



SAR EVALUATION REPORT

**FCC 47 CFR § 2.1093
IEEE Std 1528-2013**

For
GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac & NFC

FCC ID: PY7-PM0944

**Report Number: 16J22997-S4V2
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Revision History

Rev.	Date	Revisions	Revised By
V1	4/20/2016	Initial Issue	--
V2	4/25/2016	Appendix A: Removed Antenna diagram. Sec. 6.4 and 7: Updated note concerning about the Antenna Diagram.	Jose Abadilla

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1. Attestation of Test Results

Applicant Name	SONY MOBILE COMMUNICATIONS INC.			
FCC ID	PY7-PM0944			
Applicable Standards	FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013			
Exposure Category	SAR Limits (W/Kg)			
	Peak spatial-average(1g of tissue)		Extremities (hands, wrists, ankles, etc.) (10g of tissue)	
General population / Uncontrolled exposure	1.6		4	
RF Exposure Conditions	Equipment Class - Highest Reported SAR (W/kg)			
	PCE	DTS	NII	DSS
Head	0.579	0.344	0.510	N/A
Body-worn	0.669	0.023	0.020	
Hotspot/Wi-Fi Direct	0.422	0.098	N/A	
Simultaneous TX	1.380	1.380	1.380	
Date Tested	3/21/2016 to 3/31/2016			
Test Results	Pass			
<p>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.</p> <p>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.</p>				
Approved & Released By:		Prepared By:		
				
Devin Chang Senior Engineer UL Verification Services Inc.		Jose Abadilla Laboratory Technician UL Verification Services Inc.		

2. Test Specification, Methods and Procedures

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

- 248227 D01 802.11 Wi-Fi SAR v02r02
- 447498 D01 General RF Exposure Guidance v06
- 447498 D03 Supplement C Cross-Reference v01
- 648474 D04 Handset SAR v01r03
- 690783 D01 SAR Listings on Grants v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02
- 941225 D01 3G SAR Procedures v03r01
- 941225 D05 SAR for LTE Devices v02r05
- 941225 D05A LTE Rel.10 KDB Inquiry Sheet v01r02
- 941225 D06 Hotspot Mode v02r01

In addition to the above, the following information was used:

- [TCB workshop](#) October, 2014; Page 36, RF Exposure Procedures Update (Overlapping LTE Bands) and Page 37, Other LTE Considerations (LTE Band 41 Test Channels)

3. Facilities and Accreditation

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

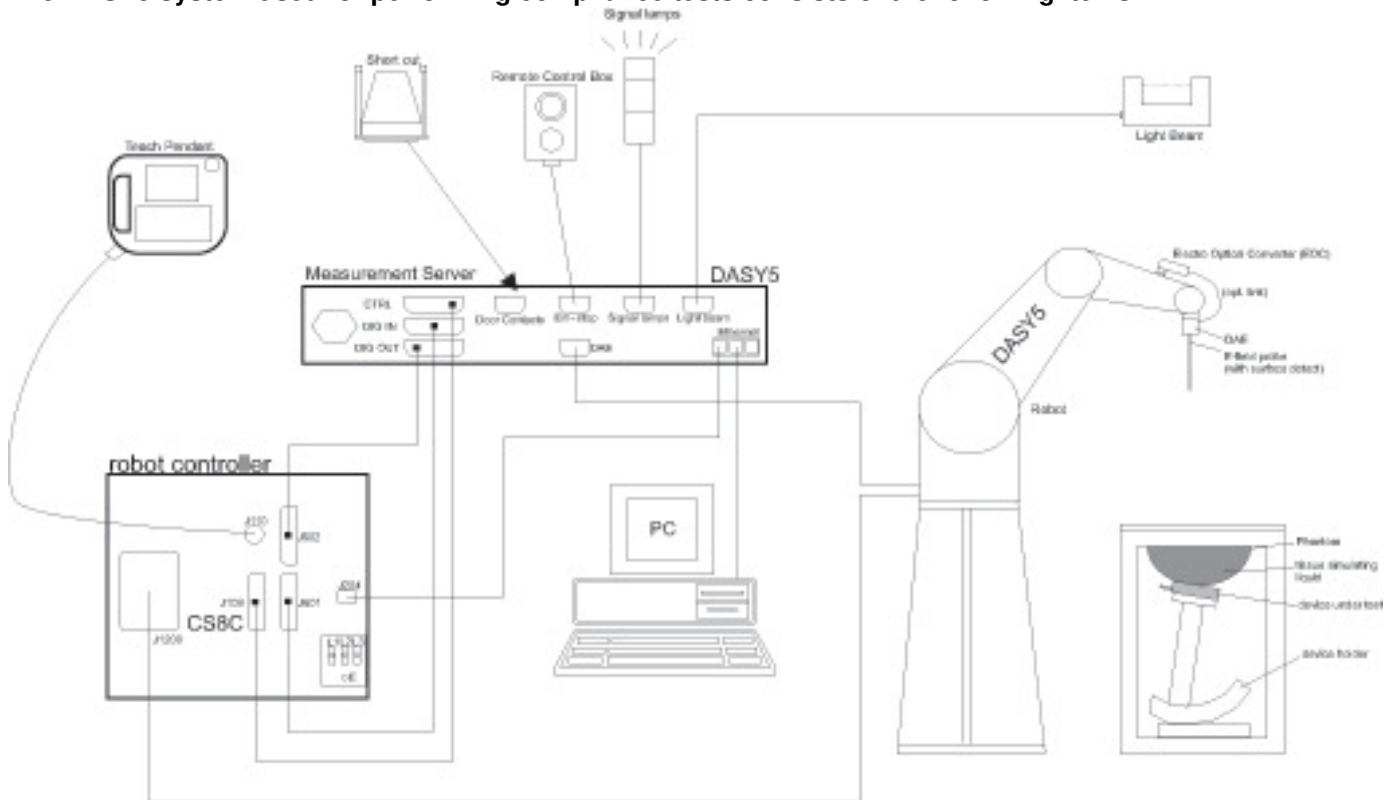
47173 Benicia Street	47266 Benicia Street
SAR Lab A	SAR Lab 1
SAR Lab B	SAR Lab 2
SAR Lab C	SAR Lab 3
SAR Lab D	SAR Lab 4
SAR Lab E	
SAR Lab F	
SAR Lab G	
SAR Lab H	

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

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

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



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

4.2. SAR Scan Procedures

Step 1: Power Reference Measurement

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

Step 2: Area Scan

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

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

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

Step 3: Zoom Scan

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

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

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

Step 4: Power drift measurement

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

Step 5: Z-Scan (FCC only)

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

4.3. Test Equipment

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

Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	Agilent	8753ES	MY40000980	4/17/2016
Dielectric Probe kit	SPEAG	DAK-3.5	1082	9/15/2016
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	Traceable Calibration Control Co.	4242	140562250	8/24/2016

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Synthesized Signal Generator	HP	8665B	3744A01084	5/8/2016
Power Meter	Keysight Technologies	N1912A	MY55196004	7/1/2016
Power Meter	Agilent	N1912A	MY50001018	10/19/2016
Power Sensor	Agilent	N1912A	MY52270022	12/17/2016
Power Sensor	Agilent	N1912A	MY52260009	12/18/2016
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1795093	N/A
Directional coupler	Werlatone	C8060-102	2149	N/A
DC Power Supply	AMETEK	XT 15-4	1319A02778	N/A
Synthesized Signal Generator	HP	8665B	3438A00633	9/4/2016
Power Meter	HP	437B	3125U16345	6/15/2016
Power Meter	HP	437B	3125U12345	7/31/2016
Power Sensor	HP	8481A	2702A76223	9/3/2016
Power Sensor	HP	8481A	1926A27048	8/3/2016
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1795092	N/A
Directional coupler	Werlatone	C8060-102	2141	N/A
DC Power Supply	BK PRECISION	1611	215-02292	N/A
E-Field Probe (SAR Lab D)	SPEAG	EX3DV4	3885	9/18/2016
E-Field Probe (SAR Lab E)	SPEAG	EX3DV4	3902	5/19/2016
E-Field Probe (SAR Lab F)	SPEAG	EX3DV4	3749	1/26/2017
E-Field Probe (SAR Lab G)	SPEAG	EX3DV4	3936	7/21/2016
E-Field Probe (SAR Lab H)	SPEAG	EX3DV4	3989	2/23/2017
Data Acquisition Electronics (SAR Lab D)	SPEAG	DAE4	1239	4/16/2016
Data Acquisition Electronics (SAR Lab E)	SPEAG	DAE4	1439	7/30/2016
Data Acquisition Electronics (SAR Lab F)	SPEAG	DAE4	1352	11/11/2016
Data Acquisition Electronics (SAR Lab G)	SPEAG	DAE4	1359	2/19/2017
Data Acquisition Electronics (SAR Lab H)	SPEAG	DAE4	1357	2/19/2017
System Validation Dipole	SPEAG	D750V3	1071	11/12/2016
System Validation Dipole	SPEAG	D835V2	4d002	11/12/2016
System Validation Dipole	SPEAG	D835V2	4d142	11/12/2016
System Validation Dipole	SPEAG	D1750V2	1053	3/24/2017
System Validation Dipole	SPEAG	D1900V2	5d043	11/17/2016
System Validation Dipole	SPEAG	D2450V2	748	2/22/2017
System Validation Dipole	SPEAG	D2600V2	1006	9/21/2016
System Validation Dipole	SPEAG	D5GHzV2	1168	11/13/2016

Other

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Power Meter	Agilent	N1912A	MY55196004	7/16/2016
Power Sensor	Agilent	N1921A	MY53260001	9/24/2016
Base Station Simulator	Agilent	8960	MY53211024	9/16/2016
Base Station Simulator	R & S	CMW500	134853	6/30/2016
Base Station Simulator	R & S	CMW500	137877	8/10/2016
Base Station Simulator	R & S	CMW500	125236	2/11/2017

5. Measurement Uncertainty

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

6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	Overall (Length x Width): 143.5 mm x 70.3 mm Overall Diagonal: 155 mm Display Diagonal: 126 mm		
Back Cover	<input checked="" type="checkbox"/> The rechargeable battery is not user accessible.		
Battery Options	<input checked="" type="checkbox"/> The rechargeable battery is not user accessible.		
Accessory	Headset		
Wireless Router (Hotspot)	Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices. <input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 2.4 GHz) <input type="checkbox"/> Mobile Hotspot (Wi-Fi 5 GHz)		
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 2.4 GHz) <input type="checkbox"/> Wi-Fi Direct (Wi-Fi 5 GHz)		
Test sample information	S/N	IMEI	Notes
	CB5129MBM	004402455865943	SAR - GSM/UMTS Power
	CB5129YMAJ	004402455865935	SAR - GSM/UMTS Power
	CB5129YMM3	00440255865786	SAR - GSM/UMTS Power
	CB5129YM70	004402455865588	SAR - LTE Power
	CB5129YMAP	004402455865919	SAR - LTE Power
	CB5129YMB6	004402455865885	SAR - WLAN Power
	CB5129YMM4	004402455865901	SAR - WLAN Power
	CB5129Z0TQ	004402456069560	SAR-GSM/UMTS_tethering Backoff_Power
	CB5129Z100	004402456069412	SAR -UMTS_Rad
	CB5129Z13F	004402456069354	SAR -UMTS_Rad
	CB5129Z13Z	004402456069537	SAR -GSM_Rad
	CB5129Z0Y6	004402456069404	SAR -GSM_Rad_
	CB5129Z0TQ	004402456069560	SAR-GSM/UMTS_tethering Backoff_rad
	CB5129Z0VT	004402456069511	SAR -LTE_LB_Rad
	CB5129Z0WJ	004402456069206	SAR-LTE_LB_Rad
	CB5129Z10P	004402456069347	SAR -LTE_MHB_Rad
	CB5129Z11W	004402456069677	SAR -LTE_MHB_Rad
	CB5129Z10H	004402456069610	SAR - WLAN_2.4GHz_Rad
	CB5129Z10F	004402456069388	SAR - WLAN_2.4GHz_Rad
	CB5129Z10B	004402456069339	SAR - WLAN_5GHz_Rad
	CB5129Z140	004402456069602	SAR - WLAN_5GHz_Rad
Hardware Version	A		
Software Version	35.0.A.1.11		

6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode	Duty Cycle used for SAR testing
GSM	850 1900	Voice (GMSK) GPRS (GMSK) EGPRS (8PSK)	GPRS Multi-Slot Class: <input type="checkbox"/> Class 8 - 1 Up, 4 Down <input type="checkbox"/> Class 10 - 2 Up, 4 Down <input type="checkbox"/> Class 12 - 4 Up, 4 Down <input checked="" type="checkbox"/> Class 33 - 4 Up, 5 Down
	Does this device support DTM (Dual Transfer Mode)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
W-CDMA (UMTS)	Band II Band IV Band V	UMTS Rel. 99 (Voice & Data) HSDPA (Rel. 5) HSUPA (Rel. 6) HSPA+ (Rel. 7)	100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 7 FDD Band 12 FDD Band 13 FDD Band 17 FDD Band 26 TDD Band 41	QPSK 16QAM <input type="checkbox"/> Rel. 10 Does not support Carrier Aggregation (CA) <input type="checkbox"/> Rel. 10 Carrier Aggregation (1 Uplink and 2 Downlinks) <input checked="" type="checkbox"/> Rel. 11 Carrier Aggregation (2 Uplink and 2 Downlinks) (Carrier Aggregation is only supported for downlink and not for uplink.)	100% (FDD) 63.3% (TDD)
	Does this device support SV-LTE (1xRTT-LTE)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20)	100%
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80)	100%
	Does this device support bands 5.60 ~ 5.65 GHz? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Does this device support Band gap channel(s)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Bluetooth	2.4 GHz	Version 4.2 LE	77.5% (DH5)

6.3. Maximum Output Power from Tune-up Procedure

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

6.3.1. GSM Tethering OFF

	GPRS									
	Tx 1 Slot		Tx 2 Slots		Tx 3 Slots		Tx 4 Slots			
	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]
GSM 850	32.2	-1.2~+1.1	31.5	-1.3~+1.1	29.5	-1.3~+1.1	28.5	-1.3~+1.1		
GSM 1900	30.0	-1.3~+0.7	28.5	-1.3~+0.7	26.5	-1.3~+0.7	25.5	-1.3~+0.7		
	EGPRS 8PSK Modulation (MCS5-9)									
	Tx 1 Slot		Tx 2 Slots		Tx 3 Slots		Tx 4 Slots			
	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]
GSM 850	27.0	-2.0~+1.1	25.5	-2.0~+1.1	23.5	-2.0~+1.1	22.5	-2.0~+1.1		
GSM 1900	26.0	-2.0~+1.0	24.5	-2.0~+1.0	22.5	-2.0~+1.0	21.5	-2.0~+1.0		
	CS Only					DTM				
	Tx 1 Slot		TX 2 Slots			TX 3 Slots				
	CS GMSK		CS GMSK		PS GMSK	CS GMSK		PS GMSK		
Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	
GSM 850	32.6	-1.3~+1.1	31.5	-1.3~+1.1	31.5	-1.3~+1.1	29.5	-1.3~+1.1	29.5	-1.3~+1.1
GSM 1900	30.0	-1.3~+0.7	28.5	-1.3~+0.7	28.5	-1.3~+0.7	26.5	-1.3~+0.7	26.5	-1.3~+0.7
	CS Only					DTM				
	Tx 1 Slot		TX 2 Slots			TX 3 Slots				
	CS GMSK		CS GMSK		PS 8PSK	CS GMSK		PS 8PSK		
Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	
GSM 850	32.6	-1.3~+1.1	31.5	-1.3~+1.1	25.5	-2.0~+1.1	29.5	-1.3~+1.1	23.5	-2.0~+1.1
GSM 1900	30.0	-1.3~+0.7	28.5	-1.3~+0.7	24.5	-2.0~+1.0	26.5	-1.3~+0.7	22.5	-2.0~+1.0

6.3.2. GSM Tethering ON

	GPRS									
	Tx 1 Slot		Tx 2 Slots		Tx 3 Slots		Tx 4 Slots			
	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]
GSM 850	30.5	-1.3~+1.1	29.5	-1.3~+1.1	27.5	-1.3~+1.1	26.5	-1.3~+1.1		
GSM 1900	26.0	-1.3~+0.7	24.5	-1.3~+0.7	22.5	-1.3~+0.7	21.5	-1.3~+0.7		
	EGPRS 8PSK Modulation (MCS5-9)									
	Tx 1 Slot		Tx 2 Slots		Tx 3 Slots		Tx 4 Slots			
	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]
GSM 850	27.0	-2.0~+1.1	25.5	-2.0~+1.1	23.5	-2.0~+1.1	22.5	-2.0~+1.1		
GSM 1900	23.7	-2.0~+1.0	22.2	-2.0~+1.0	20.2	-2.0~+1.0	19.2	-2.0~+1.0		
	CS Only					DTM				
	Tx 1 Slot		TX 2 Slots			TX 3 Slots				
	CS GMSK		CS GMSK		PS GMSK	CS GMSK		PS GMSK		
Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	
GSM 850	30.5	-1.3~+1.1	29.5	-1.3~+1.1	29.5	-1.3~+1.1	27.5	-1.3~+1.1	27.5	-1.3~+1.1
GSM 1900	26.0	-1.3~+0.7	24.5	-1.3~+0.7	24.5	-1.3~+0.7	22.5	-1.3~+0.7	21.5	-1.3~+0.7
	CS Only					DTM				
	Tx 1 Slot		TX 2 Slots			TX 3 Slots				
	CS GMSK		CS GMSK		PS 8PSK	CS GMSK		PS 8PSK		
Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	
GSM 850	30.5	-1.3~+1.1	29.5	-1.3~+1.1	25.5	-2.0~+1.1	27.5	-1.3~+1.1	23.5	-2.0~+1.1
GSM 1900	26.0	-1.3~+0.7	24.5	-1.3~+0.7	22.2	-2.0~+1.0	22.5	-1.3~+0.7	20.2	-2.0~+1.0

