Right Touch	20175	1732.5	1	0	20.2	20.2	0.086	0.086		
						50	0	20.2	20.2	0.089	0.089		
			Right Tilt	20175	1732.5	1	0	20.2	20.2	0.045	0.045		
						50	0	20.2	20.2	0.046	0.046		
Body-worn & Hotspot	QPSK	10	Rear	20175	1732.5	1	0	20.2	20.2	0.271	0.271		
						50	0	20.2	20.2	0.273	0.273		
			Front	20175	1732.5	1	0	20.2	20.2	0.163	0.163		
						50	0	20.2	20.2	0.159	0.159		
Hotspot	QPSK	10	Edge 3	20175	1732.5	1	0	20.2	20.2	0.142	0.142		
						50	0	20.2	20.2	0.142	0.142		
			Edge 4	20175	1732.5	1	0	20.2	20.2	0.141	0.141		
						50	0	20.2	20.2	0.143	0.143		

Note:

- Per 648474 D03 Wireless Chargers Battery Cover, SAR test was repeated using wireless charging battery cover from the highest SAR measured for each mode.

12.8. LTE Band 7 (20MHz Bandwidth)

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.	Note
								Tune-up limit	Meas.	Meas.	Scaled		
Head	QPSK	0	Left Touch	21100	2535.0	1	0	22.2	22.2	0.238	0.238		
						50	0	21.2	20.9	0.184	0.197		
			Left Tilt	21100	2535.0	1	0	22.2	22.2	0.302	0.302		
						50	0	21.2	20.9	0.234	0.251		
			Right Touch	21100	2535.0	1	0	22.2	22.2	0.459	0.459		
						50	0	21.2	20.9	0.361	0.387		
Right Tilt	21100	2535.0	1	0	22.2	22.2	0.561	0.561	19				
			1	0	22.2	22.2	0.365	0.365		1			
			50	0	21.2	20.9	0.438	0.469					
Body-worn & Hotspot	QPSK	10	Rear	21100	2535.0	1	0	22.2	22.2	0.786	0.786	20	
						1	0	22.2	22.2	0.653	0.653		1
						50	0	21.2	20.9	0.598	0.641		
			Front	21100	2535.0	1	0	22.2	22.2	0.099	0.099		
50	0	21.2				20.9	0.076	0.081					
Hotspot	QPSK	10	Edge 1	21100	2535.0	1	0	22.2	22.2	0.346	0.346		
						50	0	21.2	20.9	0.264	0.283		
			Edge 4	21100	2535.0	1	0	22.2	22.2	0.050	0.050		
						50	0	21.2	20.9	0.037	0.040		

Note:

- Per 648474 D03 Wireless Chargers Battery Cover, SAR test was repeated using wireless charging battery cover from the highest SAR measured for each mode.

12.9. LTE Band 13 (10MHz Bandwidth)

12.9.1. 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.	Note
								Tune-up limit	Meas.	Meas.	Scaled		
Head	QPSK	0	Left Touch	23230	782.0	1	0	24.5	24.5	0.121	0.121		
						25	0	23.5	23.5	0.085	0.085		
			Left Tilt	23230	782.0	1	0	24.5	24.5	0.088	0.088		
						25	0	23.5	23.5	0.061	0.061		
			Right Touch	23230	782.0	1	0	24.5	24.5	0.133	0.133		
						25	0	23.5	23.5	0.055	0.055	21	1
			Right Tilt	23230	782.0	1	0	24.5	24.5	0.063	0.063		
						25	0	23.5	23.5	0.044	0.044		
Body-worn & Hotspot	QPSK	10	Rear	23230	782.0	1	0	24.5	24.5	0.321	0.321		
						25	0	23.5	23.5	0.213	0.213		
						1	0	24.5	24.5	0.185	0.185		1
			Front	23230	782.0	1	0	24.5	24.5	0.185	0.185		
						25	0	23.5	23.5	0.143	0.143		
						1	0	24.5	24.5	0.185	0.185		
Hotspot	QPSK	10	Edge 3	23230	782.0	1	0	24.5	24.5	0.260	0.260		
						25	0	23.5	23.5	0.190	0.190		
			Edge 4	23230	782.0	1	0	24.5	24.5	0.349	0.349	22	
						1	0	24.5	24.5	0.254	0.254		1
						25	0	23.5	23.5	0.236	0.236		
						25	0	23.5	23.5	0.236	0.236		

12.9.2. 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.	Note
								Tune-up limit	Meas.	Meas.	Scaled		
Head	QPSK	0	Left Touch	23230	782.0	1	0	20.5	20.4	0.070	0.072		
						25	0	20.5	20.4	0.064	0.065		
			Left Tilt	23230	782.0	1	0	20.5	20.4	0.049	0.050		
						25	0	20.5	20.4	0.047	0.048		
			Right Touch	23230	782.0	1	0	20.5	20.4	0.058	0.059		
						25	0	20.5	20.4	0.055	0.056		
			Right Tilt	23230	782.0	1	0	20.5	20.4	0.042	0.043		
						25	0	20.5	20.4	0.041	0.042		
Body-worn & Hotspot	QPSK	10	Rear	23230	782.0	1	0	20.5	20.4	0.145	0.148		
						25	0	20.5	20.4	0.149	0.152		
			Front	23230	782.0	1	0	20.5	20.4	0.111	0.114		
						25	0	20.5	20.4	0.112	0.115		
Hotspot	QPSK	10	Edge 3	23230	782.0	1	0	20.5	20.4	0.151	0.155		
						25	0	20.5	20.4	0.152	0.156		
			Edge 4	23230	782.0	1	0	20.5	20.4	0.144	0.147		
						25	0	20.5	20.4	0.158	0.162		

Note:

- Per 648474 D03 Wireless Chargers Battery Cover, SAR test was repeated using wireless charging battery cover from the highest SAR measured for each mode.

