FCC 47 CFR Parts 1 & 2
Published RF Exposure KDB Procedures
IEEE Std 1528-2003 and IEEE Std 1528a-2005

(Class II Permissive Change)

SAR EVALUATION REPORT

For
GSM/CDMA/WCDMA/LTE Phone + Bluetooth & WLAN (2.4GHz & 5GHz) and NFC

Model: LG-D820, LGD820 and D820
FCC ID: ZNFD820

Report Number: 13U15778-7
Issue Date: 08/21/2013

Prepared for
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1. Attestation of Test Results

Applicant	LG ELECTRONICS MOBILECOMM U.S.A., INC.			
DUT description	GSM/CDMA/WCDMA/LTE Phone + Bluetooth & WLAN (2.4GHz & 5GHz) and NFC			
Model	LG-D820, LGD820 and D820			
Test device is	An identical prototype			
Device category	Portable			
Exposure category	General Population/Uncontrolled Exposure			
Date tested	7/31/2013 – 08/20/2013			
The highest reported SAR values	RF exposure conditions	Licensed	DTS	UNII
	Head	0.956 W/kg	0.543 W/kg	0.188 W/kg
	Body-worn Accessory	1.054 W/kg	0.171 W/kg	0.175 W/kg
	Wireless Router (Hotspot)	1.054 W/kg	0.171 W/kg	n/a W/kg
	WiFi Direct (5.8 GHz)	n/a W/kg	0.071 W/kg	n/a W/kg
	Simultaneous Transmission	1.499 W/kg	1.499 W/kg	1.188 W/kg
Applicable Standards	FCC 47 CFR Parts 1 & 2 Published RF Exposure KDB Procedures, and TCB workshop updates IEEE Std 1528-2003 and IEEE Std 1528a-2005			
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:

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UL Verification Services Inc.

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2. Test Methodology

The tests documented in this report were performed in accordance with FCC 47 CFR Parts 1 & 2, IEEE STD 1528-2003, IEEE Std 1528a-2005, the following FCC Published RF exposure KDB procedures, and TCB workshop updates:

- 447498 D01 General RF Exposure Guidance v05r01
- 648474 D04 Handset SAR v01r01
- 648474 D03 Wireless Chargers Battery Cover v01r02
- 941225 D01 SAR test for 3G devices v02
- 941225 D02 HSPA and 1x Advanced v02r02
- 941225 D03 SAR Test Reduction GSM GPRS EDGE v01
- 941225 D04 SAR for GSM E GPRS Dual Xfer Mode v01
- 941225 D05 SAR for LTE Devices v02r02
- 941225 D06 Hot Spot SAR v01r01
- 248227 D01 SAR Meas for 802 11abg v01r02
- 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01
- 865664 D02 SAR Reporting v01r01
- 690783 D01 SAR Listings on Grants v01r02
- April 2013 TCB Workshop Update – include 802.11ac SAR for highest 802.11a configuration in each 5 GHz band and each exposure condition

3. Facilities and Accreditation

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

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

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

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4. Calibration and Uncertainty

4.1. Measuring Instrument Calibration

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

Tissue Dielectric Properties

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
S-Parameter Network Analyzer	Agilent	8753ES	MY40000980	2/20/2014
Dielectronic Probe kit	SPEAG	SM DAK 040 CA	1082	9/18/2013
ENA Series Network Analyzer	Agilent	E5071B	MY42100131	2/21/2014
Dielectronic Probe kit	HP	85070E	594	N/A
Thermometer	TRACEABLE	4242	122529162	9/19/2013

System Performance Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Synthesized Signal Generator	HP	8665B	3546A00784	3/26/2014
Power Meter	HP	438A	3513U04320	9/24/2013
Power Sensor	HP	8481A	2237A31744	9/24/2013
Power Sensor	HP	8481A	2702A76223	8/21/2013
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1795093	N/A
Directional coupler	Werlatone	C8060-102	2711	N/A
DC Power Supply	Sorensen	XT20-3	1318A00529	N/A
Synthesized Signal Generator	HP	8665B	3744A01084	5/7/2014
Power Meter	HP	437B	3125U12345	7/29/2014
Power Meter	HP	437B	3125U09248	9/24/2013
Power Sensor A	HP	8481A	1926A16917	8/21/2013
Power Sensor B	HP	8481A	3318A95392	9/24/2013
Amplifier	MITEQ	4D00400600-50-30P	1620606	N/A
Directional coupler	Werlatone	C8060-102	2141	N/A
DC Power Supply	Sorensen	XT 20-3	1318A00530	N/A
Thermometer	TRACEABLE	4242	122529162	9/19/2013
System Validation Dipole	SPEAG	D750V3	1071	10/5/2013
System Validation Dipole	SPEAG	D835V2	4d002	10/24/2013
System Validation Dipole	SPEAG	D1750V2	1050	4/20/2014
System Validation Dipole	SPEAG	D1900V2	5d043	11/6/2013
System Validation Dipole	SPEAG	D1900V2	5d163	10/4/2013
System Validation Dipole	SPEAG	D2450V2	899	10/5/2013
System Validation Dipole	SPEAG	D2600V2	1006	9/13/2013
System Validation Dipole	SPEAG	D5GHzV2	1003	9/18/2013

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DASY System

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due date
E-Field Probe (SAR D)	SPEAG	EX3DV4	3686	3/11/2014
Data Acquisition Electronics (SAR D)	SPEAG	DAE4	1360	2/7/2014
E-Field Probe (SAR 1)	SPEAG	EX3DV4	3929	6/24/2014
Data Acquisition Electronics (SAR 1)	SPEAG	DAE4	1259	2/7/2014

Others

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due date
Base Station Simulator	Agilent	8960	GB46160222	11/10/2013
Base Station Simulator	Agilent	8960	GB47050526	9/20/2013
Base Station Simulator	R & S	CMU200	106301	7/3/2014
Base Station Simulator	R & S	CMW500	124594-HX	7/2/2014

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4.2. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01 Section 2.8.1., when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2003 is not required in SAR reports submitted for equipment approval.

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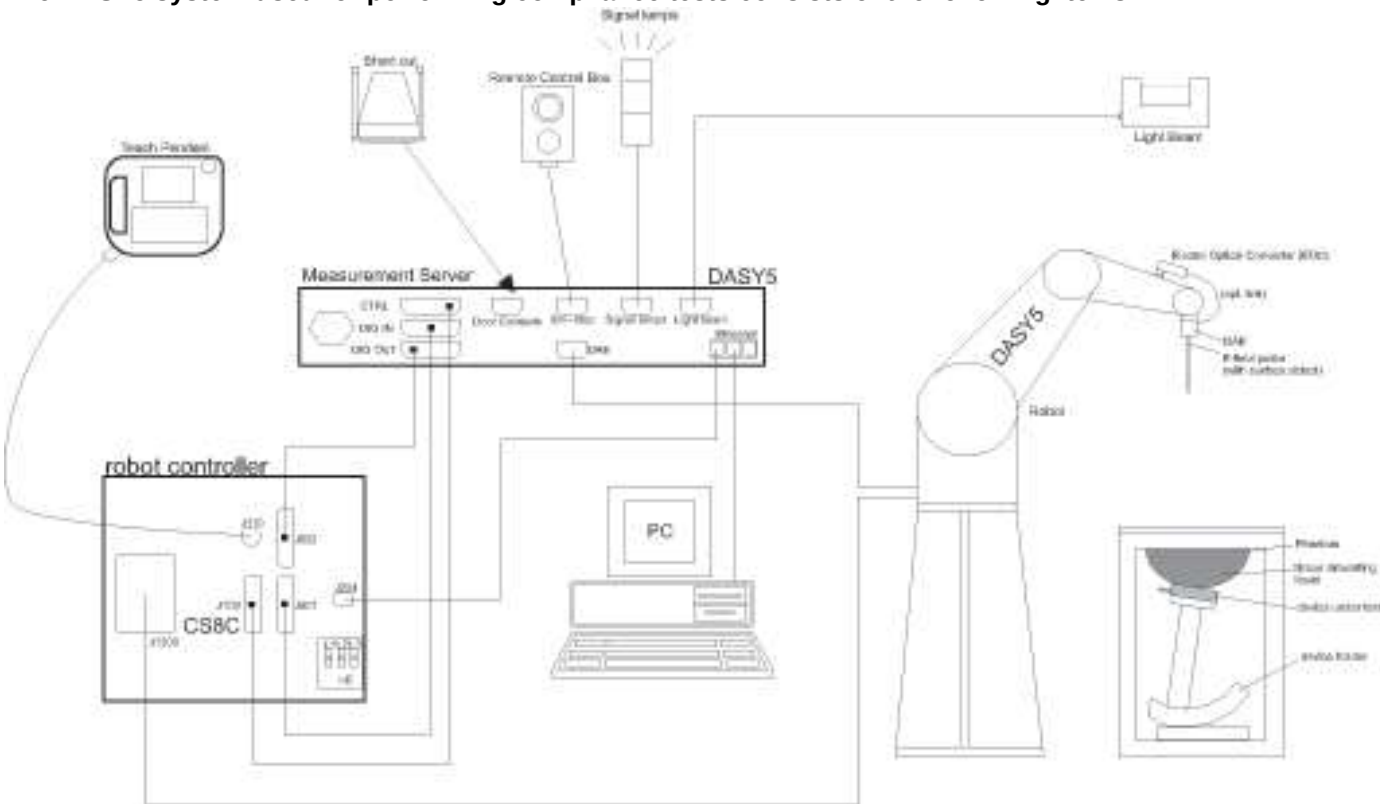
5. Measurement System Description and Setup

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



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

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6. SAR Measurement Procedure

6.1. Normal SAR Measurement Procedure

Step 1: Power Reference Measurement

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

Step 2: Area Scan

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

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

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

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Step 3: Zoom Scan

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

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

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: 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	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *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.

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6.2. Volume Scan Procedures

Step 1: Repeat Step 1-4 in Section 6.1

Step 2: Volume Scan
Volume Scans are used to assess peak SAR and averaged SAR measurements in largely extended 3-dimensional volumes within any phantom. This measurement does not need any previous area scan. The grid can be anchored to a user specific point or to the current probe location.

Step 3: Power drift measurement
The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

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7. Device Under Test

7.1. General Information

GSM/CDMA/WCDMA/LTE Phone + Bluetooth & WLAN (2.4GHz & 5GHz) and NFC Model: LG-D820, LGD820 and D820 This device uses variable Antenna matching for 'Roaming Bands (900Mhz)', 'GSM850/WCDMA B5/LTE B5&B26/CDMA BC0&BC10', 'LTE B17' and uses a switch to select the appropriate tuning elements. There are four possible switch positions but only three are used in this design. The switch position is determined based on the current operating band and this is controlled from the chipset via the General Purpose Interface Bus (GPIB). Other operating parameters do not affect the switch position. The tuning circuitry is static and does not change while operating in a specific band.	
Operating Configuration(s)	Held to head, Body-worn (Voice call)
Mobile Hotspot	WiFi Hotspot mode permits the device to share its cellular data connection with other WiFi-enabled devices. ☒ Mobile Hotspot (WiFi 2.4 GHz) ☐ Mobile Hotspot (WiFi 5 GHz)
WiFi Direct	Wi-Fi Direct enabled devices transfer data directly between each other ☒ WiFi Direct (WiFi 2.4 GHz) ☒ WiFi Direct (WiFi 5 GHz) – GO (Group Owner) only for UNII Band 4 5.8GHz band
VoIP	☒ Supported
Device dimension	Overall (Length x Width): 131.9 mm x 68.2 mm Overall Diagonal: 145.7 mm Display Diagonal: 126.0 mm
Back Cover	☐ Normal Battery Cover ☒ Wireless Charger Battery Cover
Accessory	☒ Headset
Battery Options	☒ Standard – Lithium-ion Polymer battery, Rating 3.8 Vdc, 2300 mAh, embedded to device ☐ Extended (large capacity)

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7.2. Wireless Technologies

Wireless Technology and Frequency Bands	GSM: 850 / 1900 W-CDMA Band: V / IV / II CDMA BC 0 / 1 / 10 LTE Band 2 / 4 / 5 / 17 / 25 / 26 / 41(TDD) WiFi: 2.4 / 5 GHz Bluetooth: 2.4 GHz.
Mode	GSM - ☒ Voice (GMSK) - ☒ GPRS (GMSK) - ☒ EGPRS (8PSK) W-CDMA - ☒ UMTS Rel. 8 - ☒ HSDPA - ☒ HSUPA - ☒ DC-HSDPA CDMA2000 - ☒ 1xRTT (Voice & Data) - ☒ 1xEVDO Rel. 0 - ☒ 1xEVDO Rev. A - ☒ 1xAdvanced LTE: QPSK, 16QAM WiFi 2.4GHz (802.11 b/g/n/ac) No HT40 WiFi 5GHz (802.11 a/n/ac) Bluetooth Ver. 4.0 (LE)
Duty Cycle	GSM Voice: 12.5%; GPRS 1 Slot: 12.5%; 2 Slots: 25%, 3 Slots: 37.5%,4 Slots: 50%, W-CDMA: 100% CDMA: 100% LTE (FDD): 100% LTE (TDD): 63% WiFi 802.11a/b/g/n: 100% Bluetooth: 77%
GPRS Multi-Slot Class	☐ Class 8 - One Up ☐ Class 10 - Two Up ☒ Class 12 - Four Up
Mobile Phone Capability	☐ Class A - Mobile phones can be connected to both (E)GPRS and GSM services simultaneously. ☒ Class B - Mobile phones can be attached to both (E)GPRS and GSM services, using one service at a time. ☐ Class C - Mobile phones are attached to either (E)GPRS or GSM voice service. You need to switch manually between services
DTM (Dual Transfer Mode)	Not Supported
SV-LTE & SV-DO	Not Supported

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7.3. RF Output Power Tune-up Tolerance

Upper limit (dB): 0.5		RF Output Power (dBm)							
		Target				Max. tune-up tolerance limit			
RF Air interface	Mode	1 Slot	2 Slot	3 Slot	4 Slot	1 Slot	2 Slot	3 Slot	4 Slot
GSM850	Voice	32.7				**33.2**			
	GPRS	32.7	31.7	29.7	27.7	**33.2**	**32.2**	**30.2**	**28.2**
	EGPRS	27.2	26.2	25.2	24.2	**27.7**	**26.7**	**25.7**	**24.7**
GSM1900	Voice	30.2				**30.7**			
	GPRS	30.2	29.2	27.2	25.2	**30.7**	**29.7**	**27.7**	**25.7**
	EGPRS	25.7	24.7	23.7	22.7	**26.2**	**25.2**	**24.2**	**23.2**

Upper limit (dB): 0.5		RF Output Power (dBm)									
		Target					Max. tune-up tolerance limit				
RF Air interface	Mode	Subtest 1	Subtest 2	Subtest 3	Subtest 4	Subtest 5	Subtest 1	Subtest 2	Subtest 3	Subtest 4	Subtest 5
W-CDMA Band V	R99	23.7					**24.2**				
	HSDPA	23.7	23.7	23.2	23.2		**24.2**	**24.2**	**23.7**	**23.7**	
	HSUPA	23.7	21.7	22.7	21.7	23.7	**24.2**	**22.2**	**23.2**	**22.2**	**24.2**
	DC-DSPA	23.7	23.7	23.2	23.2		**24.2**	**24.2**	**23.7**	**23.7**	
W-CDMA Band IV	R99	24.2					**24.7**				
	HSDPA	24.2	24.2	23.7	23.7		**24.7**	**24.7**	**24.2**	**24.2**	
	HSUPA	24.2	22.2	23.2	22.2	24.2	**24.7**	**22.7**	**23.7**	**22.7**	**24.7**
	DC-DSPA	24.2	24.2	23.7	23.7		**24.7**	**24.7**	**24.2**	**24.2**	
W-CDMA Band II	R99	24.2					**24.7**				
	HSDPA	24.2	24.2	23.7	23.7		**24.7**	**24.7**	**24.2**	**24.2**	
	HSUPA	24.2	22.2	23.2	22.2	24.2	**24.7**	**22.7**	**23.7**	**22.7**	**24.7**
	DC-DSPA	24.2	24.2	23.7	23.7		**24.7**	**24.7**	**24.2**	**24.2**	

Upper limit (dB): 0.5		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
CDMA BC0	1xRTT	24.2	**24.7**
	1xAdvanced	24.2	**24.7**
	1xEVDO Rel. 0	24.2	**24.7**
	1xEVDO Rev. A	24.2	**24.7**
CDMA BC1	1xRTT	24.2	**24.7**
	1xAdvanced	24.2	**24.7**
	1xEVDO Rel. 0	24.2	**24.7**
	1xEVDO Rev. A	24.2	**24.7**
CDMA BC10	1xRTT	24.2	**24.7**
	1xAdvanced	24.2	**24.7**
	1xEVDO Rel. 0	24.2	**24.7**
	1xEVDO Rev. A	24.2	**24.7**

Upper limit (dB): 0.5		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
LTE Band 2	QPSK	23.2	**23.7**
LTE Band 4	QPSK	23.2	**23.7**
LTE Band 5	QPSK	23.2	**23.7**
LTE Band 17	QPSK	23.2	**23.7**
LTE Band 25	QPSK	23.2	**23.7**
LTE Band 26	QPSK	23.2	**23.7**
LTE Band 41	QPSK	21.2	**21.7**

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Upper limit (dB): 1.0		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
WiFi 2.4 GHz	802.11b	15.5	**16.5**
	802.11g	9.5	**10.5**
	802.11n HT20	8.5	**9.5**
	802.11ac HT20	9.5	**10.5**

Upper limit (dB): 1.0		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
WiFi 5 GHz	802.11a	11.0	**12.0**
	802.11n HT20	9.5	**10.5**
	802.11n HT40	9.0	**10.0**
	802.11ac HT20	9.5	**10.5**
	802.11ac HT40	9.0	**10.0**
	802.11ac HT80	9.0	**10.0**
Upper limit (dB): 1.0		RF Output Power (dBm)	
RF Air interface	Mode	Target	Max. tune-up tolerance limit
Bluetooth	GFSK	9.0	**10.0**
	DQPSK	6.0	**7.0**
	8-DPSK	6.0	**7.0**
	4.0 LE	6.0	**7.0**

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7.4. Simultaneous Transmission Condition

RF Exposure Condition	Capable Transmit Configurations
Head	1. GSM850/1900 MHz Voice + Wi-Fi 2.4/5 GHz 2. GSM850/1900 MHz (GPRS/EDGE) + Wi-Fi 2.4/5 GHz (VoIP) 3. W-CDMA Band V / IV / II + Wi-Fi 2.4/5 GHz 4. CDMA 1xRTT BC0/BC1/BC10 + Wi-Fi 2.4/5 GHz 5. CDMA 1xEVDO BC0/BC1/BC10 + Wi-Fi 2.4/5 GHz (VoIP) 6. LTE Band 2 / 4 / 5 / 17 / 25 / 26 / 41 + Wi-Fi 2.4/5 GHz
Body-worn Accessory	1. GSM 850/1900 Voice + WiFi 2.4/5GHz 2. GSM 850/1900 Voice + BT 3. GSM 850/1900 (GPRS/EDGE) + WiFi 2.4/5GHz (VoIP) 4. GSM 850/1900 (GPRS/EDGE) + BT 5. WCDMA Band V / VI / II + WiFi 2.4/5GHz 6. WCDMA Band V / VI / II + BT 7. CDMA 1xRTT BC0/BC1/BC10 + WiFi 2.4/5GHz 8. CDMA 1xRTT BC0/BC1/BC10 + BT 9. CDMA 1xEVDO BC0/BC1/BC10 + WiFi 2.4/5GHz (VoIP) 10. CDMA 1xEVDO BC0/BC1/BC10 + BT 11. LTE Band 2 / 4 / 5 / 17 / 25 / 26 / 41 + WiFi 2.4/5GHz 12. LTE Band 2 / 4 / 5 / 17 / 25 / 26 / 41 + BT
Wireless Router (Hotspot)	1. GSM 850/1900 (GPRS/EDGE) + WiFi 2.4GHz 2. CDMA 1xEVDO BC0/BC1/BC10 + WiFi 2.4GHz 3. WCDMA Band V / IV / II + WiFi 2.4GHz 4. LTE Band 2 / 4 / 5 / 17 / 25 / 26 / 41 + WiFi 2.4GHz
WiFi Direct	1. GSM 850/1900 (GPRS/EDGE) + WiFi 2.4GHz (GO/GC) 2. GSM 850/1900 (GPRS/EDGE) + WiFi 5.8GHz (GO only) 3. CDMA 1xEVDO BC0/BC1/BC10 + WiFi 2.4GHz (GO/GC) 4. CDMA 1xEVDO BC0/BC1/BC10 + WiFi 5.8GHz (GO only) 5. WCDMA Band V / IV / II + WiFi 2.4GHz (GO/GC) 6. WCDMA Band V / IV / II + WiFi 5.8GHz (GO only) 7. LTE Band 2 / 4 / 5 / 17 / 25 / 26 / 41 + WiFi 2.4GHz (GO/GC) 8. LTE Band 2 / 4 / 5 / 17 / 25 / 26 / 41 + WiFi 5.8GHz (GO only)

Note:

1. WiFi 2.4GHz supports Hotspot and WiFi-Direct (GO/GC).
2. WiFi 5GHz does not support Hotspot but supports WiFi-Direct.
   UNII 1 (5.2GHz) = WiFi direct supports GC only, UNII 2 (5.3GHz) = WiFi direct not supported,
   UNII 3 (5.5GHz) = WiFi direct not supported, UNII 4 (5.8GHz) = WiFi direct supports GO only
3. CDMA, LTE, WCDMA, GPRS/EDGE supports Hotspot.
4. VoIP is supported in CDMA, LTE, WCDMA, GSM (e.g. 3rd part VoIP and VoLTE)
5. Bluetooth and WiFi cannot transmit simultaneously since they share the same chip.