6.3.3. W-CDMA Tethering OFF

		CS		HSDPA			
				Subtest 1/2		Subtest 3/4	
		Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]
FDD 2	Low Mid High	23.5	-1.5~+0.5	22.5	-2~+1.0	22.0	-2~+1.0
FDD 4	Low Mid High	24.0	-1.5~+0.5	23.0	-2~+1.0	22.5	-2~+1.0
FDD 5	Low Mid High	24.2	-1.5~+0.8	23.2	-2~+1.0	22.7	-2~+1.0
		HSUPA					
		Subtest 1/2		Subtest 2/4		Subtest 3	
		Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]
FDD 2	Low Mid High	22.0	-2~+1.0	20.5	-2~+1.0	21.5	-2~+1.0
FDD 4	Low Mid High	22.5	-2~+1.0	21.0	-2~+1.0	22.0	-2~+1.0
FDD 5	Low Mid High	22.7	-2~+1.3	21.2	-2~+1.0	22.2	-2~+1.0

6.3.4. W-CDMA Tethering ON

		CS		HSDPA			
				Subtest 1/2		Subtest 3/4	
		Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]
FDD 2	Low Mid High	18.5	-1.5~0.5	17.5	-2~+1.0	17.0	-2~+1.0
FDD 4	Low Mid High	19.0	-1.5~0.5	18.0	-2~+1.0	17.5	-2~+1.0
FDD 5	Low Mid High	22.2	-1.5~0.8	21.2	-2~+1.0	20.7	-2~+1.0
		HSUPA					
		Subtest 1/2		Subtest 2/4		Subtest 3	
		Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]	Target [dBm]	Tolerance +- [dB]
FDD 2	Low Mid High	17.0	-2~+1.0	15.5	-2~+1.0	16.5	-2~+1.0
FDD 4	Low Mid High	17.5	-2~+1.0	16.0	-2~+1.0	17.0	-2~+1.0
FDD 5	Low Mid High	20.7	-2~+1.3	19.2	-2~+1.0	20.2	-2~+1.0

6.3.5. LTE Tethering OFF

LTE				Data			
Band	BW	CH	RB Config	QPSK		16QAM	
				Target [dBm]	Tolerance +/-[dB]	Target [dBm]	Tolerance +/-[dB]
LTE B2	1.4MHz	Low	1RB	23.0	-1.5~+1.0	22.0	-1.5~+1.0
		Mid	50% RB	23.0	-1.5~+1.0	22.0	-1.5~+1.0
		High	100% RB	22.0	-1.5~+1.0	21.0	-1.5~+1.0
	3MHz, 5MHz, 10MHz, 15MHz, 20MHz	Low	1RB	23.0	-1.5~+1.0	22.0	-1.5~+1.0
		Mid	50% RB	22.0	-1.5~+1.0	21.0	-1.5~+1.0
		High	100% RB	22.0	-1.5~+1.0	21.0	-1.5~+1.0
LTE B4	1.4MHz	Low	1RB	23.2	-1.5~+1.0	22.2	-1.5~+1.0
		Mid	50% RB	23.2	-1.5~+1.0	22.2	-1.5~+1.0
		High	100% RB	22.2	-1.5~+1.0	21.2	-1.5~+1.0
	3MHz, 5MHz, 10MHz, 15MHz, 20MHz	Low	1RB	23.2	-1.5~+1.0	22.2	-1.5~+1.0
		Mid	50% RB	22.2	-1.5~+1.0	21.2	-1.5~+1.0
		High	100% RB	22.2	-1.5~+1.0	21.2	-1.5~+1.0
LTE B5	1.4MHz	Low	1RB	23.7	-1.5~+1.0	22.7	-1.5~+1.0
		Mid	50% RB	23.7	-1.5~+1.0	22.7	-1.5~+1.0
		High	100% RB	22.7	-1.5~+1.0	21.7	-1.5~+1.0
	3MHz, 5MHz, 10MHz,	Low	1RB	23.7	-1.5~+1.0	22.7	-1.5~+1.0
		Mid	50% RB	22.7	-1.5~+1.0	21.7	-1.5~+1.0
		High	100% RB	22.7	-1.5~+1.0	21.7	-1.5~+1.0
LTE B7	5MHz, 10MHz, 15MHz, 20MHz	Low	1RB	23.5	-1.5~+1.0	22.5	-1.5~+1.0
		Mid	50% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0
		High	100% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0
LTEB12	1.4MHz	Low	1RB	23.7	-1.5~+1.0	22.7	-1.5~+1.0
		Mid	50% RB	23.7	-1.5~+1.0	22.7	-1.5~+1.0
		High	100% RB	22.7	-1.5~+1.0	21.7	-1.5~+1.0
	3MHz 5MHz, 10MHz	Low	1RB	23.7	-1.5~+1.0	22.7	-1.5~+1.0
		Mid	50% RB	22.7	-1.5~+1.0	21.7	-1.5~+1.0
		High	100% RB	22.7	-1.5~+1.0	21.7	-1.5~+1.0
LTE B13	5MHz, 10MHz	Low	1RB	23.0	-1.5~+1.0	22.0	-1.5~+1.0
		Mid	50% RB	22.0	-1.5~+1.0	21.0	-1.5~+1.0
		High	100% RB	22.0	-1.5~+1.0	21.0	-1.5~+1.0
LTE B17	5MHz, 10MHz	Low	1RB	23.5	-1.5~+1.0	22.5	-1.5~+1.0
		Mid	50% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0
		High	100% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0
LTE B26	1.4MHz	Low	1RB	23.5	-1.5~+1.0	22.5	-1.5~+1.0
		Mid	50% RB	23.5	-1.5~+1.0	22.5	-1.5~+1.0
		High	100% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0
	3MHz, 5MHz, 10MHz, 15MHz	Low	1RB	23.5	-1.5~+1.0	22.5	-1.5~+1.0
		Mid	50% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0
		High	100% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0
LTE B41	5MHz, 10MHz, 15MHz, 20MHz	Low	1RB	23.5	-1.5~+1.0	22.5	-1.5~+1.0
		Mid	50% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0
		High	100% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0

6.3.6. LTE Tethering On

LTE				Data			
Band	BW	CH	RB Config	QPSK		16QAM	
				Target [dBm]	Tolerance +/-[dB]	Target [dBm]	Tolerance +/-[dB]
LTE B2	1.4MHz	Low Mid High	1RB	18.0	-1.5~+1.0	18.0	-1.5~+1.0
			50% RB	18.0	-1.5~+1.0	18.0	-1.5~+1.0
			100% RB	18.0	-1.5~+1.0	18.0	-1.5~+1.0
	3MHz, 5MHz, 10MHz, 15MHz, 20MHz	Low Mid High	1RB	18.0	-1.5~+1.0	18.0	-1.5~+1.0
			50% RB	18.0	-1.5~+1.0	18.0	-1.5~+1.0
			100% RB	18.0	-1.5~+1.0	18.0	-1.5~+1.0
LTE B4	1.4MHz	Low Mid High	1RB	18.0	-1.5~+1.0	18.0	-1.5~+1.0
			50% RB	18.0	-1.5~+1.0	18.0	-1.5~+1.0
			100% RB	18.0	-1.5~+1.0	18.0	-1.5~+1.0
	3MHz, 5MHz, 10MHz, 15MHz, 20MHz	Low Mid High	1RB	18.0	-1.5~+1.0	18.0	-1.5~+1.0
			50% RB	18.0	-1.5~+1.0	18.0	-1.5~+1.0
			100% RB	18.0	-1.5~+1.0	18.0	-1.5~+1.0
LTE B5	1.4MHz	Low Mid High	1RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
			50% RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
			100% RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
	3MHz, 5MHz, 10MHz,	Low Mid High	1RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
			50% RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
			100% RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
LTE B7	5MHz, 10MHz, 15MHz, 20MHz	Low Mid High	1RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
			50% RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
			100% RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
LTEB12	1.4MHz	Low Mid High	1RB	23.7	-1.5~+1.0	22.7	-1.5~+1.0
			50% RB	23.7	-1.5~+1.0	22.7	-1.5~+1.0
			100% RB	22.7	-1.5~+1.0	21.7	-1.5~+1.0
	3MHz 5MHz, 10MHz	Low Mid High	1RB	23.7	-1.5~+1.0	22.7	-1.5~+1.0
			50% RB	22.7	-1.5~+1.0	21.7	-1.5~+1.0
			100% RB	22.7	-1.5~+1.0	21.7	-1.5~+1.0
LTE B13	5MHz, 10MHz	Low Mid High	1RB	23.0	-1.5~+1.0	22.0	-1.5~+1.0
			50% RB	22.0	-1.5~+1.0	21.0	-1.5~+1.0
			100% RB	22.0	-1.5~+1.0	21.0	-1.5~+1.0
LTE B17	5MHz, 10MHz	Low Mid High	1RB	23.5	-1.5~+1.0	22.5	-1.5~+1.0
			50% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0
			100% RB	22.5	-1.5~+1.0	21.5	-1.5~+1.0
LTE B26	1.4MHz	Low Mid High	1RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
			50% RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
			100% RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
	3MHz, 5MHz, 10MHz, 15MHz	Low Mid High	1RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
			50% RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
			100% RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
LTE B41	5MHz, 10MHz, 15MHz, 20MHz	Low Mid High	1RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
			50% RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0
			100% RB	21.0	-1.5~+1.0	21.0	-1.5~+1.0

Notes:

Tethering ON for LTE Bands 12, 13 and 17 has the same Targets and Tolerances as LTE Tethering OFF

6.3.7. Wi-Fi 2.4GHz

Wi-Fi Chain 0				Wi-Fi Chain 1			
11b		Manufacturing Max Power {dBm}		11b		Manufacturing Max Power {dBm}	
Band	channel	1Mbps	11Mbps	Band	channel	1Mbps	11Mbps
2400~2485	1,11	13.2	13.2	2400~2485	1,11	7.5	7.5
	12	13.2	13.2		12	7.5	7.5
	13	13.2	13.2		13	7.5	7.5
	Other	13.2	13.2		Other	7.5	7.5
11g		Manufacturing Max Power {dBm}		11g		Manufacturing Max Power {dBm}	
Band	channel	6Mbps	54Mbps	Band	channel	6Mbps	54Mbps
2400~2485	1,11	13.6	13.6	2400~2485	1,11	8.4	8.4
	12	10.2	10.2		12	6.2	6.2
	13	3.7	3.7		13	-0.3	-0.3
	Other	13.6	13.6		Other	8.4	8.4
11n HT-20		Manufacturing Max Power {dBm}		11n HT-20		Manufacturing Max Power {dBm}	
Band	channel	MCS-0	MCS-7	Band	channel	MCS-0	MCS-7
2400~2485	1,11	13.7	13.7	2400~2485	1,11	8.5	8.5
	12	8.5	8.5		12	4.5	4.5
	13	3.0	3.0		13	-1.0	-1.0
	Other	12.7	12.7		Other	8.5	8.5

6.3.8. Wi-Fi 5GHz

Wi-Fi Chain 0				Wi-Fi Chain 1			
11a		Manufacturing Max Power {dBm}		11a		Manufacturing Max Power {dBm}	
Band	channel	6Mbps	54Mbps	Band	channel	6Mbps	54Mbps
5150~5250MHz	All	10.4	10.4	5150~5250MHz	All	5.0	5.0
5250~5350MHz	All	10.6	10.6	5250~5350MHz	All	4.9	4.9
5470~5725MHz	All	11.2	11.2	5470~5725MHz	All	5.1	5.1
5725~5850MHz	All	11.1	11.1	5725~5850MHz	All	4.3	4.3
11n HT-20		Manufacturing Max Power {dBm}		11n HT-20		Manufacturing Max Power {dBm}	
Band	channel	MCS-0	MCS-7	Band	channel	MCS-0	MCS-7
5150~5250MHz	All	10.5	10.5	5150~5250MHz	All	5.0	5.0
5250~5350MHz	All	10.7	10.7	5250~5350MHz	All	4.9	4.9
5470~5725MHz	All	11.1	11.1	5470~5725MHz	All	5.1	5.1
5725~5850MHz	All	11.1	11.1	5725~5850MHz	All	4.3	4.3
11n HT-40		Manufacturing Max Power {dBm}		11n HT-40		Manufacturing Max Power {dBm}	
Band	channel	MCS-0	MCS-7	Band	channel	MCS-0	MCS-7
5150~5250MHz	All	11.1	11.1	5150~5250MHz	All	5.4	5.4
5250~5350MHz	All	11.4	11.4	5250~5350MHz	All	5.1	5.1
5470~5725MHz	All	11.7	11.7	5470~5725MHz	All	5.9	5.9
5725~5850MHz	All	11.6	11.6	5725~5850MHz	All	5.3	5.3
11ac VHT-20		Manufacturing Max Power {dBm}		11ac VHT-20		Manufacturing Max Power {dBm}	
Band	channel	MCS-0	MCS-8, 9	Band	channel	MCS-0	MCS-8, 9
5150~5250MHz	All	10.5	10.5	5150~5250MHz	All	5.0	5.0
5250~5350MHz	All	10.7	10.7	5250~5350MHz	All	4.9	4.9
5470~5725MHz	All	11.1	11.1	5470~5725MHz	All	5.1	5.1
5725~5850MHz	All	11.1	11.1	5725~5850MHz	All	4.3	4.3
11ac VHT-40		Manufacturing Max Power {dBm}		11ac VHT-40		Manufacturing Max Power {dBm}	
Band	channel	MCS-0	MCS-8, 9	Band	channel	MCS-0	MCS-8, 9
5150~5250MHz	All	11.1	11.1	5150~5250MHz	All	5.4	5.4
5250~5350MHz	All	11.4	11.4	5250~5350MHz	All	5.1	5.1
5470~5725MHz	All	11.7	11.7	5470~5725MHz	All	5.9	5.9
5725~5850MHz	All	11.6	11.6	5725~5850MHz	All	5.3	5.3
11ac VHT-80		Manufacturing Max Power {dBm}		11ac VHT-80		Manufacturing Max Power {dBm}	
Band	channel	MCS-0	MCS-8, 9	Band	channel	MCS-0	MCS-8, 9
5150~5250MHz	All	11.1	11.1	5150~5250MHz	All	5.1	5.1
5250~5350MHz	All	11.2	11.2	5250~5350MHz	All	4.8	4.8
5470~5725MHz	All	11.9	11.9	5470~5725MHz	All	5.8	5.8
5725~5850MHz	All	11.0	11.0	5725~5850MHz	All	4.8	4.8

6.3.9. Bluetooth

BT			Manufacturing Max Power [dBm]		
			BR	EDR	BLE
2400~2485MHz	Low	Time Averaged	8.9	5.0	4.9
		Calculated to 100% Duty Cycle	10.0	6.1	5.6
	Mid	Time Averaged	10.9	6.8	7.0
		Calculated to 100% Duty Cycle	12.1	8.0	7.7
	High	Time Averaged	9.0	4.9	5.1
		Calculated to 100% Duty Cycle	10.2	6.0	5.8

6.4. General LTE SAR Test and Reporting Considerations

Item	Description						
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 2	Frequency range: 1850 - 1910 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	18700 /1860	18675/ 1857.5	18650/ 1855	18625/ 1852.5	18615/ 1851.5	18607/ 1850.7
	Mid	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880
	High	19100/ 1900	19125/ 1902.5	19150/ 1905	19175/ 1907.5	19185/ 1908.5	19193/ 1909.3
	Band 4	Frequency range: 1710 - 1755 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low		20025/ 1717.5	20000/ 1715	19975/ 1712.5	19965/ 1711.5	19957/ 1710.7
	Mid	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5
	High		20325/ 1747.5	20350/ 1750	20375/ 1752.5	20385/ 1753.5	20393/ 1754.3
	Band 5	Frequency range: 824 - 849 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low				20425/ 826.5	20415/ 825.5	20407/ 824.7
	Mid			20525/ 836.5	20525/ 836.5	20525/ 836.5	20525/ 836.5
	High				20625/ 846.5	20635/ 847.5	20643/ 848.3
	Band 7	Frequency range: 2500 - 2570 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	20850 2510	20825 2507.5	20800 2505	20775 2502.5		
	Mid	21100 2535	21100 2535	21100 2535	21100 2535		
	High	21350 2560	21375 2562.5	21400 2565	21425 2567.5		
	Band 12	Frequency range: 699 – 716 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low				23035/ 701.5	23025/ 700.5	23017/ 699.7
Mid			23095/ 707.5	23095/ 707.5	23095/ 707.5	23095/ 707.5	
High				23155/ 713.5	23165/ 714.5	23173/ 715.3	
Band 13	Frequency range: 777 - 787 MHz						
	Channel Bandwidth						
	20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz	
Low							
Mid			23230/ 782	23230/ 782			
High							

Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 17	Frequency range: 704 - 716 MHz																																										
		Channel Bandwidth																																										
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																					
	Low																																											
	Mid			23790/ 710	23790/ 710																																							
	High																																											
	Band 26	Frequency range: 814 - 849 MHz																																										
		Channel Bandwidth																																										
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																					
	Low		26765/ 821.5	26740/ 819	26715/ 816.5	26705/ 815.5	26697/ 814.7																																					
	Mid		26865/ 831.5	26865/ 831.5	26865/ 831.5	26865/ 831.5	26865/ 831.5																																					
	High		26965/ 841.5	26990/ 844	27015/ 846.5	27025/ 847.5	27033/ 848.3																																					
	Band 41	Frequency range: 2496 - 2690 MHz																																										
		Channel Bandwidth																																										
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																					
Low	39750 / 2506.0																																											
Low-Mid	40185 / 2549.5																																											
Mid	40620 / 2593.0																																											
Mid-High	41055 / 2636.5																																											
High	41490 / 2680.0																																											
LTE transmitter and antenna implementation	Refer to separate filing documents																																											
Maximum power reduction (MPR)	<p align="center">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3</p> <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th> <th rowspan="2">MPR (dB)</th> </tr> <tr> <th>1.4 MHz</th> <th>3.0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> </tr> </thead> <tbody> <tr> <td>QPSK</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 2</td> </tr> </tbody> </table> <p>MPR Built-in by design A-MPR (additional MPR) was disabled during SAR testing</p>						Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
Modulation	Channel bandwidth / Transmission bandwidth (RB)							MPR (dB)																																				
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																																						
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1																																					
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1																																					
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																					
Power reduction	No																																											
Spectrum plots for RB configurations	A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																											

6.5. LTE (TDD) Considerations

According to KDB 941225 D05 SAR for LTE Devices, 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	$26336 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$			$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-		
9	$13168 \cdot T_s$	-	-	-	-	-

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 $\times (T_s) \times \#$ of S + $\#$ of U

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle = $5120 \times [1/(15000 \times 2048)] \times 2 + 6 \text{ ms} = 63.33\%$

where

$T_s = 1/(15000 \times 2048)$ seconds

7. RF Exposure Conditions (Test Configurations)

Refer to separate filing documents for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

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

Notes:

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

8. Dielectric Property Measurements & System Check

8.1. Dielectric Property Measurements

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

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

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

For SAR measurement systems that have implemented the SAR error compensation algorithms documented in IEEE Std 1528-2013, to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters, the tolerance for ϵ_r and σ may be relaxed to $\pm 10\%$. This is limited to frequencies ≤ 3 GHz.

Tissue Dielectric Parameters

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

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

IEEE Std 1528-2013

Refer to Table 3 within the IEEE Std 1528-2013

Dielectric Property Measurements Results:

SAR Room	Date	Tissue Type	Band (MHz)	Frequency (MHz)	Relative Permittivity (ϵ_r)			Conductivity (σ)		
					Measured	Target	Delta $\pm 5\%$	Measured	Target	Delta $\pm 5\%$
D	3/21/2016	2600	Head	2600	39.72	39.01	1.82	1.90	1.96	-3.42
				2495	40.05	39.14	2.32	1.78	1.85	-3.71
				2690	39.42	38.90	1.34	1.99	2.06	-3.23
D	3/22/2016	2600	Body	2600	50.93	52.51	-3.01	2.23	2.16	3.34
				2495	51.25	52.64	-2.64	2.10	2.01	4.41
				2690	50.62	52.40	-3.40	2.35	2.29	2.79
E	3/21/2016	2450	Head	2450	40.44	39.20	3.16	1.82	1.80	0.83
				2400	40.60	39.30	3.32	1.75	1.75	-0.27
				2480	40.35	39.16	3.03	1.84	1.83	0.41
E	3/21/2016	2450	Body	2450	50.71	52.70	-3.78	1.98	1.95	1.69
				2400	50.87	52.77	-3.61	1.91	1.90	0.47
				2480	50.63	52.66	-3.86	2.01	1.99	1.05
F	3/21/2016	1900	Head	1900	39.91	40.00	-0.23	1.38	1.40	-1.30
				1850	40.00	40.00	0.00	1.34	1.40	-4.33
				1910	39.85	40.00	-4.33	1.39	1.40	-0.55
F	3/21/2016	850	Body	835	52.79	55.20	-4.37	1.01	0.97	4.49
				820	52.96	55.28	-4.19	1.00	0.97	2.82
				850	52.63	55.16	-4.58	1.03	0.99	4.09
F	3/24/2015	1900	Body	1900	51.77	53.30	-2.87	1.45	1.52	-4.54
				1850	51.82	53.30	-2.78	1.42	1.52	-6.64
				1920	51.69	53.30	-3.02	1.48	1.52	-2.63
F	3/25/2016	1900	Head	1900	40.39	40.00	0.98	1.44	1.40	2.71
				1850	40.62	40.00	1.55	1.39	1.40	-0.93
				1920	40.28	40.00	0.70	1.46	1.40	4.07
F	3/25/2016	1900	Body	1900	52.52	53.30	-1.46	1.45	1.52	-4.61
				1850	52.66	53.30	-1.20	1.40	1.52	-7.70
				1920	52.45	53.30	-1.59	1.47	1.52	-3.42
F	3/28/2016	835	Head	835	41.33	41.50	-0.41	0.91	0.90	1.64
				805	41.72	41.68	0.10	0.88	0.90	-1.45
				905	40.50	41.50	-2.41	0.98	0.97	0.63
F	3/28/2016	835	Body	835	53.03	55.20	-3.93	1.01	0.97	3.71
				805	53.33	55.33	-3.62	0.97	0.97	0.70
				905	52.32	55.00	-4.87	1.08	1.05	2.14
G	3/24/2016	5200	Body	5200	48.60	49.02	-0.86	5.30	5.29	0.10
				5150	48.70	49.09	-0.79	5.21	5.24	-0.60
				5350	48.52	48.82	-0.61	5.49	5.47	0.37
G	3/24/2016	5600	Body	5600	48.12	48.48	-0.74	5.84	5.76	1.39
				5500	48.25	48.61	-0.75	5.67	5.64	0.52
				5725	47.98	48.31	-0.68	6.01	5.91	1.71
G	3/24/2016	5800	Body	5800	47.84	48.20	-0.75	6.13	6.00	2.10
				5700	48.02	48.34	-0.67	5.98	5.88	1.81
				5850	47.78	48.20	-0.87	6.19	6.00	3.08
G	3/24/2016	5200	Head	5200	35.61	35.99	-1.06	4.44	4.65	-4.54
				5150	35.72	36.05	-0.91	4.38	4.60	-4.89
				5350	35.44	35.82	-1.06	4.59	4.80	-4.46

Dielectric Property Measurements Results Continued:

SAR Room	Date	Tissue Type	Band (MHz)	Frequency (MHz)	Relative Permittivity (ϵ_r)			Conductivity (σ)		
					Measured	Target	Delta $\pm 5\%$	Measured	Target	Delta $\pm 5\%$
G	3/24/2016	5600	Head	5600	35.14	35.53	-1.11	4.87	5.06	-3.76
				5500	35.23	35.65	-1.17	4.74	4.96	-4.40
				5725	35.04	35.39	-0.99	5.01	5.19	-3.43
G	3/24/2016	5800	Head	5800	34.95	35.30	-0.99	5.11	5.27	-3.06
				5700	35.07	35.42	-0.99	4.99	5.16	-3.34
				5850	34.90	35.30	-1.13	5.14	5.27	-2.47
H	3/21/2016	750	Head	750	41.37	41.96	-1.41	0.93	0.89	3.94
				700	42.08	42.22	-0.33	0.88	0.89	-1.30
				790	40.80	41.76	-2.29	0.96	0.90	7.40
H	3/21/2016	750	Body	750	54.26	55.55	-2.32	0.95	0.96	-0.84
				700	54.89	55.74	-1.52	0.90	0.96	-5.90
				790	53.80	55.39	-2.87	0.99	0.97	2.75
H	3/22/2016	750	Body	750	54.04	55.55	-2.71	0.96	0.96	-0.43
				695	54.61	55.76	-2.06	0.90	0.96	-5.70
				790	53.56	55.39	-3.31	1.00	0.97	3.24
H	3/22/2016	750	Head	750	40.70	41.96	-3.01	0.92	0.89	2.93
				695	41.44	42.24	-1.90	0.87	0.89	-2.24
				790	40.09	41.76	-3.99	0.96	0.90	6.61
H	3/23/2016	750	Head	750	41.81	41.96	-0.36	0.93	0.89	4.57
				695	42.57	42.24	0.77	0.88	0.89	-0.65
				790	41.24	41.76	-1.24	0.98	0.90	8.88
H	3/24/2016	1750	Body	1750	51.34	53.44	-3.93	1.48	1.49	-0.68
				1710	51.49	53.54	-3.84	1.43	1.46	-2.02
				1755	51.34	53.43	-3.91	1.48	1.49	-0.89
H	3/24/2016	1750	Head	1750	39.00	40.08	-2.71	1.34	1.37	-2.12
				1710	39.19	40.15	-2.38	1.30	1.35	-3.52
				1755	39.00	40.08	-2.69	1.35	1.37	-1.95

8.2. System Check

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

System Performance Check Measurement Conditions:

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

System Check Results

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

SAR Room	Date	Tissue Type	Dipole Type _Serial #	Dipole Cal. Due Data	Measured Results for 1g SAR				Measured Results for 10g SAR				Plot No.
					Zoom Scan to 100 mW	Normalize to 1 W	Target (Ref. Value)	Delta ±10 %	Zoom Scan to 100 mW	Normalize to 1 W	Target (Ref. Value)	Delta ±10 %	
D	3/21/2016	Head	D2600V2 SN:1006	9/21/2016	5.470	54.70	56.90	-3.87	2.400	24.00	25.50	-5.88	
D	3/22/2016	Body	D2600V2 SN:1006	9/21/2016	5.990	59.90	55.30	8.32	2.610	26.10	24.80	5.24	1, 2
E	3/21/2016	Head	D2450V2 SN:748	2/22/2017	5.390	53.90	50.90	5.89	2.440	24.40	23.70	2.95	3, 4
E	3/21/2016	Body	D2450V2 SN:748	2/22/2017	5.180	51.80	49.80	4.02	2.380	23.80	23.20	2.59	
F	3/21/2016	Head	D1900V2 SN:5d043	11/17/2016	4.020	40.20	40.00	0.50	2.090	20.90	20.90	0.00	
F	3/21/2016	Body	D835V2 SN:4d002	11/12/2016	0.990	9.90	9.47	4.54	0.653	6.53	6.21	5.15	5, 6
F	3/24/2016	Body	D1900V2 SN:5d043	11/17/2016	3.830	38.30	40.20	-4.73	2.040	20.40	21.10	-3.32	7, 8
F	3/25/2016	Head	D1900V2 SN:5d043	11/17/2016	4.170	41.70	40.00	4.25	2.170	21.70	20.90	3.83	
F	3/28/2016	Head	D835V2 SN:4d142	9/23/2016	0.936	9.36	9.27	0.97	0.615	6.15	6.01	2.33	9, 10
F	3/28/2016	Body	D835V2 SN:4d142	9/23/2016	0.937	9.37	9.41	-0.43	0.616	6.16	6.18	-0.32	
G	3/24/2016	Body	D5GHzV2 SN:1168 (5.2 GHz)	11/13/2016	7.840	78.40	75.00	4.53	2.220	22.20	21.00	5.71	
G	3/24/2016	Body	D5GHzV2 SN:1168 (5.6 GHz)	11/13/2016	8.480	84.80	82.50	2.79	2.370	23.70	23.00	3.04	
G	3/24/2016	Body	D5GHzV2 SN:1168 (5.8 GHz)	11/13/2016	7.340	73.40	78.10	-6.02	2.050	20.50	21.60	-5.09	11,12
G	3/24/2016	Head	D5GHzV2 SN:1168 (5.2 GHz)	11/13/2016	7.450	74.50	78.40	-4.97	2.140	21.40	22.50	-4.89	
G	3/24/2016	Head	D5GHzV2 SN:1168 (5.6 GHz)	11/13/2016	8.500	85.00	87.60	-2.97	2.400	24.00	24.80	-3.23	
G	3/24/2016	Head	D5GHzV2 SN:1168 (5.8 GHz)	11/13/2016	8.180	81.80	81.00	0.99	2.330	23.30	23.00	1.30	
H	3/21/2016	Head	D750V3 SN:1071	11/12/2016	0.844	8.44	8.21	2.80	0.552	5.52	5.38	2.60	13,14
H	3/21/2016	Body	D750V3 SN:1071	11/12/2016	0.869	8.69	8.74	-0.57	0.582	5.82	5.81	0.17	
H	3/24/2016	Head	D1750V2 SN:1053	8/11/2016	3.500	35.00	37.10	-5.66	1.840	18.40	19.80	-7.07	15,16
H	3/24/2016	Body	D1750V2 SN:1053	8/11/2016	3.790	37.90	37.50	1.07	2.010	20.10	20.30	-0.99	

9. Conducted Output Power Measurements

9.1. GSM

Per KDB 941225 D01 3G SAR Procedures:

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

GSM850 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Pwr		Reduced Pwr	
						Burst (dBm)	Frame (dBm)	Burst (dBm)	Frame (dBm)
850	GPRS (GMSK)	CS1	1	128	824.2	32.4	23.4	30.8	21.8
				190	836.6	32.2	23.2	30.6	21.6
				251	848.8	32.2	23.2	30.6	21.6
			2	128	824.2	31.7	25.7	29.9	23.9
				190	836.6	31.5	25.5	29.5	23.5
				251	848.8	31.4	25.4	29.5	23.5
			3	128	824.2	29.8	25.5	27.9	23.6
				190	836.6	29.6	25.3	27.8	23.5
				251	848.8	29.5	25.2	27.7	23.4
			4	128	824.2	28.9	25.9	26.8	23.8
				190	836.6	28.6	25.6	26.6	23.6
				251	848.8	28.5	25.5	26.5	23.5
	EGPRS (8PSK)	MCS5	1	128	824.2	27.4	18.4	27.3	18.3
				190	836.6	27.3	18.3	27.2	18.2
				251	848.8	27.2	18.2	27.1	18.1
			2	128	824.2	25.9	19.9	26.0	20.0
				190	836.6	25.6	19.6	25.8	19.8
				251	848.8	25.5	19.5	25.7	19.7
			3	128	824.2	23.9	19.6	24.0	19.7
				190	836.6	23.7	19.4	23.9	19.6
				251	848.8	23.6	19.3	23.8	19.5
			4	128	824.2	22.8	19.8	22.9	19.9
				190	836.6	22.6	19.6	22.7	19.7
				251	848.8	22.5	19.5	22.6	19.6

Notes:

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

- GMSK (GPRS) mode with 4 time slots for Max power and 4 time slots for Reduced power, based on the output power measurements above.
- SAR is not required for EGPRS (8PSK) mode because its output power is less than that of GPRS Mode

GSM1900 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Pwr		Reduced Pwr	
						Burst (dBm)	Frame (dBm)	Burst (dBm)	Frame (dBm)
1900	GPRS (GMSK)	CS1	1	512	1850.2	30.0	21.0	26.0	17.0
				661	1880.0	30.0	21.0	26.0	17.0
				810	1909.8	30.0	21.0	26.3	17.3
			2	512	1850.2	28.6	22.6	24.8	18.8
				661	1880.0	28.6	22.6	24.8	18.8
				810	1909.8	28.6	22.6	24.9	18.9
			3	512	1850.2	26.7	22.4	22.7	18.4
				661	1880.0	26.6	22.3	22.6	18.3
				810	1909.8	26.7	22.4	22.9	18.6
			4	512	1850.2	25.6	22.6	21.8	18.8
				661	1880.0	25.6	22.6	21.7	18.7
				810	1909.8	25.8	22.8	21.9	18.9
	EGPRS (8PSK)	MCS5	1	512	1850.2	26.1	17.1	23.5	14.5
				661	1880.0	26.1	17.1	23.6	14.6
				810	1909.8	26.3	17.3	23.7	14.7
			2	512	1850.2	24.5	18.5	22.9	16.9
				661	1880.0	24.6	18.6	22.6	16.6
				810	1909.8	24.7	18.7	22.8	16.8
			3	512	1850.2	22.2	17.9	20.3	16.0
				661	1880.0	22.2	17.9	20.3	16.0
				810	1909.8	22.4	18.1	20.5	16.2
			4	512	1850.2	21.2	18.2	19.4	16.4
				661	1880.0	21.3	18.3	19.5	16.5
				810	1909.8	21.5	18.5	19.8	16.8

Notes:

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

- GMSK (GPRS) mode with 4 time slots for Max power and 4 time slots for Reduced power, 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

GSM850 DTM Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Pwr				Reduced Pwr			
						CS		PS		CS		PS	
						Burst (dBm)	Frame (dBm)	Burst (dBm)	Frame (dBm)	Burst (dBm)	Frame (dBm)	Burst (dBm)	Frame (dBm)
850	GSM(Voice) + GPRS(GMSK)	CS1	1	128	824.2	32.4	23.4			30.8	21.8		
				190	836.6	32.2	23.2			30.6	21.6		
				251	848.8	32.2	23.2			30.6	21.6		
			2	128	824.2	31.3	25.3	31.4	25.4	29.7	23.7	29.6	23.6
				190	836.6	31.0	25.0	31.1	25.1	29.4	23.4	29.3	23.3
				251	848.8	30.9	24.9	31.0	25.0	29.4	23.4	29.3	23.3
			3	128	824.2	29.6	25.3	29.6	25.3	27.7	23.4	27.6	23.3
				190	836.6	29.4	25.1	29.4	25.1	27.6	23.3	27.5	23.2
				251	848.8	29.3	25.0	29.3	25.0	27.5	23.2	27.4	23.1
	GSM(Voice) + EGPRS(8PSK)	MCS5	1	128	824.2	32.4	23.4			30.8	21.8		
				190	836.6	32.2	23.2			30.6	21.6		
				251	848.8	32.2	23.2			30.6	21.6		
			2	128	824.2	31.4	25.4	25.4	19.4	29.7	23.7	25.5	19.5
				190	836.6	31.1	25.1	25.1	19.1	29.5	23.5	25.4	19.4
				251	848.8	31.0	25.0	25.1	19.1	29.3	23.3	25.4	19.4
			3	128	824.2	29.6	25.3	23.5	19.2	27.7	23.4	23.8	19.5
				190	836.6	29.4	25.1	23.4	19.1	27.6	23.3	23.7	19.4
				251	848.8	29.4	25.1	23.3	19.0	27.5	23.2	23.6	19.3

Notes:

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

- GSM(Voice) + GMSK (GPRS) mode with 2 time slot for both Max and Reduced power, based on the output power measurements above.
- SAR is not required for GSM(Voice) + EGPRS (8PSK) mode because its output power is less than that of GSM(Voice) + GMSK (GPRS) mode.