12.10. Wi-Fi (DTS Band)

12.10.1. 2.4 GHz Band

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Head	802.11b 1 Mbps	0	Left Touch	6	2437	17.0	15.8	0.179	0.236		
			Left Tilt	6	2437	17.0	15.8	0.186	0.245	23	
				6	2437	17.0	15.8	0.136	0.179		1
			Right Touch	6	2437	17.0	15.8	0.102	0.134		
Body-worn, Hotspot, & Wi-Fi Direct	802.11b 1 Mbps	10	Rear	6	2437	17.0	15.8	0.102	0.134	24	
				6	2437	17.0	15.8	0.098	0.129		1
			Front	6	2437	17.0	15.8	0.045	0.059		
Hotspot & Wi-Fi Direct	802.11b 1 Mbps	10	Edge 1	6	2437	17.0	15.8	0.056	0.074		
			Edge 2	6	2437	17.0	15.8	0.023	0.030		

12.10.2. 5.8 GHz Band

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Head	802.11a 6 Mbps	0	Left Touch	149	5745	12.0	11.4	0.138	0.158		
			Left Tilt	149	5745	12.0	11.4	0.201	0.231		
				149	5745	12.0	11.4	0.242	0.278	25	1
			Right Touch	149	5745	12.0	11.4	0.147	0.169		
Body-worn, Hotspot, & Wi-Fi Direct	802.11a 6 Mbps	10	Rear	149	5745	12.0	11.4	0.157	0.180	26	
				149	5745	12.0	11.4	0.153	0.176		1
			Front	149	5745	12.0	11.4	0.058	0.067		
Hotspot & Wi-Fi Direct	802.11a 6 Mbps	10	Edge 1	149	5745	12.0	11.4	0.118	0.135		
			Edge 2	149	5745	12.0	11.4	0.022	0.025		

Note:

- Per 648474 D03 Wireless Chargers Battery Cover, SAR test was repeated using wireless charging battery cover from the highest SAR measured for each mode.

12.11. Wi-Fi (UNII Band)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Head	802.11a 6 Mbps	0	Left Touch	36	5180	12.0	12.0	0.071	0.071		
				52	5260	12.0	12.0	0.117	0.117		
				116	5580	12.0	11.4	0.172	0.197		
			Left Tilt	36	5180	12.0	12.0	0.076	0.076		
				52	5260	12.0	12.0	0.116	0.116		
				116	5580	12.0	11.4	0.153	0.176		
			Right Touch	36	5180	12.0	12.0	0.113	0.113	27	
				36	5180	12.0	12.0	0.023	0.023		1
				52	5260	12.0	12.0	0.156	0.156	28	
				52	5260	12.0	12.0	0.097	0.097		1
				116	5580	12.0	11.4	0.171	0.196		
			Right Tilt	36	5180	12.0	12.0	0.067	0.067		
				52	5260	12.0	12.0	0.147	0.147		
				116	5580	12.0	11.4	0.247	0.284	29	
				116	5580	12.0	11.4	0.144	0.165		1
Body-worn	802.11a 6 Mbps	10	Rear	36	5180	12.0	12.0	0.096	0.096	30	
				36	5180	12.0	12.0	0.094	0.094		1
				52	5260	12.0	12.0	0.122	0.122	31	
				52	5260	12.0	12.0	0.105	0.105		1
				116	5580	12.0	11.4	0.149	0.171		
			116	5580	12.0	11.4	0.171	0.196	32	1	
			Front	36	5180	12.0	12.0	0.031	0.031		
				52	5260	12.0	12.0	0.036	0.036		
				116	5580	12.0	11.4	0.078	0.090		

Note:

- Per 648474 D03 Wireless Chargers Battery Cover, SAR test was repeated using wireless charging battery cover from the highest SAR measured for each mode.

12.12. Additional Testing in 802.11ac Mode for Highest 802.11a mode

Test exclusion considerations for 802.11ac mode:

Apply usual 802.11 test exclusion considerations, but include 802.11ac SAR for highest 802.11a configuration in each frequency band and each exposure condition according to April 2013 TCB Workshop Updates.

Additional testing in 802.11ac mode was performed in HT20 mode so that the same channels from the 802.11a mode could be tested.

12.12.1. 5 GHz Bands

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Head	802.11ac (HT20) MCS0	0	Right Touch	36	5180.0	11.0	10.8	0.001	0.001		
				36	5180.0	11.0	10.8	0.067	0.070		1
				52	5260.0	11.0	10.6	0.111	0.122		
				52	5260.0	11.0	10.6	0.017	0.019		1
			Right Tilt	116	5580.0	11.0	10.4	0.166	0.191		
				116	5580.0	11.0	10.4	0.100	0.115		1
			Left Tilt	149	5745.0	11.0	10.3	0.183	0.215		
				149	5745.0	11.0	10.3	0.008	0.009		1
Body-worn & Wi-Fi Direct	802.11ac (HT20) MCS0	10	Rear	36	5180.0	11.0	10.8	0.060	0.063		
				36	5180.0	11.0	10.8	0.080	0.084		1
				52	5260.0	11.0	10.6	0.052	0.057		
				52	5260.0	11.0	10.6	0.107	0.117		1
				116	5580.0	11.0	10.4	0.109	0.125		
				116	5580.0	11.0	10.4	0.140	0.161		1
				149	5745.0	11.0	10.3	0.118	0.139		
				149	5745.0	11.0	10.3	0.119	0.140		1

Note:

- Per 648474 D03 Wireless Chargers Battery Cover, SAR test was repeated using wireless charging battery cover from the highest SAR measured for each mode.

