SAR EVALUATION REPORT

FCC 47 CFR § 2.1093
IEEE Std 1528-2013

For
GSM/WCDMA/LTE PHABLET + BLUETOOTH, DTS/UNII a/b/g/n and NFC

FCC ID: ZNFH740
Model Name: LG-H740, LGH740, H740

Report Number: 15I21238-S1A
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Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Date	Revisions	Revised By
--	8/5/2015	Initial Issue (Draft)	--
A	8/13/2015	Updated Section 9: Removed band gap channels Updated Section 10: Updated KDB 648474 D04 Handset SAR explanation Updated Section 10.12: Updated Notes	AJ Newcomer

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1. Attestation of Test Results

Applicant Name	LG ELECTRONICS MOBILECOMM USA, INC.			
FCC ID	ZNFH740			
Model Name	LG-H740, LGH740, H740			
Applicable Standards	FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013			
SAR Limits (W/Kg)				
Exposure Category	Peak spatial-average(1g of tissue)		Extremities (hands, wrists, ankles, etc.) (10g of tissue)	
General population / Uncontrolled exposure	1.6		4	
The Highest Reported SAR (W/kg)				
RF Exposure Conditions	**Equipment Class**			
	Licensed	**DTS**	**U-NII**	**DSS (BT)**
Head	0.905	0.631	0.388	N/A
Body-worn*	1.012	0.321	0.278	
Hotspot/Wi-Fi Direct			0.178	
Extremity (10g)	N/A	N/A	0.356	
Simultaneous Tx	1.536		1.293	
Date Tested	7/8/2015 to 7/17/2015 and 7/31/2015 to 8/5/2015			
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:
	
Devin Chang Senior Engineer UL Verification Services Inc.	AJ Newcomer Laboratory Technician UL Verification Services Inc.

2. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE STD 1528-2013, the following FCC Published RF exposure KDB procedures:

- 248227 D01 802.11 Wi-Fi SAR v02
- 447498 D01 General RF Exposure Guidance v05r02
- 447498 D03 Supplement C Cross-Reference v01
- 648474 D04 Handset SAR v01r02
- 690783 D01 SAR Listings on Grants v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03
- 865664 D02 RF Exposure Reporting v01r01
- 941225 D01 3G SAR Procedures v03
- 941225 D05 SAR for LTE Devices v02r03
- 941225 D05A LTE Rel.10 KDB Inquiry Sheet v01r01
- 941225 D06 Hotspot Mode v02
- TCB workshop October, 2014; Page 36, RF Exposure Procedures Update

3. Facilities and Accreditation

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

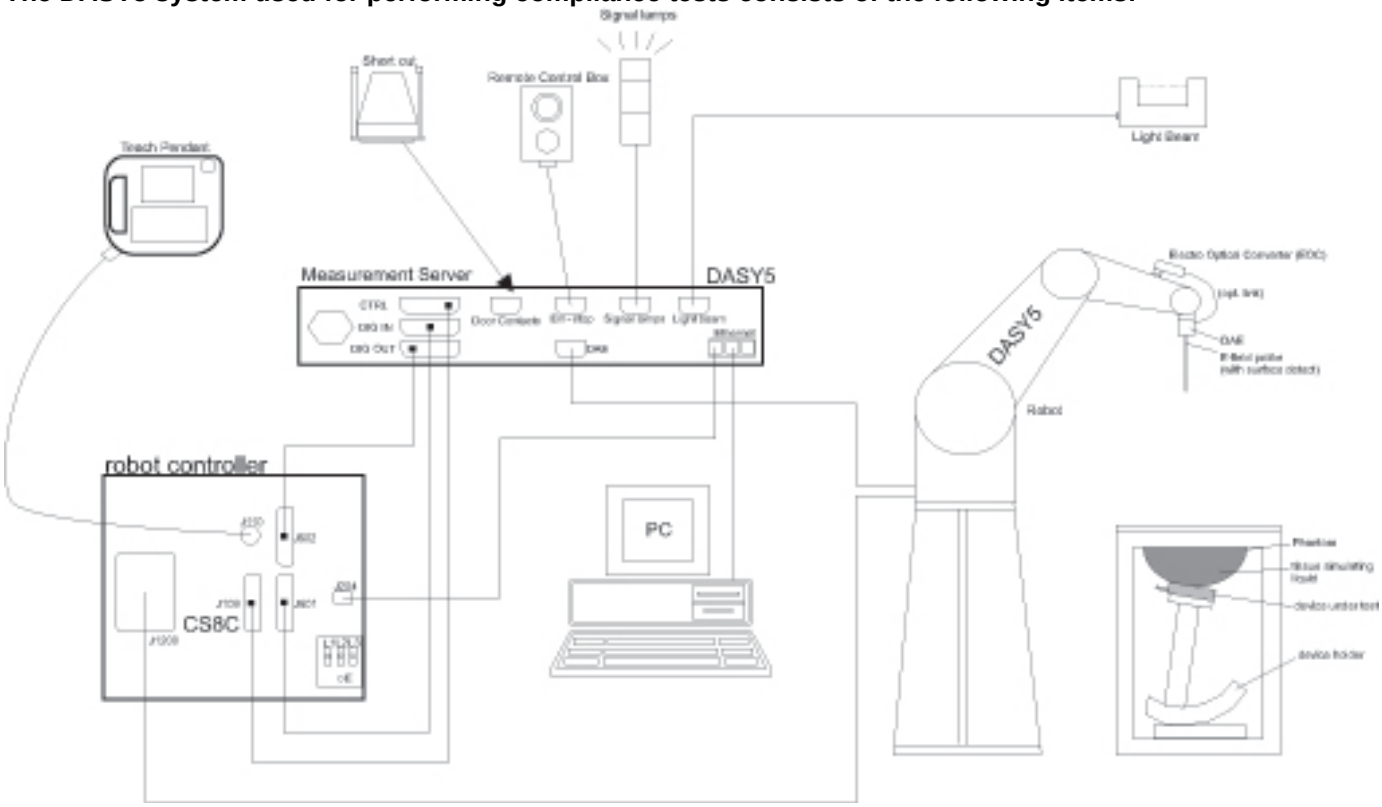
47173 Benicia Street	47266 Benicia Street
SAR Lab A	SAR Lab 1
SAR Lab B	SAR Lab 2
SAR Lab C	SAR Lab 3
SAR Lab D	SAR Lab 4
SAR Lab E	SAR Lab 5
SAR Lab F	
SAR Lab G	
SAR Lab H	

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

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

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



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

4.2. SAR Scan Procedures

Step 1: Power Reference Measurement

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

Step 2: Area Scan

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

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

<table>
<tr><td></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td>Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td>Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">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.</td></tr>
</table>

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: Δx_{Zoom}, Δy_{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 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: 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 *reported* SAR from the area scan based *1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

Step 4: Power drift measurement

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

Step 5: Z-Scan (FCC only)

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

4.3. Test Equipment

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

Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	Agilent	E753ES	MY40000980	4/17/2016
Dielectric Probe kit	SPEAG	DAK-3.5	1082	9/16/2015
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	Control Company	Traceable	122529163	10/8/2015

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Synthesized Signal Generator	Agilent	8665B	3438A00633	8/29/2015
Power Meter	HP	437B	3125U09516	8/27/2015
Power Meter	HP	437B	3125U11347	10/6/2015
Power Sensor	HP	8481A	3318A95392	10/6/2015
Power Sensor	HP	8481A	1926A16917	10/10/2015
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1808938	N/A
Bi-directional coupler	Werlatone, Inc.	C8060-102	2710	N/A
DC Power Supply	HP	6296A	2841A-05955	N/A
E-Field Probe (SAR Lab 1)	SPEAG	EX3DV4	3929	4/22/2016
E-Field Probe (SAR Lab 1)	SPEAG	EX3DV4	7356	4/22/2016
E-Field Probe (SAR Lab 2)	SPEAG	EX3DV4	3990	3/18/2016
E-Field Probe (SAR Lab 3)	SPEAG	EX3DV4	3749	1/26/2016
E-Field Probe (SAR Lab 4)	SPEAG	EX3DV4	3989	3/17/2016
E-Field Probe (SAR Lab 5)	SPEAG	EX3DV4	3773	4/22/2016
Data Acquisition Electronics (SAR Lab 1)	SPEAG	DAE4	1352	11/7/2015
Data Acquisition Electronics (SAR Lab 2)	SPEAG	DAE4	1259	1/14/2016
Data Acquisition Electronics (SAR Lab 3)	SPEAG	DAE4	1380	7/23/2015
Data Acquisition Electronics (SAR Lab 4)	SPEAG	DAE4	1377	8/27/2015
Data Acquisition Electronics (SAR Lab 5)	SPEAG	DAE4	1239	4/16/2016
System Validation Dipole	SPEAG	D750V3	1071	11/13/2015
System Validation Dipole	SPEAG	D835V2	4d142	9/9/2015
System Validation Dipole	SPEAG	D1750V2	1077	9/11/2015
System Validation Dipole	SPEAG	D1750V2	1053	8/18/2015
System Validation Dipole	SPEAG	D1900V2	5d163	9/11/2015
System Validation Dipole	SPEAG	D2300V2	1002	3/13/2016
System Validation Dipole	SPEAG	D2450V2	706	5/11/2016
System Validation Dipole	SPEAG	D5GHzV2	1168	12/4/2015
System Validation Dipole	SPEAG	D5GHzV2	1138	9/18/2015
Thermometer (SAR Lab 1)	EXTECH	445703	CCS-205	3/20/2016
Thermometer (SAR Lab 2)	EXTECH	445703	CCS-203	3/19/2016
Thermometer (SAR Lab 3)	EXTECH	445703	CCS-237	6/5/2016
Thermometer (SAR Lab 4)	EXTECH	445703	CCS-238	6/5/2016
Thermometer (SAR Lab 5)	EXTECH	445703	CCS-239	6/5/2016

Other

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Power Meter	Agilent	N1912A	MY53060007	9/15/2015
Power Sensor	Agilent	N1921A	MY53260011	6/1/2016
Base Station Simulator	R & S	CMW500	132910	10/16/2015

5. Measurement Uncertainty

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

6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	For Device Dimensions please refer to Appendix A “SAR Photos & Ant. Locations”		
Back Cover	☐ Normal Battery Cover ☒ Normal Battery Cover with NFC ☐ Wireless Charger Battery Cover ☐ Wireless Charger Battery Cover with NFC ☐ The rechargeable battery is not user accessible.		
Battery Options	☒ Standard – Lithium-ion battery, Rating 3.85Vdc, 11.6Wh ☐ Extended (large capacity) ☐ The rechargeable battery is not user accessible.		
Accessory	Headset		
Wireless Router (Hotspot)	Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices. ☒ Mobile Hotspot (Wi-Fi 2.4 GHz) ☒ Mobile Hotspot (Wi-Fi 5.8 GHz)		
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other ☒ Wi-Fi Direct (Wi-Fi 2.4 GHz) ☒ Wi-Fi Direct (Wi-Fi 5.8 GHz)		
Test sample information	**S/N**	**IMEI**	**Notes**
	506CYHE000129	353073-07-000129-2	BT/Wi-Fi Conducted
	506CYCV000131	353073-07-000131-8	BT/Wi-Fi SAR
	506CYAS000120	353073-07-000120-1	Licensed Radiated/Conducted
	506CYWC000121	353073-07-000121-9	Licensed Radiated/Conducted