GSM1900 DTM Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Max. Pwr				Reduced Pwr			
						CS		PS		CS		PS	
						Burst (dBm)	Frame (dBm)	Burst (dBm)	Frame (dBm)	Burst (dBm)	Frame (dBm)	Burst (dBm)	Frame (dBm)
1900	GSM(Voice) + GPRS(GMSK)	CS1	1	512	1850.2	30.0	21.0			26.0	17.0		
				661	1880.0	30.0	21.0			26.0	17.0		
				810	1909.8	30.0	21.0			26.3	17.3		
			2	512	1850.2	28.5	22.5	28.6	22.6	24.6	18.6	24.7	18.7
				661	1880.0	28.5	22.5	28.6	22.6	24.6	18.6	24.7	18.7
				810	1909.8	28.6	22.6	28.7	22.7	24.8	18.8	24.9	18.9
			3	512	1850.2	26.6	22.3	26.7	22.4	22.6	18.3	22.2	17.9
				661	1880.0	26.6	22.3	26.7	22.4	22.6	18.3	22.2	17.9
				810	1909.8	26.8	22.5	26.8	22.5	22.7	18.4	22.2	17.9
	GSM(Voice) + EGPRS(8PSK)	MCS5	1	512	1850.2	30.0	21.0			26.0	17.0		
				661	1880.0	30.0	21.0			26.0	17.0		
				810	1909.8	30.0	21.0			26.3	17.3		
			2	512	1850.2	28.6	22.6	24.2	18.2	24.7	18.7	22.4	16.4
				661	1880.0	28.5	22.5	24.3	18.3	24.7	18.7	22.4	16.4
				810	1909.8	28.6	22.6	24.4	18.4	24.8	18.8	22.6	16.6
			3	512	1850.2	26.6	22.3	22.5	18.2	22.6	18.3	20.2	15.9
				661	1880.0	26.7	22.4	22.5	18.2	22.6	18.3	20.2	15.9
				810	1909.8	26.8	22.5	22.6	18.3	22.8	18.5	20.5	16.2

Notes:

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

- GSM(Voice) + GMSK (GPRS) mode with 2 time slots for Max and Reduced power, based on the output power measurements above.
- SAR is not required for GSM(Voice) + EGPRS (8PSK) mode because its output power is less than that of GSM(Voice) + GMSK (GPRS) mode.

9.2. W-CDMA

Release 99 Setup Procedures used to establish the test signals

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

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

HSDPA Setup Procedures used to establish the test signals

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

Mode	Subtest	HSDPA	HSDPA	HSDPA	HSDPA
		1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	11/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	11/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
MPR (dB)	0	0	0.5	0.5	
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
$A_{hs}=\beta_{hs}/\beta_c$	30/15				

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

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

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

HSPA+

Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., UL cat6 / DL cat10. Therefore, the RF conducted power is not measured.

W-CDMA Band II Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Pwr (dBm)	Reduced Pwr (dBm)
W-CDMA Band II	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	22.9	18.5
			9400	1880.0	N/A	23.0	18.6
			9538	1907.6	N/A	22.9	18.4
	HSDPA	Subtest 1	9262	1852.4	0	22.0	17.2
			9400	1880.0	0	22.1	17.3
			9538	1907.6	0	22.1	17.2
		Subtest 2	9262	1852.4	0	22.4	17.0
			9400	1880.0	0	22.4	17.1
			9538	1907.6	0	22.3	17.0
		Subtest 3	9262	1852.4	0.5	22.1	16.8
			9400	1880.0	0.5	22.2	17.0
			9538	1907.6	0.5	22.2	16.8
		Subtest 4	9262	1852.4	0.5	22.1	16.8
			9400	1880.0	0.5	22.2	17.0
			9538	1907.6	0.5	22.2	16.8
	HSUPA	Subtest 1	9262	1852.4	0	21.7	17.1
			9400	1880.0	0	21.6	17.1
			9538	1907.6	0	21.6	17.0
		Subtest 2	9262	1852.4	2	19.9	15.3
			9400	1880.0	2	19.9	15.4
			9538	1907.6	2	19.8	15.2
		Subtest 3	9262	1852.4	1	20.9	16.3
			9400	1880.0	1	20.8	16.4
			9538	1907.6	1	20.8	16.2
		Subtest 4	9262	1852.4	2	19.9	15.3
			9400	1880.0	2	19.9	15.4
			9538	1907.6	2	19.8	15.2
		Subtest 5	9262	1852.4	0	21.7	17.1
			9400	1880.0	0	21.6	17.1
			9538	1907.6	0	21.6	17.0

W-CDMA Band IV Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Pwr (dBm)	Reduced Pwr (dBm)	
W-CDMA Band IV	Rel 99	RMC, 12.2 kbps	1312	1712.4	N/A	23.7	19.1	
			1413	1732.6	N/A	23.8	19.2	
			1513	1752.6	N/A	23.5	19.1	
	HSDPA	Subtest 1	1312	1712.4	0	22.8	17.7	
			1413	1732.6	0	22.8	17.7	
			1513	1752.6	0	22.7	17.7	
		Subtest 2	1312	1712.4	0	22.5	17.5	
			1413	1732.6	0	22.5	17.5	
			1513	1752.6	0	22.5	17.5	
		Subtest 3	1312	1712.4	0.5	22.5	17.5	
			1413	1732.6	0.5	22.5	17.5	
			1513	1752.6	0.5	22.5	17.4	
		Subtest 4	1312	1712.4	0.5	22.5	17.5	
			1413	1732.6	0.5	22.5	17.4	
			1513	1752.6	0.5	22.5	17.4	
		HSUPA	Subtest 1	1312	1712.4	0	22.3	17.6
				1413	1732.6	0	22.3	17.6
				1513	1752.6	0	22.3	17.6
	Subtest 2		1312	1712.4	2	20.8	16.0	
			1413	1732.6	2	20.8	16.1	
			1513	1752.6	2	20.8	16.1	
	Subtest 3		1312	1712.4	1	21.2	16.6	
			1413	1732.6	1	21.2	16.6	
			1513	1752.6	1	21.2	16.5	
	Subtest 4		1312	1712.4	2	20.8	16.0	
			1413	1732.6	2	20.8	16.1	
			1513	1752.6	2	20.8	16.1	
	Subtest 5		1312	1712.4	0	22.3	17.6	
			1413	1732.6	0	22.3	17.6	
			1513	1752.6	0	22.3	17.6	

W-CDMA Band V Measured Results

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Max. Pwr (dBm)	Reduced Pwr (dBm)	
W-CDMA Band V	Rel 99	RMC, 12.2 kbps	4132	826.4	N/A	24.0	22.0	
			4183	836.6	N/A	23.9	22.0	
			4233	846.6	N/A	23.8	22.0	
	HSDPA	Subtest 1	4132	826.4	0	23.3	21.3	
			4183	836.6	0	23.2	21.2	
			4233	846.6	0	23.1	21.2	
		Subtest 2	4132	826.4	0	23.0	21.1	
			4183	836.6	0	23.0	21.0	
			4233	846.6	0	22.9	21.0	
		Subtest 3	4132	826.4	0.5	22.5	20.6	
			4183	836.6	0.5	22.5	20.5	
			4233	846.6	0.5	22.5	20.5	
		Subtest 4	4132	826.4	0.5	22.5	20.6	
			4183	836.6	0.5	22.5	20.5	
			4233	846.6	0.5	22.5	20.5	
		HSUPA	Subtest 1	4132	826.4	0	22.6	21.2
				4183	836.6	0	22.7	21.0
				4233	846.6	0	22.7	21.1
	Subtest 2		4132	826.4	2	20.9	19.2	
			4183	836.6	2	20.4	19.1	
			4233	846.6	2	20.3	19.1	
	Subtest 3		4132	826.4	1	21.7	20.2	
			4183	836.6	1	21.8	20.1	
			4233	846.6	1	21.6	20.1	
	Subtest 4		4132	826.4	2	20.9	19.2	
			4183	836.6	2	20.4	19.1	
			4233	846.6	2	20.3	19.1	
	Subtest 5		4132	826.4	0	22.6	21.2	
			4183	836.6	0	22.7	21.0	
			4233	846.6	0	22.7	21.1	

9.3. LTE

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

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

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

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

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

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

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

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

LTE Band 2 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						1860 MHz	1880 MHz	1900 MHz		1860 MHz	1880 MHz	1900 MHz
LTE Band 2	20	QPSK	1	0	0	22.9	22.9	23.0	0	17.7	17.8	17.7
			1	49	0	23.5	23.5	23.7	0	18.5	18.6	18.5
			1	99	0	23.4	23.2	23.2	0	18.4	18.2	18.2
			50	0	1	22.2	22.2	22.4	0	18.2	18.2	18.2
			50	24	1	22.5	22.5	22.6	0	18.5	18.5	18.3
			50	50	1	22.4	22.4	22.5	0	18.4	18.4	18.3
		16QAM	100	0	1	22.3	22.3	22.4	0	18.3	18.3	18.1
			1	0	1	22.5	22.3	22.5	0	18.3	18.4	18.0
			1	49	1	22.5	22.5	22.5	0	19.0	18.9	18.8
			1	99	1	22.5	22.6	22.6	0	18.9	18.7	18.4
			50	0	2	21.3	21.3	21.4	0	18.1	18.2	18.1
			50	24	2	21.6	21.6	21.6	0	18.4	18.5	18.3
			50	49	2	21.5	21.4	21.5	0	18.4	18.3	18.5
			100	0	2	21.4	21.3	21.5	0	18.3	18.3	18.1
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						1857.5 MHz	1880 MHz	1902.5 MHz		1857.5 MHz	1880 MHz	1902.5 MHz
LTE Band 2	15	QPSK	1	0	0	23.0	22.9	22.9	0	17.9	17.9	17.9
			1	36	0	23.6	23.5	23.4	0	18.6	18.7	18.6
			1	74	0	23.3	23.2	23.2	0	18.4	18.1	18.3
			36	0	1	22.4	22.3	22.2	0	18.4	18.3	18.3
			36	18	1	22.6	22.5	22.5	0	18.5	18.5	18.4
			36	37	1	22.6	22.5	22.4	0	18.6	18.4	18.4
		16QAM	75	0	1	22.5	22.4	22.4	0	18.4	18.4	18.3
			1	0	1	22.0	22.3	22.3	0	17.9	18.3	18.4
			1	36	1	22.5	22.6	22.6	0	18.5	18.8	18.8
			1	74	1	22.3	22.6	22.5	0	18.3	18.6	18.5
			36	0	2	21.4	21.4	21.3	0	18.3	18.3	18.2
			36	18	2	21.6	21.5	21.6	0	18.5	18.5	18.6
			36	37	2	21.7	21.6	21.5	0	18.5	18.4	18.6
			75	0	2	21.5	21.4	21.5	0	18.4	18.3	18.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						1855 MHz	1880 MHz	1905 MHz		1855 MHz	1880 MHz	1905 MHz
LTE Band 2	10	QPSK	1	0	0	23.2	23.2	23.1	0	18.4	18.4	18.3
			1	25	0	23.2	23.0	23.0	0	18.2	18.1	18.1
			1	49	0	23.3	23.2	23.1	0	18.5	18.2	18.2
			25	0	1	22.2	22.1	22.1	0	18.2	18.3	18.2
			25	12	1	22.2	22.0	22.1	0	18.3	18.3	18.1
			25	25	1	22.2	22.1	22.1	0	18.3	18.3	18.0
		16QAM	50	0	1	22.2	22.0	22.1	0	18.4	18.3	18.1
			1	0	1	22.2	22.5	22.2	0	18.4	18.3	18.6
			1	25	1	22.1	22.4	22.0	0	18.3	18.2	18.5
			1	49	1	22.2	22.6	22.2	0	18.4	18.3	18.5
			25	0	2	21.2	21.2	21.3	0	18.3	18.3	18.3
			25	12	2	21.3	21.0	21.3	0	18.4	18.3	18.3
			25	25	2	21.2	21.1	21.3	0	18.4	18.3	18.2
			50	0	2	21.2	21.0	21.2	0	18.3	18.2	18.3

LTE Band 2 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						1852.5 MHz	1880 MHz	1907.5 MHz		1852.5 MHz	1880 MHz	1907.5 MHz
LTE Band 2	5	QPSK	1	0	0	23.0	23.0	23.0	0	18.2	18.4	18.2
			1	12	0	23.0	22.9	23.0	0	18.1	18.2	18.0
			1	24	0	23.1	22.9	23.0	0	18.4	18.1	18.2
			12	0	1	22.1	21.8	21.9	0	18.3	18.3	18.0
			12	6	1	22.0	21.8	21.9	0	18.3	18.3	18.0
			12	11	1	22.1	21.8	21.9	0	18.4	18.3	18.0
		16QAM	25	0	1	22.0	21.8	21.9	0	18.3	18.3	18.0
			1	0	1	22.5	22.1	22.1	0	18.5	18.8	18.2
			1	12	1	22.5	21.9	22.1	0	18.4	18.8	18.1
			1	24	1	22.5	22.0	22.1	0	18.6	18.8	18.2
			12	0	2	21.1	20.9	20.9	0	18.3	18.4	18.2
			12	6	2	21.1	20.9	21.0	0	18.3	18.3	18.2
			12	11	2	21.1	20.9	21.0	0	18.4	18.4	18.2
			25	0	2	21.1	20.8	20.9	0	18.3	18.3	18.0
LTE Band 2	3	QPSK	1	0	0	23.0	22.9	22.7	0	18.1	18.2	18.1
			1	7	0	23.0	22.9	22.7	0	18.2	18.3	18.2
			1	14	0	22.9	22.9	22.9	0	18.4	18.1	18.1
			8	0	1	22.0	21.8	21.9	0	18.3	18.2	18.0
			8	4	1	22.0	21.8	21.9	0	18.3	18.2	18.1
			8	7	1	22.0	21.8	21.9	0	18.3	18.3	18.1
		16QAM	15	0	1	22.0	21.8	21.9	0	18.3	18.3	18.1
			1	0	1	22.4	21.7	21.9	0	18.3	18.2	18.4
			1	7	1	22.4	21.7	22.0	0	18.4	18.3	18.5
			1	14	1	22.3	21.7	22.0	0	18.4	18.1	18.4
			8	0	2	21.0	20.9	21.0	0	18.4	18.3	18.0
			8	4	2	21.1	20.9	21.0	0	18.4	18.3	18.0
			8	7	2	21.0	20.9	20.9	0	18.4	18.3	18.0
			15	0	2	21.0	20.8	20.8	0	18.2	18.2	18.2
LTE Band 2	1.4	QPSK	1	0	0	22.9	22.8	22.9	0	18.1	18.1	18.0
			1	2	0	23.1	22.8	23.0	0	18.1	18.1	18.1
			1	5	0	23.0	22.8	22.9	0	18.0	18.1	18.0
			3	0	0	22.9	22.7	22.8	0	18.0	18.1	18.1
			3	1	0	22.9	22.8	22.8	0	18.1	18.1	18.1
			3	2	0	23.0	22.8	22.8	0	18.1	18.1	18.1
		16QAM	6	0	1	22.0	21.7	21.8	0	18.2	18.2	17.9
			1	0	1	22.0	22.1	21.9	0	18.2	18.6	18.0
			1	2	1	22.1	22.1	21.9	0	18.3	18.6	18.1
			1	5	1	22.0	22.1	21.9	0	18.2	18.6	18.0
			3	0	1	22.1	21.9	21.9	0	18.2	18.4	18.1
			3	1	1	22.2	22.0	21.9	0	18.3	18.4	18.2
			3	2	1	22.1	21.9	21.9	0	18.3	18.4	18.1
			6	0	2	21.1	20.6	21.0	0	18.2	18.1	18.2