12.13. Bluetooth

12.13.1. 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 ≤ 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.

Body-worn Accessory Exposure Conditions

Max. tune-up tolerance limit		Min. test separation distance (mm)	Frequency (GHz)	Result
(dBm)	(mW)			
7.5	6	10	2.480	0.9

Conclusion:

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

12.13.2. 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:

- $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f_{(\text{GHz})}/x}] \text{ W/kg}$ 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	6	10	2.480	0.126

13. 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.

13.1. The Highest Measured SAR Configuration in Each Frequency Band

Frequency Band (MHz)	Air Interface	Head (W/kg)	Body-worn & Hotspot (W/kg)	Hotspot/Wi-Fi Direct (W/kg)
750	LTE Band 13	N/A	N/A	N/A
850	GSM 850	N/A	N/A	N/A
	CDMA BC0	N/A	N/A	N/A
	W-CDMA Band V	N/A	N/A	N/A
1750	LTE Band 4	N/A	N/A	N/A
1900	GSM 1900	N/A	N/A	N/A
	CDMA BC1	N/A	0.944 W/kg	N/A
	W-CDMA Band II	N/A	N/A	N/A
2400	Wi-Fi 802.11b/g/n	N/A	N/A	N/A
2600	LTE Band 7	N/A	N/A	N/A
5200	802.11a/n/ac	N/A	N/A	N/A
5300		N/A	N/A	N/A
5500		N/A	N/A	N/A
5800		N/A	N/A	N/A

13.2. Repeated Measurement Results

Head Exposure Condition

Not Applicable.

Body-worn Accessory and Hotspot Mode Exposure Conditions

RF Exposure Conditions	Dist. (mm)	Mode	Test Position	Ch #.	Freq. (MHz)	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio	Note
						Original	Repeated		
Body	10	1xEVDO (Rel. 0)	Rear	1175	1908.75	0.944	0.935	1.01	1

Hotspot Mode/Wi-Fi Direct Exposure Condition

Not Applicable.

Note(s):

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

14. Simultaneous Transmission SAR Analysis

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

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

Where:

SAR₁ 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

SAR₂ 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:

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

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:

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

14.1. Sum of the SAR for GSM 850 & Wi-Fi 2.4 GHz Band & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario			Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			GSM 850	Wi-Fi (DTS)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.216	0.236		0.452	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.150	0.245		0.395	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.284	0.134		0.418	No
	Right Tilt	WWAN + Wi-Fi(DTS)	0.171	0.101		0.272	No
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.433	0.134		0.567	No
		WWAN + BT	0.433		0.126	0.559	No
	Front	WWAN + Wi-Fi(DTS)	0.332	0.059		0.391	No
		WWAN + BT	0.332		0.126	0.458	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.074		0.074	No
	Edge 2	WWAN + Wi-Fi(DTS)	0.335	0.030		0.365	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.205			0.205	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.170			0.170	No

14.2. Sum of the SAR for GSM 850 & Wi-Fi 5 GHz Bands & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			GSM 850	Wi-Fi (DTS)	Wi-Fi (UNII)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.216	0.158			0.374	No
		WWAN + Wi-Fi(UNII)	0.216		0.197		0.413	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.150	0.278			0.428	No
		WWAN + Wi-Fi(UNII)	0.150		0.176		0.326	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.284	0.169			0.453	No
		WWAN + Wi-Fi(UNII)	0.284		0.196		0.480	No
Right Tilt	WWAN + Wi-Fi(DTS)	0.171	0.194			0.365	No	
	WWAN + Wi-Fi(UNII)	0.171		0.284		0.455	No	
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.433	0.180			0.613	No
		WWAN + Wi-Fi(UNII)	0.433		0.196		0.629	No
		WWAN + BT	0.433			0.126	0.559	No
	Front	WWAN + Wi-Fi(DTS)	0.332	0.067			0.399	No
		WWAN + Wi-Fi(UNII)	0.332		0.090		0.422	No
		WWAN + BT	0.332			0.126	0.458	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.135			0.135	No
	Edge 2	WWAN + Wi-Fi(DTS)	0.335	0.025			0.360	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.205				0.205	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.170				0.170	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 GSM 1900 & Wi-Fi 2.4 GHz Band & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario			Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			GSM 1900	Wi-Fi (DTS)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.150	0.236		0.386	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.084	0.245		0.329	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.179	0.134		0.313	No
	Right Tilt	WWAN + Wi-Fi(DTS)	0.068	0.101		0.169	No
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.561	0.134		0.695	No
		WWAN + BT	0.561		0.126	0.687	No
	Front	WWAN + Wi-Fi(DTS)	0.362	0.059		0.421	No
		WWAN + BT	0.362		0.126	0.488	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.074		0.074	No
	Edge 2	WWAN + Wi-Fi(DTS)	0.178	0.030		0.208	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.506			0.506	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.089			0.089	No