Notes: GO = Group Owner (requires SAR), GC = Group Client (SAR excluded)

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7.5. General LTE SAR Test and Reporting Considerations

Item	Description						
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 2						
	Tx: 1850 to 1910 MHz			Rx: 1930 to 1990 MHz			
	Band 4						
	Tx: 1710 to 1755 MHz			Rx: 2110 to 2155 MHz			
	Band 5						
	Tx: 824 to 849 MHz			Rx: 869 to 894 MHz			
	Band 17						
	Tx: 704 to 716 MHz			Rx: 734 to 746 MHz			
	Band 25						
	Tx: 1850 to 1915 MHz			Rx: 1930 to 1995 MHz			
	Band 26						
	Tx: 814 to 849 MHz			Rx: 859 to 894 MHz			
	Band 41						
	Tx: 2496 to 2690 MHz			Rx: 2496 to 2690 MHz			
	Band 2	Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	20050	20025	20000	19975	18615	18607
	Mid	20175	20175	20175	20175	18900	18900
	High	20300	20325	20350	20375	19185	19193
	Band 4	Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	20050	20025	20000	19975	19965	19957
	Mid	20175	20175	20175	20175	20175	20175
	High	20300	20325	20350	20375	20385	20393
	Band 5	Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low			20450	20425	20415	20407
	Mid			20525	20525	20525	20525
	High			20600	20625	20635	20643
	Band 17	Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low			23780	23755		
	Mid			23790	23790		
	High			23800	23825		
	Band 25	Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	26140	26115	26090	26065	26055	26047
	Mid	26365	26365	26365	26365	26365	26365
	High	26590	26615	26640	2665	26675	26683
	Band 26	Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low			26740	26715	26705	26697
	Mid			26865	26865	26865	26865
	High			26990	27015	27025	27033

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941225 D05 SAR for LTE Devices v02 (Continued)

<table>
<tr><td rowspan="7">Frequency range, Channel Bandwidth, Numbers and Frequencies</td><td rowspan="2">Band 41</td><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td>39750</td><td>39725</td><td>39700</td><td></td><td></td><td></td></tr>
<tr><td>Low-Mid</td><td>40185</td><td>40173</td><td>40160</td><td></td><td></td><td></td></tr>
<tr><td>Mid</td><td>40620</td><td>40620</td><td>40620</td><td></td><td></td><td></td></tr>
<tr><td>Mid-High</td><td>41055</td><td>41068</td><td>41080</td><td></td><td></td><td></td></tr>
<tr><td>High</td><td>41490</td><td>41515</td><td>41540</td><td></td><td></td><td></td></tr>
<tr><td>LTE transmitter and antenna implementation</td><td colspan="7">LTE has two TX/RX antennas.
Refer to Section 17 for antenna locations</td></tr>
<tr><td>Maximum power reduction (MPR)</td><td colspan="7">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3
<table>
<tr><td rowspan="2">Modulation</td><td colspan="6">Channel bandwidth / Transmission bandwidth (RB)</td><td rowspan="2">MPR (dB)</td></tr>
<tr><td>1.4 MHz</td><td>3.0 MHz</td><td>5 MHz</td><td>10 MHz</td><td>15 MHz</td><td>20 MHz</td></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
</table>
MPR Built-in by design
A-MPR (additional MPR) was disabled during SAR testing</td></tr>
<tr><td>Power reduction</td><td colspan="7">☐ Yes
☒ No</td></tr>
<tr><td>Spectrum plots for RB configurations</td><td colspan="7">A properly configured basestation simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.</td></tr>
</table>

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7.5.1. TDD LTE Considerations

According to KDB 941225 D05 SAR for LTE Devices v02r02, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

SAR was tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7.

LTE TDD Band 41 supports 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Table 4.2-2: Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Calculated Duty Cycle

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

Calculated Duty Cycle = Extended cyclic prefix in uplink x (T_s) x # of S + # of U

<u>Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:</u>
Calculated Duty Cycle = 5120 x [1/(15000 x 2048)] x 2 + 6 ms = 63.33%
where
T_s = 1/(15000 x 2048) seconds

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8. RF Exposure Conditions

Refer to Section 17 “Antenna Dimensions and Separation Distances” for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

8.1. Head Exposure Conditions

For GSM, W-CDMA, CDMA, LTE, WiFi and Bluetooth

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

8.2. Body-worn Accessory Exposure Conditions

For WiFi and Bluetooth (❶)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	1 mm	Yes	
Front	6.59 mm	Yes	

For GSM, W-CDMA, CDMA & LTE (❷,❸)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	1.59 mm	Yes	
Front	6.6 mm	Yes	

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8.3. Hotspot Exposure Conditions

For GSM 850, W-CDMA Band V, CDMA BC0/BC10 & LTE B5/B17/B26/B41 (❷)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	1.59 mm	Yes	
Front	6.6 mm	Yes	
Edge 1 (Top)	117.5 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01
Edge 2 (Right)	1.4 mm	Yes	
Edge 3 (Bottom)	0.6 mm	Yes	
Edge 4 (Left)	38.2 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01

For GSM 1900, W-CDMA Bands IV / II, CDMA BC1 & LTE B2/B4/B25/B41 (❸)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	1.59 mm	Yes	
Front	6.6 mm	Yes	
Edge 1 (Top)	128 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01
Edge 2 (Right)	42.2 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01
Edge 3 (Bottom)	0.6 mm	Yes	
Edge 4 (Left)	1.4 mm	Yes	

For WiFi & BT (❶)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	1 mm	Yes	
Front	6.59 mm	Yes	
Edge 1 (Top)	7 mm	Yes	
Edge 2 (Right)	2.75 mm	Yes	
Edge 3 (Bottom)	111.3 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01
Edge 4 (Left)	60.9 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01

8.4. WiFi Direct Exposure Conditions

For WiFi 5.8GHz Band (❶)

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	1 mm	Yes	
Front	6.59 mm	Yes	
Edge 1 (Top)	7 mm	Yes	
Edge 2 (Right)	2.75 mm	Yes	
Edge 3 (Bottom)	111.3 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01
Edge 4 (Left)	60.9 mm	No	SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR v01r01

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9. RF Output Power Measurement

9.1. GSM

GSM (GMSK) - Voice Mode

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)
850	128	824.2	33.0
	190	836.6	33.0
	251	848.8	33.0

GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	Freq. (MHz)	Avg Power (dBm)							
			1 time slot		2 time slots		3 time slots		4 time slots	
			Burst	Frame	Burst	Frame	Burst	Frame	Burst	Frame
850	128	824.2	33.0	24.0	31.9	25.9	29.8	25.5	28.0	25.0
	190	836.6	33.0	24.0	31.9	25.9	30.0	25.7	27.8	24.8
	251	848.8	33.0	24.0	31.8	25.8	29.8	25.5	27.7	24.7

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	Freq. (MHz)	Avg Power (dBm)							
			1 time slot		2 time slots		3 time slots		4 time slots	
			Burst	Frame	Burst	Frame	Burst	Frame	Burst	Frame
850	128	824.2	27.2	18.2	26.4	20.4	25.6	19.6	24.3	21.3
	190	836.6	27.1	18.1	26.2	20.2	25.3	19.3	24.2	21.2
	251	848.8	27.0	18.0	26.1	20.1	25.3	19.3	24.1	21.1

Notes:

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

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

GSM (GMSK) - Voice Mode

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)
1900	512	1850.2	30.6
	661	1880.0	30.6
	810	1909.8	30.7

GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	Freq. (MHz)	Avg Power (dBm)				Avg Power (dBm)			
			1 time slot		2 time slots		3 time slots		4 time slots	
			Burst	Frame	Burst	Frame	Burst	Frame	Burst	Frame
1900	512	1850.2	30.6	21.6	29.5	23.5	27.4	23.1	25.3	22.3
	661	1880.0	30.7	21.7	29.4	23.4	27.4	23.1	25.4	22.4
	810	1909.8	30.7	21.7	29.4	23.4	27.4	23.1	25.3	22.3

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	Freq. (MHz)	Avg Power (dBm)				Avg Power (dBm)			
			1 time slot		2 time slots		3 time slots		4 time slots	
			Burst	Frame	Burst	Frame	Burst	Frame	Burst	Frame
1900	512	1850.2	25.5	16.5	24.9	18.9	23.8	19.5	22.9	19.9
	661	1880.0	25.4	16.4	24.8	18.8	23.7	19.4	22.9	19.9
	810	1909.8	25.3	16.3	24.8	18.8	23.7	19.4	22.9	19.9

Notes:

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

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

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9.2. W-CDMA

Release 99

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

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	βc/βd	8/15

Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
W-CDMA Band V	Rel 99 (RMC, 12.2 kbps)	4132	826.4	24.1
		4183	836.6	24.2
		4233	846.6	24.1
W-CDMA Band IV	Rel 99 (RMC, 12.2 kbps)	1312	1712.4	24.7
		1413	1732.6	24.7
		1513	1752.6	24.7
W-CDMA Band II	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	24.7
		9400	1880.0	24.7
		9538	1907.6	24.6

HSDPA

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-Set1			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βc/βd	2/15	12/15	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			

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Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
W-CDMA Band V	Subtest 1	4132	826.4	23.6
		4183	836.6	23.8
		4233	846.6	23.7
	Subtest 2	4132	826.4	23.6
		4183	836.6	23.7
		4233	846.6	23.7
	Subtest 3	4132	826.4	23.5
		4183	836.6	23.7
		4233	846.6	23.6
	Subtest 4	4132	826.4	23.6
		4183	836.6	23.7
		4233	846.6	23.6
W-CDMA Band IV	Subtest 1	1312	1712.4	24.6
		1413	1732.6	24.6
		1513	1752.6	24.7
	Subtest 2	1312	1712.4	24.6
		1413	1732.6	24.5
		1513	1752.6	24.6
	Subtest 3	1312	1712.4	24.1
		1413	1732.6	24.0
		1513	1752.6	24.1
	Subtest 4	1312	1712.4	24.0
		1413	1732.6	24.0
		1513	1752.6	24.1
W-CDMA Band II	Subtest 1	9262	1852.4	24.7
		9400	1880.0	24.7
		9538	1907.6	24.7
	Subtest 2	9262	1852.4	24.6
		9400	1880.0	24.6
		9538	1907.6	24.6
	Subtest 3	9262	1852.4	24.1
		9400	1880.0	24.2
		9538	1907.6	24.1
	Subtest 4	9262	1852.4	24.2
		9400	1880.0	24.2
		9538	1907.6	24.0

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

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HSPA (HSDPA & HSUPA)

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

	Mode	HSPA	HSPA	HSPA	HSPA	HSPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	15/15
	βec	209/225	12/15	30/15	2/15	24/15
	βc/βd	11/15	6/15	15/9	2/15	15/15
	βhs	22/15	12/15	30/15	4/15	30/15
	βed	1309/225	94/75	47/15 47/15	56/75	134/15
	CM (dB)	1.0	3.0	2.0	3.0	1.0
	MPR (dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				
	DNAK	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				
HSUPA Specific Settings	D E-DPCCH	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	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	

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Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
W-CDMA Band V	Subtest 1	4132	826.4	23.7
		4183	836.6	23.7
		4233	846.6	23.2
	Subtest 2	4132	826.4	22.2
		4183	836.6	22.2
		4233	846.6	22.5
	Subtest 3	4132	826.4	22.5
		4183	836.6	22.7
		4233	846.6	22.8
	Subtest 4	4132	826.4	22.7
		4183	836.6	22.5
		4233	846.6	22.6
	Subtest 5	4132	826.4	24.1
		4183	836.6	24.2
		4233	846.6	24.1
W-CDMA Band IV	Subtest 1	1312	1712.4	23.9
		1413	1732.6	24.0
		1513	1752.6	24.1
	Subtest 2	1312	1712.4	22.6
		1413	1732.6	22.7
		1513	1752.6	23.0
	Subtest 3	1312	1712.4	23.3
		1413	1732.6	23.4
		1513	1752.6	23.4
	Subtest 4	1312	1712.4	22.9
		1413	1732.6	23.0
		1513	1752.6	23.2
	Subtest 5	1312	1712.4	24.7
		1413	1732.6	24.7
		1513	1752.6	24.6
W-CDMA Band II	Subtest 1	9262	1852.4	23.6
		9400	1880.0	23.9
		9538	1907.6	23.6
	Subtest 2	9262	1852.4	23.0
		9400	1880.0	22.4
		9538	1907.6	22.6
	Subtest 3	9262	1852.4	23.2
		9400	1880.0	23.1
		9538	1907.6	23.4
	Subtest 4	9262	1852.4	23.1
		9400	1880.0	23.2
		9538	1907.6	23.0
	Subtest 5	9262	1852.4	24.7
		9400	1880.0	24.6
		9538	1907.6	24.6

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DC-HSDPA (Rel 8, CAT 24)

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH _Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

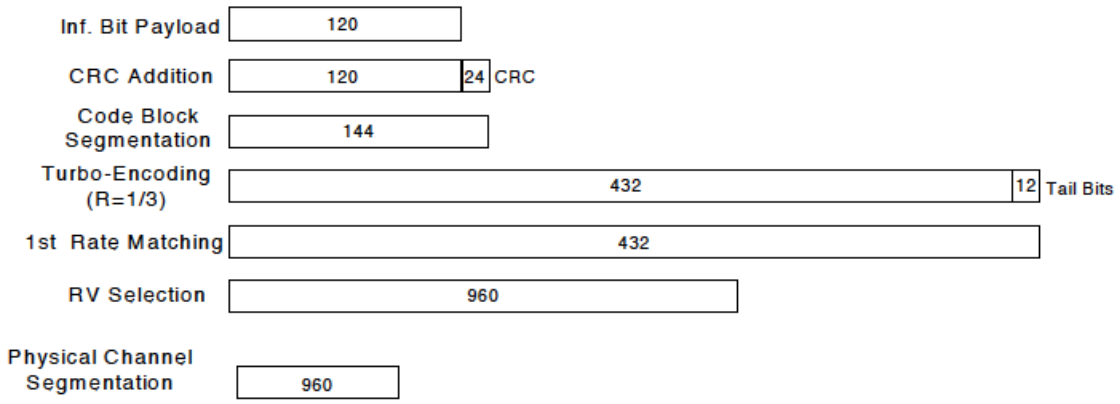

Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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The following 4 Sub-tests were completed according to Release 8 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest settings are illustrated below:

	Mode	DC-HSDPA	DC-HSDPA	DC-HSDPA	DC-HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs = βhs/ βc	30/15			

Up commands are set continuously to set the UE to Max power.

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Measured Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
W-CDMA Band V	Subtest 1	4132	826.4	24.0
		4183	836.6	24.0
		4233	846.6	24.0
	Subtest 2	4132	826.4	24.0
		4183	836.6	24.1
		4233	846.6	23.9
	Subtest 3	4132	826.4	24.0
		4183	836.6	24.1
		4233	846.6	24.0
	Subtest 4	4132	826.4	24.0
		4183	836.6	24.1
		4233	846.6	24.0
W-CDMA Band IV	Subtest 1	1312	1712.4	24.3
		1413	1732.6	24.3
		1513	1752.6	24.4
	Subtest 2	1312	1712.4	24.3
		1413	1732.6	24.4
		1513	1752.6	24.4
	Subtest 3	1312	1712.4	24.4
		1413	1732.6	24.3
		1513	1752.6	24.5
	Subtest 4	1312	1712.4	24.4
		1413	1732.6	24.4
		1513	1752.6	24.4
W-CDMA Band II	Subtest 1	9262	1852.4	24.3
		9400	1880.0	24.2
		9538	1907.6	24.3
	Subtest 2	9262	1852.4	23.9
		9400	1880.0	23.9
		9538	1907.6	23.8
	Subtest 3	9262	1852.4	23.8
		9400	1880.0	23.8
		9538	1907.6	23.7
	Subtest 4	9262	1852.4	23.7
		9400	1880.0	23.8
		9538	1907.6	23.7

HSPA+

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

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9.3. CDMA

1xRTT Measured Results

Band	Mode	Ch	Freq. (MHz)	Avg Pwr (dBm)
BC 0	RC1 SO55 (Loopback)	1013	824.70	24.4
		384	836.52	24.5
		777	848.31	24.4
	RC3 SO55 (Loopback)	1013	824.70	24.3
		384	836.52	24.5
		777	848.31	24.4
	RC3 SO32 (+F-SCH)	1013	824.70	24.4
		384	836.52	24.5
		777	848.31	24.4
BC 1	RC1 SO55 (Loopback)	25	1851.25	24.6
		600	1880.00	24.5
		1175	1908.75	24.6
	RC3 SO55 (Loopback)	25	1851.25	24.6
		600	1880.00	24.6
		1175	1908.75	24.6
	RC3 SO32 (+F-SCH)	25	1851.25	24.6
		600	1880.00	24.6
		1175	1908.75	24.6
BC 10	RC1 SO55 (Loopback)	476	817.9	24.4
		580	820.5	24.4
		684	823.1	24.5
	RC3 SO55 (Loopback)	476	817.9	24.4
		580	820.5	24.4
		684	823.1	24.4
	RC3 SO32 (+F-SCH)	476	817.9	24.4
		580	820.5	24.4
		684	823.1	24.5

1x Advanced Measured Results

Band	Mode	Ch	Freq. (MHz)	Avg Pwr (dBm)
BC 0	Fwd11/Rvs8 SO75 (Loopback)	1013	824.70	24.3
		384	836.52	24.5
		777	848.31	24.3
BC 1	Fwd11/Rvs8 SO75 (Loopback)	25	1851.25	24.3
		600	1880.00	24.3
		1175	1908.75	24.4
BC 10	Fwd11/Rvs8 SO75 (Loopback)	476	817.9	24.3
		580	820.5	24.3
		684	823.1	24.4

1xEv-Do Rel. 0 Measured Results

Band	FTAP Rate	RTAP Rate	Channel	Freq. (MHz)	Avg Pwr (dBm)
BC 0	307.2 kbps (2 slot, QPSK)	153.6 kbps	1013	824.70	24.4
			384	836.52	24.5
			777	848.31	24.5
BC1	307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	24.6
			600	1880.00	24.5
			1175	1908.75	24.7
BC10	307.2 kbps (2 slot, QPSK)	153.6 kbps	476	817.9	24.5
			580	820.5	24.4
			684	823.1	24.5

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1xEv-Do Rev. A Measured Results

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	Freq. (MHz)	Avg Pwr (dBm)
BC 0	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	24.3
			384	836.52	24.5
			777	848.31	24.4
BC1	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	24.6
			600	1880.00	24.5
			1175	1908.75	24.7
BC10	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	476	817.9	24.5
			580	820.5	24.5
			684	823.1	24.6

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9.4. LTE Bands

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

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

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

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

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

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

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

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LTE Band 2 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1860 MHz	1880 MHz	1900 MHz
LTE Band 2	20	QPSK	1	0	0	0	23.6	23.7	23.5
			1	50	0	0	23.5	23.6	23.6
			1	99	0	0	23.7	23.7	23.6
			50	0	1	1	22.2	22.3	22.3
			50	25	1	1	22.3	22.2	22.3
			50	50	1	1	22.3	22.2	22.3
			100	0	1	1	22.3	22.3	22.4
		16QAM	1	0	1	1	22.1	22.4	22.5
			1	50	1	1	22.1	22.4	22.4
			1	99	1	1	22.2	22.5	22.4
			50	0	2	2	21.2	21.2	21.2
			50	25	2	2	21.1	21.3	21.2
			50	50	2	2	21.2	21.2	21.4
			100	0	2	2	21.2	21.3	21.3
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1857.5 MHz	1880 MHz	1902.5 MHz
LTE Band 2	15	QPSK	1	0	0	0	23.6	23.6	23.7
			1	36	0	0	23.6	23.6	23.7
			1	74	0	0	23.6	23.5	23.6
			36	0	1	1	22.4	22.3	22.4
			36	18	1	1	22.3	22.3	22.4
			36	37	1	1	22.4	22.4	22.4
			75	0	1	1	22.3	22.3	22.4
		16QAM	1	0	1	1	22.2	22.2	22.2
			1	36	1	1	22.3	22.2	22.4
			1	74	1	1	22.3	22.2	22.2
			36	0	2	2	21.3	21.1	21.2
			36	18	2	2	21.3	21.2	21.3
			36	37	2	2	21.3	21.2	21.3
			75	0	2	2	21.2	21.1	21.2
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1855 MHz	1880 MHz	1905 MHz
LTE Band 2	10	QPSK	1	0	0	0	23.6	23.5	23.6
			1	25	0	0	23.6	23.6	23.6
			1	49	0	0	23.6	23.6	23.5
			25	0	1	0	22.5	22.3	22.5
			25	12	1	0	22.5	22.3	22.5
			25	25	1	0	22.4	22.4	22.5
			50	0	1	0	22.3	22.3	22.4
		16QAM	1	0	1	0	22.2	22.2	22.3
			1	25	1	0	22.2	22.2	22.4
			1	49	1	0	22.2	22.3	22.4
			25	0	2	0	21.3	21.3	21.3
			25	12	2	0	21.3	21.2	21.4
			25	25	2	0	21.3	21.3	21.4
			50	0	2	0	21.2	21.1	21.4

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LTE Band 2 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1852.5 MHz	1880 MHz	1907.5 MHz
LTE Band 2	5	QPSK	1	0	0	0	23.5	23.5	23.6
			1	12	0	0	23.6	23.5	23.6
			1	24	0	0	23.6	23.7	23.5
			12	0	1	1	22.5	22.5	22.7
			12	6	1	1	22.5	22.5	22.6
			12	11	1	1	22.6	22.5	22.5
			25	0	1	1	22.4	22.4	22.5
		16QAM	1	0	1	2	22.2	22.2	22.0
			1	12	1	1	22.2	22.2	22.1
			1	24	1	1	22.2	22.3	22.0
			12	0	2	2	21.5	21.5	21.5
			12	6	2	2	21.5	21.5	21.5
			12	11	2	2	21.6	21.5	21.4
			25	0	2	2	21.3	21.3	21.4
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1851.5 MHz	1880 MHz	1908.5 MHz
LTE Band 2	3	QPSK	1	0	0	0	23.5	23.6	23.7
			1	7	0	0	23.6	23.6	23.6
			1	14	0	0	23.6	23.6	23.5
			8	0	1	1	22.5	22.5	22.7
			8	4	1	1	22.6	22.5	22.6
			8	7	1	1	22.5	22.6	22.6
			15	0	1	1	22.5	22.5	22.6
		16QAM	1	0	1	1	22.2	22.2	22.3
			1	7	1	1	22.2	22.2	22.3
			1	14	1	1	22.3	22.3	22.2
			8	0	2	2	21.4	21.4	21.5
			8	4	2	2	21.5	21.4	21.4
			8	7	2	2	21.5	21.4	21.4
			15	0	2	2	21.4	21.4	21.4
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1850.7 MHz	1880 MHz	1909.3 MHz
LTE Band 2	1.4	QPSK	1	0	0	0	23.5	23.6	23.6
			1	2	0	0	23.5	23.6	23.5
			1	5	0	0	23.5	23.6	23.5
			3	0	0	0	23.5	23.7	23.6
			3	1	0	0	23.6	23.6	23.6
			3	2	0	0	23.6	23.6	23.6
			6	0	1	0	22.5	22.6	22.6
		16QAM	1	0	1	0	22.3	22.4	22.4
			1	2	1	0	22.3	22.3	22.3
			1	5	1	0	22.3	22.3	22.2
			3	0	1	0	22.4	22.5	22.4
			3	1	1	0	22.4	22.4	22.4
			3	2	1	0	22.3	22.4	22.4
			6	0	2	0	21.3	21.4	21.4