LTE Band 4 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						1720 MHz	1732.5 MHz	1745 MHz		1720 MHz	1732.5 MHz	1745 MHz
LTE Band 4	20	QPSK	1	0	0		23.1		0		18.4	
			1	49	0		23.7		0		19.0	
			1	99	0		22.8		0		18.2	
			50	0	1		22.5		0		18.8	
			50	24	1		22.7		0		18.9	
			50	49	1		22.5		0		18.8	
			100	0	1		22.4		0		18.8	
		16QAM	1	0	1		22.7		0		18.8	
			1	49	1		22.7		0		18.9	
			1	99	1		22.4		0		18.6	
			50	0	2		21.6		0		18.9	
			50	24	2		21.8		0		19.0	
			50	50	2		21.5		0		18.8	
			100	0	2		21.5		0		18.8	
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						1717.5 MHz	1732.5 MHz	1747.5 MHz		1717.5 MHz	1732.5 MHz	1747.5 MHz
LTE Band 4	15	QPSK	1	0	0	23.3	23.3	23.2	0	18.3	18.6	18.4
			1	36	0	23.6	23.1	23.6	0	19.0	19.0	18.7
			1	74	0	23.4	23.2	23.2	0	18.4	18.5	18.4
			36	0	1	22.6	22.5	22.6	0	18.6	18.8	18.6
			36	18	1	22.8	22.7	22.7	0	18.8	19.0	18.7
			36	37	1	22.7	22.6	22.5	0	18.7	18.8	18.6
			75	0	1	22.7	22.5	22.5	0	18.7	18.8	18.6
		16QAM	1	0	1	22.7	22.3	22.5	0	18.3	19.0	18.7
			1	36	1	22.8	22.7	22.9	0	18.8	19.0	19.0
			1	74	1	22.8	22.3	22.4	0	18.4	18.9	18.7
			36	0	2	21.7	21.7	21.6	0	18.7	18.9	18.6
			36	18	2	21.9	21.8	21.7	0	18.9	19.0	18.7
			36	37	2	21.9	21.7	21.6	0	18.8	18.9	18.7
			75	0	2	21.8	21.6	21.6	0	18.8	18.9	18.7
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						1715 MHz	1732.5 MHz	1750 MHz		1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4	10	QPSK	1	0	0	23.5	23.5	23.4	0	18.5	18.4	18.4
			1	25	0	23.4	23.4	23.2	0	18.3	18.2	18.2
			1	49	0	23.4	23.4	23.4	0	18.5	18.1	18.5
			25	0	1	22.4	22.3	22.3	0	18.3	18.2	18.2
			25	12	1	22.4	22.3	22.3	0	18.4	18.2	18.2
			25	25	1	22.4	22.3	22.2	0	18.3	18.2	18.1
			50	0	1	22.4	22.3	22.3	0	18.3	18.1	18.2
		16QAM	1	0	1	22.9	22.4	22.5	0	18.4	18.8	18.4
			1	25	1	22.8	22.2	22.3	0	18.2	18.6	18.2
			1	49	1	22.9	22.3	22.4	0	18.4	18.5	18.4
			25	0	2	21.4	21.4	21.5	0	18.3	18.2	18.5
			25	12	2	21.5	21.4	21.4	0	18.4	18.2	18.4
			25	25	2	21.5	21.4	21.4	0	18.4	18.2	18.3
			50	0	2	21.6	21.4	21.4	0	18.3	18.2	18.3

LTE Band 4 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						1712.5 MHz	1732.5 MHz	1752.5 MHz		1712.5 MHz	1732.5 MHz	1752.5 MHz
LTE Band 4	5	QPSK	1	0	0	23.5	23.4	23.3	0	18.4	18.1	18.3
			1	12	0	23.4	23.5	23.3	0	18.2	18.2	18.2
			1	24	0	23.5	23.5	23.4	0	18.3	18.2	18.4
			12	0	1	22.5	22.4	22.3	0	18.4	18.1	18.3
			12	6	1	22.5	22.4	22.3	0	18.4	18.2	18.2
			12	11	1	22.5	22.4	22.3	0	18.3	18.2	18.2
		16QAM	25	0	1	22.5	22.4	22.3	0	18.3	18.2	18.2
			1	0	1	22.6	22.5	22.4	0	18.6	18.6	18.4
			1	12	1	22.6	22.6	22.3	0	18.4	18.7	18.3
			1	24	1	22.5	22.5	22.4	0	18.4	18.7	18.5
			12	0	2	21.6	21.5	21.3	0	18.4	18.3	18.3
			12	6	2	21.6	21.6	21.4	0	18.5	18.4	18.3
			12	11	2	21.7	21.5	21.4	0	18.4	18.4	18.3
			25	0	2	21.6	21.5	21.3	0	18.4	18.3	18.3

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						1711.5 MHz	1732.5 MHz	1753.5 MHz		1711.5 MHz	1732.5 MHz	1753.5 MHz
LTE Band 4	3	QPSK	1	0	0	23.4	23.3	23.1	0	18.3	18.1	18.1
			1	7	0	23.4	23.4	23.1	0	18.4	18.2	18.3
			1	14	0	23.4	23.3	23.1	0	18.2	18.1	18.3
			8	0	1	22.4	22.3	22.2	0	18.3	18.1	18.2
			8	4	1	22.5	22.4	22.2	0	18.3	18.2	18.2
			8	7	1	22.5	22.3	22.2	0	18.3	18.2	18.2
		16QAM	15	0	1	22.5	22.4	22.2	0	18.3	18.2	18.2
			1	0	1	22.8	22.2	22.2	0	18.4	18.0	18.5
			1	7	1	22.8	22.3	22.3	0	18.4	18.2	18.7
			1	14	1	22.7	22.2	22.2	0	18.2	18.1	18.7
			8	0	2	21.5	21.5	21.2	0	18.5	18.2	18.1
			8	4	2	21.6	21.6	21.3	0	18.6	18.3	18.2
			8	7	2	21.6	21.5	21.3	0	18.5	18.3	18.2
			15	0	2	21.5	21.5	21.2	0	18.3	18.2	18.3

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						1710.7 MHz	1732.5 MHz	1754.3 MHz		1710.7 MHz	1732.5 MHz	1754.3 MHz
LTE Band 4	1.4	QPSK	1	0	0	23.4	23.3	23.0	0	18.2	18.1	18.1
			1	2	0	23.4	23.5	23.1	0	18.3	18.1	18.1
			1	5	0	23.3	23.4	23.1	0	18.2	18.0	18.1
			3	0	0	23.5	23.2	23.1	0	18.3	18.1	18.1
			3	1	0	23.5	23.3	23.1	0	18.3	18.1	18.2
			3	2	0	23.4	23.3	23.1	0	18.3	18.2	18.2
		16QAM	6	0	1	22.4	22.2	22.1	0	18.2	18.0	18.1
			1	0	1	22.7	22.3	22.2	0	18.7	18.1	18.2
			1	2	1	22.7	22.5	22.2	0	18.7	18.2	18.3
			1	5	1	22.7	22.4	22.2	0	18.7	18.1	18.2
			3	0	1	22.7	22.3	22.3	0	18.6	18.3	18.2
			3	1	1	22.7	22.3	22.4	0	18.5	18.3	18.3
			3	2	1	22.5	22.4	22.3	0	18.6	18.4	18.2
			6	0	2	21.4	21.4	21.3	0	18.3	18.3	18.3

Note(s):
 20 MHz Bandwidth does not support at least three non-overlapping channels. 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 per KDB 941225 D05 SAR for LTE Devices.

LTE Band 5 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						829 MHz	836.5 MHz	844 MHz		829 MHz	836.5 MHz	844 MHz
LTE Band 5	10	QPSK	1	0	0		23.7		0		21.4	
			1	25	0		23.6		0		21.3	
			1	49	0		23.8		0		21.4	
			25	0	1		22.6		1		21.4	
			25	12	1		22.6		1		21.4	
			25	25	1		22.7		1		21.4	
		16QAM	50	0	1		22.6		1		21.3	
			1	0	1		22.6		1		21.7	
			1	25	1		22.5		1		21.7	
			1	49	1		22.7		1		21.8	
			25	0	2		21.7		2		21.4	
			25	12	2		21.6		2		21.5	
			25	25	2		21.7		2		21.4	
	50	0	2		21.6		2		21.4			
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						826.5 MHz	836.5 MHz	846.5 MHz		826.5 MHz	836.5 MHz	846.5 MHz
LTE Band 5	5	QPSK	1	0	0	23.7	23.7	23.5	0	21.1	21.3	21.2
			1	12	0	23.7	23.7	23.6	0	21.1	21.3	21.1
			1	24	0	23.8	23.9	23.7	0	21.3	21.4	21.2
			12	0	1	22.7	22.6	22.6	1	21.2	21.3	21.2
			12	7	1	22.8	22.6	22.7	1	21.3	21.3	21.2
			12	13	1	22.7	22.7	22.6	1	21.3	21.3	21.3
		16QAM	25	0	1	22.7	22.7	22.7	1	21.2	21.3	21.2
			1	0	1	23.2	22.8	22.7	1	21.4	21.8	21.3
			1	12	1	23.3	22.7	22.7	1	21.4	21.9	21.2
			1	24	1	23.3	22.9	22.8	1	21.5	21.9	21.3
			12	0	2	21.9	21.7	21.7	2	21.3	21.5	21.2
			12	7	2	21.9	21.7	21.7	2	21.4	21.6	21.3
			12	13	2	21.9	21.8	21.7	2	21.4	21.5	21.3
			25	0	2	21.8	21.7	21.7	2	21.3	21.5	21.2
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						825.5 MHz	836.5 MHz	847.5 MHz		825.5 MHz	836.5 MHz	847.5 MHz
LTE Band 5	3	QPSK	1	0	0	23.6	23.6	23.8	0	21.1	21.3	21.4
			1	8	0	23.6	23.6	23.7	0	21.1	21.4	21.5
			1	14	0	23.6	23.7	23.8	0	21.1	21.3	21.4
			8	0	1	22.6	22.6	22.8	1	21.1	21.4	21.4
			8	4	1	22.6	22.6	22.8	1	21.1	21.3	21.4
			8	7	1	22.6	22.6	22.8	1	21.1	21.4	21.4
		16QAM	15	0	1	22.6	22.6	22.8	1	21.1	21.3	21.4
			1	0	1	22.9	22.5	22.9	1	21.0	21.7	21.4
			1	8	1	22.9	22.5	22.9	1	21.0	21.8	21.5
			1	14	1	23.0	22.6	22.9	1	21.0	21.8	21.4
			8	0	2	21.7	21.7	21.9	2	21.2	21.3	21.6
			8	4	2	21.7	21.7	21.9	2	21.2	21.3	21.6
			8	7	2	21.7	21.7	21.9	2	21.2	21.4	21.6
			15	0	2	21.7	21.6	21.9	2	21.1	21.3	21.4

LTE Band 5 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						824.7 MHz	836.5 MHz	848.3 MHz		824.7 MHz	836.5 MHz	848.3 MHz
LTE Band 5	1.4	QPSK	1	0	0	23.5	23.6	23.8	0	21.0	21.3	21.3
			1	2	0	23.6	23.6	23.9	0	21.1	21.3	21.4
			1	5	0	23.6	23.6	23.8	0	21.1	21.3	21.3
			3	0	0	23.6	23.7	23.8	0	21.0	21.3	21.4
			3	1	0	23.6	23.6	23.8	0	21.1	21.3	21.4
			3	2	0	23.6	23.6	23.8	0	21.1	21.3	21.4
		16QAM	6	0	1	22.5	22.5	22.8	1	21.0	21.3	21.3
			1	0	1	22.6	23.0	22.9	1	21.1	21.6	21.4
			1	2	1	22.6	23.0	22.8	1	21.2	21.7	21.4
			1	5	1	22.6	22.9	22.8	1	21.2	21.7	21.4
			3	0	1	22.7	22.8	22.9	1	21.1	21.5	21.5
			3	1	1	22.8	22.8	22.9	1	21.2	21.6	21.6
			3	2	1	22.7	22.8	23.0	1	21.2	21.6	21.6
			6	0	2	21.7	21.5	21.9	2	21.2	21.3	21.5

Note(s):

10 MHz Bandwidth does not support at least three non-overlapping channels. 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 per KDB 941225 D05 SAR for LTE Devices.

LTE Band 7 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						2510 MHz	2535 MHz	2560 MHz		2510 MHz	2535 MHz	2560 MHz
LTE Band 7	20	QPSK	1	0	0	23.4	23.4	23.4	0	20.7	20.8	20.7
			1	49	0	23.9	24.0	23.8	0	21.2	21.4	21.2
			1	99	0	23.6	23.7	23.4	0	20.8	21.2	20.9
			50	0	1	23.4	23.3	23.2	0	21.2	21.2	21.2
			50	24	1	23.5	23.5	23.3	0	21.3	21.3	21.2
			50	50	1	23.4	23.4	23.3	0	21.1	21.3	21.1
		16QAM	100	0	1	23.4	23.4	23.2	0	21.2	21.3	21.1
			1	0	1	23.4	23.4	23.3	0	21.1	21.3	21.3
			1	49	1	23.4	23.5	23.5	0	21.6	21.9	21.7
			1	99	1	23.5	23.5	23.5	0	21.3	21.7	21.4
			50	0	2	22.4	22.4	22.3	0	21.2	21.2	21.2
			50	24	2	22.5	22.5	22.3	0	21.3	21.3	21.2
			50	50	2	22.4	22.4	22.3	0	21.1	21.3	21.1
			100	0	2	22.4	22.4	22.2	0	21.1	21.3	21.1

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						2507.5 MHz	2535 MHz	2562.5 MHz		2507.5 MHz	2535 MHz	2562.5 MHz
LTE Band 7	15	QPSK	1	0	0	23.7	23.5	23.4	0	20.9	20.8	20.7
			1	37	0	24.1	24.2	24.0	0	21.3	21.4	21.1
			1	74	0	23.7	23.5	23.4	0	20.9	20.9	20.7
			36	0	1	23.5	23.4	23.3	0	21.3	21.3	21.2
			36	20	1	23.5	23.5	23.4	0	21.3	21.4	21.2
			36	39	1	23.4	23.4	23.3	0	21.2	21.3	21.1
		16QAM	75	0	1	23.5	23.4	23.3	0	21.3	21.2	21.1
			1	0	1	23.5	23.0	23.4	0	21.4	20.9	21.2
			1	37	1	23.5	23.5	23.5	0	21.7	21.4	21.4
			1	74	1	23.5	23.1	23.3	0	21.3	20.9	21.0
			36	0	2	22.5	22.4	22.4	0	21.2	21.2	21.2
			36	20	2	22.4	22.5	22.4	0	21.3	21.3	21.2
			36	39	2	22.5	22.5	22.3	0	21.2	21.3	21.1
			75	0	2	22.5	22.4	22.3	0	21.3	21.2	21.1

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						2505 MHz	2535 MHz	2565 MHz		2505 MHz	2535 MHz	2565 MHz
LTE Band 7	10	QPSK	1	0	0	23.6	23.8	23.4	0	21.0	21.1	20.7
			1	25	0	23.5	23.5	23.3	0	20.8	20.9	20.5
			1	49	0	24.0	24.1	23.8	0	21.3	21.5	21.1
			25	0	1	23.1	23.0	22.8	0	20.9	20.9	20.5
			25	12	1	23.1	23.1	22.8	0	20.8	21.0	20.6
			25	25	1	23.3	23.2	23.0	0	21.0	21.1	20.7
		16QAM	50	0	1	23.1	23.1	22.9	0	20.9	21.1	20.6
			1	0	1	23.1	23.1	23.3	0	21.0	21.1	21.0
			1	25	1	23.1	22.9	23.2	0	20.8	20.9	20.9
			1	49	1	23.5	23.5	23.5	0	21.3	21.4	21.5
			25	0	2	22.2	22.0	21.8	0	21.0	20.8	20.5
			25	12	2	22.2	22.1	21.8	0	20.9	21.0	20.7
			25	25	2	22.4	22.2	21.9	0	21.1	21.1	20.7
			50	0	2	22.2	22.1	21.8	0	20.9	21.1	20.6