14.4. Sum of the SAR for GSM 1900 & Wi-Fi 5 GHz Bands & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			GSM 1900	Wi-Fi (DTS)	Wi-Fi (UNII)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.150	0.158			0.308	No
		WWAN + Wi-Fi(UNII)	0.150		0.197		0.347	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.084	0.278			0.362	No
		WWAN + Wi-Fi(UNII)	0.084		0.176		0.260	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.179	0.169			0.348	No
		WWAN + Wi-Fi(UNII)	0.179		0.196		0.375	No
Right Tilt	WWAN + Wi-Fi(DTS)	0.068	0.194			0.262	No	
	WWAN + Wi-Fi(UNII)	0.068		0.284		0.352	No	
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.561	0.180			0.741	No
		WWAN + Wi-Fi(UNII)	0.561		0.196		0.757	No
		WWAN + BT	0.561			0.126	0.687	No
	Front	WWAN + Wi-Fi(DTS)	0.362	0.067			0.429	No
		WWAN + Wi-Fi(UNII)	0.362		0.090		0.452	No
		WWAN + BT	0.362			0.126	0.488	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.135			0.135	No
	Edge 2	WWAN + Wi-Fi(DTS)	0.178	0.025			0.203	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.506				0.506	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.089				0.089	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 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	Wi-Fi (DTS)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.299	0.236		0.535	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.202	0.245		0.447	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.376	0.134		0.510	No
	Right Tilt	WWAN + Wi-Fi(DTS)	0.230	0.101		0.331	No
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.489	0.134		0.623	No
		WWAN + BT	0.489		0.126	0.615	No
	Front	WWAN + Wi-Fi(DTS)	0.373	0.059		0.432	No
		WWAN + BT	0.373		0.126	0.499	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.074		0.074	No
	Edge 2	WWAN + Wi-Fi(DTS)	0.466	0.030		0.496	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.261			0.261	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.243			0.243	No

14.6. 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	Wi-Fi (DTS)	Wi-Fi (UNII)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.299	0.158			0.457	No
		WWAN + Wi-Fi(UNII)	0.299		0.197		0.496	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.202	0.278			0.480	No
		WWAN + Wi-Fi(UNII)	0.202		0.176		0.378	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.376	0.169			0.545	No
		WWAN + Wi-Fi(UNII)	0.376		0.196		0.572	No
Right Tilt	WWAN + Wi-Fi(DTS)	0.230	0.194			0.424	No	
	WWAN + Wi-Fi(UNII)	0.230		0.284		0.514	No	
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.489	0.180			0.669	No
		WWAN + Wi-Fi(UNII)	0.489		0.196		0.685	No
		WWAN + BT	0.489			0.126	0.615	No
	Front	WWAN + Wi-Fi(DTS)	0.373	0.067			0.440	No
		WWAN + Wi-Fi(UNII)	0.373		0.090		0.463	No
		WWAN + BT	0.373			0.126	0.499	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.135			0.135	No
	Edge 2	WWAN + Wi-Fi(DTS)	0.466	0.025			0.491	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.261				0.261	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.243				0.243	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.

14.7. Sum of the SAR for CDMA BC1 & Wi-Fi 2.4 GHz & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario			Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			CDMA BC1	Wi-Fi (DTS)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.237	0.236		0.473	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.146	0.245		0.391	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.290	0.134		0.424	No
	Right Tilt	WWAN + Wi-Fi(DTS)	0.103	0.101		0.204	No
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.964	0.134		1.098	No
		WWAN + BT	0.964		0.126	1.090	No
	Front	WWAN + Wi-Fi(DTS)	0.625	0.059		0.684	No
		WWAN + BT	0.625		0.126	0.751	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.074		0.074	No
	Edge 2	WWAN + Wi-Fi(DTS)	0.316	0.030		0.346	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.902			0.902	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.149			0.149	No

14.8. 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	Wi-Fi (DTS)	Wi-Fi (UNII)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.237	0.158			0.395	No
		WWAN + Wi-Fi(UNII)	0.237		0.197		0.434	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.146	0.278			0.424	No
		WWAN + Wi-Fi(UNII)	0.146		0.176		0.322	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.290	0.169			0.459	No
		WWAN + Wi-Fi(UNII)	0.290		0.196		0.486	No
Right Tilt	WWAN + Wi-Fi(DTS)	0.103	0.194			0.297	No	
	WWAN + Wi-Fi(UNII)	0.103		0.284		0.387	No	
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.964	0.180			1.144	No
		WWAN + Wi-Fi(UNII)	0.964		0.196		1.160	No
		WWAN + BT	0.964			0.126	1.090	No
	Front	WWAN + Wi-Fi(DTS)	0.625	0.067			0.692	No
		WWAN + Wi-Fi(UNII)	0.625		0.090		0.715	No
		WWAN + BT	0.625			0.126	0.751	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.135			0.135	No
	Edge 2	WWAN + Wi-Fi(DTS)	0.316	0.025			0.341	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.902				0.902	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.149				0.149	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.