6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode		Duty Cycle used for SAR testing
GSM	850 1900	Voice (GMSK) GPRS (GMSK) EGPRS (8PSK)	GPRS Multi-Slot Class: ☐ Class 8 - 1 Up, 4 Down ☒ Class 10 - 2 Up, 4 Down ☐ Class 12 - 4 Up, 4 Down ☐ Class 33 - 4 Up, 5 Down	GSM Voice: 12.5% (E)GPRS: 1 Slot: 12.5% 2 Slots: 25% 3 Slots: 37.5% 4 Slots: 50%
	☐ Class A = Can be connected to GPRS service and GSM service (voice, SMS), using both at the same time. Does this device support DTM (Dual Transfer Mode)? ☐ Yes ☐ No ☒ Class B = GPRS connection interrupted during a GSM call, automatically resumed at end of call. ☐ Class C = manual GSM / GPRS mode switching.			
W-CDMA (UMTS)	Band II Band V	UMTS Rel. 99 (Voice & Data) HSDPA (Rel. 5) HSUPA (Rel. 6) HSPA+ (Rel. 7)		100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 12 FDD Band 17 FDD Band 30	QPSK 16QAM ☒ Rel. 10 Carrier Aggregation (Downlinks Only) ☐ Rel. 10 Carrier Aggregation (1 Uplink and 2 Downlinks) ☐ Rel. 11 Carrier Aggregation (2 Uplink and 2 Downlinks)		100% (FDD)
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20)		100%
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40)		100%
	Does this device support bands 5.60 ~ 5.65 GHz? ☐ Yes ☒ No			
	Does this device support Band gap channel(s)? ☐ Yes ☒ No			
Bluetooth	2.4 GHz	Version 4.1 LE		77.5% (DH5)

6.3. Nominal and Maximum Output Power

KDB 447498 sec.4.1.(3) at the maximum rated output power and within the tune-up tolerance range specified for the product, but not more than 2 dB lower than the maximum tune-up tolerance limit

Upper limit (dB): -1.5 ~ 0.5		Max. RF Output Power (dBm)		
RF Air interface	Mode	Target	Max. tune-up tolerance limit	
			Burst	Frame
GSM850	Voice (1 slot)	32.7	**33.2**	**24.2**
	GPRS 1 slot	32.7	**33.2**	**24.2**
	GPRS 2 slots	31.7	**32.2**	**26.2**
	EGPRS 1 slot	27.2	**27.7**	**18.7**
	EGPRS 2 slots	26.2	**26.7**	**20.7**
GSM1900	Voice (1 slot)	29.2	**29.7**	**20.7**
	GPRS 1 slot	29.2	**29.7**	**20.7**
	GPRS 2 slots	27.2	**27.7**	**21.7**
	EGPRS 1 slot	25.2	**25.7**	**16.7**
	EGPRS 2 slots	24.2	**24.7**	**18.7**

Upper limit (dB): -1.5 ~ 0.5		Max. RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
W-CDMA Band II	R99	23.7	**24.2**
	HSDPA	23.7	**24.2**
	HSUPA	23.7	**24.2**
W-CDMA Band V	R99	23.7	**24.2**
	HSDPA	23.7	**24.2**
	HSUPA	23.7	**24.2**
LTE Band 2	QPSK	24.2	**24.7**
	16QAM	23.2	**23.7**
LTE Band 4	QPSK	24.2	**24.7**
	16QAM	23.2	**23.7**
LTE Band 5	QPSK	24.2	**24.7**
	16QAM	23.2	**23.7**
LTE Band 12	QPSK	24.2	**24.7**
	16QAM	23.2	**23.7**
LTE Band 17	QPSK	24.2	**24.7**
	16QAM	23.2	**23.7**
LTE Band 30	QPSK	22.2	**22.7**
	16QAM	21.2	**21.7**

Upper limit (dB): ~ 1.0		Max. RF Output Power (dBm)		
RF Air interface	Mode	CH.	Target	Max. tune-up tolerance limit
WiFi 2.4 GHz	802.11b	2~10	17.5	**18.5**
		1,11	14.5	**15.5**
	802.11g	2~10	14.5	**15.5**
		1,11	11.5	**12.5**
	802.11n HT20	2~10	13.0	**14.0**
		1,11	10.0	**11.0**
WiFi 5 GHz	802.11a	All	12.5	**13.5**
	802.11n HT20	All	11.5	**12.5**
	802.11n HT40	All	10.5	**11.5**
Bluetooth		All	8.0	**9.0**
Bluetooth LE		All	-1.0	**0.0**

6.4. General LTE SAR Test and Reporting Considerations

Item	Description						
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 2	Frequency range: 1850 - 1910 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	18700 /1860	18675/ 1857.5	18650/ 1855	18625/ 1852.5	18615/ 1851.5	18607/ 1850.7
	Mid	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880
	High	19100/ 1900	19125/ 1902.5	19150/ 1905	19175/ 1907.5	19185/ 1908.5	19193/ 1909.3
	Band 4	Frequency range: 1710 - 1755 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low		20025/ 1717.5	20000/ 1715	19975/ 1712.5	19965/ 1711.5	19957/ 1710.7
	Mid	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5
	High		20325/ 1747.5	20350/ 1750	20375/ 1752.5	20385/ 1753.5	20393/ 1754.3
	Band 5	Frequency range: 824 - 849 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low				20425/ 826.5	20415/ 825.5	20407/ 824.7
	Mid			20525/ 836.5	20525/ 836.5	20525/ 836.5	20525/ 836.5
	High				20625/ 846.5	20635/ 847.5	20643/ 848.3
	Band 12	Frequency range: 699 – 716 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low			23060/ 704	23035/ 701.5	23025/ 700.5	23017/ 699.7
	Mid			23095/ 707.5	23095/ 707.5	23095/ 707.5	23095/ 707.5
	High			23130/ 711	23155/ 713.5	23165/ 714.5	23173/ 715.3
	Band 17	Frequency range: 704 - 716 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low				23755/ 706.5		
	Mid			23790/ 710	23790/ 710		
	High				23825/ 713.5		
	Band 30	Frequency range: 2305 - 2315 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low				27685/ 2307.5		
	Mid			27710/ 2310	27710/ 2310		
	High				27735/ 2312.5		

General LTE SAR Test and Reporting Considerations (Continued)

Carrier Aggregation Combinations
(For supported channels, please refer to the tables above)

Band 4 Primary	Channel Bandwidth	Band 29 Secondary	Channel Bandwidth
	10, 5 MHz		10, 5, 3 MHz
Band 2 Primary	Channel Bandwidth	Band 29 Secondary	Channel Bandwidth
	10, 5 MHz		10, 5, 3 MHz
Band 4 Primary	Channel Bandwidth	Band 5 Secondary	Channel Bandwidth
	10, 5 MHz		10, 5 MHz
Band 5 Primary	Channel Bandwidth	Band 4 Secondary	Channel Bandwidth
	10, 5 MHz		10, 5 MHz
Band 2 Primary	Channel Bandwidth	Band 17 Secondary	Channel Bandwidth
	10, 5 MHz		10, 5 MHz
Band 17 Primary	Channel Bandwidth	Band 2 Secondary	Channel Bandwidth
	10, 5 MHz		10, 5 MHz
Band 4 Primary	Channel Bandwidth	Band 12 Secondary	Channel Bandwidth
	10, 5, 3, 1.4 MHz		10, 5 MHz
Band 12 Primary	Channel Bandwidth	Band 4 Secondary	Channel Bandwidth
	10, 5 MHz		10, 5, 3, 1.4 MHz
Band 4 Primary	Channel Bandwidth	Band 17 Secondary	Channel Bandwidth
	10, 5 MHz		10, 5 MHz
Band 17 Primary	Channel Bandwidth	Band 4 Secondary	Channel Bandwidth
	10, 5 MHz		10, 5 MHz

Maximum power reduction (MPR)

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

MPR Built-in by design
A-MPR (additional MPR) was disabled during SAR testing

Power reduction: No

Spectrum plots for RB configurations: A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.

7. RF Exposure Conditions (Test Configurations)

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

Wireless technologies	RF Exposure Conditions	DUT-to-User Separation	Test Position	Antenna-to-edge/surface	SAR Required	Note
WWAN ①	Head	0 mm	Left Touch	N/A	Yes	
			Left Tilt (15°)	N/A	Yes	
			Right Touch	N/A	Yes	
			Right Tilt (15°)	N/A	Yes	
	Body	10 mm	Rear	N/A	Yes	
			Front	N/A	Yes	
	Hotspot	10 mm	Rear	< 25 mm	Yes	
			Front	< 25 mm	Yes	
			Edge 1 (Top)	> 25 mm	No	1
			Edge 2 (Right)	< 25 mm	Yes	
			Edge 3 (Bottom)	< 25 mm	Yes	
			Edge 4 (Left)	> 25 mm	No	1
WWAN ②	Head	0 mm	Left Touch	N/A	Yes	
			Left Tilt (15°)	N/A	Yes	
			Right Touch	N/A	Yes	
			Right Tilt (15°)	N/A	Yes	
	Body	10 mm	Rear	N/A	Yes	
			Front	N/A	Yes	
	Hotspot	10 mm	Rear	< 25 mm	Yes	
			Front	< 25 mm	Yes	
			Edge 1 (Top)	> 25 mm	No	1
			Edge 2 (Right)	> 25 mm	No	1
			Edge 3 (Bottom)	< 25 mm	Yes	
			Edge 4 (Left)	< 25 mm	Yes	
WLAN ④	Head	0 mm	Left Touch	N/A	Yes	
			Left Tilt (15°)	N/A	Yes	
			Right Touch	N/A	Yes	
			Right Tilt (15°)	N/A	Yes	
	Body	15 mm	Rear	N/A	Yes	
			Front	N/A	Yes	
	Hotspot / Wi-Fi Direct	10 mm	Rear	< 25 mm	Yes	
			Front	< 25 mm	Yes	
			Edge 1 (Top)	< 25 mm	Yes	
			Edge 2 (Right)	< 25 mm	Yes	
			Edge 3 (Bottom)	> 25 mm	No	1
			Edge 4 (Left)	> 25 mm	No	1

Notes:

1. SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.

8. Dielectric Property Measurements & System Check

8.1. Dielectric Property Measurements

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

Tissue Dielectric Parameters

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

IEEE Std 1528-2013

Refer to Table 3 within the IEEE Std 1528-2013

Dielectric Property Measurements Results:

SAR Lab 1

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/12/2015	Head 2450	e'	40.5500	Relative Permittivity (ϵ_r):	40.55	39.20	3.44	5
		e''	13.8500	Conductivity (σ):	1.89	1.80	4.82	5
	Head 2410	e'	40.7800	Relative Permittivity (ϵ_r):	40.78	39.28	3.82	5
		e''	13.7100	Conductivity (σ):	1.84	1.76	4.36	5
	Head 2475	e'	40.5000	Relative Permittivity (ϵ_r):	40.50	39.17	3.40	5
		e''	13.8200	Conductivity (σ):	1.90	1.83	4.10	5
7/12/2015	Body 2450	e'	51.5200	Relative Permittivity (ϵ_r):	51.52	52.70	-2.24	5
		e''	14.7000	Conductivity (σ):	2.00	1.95	2.69	5
	Body 2410	e'	51.6600	Relative Permittivity (ϵ_r):	51.66	52.76	-2.08	5
		e''	14.5800	Conductivity (σ):	1.95	1.91	2.43	5
	Body 2475	e'	51.5000	Relative Permittivity (ϵ_r):	51.50	52.67	-2.22	5
		e''	14.8300	Conductivity (σ):	2.04	1.99	2.81	5
7/15/2015	Head 2300	e'	38.5871	Relative Permittivity (ϵ_r):	38.59	39.47	-2.24	5
		e''	13.2630	Conductivity (σ):	1.70	1.66	1.95	5
	Head 2310	e'	38.5568	Relative Permittivity (ϵ_r):	38.56	39.45	-2.28	5
		e''	13.2826	Conductivity (σ):	1.71	1.67	2.00	5
	Head 2350	e'	38.2512	Relative Permittivity (ϵ_r):	38.25	39.38	-2.88	5
		e''	13.4449	Conductivity (σ):	1.76	1.71	2.88	5
7/17/2015	Body 2300	e'	51.33000	Relative Permittivity (ϵ_r):	51.33	52.90	-2.98	5
		e''	14.40000	Conductivity (σ):	1.84	1.80	2.11	5
	Body 2310	e'	51.2400	Relative Permittivity (ϵ_r):	51.24	52.89	-3.12	5
		e''	14.4500	Conductivity (σ):	1.86	1.81	2.37	5
	Body 2320	e'	51.2100	Relative Permittivity (ϵ_r):	51.21	52.88	-3.15	5
		e''	14.4700	Conductivity (σ):	1.87	1.82	2.43	5