LTE Band 7 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						2502.5 MHz	2535 MHz	2567.5 MHz		2502.5 MHz	2535 MHz	2567.5 MHz
LTE Band 7	5	QPSK	1	0	0	23.6	23.5	23.3	0	20.9	21.0	20.6
			1	12	0	23.7	23.6	23.3	0	21.0	21.0	20.7
			1	24	0	23.7	23.7	23.4	0	21.0	21.1	20.6
			12	0	1	23.0	23.0	22.7	0	20.8	20.9	20.6
			12	7	1	23.0	23.1	22.8	0	20.8	21.0	20.6
			12	13	1	23.1	23.1	22.8	0	20.9	21.0	20.6
		25	0	1	23.1	23.0	22.8	0	20.9	20.9	20.6	
		16QAM	1	0	1	23.2	23.4	22.8	0	21.1	21.4	20.7
			1	12	1	23.3	23.5	22.9	0	21.2	21.5	20.8
			1	24	1	23.4	23.4	22.9	0	21.2	21.6	20.8
			12	0	2	22.1	22.1	21.8	0	21.0	21.1	20.6
			12	7	2	22.1	22.2	21.8	0	20.9	21.1	20.7
			12	13	2	22.2	22.3	21.8	0	20.9	21.2	20.7
			25	0	2	22.2	22.1	21.8	0	20.9	21.0	20.6

LTE Band 12 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						704 MHz	707.5 MHz	711 MHz
LTE Band 12	10	QPSK	1	0	0		24.0	
			1	25	0		23.7	
			1	49	0		23.8	
			25	0	1		22.8	
			25	12	1		22.8	
			25	25	1		22.7	
		16QAM	50	0	1		22.7	
			1	0	1		22.8	
			1	25	1		22.6	
			1	49	1		22.6	
			25	0	2		21.8	
			25	12	2		21.8	
			25	25	2		21.7	
			50	0	2		21.7	
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						701.5 MHz	707.5 MHz	713.5 MHz
LTE Band 12	5	QPSK	1	0	0	23.6	23.7	23.8
			1	12	0	23.6	23.7	23.8
			1	24	0	23.5	23.6	23.8
			12	0	1	22.6	22.6	22.8
			12	7	1	22.7	22.7	22.8
			12	13	1	22.6	22.6	22.7
		16QAM	25	0	1	22.6	22.6	22.8
			1	0	1	23.2	22.8	22.9
			1	12	1	23.1	22.7	23.0
			1	24	1	23.1	22.7	23.0
			12	0	2	21.8	21.7	21.9
			12	7	2	21.8	21.7	21.9
			12	13	2	21.8	21.7	21.8
			25	0	2	21.8	21.7	21.8
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						700.5 MHz	707.5 MHz	714.5 MHz
LTE Band 12	3	QPSK	1	0	0	23.7	23.5	23.8
			1	8	0	23.7	23.5	23.7
			1	14	0	23.6	23.5	23.7
			8	0	1	22.6	22.6	22.7
			8	4	1	22.6	22.6	22.8
			8	7	1	22.6	22.5	22.7
		16QAM	15	0	1	22.5	22.5	22.7
			1	0	1	22.9	22.3	22.8
			1	8	1	22.9	22.4	22.8
			1	14	1	22.8	22.3	22.7
			8	0	2	21.7	21.6	21.8
			8	4	2	21.7	21.7	21.8
			8	7	2	21.6	21.6	21.8
			15	0	2	21.6	21.6	21.7

LTE Band 12 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)		
						699.7 MHz	707.5 MHz	715.3 MHz
LTE Band 12	1.4	QPSK	1	0	0	23.5	23.2	23.7
			1	3	0	23.6	23.3	23.7
			1	5	0	23.6	23.3	23.7
			3	0	0	23.7	23.6	23.7
			3	1	0	23.7	23.6	23.8
			3	3	0	23.7	23.6	23.7
		6	0	1	22.5	22.5	22.7	
		16QAM	1	0	1	22.6	22.8	22.7
			1	3	1	22.6	22.9	22.8
			1	5	1	22.6	22.8	22.7
			3	0	1	22.7	22.7	22.8
			3	1	1	22.7	22.7	22.8
			3	3	1	22.7	22.6	22.8
			6	0	2	21.7	21.4	21.8

Note(s):

10 MHz Bandwidth does not support at least three non-overlapping channels. 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 per KDB 941225 D05 SAR for LTE Devices.

LTE Band 13 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)
						782 MHz
LTE Band 13	10	QPSK	1	0	0	22.9
			1	25	0	22.9
			1	49	0	23.2
			25	0	1	22.0
			25	12	1	22.0
			25	25	1	22.2
		16QAM	1	0	1	22.0
			1	25	1	22.0
			1	49	1	22.4
			25	0	2	21.1
			25	12	2	21.1
			25	25	2	21.2
			50	0	2	21.0
			50	0	2	21.0
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)
						782 MHz
LTE Band 13	5	QPSK	1	0	0	23.0
			1	12	0	22.9
			1	24	0	23.0
			12	0	1	21.9
			12	6	1	22.0
			12	11	1	22.0
		16QAM	25	0	1	22.0
			1	0	1	22.2
			1	12	1	22.1
			1	24	1	22.2
			12	0	2	21.0
			12	6	2	21.0
			12	11	2	21.1
			25	0	2	21.0
			25	0	2	21.0
			25	0	2	21.0

Note(s):

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

LTE Band 17 Measured Results

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

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)
						710 MHz
LTE Band 17	10	QPSK	1	0	0	23.6
			1	25	0	23.3
			1	49	0	23.2
			25	0	1	22.3
			25	12	1	22.4
			25	25	1	22.3
			50	0	1	22.4
		16QAM	1	0	1	22.7
			1	25	1	22.3
			1	49	1	22.3
			25	0	2	21.4
			25	12	2	21.5
			25	25	2	21.4
			50	0	2	21.4
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)
						710 MHz
LTE Band 17	5	QPSK	1	0	0	23.4
			1	12	0	23.4
			1	24	0	23.3
			12	0	1	22.3
			12	6	1	22.4
			12	11	1	22.4
			25	0	1	22.3
		16QAM	1	0	1	22.4
			1	12	1	22.4
			1	24	1	22.4
			12	0	2	21.4
			12	6	2	21.4
			12	11	2	21.5
			25	0	2	21.3

Note(s):

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

LTE Band 26 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						821.5 MHz	831.5 MHz	841.5 MHz		821.5 MHz	831.5 MHz	841.5 MHz
LTE Band 26	15	QPSK	1	0	0	23.4	23.0	23.4	0	21.1	21.0	21.0
			1	37	0	23.7	23.1	24.2	0	21.3	21.4	21.2
			1	74	0	23.7	23.3	23.6	0	21.1	21.3	21.1
			36	0	1	22.7	22.2	22.6	0	21.2	21.3	21.2
			36	20	1	22.7	22.4	22.7	0	21.3	21.5	21.3
			36	37	1	22.6	22.4	22.7	0	21.2	21.4	21.3
		16QAM	75	0	1	22.6	22.3	22.5	0	21.2	21.3	21.3
			1	0	1	22.7	21.8	22.6	0	21.3	21.0	21.2
			1	37	1	22.9	22.2	22.8	0	21.6	21.2	21.6
			1	74	1	22.9	22.2	22.8	0	21.3	21.2	21.4
			36	0	2	21.8	21.3	21.6	0	21.3	21.3	21.3
			36	20	2	21.8	21.4	21.7	0	21.3	21.5	21.4
			36	37	2	21.7	21.4	21.7	0	21.2	21.5	21.4
			75	0	2	21.7	21.3	21.7	0	21.3	21.4	21.4
LTE Band 26	10	QPSK	1	0	0	23.6	23.3	23.5	0	21.2	21.2	21.0
			1	25	0	23.5	23.3	23.4	0	21.1	21.2	21.0
			1	49	0	23.5	23.3	23.5	0	21.0	21.1	21.1
			25	0	1	22.6	22.4	22.5	0	21.2	21.2	21.1
			25	12	1	22.6	22.4	22.5	0	21.1	21.3	21.1
			25	25	1	22.5	22.4	22.5	0	21.1	21.2	21.2
		16QAM	50	0	1	22.6	22.4	22.6	0	21.1	21.2	21.1
			1	0	1	22.5	22.3	22.8	0	21.5	21.2	21.0
			1	25	1	22.4	22.4	22.8	0	21.4	21.2	21.1
			1	49	1	22.3	22.3	23.0	0	21.4	21.1	21.0
			25	0	2	21.6	21.5	21.6	0	21.3	21.3	21.1
			25	12	2	21.6	21.5	21.6	0	21.2	21.4	21.2
			25	25	2	21.6	21.5	21.6	0	21.2	21.3	21.2
			50	0	2	21.6	21.5	21.6	0	21.2	21.2	21.2
LTE Band 26	5	QPSK	1	0	0	23.4	23.6	23.5	0	21.2	21.1	21.3
			1	12	0	23.4	23.6	23.4	0	21.1	21.1	21.2
			1	24	0	23.6	23.5	23.5	0	21.2	21.1	21.3
			12	0	1	22.6	22.4	22.5	0	21.2	21.1	21.2
			12	6	1	22.6	22.4	22.5	0	21.2	21.1	21.3
			12	11	1	22.6	22.4	22.4	0	21.2	21.2	21.3
			25	0	1	22.5	22.4	22.5	0	21.2	21.2	21.3
		16QAM	1	0	1	23.2	22.7	22.5	0	21.4	21.4	21.9
			1	12	1	23.0	22.7	22.5	0	21.2	21.4	21.8
			1	24	1	23.2	22.6	22.5	0	21.3	21.4	21.9
			12	0	2	21.8	21.4	21.6	0	21.3	21.2	21.5
			12	6	2	21.7	21.4	21.6	0	21.3	21.2	21.5
			12	11	2	21.7	21.4	21.5	0	21.2	21.3	21.5
			25	0	2	21.6	21.4	21.5	0	21.2	21.2	21.5

LTE Band 26 Measured Results (continued)

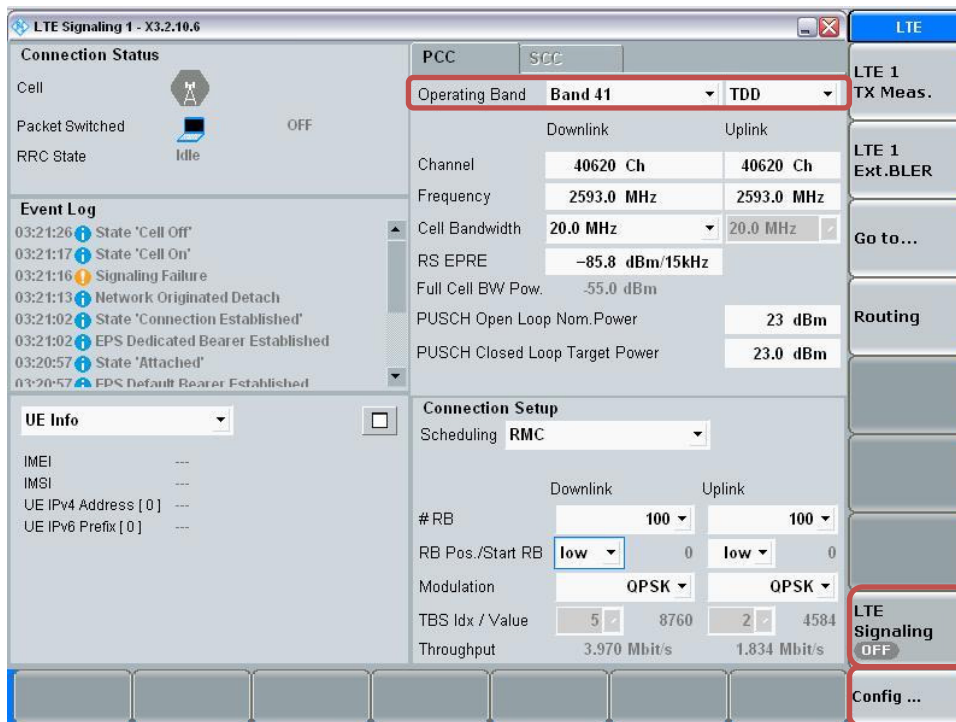
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						815.5 MHz	831.5 MHz	847.5 MHz		815.5 MHz	831.5 MHz	847.5 MHz
LTE Band 26	3	QPSK	1	0	0	23.5	23.3	23.6	0	21.1	21.1	21.4
			1	7	0	23.5	23.3	23.7	0	21.1	21.2	21.4
			1	14	0	23.4	23.3	23.8	0	21.0	21.1	21.3
			8	0	1	22.5	22.3	22.8	0	21.1	21.1	21.5
			8	4	1	22.5	22.4	22.7	0	21.0	21.1	21.3
			8	7	1	22.4	22.3	22.8	0	21.0	21.1	21.4
		16QAM	15	0	1	22.5	22.4	22.8	0	21.1	21.2	21.4
			1	0	1	22.4	22.4	23.0	0	21.1	21.0	21.7
			1	7	1	22.3	22.5	23.0	0	21.2	21.1	21.8
			1	14	1	22.3	22.4	23.1	0	21.1	21.0	21.7
			8	0	2	21.6	21.4	21.9	0	21.3	21.3	21.4
			8	4	2	21.6	21.5	21.9	0	21.3	21.3	21.3
			8	7	2	21.6	21.3	21.8	0	21.3	21.3	21.3
			15	0	2	21.5	21.3	21.8	0	21.1	21.2	21.4
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Avg Pwr (dBm)			MPR	Reduced Avg Pwr (dBm)		
						814.7 MHz	831.5 MHz	848.3 MHz		814.7 MHz	831.5 MHz	848.3 MHz
LTE Band 26	1.4	QPSK	1	0	0	23.5	23.3	23.8	0	21.1	21.1	21.2
			1	2	0	23.5	23.4	23.7	0	21.0	21.1	21.3
			1	5	0	23.4	23.3	23.7	0	21.0	21.1	21.2
			3	0	0	23.5	23.3	23.8	0	21.0	21.0	21.4
			3	1	0	23.5	23.3	23.8	0	21.0	21.1	21.3
			3	2	0	23.5	23.3	23.8	0	21.1	21.1	21.4
		16QAM	6	0	1	22.4	22.3	22.7	0	21.0	21.1	21.2
			1	0	1	22.5	22.4	23.1	0	21.1	21.4	21.3
			1	2	1	22.5	22.4	23.1	0	21.1	21.5	21.4
			1	5	1	22.5	22.3	23.1	0	21.1	21.4	21.3
			3	0	1	22.5	22.5	23.0	0	21.1	21.3	21.5
			3	1	1	22.6	22.5	23.0	0	21.1	21.4	21.5
			3	2	1	22.6	22.5	23.0	0	21.1	21.3	21.5
			6	0	2	21.5	21.5	21.6	0	21.2	21.0	21.5

LTE Band 41 Measured Results

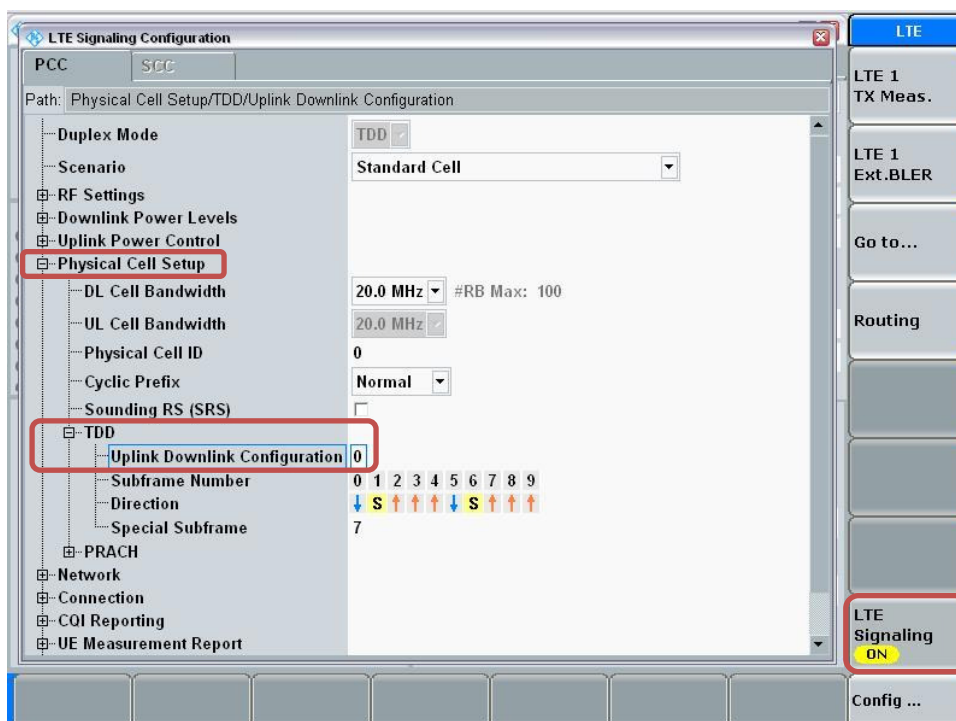
Procedure used to establish SAR test signal for LTE TDD Band 41

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...”