14.9. Sum of the SAR for W-CDMA Band V & Wi-Fi 2.4 GHz & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario			Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			W-CDMA Band V	Wi-Fi (DTS)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.179	0.236		0.415	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.126	0.245		0.371	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.241	0.134		0.375	No
	Right Tilt	WWAN + Wi-Fi(DTS)	0.148	0.101		0.249	No
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.355	0.134		0.489	No
		WWAN + BT	0.355		0.126	0.481	No
	Front	WWAN + Wi-Fi(DTS)	0.261	0.059		0.320	No
		WWAN + BT	0.261		0.126	0.387	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.074		0.074	No
	Edge 2	WWAN + Wi-Fi(DTS)	0.380	0.030		0.410	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.186			0.186	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.150			0.150	No

14.10. Sum of the SAR for W-CDMA Band V & Wi-Fi 5 GHz Bands & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			W-CDMA Band V	Wi-Fi (DTS)	Wi-Fi (UNII)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.179	0.158			0.337	No
		WWAN + Wi-Fi(UNII)	0.179		0.197		0.376	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.126	0.278			0.404	No
		WWAN + Wi-Fi(UNII)	0.126		0.176		0.302	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.241	0.169			0.410	No
		WWAN + Wi-Fi(UNII)	0.241		0.196		0.437	No
Right Tilt	WWAN + Wi-Fi(DTS)	0.148	0.194			0.342	No	
	WWAN + Wi-Fi(UNII)	0.148		0.284		0.432	No	
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.355	0.180			0.535	No
		WWAN + Wi-Fi(UNII)	0.355		0.196		0.551	No
		WWAN + BT	0.355			0.126	0.481	No
	Front	WWAN + Wi-Fi(DTS)	0.261	0.067			0.328	No
		WWAN + Wi-Fi(UNII)	0.261		0.090		0.351	No
		WWAN + BT	0.261			0.126	0.387	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.135			0.135	No
	Edge 2	WWAN + Wi-Fi(DTS)	0.380	0.025			0.405	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.186				0.186	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.150				0.150	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.

14.11. Sum of the SAR for W-CDMA Band II & Wi-Fi 2.4 GHz & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario			Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			W-CDMA Band II	Wi-Fi (DTS)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.146	0.236		0.382	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.118	0.245		0.363	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.237	0.134		0.371	No
	Right Tilt	WWAN + Wi-Fi(DTS)	0.082	0.101		0.183	No
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.592	0.134		0.726	No
		WWAN + BT	0.592		0.126	0.718	No
	Front	WWAN + Wi-Fi(DTS)	0.421	0.059		0.480	No
		WWAN + BT	0.421		0.126	0.547	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.074		0.074	No
	Edge 2	WWAN + Wi-Fi(DTS)	0.219	0.030		0.249	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.611			0.611	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.147			0.147	No

14.12. Sum of the SAR for W-CDMA Band II & Wi-Fi 5 GHz Bands & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario				Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			W-CDMA Band II	Wi-Fi (DTS)	Wi-Fi (UNII)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.146	0.158			0.304	No
		WWAN + Wi-Fi(UNII)	0.146		0.197		0.343	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.118	0.278			0.396	No
		WWAN + Wi-Fi(UNII)	0.118		0.176		0.294	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.237	0.169			0.406	No
		WWAN + Wi-Fi(UNII)	0.237		0.196		0.433	No
	Right Tilt	WWAN + Wi-Fi(DTS)	0.082	0.194			0.276	No
		WWAN + Wi-Fi(UNII)	0.082		0.284		0.366	No
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.592	0.180			0.772	No
		WWAN + Wi-Fi(UNII)	0.592		0.196		0.788	No
		WWAN + BT	0.592			0.126	0.718	No
	Front	WWAN + Wi-Fi(DTS)	0.421	0.067			0.488	No
		WWAN + Wi-Fi(UNII)	0.421		0.090		0.511	No
		WWAN + BT	0.421			0.126	0.547	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.135			0.135	No
	Edge 2	WWAN + Wi-Fi(DTS)	0.219	0.025			0.244	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.611				0.611	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.147				0.147	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.

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

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario			Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			LTE Band 4	Wi-Fi (DTS)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.212	0.236		0.448	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.087	0.245		0.332	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.251	0.134		0.385	No
	Right Tilt	WWAN + Wi-Fi(DTS)	0.120	0.101		0.221	No
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.607	0.134		0.741	No
		WWAN + BT	0.607		0.126	0.733	No
	Front	WWAN + Wi-Fi(DTS)	0.341	0.059		0.400	No
		WWAN + BT	0.341		0.126	0.467	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.074		0.074	No
	Edge 2	WWAN + Wi-Fi(DTS)		0.030		0.030	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.384			0.384	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.369			0.369	No

14.14. 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	Wi-Fi (DTS)	Wi-Fi (UNII)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.212	0.158			0.370	No
		WWAN + Wi-Fi(UNII)	0.212		0.197		0.409	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.087	0.278			0.365	No
		WWAN + Wi-Fi(UNII)	0.087		0.176		0.263	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.251	0.169			0.420	No
		WWAN + Wi-Fi(UNII)	0.251		0.196		0.447	No
Right Tilt	WWAN + Wi-Fi(DTS)	0.120	0.194			0.314	No	
	WWAN + Wi-Fi(UNII)	0.120		0.284		0.404	No	
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.607	0.180			0.787	No
		WWAN + Wi-Fi(UNII)	0.607		0.196		0.803	No
		WWAN + BT	0.607			0.126	0.733	No
	Front	WWAN + Wi-Fi(DTS)	0.341	0.067			0.408	No
		WWAN + Wi-Fi(UNII)	0.341		0.090		0.431	No
		WWAN + BT	0.341			0.126	0.467	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.135			0.135	No
	Edge 2	WWAN + Wi-Fi(DTS)		0.025			0.025	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.384				0.384	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.369				0.369	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.