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LTE Band 4 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1720 MHz	1732.5 MHz	1745 MHz
LTE Band 4	20	QPSK	1	0	0	0	23.5	23.5	23.4
			1	50	0	0	23.5	23.5	23.4
			1	99	0	0	23.6	23.6	23.5
			50	0	1	1	22.2	22.2	22.2
			50	25	1	1	22.2	22.2	22.3
			50	50	1	1	22.2	22.2	22.2
			100	0	1	1	22.3	22.3	22.3
		16QAM	1	0	1	1	22.1	22.2	22.7
			1	50	1	1	22.2	22.3	22.4
			1	99	1	1	22.3	22.4	22.6
			50	0	2	2	21.1	21.3	21.3
			50	25	2	2	21.2	21.3	21.3
			50	50	2	2	21.3	21.3	21.4
			100	0	2	2	21.3	21.3	21.3
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1717.5 MHz	1732.5 MHz	1747.5 MHz
LTE Band 4	15	QPSK	1	0	0	0	23.5	23.6	23.6
			1	36	0	0	23.5	23.6	23.6
			1	74	0	0	23.6	23.4	23.6
			36	0	1	1	22.2	22.4	22.2
			36	18	1	1	22.2	22.3	22.3
			36	37	1	1	22.3	22.4	22.3
			75	0	1	1	22.2	22.4	22.2
		16QAM	1	0	1	1	22.2	22.4	22.3
			1	36	1	1	22.2	22.3	22.4
			1	74	1	1	22.3	22.1	22.3
			36	0	2	2	21.2	21.4	21.3
			36	18	2	2	21.3	21.3	21.4
			36	37	2	2	21.3	21.4	21.3
			75	0	2	2	21.2	21.3	21.3
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4	10	QPSK	1	0	0	0	23.5	23.7	23.5
			1	25	0	0	23.5	23.6	23.5
			1	49	0	0	23.7	23.7	23.5
			25	0	1	0	22.3	22.5	22.5
			25	12	1	0	22.3	22.4	22.4
			25	25	1	0	22.3	22.5	22.4
			50	0	1	0	22.2	22.5	22.3
		16QAM	1	0	1	0	22.2	22.4	22.5
			1	25	1	0	22.2	22.3	22.4
			1	49	1	0	22.3	22.4	22.4
			25	0	2	0	21.3	21.5	21.4
			25	12	2	0	21.3	21.4	21.4
			25	25	2	0	21.3	21.5	21.4
			50	0	2	0	21.2	21.4	21.4

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LTE Band 4 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1712.5 MHz	1732.5 MHz	1752.5 MHz
LTE Band 4	5	QPSK	1	0	0	0	23.4	23.5	23.5
			1	12	0	0	23.5	23.5	23.6
			1	24	0	0	23.5	23.6	23.5
			12	0	1	1	22.5	22.5	22.6
			12	6	1	1	22.4	22.5	22.6
			12	11	1	1	22.5	22.6	22.6
			25	0	1	1	22.3	22.4	22.4
		16QAM	1	0	1	1	22.1	22.3	22.0
			1	12	1	1	22.2	22.3	22.1
			1	24	1	1	22.2	22.2	22.0
			12	0	2	2	21.5	21.6	21.7
			12	6	2	2	21.6	21.7	21.6
			12	11	2	2	21.5	21.6	21.5
			25	0	2	2	21.3	21.4	21.4

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1711.5 MHz	1732.5 MHz	1753.5 MHz
LTE Band 4	3	QPSK	1	0	0	0	23.5	23.6	23.7
			1	7	0	0	23.5	23.5	23.5
			1	14	0	0	23.5	23.6	23.5
			8	0	1	1	22.5	22.5	22.7
			8	4	1	1	22.5	22.5	22.6
			8	7	1	1	22.5	22.6	22.5
			15	0	1	1	22.4	22.5	22.5
		16QAM	1	0	1	1	22.2	22.3	22.3
			1	7	1	1	22.2	22.2	22.2
			1	14	1	1	22.2	22.3	22.2
			8	0	2	2	21.5	21.6	21.6
			8	4	2	2	21.5	21.6	21.5
			8	7	2	2	21.5	21.6	21.5
			15	0	2	2	21.4	21.4	21.5

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1710.7 MHz	1732.5 MHz	1754.3 MHz
LTE Band 4	1.4	QPSK	1	0	0	0	23.5	23.6	23.6
			1	2	0	0	23.5	23.5	23.5
			1	5	0	0	23.4	23.6	23.5
			3	0	0	0	22.4	23.6	23.6
			3	1	0	0	22.5	23.6	23.6
			3	2	0	0	22.3	23.6	23.6
			6	0	1	0	22.5	22.6	22.6
		16QAM	1	0	1	0	22.3	22.4	22.3
			1	2	1	0	22.2	22.2	22.4
			1	5	1	0	22.4	22.4	22.4
			3	0	1	0	22.4	22.4	22.5
			3	1	1	0	22.3	22.4	22.4
			3	2	1	0	22.4	22.4	22.4
			6	0	2	0	21.4	21.5	21.4

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LTE Band 5 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							829 MHz	836.5 MHz	844 MHz
LTE Band 5	10	QPSK	1	0	0	0	23.5	23.6	23.5
			1	25	0	0	23.5	23.7	23.7
			1	49	0	0	23.6	23.7	23.6
			25	0	1	1	22.4	22.6	22.6
			25	12	1	1	22.5	22.6	22.6
			25	25	1	1	22.5	22.5	22.5
			50	0	1	1	22.3	22.4	22.5
		16QAM	1	0	1	1	22.3	22.3	22.5
			1	25	1	1	22.3	22.3	22.5
			1	49	1	1	22.4	22.4	22.6
			25	0	2	2	21.3	21.4	21.4
			25	12	2	2	21.3	21.4	21.4
			25	25	2	2	21.4	21.4	21.5
			50	0	2	2	21.2	21.4	21.3
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							826.5 MHz	836.5 MHz	846.5 MHz
LTE Band 5	5	QPSK	1	0	0	0	23.7	23.7	23.5
			1	12	0	0	23.5	23.6	23.6
			1	24	0	0	23.6	23.5	23.6
			12	0	1	1	22.6	22.5	22.6
			12	6	1	1	22.6	22.5	22.6
			12	11	1	1	22.5	22.6	22.5
			25	0	1	1	22.4	22.4	22.5
		16QAM	1	0	1	1	22.4	22.4	22.0
			1	12	1	1	22.2	22.3	22.1
			1	24	1	1	22.3	22.2	22.0
			12	0	2	2	21.7	21.7	21.7
			12	6	2	2	21.7	21.7	21.6
			12	11	2	2	21.6	21.7	21.6
			25	0	2	2	21.4	21.4	21.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							825.5 MHz	836.5 MHz	847.5 MHz
LTE Band 5	3	QPSK	1	0	0	0	23.7	23.6	23.7
			1	7	0	0	23.7	23.7	23.6
			1	14	0	0	23.6	23.5	23.6
			8	0	1	0	22.6	22.6	22.6
			8	4	1	0	22.5	22.6	22.6
			8	7	1	0	22.6	22.6	22.5
			15	0	1	0	22.6	22.6	22.6
		16QAM	1	0	1	0	22.4	22.3	22.3
			1	7	1	0	22.4	22.3	22.3
			1	14	1	0	22.2	22.2	22.3
			8	0	2	0	21.6	21.6	21.6
			8	4	2	0	21.7	21.6	21.5
			8	7	2	0	21.7	21.7	21.6
			15	0	2	0	21.6	21.5	21.5

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LTE Band 5 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							824.7 MHz	836.5 MHz	848.3 MHz
LTE Band 5	1.4	QPSK	1	0	0	0	23.7	23.5	23.7
			1	2	0	0	23.6	23.5	23.6
			1	5	0	0	23.7	23.5	23.6
			3	0	0	0	23.7	23.6	23.6
			3	1	0	0	23.7	23.6	23.6
			3	2	0	0	23.7	23.5	23.6
			6	0	1	0	22.7	22.6	22.6
		16QAM	1	0	1	0	22.6	22.6	22.4
			1	2	1	0	22.4	22.3	22.3
			1	5	1	0	22.4	22.3	22.4
			3	0	1	0	22.6	22.5	22.5
			3	1	1	0	22.5	22.4	22.5
			3	2	1	0	22.5	22.4	22.5
			6	0	2	0	21.5	21.3	21.5

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LTE Band 17 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)
							710 MHz
LTE Band 17	10	QPSK	1	0	0	0	23.6
			1	25	0	0	23.5
			1	49	0	0	23.6
			25	0	1	1	22.4
			25	12	1	1	22.5
			25	25	1	1	22.4
			50	0	1	1	22.4
		16QAM	1	0	1	1	22.4
			1	25	1	1	22.3
			1	49	1	1	22.3
			25	0	2	2	21.4
			25	12	2	2	21.4
			25	25	2	2	21.4
			50	0	2	2	21.3
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)
							710 MHz
LTE Band 17	5	QPSK	1	0	0	0	23.5
			1	12	0	0	23.5
			1	24	0	0	23.6
			12	0	1	0	22.6
			12	6	1	0	22.5
			12	11	1	0	22.6
			25	0	1	0	22.5
		16QAM	1	0	1	0	22.3
			1	12	1	0	22.3
			1	24	1	0	22.3
			12	0	2	0	21.6
			12	6	2	0	21.6
			12	11	2	0	21.6
			25	0	2	0	21.5

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LTE Band 25 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1860 MHz	1882.5 MHz	1905 MHz
LTE Band 25	20	QPSK	1	0	0	0	23.6	23.6	23.5
			1	50	0	0	23.4	23.7	23.5
			1	99	0	0	23.4	23.7	23.5
			50	0	1	0	22.3	22.3	22.3
			50	25	1	0	22.3	22.3	22.3
			50	50	1	0	22.3	22.4	22.3
			100	0	1	0	22.3	22.3	22.4
		16QAM	1	0	1	0	22.2	22.5	22.5
			1	50	1	0	22.2	22.5	22.4
			1	99	1	0	22.2	22.4	22.5
			50	0	2	0	21.3	21.3	21.3
			50	25	2	0	21.2	21.4	21.2
			50	50	2	0	21.4	21.3	21.2
			100	0	2	0	21.3	21.2	21.2
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1857.5 MHz	1882.5 MHz	1907.5 MHz
LTE Band 25	15	QPSK	1	0	0	0	23.4	23.4	23.6
			1	36	0	0	23.5	23.5	23.6
			1	74	0	0	23.5	23.4	23.5
			36	0	1	0	22.3	22.2	22.2
			36	18	1	0	22.2	22.2	22.2
			36	37	1	0	22.4	22.2	22.3
			75	0	1	0	22.2	22.1	22.3
		16QAM	1	0	1	0	22.3	22.2	22.2
			1	36	1	0	22.2	22.3	22.3
			1	74	1	0	22.4	22.5	22.3
			36	0	2	0	21.3	21.3	21.2
			36	18	2	0	21.1	21.3	21.3
			36	37	2	0	21.3	21.4	21.2
			75	0	2	0	21.5	21.5	21.2
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1855 MHz	1882.5 MHz	1910 MHz
LTE Band 25	10	QPSK	1	0	0	0	23.4	23.4	23.5
			1	25	0	0	23.5	23.4	23.5
			1	49	0	0	23.5	23.5	23.4
			25	0	1	0	22.3	22.3	22.2
			25	12	1	0	22.3	22.3	22.4
			25	25	1	0	22.3	22.3	22.2
			50	0	1	0	22.2	22.2	22.2
		16QAM	1	0	1	0	22.2	22.3	22.7
			1	25	1	0	22.2	22.2	22.6
			1	49	1	0	22.2	22.2	22.5
			25	0	2	0	21.2	21.5	21.3
			25	12	2	0	21.2	21.3	21.3
			25	25	2	0	21.2	21.2	21.1
			50	0	2	0	21.1	21.2	21.2

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LTE Band 25 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1852.5 MHz	1882.5 MHz	1912.5 MHz
LTE Band 25	5	QPSK	1	0	0	0	23.3	23.4	23.5
			1	12	0	0	23.4	23.4	23.5
			1	24	0	0	23.5	23.5	23.4
			12	0	1	0	22.4	22.4	22.4
			12	6	1	0	22.4	22.4	22.5
			12	11	1	0	22.5	22.4	22.5
			25	0	1	0	22.3	22.3	22.2
		16QAM	1	0	1	0	22.2	22.3	22.1
			1	12	1	0	22.2	22.4	22.2
			1	24	1	0	22.3	22.1	22.4
			12	0	2	0	21.4	21.4	21.4
			12	6	2	0	21.4	21.4	21.6
			12	11	2	0	21.4	21.3	21.2
			25	0	2	0	21.2	21.2	21.3

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1851.5 MHz	1882.5 MHz	1913.5 MHz
LTE Band 25	3	QPSK	1	0	0	0	23.4	23.6	23.5
			1	7	0	0	23.4	23.4	23.5
			1	14	0	0	23.5	23.4	23.4
			8	0	1	1	22.4	22.4	22.5
			8	4	1	1	22.4	22.4	22.4
			8	7	1	1	22.3	22.3	22.4
			15	0	1	1	22.4	22.4	22.4
		16QAM	1	0	1	1	22.2	22.5	22.2
			1	7	1	1	22.2	22.4	22.2
			1	14	1	1	22.2	22.2	22.4
			8	0	2	2	21.3	21.3	21.3
			8	4	2	2	21.3	21.3	21.2
			8	7	2	2	21.4	21.3	21.2
			15	0	2	2	21.3	21.2	21.2

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							1850.7 MHz	1882.5 MHz	1914.3 MHz
LTE Band 25	1.4	QPSK	1	0	0	0	23.4	23.4	23.5
			1	2	0	0	23.3	23.5	23.4
			1	5	0	0	23.4	23.4	23.4
			3	0	0	0	23.4	23.5	23.5
			3	1	0	0	23.5	23.5	23.5
			3	2	0	0	23.5	23.4	23.5
			6	0	1	0	22.4	22.5	22.4
		16QAM	1	0	1	0	22.3	22.2	22.3
			1	2	1	0	22.2	22.2	22.2
			1	5	1	0	22.2	22.5	22.3
			3	0	1	0	22.5	22.4	22.4
			3	1	1	0	22.5	22.6	22.4
			3	2	1	0	22.5	22.5	22.3
			6	0	2	0	21.2	21.2	21.2

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LTE Band 26 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							821 MHz	831.5 MHz	844 MHz
LTE Band 26	10	QPSK	1	0	0	0	23.5	23.5	23.5
			1	25	0	0	23.5	23.3	23.4
			1	49	0	0	23.5	23.5	23.4
			25	0	1	1	22.5	22.4	22.4
			25	12	1	1	22.5	22.3	22.3
			25	25	1	1	22.5	22.4	22.4
			50	0	1	1	22.3	22.2	22.2
		16QAM	1	0	1	1	22.4	22.4	22.2
			1	25	1	1	22.2	22.2	22.3
			1	49	1	1	22.2	22.4	22.3
			25	0	2	2	21.4	21.4	21.3
			25	12	2	2	21.4	21.3	21.4
			25	25	2	2	21.4	21.4	21.4
			50	0	2	2	21.4	21.3	21.4
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							818.5 MHz	831.5 MHz	846.5 MHz
LTE Band 26	5	QPSK	1	0	0	0	23.7	23.6	23.5
			1	12	0	0	23.7	23.5	23.6
			1	24	0	0	23.5	23.6	23.5
			12	0	1	1	22.7	22.6	22.6
			12	6	1	1	22.6	22.6	22.5
			12	11	1	1	22.5	22.4	22.4
			25	0	1	1	22.4	22.4	22.4
		16QAM	1	0	1	1	22.4	22.3	22.4
			1	12	1	1	22.4	22.2	22.4
			1	24	1	1	22.2	22.3	22.3
			12	0	2	2	21.7	21.7	21.6
			12	6	2	2	21.7	21.7	21.6
			12	11	2	2	21.6	21.5	21.5
			25	0	2	2	21.5	21.3	21.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							817.5 MHz	831.5 MHz	847.5 MHz
LTE Band 26	3	QPSK	1	0	0	0	23.7	23.6	23.6
			1	7	0	0	23.7	23.5	23.5
			1	14	0	0	23.7	23.5	23.5
			8	0	1	0	22.7	22.6	22.5
			8	4	1	0	22.7	22.5	22.5
			8	7	1	0	22.7	22.5	22.5
			15	0	1	0	22.7	22.5	22.5
		16QAM	1	0	1	0	22.4	22.3	22.6
			1	7	1	0	22.4	22.3	22.5
			1	14	1	0	22.4	22.2	22.4
			8	0	2	0	21.6	21.7	21.4
			8	4	2	0	21.7	21.6	21.4
			8	7	2	0	21.7	21.6	21.4
			15	0	2	0	21.7	21.5	21.5

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LTE Band 26 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)		
							816.7 MHz	831.5 MHz	841.5 MHz
LTE Band 26	1.4	QPSK	1	0	0	0	23.6	23.5	23.5
			1	2	0	0	23.6	23.4	23.4
			1	5	0	0	23.7	23.5	23.5
			3	0	0	0	23.7	23.6	23.6
			3	1	0	0	23.7	23.5	23.5
			3	2	0	0	23.6	23.5	23.5
			6	0	1	0	22.7	22.5	22.5
		16QAM	1	0	1	0	22.6	22.5	22.5
			1	2	1	0	22.4	22.2	22.6
			1	5	1	0	22.5	22.2	22.5
			3	0	1	0	22.6	22.5	22.5
			3	1	1	0	22.5	22.3	22.5
			3	2	1	0	22.5	22.3	22.6
			6	0	2	0	21.5	21.4	21.4

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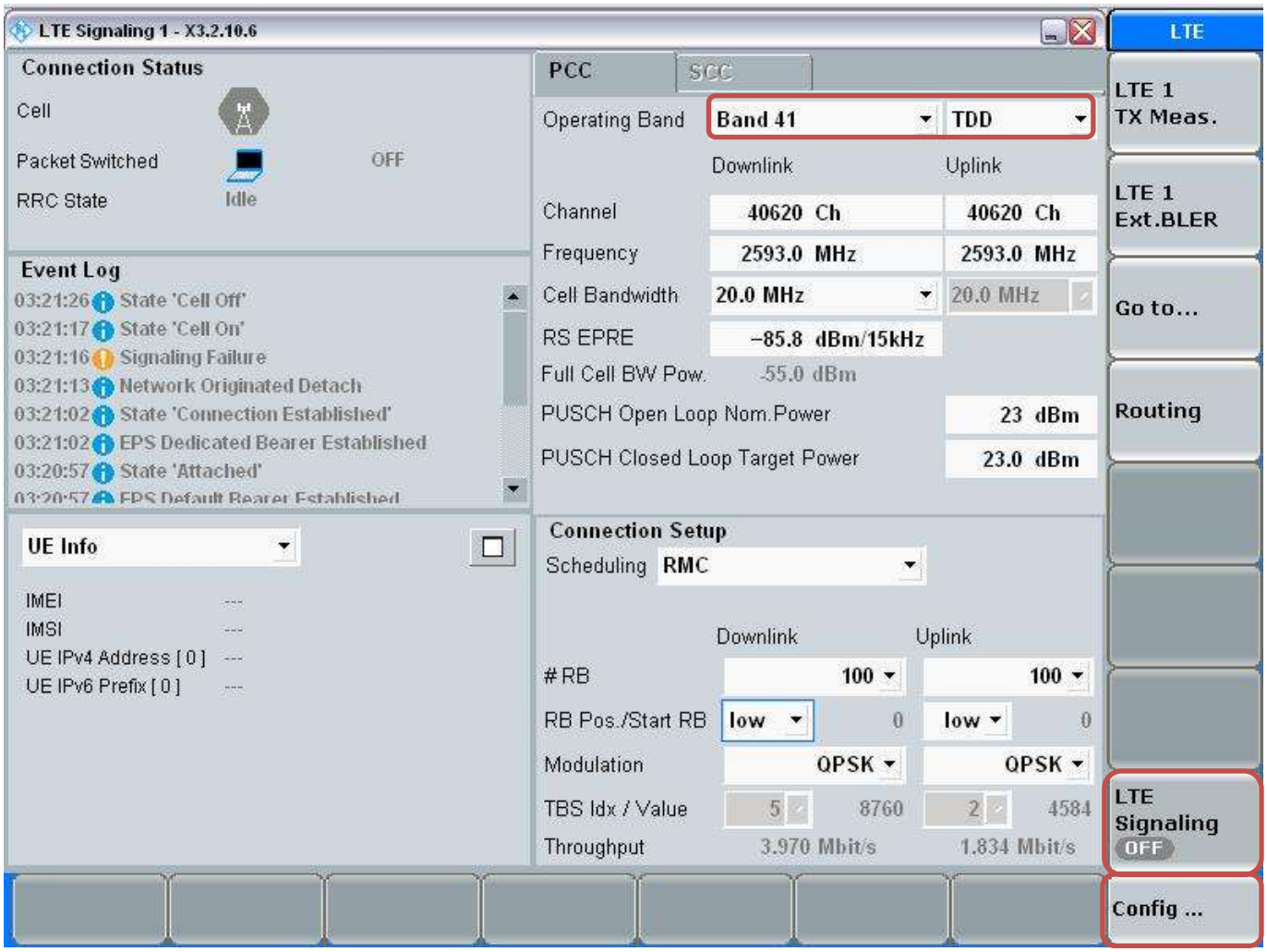
LTE Band 41 Measured Results

Procedure used to establish SAR test signal for LTE TDD Band 41

Set to CMW-500 with following parameters:

- Turn the LTE Signaling off using “ON | OFF” key
- Operating Band: Select Band 41 and TDD
- Go to “Config….”