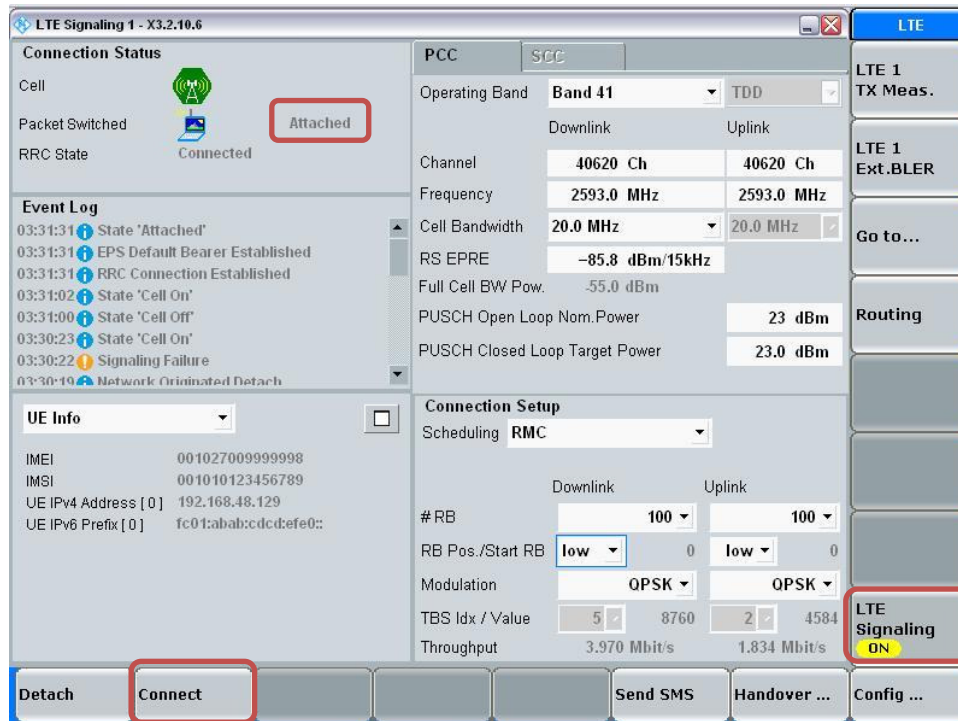


- Go to “Physical Cell Setup”
- Select “TDD” and Set “Uplink Downlink Configuration” to “0”
- Turn the cell on using “ON | OFF” key



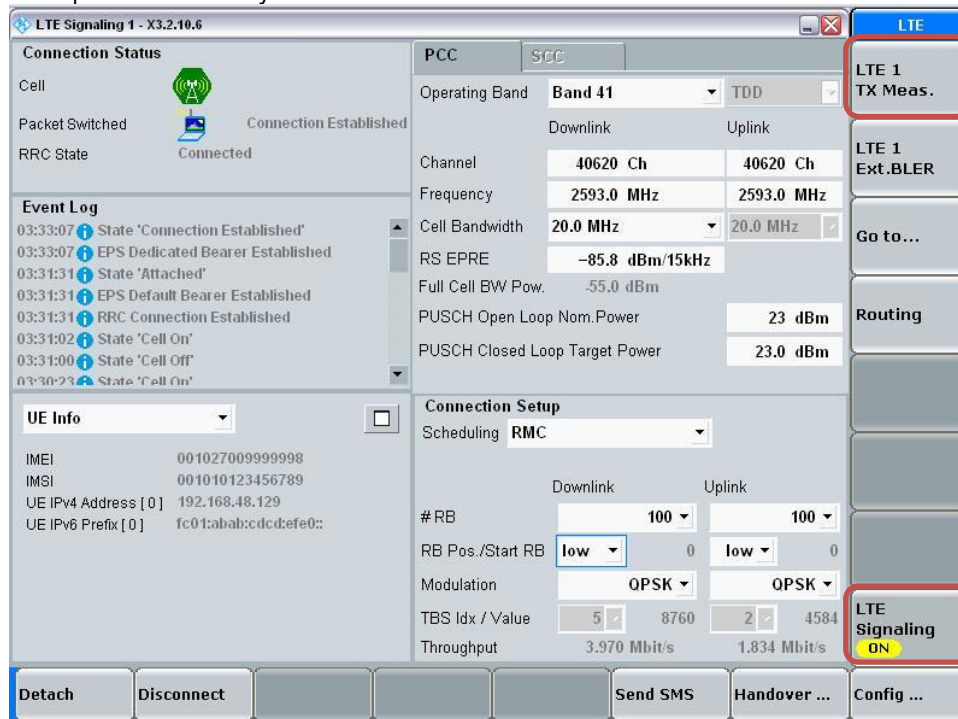
Connect to EUT

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

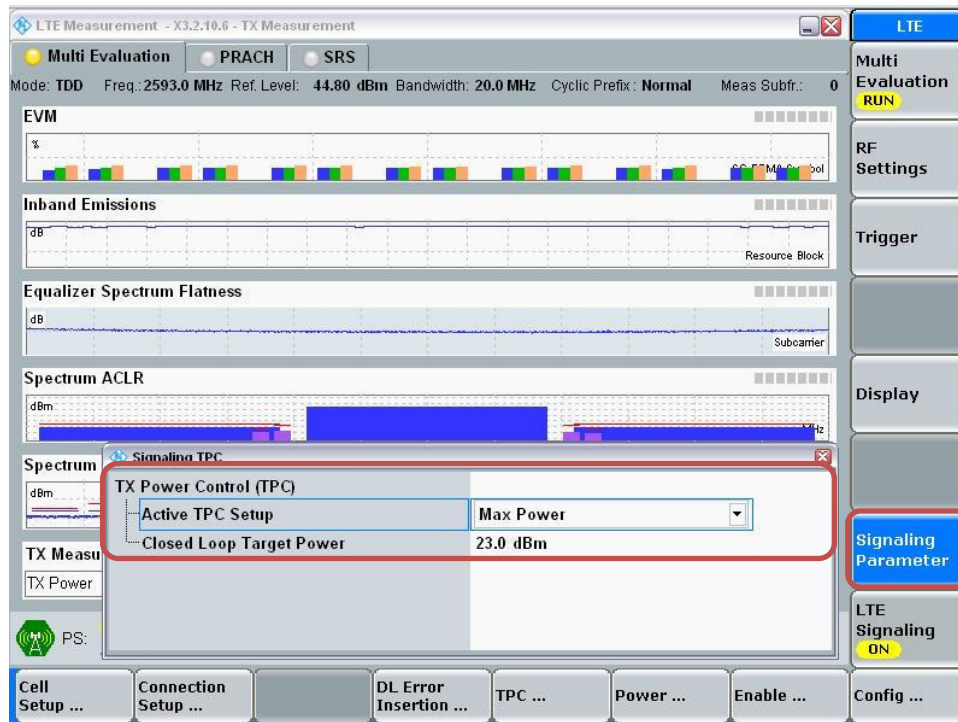


Max Power Setting

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

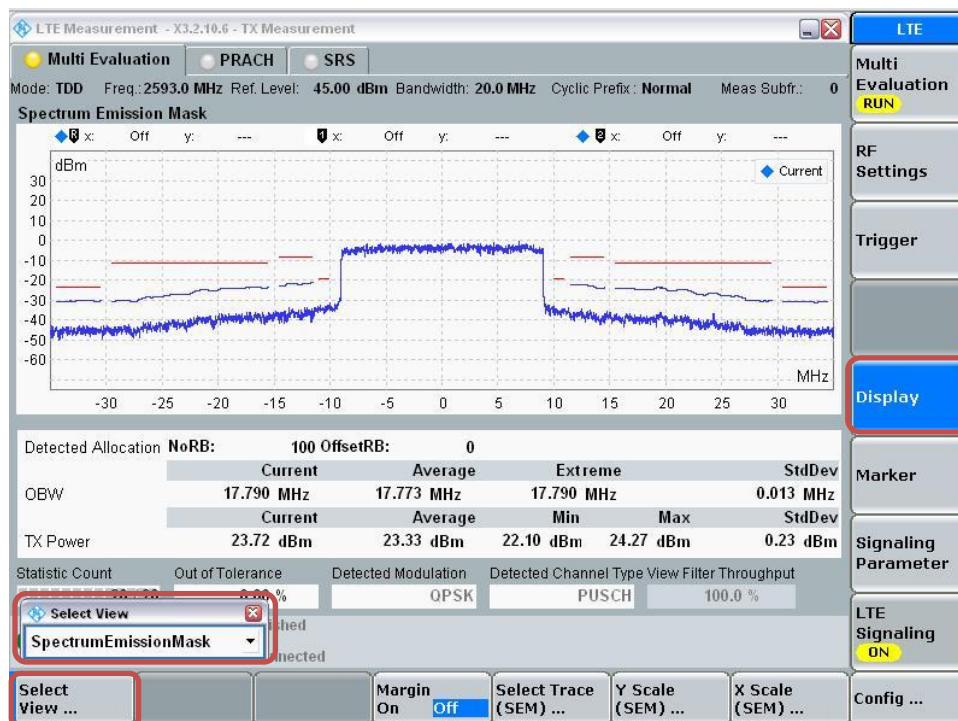


- Select “Signaling Parameter”
- Select “TX Power Control (TPC)” > Select “Active TPC Setup” to “Max Power” > Set “Closed Loop Target Power” to “23 dBm”



View TX Power

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



LTE Band 41 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Max. Avg Pwr (dBm)					Reduced Avg Pwr (dBm)				
					2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz	2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz
LTE Band 41	20	QPSK	1	0	23.4	23.3	23.3	22.9	23.0	20.6	20.6	20.3	20.4	20.1
			1	49	24.1	24.0	23.9	23.6	23.7	21.2	21.1	20.9	21.1	20.8
			1	99	23.5	23.3	23.2	23.0	23.1	20.4	20.4	20.2	20.3	20.2
			50	0	22.9	23.0	22.6	22.4	22.5	20.9	20.9	20.7	20.8	20.5
			50	24	23.2	23.2	22.9	22.7	22.8	21.1	21.1	20.9	21.0	20.8
			50	50	23.0	22.9	22.7	22.5	22.6	20.9	20.9	20.7	20.8	20.6
		16QAM	1	49	22.9	22.4	22.4	22.0	22.2	20.7	20.7	20.3	20.2	20.1
			1	50	23.4	23.1	23.0	22.7	22.9	21.3	21.3	20.9	20.9	20.7
			1	99	23.0	22.4	22.3	22.0	22.2	20.6	20.5	20.1	20.2	20.1
			50	0	21.9	22.0	21.7	22.4	21.4	20.9	20.9	20.6	20.7	20.5
			50	25	22.0	22.1	21.9	21.6	21.7	21.2	21.1	20.9	21.0	20.8
			50	49	22.0	21.8	21.6	21.4	21.5	21.0	20.9	20.6	20.8	20.6
			100	0	21.9	21.9	21.6	21.4	21.6	20.9	20.9	20.7	20.8	20.6
LTE Band 41	15	QPSK	1	0	23.9	23.5	23.4	23.1	23.2	20.6	20.6	20.4	20.5	20.3
			1	36	24.4	24.3	24.1	23.8	23.9	21.0	20.9	20.9	21.0	21.0
			1	74	24.0	23.5	23.5	23.3	23.3	20.5	20.5	20.4	20.4	20.4
			36	0	23.1	22.9	23.0	22.6	22.6	21.0	21.1	20.8	20.9	20.7
			36	18	23.4	23.0	23.1	22.7	22.7	21.2	21.1	20.9	21.0	20.9
			36	37	23.2	22.9	22.9	22.6	22.6	21.1	21.1	20.8	20.9	20.8
		16QAM	75	0	23.2	22.9	22.9	22.6	22.5	21.1	21.0	20.8	20.9	20.7
			1	0	22.7	22.6	22.2	22.1	22.2	20.7	20.8	20.5	20.5	20.3
			1	36	23.3	22.8	22.6	22.7	22.4	21.2	21.2	21.0	21.0	20.7
			1	74	22.9	22.6	22.2	22.2	22.1	20.7	20.7	20.4	20.5	20.4
			36	0	22.0	21.9	21.9	21.5	21.4	21.0	21.0	20.7	20.8	20.6
			36	18	22.2	22.0	22.0	21.6	21.5	21.2	21.1	20.9	21.0	20.8
			36	37	22.2	21.8	21.8	21.6	21.5	21.1	21.1	20.8	20.9	20.7
			75	0	22.1	21.9	21.8	21.5	21.6	21.0	20.9	20.8	20.9	20.7
LTE Band 41	10	QPSK	1	0	23.1	23.5	23.3	23.1	23.2	20.8	21.1	20.8	20.8	20.6
			1	25	23.2	23.4	23.2	23.1	23.2	20.8	21.0	20.6	20.8	20.6
			1	49	23.2	23.4	23.3	23.1	23.3	20.8	21.0	20.6	20.8	20.6
			25	0	22.1	22.4	22.3	22.0	22.2	20.9	21.1	20.6	20.7	20.6
			25	12	22.1	22.4	22.2	22.0	22.2	20.9	21.0	20.6	20.7	20.7
			25	25	22.2	22.4	22.2	22.1	22.3	20.9	21.1	20.6	20.7	20.6
		16QAM	50	0	22.2	22.5	22.2	22.0	22.3	20.8	21.0	20.6	20.8	20.6
			1	0	22.0	22.2	22.3	21.9	22.2	20.7	21.0	20.6	20.6	20.7
			1	25	22.0	22.2	22.2	21.8	22.2	20.8	20.9	20.5	20.6	20.6
			1	49	21.9	22.2	22.2	21.9	22.3	20.8	20.9	20.5	20.7	20.7
			25	0	21.1	21.4	21.2	21.0	21.2	20.8	21.1	20.6	20.6	20.6
			25	12	21.2	21.4	21.2	21.1	21.2	20.9	21.0	20.6	20.7	20.6
			25	25	21.2	21.4	21.1	21.1	21.2	20.9	21.1	20.6	20.7	20.6
			50	0	21.1	21.3	21.2	21.1	21.3	20.8	21.0	20.6	20.7	20.6

LTE Band 41 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Max. Avg Pwr (dBm)					Reduced Avg Pwr (dBm)				
					2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz	2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz
LTE Band 41	5	QPSK	1	0	23.3	23.4	23.2	23.0	23.2	20.9	21.2	20.7	20.8	20.6
			1	12	23.2	23.5	23.1	23.1	23.3	20.9	21.1	20.7	20.8	20.7
			1	24	23.2	23.4	23.1	23.1	23.3	20.9	21.1	20.7	20.8	20.7
			12	0	22.1	22.3	22.2	22.0	22.2	20.8	21.0	20.6	20.7	20.6
			12	7	22.2	22.3	22.2	22.0	22.1	20.8	21.0	20.6	20.7	20.6
			12	13	22.1	22.3	22.1	22.0	22.1	20.8	21.1	20.6	20.7	20.6
			25	0	22.2	22.3	22.1	22.0	22.2	20.8	21.0	20.6	20.7	20.6
		16QAM	1	0	22.2	22.3	22.4	22.0	22.1	20.7	20.9	20.5	20.6	20.7
			1	12	22.2	22.3	22.3	22.0	22.1	20.7	20.9	20.6	20.6	20.7
			1	24	22.2	22.3	22.3	22.0	22.2	20.8	20.9	20.5	20.6	20.8
			12	0	21.1	21.2	21.2	21.0	21.1	20.8	21.1	20.6	20.7	20.6
			12	7	21.1	21.2	21.1	21.0	21.1	20.8	21.0	20.6	20.7	20.7
			12	13	21.1	21.2	21.1	21.0	21.1	20.9	21.1	20.6	20.7	20.7
			25	0	21.1	21.2	21.1	21.0	21.1	20.8	21.0	20.6	20.7	20.6

LTE Rel. 11 Carrier Aggregation

Carrier Aggregation is only supported for downlink and not for uplink.