14.15. Sum of the SAR for LTE Band 7 & Wi-Fi 2.4 GHz & BT

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario			Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			LTE Band 7	Wi-Fi (DTS)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.238	0.236		0.474	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.302	0.245		0.547	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.459	0.134		0.593	No
	Right Tilt	WWAN + Wi-Fi(DTS)	0.561	0.101		0.662	No
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.786	0.134		0.920	No
		WWAN + BT	0.786		0.126	0.912	No
	Front	WWAN + Wi-Fi(DTS)	0.099	0.059		0.158	No
		WWAN + BT	0.099		0.126	0.225	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)	0.346	0.074		0.420	No
	Edge 2	WWAN + Wi-Fi(DTS)		0.030		0.030	No
	Edge 3	WWAN + Wi-Fi(DTS)				0.000	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.050			0.050	No

14.16. Sum of the SAR for LTE Band 7 & 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 7	Wi-Fi (DTS)	Wi-Fi (UNII)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.238	0.158			0.396	No
		WWAN + Wi-Fi(UNII)	0.238		0.197		0.435	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.302	0.278			0.580	No
		WWAN + Wi-Fi(UNII)	0.302		0.176		0.478	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.459	0.169			0.628	No
		WWAN + Wi-Fi(UNII)	0.459		0.196		0.655	No
Right Tilt	WWAN + Wi-Fi(DTS)	0.561	0.194			0.755	No	
	WWAN + Wi-Fi(UNII)	0.561		0.284		0.845	No	
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.786	0.180			0.966	No
		WWAN + Wi-Fi(UNII)	0.786		0.196		0.982	No
		WWAN + BT	0.786			0.126	0.912	No
	Front	WWAN + Wi-Fi(DTS)	0.099	0.067			0.166	No
		WWAN + Wi-Fi(UNII)	0.099		0.090		0.189	No
		WWAN + BT	0.099			0.126	0.225	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)	0.346	0.135			0.481	No
	Edge 2	WWAN + Wi-Fi(DTS)		0.025			0.025	No
	Edge 3	WWAN + Wi-Fi(DTS)					0.000	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.050				0.050	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.

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

RF Exposure conditions	Test Position		Simultaneous Transmission Scenario			Σ 1-g SAR (mW/g)	SPLSR (Yes/ No)
			LTE Band 13	Wi-Fi (DTS)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.121	0.236		0.357	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.088	0.245		0.333	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.137	0.134		0.271	No
	Right Tilt	WWAN + Wi-Fi(DTS)	0.063	0.101		0.164	No
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.335	0.134		0.469	No
		WWAN + BT	0.335		0.126	0.461	No
	Front	WWAN + Wi-Fi(DTS)	0.185	0.059		0.244	No
		WWAN + BT	0.185		0.126	0.311	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.074		0.074	No
	Edge 2	WWAN + Wi-Fi(DTS)		0.030		0.030	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.260			0.260	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.349			0.349	No

14.18. 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	Wi-Fi (DTS)	Wi-Fi (UNII)	Bluetooth		
Head	Left Touch	WWAN + Wi-Fi(DTS)	0.121	0.158			0.279	No
		WWAN + Wi-Fi(UNII)	0.121		0.197		0.318	No
	Left Tilt	WWAN + Wi-Fi(DTS)	0.088	0.278			0.366	No
		WWAN + Wi-Fi(UNII)	0.088		0.176		0.264	No
	Right Touch	WWAN + Wi-Fi(DTS)	0.137	0.169			0.306	No
		WWAN + Wi-Fi(UNII)	0.137		0.196		0.333	No
Right Tilt	WWAN + Wi-Fi(DTS)	0.063	0.194			0.257	No	
	WWAN + Wi-Fi(UNII)	0.063		0.284		0.347	No	
Body-worn Accessory & Hotspot	Rear	WWAN + Wi-Fi(DTS)	0.335	0.180			0.515	No
		WWAN + Wi-Fi(UNII)	0.335		0.196		0.531	No
		WWAN + BT	0.335			0.126	0.461	No
	Front	WWAN + Wi-Fi(DTS)	0.185	0.067			0.252	No
		WWAN + Wi-Fi(UNII)	0.185		0.090		0.275	No
		WWAN + BT	0.185			0.126	0.311	No
Hotspot	Edge 1	WWAN + Wi-Fi(DTS)		0.135			0.135	No
	Edge 2	WWAN + Wi-Fi(DTS)		0.025			0.025	No
	Edge 3	WWAN + Wi-Fi(DTS)	0.260				0.260	No
	Edge 4	WWAN + Wi-Fi(DTS)	0.349				0.349	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.