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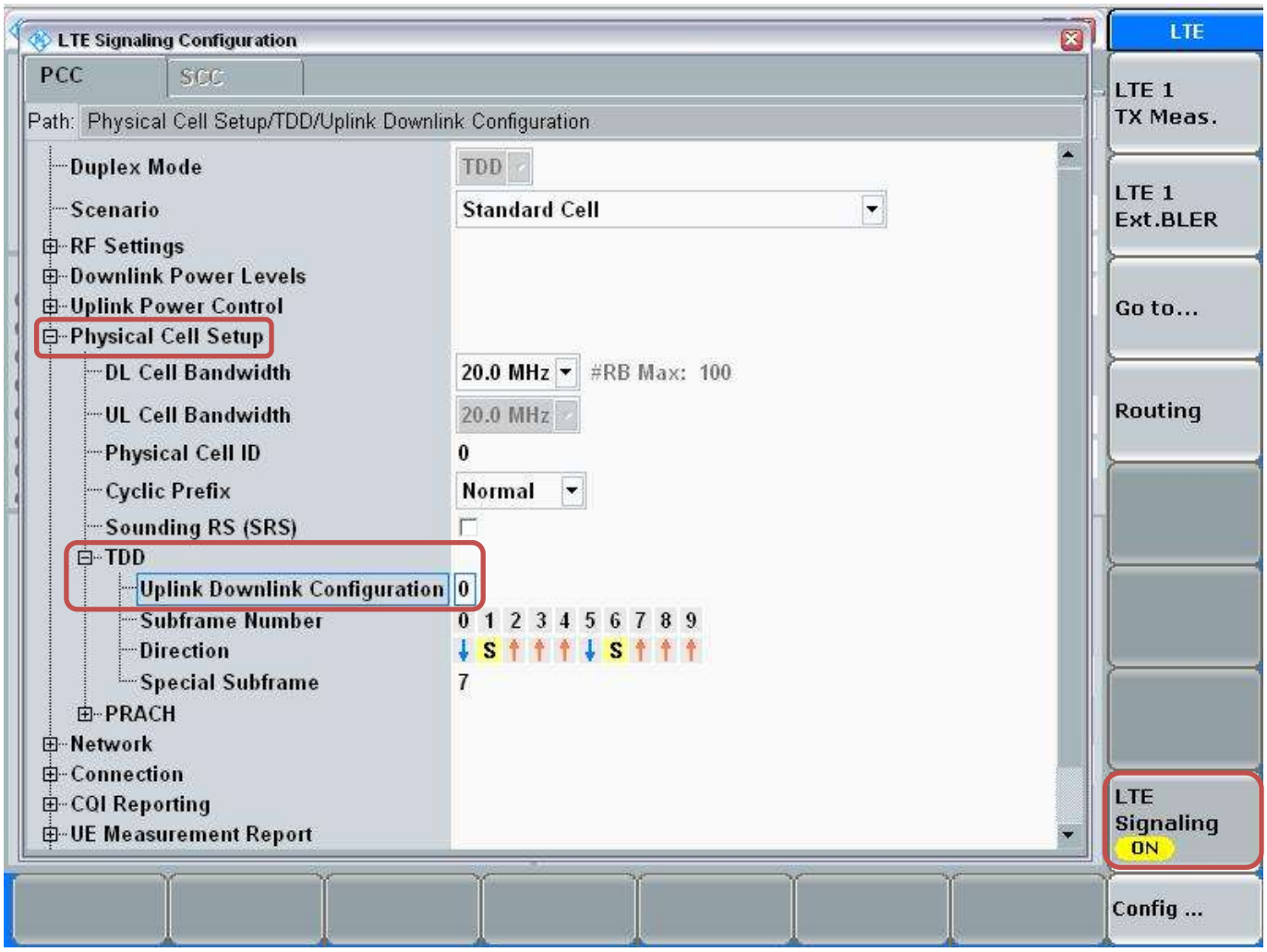
- Go to “Physical Cell Setup”
- Select “TDD” and Set “Uplink Downlink Configuration” to “0”
- Turn the cell on using “ON | OFF” key



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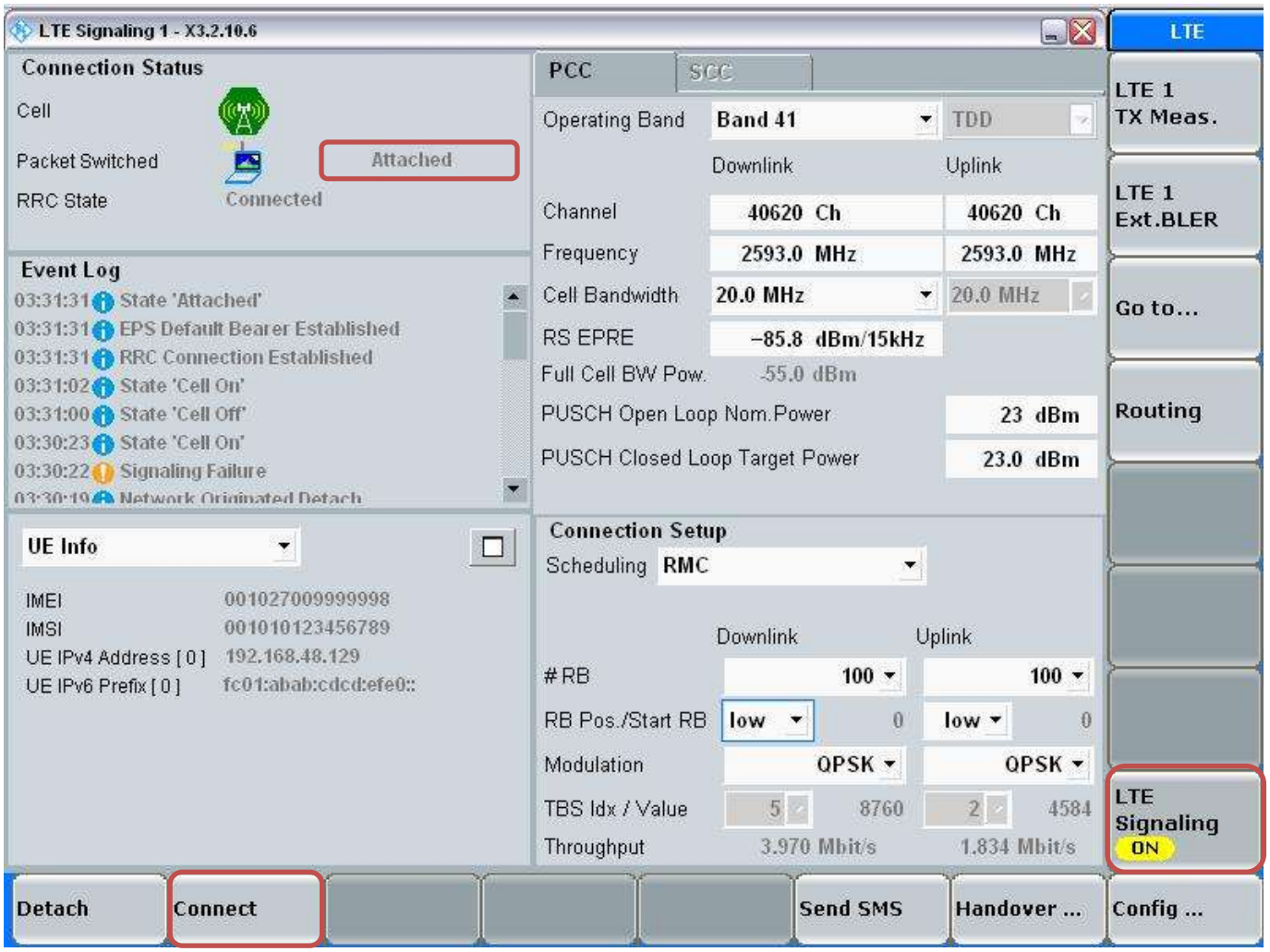
Connect to EUT

- Turn the cell on using “ON | OFF” key
- After EUT is Attached
- Select “Connect”



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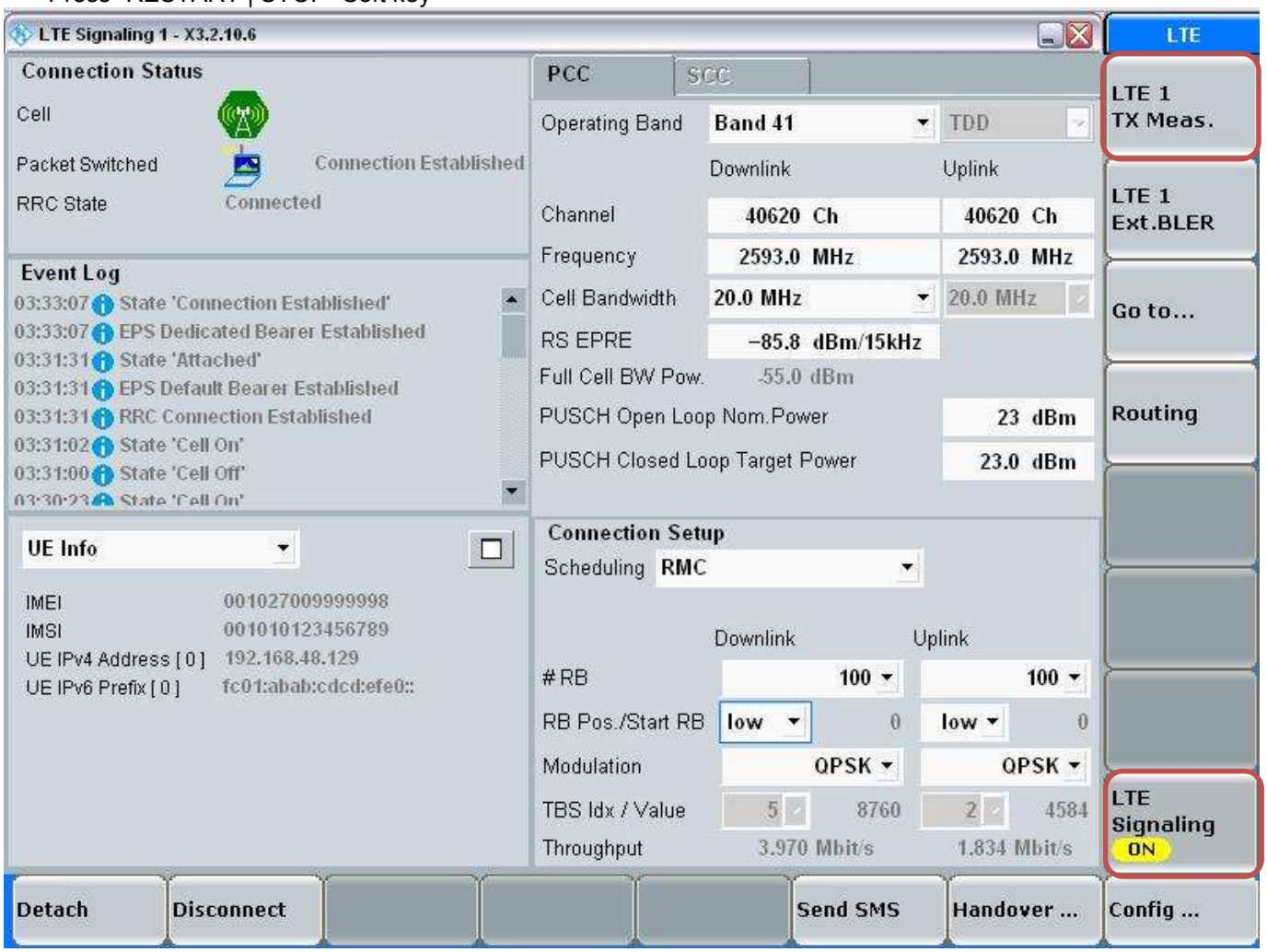
Max Power Setting

- Select “LTE 1 TX Meas.”
- Press “RESTART | STOP” Soft key



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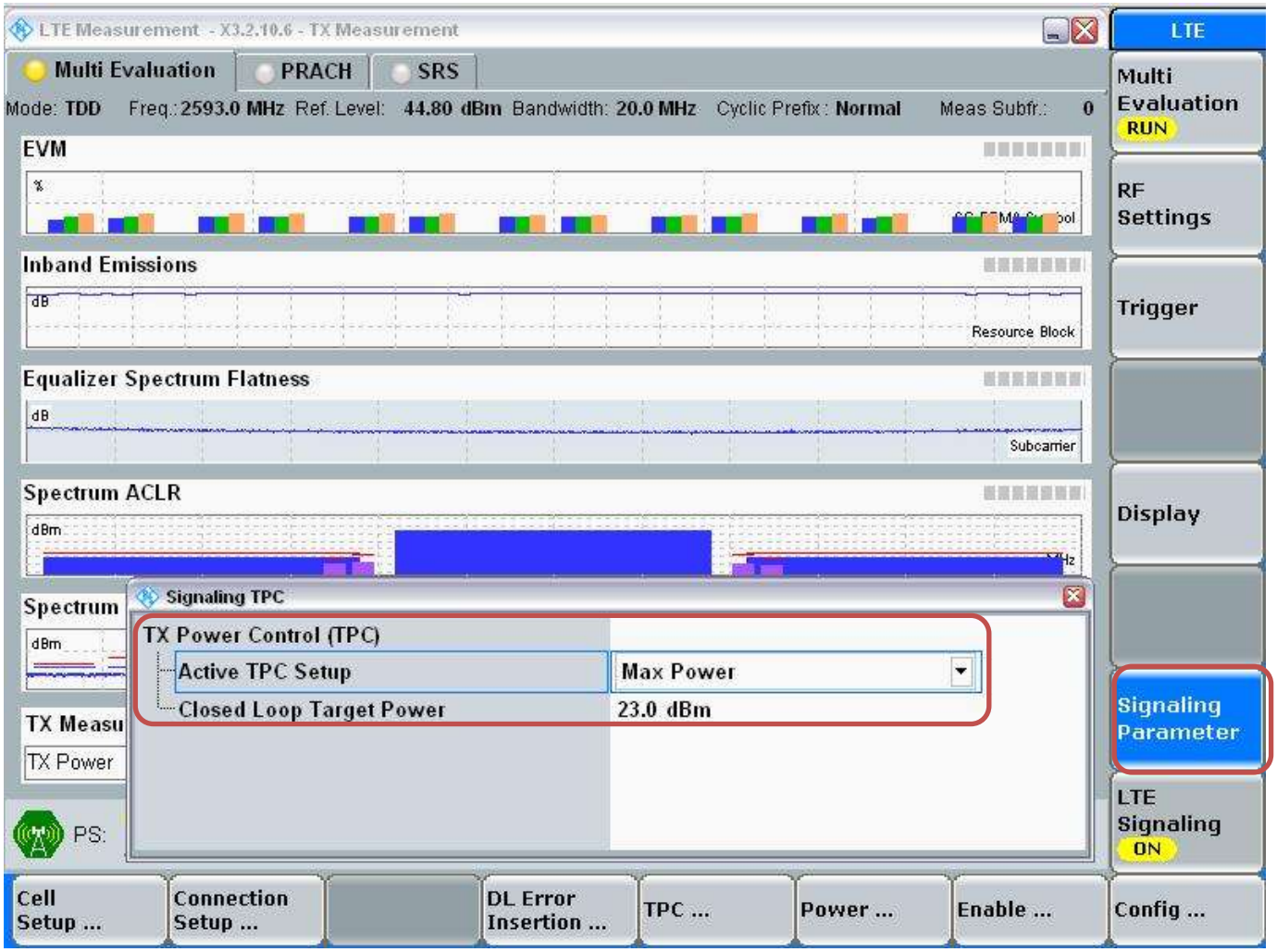
- Select “Signaling Parameter”
- Select “TX Power Control (TPC)” > Select “Active TPC Setup” to “Max Power” > Set “Closed Loop Target Power” to “23 dBm”



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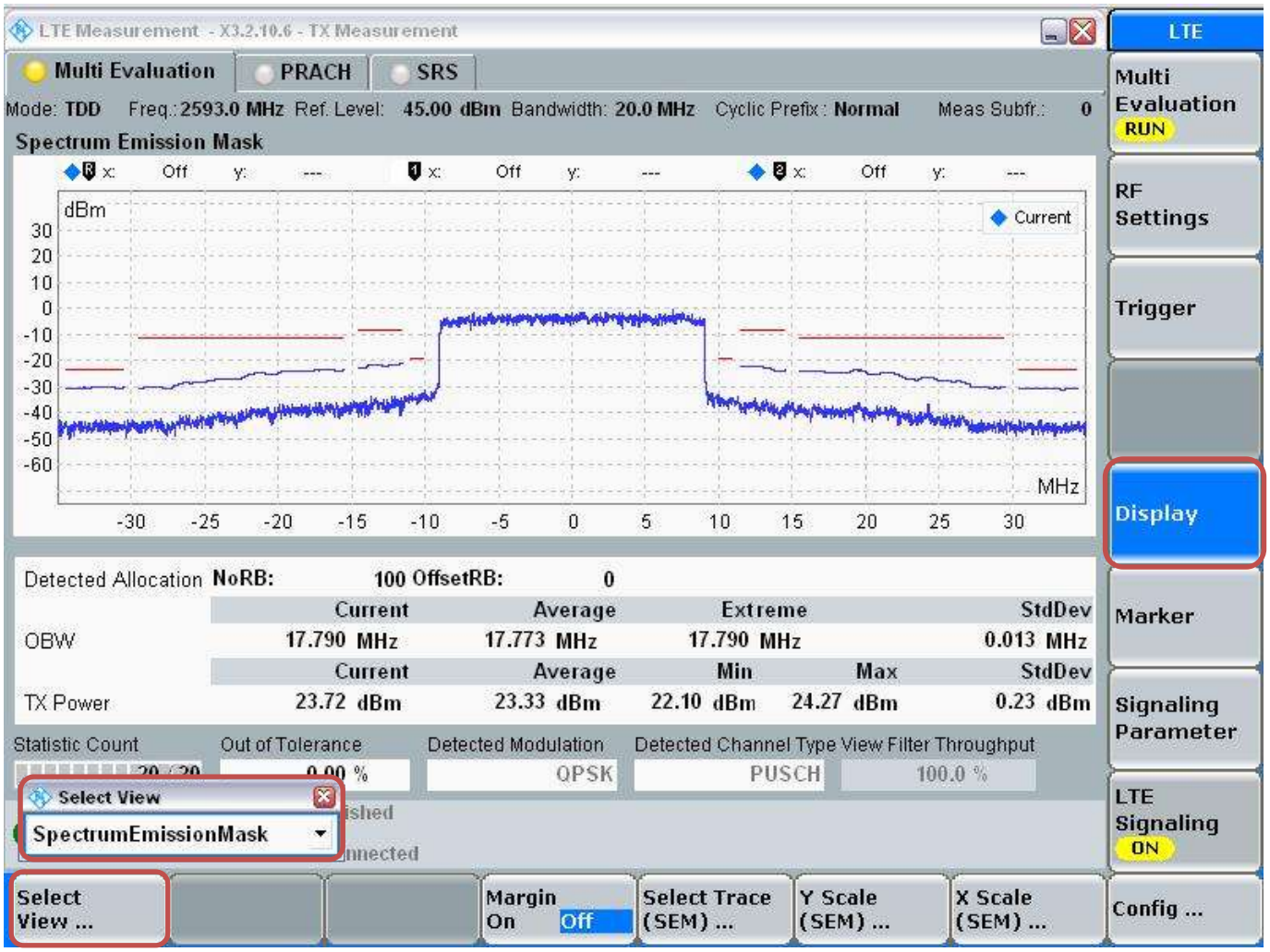
View TX Power

- Go to “Display”
- Select “Select View…”
- Select “Spectrum Emission Mask”



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LTE Band 41 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)				
							2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz
LTE Band 41	20	QPSK	1	0	0	0	21.5	21.4	21.4	21.5	21.5
			1	50	0	0	21.4	21.5	21.4	21.6	21.6
			1	99	0	0	21.4	21.6	21.5	21.7	21.5
			50	0	1	1	20.5	20.5	20.6	20.5	20.5
			50	25	1	1	20.4	20.5	20.6	20.6	20.5
			50	50	1	1	20.4	20.5	20.6	20.6	20.4
			100	0	1	1	20.5	20.5	20.6	20.5	20.5
		16QAM	1	0	1	1	20.6	20.6	20.3	20.6	20.4
			1	50	1	1	20.5	20.6	20.3	20.5	20.5
			1	99	1	1	20.5	20.6	20.4	20.5	20.3
			50	0	2	2	19.4	19.5	19.5	19.3	19.5
			50	25	2	2	19.3	19.5	19.4	19.4	19.4
			50	50	2	2	19.4	19.5	19.4	19.4	19.4
			100	0	2	2	19.4	19.5	19.4	19.4	19.5

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)				
							2503.5 MHz	2548.3 MHz	2593 MHz	2637.75 MHz	2682.5 MHz
LTE Band 41	15	QPSK	1	0	0	0	21.5	21.6	21.5	21.5	21.7
			1	36	0	0	21.5	21.6	21.5	21.5	21.7
			1	74	0	0	21.6	21.5	21.5	21.5	21.6
			36	0	1	1	20.5	20.5	20.5	20.5	20.4
			36	18	1	1	20.5	20.6	20.4	20.5	20.4
			36	37	1	1	20.5	20.5	20.5	20.6	20.3
			75	0	1	1	20.5	20.5	20.5	20.5	20.3
		16QAM	1	0	1	1	20.4	20.4	20.3	20.4	20.6
			1	36	1	1	20.3	20.4	20.3	20.3	20.6
			1	74	1	1	20.4	20.4	20.3	20.3	20.5
			36	0	2	2	19.5	19.5	19.5	19.6	19.5
			36	18	2	2	19.5	19.5	19.5	19.5	19.4
			36	37	2	2	19.5	19.5	19.5	19.6	19.4
			75	0	2	2	19.5	19.5	19.4	19.5	19.4

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)				
							2498.5 MHz	2545.8 MHz	2593 MHz	2640.25 MHz	2687.5 MHz
LTE Band 41	10	QPSK	1	0	0	0	21.5	21.6	21.7	21.5	21.5
			1	25	0	0	21.6	21.6	21.6	21.5	21.4
			1	49	0	0	21.6	21.7	21.6	21.4	21.3
			25	0	1	1	20.5	20.6	20.5	20.5	20.4
			25	12	1	1	20.5	20.6	20.6	20.4	20.4
			25	25	1	1	20.6	20.5	20.5	20.4	20.3
			50	0	1	1	20.5	20.5	20.5	20.5	20.4
		16QAM	1	0	1	1	20.3	20.3	20.3	20.5	20.2
			1	25	1	1	20.3	20.4	20.3	20.5	20.2
			1	49	1	1	20.4	20.4	20.3	20.4	20.2
			25	0	2	2	19.4	19.4	19.5	19.4	19.3
			25	12	2	2	19.4	19.4	19.5	19.3	19.3
			25	25	2	2	19.3	19.5	19.5	19.4	19.2
			50	0	2	2	19.4	19.4	19.5	19.4	19.3