SAR Lab 2

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/11/2015	Head 1750	e'	38.9400	Relative Permittivity (ϵ_r):	38.94	40.08	-2.86	5
		e''	13.9000	Conductivity (σ):	1.35	1.37	-1.20	5
	Head 1710	e'	39.1700	Relative Permittivity (ϵ_r):	39.17	40.15	-2.43	5
		e''	13.7700	Conductivity (σ):	1.31	1.35	-2.76	5
	Head 1755	e'	38.9300	Relative Permittivity (ϵ_r):	38.93	40.08	-2.86	5
		e''	13.9600	Conductivity (σ):	1.36	1.37	-0.69	5
7/11/2015	Body 1750	e'	51.4500	Relative Permittivity (ϵ_r):	51.45	53.44	-3.73	5
		e''	15.2100	Conductivity (σ):	1.48	1.49	-0.41	5
	Body 1710	e'	51.6800	Relative Permittivity (ϵ_r):	51.68	53.54	-3.48	5
		e''	15.0500	Conductivity (σ):	1.43	1.46	-2.09	5
	Body 1755	e'	51.4900	Relative Permittivity (ϵ_r):	51.49	53.43	-3.63	5
		e''	15.2100	Conductivity (σ):	1.48	1.49	-0.33	5
8/3/2015	Head 1750	e'	38.5200	Relative Permittivity (ϵ_r):	38.52	40.08	-3.90	5
		e''	13.6400	Conductivity (σ):	1.33	1.37	-3.05	5
	Head 1710	e'	38.6600	Relative Permittivity (ϵ_r):	38.66	40.15	-3.70	5
		e''	13.5700	Conductivity (σ):	1.29	1.35	-4.17	5
	Head 1755	e'	38.4400	Relative Permittivity (ϵ_r):	38.44	40.08	-4.08	5
		e''	13.6400	Conductivity (σ):	1.33	1.37	-2.97	5

SAR Lab 3

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/10/2015	Body 1900	e'	51.1100	Relative Permittivity (ϵ_r):	51.11	53.30	-4.11	5
		e''	14.5000	Conductivity (σ):	1.53	1.52	0.78	5
	Body 1850	e'	51.2100	Relative Permittivity (ϵ_r):	51.21	53.30	-3.92	5
		e''	14.3300	Conductivity (σ):	1.47	1.52	-3.02	5
	Body 1910	e'	51.1200	Relative Permittivity (ϵ_r):	51.12	53.30	-4.09	5
		e''	14.4000	Conductivity (σ):	1.53	1.52	0.61	5
7/10/2015	Head 1900	e'	38.1200	Relative Permittivity (ϵ_r):	38.12	40.00	-4.70	5
		e''	13.5500	Conductivity (σ):	1.43	1.40	2.25	5
	Head 1850	e'	38.1000	Relative Permittivity (ϵ_r):	38.10	40.00	-4.75	5
		e''	13.4200	Conductivity (σ):	1.38	1.40	-1.40	5
	Head 1910	e'	38.1100	Relative Permittivity (ϵ_r):	38.11	40.00	-4.73	5
		e''	13.4300	Conductivity (σ):	1.43	1.40	1.88	5

SAR Lab 4

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/13/2015	Head 5180	e'	35.9400	Relative Permittivity (ϵ_r):	35.94	36.01	-0.20	5
		e''	15.6100	Conductivity (σ):	4.50	4.63	-2.90	5
	Head 5200	e'	35.7700	Relative Permittivity (ϵ_r):	35.77	35.99	-0.61	5
		e''	15.6700	Conductivity (σ):	4.53	4.65	-2.58	5
	Head 5600	e'	35.2600	Relative Permittivity (ϵ_r):	35.26	35.53	-0.77	5
		e''	15.8500	Conductivity (σ):	4.94	5.06	-2.47	5
	Head 5800	e'	35.2000	Relative Permittivity (ϵ_r):	35.20	35.30	-0.28	5
		e''	15.8300	Conductivity (σ):	5.11	5.27	-3.13	5
	Head 5825	e'	35.0700	Relative Permittivity (ϵ_r):	35.07	35.30	-0.65	5
		e''	15.9800	Conductivity (σ):	5.18	5.27	-1.79	5
7/13/2015	Body 5180	e'	48.7400	Relative Permittivity (ϵ_r):	48.74	49.05	-0.63	5
		e''	18.6400	Conductivity (σ):	5.37	5.27	1.85	5
	Body 5200	e'	48.6600	Relative Permittivity (ϵ_r):	48.66	49.02	-0.73	5
		e''	18.9900	Conductivity (σ):	5.49	5.29	3.70	5
	Body 5600	e'	48.0900	Relative Permittivity (ϵ_r):	48.09	48.48	-0.80	5
		e''	19.0300	Conductivity (σ):	5.93	5.76	2.86	5
	Body 5800	e'	47.9600	Relative Permittivity (ϵ_r):	47.96	48.20	-0.50	5
		e''	19.1200	Conductivity (σ):	6.17	6.00	2.77	5
	Body 5825	e'	47.7700	Relative Permittivity (ϵ_r):	47.77	48.20	-0.89	5
		e''	19.2600	Conductivity (σ):	6.24	6.00	3.97	5
7/31/2015	Body 5180	e'	47.3800	Relative Permittivity (ϵ_r):	47.38	49.05	-3.40	5
		e''	18.2200	Conductivity (σ):	5.25	5.27	-0.45	5
	Body 5200	e'	47.2900	Relative Permittivity (ϵ_r):	47.29	49.02	-3.53	5
		e''	18.2600	Conductivity (σ):	5.28	5.29	-0.28	5
	Body 5600	e'	46.6800	Relative Permittivity (ϵ_r):	46.68	48.48	-3.71	5
		e''	18.4700	Conductivity (σ):	5.75	5.76	-0.17	5
	Body 5800	e'	46.4300	Relative Permittivity (ϵ_r):	46.43	48.20	-3.67	5
		e''	18.6400	Conductivity (σ):	6.01	6.00	0.19	5
	Body 5825	e'	46.3500	Relative Permittivity (ϵ_r):	46.35	48.20	-3.84	5
		e''	18.6600	Conductivity (σ):	6.04	6.00	0.73	5

SAR Lab 5

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/8/2015	Head 835	e'	41.4100	Relative Permittivity (ϵ_r):	41.41	41.50	-0.22	5
		e''	19.0100	Conductivity (σ):	0.88	0.90	-1.93	5
	Head 820	e'	41.4100	Relative Permittivity (ϵ_r):	41.41	41.60	-0.46	5
		e''	19.1300	Conductivity (σ):	0.87	0.90	-2.92	5
	Head 850	e'	41.1100	Relative Permittivity (ϵ_r):	41.11	41.50	-0.94	5
		e''	19.0400	Conductivity (σ):	0.90	0.92	-1.65	5
7/8/2015	Body 835	e'	53.9100	Relative Permittivity (ϵ_r):	53.91	55.20	-2.34	5
		e''	21.9000	Conductivity (σ):	1.02	0.97	4.82	5
	Body 820	e'	54.1300	Relative Permittivity (ϵ_r):	54.13	55.28	-2.07	5
		e''	21.9700	Conductivity (σ):	1.00	0.97	3.43	5
	Body 850	e'	53.7100	Relative Permittivity (ϵ_r):	53.71	55.16	-2.62	5
		e''	21.6700	Conductivity (σ):	1.02	0.99	3.75	5
7/13/2015	Head 750	e'	40.7700	Relative Permittivity (ϵ_r):	40.77	41.96	-2.84	5
		e''	21.4200	Conductivity (σ):	0.89	0.89	0.02	5
	Head 700	e'	41.4000	Relative Permittivity (ϵ_r):	41.40	42.22	-1.94	5
		e''	21.8200	Conductivity (σ):	0.85	0.89	-4.49	5
	Head 790	e'	40.3000	Relative Permittivity (ϵ_r):	40.30	41.76	-3.49	5
		e''	21.1300	Conductivity (σ):	0.93	0.90	3.57	5
7/13/2015	Body 750	e'	53.9700	Relative Permittivity (ϵ_r):	53.97	55.55	-2.84	5
		e''	23.2400	Conductivity (σ):	0.97	0.96	0.63	5
	Body 700	e'	54.3300	Relative Permittivity (ϵ_r):	54.33	55.74	-2.53	5
		e''	23.6400	Conductivity (σ):	0.92	0.96	-4.08	5
	Body 790	e'	53.5300	Relative Permittivity (ϵ_r):	53.53	55.39	-3.36	5
		e''	22.8200	Conductivity (σ):	1.00	0.97	3.75	5

8.2. System Check

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

System Performance Check Measurement Conditions:

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

Reference Target SAR Values

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

System Dipole	Serial No.	Cal. Date	Freq. (MHz)	Target SAR Values (W/kg)		
				1g/10g	Head	Body
D750V3	1071	11/13/2014	750	1g	8.22	8.52
				10g	5.39	5.64
D835V2	4d142	9/9/2014	835	1g	8.91	9.22
				10g	5.77	6.05
D1750V2	1077	9/11/2014	1750	1g	36.5	36.9
				10g	19.4	19.8
D1750V2	1053	8/18/2014	1750	1g	36.9	38.00
				10g	19.6	20.4
D1900V2	5d163	9/11/2014	1900	1g	40.8	40.6
				10g	21.2	21.4
D2300V2	1002	3/13/2015	2300	1g	47.7	49.1
				10g	23.0	23.7
D2450V2	706	5/11/2015	2450	1g	52.6	51.3
				10g	24.6	24.0
D5GHzV2	1168	12/4/2014	5200	1g	79.3	76.0
				10g	22.5	21.1
			5600	1g	81.7	82.0
				10g	23.2	22.7
			5800	1g	78.0	76.2
				10g	22.1	21.0
D5GHzV2	1138	9/18/2014	5200	1g	81.4	75.4
				10g	23.3	21.0
			5600	1g	85.1	81.9
				10g	24.2	22.6
			5800	1g	80.6	75.2
				10g	23.0	20.8

System Check Results

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

SAR Lab 1

Date Tested	System Dipole		T.S. Liquid		Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.
	Type	Serial #			Zoom Scan to 100 mW	Normalize to 1 W			
7/12/2015	D2450V2	706	Head	1g	5.36	53.6	52.6	1.90	
				10g	2.43	24.3	24.6	-1.22	
7/12/2015	D2450V2	706	Body	1g	5.01	50.1	51.3	**-2.34**	1,2
				10g	2.31	23.1	24.0	-3.75	
7/16/2015	D2300V2	1002	Head	1g	5.00	50.0	47.7	4.82	
				10g	2.35	23.5	23.0	2.17	
7/17/2015	D2300V2	1002	Body	1g	4.52	45.2	49.1	**-7.94**	3,4
				10g	2.15	21.5	23.7	-9.28	

SAR Lab 2

Date Tested	System Dipole		T.S. Liquid		Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.
	Type	Serial #			Zoom Scan to 100 mW	Normalize to 1 W			
7/11/2015	D1750V2	1077	Head	1g	3.67	36.7	36.50	0.55	
				10g	1.94	19.4	19.40	0.00	
7/11/2015	D1750V2	1077	Body	1g	3.93	39.3	36.90	**6.50**	5,6
				10g	2.11	21.1	19.8	6.57	
8/3/2015	D1750V2	1053	Head	1g	3.61	36.1	36.90	**-2.17**	7,8
				10g	1.90	19.0	19.60	-3.06	

SAR Lab 3

Date Tested	System Dipole		T.S. Liquid		Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.
	Type	Serial #			Zoom Scan to 100 mW	Normalize to 1 W			
7/10/2015	D1900V2	5d163	Body	1g	4.04	40.4	40.6	**-0.49**	9,10
				10g	2.11	21.1	21.4	-1.40	
7/10/2015	D1900V2	5d163	Head	1g	4.10	41.0	40.8	0.49	
				10g	2.12	21.2	21.2	0.00	