14.19. Sum of the SAR for SV-LTE

14.19.1. 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 (W/kg)
		CDMA BC0	CDMA BC1	LTE Band 4	LTE Band 13	WiFi DTS Band	Bluetooth	
Head	Left Touch	0.297		0.073		0.236		0.606
		0.297			0.072	0.236		0.605
			0.213	0.073		0.236		0.522
			0.213		0.072	0.236		0.521
	Left Tilt	0.202		0.035		0.245		0.482
		0.202			0.050	0.245		0.497
			0.143	0.035		0.245		0.423
			0.143		0.050	0.245		0.438
	Right Touch	0.374		0.089		0.134		0.597
		0.374			0.059	0.134		0.567
			0.278	0.089		0.134		0.501
			0.278		0.059	0.134		0.471
	Right Tilt	0.230		0.046		0.101		0.377
		0.230			0.043	0.101		0.374
			0.103	0.046		0.101		0.250
			0.103		0.043	0.101		0.247
Body-worn, Hotspot, and Wi-Fi Direct	Rear	0.489		0.273		0.134		0.896
		0.489		0.273			0.126	0.888
		0.489			0.152	0.134		0.775
		0.489			0.152		0.126	0.767
			0.872	0.273		0.134		1.279
			0.872	0.273			0.126	1.271
			0.872		0.152	0.134		1.158
			0.872		0.152		0.126	1.150
	Front	0.373		0.163		0.059		0.595
		0.373		0.163			0.126	0.662
		0.373			0.115	0.059		0.547
		0.373			0.115		0.126	0.614
			0.546	0.163		0.059		0.768
			0.546	0.163			0.126	0.835
			0.546		0.115	0.059		0.720
			0.546		0.115		0.126	0.787
Hotspot and Wi-Fi Direct	Edge 1					0.074		0.074
	Edge 2	0.377				0.030		0.407
			0.292			0.030		0.322
	Edge 3	0.261		0.142				0.403
		0.261			0.156			0.417
			0.866	0.142				1.008
			0.866		0.156			1.022
	Edge 4	0.188		0.143				0.331
		0.188			0.162			0.350
			0.149	0.143				0.292
			0.149		0.162			0.311

14.19.2. 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 (W/kg)	
		CDMA BC0	CDMA BC1	LTE Band 4	LTE Band 13	WiFi 5.8 GHz DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.297		0.073		0.158			0.528	
		0.297		0.073			0.197		0.567	
		0.297			0.072	0.158			0.527	
		0.297			0.072		0.197		0.566	
			0.213	0.073		0.158			0.444	
			0.213	0.073			0.197		0.483	
			0.213		0.072	0.158			0.443	
			0.213		0.072		0.197		0.482	
	Left Tilt	0.202		0.035		0.278			0.515	
		0.202		0.035			0.176		0.413	
		0.202			0.050	0.278			0.530	
		0.202			0.050		0.176		0.428	
			0.143	0.035		0.278			0.456	
			0.143	0.035			0.176		0.354	
			0.143		0.050	0.278			0.471	
			0.143		0.050		0.176		0.369	
	Right Touch	0.374		0.089		0.169			0.632	
		0.374		0.089			0.196		0.659	
		0.374			0.059	0.169			0.602	
		0.374			0.059		0.196		0.629	
			0.278	0.089		0.169			0.536	
			0.278	0.089			0.196		0.563	
			0.278		0.059	0.169			0.506	
			0.278		0.059		0.196		0.533	
	Right Tilt	0.230		0.046		0.194			0.470	
		0.230		0.046			0.284		0.560	
		0.230			0.043	0.194			0.467	
		0.230			0.043		0.284		0.557	
			0.103	0.046		0.194			0.343	
			0.103	0.046			0.284		0.433	
			0.103		0.043	0.194			0.340	
			0.103		0.043		0.284		0.430	
	Body-worn, Hotspot, and Wi-Fi Direct	Rear	0.489		0.273		0.180			0.942
			0.489		0.273			0.196		0.958
			0.489		0.273				0.126	0.888
			0.489			0.152	0.180			0.821
0.489					0.152		0.196		0.837	
0.489					0.152			0.126	0.767	
			0.872	0.273		0.180			1.325	
			0.872	0.273			0.196		1.341	
			0.872	0.273				0.126	1.271	
			0.872		0.152	0.180			1.204	
			0.872		0.152		0.196		1.220	
			0.872		0.152			0.126	1.150	
Front		0.373		0.163		0.067			0.603	
		0.373		0.163			0.090		0.626	
		0.373		0.163				0.126	0.662	
		0.373			0.115	0.067			0.555	
		0.373			0.115		0.090		0.578	
		0.373			0.115			0.126	0.614	
			0.546	0.163		0.067			0.776	
			0.546	0.163			0.090		0.799	
			0.546	0.163				0.126	0.835	
			0.546		0.115	0.067			0.728	
			0.546		0.115		0.090		0.751	
			0.546		0.115			0.126	0.787	
Hotspot and Wi-Fi Direct	Edge 1					0.135			0.135	
	Edge 2	0.377				0.025			0.402	
			0.292				0.025		0.317	
	Edge 3	0.261		0.142					0.403	
		0.261			0.156				0.417	
			0.866	0.142					1.008	
			0.866		0.156				1.022	
	Edge 4	0.188		0.143					0.331	
		0.188			0.162				0.350	
			0.149	0.143					0.292	
		0.149		0.162				0.311		