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LTE Band 41 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Meas. MPR	Avg Pwr (dBm)				
							2498.5 MHz	2545.8 MHz	2593 MHz	2640.25 MHz	2687.5 MHz
LTE Band 41	5	QPSK	1	0	0	0	21.6	21.7	21.6	21.6	23.7
			1	12	0	2	21.7	21.7	21.7	21.6	21.5
			1	24	0	2	21.7	21.7	21.6	21.6	21.5
			12	0	1	2	20.5	20.6	20.5	20.5	21.4
			12	6	1	3	20.5	20.5	20.5	20.5	20.4
			12	13	1	3	20.6	20.5	20.5	20.5	20.3
			25	0	1	3	20.5	20.5	20.5	20.5	20.3
		16QAM	1	0	1	3	20.3	20.3	20.3	20.3	20.5
			1	12	1	3	20.3	20.3	20.3	20.3	20.3
			1	24	1	3	20.3	20.3	20.2	20.3	20.3
			12	0	2	4	19.6	19.5	19.5	19.5	19.7
			12	6	2	4	19.5	19.5	19.6	19.6	19.7
			12	13	2	4	19.6	19.6	19.6	19.7	19.6
			25	0	2	4	19.4	19.6	19.4	19.5	19.6

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9.5. WiFi (2.4 GHz Band)

Required Test Channels per KDB 248227 D01

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

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

Measured Results

Band (GHz)	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)
2.4	802.11b	1	2412	15.0
		6	2437	15.7
		11	2462	15.4
	802.11g	1	2412	9.7
		6	2437	10.2
		11	2462	10.0
	802.11n (HT20)	1	2412	8.8
		6	2437	9.3
		11	2462	9.0
	802.11ac (HT20)	1	2412	9.8
		6	2437	10.4
		11	2462	9.9

Note(s):

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

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9.6. WiFi (5 GHz Bands)

Required Test Channels per KDB 248227 D01

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

√ = "default test channels"

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

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

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Measured Results

Band (GHz)	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)
5.2 (UNII)	802.11a	36	5180	10.5
		40	5200	10.6
		44	5220	10.9
		48	5240	11.0
	802.11n (HT20)	36	5180	9.7
		40	5200	9.9
		48	5240	10.0
	802.11n (HT40)	38	5190	9.1
		46	5230	9.0
	802.11ac (HT20)	36	5180	9.9
		40	5200	9.6
		44	5220	9.6
		48	5240	9.8
	802.11ac (HT40)	38	5190	9.0
		46	5230	9.0
	802.11ac (HT80)	42	5210	8.0
5.3 (UNII)	802.11a	52	5260	11.4
		56	5280	11.6
		60	5300	11.5
		64	5320	11.6
	802.11n (HT20)	52	5260	10.2
		60	5300	10.1
		64	5320	10.0
	802.11n (HT40)	54	5270	9.2
		62	5310	9.2
	802.11ac (HT20)	52	5260	9.2
		56	5280	10.3
		60	5300	10.2
		64	5320	10.1
	802.11ac (HT40)	54	5270	9.4
		62	5310	9.2
	802.11ac (HT80)	58	5290	9.2

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Band (GHz)	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)
5.5 (UNII)	802.11a	100	5500	10.7
		104	5520	10.9
		108	5540	10.6
		112	5560	10.9
		116	5580	10.7
		120	5600	not supported
		124	5620	not supported
		128	5640	not supported
		132	5660	10.5
		136	5680	10.6
		140	5700	10.6
	802.11n (HT20)	100	5500	10.0
		104	5520	10.2
		108	5540	10.1
		112	5560	10.2
		116	5580	10.1
		120	5600	not supported
		124	5620	not supported
		128	5640	not supported
		132	5660	9.9
		136	5680	9.8
		140	5700	9.7
	802.11n (HT40)	102	5510	9.6
		110	5550	9.4
		134	5670	9.0
	802.11ac (HT20)	100	5500	10.3
		104	5520	10.2
		108	5540	10.2
		112	5560	10.1
		116	5580	10.1
		120	5600	not supported
		124	5620	not supported
		128	5640	not supported
		132	5660	9.8
		136	5680	9.6
		140	5700	9.8
	802.11ac (HT40)	134	5670	9.0
		142	5710	9.1
	802.11ac (HT80)	106	5530	8.8
		138	5690	8.3

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Band (GHz)	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)
5.8 (DTS)	802.11a	149	5745	10.0
		153	5765	9.8
		157	5785	9.8
		161	5805	10.0
		165	5825	9.5
	802.11n (HT20)	149	5745	9.6
		153	5765	9.6
		157	5785	9.5
		161	5805	9.5
		165	5825	9.3
	802.11n (HT40)	151	5755	8.7
		159	5795	8.7
	802.11ac (HT20)	149	5745	9.6
		153	5765	9.5
		157	5785	9.5
		161	5805	9.3
		165	5825	9.2
	802.11ac (HT40)	151	5755	8.7
		159	5795	8.6
	802.11ac (HT80)	155	5775	8.5

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9.7. Bluetooth

Band (GHz)	Mode	Ch #	Freq. (MHz)	Conducted Avg Power	
				(dBm)	(mW)
2.4	V3.0 + EDR, GFSK	0	2402	8.3	6.76
		39	2441	9.9	9.77
		78	2480	7.6	5.75
	V3.0 + EDR, π/4 DQPSK	0	2402	5.2	3.31
		39	2441	6.2	4.17
		78	2480	4.5	2.82
	V3.0 + EDR, 8-DPSK	0	2402	5.3	3.39
		39	2441	6.2	4.17
		78	2480	4.6	2.88
	V4.0 LE, GFSK	0	2402	4.8	2.99
		19	2440	6.0	3.98
		39	2480	5.6	3.62

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10. Tissue Dielectric Properties

IEEE Std 1528-2003 Table 2

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

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

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

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

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

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

Salt: 99+% Pure Sodium Chloride Sugar: 98+% Pure Sucrose
Water: De-ionized, 16 MΩ+ resistivity HEC: Hydroxyethyl Cellulose
DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

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

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

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

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

Simulating Liquids for 5 GHz, Manufactured by SPEAG

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

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10.2. Tissue Dielectric Parameter Check Results

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

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

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

SAR Room D

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/31/2013	Head 750	e'	40.9300	Relative Permittivity (ε_r):	40.93	41.96	-2.46	5
		e''	21.9200	Conductivity (σ):	0.91	0.89	2.36	5
	Head 700	e'	41.4400	Relative Permittivity (ε_r):	41.44	42.22	-1.84	5
		e''	21.8600	Conductivity (σ):	0.85	0.89	-4.32	5
	Head 790	e'	40.4800	Relative Permittivity (ε_r):	40.48	41.76	-3.06	5
		e''	21.4100	Conductivity (σ):	0.94	0.90	4.94	5
7/31/2013	Body 750	e'	55.4600	Relative Permittivity (ε_r):	55.46	55.55	-0.16	5
		e''	23.4800	Conductivity (σ):	0.98	0.96	1.67	5
	Body 700	e'	55.7800	Relative Permittivity (ε_r):	55.78	55.74	0.07	5
		e''	23.4600	Conductivity (σ):	0.91	0.96	-4.81	5
	Body 790	e'	55.1200	Relative Permittivity (ε_r):	55.12	55.39	-0.49	5
		e''	22.8700	Conductivity (σ):	1.00	0.97	3.98	5
8/1/2013	Head 1750	e'	41.4900	Relative Permittivity (ε_r):	41.49	40.08	3.51	5
		e''	13.7700	Conductivity (σ):	1.34	1.37	-2.12	5
	Head 1710	e'	41.6100	Relative Permittivity (ε_r):	41.61	40.15	3.65	5
		e''	13.6700	Conductivity (σ):	1.30	1.35	-3.46	5
	Head 1755	e'	41.4600	Relative Permittivity (ε_r):	41.46	40.08	3.45	5
		e''	13.7800	Conductivity (σ):	1.34	1.37	-1.98	5
8/1/2013	Body 1750	e'	53.6200	Relative Permittivity (ε_r):	53.62	53.44	0.33	5
		e''	15.2500	Conductivity (σ):	1.48	1.49	-0.15	5
	Body 1710	e'	53.7000	Relative Permittivity (ε_r):	53.70	53.54	0.29	5
		e''	15.1500	Conductivity (σ):	1.44	1.46	-1.44	5
	Body 1755	e'	53.5900	Relative Permittivity (ε_r):	53.59	53.43	0.30	5
		e''	15.2600	Conductivity (σ):	1.49	1.49	-0.01	5
8/2/2013	Head 1900	e'	40.0900	Relative Permittivity (ε_r):	40.09	40.00	0.23	5
		e''	13.2400	Conductivity (σ):	1.40	1.40	-0.09	5
	Head 1850	e'	40.3300	Relative Permittivity (ε_r):	40.33	40.00	0.82	5
		e''	13.1400	Conductivity (σ):	1.35	1.40	-3.45	5
	Head 1910	e'	40.0300	Relative Permittivity (ε_r):	40.03	40.00	0.08	5
		e''	13.2700	Conductivity (σ):	1.41	1.40	0.66	5
8/2/2013	Body 1900	e'	51.3500	Relative Permittivity (ε_r):	51.35	53.30	-3.66	5
		e''	14.2200	Conductivity (σ):	1.50	1.52	-1.17	5
	Body 1850	e'	51.5700	Relative Permittivity (ε_r):	51.57	53.30	-3.25	5
		e''	14.1200	Conductivity (σ):	1.45	1.52	-4.44	5
	Body 1910	e'	51.3100	Relative Permittivity (ε_r):	51.31	53.30	-3.73	5
		e''	14.2400	Conductivity (σ):	1.51	1.52	-0.51	5

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Tissue Dielectric Parameter Check Results (continued)

SAR Room D (continued)

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
8/5/2013	Head 835	e'	41.3700	Relative Permittivity (ε_r):	41.37	41.50	-0.31	5
		e"	19.9600	Conductivity (σ):	0.93	0.90	2.97	5
	Head 820	e'	41.4900	Relative Permittivity (ε_r):	41.49	41.60	-0.27	5
		e"	20.0200	Conductivity (σ):	0.91	0.90	1.60	5
	Head 850	e'	41.2700	Relative Permittivity (ε_r):	41.27	41.50	-0.55	5
		e"	19.9200	Conductivity (σ):	0.94	0.92	2.89	5
8/5/2013	Body 835	e'	54.2200	Relative Permittivity (ε_r):	54.22	55.20	-1.78	5
		e"	21.8800	Conductivity (σ):	1.02	0.97	4.73	5
	Body 820	e'	54.3000	Relative Permittivity (ε_r):	54.30	55.28	-1.77	5
		e"	21.9700	Conductivity (σ):	1.00	0.97	3.43	5
	Body 850	e'	54.1800	Relative Permittivity (ε_r):	54.18	55.16	-1.77	5
		e"	21.8200	Conductivity (σ):	1.03	0.99	4.47	5
8/6/2013	Head 2450	e'	37.6900	Relative Permittivity (ε_r):	37.69	39.20	-3.85	5
		e"	13.5500	Conductivity (σ):	1.85	1.80	2.55	5
	Head 2410	e'	37.8600	Relative Permittivity (ε_r):	37.86	39.28	-3.61	5
		e"	13.4100	Conductivity (σ):	1.80	1.76	2.08	5
	Head 2475	e'	37.6000	Relative Permittivity (ε_r):	37.60	39.17	-4.00	5
		e"	13.6100	Conductivity (σ):	1.87	1.83	2.52	5
8/8/2013	Head 5180	e'	36.5300	Relative Permittivity (ε_r):	36.53	36.01	1.44	5
		e"	15.7400	Conductivity (σ):	4.53	4.63	-2.10	5
	Head 5200	e'	36.4900	Relative Permittivity (ε_r):	36.49	35.99	1.39	5
		e"	15.7500	Conductivity (σ):	4.55	4.65	-2.09	5
	Head 5600	e'	35.9000	Relative Permittivity (ε_r):	35.90	35.53	1.03	5
		e"	15.9200	Conductivity (σ):	4.96	5.06	-2.04	5
	Head 5800	e'	35.6200	Relative Permittivity (ε_r):	35.62	35.30	0.91	5
		e"	16.0100	Conductivity (σ):	5.16	5.27	-2.03	5
	Head 5825	e'	35.5800	Relative Permittivity (ε_r):	35.58	35.30	0.79	5
		e"	16.0200	Conductivity (σ):	5.19	5.27	-1.54	5
8/8/2013	Body 5180	e'	47.9900	Relative Permittivity (ε_r):	47.99	49.05	-2.15	5
		e"	18.3100	Conductivity (σ):	5.27	5.27	0.04	5
	Body 5200	e'	47.9800	Relative Permittivity (ε_r):	47.98	49.02	-2.12	5
		e"	18.3100	Conductivity (σ):	5.29	5.29	-0.01	5
	Body 5600	e'	47.3500	Relative Permittivity (ε_r):	47.35	48.48	-2.33	5
		e"	18.5600	Conductivity (σ):	5.78	5.76	0.32	5
	Body 5800	e'	47.0500	Relative Permittivity (ε_r):	47.05	48.20	-2.39	5
		e"	18.7700	Conductivity (σ):	6.05	6.00	0.89	5
	Body 5825	e'	47.0300	Relative Permittivity (ε_r):	47.03	48.20	-2.43	5
		e"	18.7600	Conductivity (σ):	6.08	6.00	1.27	5
8/16/2013	Body 1900	e'	52.85	Relative Permittivity (ε_r):	52.85	53.30	-0.84	5
		e"	14.44	Conductivity (σ):	1.53	1.52	0.36	5
	Body 1850	e'	53.06	Relative Permittivity (ε_r):	53.06	53.30	-0.45	5
		e"	14.31	Conductivity (σ):	1.47	1.52	-3.16	5
	Body 1910	e'	52.80	Relative Permittivity (ε_r):	52.80	53.30	-0.94	5
		e"	14.46	Conductivity (σ):	1.54	1.52	1.30	5

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Tissue Dielectric Parameter Check Results (continued)

SAR Room 1

	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/31/2013	Head 1900	e'	40.9400	Relative Permittivity (ε_r):	40.94	40.00	2.35	5
		e''	13.2500	Conductivity (σ):	1.40	1.40	-0.01	5
	Head 1850	e'	41.1300	Relative Permittivity (ε_r):	41.13	40.00	2.83	5
		e''	13.1700	Conductivity (σ):	1.35	1.40	-3.23	5
	Head 1910	e'	40.9000	Relative Permittivity (ε_r):	40.90	40.00	2.25	5
		e''	13.2600	Conductivity (σ):	1.41	1.40	0.59	5
7/31/2013	Body 1900	e'	52.5700	Relative Permittivity (ε_r):	52.57	53.30	-1.37	5
		e''	14.2800	Conductivity (σ):	1.51	1.52	-0.75	5
	Body 1850	e'	52.7600	Relative Permittivity (ε_r):	52.76	53.30	-1.01	5
		e''	14.2000	Conductivity (σ):	1.46	1.52	-3.90	5
	Body 1910	e'	52.5300	Relative Permittivity (ε_r):	52.53	53.30	-1.44	5
		e''	14.3000	Conductivity (σ):	1.52	1.52	-0.09	5
8/1/2013	Body 2600	e'	51.1300	Relative Permittivity (ε_r):	51.13	52.51	-2.63	5
		e''	14.7000	Conductivity (σ):	2.13	2.16	-1.65	5
	Body 2500	e'	51.5300	Relative Permittivity (ε_r):	51.53	52.64	-2.10	5
		e''	14.3600	Conductivity (σ):	2.00	2.02	-1.19	5
	Body 2700	e'	50.7800	Relative Permittivity (ε_r):	50.78	52.38	-3.06	5
		e''	15.0200	Conductivity (σ):	2.25	2.30	-2.02	5
8/2/2013	Head 2600	e'	38.2000	Relative Permittivity (εr):	38.20	39.01	-2.08	5
		e''	14.1000	Conductivity (σ):	2.04	1.96	3.89	5
	Head 2500	e'	38.6100	Relative Permittivity (εr):	38.61	39.14	-1.35	5
		e''	13.8400	Conductivity (σ):	1.92	1.85	3.77	5
	Head 2700	e'	37.8000	Relative Permittivity (εr):	37.80	38.88	-2.79	5
		e''	14.3400	Conductivity (σ):	2.15	2.07	3.99	5
8/5/2013	Body 2450	e'	50.8800	Relative Permittivity (ε_r):	50.88	52.70	-3.45	5
		e''	14.1900	Conductivity (σ):	1.93	1.95	-0.87	5
	Body 2410	e'	51.0000	Relative Permittivity (ε_r):	51.00	52.76	-3.33	5
		e''	14.0500	Conductivity (σ):	1.88	1.91	-1.30	5
	Body 2475	e'	50.8100	Relative Permittivity (ε_r):	50.81	52.67	-3.53	5
		e''	14.2900	Conductivity (σ):	1.97	1.99	-0.94	5
8/19/2013	Body 835	e'	53.7000	Relative Permittivity (ε_r):	53.70	55.20	-2.72	5
		e''	21.7600	Conductivity (σ):	1.01	0.97	4.15	5
	Body 820	e'	53.8500	Relative Permittivity (ε_r):	53.85	55.28	-2.58	5
		e''	21.8600	Conductivity (σ):	1.00	0.97	2.92	5
	Body 850	e'	53.5700	Relative Permittivity (ε_r):	53.57	55.16	-2.88	5
		e''	21.7000	Conductivity (σ):	1.03	0.99	3.90	5
8/20/2013	Body 1750	e'	53.0700	Relative Permittivity (ε_r):	53.07	53.44	-0.69	5
		e''	15.2300	Conductivity (σ):	1.48	1.49	-0.28	5
	Body 1710	e'	53.2200	Relative Permittivity (ε_r):	53.22	53.54	-0.60	5
		e''	15.1700	Conductivity (σ):	1.44	1.46	-1.31	5
	Body 1755	e'	53.0500	Relative Permittivity (ε_r):	53.05	53.43	-0.71	5
		e''	15.2400	Conductivity (σ):	1.49	1.49	-0.14	5
8/20/2013	Body 750	e'	55.8600	Relative Permittivity (ε_r):	55.86	55.55	0.57	5
		e''	23.4600	Conductivity (σ):	0.98	0.96	1.58	5
	Body 700	e'	56.4900	Relative Permittivity (ε_r):	56.49	55.74	1.35	5
		e''	23.7300	Conductivity (σ):	0.92	0.96	-3.71	5
	Body 790	e'	55.7600	Relative Permittivity (ε_r):	55.76	55.39	0.66	5
		e''	23.0600	Conductivity (σ):	1.01	0.97	4.84	5

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11. System Performance Check

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

11.1. System Performance Check Measurement Conditions

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

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11.2. Reference SAR Values for System Performance Check

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

System Dipole	Serial No.	Cal. Date	Freq. (MHz)	Target SAR Values (mW/g)		
				1g/10g	Head	Body
D750V3	1071	10/5/2012	750	1g	8.29	8.79
				10g	5.49	5.82
D835V2	4d002	10/24/2012	835	1g	9.58	9.48
				10g	6.28	6.26
D1750V2	1050	4/20/2013	1750	1g	36.5	37.1
				10g	19.4	20.1
D1900V2	5d043	11/6/2012	1900	1g	39.9	40.9
				10g	20.9	21.6
D1900V2	5d163	10/4/2012	1900	1g	39.4	39.6
				10g	20.7	21.1
D2600V2	1006	9/13/2012	2600	1g	57.6	54.8
				10g	25.7	24.5
D2450V2	899	10/5/2012	2450	1g	53.6	51.7
				10g	25	24.3
D5GHzV2	1003	9/18/2012	5200	1g	76.5	74.8
				10g	21.9	20.9
			5600	1g	82.8	79.0
				10g	23.6	22.0
			5800	1g	76.9	77.0
				10g	22.0	21.4

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11.3. System Performance Check Results

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

SAR Room D

Date Tested	System Dipole		T.S. Liquid		Measured Results			Target (Ref. Value)	Delta ±10 %	Est./Zoom Ratio	Plot No.
	Type	Serial #			Area Scan	Zoom Scan	Normalize to 1 W				
7/31/2013	D750V3	1071	Head	1g	0.81	0.77	7.67	8.29	-7.48	5.77	1,2
				10g	0.56	0.50	5.03	5.49	**-8.38**		
7/31/2013	D750V3	1071	Body	1g	0.92	0.91	9.13	8.79	3.87	0.98	
				10g	0.63	0.61	6.08	5.82	4.47		
8/1/2013	D1750V2	1050	Head	1g	3.57	3.48	34.80	36.5	-4.66	2.52	
				10g	1.91	1.85	18.50	19.4	-4.64		
8/1/2013	D1750V2	1050	Body	1g	3.57	3.54	35.40	37.1	-4.58	0.84	3,4
				10g	1.86	1.90	19.00	20.1	**-5.47**		
8/2/2013	D1900V2	5d043	Head	1g	4.10	4.02	40.20	39.9	0.75	1.95	
				10g	2.11	2.08	20.80	20.9	-0.48		
8/2/2013	D1900V2	5d043	Body	1g	3.82	3.79	37.90	40.9	-7.33	0.79	5,6
				10g	1.94	1.99	19.90	21.6	**-7.87**		
8/5/2013	D835V2	4d002	Head	1g	0.97	0.96	9.58	9.6	0.00	1.64	
				10g	0.66	0.63	6.28	6.3	0.00		
8/5/2013	D835V2	4d002	Body	1g	1.01	0.99	9.90	9.5	**4.43**	1.98	7,8
				10g	0.68	0.65	6.52	6.3	4.15		
8/6/2013	D2450V2	899	Head	1g	5.50	5.46	54.60	53.6	**1.87**	0.73	9,10
				10g	2.36	2.48	24.80	25.0	-0.80		
8/8/2013	D5GHzV2 (5.2GHz)	1003	Head	1g	7.29	8.10	81.00	76.5	5.88	-11.11	
				10g	2.04	2.31	23.10	21.9	5.48		
8/8/2013	D5GHzV2 (5.6GHz)	1003	Head	1g	8.06	8.72	87.20	82.8	5.31	-8.19	
				10g	2.23	2.45	24.50	23.6	3.81		
8/8/2013	D5GHzV2 (5.8GHz)	1003	Head	1g	6.93	7.80	78.00	76.9	1.43	-12.55	
				10g	1.93	2.20	22.00	22.0	0.00		
8/8/2013	D5GHzV2 (5.2GHz)	1003	Body	1g	7.31	7.79	77.90	74.8	4.14	-6.57	
				10g	2.08	2.20	22.00	20.9	5.26		
8/8/2013	D5GHzV2 (5.6GHz)	1003	Body	1g	8.03	8.52	85.20	79.0	**7.85**	-6.10	11,12
				10g	2.25	2.36	23.60	22.0	7.27		
8/8/2013	D5GHzV2 (5.8GHz)	1003	Body	1g	6.84	7.66	76.60	77.0	-0.52	-11.99	
				10g	1.93	2.13	21.30	21.4	-0.47		
8/16/2013	D1900V2	5d163	Body	1g	3.81	3.85	38.50	39.6	**-2.78**	-1.05	13,14
				10g	1.91	2.07	20.70	21.1	-1.90		