SAR Lab 4

Date Tested	System Dipole		T.S. Liquid		Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.
	Type	Serial #			Zoom Scan to 100 mW	Normalize to 1 W			
7/13/2015	D5GHzV2 (5.2)	1168	Head	1g	7.81	78.1	79.30	-1.51	
				10g	2.24	22.4	22.50	-0.44	
7/13/2015	D5GHzV2 (5.2)	1168	Body	1g	7.36	73.6	76.00	-3.16	
				10g	2.08	20.8	21.10	-1.42	
7/13/2015	D5GHzV2 (5.6)	1168	Head	1g	8.66	86.6	81.70	**6.00**	11,12
				10g	2.48	24.8	23.20	6.90	
7/13/2015	D5GHzV2 (5.6)	1168	Body	1g	8.54	85.4	82.00	4.15	
				10g	2.38	23.8	22.70	4.85	
7/13/2015	D5GHzV2 (5.8)	1168	Head	1g	8.18	81.8	78.00	4.87	
				10g	2.33	23.3	22.10	5.43	
7/13/2015	D5GHzV2 (5.8)	1168	Body	1g	7.69	76.9	76.20	0.92	
				10g	2.14	21.4	21.00	1.90	
7/31/2015	D5GHzV2 (5.2)	1138	Body	1g	7.14	71.4	75.4	-5.31	
				10g	2.00	20.0	21.0	-4.76	
7/31/2015	D5GHzV2 (5.6)	1138	Body	1g	8.52	85.2	81.9	4.03	13,14
				10g	2.37	23.7	22.6	**4.87**	

SAR Lab 5

Date Tested	System Dipole		T.S. Liquid		Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.
	Type	Serial #			Zoom Scan to 100 mW	Normalize to 1 W			
7/8/2015	D835V2	4d142	Head	1g	0.90	9.0	8.91	1.12	
				10g	0.59	5.9	5.77	2.60	
7/8/2015	D835V2	4d142	Body	1g	0.98	9.8	9.22	**6.51**	15,16
				10g	0.65	6.5	6.05	6.61	
7/13/2015	D750V3	1071	Head	1g	0.79	7.9	8.22	**-4.26**	17,18
				10g	0.52	5.2	5.39	-4.27	
7/13/2015	D750V3	1071	Body	1g	0.86	8.6	8.52	1.06	
				10g	0.58	5.8	5.64	1.95	

9. Conducted Output Power Measurements

9.1. GSM

Per KDB 941225 D01 3G SAR Procedures:

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

GSM850 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Pwr	
						Burst (dBm)	Frame (dBm)
850	GSM (Voice)	CS1	1	128	824.2	33.2	24.2
				190	836.6	33.1	24.1
				251	848.8	33.2	24.2
	GPRS (GMSK)	CS1	1	128	824.2	33.1	24.1
				190	836.6	33.2	24.2
				251	848.8	33.2	24.2
			2	128	824.2	32.2	26.2
				190	836.6	32.2	26.2
				251	848.8	32.2	26.2
	EGPRS (8PSK)	MCS5	1	128	824.2	27.6	18.6
				190	836.6	27.7	18.7
				251	848.8	27.7	18.7
			2	128	824.2	26.3	20.3
				190	836.6	26.4	20.4
				251	848.8	26.5	20.5

Notes:

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

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

GSM1900 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Pwr	
						Burst (dBm)	Frame (dBm)
1900	GSM (Voice)	CS1	1	512	1850.2	29.3	20.3
				661	1880.0	29.7	20.7
				810	1909.8	29.5	20.5
	GPRS (GMSK)	CS1	1	512	1850.2	29.4	20.4
				661	1880.0	29.7	20.7
				810	1909.8	29.5	20.5
			2	512	1850.2	27.6	21.6
				661	1880.0	27.7	21.7
				810	1909.8	27.7	21.7
	EGPRS (8PSK)	MCS5	1	512	1850.2	25.4	16.4
				661	1880.0	25.4	16.4
				810	1909.8	25.4	16.4
			2	512	1850.2	24.3	18.3
				661	1880.0	24.3	18.3
				810	1909.8	24.3	18.3

Notes:

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

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

9.2. W-CDMA

Release 99 Setup Procedures used to establish the test signals

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

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	βc/βd	8/15

HSDPA Setup Procedures used to establish the test signals

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

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	11/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βc/βd	2/15	11/15	15/8	15/4
	βhs	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=βhs/βc	30/15			

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

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSPA				
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2 kbps RMC				
	HSDPA FRC	H-Set 1				
	HSUPA Test	HSPA				
	Power Control Algorithm	Algorithm 2				Algorithm 1
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/βd	11/15	6/15	15/9	2/15	15/1
	βhs	22/15	12/15	30/15	4/15	5/15
	βed	1309/225	94/75	47/15	56/75	47/15
	CM (dB)	1	3	2	3	1
	MPR (dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				0
	DNAK	8				0
	DCQI	8				0
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = βhs/βc	30/15				
HSUPA Specific Settings	E-DPDCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E-TFCIs	5	5	2	5	1
	Reference E-TFCI	11	11	11	11	67
	Reference E-TFCI PO	4	4	4	4	18
	Reference E-TFCI	67	67	92	67	67
	Reference E-TFCI PO	18	18	18	18	18
	Reference E-TFCI	71	71	71	71	71
	Reference E-TFCI PO	23	23	23	23	23
	Reference E-TFCI	75	75	75	75	75
	Reference E-TFCI PO	26	26	26	26	26
	Reference E-TFCI	81	81	81	81	81
	Reference E-TFCI PO	27	27	27	27	27
	Maximum Channelization Codes	2xSF2				SF4

HSPA+

Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., Rel. 7 Therefore, the RF conducted power is not measured.

W-CDMA Band II Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Pwr (dBm)
W-CDMA Band II	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	23.9
			9400	1880.0	N/A	24.0
			9538	1907.6	N/A	24.0
	HSDPA	Subtest 1	9262	1852.4	0	23.6
			9400	1880.0	0	23.6
			9538	1907.6	0	23.7
		Subtest 2	9262	1852.4	0	23.7
			9400	1880.0	0	23.8
			9538	1907.6	0	23.5
		Subtest 3	9262	1852.4	0.5	23.6
			9400	1880.0	0.5	23.3
			9538	1907.6	0.5	23.6
		Subtest 4	9262	1852.4	0.5	23.4
			9400	1880.0	0.5	23.4
			9538	1907.6	0.5	23.6
	HSUPA	Subtest 1	9262	1852.4	0	24.0
			9400	1880.0	0	23.9
			9538	1907.6	0	24.1
		Subtest 2	9262	1852.4	2	21.8
			9400	1880.0	2	21.9
			9538	1907.6	2	21.9
		Subtest 3	9262	1852.4	1	22.2
			9400	1880.0	1	22.4
			9538	1907.6	1	22.3
		Subtest 4	9262	1852.4	2	22.2
			9400	1880.0	2	22.2
			9538	1907.6	2	22.2
		Subtest 5	9262	1852.4	0	23.6
			9400	1880.0	0	23.6
			9538	1907.6	0	23.6

W-CDMA Band V Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Pwr (dBm)
W-CDMA Band V	Rel 99	RMC, 12.2 kbps	4132	826.4	N/A	23.8
			4183	836.6	N/A	23.9
			4233	846.6	N/A	24.0
	HSDPA	Subtest 1	4132	826.4	0	23.8
			4183	836.6	0	24.0
			4233	846.6	0	23.9
		Subtest 2	4132	826.4	0	23.6
			4183	836.6	0	23.9
			4233	846.6	0	23.8
		Subtest 3	4132	826.4	0.5	23.3
			4183	836.6	0.5	23.2
			4233	846.6	0.5	23.3
		Subtest 4	4132	826.4	0.5	23.3
			4183	836.6	0.5	23.2
			4233	846.6	0.5	23.2
	HSUPA	Subtest 1	4132	826.4	0	23.9
			4183	836.6	0	23.8
			4233	846.6	0	24.0
		Subtest 2	4132	826.4	2	22.2
			4183	836.6	2	21.8
			4233	846.6	2	21.6
		Subtest 3	4132	826.4	1	22.6
			4183	836.6	1	22.6
			4233	846.6	1	22.6
		Subtest 4	4132	826.4	2	22.2
			4183	836.6	2	22.1
			4233	846.6	2	22.1
		Subtest 5	4132	826.4	0	23.8
			4183	836.6	0	23.8
			4233	846.6	0	23.8

9.4. LTE

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

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

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

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
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 Signaling Value of “NS_01”.

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

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-
Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.					

LTE Band 2 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						1860 MHz	1880 MHz	1900 MHz
LTE Band 2	20	QPSK	1	0	0	24.5	24.6	24.7
			1	50	0	24.6	24.4	24.7
			1	99	0	24.6	24.5	24.2
			50	0	1	23.4	23.3	23.6
			50	25	1	23.6	23.5	23.4
			50	50	1	23.6	23.6	23.3
			100	0	1	23.5	23.6	23.4
		16QAM	1	0	1	23.0	23.6	23.5
			1	50	1	23.6	23.7	23.7
			1	99	1	23.1	23.3	23.0
			50	0	2	22.5	22.6	22.7
			50	25	2	22.7	22.5	22.5
			50	50	2	22.6	22.7	22.4
			100	0	2	22.5	22.6	22.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						1857.5 MHz	1880 MHz	1902.5 MHz
LTE Band 2	15	QPSK	1	0	0	24.6	24.7	24.7
			1	36	0	24.4	24.5	24.6
			1	74	0	24.7	24.6	24.4
			36	0	1	23.5	23.5	23.5
			36	18	1	23.6	23.4	23.4
			36	37	1	23.7	23.7	23.4
			75	0	1	23.5	23.6	23.4
		16QAM	1	0	1	23.7	23.4	23.6
			1	36	1	23.6	23.2	23.1
			1	74	1	23.6	23.5	23.4
			36	0	2	22.5	22.7	22.5
			36	18	2	22.4	22.5	22.6
			36	37	2	22.6	22.7	22.5
			75	0	2	22.5	22.6	22.4
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						1855 MHz	1880 MHz	1905 MHz
LTE Band 2	10	QPSK	1	0	0	24.5	24.7	24.4
			1	25	0	24.7	24.6	24.5
			1	49	0	24.6	24.7	24.3
			25	0	1	23.5	23.5	23.4
			25	12	1	23.4	23.3	23.5
			25	25	1	23.5	23.5	23.3
			50	0	1	23.5	23.4	23.4
		16QAM	1	0	1	23.4	23.3	23.2
			1	25	1	23.5	23.5	23.7
			1	49	1	23.5	23.5	23.1
			25	0	2	22.6	22.5	22.6
			25	12	2	22.6	22.4	22.7
			25	25	2	22.6	22.7	22.5
			50	0	2	22.5	22.5	22.4

LTE Band 2 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						1852.5 MHz	1880 MHz	1907.5 MHz
LTE Band 2	5	QPSK	1	0	0	24.4	24.6	24.4
			1	12	0	22.7	24.7	24.6
			1	24	0	24.4	24.6	24.4
			12	0	1	23.3	23.4	23.5
			12	6	1	23.5	23.3	23.5
			12	11	1	23.4	23.4	23.4
			25	0	1	23.4	23.4	23.4
		16QAM	1	0	1	23.1	22.8	22.9
			1	12	1	23.4	23.1	23.3
			1	24	1	22.9	23.3	23.0
			12	0	2	22.3	22.2	22.4
			12	6	2	22.6	22.1	22.3
			12	11	2	22.2	22.3	22.2
			25	0	2	22.5	22.3	22.3