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

RF Exposure Conditions	Test Position	Voice (Reduced Power)		Data (Maximum Power)		Data		Σ 1-g SAR (W/kg)
		CDMA BC0	CDMA BC1	LTE Band 4	LTE Band 13	WiFi DTS Band	Bluetooth	
Head	Left Touch	0.064		0.212		0.236		0.512
		0.064			0.121	0.236		0.421
			0.040	0.212		0.236		0.488
			0.040		0.121	0.236		0.397
	Left Tilt	0.042		0.087		0.245		0.374
		0.042			0.088	0.245		0.375
			0.022	0.087		0.245		0.354
			0.022		0.088	0.245		0.355
	Right Touch	0.080		0.251		0.134		0.465
		0.080			0.137	0.134		0.351
			0.043	0.251		0.134		0.428
			0.043		0.137	0.134		0.314
	Right Tilt	0.047		0.120		0.101		0.268
		0.047			0.063	0.101		0.211
			0.012	0.120		0.101		0.233
			0.012		0.063	0.101		0.176
Body-worn, Hotspot, and Wi-Fi Direct	Rear	0.115		0.607		0.134		0.856
		0.115		0.607			0.126	0.848
		0.115			0.335	0.134		0.584
		0.115			0.335		0.126	0.576
			0.173	0.607		0.134		0.914
			0.173	0.607			0.126	0.906
			0.173		0.335	0.134		0.642
			0.173		0.335		0.126	0.634
	Front	0.095		0.341		0.059		0.495
		0.095		0.341			0.126	0.562
		0.095			0.185	0.059		0.339
		0.095			0.185		0.126	0.406
			0.109	0.341		0.059		0.509
			0.109	0.341			0.126	0.576
			0.109		0.185	0.059		0.353
			0.109		0.185		0.126	0.420
Hotspot and Wi-Fi Direct	Edge 1					0.074		0.074
	Edge 2	0.044				0.030		0.074
			0.026			0.030		0.056
	Edge 3	0.063		0.384				0.447
		0.063			0.260			0.323
			0.153	0.384				0.537
	Edge 4		0.153		0.260			0.413
		0.053		0.369				0.422
		0.053			0.349			0.402
			0.020	0.369				0.389
	0.020		0.349				0.369	

14.19.4. 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 (W/kg)	
		CDMA BC0	CDMA BC1	LTE Band 4	LTE Band 13	WiFi 5.8 GHz DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.064		0.212		0.158			0.434	
		0.064		0.212			0.197		0.473	
		0.064			0.121	0.158			0.343	
		0.064			0.121		0.197		0.382	
			0.040	0.212		0.158			0.410	
			0.040	0.212			0.197		0.449	
	Left Tilt		0.040		0.121	0.158			0.319	
			0.040		0.121		0.197		0.358	
		0.042		0.087		0.278			0.407	
		0.042		0.087			0.176		0.305	
		0.042			0.088	0.278			0.408	
		0.042			0.088		0.176		0.306	
	Right Touch		0.022	0.087		0.278			0.387	
			0.022	0.087			0.176		0.285	
			0.022		0.088	0.278			0.388	
			0.022		0.088		0.176		0.286	
		0.080		0.251		0.169			0.500	
		0.080		0.251			0.196		0.527	
	Right Tilt				0.137	0.169			0.386	
					0.137		0.196		0.413	
			0.043	0.251		0.169			0.463	
			0.043	0.251			0.196		0.490	
			0.043		0.137	0.169			0.349	
			0.043		0.137		0.196		0.376	
	Body-worn, Hotspot, and Wi-Fi Direct	Rear	0.047		0.120		0.194			0.361
			0.047		0.120			0.284		0.451
			0.047			0.063	0.194			0.304
			0.047			0.063		0.284		0.394
				0.012	0.120		0.194			0.326
				0.012	0.120			0.284		0.416
Front			0.012		0.063	0.194			0.269	
			0.012		0.063		0.284		0.359	
		0.115		0.607		0.180			0.902	
		0.115		0.607			0.196		0.918	
	0.115		0.607				0.126	0.848		
	0.115			0.335	0.180			0.630		
	0.115			0.335		0.196		0.646		
	0.115			0.335			0.126	0.576		
		0.173	0.607		0.180			0.960		
		0.173	0.607			0.196		0.976		
		0.173	0.607				0.126	0.906		
		0.173		0.335	0.180			0.688		
		0.173		0.335		0.196		0.704		
		0.173		0.335			0.126	0.634		
Hotspot and Wi-Fi Direct	Edge 1	0.095		0.341		0.067			0.503	
		0.095		0.341			0.090		0.526	
		0.095		0.341				0.126	0.562	
		0.095			0.185	0.067			0.347	
		0.095			0.185		0.090		0.370	
		0.095			0.185			0.126	0.406	
	Edge 2		0.109	0.341		0.067			0.517	
			0.109	0.341			0.090		0.540	
			0.109	0.341				0.126	0.576	
			0.109		0.185	0.067			0.361	
Edge 3		0.109		0.185		0.090		0.384		
		0.109		0.185			0.126	0.420		
	0.053		0.369					0.422		
	0.053		0.369		0.349			0.402		
Edge 4		0.020	0.369					0.389		
		0.020		0.349				0.369		

15. Appendixes

Refer to 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 3885**
- 15.5. Calibration Certificate for E-Field Probe EX3DV4 - SN 3749**
- 15.6. Calibration Certificate for E-Field Probe EX3DV4 - SN 3901**
- 15.7. Calibration Certificate for E-Field Probe EX3DV4 - SN 3686**
- 15.8. Calibration Certificate for E-Field Probe EX3DV4 - SN 3989**
- 15.9. Calibration Certificate for E-Field Probe EX3DV4 - SN 3990**
- 15.10. Calibration Certificate for D750V3 - SN 1019**
- 15.11. Calibration Certificate for D835V2 - SN 4d002**
- 15.12. Calibration Certificate for D1750V2- SN 1053**
- 15.13. Calibration Certificate for D1750V2- SN 1077**
- 15.14. Calibration Certificate for D1900V2- SN 5d043**
- 15.15. Calibration Certificate for D2450V2 - SN 748**
- 15.16. Calibration Certificate for D2600V2 - SN 1036**
- 15.17. Calibration Certificate for D5GHzV2 – SN 1003**

END OF REPORT