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SAR Room 1

Date Tested	System Dipole		T.S. Liquid		Measured Results			Target (Ref. Value)	Delta ±10 %	Est./Zoom Ratio	Plot No.
	Type	Serial #			Area Scan	Zoom Scan	Normalize to 1 W				
7/31/2013	D1900V2	5d043	Body	1g	3.71	3.75	37.50	40.9	**-8.31**	-1.08	15,16
				10g	1.91	1.99	19.90	21.6	-7.87		
7/31/2013	D1900V2	5d043	Head	1g	4.22	4.12	41.20	39.9	3.26	2.37	
				10g	2.16	2.14	21.40	20.9	2.39		
8/1/2013	D2600V2	1006	Body	1g	5.93	5.76	57.60	54.8	**5.11**	2.87	17,18
				10g	2.59	2.55	25.50	24.5	4.08		
8/2/2013	D2600V2	1006	Head	1g	5.98	5.84	58.40	57.6	1.39	2.34	
				10g	2.67	2.58	25.80	25.7	0.39		
8/5/2013	D2450V2	899	Body	1g	5.42	5.48	54.80	51.7	**6.00**	-1.11	19,20
				10g	2.36	2.54	25.40	24.3	4.53		
8/19/2013	D835V2	4d002	Body	1g	1.00	0.98	9.77	9.48	**3.06**	2.30	21,22
				10g	0.67	0.64	6.42	6.26	2.56		
8/20/2013	D1750V2	1050	Body	1g	3.73	3.69	36.90	37.1	-0.54	1.07	23,24
				10g	1.94	1.98	19.80	20.1	**-1.49**		
8/20/2013	D750V3	1071	Body	1g	0.85	0.85	8.49	8.79	**-3.41**	0.59	25,26
				10g	0.58	0.56	5.64	5.82	-3.09		

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12. SAR Test Results

12.1. GSM850

12.1.1. Head Exposure Conditions

Head Exposure Conditions (Voice mode)

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
				Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	Voice	128	824.2	33.2	33.0				1
		190	836.6	33.2	33.0	0.275	0.288		
		251	848.8	33.2	33.0				1
Left Tilt (15°)	Voice	128	824.2	33.2	33.0				1
		190	836.6	33.2	33.0	0.184	0.193		
		251	848.8	33.2	33.0				1
Right Touch	Voice	128	824.2	33.2	33.0				1
		190	836.6	33.2	33.0	0.316	0.331		
		251	848.8	33.2	33.0				1
Right Tilt (15°)	Voice	128	824.2	33.2	33.0				1
		190	836.6	33.2	33.0	0.208	0.218		
		251	848.8	33.2	33.0				1

Head Exposure Conditions (VoIP mode)

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
				Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	GPRS 2 Slots	128	824.2	32.2	31.9				1
		190	836.6	32.2	31.9	0.408	0.437		
		251	848.8	32.2	31.8				1
Left Tilt (15°)	GPRS 2 Slots	128	824.2	32.2	31.9				1
		190	836.6	32.2	31.9	0.284	0.304		
		251	848.8	32.2	31.8				1
Right Touch	GPRS 2 Slots	128	824.2	32.2	31.9				1
		190	836.6	32.2	31.9	0.479	**0.513**	1	
		251	848.8	32.2	31.8				1
Right Tilt (15°)	GPRS 2 Slots	128	824.2	32.2	31.9				1
		190	836.6	32.2	31.9	0.319	0.342		
		251	848.8	32.2	31.8				1

Note(s):

1. 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

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12.1.2. Body-worn Accessory & Hotspot Exposure Conditions

Body-worn Accessory (Voice Mode)

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	Voice	10	128	824.2	33.2	33.0				1
			190	836.6	33.2	33.0	0.416	0.436		
			251	848.8	33.2	33.0				1
Front	Voice	10	128	824.2	33.2	33.0				1
			190	836.6	33.2	33.0	0.400	0.419		
			251	848.8	33.2	33.0				1

Body-worn Accessory (VoIP mode) & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	GPRS 2 Slots	10	128	824.2	32.2	31.9				1
			190	836.6	32.2	31.9	0.631	**0.676**	2	
			251	848.8	32.2	31.8				1
Front	GPRS 2 Slots	10	128	824.2	32.2	31.9				1
			190	836.6	32.2	31.9	0.616	0.660		
			251	848.8	32.2	31.8				1

Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Edge 2	GPRS 2 Slots	10	128	824.2	32.2	31.9				1
			190	836.6	32.2	31.9	0.498	0.534		
			251	848.8	32.2	31.8				1
Edge 3	GPRS 2 Slots	10	128	824.2	32.2	31.9				1
			190	836.6	32.2	31.9	0.234	0.251		
			251	848.8	32.2	31.8				1

Note(s):

1. 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

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12.2. GSM1900

12.2.1. Head Exposure Conditions

Head Exposure Conditions (Voice mode)

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
				Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	Voice	512	1850.2	30.7	30.6				1
		661	1880.0	30.7	30.6	0.434	0.444		
		810	1909.8	30.7	30.7				1
Left Tilt (15°)	Voice	512	1850.2	30.7	30.6				1
		661	1880.0	30.7	30.6	0.188	0.192		
		810	1909.8	30.7	30.7				1
Right Touch	Voice	512	1850.2	30.7	30.6				1
		661	1880.0	30.7	30.6	0.372	0.381		
		810	1909.8	30.7	30.7				1
Right Tilt (15°)	Voice	512	1850.2	30.7	30.6				1
		661	1880.0	30.7	30.6	0.145	0.148		
		810	1909.8	30.7	30.7				1

Head Exposure Conditions (VoIP mode)

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
				Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	GPRS 2 Slots	512	1850.2	29.7	29.5				1
		661	1880.0	29.7	29.4	0.622	**0.666**	3	
		810	1909.8	29.7	29.4				1
Left Tilt (15°)	GPRS 2 Slots	512	1850.2	29.7	29.5				1
		661	1880.0	29.7	29.4	0.274	0.294		
		810	1909.8	29.7	29.4				1
Right Touch	GPRS 2 Slots	512	1850.2	29.7	29.5				1
		661	1880.0	29.7	29.4	0.549	0.588		
		810	1909.8	29.7	29.4				1
Right Tilt (15°)	GPRS 2 Slots	512	1850.2	29.7	29.5				1
		661	1880.0	29.7	29.4	0.214	0.229		
		810	1909.8	29.7	29.4				1

Note(s):

1. 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

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12.2.2. Body-worn Accessory & Hotspot Exposure Conditions

Body-worn Accessory (Voice mode)

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	Voice	10	512	1850.2	30.7	30.6				1
			661	1880.0	30.7	30.6	0.482	0.493		
			810	1909.8	30.7	30.7				1
Front	Voice	10	512	1850.2	30.7	30.6				1
			661	1880.0	30.7	30.6	0.482	0.493		
			810	1909.8	30.7	30.7				1

Body-worn Accessory (VoIP mode) & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	GPRS 2 Slots	10	512	1850.2	29.7	29.5				1
			661	1880.0	29.7	29.4	0.678	0.726		
			810	1909.8	29.7	29.4				1
Front	GPRS 2 Slots	10	512	1850.2	29.7	29.5				1
			661	1880.0	29.7	29.4	0.681	**0.730**	4	
			810	1909.8	29.7	29.4				1

Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Edge 3	GPRS 2 Slots	10	512	1850.2	29.7	29.5				1
			661	1880.0	29.7	29.4	0.403	0.432		
			810	1909.8	29.7	29.4				1
Edge 4	GPRS 2 Slots	10	512	1850.2	29.7	29.5				1
			661	1880.0	29.7	29.4	0.415	0.445		
			810	1909.8	29.7	29.4				1

Note(s):

1. 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

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12.3. W-CDMA Band V

12.3.1. Head Exposure Conditions

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
				Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	Rel 99 RMC 12.2 kbps	4132	826.4	24.2	24.1				1
		4183	836.6	24.2	24.2	0.286	0.286		
		4233	846.6	24.2	24.1				1
Left Tilt (15°)	Rel 99 RMC 12.2 kbps	4132	826.4	24.2	24.1				1
		4183	836.6	24.2	24.2	0.187	0.187		
		4233	846.6	24.2	24.1				1
Right Touch	Rel 99 RMC 12.2 kbps	4132	826.4	24.2	24.1				1
		4183	836.6	24.2	24.2	0.353	**0.353**	5	
		4233	846.6	24.2	24.1				1
Right Tilt (15°)	Rel 99 RMC 12.2 kbps	4132	826.4	24.2	24.1				1
		4183	836.6	24.2	24.2	0.215	0.215		
		4233	846.6	24.2	24.1				1

Note(s):

1. 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

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12.3.2. Body-worn Accessory & Hotspot Exposure Conditions

KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit. (pg.12)

Body-worn Accessory & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	Rel 99 RMC 12.2 kbps	10	4132	826.4	24.2	24.1				1
			4183	836.6	24.2	24.2	0.323	0.323		
			4233	846.6	24.2	24.1				1
Front	Rel 99 RMC 12.2 kbps	10	4132	826.4	24.2	24.1				1
			4183	836.6	24.2	24.2	0.391	**0.391**	6	
			4233	846.6	24.2	24.1				1

Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Edge 2	Rel 99 RMC 12.2 kbps	10	4132	826.4	24.2	24.1				1
			4183	836.6	24.2	24.2	0.293	0.293		
			4233	846.6	24.2	24.1				1
Edge 3	Rel 99 RMC 12.2 kbps	10	4132	826.4	24.2	24.1				1
			4183	836.6	24.2	24.2	0.190	0.190		
			4233	846.6	24.2	24.1				1

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. With headset attached. According to KDB 648474 Section 2.3, 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.

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12.4. W-CDMA Band IV

12.4.1. Head Exposure Conditions

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
				Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	Rel 99 RMC 12.2kbps	1312	1712.4	24.7	24.7				1
		1413	1732.6	24.7	24.7	0.700	**0.700**	7	
		1513	1752.6	24.7	24.7				1
Left Tilt (15°)	Rel 99 RMC 12.2kbps	1312	1712.4	24.7	24.7				1
		1413	1732.6	24.7	24.7	0.367	0.367		
		1513	1752.6	24.7	24.7				1
Right Touch	Rel 99 RMC 12.2kbps	1312	1712.4	24.7	24.7				1
		1413	1732.6	24.7	24.7	0.611	0.611		
		1513	1752.6	24.7	24.7				1
Right Tilt (15°)	Rel 99 RMC 12.2kbps	1312	1712.4	24.7	24.7				1
		1413	1732.6	24.7	24.7	0.271	0.271		
		1513	1752.6	24.7	24.7				1

Note(s):

1. 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

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12.4.2. Body-worn Accessory & Hotspot Exposure Conditions

KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit. (pg.12)

Body-worn Accessory & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	Rel 99 RMC 12.2kbps	10	1312	1712.4	24.7	24.7	0.969	**0.969**	8	
			1413	1732.6	24.7	24.7	0.929	0.929		
			1513	1752.6	24.7	24.7	0.904	0.904		
Front	Rel 99 RMC 12.2kbps	10	1312	1712.4	24.7	24.7	0.936	0.936		
			1413	1732.6	24.7	24.7	0.905	0.905		
			1513	1752.6	24.7	24.7	0.873	0.873		

Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Edge 3	Rel 99 RMC 12.2kbps	10	1312	1712.4	24.7	24.7				1
			1413	1732.6	24.7	24.7	0.422	0.422		
			1513	1752.6	24.7	24.7				1
Edge 4	Rel 99 RMC 12.2kbps	10	1312	1712.4	24.7	24.7				1
			1413	1732.6	24.7	24.7	0.502	0.502		
			1513	1752.6	24.7	24.7				1

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. With headset attached. According to KDB 648474 Section 2.3, 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.

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12.5. W-CDMA Band II

12.5.1. Head Exposure Conditions

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
				Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	Rel 99 RMC 12.2kbps	9262	1852.4	24.7	24.7				1
		9400	1880.0	24.7	24.7	0.779	**0.779**	9	
		9538	1907.6	24.7	24.6				1
Left Tilt (15°)	Rel 99 RMC 12.2kbps	9262	1852.4	24.7	24.7				1
		9400	1880.0	24.7	24.7	0.328	0.328		
		9538	1907.6	24.7	24.6				1
Right Touch	Rel 99 RMC 12.2kbps	9262	1852.4	24.7	24.7				1
		9400	1880.0	24.7	24.7	0.718	0.718		
		9538	1907.6	24.7	24.6				1
Right Tilt (15°)	Rel 99 RMC 12.2kbps	9262	1852.4	24.7	24.7				1
		9400	1880.0	24.7	24.7	0.245	0.245		
		9538	1907.6	24.7	24.6				1

Note(s):

1. 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

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12.5.2. Body-worn Accessory & Hotspot Exposure Conditions

KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit. (pg.12)

Body-worn Accessory & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	Rel 99 RMC 12.2kbps	10	9262	1852.4	24.7	24.7	0.910	0.910		
			9400	1880.0	24.7	24.7	0.936	**0.936**	10	
			9538	1907.6	24.7	24.6	0.831	0.850		
Front	Rel 99 RMC 12.2kbps	10	9262	1852.4	24.7	24.7	0.932	0.932		
			9400	1880.0	24.7	24.7	0.879	0.879		
			9538	1907.6	24.7	24.6	0.845	0.865		

Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Edge 3	Rel 99 RMC 12.2kbps	10	9262	1852.4	24.7	24.7				1
			9400	1880.0	24.7	24.7	0.646	0.646		
			9538	1907.6	24.7	24.6				1
Edge 4	Rel 99 RMC 12.2kbps	10	9262	1852.4	24.7	24.7				1
			9400	1880.0	24.7	24.7	0.623	0.623		
			9538	1907.6	24.7	24.6				1

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. With headset attached. According to KDB 648474 Section 2.3, 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.

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12.6. CDMA BC0

12.6.1. Head Exposure Conditions

Head Exposure Conditions (Voice mode)

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
				Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	1xRTT (RC3 SO55)	1013	824.70	24.7	24.3				1
		384	836.52	24.7	24.5	0.300	0.314		
		777	848.31	24.7	24.4				1
Left Tilt (15°)	1xRTT (RC3 SO55)	1013	824.70	24.7	24.3				1
		384	836.52	24.7	24.5	0.200	0.209		
		777	848.31	24.7	24.4				1
Right Touch	1xRTT (RC3 SO55)	1013	824.70	24.7	24.3				1
		384	836.52	24.7	24.5	0.379	0.397		
		777	848.31	24.7	24.4				1
Right Tilt (15°)	1xRTT (RC3 SO55)	1013	824.70	24.7	24.3				1
		384	836.52	24.7	24.5	0.226	0.237		
		777	848.31	24.7	24.4				1

Head Exposure Conditions (VoIP mode)

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
				Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	1xEVDO (Rel. 0)	1013	824.70	24.7	24.4				1
		384	836.52	24.7	24.5	0.334	0.350		
		777	848.31	24.7	24.5				1
Left Tilt (15°)	1xEVDO (Rel. 0)	1013	824.70	24.7	24.4				1
		384	836.52	24.7	24.5	0.239	0.250		
		777	848.31	24.7	24.5				1
Right Touch	1xEVDO (Rel. 0)	1013	824.70	24.7	24.4				1
		384	836.52	24.7	24.5	0.423	**0.443**	11	
		777	848.31	24.7	24.5				1
Right Tilt (15°)	1xEVDO (Rel. 0)	1013	824.70	24.7	24.4				1
		384	836.52	24.7	24.5	0.270	0.283		
		777	848.31	24.7	24.5				1

Note(s):

1. 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

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12.6.2. Body-worn Accessory & Hotspot Exposure Conditions

Body-worn Accessory (Voice mode) & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	1xRTT (RC3 SO32)	10	1013	824.70	24.7	24.4				1
			384	836.52	24.7	24.5	0.341	0.357		
			777	848.31	24.7	24.4				1
Front	1xRTT (RC3 SO32)	10	1013	824.70	24.7	24.4				1
			384	836.52	24.7	24.5	0.412	0.431		
			777	848.31	24.7	24.4				1

Body-worn Accessory (VoIP mode) & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	1xEVDO (Rel. 0)	10	1013	824.70	24.7	24.4				1
			384	836.52	24.7	24.5	0.422	0.442		
			777	848.31	24.7	24.5				1
Front	1xEVDO (Rel. 0)	10	1013	824.70	24.7	24.4				1
			384	836.52	24.7	24.5	0.504	**0.528**	12	
			777	848.31	24.7	24.5				1

Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Edge 2	1xRTT (RC3 SO32)	10	1013	824.70	24.7	24.4				1
			384	836.52	24.7	24.5	0.326	0.341		
			777	848.31	24.7	24.4				1
Edge 3	1xRTT (RC3 SO32)	10	1013	824.70	24.7	24.4				1
			384	836.52	24.7	24.5	0.219	0.229		
			777	848.31	24.7	24.4				1
Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Edge 2	1xEVDO (Rel. 0)	10	1013	824.70	24.7	24.4				1
			384	836.52	24.7	24.5	0.336	0.352		
			777	848.31	24.7	24.5				1
Edge 3	1xEVDO (Rel. 0)	10	1013	824.70	24.7	24.4				1
			384	836.52	24.7	24.5	0.245	0.257		
			777	848.31	24.7	24.5				1

Note(s):

1. 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

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12.7. CDMA BC1

12.7.1. Head Exposure Conditions

Head Exposure Conditions (Voice mode)

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
				Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	1xRTT (RC3 SO55)	25	1851.25	24.7	24.6				1
		600	1880.00	24.7	24.6	0.705	0.721		
		1175	1908.75	24.7	24.6				1
Left Tilt (15°)	1xRTT (RC3 SO55)	25	1851.25	24.7	24.6				1
		600	1880.00	24.7	24.6	0.285	0.292		
		1175	1908.75	24.7	24.6				1
Right Touch	1xRTT (RC3 SO55)	25	1851.25	24.7	24.6				1
		600	1880.00	24.7	24.6	0.675	0.691		
		1175	1908.75	24.7	24.6				1
Right Tilt (15°)	1xRTT (RC3 SO55)	25	1851.25	24.7	24.6				1
		600	1880.00	24.7	24.6	0.259	0.265		
		1175	1908.75	24.7	24.6				1

Head Exposure Conditions (VoIP mode)

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
				Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	1xEVDO (Rel. 0)	25	1851.25	24.7	24.6	0.786	0.804		
		600	1880.00	24.7	24.5	0.862	0.903		
		1175	1908.75	24.7	24.7	0.956	**0.956**	13	
Left Tilt (15°)	1xEVDO (Rel. 0)	25	1851.25	24.7	24.6				1
		600	1880.00	24.7	24.5	0.387	0.405		
		1175	1908.75	24.7	24.7				1
Right Touch	1xEVDO (Rel. 0)	25	1851.25	24.7	24.6				1
		600	1880.00	24.7	24.5	0.721	0.755		
		1175	1908.75	24.7	24.7				1
Right Tilt (15°)	1xEVDO (Rel. 0)	25	1851.25	24.7	24.6				1
		600	1880.00	24.7	24.5	0.263	0.275		
		1175	1908.75	24.7	24.7				1

Note(s):

1. 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

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12.7.2. Body-worn Accessory & Hotspot Exposure Conditions

Body-worn Accessory (Voice mode) & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	1xRTT (RC3 SO32)	10	25	1851.25	24.7	24.6	0.962	0.984		
			600	1880.00	24.7	24.6	0.990	1.013		
			1175	1908.75	24.7	24.6	0.942	0.964		
Front	1xRTT (RC3 SO32)	10	25	1851.25	24.7	24.6	1.030	**1.054**	14	
			600	1880.00	24.7	24.6	0.958	0.980		
			1175	1908.75	24.7	24.6	0.871	0.891		

Body-worn Accessory (VoIP mode) & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	1xEVDO (Rel. 0)	10	25	1851.25	24.7	24.6	0.740	0.757		
			600	1880.00	24.7	24.5	0.794	0.831		
			1175	1908.75	24.7	24.7	0.905	0.905		
Front	1xEVDO (Rel. 0)	10	25	1851.25	24.7	24.6				1
			600	1880.00	24.7	24.5	0.738	0.773		
			1175	1908.75	24.7	24.7				1

Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Edge 3	1xRTT (RC3 SO32)	10	25	1851.25	24.7	24.6				1
			600	1880.00	24.7	24.6	0.719	0.736		
			1175	1908.75	24.7	24.6				1
Edge 4	1xRTT (RC3 SO32)	10	25	1851.25	24.7	24.6				1
			600	1880.00	24.7	24.6	0.666	0.682		
			1175	1908.75	24.7	24.6				1

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Edge 3	1xEVDO (Rel. 0)	10	25	1851.25	24.7	24.6				1
			600	1880.00	24.7	24.5	0.628	0.658		
			1175	1908.75	24.7	24.7				1
Edge 4	1xEVDO (Rel. 0)	10	25	1851.25	24.7	24.6				1
			600	1880.00	24.7	24.5	0.653	0.684		
			1175	1908.75	24.7	24.7				1

Note(s):

1. 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

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12.8. CDMA BC10

12.8.1. Head Exposure Conditions

Head Exposure Conditions (Voice mode)

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
				Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	1xRTT (RC3 SO55)	476	817.90	24.7	24.4				1
		580	820.50	24.7	24.4	0.257	0.275		
		684	823.10	24.7	24.4				1
Left Tilt (15°)	1xRTT (RC3 SO55)	476	817.90	24.7	24.4				1
		580	820.50	24.7	24.4	0.174	0.186		
		684	823.10	24.7	24.4				1
Right Touch	1xRTT (RC3 SO55)	476	817.90	24.7	24.4				1
		580	820.50	24.7	24.4	0.308	**0.330**	15	
		684	823.10	24.7	24.4				1
Right Tilt (15°)	1xRTT (RC3 SO55)	476	817.90	24.7	24.4				1
		580	820.50	24.7	24.4	0.196	0.210		
		684	823.10	24.7	24.4				1

Head Exposure Conditions (VoIP mode)