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						1851.5 MHz	1880 MHz	1908.5 MHz
LTE Band 2	3	QPSK	1	0	0	24.5	24.6	24.4
			1	7	0	24.7	24.5	24.4
			1	14	0	24.6	24.4	24.4
			8	0	1	23.5	23.5	23.5
			8	4	1	23.6	23.3	23.5
			8	7	1	23.5	23.5	23.4
			15	0	1	23.4	23.2	23.4
		16QAM	1	0	1	23.7	23.1	23.1
			1	7	1	23.5	23.4	23.2
			1	14	1	23.4	23.3	23.1
			8	0	2	22.5	22.3	22.1
			8	4	2	22.6	22.2	22.3
			8	7	2	22.5	22.3	22.2
			15	0	2	22.5	22.3	22.2

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						1850.7 MHz	1880 MHz	1909.3 MHz
LTE Band 2	1.4	QPSK	1	0	0	24.5	24.3	24.4
			1	2	0	24.7	24.4	24.5
			1	5	0	24.5	24.4	24.5
			3	0	0	24.6	24.5	24.7
			3	1	0	24.7	24.5	24.7
			3	2	0	24.6	24.4	24.5
			6	0	1	23.4	23.2	23.4
		16QAM	1	0	1	23.7	23.2	23.3
			1	2	1	23.4	23.3	23.4
			1	5	1	23.3	23.3	23.3
			3	0	1	23.7	23.0	23.4
			3	1	1	23.7	23.0	23.4
			3	2	1	23.6	23.0	23.5
			6	0	2	22.4	22.0	22.4

LTE Band 4 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						1720 MHz	1732.5 MHz	1745 MHz
LTE Band 4	20	QPSK	1	0	0		24.6	
			1	50	0		24.4	
			1	99	0		24.4	
			50	0	1		23.6	
			50	25	1		23.4	
			50	50	1		23.3	
			100	0	1		23.4	
		16QAM	1	0	1		23.4	
			1	50	1		23.4	
			1	99	1		23.0	
			50	0	2		22.6	
			50	25	2		22.5	
			50	50	2		22.3	
			100	0	2		22.4	

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						1717.5 MHz	1732.5 MHz	1747.5 MHz
LTE Band 4	15	QPSK	1	0	0	24.4	24.5	24.5
			1	36	0	24.7	24.5	24.7
			1	74	0	24.6	24.5	24.3
			36	0	1	23.5	23.5	23.6
			36	18	1	23.7	23.4	23.7
			36	37	1	23.7	23.2	23.4
			75	0	1	23.7	23.4	23.5
		16QAM	1	0	1	23.1	23.7	23.3
			1	36	1	23.5	23.7	23.6
			1	74	1	23.3	23.1	23.0
			36	0	2	22.5	22.6	22.7
			36	18	2	22.7	22.4	22.7
			36	37	2	22.7	22.1	22.5
			75	0	2	22.6	22.4	22.6

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4	10	QPSK	1	0	0	24.5	24.7	24.5
			1	25	0	24.6	24.7	24.6
			1	49	0	24.5	24.5	24.3
			25	0	1	23.5	23.6	23.7
			25	12	1	23.5	23.4	23.6
			25	25	1	23.6	23.3	23.5
			50	0	1	23.6	23.5	23.5
		16QAM	1	0	1	23.3	23.6	23.4
			1	25	1	23.6	23.4	23.7
			1	49	1	23.5	23.5	23.3
			25	0	2	22.6	22.5	22.7
			25	12	2	22.5	22.5	22.7
			25	25	2	22.6	22.4	22.7
			50	0	2	22.7	22.4	22.5

Note(s):

20 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

LTE Band 4 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						1712.5 MHz	1732.5 MHz	1752.5 MHz
LTE Band 4	5	QPSK	1	0	0	24.7	24.6	24.7
			1	12	0	24.7	24.7	24.7
			1	24	0	24.5	24.3	24.4
			12	0	1	23.7	23.5	23.5
			12	6	1	23.5	23.3	23.6
			12	11	1	23.4	23.3	23.4
			25	0	1	23.5	23.3	23.5
		16QAM	1	0	1	23.1	23.1	23.2
			1	12	1	23.1	23.3	23.7
			1	24	1	22.9	22.8	23.1
			12	0	2	22.4	22.3	22.5
			12	6	2	22.5	22.3	22.6
			12	11	2	22.3	22.4	22.3
			25	0	2	22.6	22.4	22.6

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						1711.5 MHz	1732.5 MHz	1753.5 MHz
LTE Band 4	3	QPSK	1	0	0	24.6	24.6	24.3
			1	7	0	24.6	24.6	24.2
			1	14	0	24.4	24.3	24.5
			8	0	1	23.6	23.4	23.2
			8	4	1	23.7	23.4	23.2
			8	7	1	23.6	23.3	23.3
			15	0	1	23.6	23.4	23.1
		16QAM	1	0	1	23.3	23.5	23.2
			1	7	1	23.4	23.7	23.2
			1	14	1	23.3	23.5	23.0
			8	0	2	22.6	22.5	22.1
			8	4	2	22.5	22.2	22.0
			8	7	2	22.5	22.4	22.2
			15	0	2	22.4	22.4	22.0

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						1710.7 MHz	1732.5 MHz	1754.3 MHz
LTE Band 4	1.4	QPSK	1	0	0	24.3	24.6	24.6
			1	2	0	24.6	24.5	24.6
			1	5	0	24.6	24.5	24.3
			3	0	0	24.6	24.6	24.7
			3	1	0	24.6	24.6	24.7
			3	2	0	24.7	24.6	24.5
			6	0	1	23.6	23.4	23.4
		16QAM	1	0	1	23.3	23.7	23.3
			1	2	1	23.5	23.2	23.5
			1	5	1	23.2	23.0	23.0
			3	0	1	23.4	23.4	23.1
			3	1	1	23.4	23.2	23.1
			3	2	1	23.3	23.4	23.0
			6	0	2	22.3	22.3	22.5

LTE Band 5 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						829 MHz	836.5 MHz	844 MHz
LTE Band 5	10	QPSK	1	0	0		24.4	
			1	25	0		24.4	
			1	49	0		24.5	
			25	0	1		23.5	
			25	12	1		23.3	
			25	25	1		23.4	
			50	0	1		23.5	
		16QAM	1	0	1		23.3	
			1	25	1		23.5	
			1	49	1		23.1	
			25	0	2		22.6	
			25	12	2		22.5	
			25	25	2		22.6	
			50	0	2		22.5	

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						826.5 MHz	836.5 MHz	846.5 MHz
LTE Band 5	5	QPSK	1	0	0	24.7	24.7	24.7
			1	12	0	24.5	24.7	24.7
			1	24	0	24.5	24.4	24.7
			12	0	1	23.5	23.4	23.4
			12	6	1	23.5	23.3	23.4
			12	11	1	23.5	23.3	23.4
			25	0	1	23.4	23.4	23.5
		16QAM	1	0	1	23.0	23.2	23.0
			1	12	1	23.5	22.9	23.3
			1	24	1	22.9	23.1	23.0
			12	0	2	22.4	22.1	22.3
			12	6	2	22.2	22.1	22.3
			12	11	2	22.4	22.0	22.3
			25	0	2	22.4	22.3	22.4

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						825.5 MHz	836.5 MHz	847.5 MHz
LTE Band 5	3	QPSK	1	0	0	24.7	24.6	24.5
			1	7	0	24.7	24.5	24.6
			1	14	0	24.4	24.3	24.4
			8	0	1	23.5	23.3	23.6
			8	4	1	23.4	23.2	23.6
			8	7	1	23.4	23.2	23.5
			15	0	1	23.4	23.3	23.5
		16QAM	1	0	1	23.6	23.1	23.1
			1	7	1	23.6	23.6	23.2
			1	14	1	23.6	23.3	23.2
			8	0	2	22.5	22.1	22.2
			8	4	2	22.6	22.1	22.3
			8	7	2	22.6	22.1	22.1
			15	0	2	22.5	22.1	22.3

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

LTE Band 5 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						824.7 MHz	836.5 MHz	848.3 MHz
LTE Band 5	1.4	QPSK	1	0	0	24.6	24.4	24.6
			1	2	0	24.5	24.4	24.7
			1	5	0	24.4	24.4	24.5
			3	0	0	24.4	24.4	24.6
			3	1	0	24.7	24.3	24.6
			3	2	0	24.6	24.3	24.6
			6	0	1	23.6	23.3	23.7
		16QAM	1	0	1	23.6	23.0	23.4
			1	2	1	23.3	23.1	23.6
			1	5	1	23.2	23.1	23.4
			3	0	1	23.4	23.0	23.4
			3	1	1	23.6	22.9	23.4
			3	2	1	23.3	22.9	23.4
			6	0	2	22.4	21.8	22.4

LTE Band 12 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						704 MHz	707.5 MHz	711 MHz
LTE Band 12	20	QPSK	1	0	0	24.7	24.5	24.4
			1	49	0	24.7	24.4	24.5
			1	99	0	24.2	24.5	24.4
			50	0	1	23.3	23.3	23.2
			50	24	1	23.5	23.2	23.4
			50	50	1	23.3	23.2	23.2
			100	0	1	23.3	23.4	23.3
		16QAM	1	0	1	23.3	23.7	23.1
			1	49	1	23.6	23.6	23.6
			1	99	1	23.1	23.7	23.4
			50	0	2	22.3	22.4	22.3
			50	24	2	22.5	22.3	22.6
			50	50	2	22.3	22.3	22.4
			100	0	2	22.3	22.3	22.3
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						701.5 MHz	707.5 MHz	713.5 MHz
LTE Band 12	15	QPSK	1	0	0	24.6	24.2	24.6
			1	37	0	24.7	24.6	24.4
			1	74	0	24.5	24.4	24.6
			36	0	1	23.4	23.2	23.3
			36	20	1	23.4	23.1	23.2
			36	39	1	23.4	23.2	23.2
			75	0	1	23.4	23.2	23.2
		16QAM	1	0	1	22.9	22.9	22.9
			1	37	1	23.2	23.3	23.6
			1	74	1	22.9	22.8	23.1
			36	0	2	22.3	22.3	22.3
			36	20	2	22.2	22.3	22.3
			36	39	2	22.3	22.1	22.0
			75	0	2	22.3	22.1	22.2
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						700.5 MHz	707.5 MHz	714.5 MHz
LTE Band 12	10	QPSK	1	0	0	24.6	24.2	24.2
			1	25	0	24.7	24.4	24.5
			1	49	0	24.3	24.4	24.5
			25	0	1	23.5	23.1	23.0
			25	12	1	23.5	23.2	23.3
			25	25	1	23.3	23.1	23.4
			50	0	1	23.3	23.2	23.2
		16QAM	1	0	1	23.2	23.5	22.8
			1	25	1	23.4	23.6	23.3
			1	49	1	23.0	23.3	23.1
			25	0	2	22.4	22.1	22.0
			25	12	2	22.2	22.1	22.0
			25	25	2	22.1	22.1	22.1
			50	0	2	22.2	22.2	22.2

LTE Band 12 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						699.7 MHz	707.5 MHz	715.3 MHz
LTE Band 12	5	QPSK	1	0	0	24.5	24.2	24.4
			1	12	0	24.5	24.1	24.5
			1	24	0	24.4	24.1	24.4
			12	0	1	24.5	24.3	24.5
			12	7	1	24.6	24.1	24.6
			12	13	1	24.6	24.2	24.5
			25	0	1	23.4	23.2	23.3
		16QAM	1	0	1	23.2	23.4	22.9
			1	12	1	23.3	22.9	23.5
			1	24	1	23.2	23.0	23.1
			12	0	2	23.3	23.0	23.4
			12	7	2	23.3	23.3	23.3
			12	13	2	23.3	23.0	23.4
			25	0	2	22.1	22.1	22.3

LTE Band 17 Measured Results

SAR for LTE Band 17 is covered by LTE Band 12 due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 30 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)
						2310 MHz
LTE Band 30	10	QPSK	1	0	0	22.7
			1	25	0	22.5
			1	49	0	22.7
			25	0	1	21.6
			25	12	1	21.6
			25	25	1	21.6
			50	0	1	21.6
		16QAM	1	0	1	21.6
			1	25	1	21.7
			1	49	1	21.6
			25	0	2	20.7
			25	12	2	20.6
			25	25	2	20.5
			50	0	2	20.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)
						2310 MHz
LTE Band 30	5	QPSK	1	0	0	22.5
			1	12	0	22.6
			1	24	0	22.7
			12	0	1	21.5
			12	7	1	21.5
			12	13	1	21.5
			25	0	1	21.5
		16QAM	1	0	1	21.2
			1	12	1	21.0
			1	24	1	20.9
			12	0	2	20.2
			12	7	2	20.2
			12	13	2	20.2
			25	0	2	20.4

Note(s):

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

LTE Rel. 10 Carrier Aggregation

The following power measurements were performed with a single carrier uplink; CA for this particular project is only supported in the downlinks. The CA combination is one (1) Uplink and two (2) Downlinks.

LTE CA combinations			PCC				SCC			LTE Rel 10 Tx. Power [dBm]
PCC	+	SCC	Bandwidth (MHz)	Frequency (MHz)	Channel	RB/Offset	Bandwidth (MHz)	Frequency (MHz)	Channel	
4	+	29	10	1732.5	20175	1/25	5	722.5	9715	24.7
2	+	29	5	1880.0	18900	1/12	3	722.5	9715	24.6
4	+	5	10	1732.5	20175	1/25	5	881.5	2525	24.7
5	+	4	5	836.5	20525	1/12	10	2132.5	2175	24.7
2	+	17	5	1880.0	18900	1/12	10	740.0	5790	24.6
17	+	2	10	710.0	23790	1/25	5	1960.0	900	24.6
4	+	12	10	1732.5	20175	1/25	10	737.5	5095	24.7
12	+	4	10	707.5	23095	1/25	5	2132.5	2175	24.7
4	+	17	10	1732.5	20175	1/25	10	740.0	5790	24.7
17	+	4	10	710.0	23790	1/25	5	2132.5	2175	24.6

Note:

Per KDB 941225 D05A LTE Rel. 10 KDB Inquiry Sheet: SAR is excluded for Carrier Aggregation when measured power does not exceed LTE Release 8 by more than a $^{1}/_{4}$ dBm

9.5. Wi-Fi 2.4GHz (DTS Band)

Measured Results

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Note(s)
2.4	802.11b	1 Mbps	1	2412	15.0	15.5	Yes	
			6	**2437**	**18.2**	18.5		
			11	2462	15.0	15.5		
	802.11g	6 Mbps	1	2412	Not Required	12.5	No	1
			6	2437		15.5		
			11	2462		12.5		
	802.11n (HT20)	6.5 Mbps	1	2412		11.0	No	1
			6	2437		14.0		
			11	2462		11.0		

Note(s):

1. Output Power and SAR is not required for 802.11g/n HT20 channels when the highest *reported* SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

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

Measured Results

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Note(s)
5.3 (U-NII 2A)	802.11a	6 Mbps	52	5260	13.2	13.5	Yes	
			56	5280	13.1			
			60	**5300**	**13.2**			
			64	5320	12.9			
	802.11n (HT20)	6.5 Mbps	52	5260	Not Required	12.5	No	1
			56	5280				
			60	5300				
			64	5320				
	802.11n (HT40)	13.5 Mbps	54	5270	Not Required	11.5	No	1
			62	5310				
5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500	12.7	13.5	Yes	
			116	**5580**	**12.7**			
			124	5620	TDWR			
			140	5700	12.7			
	802.11n (HT20)	6.5 Mbps	100	5500	Not Required	12.5	No	1
			116	5580				
			124	5620				
			140	5700				
	802.11n (HT40)	13.5 Mbps	102	5510	Not Required	11.5	No	1
			118	5590				
			134	5670				
	802.11a	6 Mbps	149	5745	12.6	13.5	Yes	
			157	5785	12.6			
			165	**5825**	**12.7**			
	802.11n (HT20)	6.5 Mbps	149	5745	Not Required	12.5	No	1
			157	5785				
			165	5825				
	802.11n (HT40)	13.5 Mbps	151	5755	Not Required	11.5	No	1
			159	5795				

Note(s):

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

9.7. Bluetooth

Maximum tune-up tolerance limit is 9.00 dBm from the rated nominal maximum output power. This power level qualifies for exclusion of SAR testing.

10. Measured and Reported (Scaled) SAR Results

SAR Test Reduction criteria are as follows:

KDB 447498 D01 General RF Exposure Guidance:
Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

- ≤ 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 D04 Handset SAR:
With headset attached, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

KDB 648474 D04 Handset SAR (Phablet Only):
When Hotspot mode does not apply, SAR is required for all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge in direct contact with a flat phantom, for 10-g extremity SAR to address interactive hand use exposure conditions, for when 1-g SAR was measured at a test separation distance greater than 5 mm. 1-g SAR testing at 5 mm is not required.
When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g SAR > 1.2 W/kg.

KDB 941225 D01 SAR test for 3G devices:
When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode

KDB 941225 D05 SAR for LTE Devices:
SAR test reduction is applied using the following criteria:

- Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel.
- When the reported SAR is > 0.8 W/kg, testing for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
- Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are > 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
- Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
- Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.
- For LTE bands that do not support at least three non-overlapping channels in certain channel bandwidths, test the available non-overlapping channels instead. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing; therefore, the requirement for H, M and L channels may not fully apply.

KDB 248227 D01 SAR meas for 802.11 v02:

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

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

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

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

10.1. GSM850

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Voice	0	Left Touch	190	836.6	33.2	33.1	0.152	0.156	
			Left Tilt	190	836.6	33.2	33.1	0.098	0.100	
			Right Touch	190	836.6	33.2	33.1	0.238	**0.244**	1
			Right Tilt	190	836.6	33.2	33.1	0.107	0.109	
Head VoIP	GPRS 2 Slots	0	Left Touch	190	836.6	32.2	32.2	0.264	0.264	
			Left Tilt	190	836.6	32.2	32.2	0.169	0.169	
			Right Touch	190	836.6	32.2	32.2	0.376	**0.376**	2
			Right Tilt	190	836.6	32.2	32.2	0.180	0.180	
Body-worn	Voice	10	Rear	190	836.6	33.2	33.1	0.524	**0.536**	3
			Front	190	836.6	33.2	33.1	0.249	0.255	
Body-worn(VoIP) & Hotspot	GPRS 2 Slots	10	Rear	128	824.2	32.2	32.2	0.635	0.635	
				190	836.6	32.2	32.2	0.899	**0.899**	4
				251	848.8	32.2	32.2	0.839	0.839	
			Front	190	836.6	32.2	32.2	0.431	0.431	
Hotspot			Edge 2	190	836.6	32.2	32.2	0.578	0.578	
			Edge 3	190	836.6	32.2	32.2	0.563	0.563	

10.2. GSM1900

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Voice	0	Left Touch	661	1880.0	29.7	29.7	0.266	**0.266**	5
			Left Tilt	661	1880.0	29.7	29.7	0.102	0.102	
			Right Touch	661	1880.0	29.7	29.7	0.138	0.138	
			Right Tilt	661	1880.0	29.7	29.7	0.101	0.101	
Head VoIP	GPRS 2 Slots	0	Left Touch	661	1880.0	27.7	27.7	0.376	**0.376**	6
			Left Tilt	661	1880.0	27.7	27.7	0.132	0.132	
			Right Touch	661	1880.0	27.7	27.7	0.196	0.196	
			Right Tilt	661	1880.0	27.7	27.7	0.147	0.147	
Body-worn	Voice	10	Rear	661	1880.0	29.7	29.7	0.285	**0.285**	7
			Front	661	1880.0	29.7	29.7	0.264	0.264	
Body-worn(VoIP) & Hotspot	GPRS 2 Slots	10	Rear	661	1880.0	27.7	27.7	0.395	**0.395**	8
			Front	661	1880.0	27.7	27.7	0.367	0.367	
Hotspot			Edge 3	661	1880.0	27.7	27.7	0.175	0.175	
			Edge 4	661	1880.0	27.7	27.7	0.342	0.342	

10.3. W-CDMA Band II

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Rel 99 RMC	0	Left Touch	9400	1880.0	24.2	24.0	0.749	**0.784**	9
			Left Tilt	9400	1880.0	24.2	24.0	0.282	0.295	
			Right Touch	9400	1880.0	24.2	24.0	0.310	0.325	
			Right Tilt	9400	1880.0	24.2	24.0	0.243	0.254	
Body-worn & Hotspot	Rel 99 RMC	10	Rear	9262	1852.4	24.2	23.9	0.860	**0.922**	10
				9400	1880.0	24.2	24.0	0.799	0.837	
				9538	1907.6	24.2	24.0	0.828	0.867	
			Front	9400	1880.0	24.2	24.0	0.763	0.799	
Hotspot	Rel 99 RMC	10	Edge 3	9400	1880.0	24.2	24.0	0.429	0.449	
			Edge 4	9400	1880.0	24.2	24.0	0.691	0.724	

10.4. W-CDMA Band V

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Rel 99 RMC	0	Left Touch	4183	836.6	24.2	23.9	0.168	0.180	
			Left Tilt	4183	836.6	24.2	23.9	0.102	0.109	
			Right Touch	4183	836.6	24.2	23.9	0.255	**0.273**	11
			Right Tilt	4183	836.6	24.2	23.9	0.113	0.121	
Body-worn & Hotspot	Rel 99 RMC	10	Rear	4132	826.4	24.2	23.8	0.792	**0.868**	12
				4183	836.6	24.2	23.9	0.769	0.824	
				4233	846.6	24.2	24.0	0.764	0.800	
			Front	4183	836.6	24.2	23.9	0.288	0.309	
Hotspot	Rel 99 RMC	10	Edge 2	4183	836.6	24.2	23.9	0.321	0.344	
			Edge 3	4183	836.6	24.2	23.9	0.369	0.395	

10.5. LTE Band 2 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	18700	1860.0	1	49	24.7	24.6	0.773	0.786	
				18900	1880.0	1	0	24.7	24.6	0.874	**0.890**	13
						50	50	23.7	23.6	0.744	0.763	
				19100	1900.0	1	49	24.7	24.7	0.780	0.780	
			Left Tilt	18900	1880.0	1	0	24.7	24.6	0.390	0.397	
						50	50	23.7	23.6	0.296	0.304	
			Right Touch	18900	1880.0	1	0	24.7	24.6	0.385	0.392	
						50	50	23.7	23.6	0.310	0.318	
			Right Tilt	18900	1880.0	1	0	24.7	24.6	0.285	0.290	
						50	50	23.7	23.6	0.211	0.216	
Body-worn & Hotspot	QPSK	10	Rear	18700	1860.0	1	49	24.7	24.6	0.881	0.895	
				18900	1880.0	1	0	24.7	24.6	0.837	0.853	
						50	50	23.7	23.6	0.661	0.678	
				19100	1900.0	1	49	24.7	24.7	0.820	0.820	
			Front	18700	1860.0	1	49	24.7	24.6	0.956	0.972	
				18900	1880.0	1	0	24.7	24.6	0.944	0.962	
						50	50	23.7	23.6	0.762	0.782	
				19100	1900.0	1	49	24.7	24.7	0.988	**0.988**	14
Hotspot	QPSK	10	Edge 3	18900	1880.0	1	0	24.7	24.6	0.412	0.420	
						50	50	23.7	23.6	0.326	0.334	
			Edge 4	18900	1880.0	1	0	24.7	24.6	0.688	0.701	
						50	50	23.7	23.6	0.552	0.566	