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
				Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	1xEVDO (Rel. 0)	476	817.90	24.7	24.5				1
		580	820.50	24.7	24.4	0.237	0.254		
		684	823.10	24.7	24.5				1
Left Tilt (15°)	1xEVDO (Rel. 0)	476	817.90	24.7	24.5				1
		580	820.50	24.7	24.4	0.224	0.240		
		684	823.10	24.7	24.5				1
Right Touch	1xEVDO (Rel. 0)	476	817.90	24.7	24.5				1
		580	820.50	24.7	24.4	0.281	0.301		
		684	823.10	24.7	24.5				1
Right Tilt (15°)	1xEVDO (Rel. 0)	476	817.90	24.7	24.5				1
		580	820.50	24.7	24.4	0.182	0.195		
		684	823.10	24.7	24.5				1

Note(s):

1. 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

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12.8.2. Body-worn Accessory & Hotspot Exposure Conditions

Body-worn Accessory (Voice mode) & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	1xRTT (RC3 SO32)	10	476	817.90	24.7	24.4				1
			580	820.50	24.7	24.4	0.340	0.364		
			684	823.10	24.7	24.5				1
Front	1xRTT (RC3 SO32)	10	476	817.90	24.7	24.4				1
			580	820.50	24.7	24.4	0.365	0.391		
			684	823.10	24.7	24.5				1

Body-worn Accessory (VoIP mode) & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	1xEVDO (Rel. 0)	10	476	817.90	24.7	24.5				1
			580	820.50	24.7	24.4	0.441	0.473		
			684	823.10	24.7	24.5				1
Front	1xEVDO (Rel. 0)	10	476	817.90	24.7	24.5				1
			580	820.50	24.7	24.4	0.492	**0.527**	16	
			684	823.10	24.7	24.5				1

Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Edge 2	1xRTT (RC3 SO32)	10	476	817.90	24.7	24.4				1
			580	820.50	24.7	24.4	0.286	0.306		
			684	823.10	24.7	24.5				1
Edge 3	1xRTT (RC3 SO32)	10	476	817.90	24.7	24.4				1
			580	820.50	24.7	24.4	0.153	0.164		
			684	823.10	24.7	24.5				1
Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Edge 2	1xEVDO (Rel. 0)	10	476	817.90	24.7	24.5				1
			580	820.50	24.7	24.4	0.294	0.315		
			684	823.10	24.7	24.5				1
Edge 3	1xEVDO (Rel. 0)	10	476	817.90	24.7	24.5				1
			580	820.50	24.7	24.4	0.202	0.216		
			684	823.10	24.7	24.5				1

Note(s):

1. 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

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12.9. LTE Band 2 (20MHz Bandwidth)

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

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12.10. LTE Band 4 (20MHz Bandwidth)

12.10.1. Head Exposure Conditions

Test Position	Mode	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	QPSK	20050	1720.0	1	99	23.7	23.6				1
				50	0	22.7	22.2				1
		20175	1732.5	1	99	23.7	23.6	0.502	**0.514**	17	
				50	25	22.7	22.2	0.383	0.430		
				100	0	22.7	22.3				1
		20300	1745.0	1	99	23.7	23.5				1
				50	25	22.7	22.3				1
Left Tilt (15°)	QPSK	20050	1720.0	1	99	23.7	23.6				1
				50	0	22.7	22.2				1
		20175	1732.5	1	99	23.7	23.6	0.260	0.266		
				50	25	22.7	22.2	0.196	0.220		
				100	0	22.7	22.3				1
		20300	1745.0	1	99	23.7	23.5				1
				50	25	22.7	22.3				1
Right Touch	QPSK	20050	1720.0	1	99	23.7	23.6				1
				50	0	22.7	22.2				1
		20175	1732.5	1	99	23.7	23.6	0.390	0.399		
				50	25	22.7	22.2	0.297	0.333		
				100	0	22.7	22.3				1
		20300	1745.0	1	99	23.7	23.5				1
				50	25	22.7	22.3				1
Right Tilt (15°)	QPSK	20050	1720.0	1	99	23.7	23.6				1
				50	0	22.7	22.2				1
		20175	1732.5	1	99	23.7	23.6	0.175	0.179		
				50	25	22.7	22.2	0.135	0.151		
				100	0	22.7	22.3				1
		20300	1745.0	1	99	23.7	23.5				1
				50	25	22.7	22.3				1

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
   - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
   - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are ≥ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
   - Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
   - Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

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12.10.2. Body-worn Accessory & Hotspot Exposure Conditions

Body-worn Accessory & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Rear	QPSK	10	20050	1720.0	1	99	23.7	23.6				1
					50	0	22.7	22.2				1
			20175	1732.5	1	99	23.7	23.6	0.719	0.736		
					50	25	22.7	22.2	0.547	0.614		
					100	0	22.7	22.3				1
			20300	1745.0	1	99	23.7	23.5				1
					50	25	22.7	22.3				1
Front	QPSK	10	20050	1720.0	1	99	23.7	23.6				1
					50	0	22.7	22.2				1
			20175	1732.5	1	99	23.7	23.6	0.728	**0.745**	18	
					50	25	22.7	22.2	0.554	0.622		
					100	0	22.7	22.3				1
			20300	1745.0	1	99	23.7	23.5				1
					50	25	22.7	22.3				1

Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Edge 3	QPSK	10	20050	1720.0	1	99	23.7	23.6				1
					50	0	22.7	22.2				1
			20175	1732.5	1	99	23.7	23.6	0.280	0.287		
					50	25	22.7	22.2	0.207	0.232		
					100	0	22.7	22.3				1
			20300	1745.0	1	99	23.7	23.5				1
					50	25	22.7	22.3				1
Edge 4	QPSK	10	20050	1720.0	1	99	23.7	23.6				1
					50	0	22.7	22.2				1
			20175	1732.5	1	99	23.7	23.6	0.405	0.414		
					50	25	22.7	22.2	0.313	0.351		
					100	0	22.7	22.3				1
			20300	1745.0	1	99	23.7	23.5				1
					50	25	22.7	22.3				1

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
   - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
   - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are ≥ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
   - Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
   - Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

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12.11. LTE Band 5 (10MHz Bandwidth)

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

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12.12. LTE Band 17 (10MHz Bandwidth)

12.12.1. Head Exposure Conditions

Test Position	Mode	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	QPSK	N/A	N/A								3
											3
		23790	710.0	1	49	23.7	23.6	0.144	0.147		
				25	12	22.7	22.5	0.112	0.117		
				50	0	22.7	22.4				1
		N/A	N/A								3
											3
Left Tilt (15°)	QPSK	N/A	N/A								3
											3
		23790	710.0	1	49	23.7	23.6	0.099	0.101		
				25	12	22.7	22.5	0.074	0.077		
				50	0	22.7	22.4				1
		N/A	N/A								3
											3
Right Touch	QPSK	N/A	N/A								3
											3
		23790	710.0	1	49	23.7	23.6	0.164	**0.168**	19	
				25	12	22.7	22.5	0.128	0.134		
				50	0	22.7	22.4				1
		N/A	N/A								3
											3
Right Tilt (15°)	QPSK	N/A	N/A								3
											3
		23790	710.0	1	49	23.7	23.6	0.106	0.108		
				25	12	22.7	22.5	0.080	0.084		
				50	0	22.7	22.4				1
		N/A	N/A								3
											3

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
   - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
   - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are ≥ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
   - Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
   - Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.
3. 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.

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12.12.2. Body-worn Accessory & Hotspot Exposure Conditions

Body-worn Accessory & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Rear	QPSK	10	N/A	N/A								3
												3
			23790	710.0	1	49	23.7	23.6	0.251	**0.257**	20	
					25	12	22.7	22.5	0.197	0.206		
					50	0	22.7	22.4				1
			N/A	N/A								3
												3
Front	QPSK	10	N/A	N/A								3
												3
			23790	710.0	1	49	23.7	23.6	0.186	0.190		
					25	12	22.7	22.5	0.144	0.151		
					50	0	22.7	22.4				1
			N/A	N/A								3
												3

Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Edge 2	QPSK	10	N/A	N/A								3
												3
			23790	710.0	1	49	23.7	23.6	0.278	0.284		
					25	12	22.7	22.5	0.205	0.215		
					50	0	22.7	22.4				1
			N/A	N/A								3
												3
Edge 3	QPSK	10	N/A	N/A								3
												3
			23790	710.0	1	49	23.7	23.6	0.071	0.073		
					25	12	22.7	22.5	0.056	0.059		
					50	0	22.7	22.4				1
			N/A	N/A								3
												3

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
   - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
   - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are ≥ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
   - Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
   - Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.
3. 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.

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12.13. LTE Band 25 (20MHz Bandwidth)

12.13.1. Head Exposure Conditions

Test Position	Mode	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	QPSK	26140	1860	1	0	23.7	23.6				1
				50	50	22.7	22.3				1
		26365	1882.5	1	59	23.7	23.7	0.626	**0.626**	21	
				50	50	22.7	22.4	0.492	0.527		
		26590	1905	1	0	23.7	23.5				1
				50	0	22.7	22.3				1
				100	0	22.7	22.4				1
Left Tilt (15°)	QPSK	26140	1860	1	0	23.7	23.6				1
				50	50	22.7	22.3				1
		26365	1882.5	1	59	23.7	23.7	0.362	0.362		
				50	50	22.7	22.4	0.266	0.285		
		26590	1905	1	0	23.7	23.5				1
				50	0	22.7	22.3				1
				100	0	22.7	22.4				1
Right Touch	QPSK	26140	1860	1	0	23.7	23.6				1
				50	50	22.7	22.3				1
		26365	1882.5	1	59	23.7	23.7	0.562	0.562		
				50	50	22.7	22.4	0.411	0.440		
		26590	1905	1	0	23.7	23.5				1
				50	0	22.7	22.3				1
				100	0	22.7	22.4				1
Right Tilt (15°)	QPSK	26140	1860	1	0	23.7	23.6				1
				50	50	22.7	22.3				1
		26365	1882.5	1	59	23.7	23.7	0.277	0.277		
				50	50	22.7	22.4	0.208	0.223		
		26590	1905	1	0	23.7	23.5				1
				50	0	22.7	22.3				1
				100	0	22.7	22.4				1

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
   - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
   - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are ≥ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
   - Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
   - Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

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12.13.2. Body-worn Accessory & Hotspot Exposure Conditions

Body-worn Accessory & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Rear	QPSK	10	26140	1860	1	0	23.7	23.6	0.795	0.814		
					50	50	22.7	22.3				1
			26365	1882.5	1	59	23.7	23.7	0.882	0.882		
					50	50	22.7	22.4	0.663	0.710		
			26590	1905	1	0	23.7	23.5	0.830	0.869		
					50	0	22.7	22.3				
					100	0	22.7	22.4				1
Front	QPSK	10	26140	1860	1	0	23.7	23.6	0.833	0.852		
					50	50	22.7	22.3				1
			26365	1882.5	1	59	23.7	23.7	0.899	0.899		
					50	50	22.7	22.4	0.672	0.720		
			26590	1905	1	0	23.7	23.5	0.875	**0.916**	22	
					50	0	22.7	22.3				
					100	0	22.7	22.4				1

Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Edge 3	QPSK	10	26140	1860	1	0	23.7	23.6				1
					50	50	22.7	22.3				1
			26365	1882.5	1	59	23.7	23.7	0.560	0.560		
					50	50	22.7	22.4	0.420	0.450		
			26590	1905	1	0	23.7	23.5				1
					50	0	22.7	22.3				
					100	0	22.7	22.4				1
Edge 4	QPSK	10	26140	1860	1	0	23.7	23.6				1
					50	50	22.7	22.3				1
			26365	1882.5	1	59	23.7	23.7	0.501	0.501		
					50	50	22.7	22.4	0.376	0.403		
			26590	1905	1	0	23.7	23.5				1
					50	0	22.7	22.3				
					100	0	22.7	22.4				1

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
   - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
   - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are ≥ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
   - Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
   - Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

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12.14. LTE Band 26 (10MHz Bandwidth)

12.14.1. Head Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	QPSK	0	26740	819.0	1	0	23.7	23.5				1
					25	0	22.7	22.5				1
					50	0	22.7	22.3				1
			26865	831.5	1	0	23.7	23.5	0.188	0.197		
					25	25	22.7	22.4	0.152	0.163		
			26990	844.0	1	0	23.7	23.5				1
					25	0	22.7	22.4				1
Left Tilt (15°)	QPSK	0	26740	819.0	1	0	23.7	23.5				1
					25	0	22.7	22.5				1
					50	0	22.7	22.3				1
			26865	831.5	1	0	23.7	23.5	0.136	0.142		
					25	25	22.7	22.4	0.109	0.117		
			26990	844.0	1	0	23.7	23.5				1
					25	0	22.7	22.4				1
Right Touch	QPSK	0	26740	819.0	1	0	23.7	23.5				1
					25	0	22.7	22.5				1
					50	0	22.7	22.3				1
			26865	831.5	1	0	23.7	23.5	0.226	**0.237**	23	
					25	25	22.7	22.4	0.183	0.196		
			26990	844.0	1	0	23.7	23.5				1
					25	0	22.7	22.4				1
Right Tilt (15°)	QPSK	0	26740	819.0	1	0	23.7	23.5				1
					25	0	22.7	22.5				1
					50	0	22.7	22.3				1
			26865	831.5	1	0	23.7	23.5	0.147	0.154		
					25	25	22.7	22.4	0.118	0.126		
			26990	844.0	1	0	23.7	23.5				1
					25	0	22.7	22.4				1

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
   - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
   - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are ≥ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
   - Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
   - Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

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12.14.2. Body-worn Accessory & Hotspot Exposure Conditions

Body-worn Accessory & Hotspot Exposure Conditions

Test Position	Mode	Pwr Back-off	Dist. (mm)	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
								Tune-up limit	Meas.	Meas.	Scaled		
Rear	QPSK	N/A	10	26740	819.0	1	0	23.7	23.5				1
						25	0	22.7	22.5				1
						50	0	22.7	22.3				1
				26865	831.5	1	0	23.7	23.5	0.324	0.339		
						25	25	22.7	22.4	0.258	0.276		
				26990	844.0	1	0	23.7	23.5				1
						25	0	22.7	22.4				1
Front	QPSK	N/A	10	26740	819.0	1	0	23.7	23.5				1
						25	0	22.7	22.5				1
						50	0	22.7	22.3				1
				26865	831.5	1	0	23.7	23.5	0.334	**0.350**	24	
						25	25	22.7	22.4	0.271	0.290		
				26990	844.0	1	0	23.7	23.5				1
						25	0	22.7	22.4				1

Hotspot Exposure Conditions

Test Position	Mode	Pwr Back-off	Dist. (mm)	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
								Tune-up limit	Meas.	Meas.	Scaled		
Edge 2	QPSK	N/A	10	26740	819.0	1	0	23.7	23.5				1
						25	0	22.7	22.5				1
						50	0	22.7	22.3				1
				26865	831.5	1	0	23.7	23.5	0.248	0.260		
						25	25	22.7	22.4	0.187	0.200		
				26990	844.0	1	0	23.7	23.5				1
						25	0	22.7	22.4				1
Edge 3	QPSK	N/A	10	26740	819.0	1	0	23.7	23.5				1
						25	0	22.7	22.5				1
						50	0	22.7	22.3				1
				26865	831.5	1	0	23.7	23.5	0.131	0.137		
						25	25	22.7	22.4	0.107	0.115		
				26990	844.0	1	0	23.7	23.5				1
						25	0	22.7	22.4				1

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
   - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
   - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are ≥ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
   - Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
   - Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

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12.15. LTE Band 41 (20MHz Bandwidth)

12.15.1. Head Exposure Conditions

Test Position	Mode	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	QPSK	39750	2506	1	0	21.7	21.5				1
				50	0	20.7	20.5				1
		40185	2549.5	1	99	21.7	21.6				1
				50	25	20.7	20.5				1
		40620	2593.0	1	99	21.7	21.5	0.236	**0.247**	25	
				50	0	20.7	20.6	0.189	0.193		
				100	0	20.7	20.6				1
		41055	2636.5	1	99	21.7	21.7				1
				50	50	20.7	20.6				1
		41490	2680.0	1	59	21.7	21.6				1
				50	0	20.7	20.5				1
Left Tilt (15°)	QPSK	39750	2506	1	0	21.7	21.5				1
				50	0	20.7	20.5				1
		40185	2549.5	1	99	21.7	21.6				1
				50	25	20.7	20.5				1
		40620	2593.0	1	99	21.7	21.5	0.057	0.060		
				50	0	20.7	20.6	0.040	0.041		
				100	0	20.7	20.6				1
		41055	2636.5	1	99	21.7	21.7				1
				50	50	20.7	20.6				1
		41490	2680.0	1	59	21.7	21.6				1
				50	0	20.7	20.5				1

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12.15.1. Head Exposure Conditions (continued)

Test Position	Mode	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
Right Touch	QPSK	39750	2506	1	0	21.7	21.5				1
				50	0	20.7	20.5				1
		40185	2549.5	1	99	21.7	21.6				1
				50	25	20.7	20.5				1
		40620	2593.0	1	99	21.7	21.5	0.112	0.117		
				50	0	20.7	20.6	0.099	0.101		
				100	0	20.7	20.6				1
		41055	2636.5	1	99	21.7	21.7				1
				50	50	20.7	20.6				1
		41490	2680.0	1	59	21.7	21.6				1
				50	0	20.7	20.5				1
Right Tilt (15°)	QPSK	39750	2506	1	0	21.7	21.5				1
				50	0	20.7	20.5				1
		40185	2549.5	1	99	21.7	21.6				1
				50	25	20.7	20.5				1
		40620	2593.0	1	99	21.7	21.5	0.099	0.104		
				50	0	20.7	20.6	0.088	0.090		
				100	0	20.7	20.6				1
		41055	2636.5	1	99	21.7	21.7				1
				50	50	20.7	20.6				1
		41490	2680.0	1	59	21.7	21.6				1
				50	0	20.7	20.5				1

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
   - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
   - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are ≥ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
   - Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
   - Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

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12.15.2. Body-worn Accessory & Hotspot Exposure Conditions

Body-worn Accessory & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Rear	QPSK	10	39750	2506	1	0	21.7	21.5				1
					50	0	20.7	20.5				1
			40185	2549.5	1	99	21.7	21.6				1
					50	25	20.7	20.5				1
			40620	2593.0	1	99	21.7	21.5	0.232	**0.243**	26	
					50	0	20.7	20.6	0.204	0.209		
					100	0	20.7	20.6				1
			41055	2636.5	1	99	21.7	21.7				1
					50	50	20.7	20.6				1
			41490	2680.0	1	59	21.7	21.6				1
					50	0	20.7	20.5				1
Front	QPSK	10	39750	2506	1	0	21.7	21.5				1
					50	0	20.7	20.5				1
			40185	2549.5	1	99	21.7	21.6				1
					50	25	20.7	20.5				1
			40620	2593.0	1	99	21.7	21.5	0.199	0.208		
					50	0	20.7	20.6	0.158	0.162		
					100	0	20.7	20.6				1
			41055	2636.5	1	99	21.7	21.7				1
					50	50	20.7	20.6				1
			41490	2680.0	1	59	21.7	21.6				1
					50	0	20.7	20.5				1

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
   - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
   - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are ≥ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
   - Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
   - Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

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Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
							Tune-up limit	Meas.	Meas.	Scaled		
Edge 2	QPSK	10	39750	2506	1	0	21.7	21.5				1
					50	0	20.7	20.5				1
			40185	2549.5	1	99	21.7	21.6				1
					50	25	20.7	20.5				1
			40620	2593.0	1	99	21.7	21.5	0.048	0.050		
					50	0	20.7	20.6	0.040	0.041		
					100	0	20.7	20.6				1
			41055	2636.5	1	99	21.7	21.7				1
					50	50	20.7	20.6				1
			41490	2680.0	1	59	21.7	21.6				1
					50	0	20.7	20.5				1
Edge 3	QPSK	10	39750	2506	1	0	21.7	21.5				1
					50	0	20.7	20.5				1
			40185	2549.5	1	99	21.7	21.6				1
					50	25	20.7	20.5				1
			40620	2593.0	1	99	21.7	21.5	0.235	**0.246**	27	
					50	0	20.7	20.6	0.221	0.226		
					100	0	20.7	20.6				1
			41055	2636.5	1	99	21.7	21.7				1
					50	50	20.7	20.6				1
			41490	2680.0	1	59	21.7	21.6				1
					50	0	20.7	20.5				1
Edge 4	QPSK	10	39750	2506	1	0	21.7	21.5				1
					50	0	20.7	20.5				1
			40185	2549.5	1	99	21.7	21.6				1
					50	25	20.7	20.5				1
			40620	2593.0	1	99	21.7	21.5	0.115	0.120		
					50	0	20.7	20.6	0.102	0.104		
					100	0	20.7	20.6				1
			41055	2636.5	1	99	21.7	21.7				1
					50	50	20.7	20.6				1
			41490	2680.0	1	59	21.7	21.6				1
					50	0	20.7	20.5				1

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction is applied using the following criteria:
   - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
   - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are ≥ 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
   - Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
   - Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

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12.16. Wi-Fi (DTS Band)

12.16.1. Head Exposure Conditions

Band	Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
2.4GHz	Left Touch	802.11b	1	2412	16.5	15.0				1
			6	2437	16.5	15.7	0.452	**0.543**	28	
			11	2462	16.5	15.4				1
	Left Tilt (15°)	802.11b	1	2412	16.5	15.0				1
			6	2437	16.5	15.7	0.290	0.349		
			11	2462	16.5	15.4				1
	Right Touch	802.11b	1	2412	16.5	15.0				1
			6	2437	16.5	15.7	0.126	0.151		
			11	2462	16.5	15.4				1
	Right Tilt (15°)	802.11b	1	2412	16.5	15.0				1
			6	2437	16.5	15.7	0.107	0.129		
			11	2462	16.5	15.4				1
5.8GHz	Left Touch	802.11a	149	5745	12.0	10.0				1
			161	5805	12.0	10.0	0.030	0.048		
			165	5825	12.0	9.5				1
	Left Tilt (15°)	802.11a	149	5745	12.0	10.0				1
			161	5805	12.0	10.0	0.024	0.038		
			165	5825	12.0	9.5				1
	Right Touch	802.11a	149	5745	12.0	10.0				1
			161	5805	12.0	10.0	0.023	0.036		
			165	5825	12.0	9.5				1
	Right Tilt (15°)	802.11a	149	5745	12.0	10.0				1
			161	5805	12.0	10.0	0.022	0.035		
			165	5825	12.0	9.5				1

12.16.2. Body-worn Accessory & Hotspot Exposure Conditions

Body-worn Accessory & Hotspot Exposure Conditions

Band	Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
2.4 GHz	Rear	802.11b	10	1	2412	16.5	15.0				1
				6	2437	16.5	15.7	0.142	**0.171**	29	
				11	2462	16.5	15.4				1
	Front	802.11b	10	1	2412	16.5	15.0				1
				6	2437	16.5	15.7	0.078	0.094		
				11	2462	16.5	15.4				1
5.8 GHz	Rear	802.11a	10	149	5745	12.0	10.0				1
				161	5805	12.0	10.0	0.045	**0.071**	30	
				165	5825	12.0	9.5				1
	Front	802.11a	10	149	5745	12.0	10.0				1
				161	5805	12.0	10.0	0.002	0.003		
				165	5825	12.0	9.5				1

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Hotspot Exposure Conditions

Band	Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
2.4 GHz	Edge 1	802.11b	10	1	2412	16.5	15.0				1
				6	2437	16.5	15.7	0.039	0.047		
				11	2462	16.5	15.4				1
	Edge 2	802.11b	10	1	2412	16.5	15.0				1
				6	2437	16.5	15.7	0.122	0.147		
				11	2462	16.5	15.4				1

WiFi Direct (Group Owner) Exposure Conditions

Band	Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
						Tune-up limit	Meas.	Meas.	Scaled		
5.8 GHz	Edge 1	802.11a	10	149	5745	12.0	10.0				1
				161	5805	12.0	10.0	0.002	0.003		
				165	5825	12.0	9.5				1
	Edge 2	802.11a	10	149	5745	12.0	10.0				1
				161	5805	12.0	10.0	0.037	0.059		
				165	5825	12.0	9.5				1

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. Apply usual 802.11 test exclusion considerations, but include 802.11ac SAR for highest 802.11a configuration in each frequency band and each exposure condition according to April 2013 TCB Workshop Updates.