10.6. LTE Band 4 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	20025	1717.5	1	37	24.7	24.7	0.866	0.876	
				20175	1732.5	1	0	24.7	24.6	0.817	0.838	
						50	0	23.7	23.6	0.679	0.696	
				20325	1747.5	1	37	24.7	24.7	0.903	**0.905**	15
			Left Tilt	20175	1732.5	1	0	24.7	24.6	0.332	0.341	
						50	0	23.7	23.6	0.267	0.274	
			Right Touch	20175	1732.5	1	0	24.7	24.6	0.447	0.458	
						50	0	23.7	23.6	0.361	0.370	
			Right Tilt	20175	1732.5	1	0	24.7	24.6	0.261	0.268	
						50	0	23.7	23.6	0.204	0.209	
Body-worn & Hotspot	QPSK	10	Rear	20025	1717.5	1	37	24.7	24.7	0.969	0.980	
				20175	1732.5	1	0	24.7	24.6	0.905	0.928	
						50	0	23.7	23.6	0.713	0.731	
				20325	1747.5	1	37	24.7	24.7	0.877	0.879	
			Front	20175	1732.5	1	37	24.7	24.7	0.969	0.980	
						1	0	24.7	24.6	0.939	0.963	
						50	0	23.7	23.6	0.744	0.763	
						1	37	24.7	24.7	1.010	**1.012**	16
Hotspot	QPSK	10	Edge 3	20175	1732.5	1	0	24.7	24.6	0.455	0.467	
						50	0	23.7	23.6	0.332	0.341	
			Edge 4	20175	1732.5	1	0	24.7	24.6	0.756	0.775	
						50	0	23.7	23.6	0.601	0.616	

10.7. LTE Band 5 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	20525	836.5	1	49	24.7	24.5	0.240	0.251	
						25	0	23.7	23.5	0.177	0.186	
			Left Tilt	20525	836.5	1	49	24.7	24.5	0.150	0.157	
						25	0	23.7	23.5	0.116	0.122	
			Right Touch	20525	836.5	1	49	24.7	24.5	0.330	**0.346**	17
						25	0	23.7	23.5	0.244	0.256	
			Right Tilt	20525	836.5	1	49	24.7	24.5	0.165	0.173	
						25	0	23.7	23.5	0.128	0.134	
Body-worn & Hotspot	QPSK	10	Rear	20525	836.5	1	49	24.7	24.5	0.411	**0.430**	18
						25	0	23.7	23.5	0.309	0.324	
			Front	20525	836.5	1	49	24.7	24.5	0.369	0.386	
						25	0	23.7	23.5	0.281	0.295	
Hotspot	QPSK	10	Edge 2	20525	836.5	1	49	24.7	24.5	0.334	0.350	
						25	0	23.7	23.5	0.240	0.252	
			Edge 3	20525	836.5	1	49	24.7	24.5	0.350	0.366	
						25	0	23.7	23.5	0.256	0.269	

10.8. LTE Band 12 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	23095	707.5	1	49	24.7	24.5	0.100	0.104	
						25	0	23.7	23.3	0.091	0.099	
			Left Tilt	23095	707.5	1	49	24.7	24.5	0.062	0.065	
						25	0	23.7	23.3	0.053	0.058	
			Right Touch	23095	707.5	1	49	24.7	24.5	0.134	**0.140**	19
						25	0	23.7	23.3	0.103	0.112	
			Right Tilt	23095	707.5	1	49	24.7	24.5	0.074	0.077	
						25	0	23.7	23.3	0.058	0.063	
Body-worn & Hotspot	QPSK	10	Rear	23095	707.5	1	49	24.7	24.5	0.323	**0.337**	20
						25	0	23.7	23.3	0.272	0.296	
			Front	23095	707.5	1	49	24.7	24.5	0.186	0.194	
						25	0	23.7	23.3	0.163	0.177	
Hotspot	QPSK	10	Edge 2	23095	707.5	1	49	24.7	24.5	0.388	**0.404**	21
						25	0	23.7	23.3	0.305	0.331	
			Edge 3	23095	707.5	1	49	24.7	24.5	0.124	0.129	
						25	0	23.7	23.3	0.104	0.113	

10.9. LTE Band 17 (10MHz Bandwidth)

SAR for LTE Band 17 is covered by LTE Band 12 due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

10.10. LTE Band 30 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	27710	2310.0	1	0	22.7	22.7	0.254	**0.254**	22
						25	0	21.7	21.6	0.238	0.243	
			Left Tilt	27710	2310.0	1	0	22.7	22.7	0.067	0.067	
						25	0	21.7	21.6	0.063	0.065	
			Right Touch	27710	2310.0	1	0	22.7	22.7	0.072	0.072	
						25	0	21.7	21.6	0.069	0.070	
			Right Tilt	27710	2310.0	1	0	22.7	22.7	0.066	0.066	
						25	0	21.7	21.6	0.061	0.062	
Body-worn & Hotspot	QPSK	10	Rear	27710	2310.0	1	0	22.7	22.7	0.231	**0.231**	23
						25	0	21.7	21.6	0.226	0.231	
			Front	27710	2310.0	1	0	22.7	22.7	0.333	0.333	
						25	0	21.7	21.6	0.326	0.333	
Hotspot	QPSK	10	Edge 3	27710	2310.0	1	0	22.7	22.7	0.138	0.138	
						25	0	21.7	21.6	0.131	0.134	
			Edge 4	27710	2310.0	1	0	22.7	22.7	0.179	0.179	
						25	0	21.7	21.6	0.170	0.174	

10.11. Wi-Fi (DTS Band)

Frequency Band	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Notes	Plot No.
								Tune-up limit	Meas.	Meas.	Scaled		
2.4GHz	802.11b 1 Mbps	Head	0	Left Touch	6	2437.0	0.537	18.5	18.2	0.589	**0.631**	2	24
				Left Tilt	6	2437.0	0.435	18.5	18.2	0.477	0.511		
				Right Touch	6	2437.0	0.183						
				Right Tilt	6	2437.0	0.194						
		Body-worn & Hotspot & Wi-Fi Direct	10	Rear	6	2437.0	0.253	18.5	18.2	0.300	**0.321**	1	25
				Front	6	2437.0	0.111						
				Edge 1	6	2437.0	0.109						
				Edge 2	6	2437.0	0.084						

Note(s):

1. Highest *reported* SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.
2. Highest *reported* SAR is > 0.4 W/kg. Due to the highest *reported* SAR for this test position, other test positions in Head exposure condition were evaluated until a SAR ≤ 0.8 W/kg was *reported*.

10.12. Wi-Fi (U-NII Band)

Frequency Band	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Notes	Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled		
5.3 GHz U-NII 2A	802.11a 6 Mbps	Head	0	Left Touch	60	5300.0	0.577	13.5	13.2	0.362	**0.388**			1	26
				Left Tilt	60	5300.0	0.290								
				Right Touch	60	5300.0	0.165								
				Right Tilt	60	5300.0	0.209								
		Body-worn	10	Rear	60	5300.0	0.387	13.5	13.2	0.259	**0.278**			1	27
				Front	60	5300.0	0.097								
		Extremity	0	Rear	60	5300.0	2.550	13.5	13.2			0.332	**0.356**	1,3	28
				Edge 1	60	5300.0	1.220								
				Edge 2	60	5300.0	2.310								
Frequency Band	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Notes	Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled		
5.5 GHz U-NII 2C	802.11a 6 Mbps	Head	0	Left Touch	116	5580.0	0.375	13.5	12.9	0.244	**0.280**			1	29
				Left Tilt	116	5580.0	0.309								
				Right Touch	116	5580.0	0.207								
				Right Tilt	116	5580.0	0.216								
		Body-worn	10	Rear	116	5580.0	0.330	13.5	12.9	0.160	**0.184**			1	30
				Front	116	5580.0	0.100								
		Extremity	0	Rear	116	5580.0	0.593								
				Edge 1	116	5580.0	0.564								
				Edge 2	116	5580.0	1.300	13.5	12.9			0.264	0.303	1,3	31
Frequency Band	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Notes	Plot No.
								Tune-up limit	Meas.	Meas.	Scaled		
5.8 GHz U-NII 3	802.11a 6 Mbps	Head	0	Left Touch	165	5825.0	0.326	13.5	12.7	0.190	**0.228**	1	32
				Left Tilt	165	5825.0	0.332						
				Right Touch	165	5825.0	0.138						
				Right Tilt	165	5825.0	0.194						
		Body-worn & Hotspot & Wi-Fi Direct	10	Rear	165	5825.0	0.291	13.5	12.7	0.148	**0.178**	1	33
				Front	165	5825.0	0.071						
				Edge 1	165	5825.0	0.171						
				Edge 2	165	5825.0	0.149						

Note(s):

1. Highest *reported* SAR is ≤ 0.4 W/kg (1-g) or ≤ 1.00 W/kg (10-g); respectively. Therefore, further SAR measurements within this exposure condition are not required.
2. Highest *reported* SAR is > 0.4 W/kg (1-g) or > 1.00 W/kg (10-g); respectively. Due to the highest *reported* SAR for this test position, other test positions in Head exposure condition were evaluated until a SAR ≤ 0.8 W/kg (1-g) or ≤ 2.00 W/kg (10-g); respectively, was *reported*.
3. 10-g Extremity SAR is required for this frequency band when Hotspot Mode is not supported.

10.13. Bluetooth

Standalone SAR Test Exclusion Considerations & Estimated SAR

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

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√f(GHz)] ≤ 3.0, for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f_{(GHz)}$ 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.

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:

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

Body-worn Accessory Exposure Conditions

Max. tune-up tolerance limit		Min. test separation distance (mm)	Frequency (GHz)	SAR test exclusion Result*	Test Configuration	Estimated 1-g SAR (W/kg)
(dBm)	(mW)					
9.0	8	10	2.480	1.3	Rear/Front	0.168

Conclusion:

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

11. SAR Measurement Variability

In accordance with published RF Exposure KDB 865664 D01 SAR measurement 100 MHz to 6 GHz. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1) Repeated measurement is not required when the original highest measured SAR is <1.6 or 2 W/kg (1-g or 10-g respectively); steps 2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 0.8 or 2 W/kg (1-g or 10-g respectively), repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or 3 (1-g or 10-g respectively) or when the original or repeated measurement is ≥ 1.45 or 3.6 W/kg (~ 10% from the 1-g or 10-g respective SAR limit).
4) Perform a third repeated measurement only if the original, first, or second repeated measurement is ≥ 1.5 or 3.75 W/kg (1-g or 10-g respectively) and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 or 3 (1-g or 10-g respectively).

Standard SAR

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Repeated Measured SAR (W/kg)	Largest to Smallest SAR Ratio
700	LTE Band 12	Hotspot	Edge 2	No	0.388	N/A	N/A
850	GSM 850	Body & Hotspot	Rear	Yes	0.899	0.874	1.03
	WCDMA Band V	Body & Hotspot	Rear	No	0.792	N/A	N/A
	LTE Band 5	Body & Hotspot	Rear	No	0.411	N/A	N/A
1900	GSM 1900	Body & Hotspot	Rear	No	0.395	N/A	N/A
	WCDMA Band II	Body & Hotspot	Rear	No	0.860	N/A	N/A
	LTE Band 2	Body & Hotspot	Front	Yes	0.988	0.983	1.01
1700	LTE Band 4	Body & Hotspot	Front	Yes	1.01	0.997	1.01
2300	LTE Band 30	Body & Hotspot	Front	No	0.333	N/A	N/A
2400	Wi-Fi 802.11b/g/n	Head	Left Touch	No	0.589	N/A	N/A
5300	Wi-Fi 802.11a/n	Head	Left Touch	No	0.362	N/A	N/A
5500	Wi-Fi 802.11a/n	Head	Left Touch	No	0.244	N/A	N/A
5800	Wi-Fi 802.11a/n	Head	Left Touch	No	0.190	N/A	N/A

Note(s):
Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not > 1.20.

Extremity SAR

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Repeated Measured SAR (W/kg)	Largest to Smallest SAR Ratio
5300	Wi-Fi 802.11a/n	Extremity (Hand/Wrist/Ankle)	Rear	No	0.332	N/A	N/A
5500	Wi-Fi 802.11a/n	Extremity (Hand/Wrist/Ankle)	Edge 2	No	0.264	N/A	N/A

Note(s):
Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not > 3.00.

12. Simultaneous Transmission SAR Analysis

Simultaneous Transmission Condition

RF Exposure Condition	Item	Capable Transmit Configurations				
Head	1	GSM(Voice)	+	DTS		
	2	GSM(Voice)	+	U-NII		
	3	GSM(GPRS/EDGE)	+	DTS		
	4	GSM(GPRS/EDGE)	+	U-NII		
	5	W-CDMA	+	DTS		
	6	W-CDMA	+	U-NII		
	7	LTE	+	DTS		
	8	LTE	+	U-NII		
Body-worn	9	GSM(Voice)	+	DTS		
	10	GSM(Voice)	+	U-NII		
	11	GSM(Voice)	+	BT		
	12	GSM(Voice)	+	U-NII	+	BT
	13	GSM(GPRS/EDGE)	+	DTS		
	14	GSM(GPRS/EDGE)	+	U-NII		
	15	GSM(GPRS/EDGE)	+	BT		
	16	GSM(GPRS/EDGE)	+	U-NII	+	BT
	17	W-CDMA	+	DTS		
	18	W-CDMA	+	U-NII		
	19	W-CDMA	+	BT		
	20	W-CDMA	+	U-NII	+	BT
	21	LTE	+	DTS		
	22	LTE	+	U-NII		
	23	LTE	+	BT		
	24	LTE	+	U-NII	+	BT
Hotspot & Wi-Fi Direct	25	GSM(GPRS/EDGE)	+	DTS		
	26	GSM(GPRS/EDGE)	+	U-NII 3		
	27	W-CDMA	+	DTS		
	28	W-CDMA	+	U-NII 3		
	29	LTE	+	DTS		
	30	LTE	+	U-NII 3		

Notes:

1. DTS and U-NII 3 supports Hotspot and Wi-Fi Direct.
2. GPRS/EDGE, W-CDMA, and LTE support Hotspot.
3. VoIP is supported in GPRS/EDGE, W-CDMA, and LTE.
4. DTS Radio cannot transmit simultaneously with Bluetooth Radio.
5. U-NII Radio can transmit simultaneously with Bluetooth Radio.
6. Extremity SAR was only performed for UNII-2A/C because UNII-2A/C do not support Hotspot mode.

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

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+③+④ WWAN +U-NII+BT	
						∑1g SAR (mW/g)	SPLSR (Yes/ No)	∑1g SAR (mW/g)	SPLSR (Yes/ No)	∑1g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.264	0.631	0.388		0.895	No	0.652	No		
	Left Tilt	0.169	0.511	0.388		0.680	No	0.557	No		
	Right Touch	0.376	0.631	0.388		1.007	No	0.764	No		
	Right Tilt	0.180	0.631	0.388		0.811	No	0.568	No		
Body-worn & Hotspot	Rear	0.899	0.321	0.278	0.168	1.220	No	1.177	No	1.345	No
	Front	0.431	0.321	0.278	0.168	0.752	No	0.709	No	0.877	No
Hotspot	Edge 1		0.321	0.278		0.321	No	0.278	No		
	Edge 2	0.578	0.321	0.278		0.899	No	0.856	No		
	Edge 3	0.563	0.321	0.278		0.884	No	0.841	No		
	Edge 4	0.213	0.321	0.278		0.534	No	0.491	No		

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

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+③+④ WWAN +U-NII+BT	
						∑1g SAR (mW/g)	SPLSR (Yes/ No)	∑1g SAR (mW/g)	SPLSR (Yes/ No)	∑1g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.376	0.631	0.388		1.007	No	0.764	No		
	Left Tilt	0.132	0.511	0.388		0.643	No	0.520	No		
	Right Touch	0.196	0.631	0.388		0.827	No	0.584	No		
	Right Tilt	0.147	0.631	0.388		0.778	No	0.535	No		
Body-worn & Hotspot	Rear	0.395	0.321	0.278	0.168	0.716	No	0.673	No	0.841	No
	Front	0.367	0.321	0.278	0.168	0.688	No	0.645	No	0.813	No
Hotspot	Edge 1		0.321	0.278		0.321	No	0.278	No		
	Edge 2	0.098	0.321	0.278		0.419	No	0.376	No		
	Edge 3	0.175	0.321	0.278		0.496	No	0.453	No		
	Edge 4	0.342	0.321	0.278		0.663	No	0.620	No		

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

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+③+④ WWAN +U-NII+BT	
						∑1g SAR (mW/g)	SPLSR (Yes/ No)	∑1g SAR (mW/g)	SPLSR (Yes/ No)	∑1g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.784	0.631	0.388		1.415	No	1.172	No		
	Left Tilt	0.295	0.511	0.388		0.806	No	0.683	No		
	Right Touch	0.325	0.631	0.388		0.956	No	0.713	No		
	Right Tilt	0.254	0.631	0.388		0.885	No	0.642	No		
Body-worn & Hotspot	Rear	0.922	0.321	0.278	0.168	1.243	No	1.200	No	1.368	No
	Front	0.799	0.321	0.278	0.168	1.120	No	1.077	No	1.245	No
Hotspot	Edge 1		0.321	0.278		0.321	No	0.278	No		
	Edge 2	0.203	0.321	0.278		0.524	No	0.481	No		
	Edge 3	0.449	0.321	0.278		0.770	No	0.727	No		
	Edge 4	0.724	0.321	0.278		1.045	No	1.002	No		

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

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+③+④ WWAN +U-NII+BT	
						∑1-g SAR (mW/g)	SPLSR (Yes/ No)	∑1-g SAR (mW/g)	SPLSR (Yes/ No)	∑1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.180	0.631	0.388		0.811	No	0.568	No		
	Left Tilt	0.109	0.511	0.388		0.620	No	0.497	No		
	Right Touch	0.273	0.631	0.388		0.904	No	0.661	No		
	Right Tilt	0.121	0.631	0.388		0.752	No	0.509	No		
Body-worn & Hotspot	Rear	0.868	0.321	0.278	0.168	1.189	No	1.146	No	1.314	No
	Front	0.309	0.321	0.278	0.168	0.630	No	0.587	No	0.755	No
Hotspot	Edge 1		0.321	0.278		0.321	No	0.278	No		
	Edge 2	0.344	0.321	0.278		0.665	No	0.622	No		
	Edge 3	0.395	0.321	0.278		0.716	No	0.673	No		
	Edge 4	0.129	0.321	0.278		0.450	No	0.407	No		

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

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+③+④ WWAN +U-NII+BT	
						∑1-g SAR (mW/g)	SPLSR (Yes/ No)	∑1-g SAR (mW/g)	SPLSR (Yes/ No)	∑1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.890	0.631	0.388		1.521	No	1.278	No		
	Left Tilt	0.397	0.511	0.388		0.908	No	0.785	No		
	Right Touch	0.392	0.631	0.388		1.023	No	0.780	No		
	Right Tilt	0.290	0.631	0.388		0.921	No	0.678	No		
Body-worn & Hotspot	Rear	0.895	0.321	0.278	0.168	1.216	No	1.173	No	1.341	No
	Front	0.988	0.321	0.278	0.168	1.309	No	1.266	No	1.434	No
Hotspot	Edge 1		0.321	0.278		0.321	No	0.278	No		
	Edge 2		0.321	0.278		0.321	No	0.278	No		
	Edge 3	0.420	0.321	0.278		0.741	No	0.698	No		
	Edge 4	0.701	0.321	0.278		1.022	No	0.979	No		

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

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+③+④ WWAN +U-NII+BT	
						∑1-g SAR (mW/g)	SPLSR (Yes/ No)	∑1-g SAR (mW/g)	SPLSR (Yes/ No)	∑1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.905	0.631	0.388		**1.536**	No	**1.293**	No		
	Left Tilt	0.341	0.511	0.388		0.852	No	0.729	No		
	Right Touch	0.458	0.631	0.388		1.089	No	0.846	No		
	Right Tilt	0.268	0.631	0.388		0.899	No	0.656	No		
Body-worn & Hotspot	Rear	0.980	0.321	0.278	0.168	1.301	No	1.258	No	1.426	No
	Front	1.012	0.321	0.278	0.168	1.333	No	1.290	No	1.458	No
Hotspot	Edge 1		0.321	0.278		0.321	No	0.278	No		
	Edge 2		0.321	0.278		0.321	No	0.278	No		
	Edge 3	0.467	0.321	0.278		0.788	No	0.745	No		
	Edge 4	0.775	0.321	0.278		1.096	No	1.053	No		

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

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+③+④ WWAN +U-NII +BT	
						∑1-g SAR (mW/g)	SPLSR (Yes/ No)	∑1-g SAR (mW/g)	SPLSR (Yes/ No)	∑1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.251	0.631	0.388		0.882	No	0.639	No		
	Left Tilt	0.157	0.511	0.388		0.668	No	0.545	No		
	Right Touch	0.346	0.631	0.388		0.977	No	0.734	No		
	Right Tilt	0.173	0.631	0.388		0.804	No	0.561	No		
Body-worn & Hotspot	Rear	0.430	0.321	0.278	0.168	0.751	No	0.708	No	0.876	No
	Front	0.386	0.321	0.278	0.168	0.707	No	0.664	No	0.832	No
Hotspot	Edge 1		0.321	0.278		0.321	No	0.278	No		
	Edge 2	0.350	0.321	0.278		0.671	No	0.628	No		
	Edge 3	0.366	0.321	0.278		0.687	No	0.644	No		
	Edge 4		0.321	0.278		0.321	No	0.278	No		

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

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+③+④ WWAN +U-NII +BT	
						∑1-g SAR (mW/g)	SPLSR (Yes/ No)	∑1-g SAR (mW/g)	SPLSR (Yes/ No)	∑1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.104	0.631	0.388		0.735	No	0.492	No		
	Left Tilt	0.065	0.511	0.388		0.576	No	0.453	No		
	Right Touch	0.140	0.631	0.388		0.771	No	0.528	No		
	Right Tilt	0.077	0.631	0.388		0.708	No	0.465	No		
Body-worn & Hotspot	Rear	0.337	0.321	0.278	0.168	0.658	No	0.615	No	0.783	No
	Front	0.194	0.321	0.278	0.168	0.515	No	0.472	No	0.640	No
Hotspot	Edge 1		0.321	0.278		0.321	No	0.278	No		
	Edge 2	0.404	0.321	0.278		0.725	No	0.682	No		
	Edge 3	0.129	0.321	0.278		0.450	No	0.407	No		
	Edge 4		0.321	0.278		0.321	No	0.278	No		

12.9. Sum of the SAR for LTE Band 17 & Wi-Fi & BT

Covered by LTE Band 12 due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

12.10. Sum of the SAR for LTE Band 30 & Wi-Fi & BT

RF Exposure conditions	Test Position	① WWAN	② DTS	③ U-NII	④ BT	①+② WWAN +DTS		①+③ WWAN + U-NII		①+③+④ WWAN +U-NII +BT	
						∑1-g SAR (mW/g)	SPLSR (Yes/ No)	∑1-g SAR (mW/g)	SPLSR (Yes/ No)	∑1-g SAR (mW/g)	SPLSR (Yes/ No)
Head	Left Touch	0.254	0.631	0.388		0.885	No	0.642	No		
	Left Tilt	0.067	0.511	0.388		0.578	No	0.455	No		
	Right Touch	0.072	0.631	0.388		0.703	No	0.460	No		
	Right Tilt	0.066	0.631	0.388		0.697	No	0.454	No		
Body-worn & Hotspot	Rear	0.231	0.321	0.278	0.168	0.552	No	0.509	No	0.677	No
	Front	0.333	0.321	0.278	0.168	0.654	No	0.611	No	0.779	No
Hotspot	Edge 1		0.321	0.278		0.321	No	0.278	No		
	Edge 2		0.321	0.278		0.321	No	0.278	No		
	Edge 3	0.138	0.321	0.278		0.459	No	0.416	No		
	Edge 4	0.179	0.321	0.278		0.500	No	0.457	No		

Conclusion:

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

Appendixes

Refer to separated files for the following appendixes.

A_15I21238v0 SAR Photos & Ant. Locations

B_15I21238v0 SAR System Check Plots

C_15I21238v0 SAR Highest Test Plots

D_15I21238v0 SAR Tissue Ingredients

E_15I21238v0 SAR Probe Cal. Certificates

F_15I21238v0 SAR Dipole Cal. Certificates

END OF REPORT