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12.16.3. Additional Testing in 802.11ac Mode for Highest 802.11b

Test exclusion considerations for 802.11ac mode:

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

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

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	802.11ac (HT 20)	0	6	2437	10.5	10.4	0.128	0.131		
Rear	802.11ac (HT 20)	10	6	2437	10.5	10.4	0.03	0.031		
Left Touch	802.11ac (HT20)	0	161	5805	10.5	9.3	0.024	0.032		
Rear	802.11ac (HT 20)	10	161	5805	10.5	9.3	0.026	0.034		

Note(s):

1. 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

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12.17. Wi-Fi (UNII Band)

12.17.1. Head Exposure Conditions

Band	Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
5.2GHz	Left Touch	802.11a	40	5200	12.0	10.6				1
			48	5240	12.0	11.0	0.149	**0.188**	31	
	Left Tilt (15°)	802.11a	40	5200	12.0	10.6				1
			48	5240	12.0	11.0	0.091	0.115		
	Right Touch	802.11a	40	5200	12.0	10.6				1
			48	5240	12.0	11.0	0.057	0.072		
	Right Tilt (15°)	802.11a	40	5200	12.0	10.6				1
			48	5240	12.0	11.0	0.048	0.060		
5.3GHz	Left Touch	802.11a	56	5280	12.0	11.6				1
			64	5320	12.0	11.6	0.160	0.175		
	Left Tilt (15°)	802.11a	56	5280	12.0	11.6				1
			64	5320	12.0	11.6	0.109	0.120		
	Right Touch	802.11a	56	5280	12.0	11.6				1
			64	5320	12.0	11.6	0.061	0.067		
	Right Tilt (15°)	802.11a	56	5280	12.0	11.6				1
			64	5320	12.0	11.6	0.045	0.049		
5.5GHz	Left Touch	802.11a	104	5520	12.0	10.9				1
			112	5560	12.0	10.9	0.042	0.054		
			124	Not supported						
			136	5680	12.0	10.6				1
	Left Tilt (15°)	802.11a	104	5520	12.0	10.9				1
			112	5560	12.0	10.9	0.035	0.045		
			124	Not supported						
			136	5680	12.0	10.6				1
	Right Touch	802.11a	104	5520	12.0	10.9				1
			112	5560	12.0	10.9	0.032	0.041		
			124	Not supported						
			136	5680	12.0	10.6				1
	Right Tilt (15°)	802.11a	104	5520	12.0	10.9				1
			112	5560	12.0	10.9	0.028	0.036		
			124	Not supported						
			136	5680	12.0	10.6				1

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12.17.2. Body-worn Accessory Exposure Conditions

Band	Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note(s)
						Tune-up limit	Meas.	Meas.	Scaled		
5.2	Rear	802.11a	10	40	5200	12.0	10.6				1
				48	5240	12.0	11.0	0.135	0.170		
	Front	802.11a	10	40	5200	12.0	10.6				1
				48	5240	12.0	11.0	0.007	0.009		
5.3	Rear	802.11a	10	56	5280	12.0	11.6				1
				64	5320	12.0	11.6	0.160	**0.175**	32	
	Front	802.11a	10	56	5280	12.0	11.6				1
				64	5320	12.0	11.6	0.039	0.043		
5.5	Rear	802.11a	10	104	5520	12.0	10.9				1
				112	5560	12.0	10.9	0.044	0.057		
				124	Not supported						
				136	5680	12.0	10.6				1
	Front	802.11a	10	104	5520	12.0	10.9				1
				112	5560	12.0	10.9	0.012	0.015		
				124	Not supported						
				136	5680	12.0	10.6				1

Note(s):

1. Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
2. Apply usual 802.11 test exclusion considerations, but include 802.11ac SAR for highest 802.11a configuration in each frequency band and each exposure condition according to April 2013 TCB Workshop Updates.

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12.17.3. Additional Testing in 802.11ac Mode for Highest 802.11a

Test exclusion considerations for 802.11ac mode:

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

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

Head Exposure

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Left Touch	802.11ac (HT 20)	0	48	5240	10.5	9.8	0.108	0.127		
Left Touch	802.11ac (HT 20)	0	64	5320	10.5	10.1	0.118	0.129		
Left Touch	802.11ac (HT20)	0	112	5560	10.5	10.1	0.035	0.038		

Body-worn Accessory & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	802.11ac (HT 20)	10	48	5240	10.5	9.8	0.109	0.128		
Rear	802.11ac (HT 20)	10	64	5320	10.5	10.1	0.119	0.130		
Rear	802.11ac (HT 20)	10	112	5560	10.5	10.1	0.043	0.047		

Note(s):

1. 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

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12.18. Bluetooth

Body-worn Accessory & Hotspot Exposure Conditions

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note
					Tune-up limit	Meas.	Meas.	Scaled		
Rear	GFSK	10	0	2402	10.0	8.3				1
			39	2441	10.0	9.9	0.017	0.017		
			78	2480	10.0	7.6				1
Front	GFSK	10	0	2402	10.0	8.3				1
			39	2441	10.0	9.9	0.008	0.009		
			78	2480	10.0	7.6				1

Note(s):

1. 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

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13. SAR Measurement Variability

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01r01. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

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

13.1. The Highest Measured SAR Configuration in Each Frequency Band

Frequency Band (MHz)	Air Interface	Head (W/kg)	Body-worn Accessory (W/kg)	Hotspot/WiFi Direct (W/kg)
850	GSM 850	0.479	0.631	0.631
	CDMA BC0	0.423	0.504	0.504
	CDMA BC10	0.308	0.492	0.492
	WCDMA Band V	0.353	0.391	0.391
	LTE Band 5	----	----	----
	LTE Band 26	0.222	0.329	0.329
1900	GSM 1900	0.622	0.681	0.681
	CDMA BC1	**0.956**	**1.030**	**1.030**
	WCDMA Band II	0.779	0.936	0.936
	LTE Band 2	----	----	----
	LTE Band 25	0.626	0.899	0.899
1750	LTE Band 4	0.502	0.728	0.728
	WCDMA Band IV	0.700	**0.969**	**0.969**
750	LTE Band 17	0.164	0.251	0.251
2400	WiFi 802.11b/g/n/ac	0.452	0.142	0.142
2600	LTE Band 41	0.236	0.232	0.235
5000	WiFi 802.11a/n/ac	0.160	0.160	0.045

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13.2. Repeated Measurement Results

Head Exposure Condition

Frequency band	Test Position	Mode	Ch #.	Freq. (MHz)	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio	Note
					Original	Repeated		
CDMA BC1	Left Touch	1xEVDO (Rel. 0)	1175	1908.8	0.956	0.955	1.00	1

Body-worn Accessory Exposure Condition & Hotspot Mode Exposure Conditions

Frequency band	Test Position	Mode	Ch #.	Freq. (MHz)	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio	Note
					Original	Repeated		
CDMA BC1	Rear	1xEVDO (Rel. 0)	25	1851.3	1.030	1.020	1.01	1

Body-worn Accessory Exposure Condition & Hotspot Mode Exposure Conditions

Frequency band	Test Position	Mode	Ch #.	Freq. (MHz)	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio	Note
					Original	Repeated		
WCDMA Band IV	Rear	Rel. 99 RMC 12.2 kbps	1312	1712.4	0.969	0.926	1.05	1

Note(s):

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

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14. Simultaneous Transmission SAR Analysis

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

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

Where:

SAR_1 is the highest measured or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

SAR_2 is the highest measured or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

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

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

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

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14.1. Sum of the SAR for GSM850, WiFi, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		GSM 850	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.437	0.543			0.980	No
		0.437		0.188		0.625	No
	Left Tilt	0.304	0.349			0.653	No
		0.304		0.120		0.424	No
	Right Touch	0.513	0.151			0.664	No
		0.513		0.072		0.585	No
	Right Tilt	0.342	0.129			0.471	No
		0.342		0.060		0.402	No
Body-worn Accessory & Hotspot	Rear	0.676	0.171			0.847	No
		0.676		0.175		0.851	No
		0.676			0.017	0.693	No
	Front	0.660	0.094			0.754	No
		0.660		0.043		0.703	No
		0.660			0.009	0.669	No
Hotspot	Edge 1		0.047			0.047	No
	Edge 2	0.534	0.147			0.681	No
	Edge 3	0.251				0.251	No
	Edge 4						

SAR to Peak Location Separation Ratio (SPLSR)
As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.2. Sum of the SAR for GSM1900, WiFi, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		GSM 850	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.666	0.543			1.209	No
		0.666		0.188		0.854	No
	Left Tilt	0.294	0.349			0.643	No
		0.294		0.120		0.414	No
	Right Touch	0.588	0.151			0.739	No
		0.588		0.072		0.660	No
	Right Tilt	0.229	0.129			0.358	No
		0.229		0.060		0.289	No
Body-worn Accessory & Hotspot	Rear	0.726	0.171			0.897	No
		0.726		0.175		0.901	No
		0.726			0.017	0.743	No
	Front	0.730	0.094			0.824	No
		0.730		0.043		0.773	No
		0.730			0.009	0.739	No
Hotspot	Edge 1		0.047			0.047	No
	Edge 2		0.147			0.147	No
	Edge 3	0.432				0.432	No
	Edge 4	0.445				0.445	No

SAR to Peak Location Separation Ratio (SPLSR)
As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

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14.3. Sum of the SAR for WCDMA Band V, WiFi, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		WCDMA Band V	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.286	0.543			0.829	No
		0.286		0.188		0.474	No
	Left Tilt	0.187	0.349			0.536	No
		0.187		0.120		0.307	No
	Right Touch	0.353	0.151			0.504	No
		0.353		0.072		0.425	No
	Right Tilt	0.215	0.129			0.344	No
		0.215		0.060		0.275	No
Body-worn Accessory & Hotspot	Rear	0.323	0.171			0.494	No
		0.323		0.175		0.498	No
		0.323			0.017	0.340	No
	Front	0.391	0.094			0.485	No
		0.391		0.043		0.434	No
		0.391			0.009	0.400	No
Hotspot	Edge 1		0.047			0.047	No
	Edge 2	0.293	0.147			0.440	No
	Edge 3	0.190				0.190	No
	Edge 4						

SAR to Peak Location Separation Ratio (SPLSR)
As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.4. Sum of the SAR for WCDMA Band IV, WiFi, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		WCDMA Band IV	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.700	0.543			1.243	No
		0.700		0.188		0.888	No
	Left Tilt	0.367	0.349			0.716	No
		0.367		0.120		0.487	No
	Right Touch	0.611	0.151			0.762	No
		0.611		0.072		0.683	No
	Right Tilt	0.271	0.129			0.400	No
		0.271		0.060		0.331	No
Body-worn Accessory & Hotspot	Rear	0.969	0.171			1.140	No
		0.969		0.175		1.144	No
		0.969			0.017	0.986	No
	Front	0.936	0.094			1.030	No
		0.936		0.043		0.979	No
		0.936			0.009	0.945	No
Hotspot	Edge 1		0.047			0.047	No
	Edge 2		0.147			0.147	No
	Edge 3	0.422				0.422	No
	Edge 4	0.502				0.502	No

SAR to Peak Location Separation Ratio (SPLSR)
As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

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14.5. Sum of the SAR for WCDMA Band II, WiFi, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		WCDMA Band II	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.779	0.543			1.322	No
		0.779		0.188		0.967	No
	Left Tilt	0.328	0.349			0.677	No
		0.328		0.120		0.448	No
	Right Touch	0.718	0.151			0.869	No
		0.718		0.072		0.790	No
	Right Tilt	0.245	0.129			0.374	No
		0.245		0.060		0.305	No
Body-worn Accessory & Hotspot	Rear	0.936	0.171			1.107	No
		0.936		0.175		1.111	No
		0.936			0.017	0.953	No
	Front	0.932	0.094			1.026	No
		0.932		0.043		0.975	No
		0.932			0.009	0.941	No
Hotspot	Edge 1		0.047			0.047	No
	Edge 2		0.147			0.147	No
	Edge 3	0.646				0.646	No
	Edge 4	0.623				0.623	No

SAR to Peak Location Separation Ratio (SPLSR)
As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.6. Sum of the SAR for CDMA BC0, WiFi, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		CDMA BC0	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.350	0.543			0.893	No
		0.350		0.188		0.538	No
	Left Tilt	0.250	0.349			0.599	No
		0.250		0.120		0.370	No
	Right Touch	0.443	0.151			0.594	No
		0.443		0.072		0.515	No
	Right Tilt	0.283	0.129			0.412	No
		0.283		0.060		0.343	No
Body-worn Accessory & Hotspot	Rear	0.442	0.171			0.613	No
		0.442		0.175		0.617	No
		0.442			0.017	0.459	No
	Front	0.528	0.094			0.622	No
		0.528		0.043		0.571	No
		0.528			0.009	0.537	No
Hotspot	Edge 1		0.047			0.047	No
	Edge 2	0.352	0.147			0.499	No
	Edge 3	0.257				0.257	No
	Edge 4						

SAR to Peak Location Separation Ratio (SPLSR)
As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

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14.7. Sum of the SAR for CDMA BC1, WiFi, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		CDMA BC1	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.956	0.543			1.499	No
		0.956		0.188		1.144	No
	Left Tilt	0.405	0.349			0.754	No
		0.405		0.120		0.525	No
	Right Touch	0.755	0.151			0.906	No
		0.755		0.072		0.827	No
	Right Tilt	0.275	0.129			0.404	No
		0.275		0.060		0.335	No
Body-worn Accessory & Hotspot	Rear	1.013	0.171			1.184	No
		1.013		0.175		1.188	No
		1.013			0.017	1.030	No
	Front	1.054	0.094			1.148	No
		1.054		0.043		1.097	No
		1.054			0.009	1.063	No
Hotspot	Edge 1		0.047			0.047	No
	Edge 2		0.147			0.147	No
	Edge 3	0.736				0.736	No
	Edge 4	0.684				0.684	No

SAR to Peak Location Separation Ratio (SPLSR)
As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.8. Sum of the SAR for CDMA BC10, WiFi, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		CDMA BC10	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.275	0.543			0.818	No
		0.275		0.188		0.463	No
	Left Tilt	0.240	0.349			0.589	No
		0.240		0.120		0.360	No
	Right Touch	0.330	0.151			0.481	No
		0.330		0.072		0.402	No
	Right Tilt	0.210	0.129			0.339	No
		0.210		0.060		0.270	No
Body-worn Accessory & Hotspot	Rear	0.473	0.171			0.644	No
		0.473		0.175		0.648	No
		0.473			0.017	0.490	No
	Front	0.527	0.094			0.621	No
		0.527		0.043		0.570	No
		0.527			0.009	0.536	No
Hotspot	Edge 1		0.047			0.047	No
	Edge 2	0.315	0.147			0.462	No
	Edge 3	0.216				0.216	No
	Edge 4						

SAR to Peak Location Separation Ratio (SPLSR)
As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

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14.9. Sum of the SAR for LTE Band 2, WiFi, & BT

Covered by LTE Band 25 (refer to Section 14.13.) due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

14.10. Sum of the SAR for LTE Band 4, WiFi, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 4	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.514	0.543			1.057	No
		0.514		0.188		0.702	No
	Left Tilt	0.266	0.349			0.615	No
		0.266		0.120		0.386	No
	Right Touch	0.399	0.151			0.550	No
		0.399		0.072		0.471	No
	Right Tilt	0.179	0.129			0.308	No
		0.179		0.060		0.239	No
Body-worn Accessory & Hotspot	Rear	0.736	0.171			0.907	No
		0.736		0.175		0.911	No
		0.736			0.017	0.753	No
	Front	0.745	0.094			0.839	No
		0.745		0.043		0.788	No
		0.745			0.009	0.754	No
Hotspot	Edge 1		0.047			0.047	No
	Edge 2		0.147			0.147	No
	Edge 3	0.287				0.287	No
	Edge 4	0.414				0.414	No

SAR to Peak Location Separation Ratio (SPLSR)

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

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14.11. Sum of the SAR for LTE Band 5, WiFi, & BT

Covered by LTE Band 26 (refer to Section 14.14.) due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

14.12. Sum of the SAR for LTE Band 17, WiFi, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 17	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.147	0.543			0.690	No
		0.147		0.188		0.335	No
	Left Tilt	0.101	0.349			0.450	No
		0.101		0.120		0.221	No
	Right Touch	0.168	0.151			0.319	No
		0.168		0.072		0.240	No
	Right Tilt	0.108	0.129			0.237	No
		0.108		0.060		0.168	No
Body-worn Accessory & Hotspot	Rear	0.257	0.171			0.428	No
		0.257		0.175		0.432	No
		0.257			0.017	0.274	No
	Front	0.190	0.094			0.284	No
		0.190		0.043		0.233	No
		0.190			0.009	0.199	No
Hotspot	Edge 1		0.047			0.047	No
	Edge 2	0.284	0.147			0.431	No
	Edge 3	0.073				0.073	No
	Edge 4						

SAR to Peak Location Separation Ratio (SPLSR)

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

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14.13. Sum of the SAR for LTE Band 25, WiFi, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 25	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.626	0.543			1.169	No
		0.626		0.188		0.814	No
	Left Tilt	0.362	0.349			0.711	No
		0.362		0.120		0.482	No
	Right Touch	0.562	0.151			0.713	No
		0.562		0.072		0.634	No
	Right Tilt	0.277	0.129			0.406	No
		0.277		0.060		0.337	No
Body-worn Accessory & Hotspot	Rear	0.882	0.171			1.053	No
		0.882		0.175		1.057	No
		0.882			0.017	0.899	No
	Front	0.916	0.094			1.010	No
		0.916		0.043		0.959	No
		0.916			0.009	0.925	No
Hotspot	Edge 1		0.047			0.047	No
	Edge 2		0.147			0.147	No
	Edge 3	0.560				0.560	No
	Edge 4	0.501				0.501	No

SAR to Peak Location Separation Ratio (SPLSR)
As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

14.14. Sum of the SAR for LTE Band 26, WiFi, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 26	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.194	0.543			0.737	No
		0.194		0.188		0.382	No
	Left Tilt	0.140	0.349			0.489	No
		0.140		0.120		0.260	No
	Right Touch	0.232	0.151			0.383	No
		0.232		0.072		0.304	No
	Right Tilt	0.152	0.129			0.281	No
		0.152		0.060		0.212	No
Body-worn Accessory & Hotspot	Rear	0.334	0.171			0.505	No
		0.334		0.175		0.509	No
		0.334			0.017	0.351	No
	Front	0.345	0.094			0.439	No
		0.345		0.043		0.388	No
		0.345			0.009	0.354	No
Hotspot	Edge 1		0.047			0.047	No
	Edge 2	0.255	0.147			0.402	No
	Edge 3	0.135				0.135	No
	Edge 4						

SAR to Peak Location Separation Ratio (SPLSR)
As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

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14.15. Sum of the SAR for LTE Band 41, WiFi, & BT

RF Exposure conditions	Test Position	Simultaneous Transmission Scenario				∑ 1-g SAR (mW/g)	SPLSR (Yes/ No)
		LTE Band 41	WiFi DTS Band	WiFi UNII Band	Bluetooth		
Head	Left Touch	0.247	0.543			0.790	No
		0.247		0.188		0.435	No
	Left Tilt	0.060	0.349			0.409	No
		0.060		0.120		0.180	No
	Right Touch	0.117	0.151			0.268	No
		0.117		0.072		0.189	No
	Right Tilt	0.104	0.129			0.233	No
		0.104		0.060		0.164	No
Body-worn Accessory & Hotspot	Rear	0.243	0.171			0.414	No
		0.243		0.175		0.418	No
		0.243			0.017	0.260	No
	Front	0.208	0.094			0.302	No
		0.208		0.043		0.251	No
		0.208			0.009	0.217	No
Hotspot	Edge 1		0.047			0.047	No
	Edge 2	0.050	0.147			0.197	No
	Edge 3	0.246				0.246	No
	Edge 4	0.120				0.120	No

SAR to Peak Location Separation Ratio (SPLSR)

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

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg.

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15. Appendixes

Refer to separated files for the following appendixes.

15.1. System Performance Check Plots

15.2. Highest SAR Test Plots

15.3. Calibration Certificate for E-Field Probe EX3DV4 - SN 3686

15.4. Calibration Certificate for E-Field Probe EX3DV4 - SN 3929

15.5. Calibration Certificate for D750V3 - SN 1071

15.6. Calibration Certificate for D835V2 - SN 4d002

15.7. Calibration Certificate for D1750V2 - SN 1050

15.8. Calibration Certificate for D1900V2- SN 5d043

15.9. Calibration Certificate for D1900V2- SN 5d163

15.10. Calibration Certificate for D2450V2 - SN 899

15.11. Calibration Certificate for D2600V2 – SN 1006

15.12. Calibration Certificate for D5GHzV2 - SN 1003

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