9.4. Wi-Fi 2.4GHz (DTS Band)

Measured Results

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Chain 0			Chain 1		
					Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)
2.4	802.11b	1 Mbps	1	2412	12.5	13.2	Yes	6.4	7.5	No
			6	2437	12.0			6.4		
			11	2462	12.3			6.7		
	802.11g	6 Mbps	1	2412	Not Required	13.6	No	Not Required	8.4	No
			6	2437						
			11	2462						
	802.11n (HT20)	6.5 Mbps	1	2412	Not Required	13.7	No	Not Required	8.5	No
			6	2437						
			11	2462						

Note(s):

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

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

Measured Results

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Chain 0			Chain 1			
					Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	
5.2 (U-NII 1)	802.11a	6 Mbps	36	5180	Not Required	10.4	No	Not Required	5.0	No	
			40	5200							
			44	5220							
			48	5240							
	802.11n (HT20)	6.5 Mbps	6.5 Mbps	36	5180	Not Required	10.5	No	Not Required	5.0	No
				40	5200						
				44	5220						
				48	5240						
	802.11n (HT40)	13.5 Mbps	13.5 Mbps	38	5190	Not Required	11.1	No	4.9	5.4	No
				46	5230				4.9		
	802.11ac (VHT20)	6.5 Mbps	6.5 Mbps	36	5180	Not Required	10.5	No	Not Required	5.0	No
				40	5200						
				44	5220						
	802.11ac (VHT40)	13.5 Mbps	13.5 Mbps	48	5240	Not Required	11.1	No	4.9	5.4	No
46				5230	4.8						
802.11ac (VHT80)	29.3 Mbps	29.3 Mbps	42	5210	11.0	11.1	No	Not Required	5.1	No	
5.3 (U-NII 2A)	802.11a	6 Mbps	52	5260	Not Required	10.6	No	Not Required	4.9	No	
			56	5280							
			60	5300							
			64	5320							
	802.11n (HT20)	6.5 Mbps	6.5 Mbps	52	5260	Not Required	10.7	No	Not Required	4.9	No
				56	5280						
				60	5300						
				64	5320						
	802.11n (HT40)	13.5 Mbps	13.5 Mbps	54	5270	10.7	11.4	No	4.6	5.1	No
				62	5310	10.7			4.4		
	802.11ac (VHT20)	6.5 Mbps	6.5 Mbps	52	5260	Not Required	10.7	No	Not Required	4.9	No
				56	5280						
				60	5300						
				64	5320						
802.11ac (VHT40)	13.5 Mbps	13.5 Mbps	54	5270	10.7	11.4	Yes	4.5	5.1	No	
			62	5310	10.7			4.4			
802.11ac (VHT80)	29.3 Mbps	29.3 Mbps	58	5290	Not Required	11.2	No	Not Required	4.8	No	
5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500	Not Required	11.2	No	Not Required	5.1	No	
			116	5580							
			124	5620							
			144	5720							
	802.11n (HT20)	6.5 Mbps	6.5 Mbps	100	5500	Not Required	11.1	No	Not Required	5.1	No
				116	5580						
				124	5620						
				144	5720						
	802.11n (HT40)	13.5 Mbps	13.5 Mbps	102	5510	Not Required	11.7	No	5.3	5.9	No
				118	5590				5.5		
				142	5710				5.4		
	802.11ac (VHT20)	6.5 Mbps	6.5 Mbps	100	5500	Not Required	11.1	No	Not Required	5.1	No
				116	5580						
				124	5620						
				144	5720						
	802.11ac (VHT40)	13.5 Mbps	13.5 Mbps	102	5510	Not Required	11.7	No	5.5	5.9	No
				118	5590				5.4		
				142	5710				5.4		
	802.11ac (VHT80)	29.3 Mbps	29.3 Mbps	106	5530	10.7	11.9	Yes	Not Required	5.8	No
122				5610	10.7						
138				5690	10.9						

Wi-Fi 5GHz (U-NII Bands) continued

Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Chain 0			Chain 1			
					Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max Output Power (dBm)	SAR Test (Yes/No)	
5.8 (U-NII 3)	802.11a	6 Mbps	149	5745	Not required	11.1	No	Not required	4.3	No	
			157	5785							
			165	5825							
	802.11n (HT20)	6.5 Mbps	6.5 Mbps	149	5745	Not required	11.1	No	Not required	4.3	No
				157	5785						
				165	5825						
	802.11n (HT40)	13.5 Mbps	13.5 Mbps	151	5755	11.1	11.6	Yes	4.4	5.3	No
				159	5795	11.3			4.1		
	802.11ac (VHT20)	6.5 Mbps	6.5 Mbps	149	5745	Not required	11.1	No	Not required	4.3	No
				157	5785						
				165	5825						
	802.11ac (VHT40)	13.5 Mbps	13.5 Mbps	151	5755	Not required	11.6	No	4.4	5.3	No
159				5795	4.1						
802.11ac (VHT80)	29.3 Mbps	29.3 Mbps	155	5775	Not required	11.0	No	Not required	4.8	No	

Note(s):

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

9.6. Bluetooth

Maximum tune-up tolerance limit is 12.10 dBm from the rated nominal maximum output power. This power level qualifies for exclusion of SAR testing.

10. Measured and Reported (Scaled) SAR Results

SAR Test Reduction criteria are as follows:

KDB 447498 D01 General RF Exposure Guidance:

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

- ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
- ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
- ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

KDB 648474 D04 Handset SAR:

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

KDB 941225 D01 SAR test for 3G devices:

When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode

KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

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

KDB 248227 D01 SAR meas for 802.11:

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

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

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

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

10.1. GSM850

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	GPRS 4 Slots	0	Left Touch	190	836.6	29.6	28.6	0.280	0.352	1
			Left Tilt	190	836.6	29.6	28.6	0.092	0.116	
			Right Touch	190	836.6	29.6	28.6	0.180	0.227	
			Right Tilt	190	836.6	29.6	28.6	0.078	0.098	
Body-worn(VoIP)	GPRS 4 Slots	15	Rear	190	836.6	29.6	28.6	0.250	0.315	
Front			190	836.6	29.6	28.6	0.269	0.339	2	
Hotspot		10	Rear	190	836.6	27.6	26.6	0.159	0.200	
			Front	190	836.6	27.6	26.6	0.235	0.296	
			Edge 2	190	836.6	27.6	26.6	0.111	0.140	
			Edge 3	190	836.6	27.6	26.6	0.158	0.199	
			Edge 4	190	836.6	27.6	26.6	0.242	0.305	3

DTM (Dual Transfer Mode)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	DTM CS + 2 Slots	0	Left Touch	190	836.6	32.6	31.0	0.351	0.507	4
			Left Tilt	190	836.6	32.6	31.0	0.110	0.159	
			Right Touch	190	836.6	32.6	31.0	0.219	0.317	
			Right Tilt	190	836.6	32.6	31.0	0.090	0.130	

10.2. GSM1900

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	GPRS 4 Slots	0	Left Touch	661	1880.0	26.2	25.6	0.151	0.173	5
			Left Tilt	661	1880.0	26.2	25.6	0.038	0.044	
			Right Touch	661	1880.0	26.2	25.6	0.086	0.099	
			Right Tilt	661	1880.0	26.2	25.6	0.037	0.042	
Body-worn(VoIP)	GPRS 4 Slots	15	Rear	661	1880.0	26.2	25.6	0.085	0.098	
Front			661	1880.0	26.2	25.6	0.240	0.276	6	
Hotspot		10	Rear	661	1880.0	22.2	21.7	0.065	0.073	
			Front	661	1880.0	22.2	21.7	0.238	0.267	7
			Edge 2	661	1880.0	22.2	21.7	0.017	0.020	
			Edge 3	661	1880.0	22.2	21.7	0.192	0.215	
			Edge 4	661	1880.0	22.2	21.7	0.061	0.068	

DTM (Dual Transfer Mode)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Body-worn(VoIP)	DTM CS + 2Slots	15	Rear	661	1880.0	29.2	28.5	0.106	0.125	
Front			661	1880.0	29.2	28.5	0.309	0.363	8	
Hotspot		10	Rear	661	1880.0	25.2	24.6	0.073	0.083	
			Front	661	1880.0	25.2	24.6	0.249	0.286	
			Edge 2	661	1880.0	25.2	24.6	0.021	0.024	
			Edge 3	661	1880.0	25.2	24.6	0.190	0.218	
			Edge 4	661	1880.0	25.2	24.6	0.072	0.083	

10.3. W-CDMA Band II

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Rel 99 RMC	0	Left Touch	9400	1880.0	24.0	23.0	0.245	0.308	9
			Left Tilt	9400	1880.0	24.0	23.0	0.056	0.070	
			Right Touch	9400	1880.0	24.0	23.0	0.126	0.159	
			Right Tilt	9400	1880.0	24.0	23.0	0.051	0.064	
Body-worn	Rel 99 RMC	15	Rear	9400	1880.0	24.0	23.0	0.186	0.234	
			Front	9400	1880.0	24.0	23.0	0.520	0.655	10
Hotspot	Rel 99 RMC	10	Rear	9400	1880.0	19.0	18.6	0.079	0.087	
			Front	9400	1880.0	19.0	18.6	0.334	0.366	11
			Edge 2	9400	1880.0	19.0	18.6	0.025	0.027	
			Edge 3	9400	1880.0	19.0	18.6	0.220	0.241	
			Edge 4	9400	1880.0	19.0	18.6	0.073	0.080	

10.4. W-CDMA Band IV

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Rel 99 RMC	0	Left Touch	1413	1732.6	24.5	23.8	0.310	0.364	12
			Left Tilt	1413	1732.6	24.5	23.8	0.107	0.126	
			Right Touch	1413	1732.6	24.5	23.8	0.207	0.243	
			Right Tilt	1413	1732.6	24.5	23.8	0.099	0.116	
Body-worn	Rel 99 RMC	15	Rear	1413	1732.6	24.5	23.8	0.309	0.363	
			Front	1413	1732.6	24.5	23.8	0.569	0.669	13
Hotspot	Rel 99 RMC	10	Rear	1413	1732.6	19.5	19.2	0.140	0.150	
			Front	1413	1732.6	19.5	19.2	0.374	0.401	14
			Edge 2	1413	1732.6	19.5	19.2	0.035	0.038	
			Edge 3	1413	1732.6	19.5	19.2	0.315	0.338	
			Edge 4	1413	1732.6	19.5	19.2	0.148	0.159	

10.5. W-CDMA Band V

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
						Tune-up limit	Meas.	Meas.	Scaled	
Head	Rel 99 RMC	0	Left Touch	4183	836.6	25.0	23.9	0.415	0.535	15
			Left Tilt	4183	836.6	25.0	23.9	0.155	0.200	
			Right Touch	4183	836.6	25.0	23.9	0.267	0.344	
			Right Tilt	4183	836.6	25.0	23.9	0.116	0.149	
Body-worn	Rel 99 RMC	15	Rear	4183	836.6	25.0	23.9	0.296	0.381	16
			Front	4183	836.6	25.0	23.9	0.279	0.359	
Hotspot	Rel 99 RMC	10	Rear	4183	836.6	23.0	22.0	0.186	0.234	
			Front	4183	836.6	23.0	22.0	0.335	0.422	17
			Edge 2	4183	836.6	23.0	22.0	0.114	0.144	
			Edge 3	4183	836.6	23.0	22.0	0.225	0.283	
			Edge 4	4183	836.6	23.0	22.0	0.240	0.302	

10.6. LTE Band 2 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.			
								Tune-up limit	Meas.	Meas.	Scaled				
Head	QPSK	0	Left Touch	18900	1880.0	1	49	24.0	23.5	0.199	0.222	18			
						50	24	23.0	22.5	0.161	0.181				
			Left Tilt	18900	1880.0	1	49	24.0	23.5	0.070	0.078				
						50	24	23.0	22.5	0.054	0.061				
			Right Touch	18900	1880.0	1	49	24.0	23.5	0.128	0.143				
						50	24	23.0	22.5	0.102	0.115				
			Right Tilt	18900	1880.0	1	49	24.0	23.5	0.061	0.068				
						50	24	23.0	22.5	0.047	0.053				
			Body-worn	QPSK	15	Rear	18900	1880.0	1	49	24.0	23.5	0.134	0.150	
									50	24	23.0	22.5	0.106	0.119	
Front	18900	1880.0				1	49	24.0	23.5	0.378	0.422	19			
						50	24	23.0	22.5	0.303	0.341				
Hotspot	QPSK	10	Rear	18900	1880.0	1	49	19.0	18.6	0.114	0.125				
						50	24	19.0	18.5	0.113	0.127				
			Front	18900	1880.0	1	49	19.0	18.6	0.348	0.382				
						50	24	19.0	18.5	0.350	0.393				
			Edge 2	18900	1880.0	1	49	19.0	18.6	0.028	0.031				
						50	24	19.0	18.5	0.028	0.031				
			Edge 3	18900	1880.0	1	49	19.0	18.6	0.281	0.309				
						50	24	19.0	18.5	0.285	0.320				
			Edge 4	18900	1880.0	1	49	19.0	18.6	0.080	0.088				
						50	24	19.0	18.5	0.080	0.090				

10.7. LTE Band 4 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.			
								Tune-up limit	Meas.	Meas.	Scaled				
Head	QPSK	0	Left Touch	20175	1732.5	1	49	24.2	23.7	0.204	0.229				
						50	24	23.2	22.7	0.165	0.185				
			Left Tilt	20175	1732.5	1	49	24.2	23.7	0.074	0.083				
						50	24	23.2	22.7	0.058	0.065				
			Right Touch	20175	1732.5	1	49	24.2	23.7	0.210	0.236	21			
						50	24	23.2	22.7	0.168	0.188				
			Right Tilt	20175	1732.5	1	49	24.2	23.7	0.063	0.071				
						50	24	23.2	22.7	0.050	0.056				
			Body-worn	QPSK	15	Rear	20175	1732.5	1	49	24.2	23.7	0.284	0.319	
									50	24	23.2	22.7	0.231	0.259	
Front	20175	1732.5				1	49	24.2	23.7	0.496	0.557	22			
						50	24	23.2	22.7	0.401	0.450				
Hotspot	QPSK	10	Rear	20175	1732.5	1	49	19.0	19.0	0.111	0.111				
						50	24	19.0	18.9	0.111	0.114				
			Front	20175	1732.5	1	49	19.0	19.0	0.312	0.312				
						50	24	19.0	18.9	0.313	0.322				
			Edge 2	20175	1732.5	1	49	19.0	19.0	0.027	0.027				
						50	24	19.0	18.9	0.027	0.028				
			Edge 3	20175	1732.5	1	49	19.0	19.0	0.210	0.210				
						50	24	19.0	18.9	0.214	0.220				
			Edge 4	20175	1732.5	1	49	19.0	19.0	0.184	0.184				
						50	24	19.0	18.9	0.186	0.191				

10.8. LTE Band 5 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	20525	836.5	1	49	24.7	23.8	0.471	0.579	24
						25	25	23.7	22.7	0.364	0.458	
			Left Tilt	20525	836.5	1	49	24.7	23.8	0.188	0.231	
						25	25	23.7	22.7	0.140	0.176	
			Right Touch	20525	836.5	1	49	24.7	23.8	0.328	0.404	
						25	25	23.7	22.7	0.252	0.317	
			Right Tilt	20525	836.5	1	49	24.7	23.8	0.146	0.180	
						25	25	23.7	22.7	0.109	0.137	
Body-worn	QPSK	15	Rear	20525	836.5	1	49	24.7	23.8	0.261	0.321	
						25	25	23.7	22.7	0.201	0.253	
			Front	20525	836.5	1	49	24.7	23.8	0.289	0.356	25
						25	25	23.7	22.7	0.219	0.276	
Hotspot	QPSK	10	Rear	20525	836.5	1	49	22.0	21.4	0.072	0.082	
						25	12	22.0	21.4	0.074	0.085	
			Front	20525	836.5	1	49	22.0	21.4	0.166	0.189	
						25	12	22.0	21.4	0.170	0.196	
			Edge 2	20525	836.5	1	49	22.0	21.4	0.060	0.068	
						25	12	22.0	21.4	0.064	0.074	
			Edge 3	20525	836.5	1	49	22.0	21.4	0.135	0.154	
						25	12	22.0	21.4	0.135	0.155	
			Edge 4	20525	836.5	1	49	22.0	21.4	0.142	0.162	
						25	12	22.0	21.4	0.130	0.150	

10.9. LTE Band 7 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	21100	2535.0	1	49	24.5	24.0	0.149	0.168	
						50	24	23.5	23.5	0.124	0.124	
			Left Tilt	21100	2535.0	1	49	24.5	24.0	0.041	0.046	
						50	24	23.5	23.5	0.036	0.036	
			Right Touch	21100	2535.0	1	49	24.5	24.0	0.213	0.240	27
						50	24	23.5	23.5	0.183	0.183	
			Right Tilt	21100	2535.0	1	49	24.5	24.0	0.050	0.056	
						50	24	23.5	23.5	0.039	0.039	
Body-worn	QPSK	15	Rear	21100	2535.0	1	49	24.5	24.0	0.113	0.127	
						50	24	23.5	23.5	0.092	0.092	
			Front	21100	2535.0	1	49	24.5	24.0	0.190	0.214	28
						50	24	23.5	23.5	0.158	0.158	
Hotspot	QPSK	10	Rear	21100	2535.0	1	49	22.0	21.4	0.069	0.079	
						50	24	22.0	21.3	0.072	0.084	
			Front	21100	2535.0	1	49	22.0	21.4	0.235	0.270	
						50	24	22.0	21.3	0.242	0.284	
			Edge 2	21100	2535.0	1	49	22.0	21.4	0.066	0.076	
						50	24	22.0	21.3	0.058	0.068	
			Edge 3	21100	2535.0	1	49	22.0	21.4	0.170	0.196	
						50	24	22.0	21.3	0.175	0.205	
			Edge 4	21100	2535.0	1	49	22.0	21.4	0.068	0.078	
						50	24	22.0	21.3	0.066	0.077	

10.10. LTE Band 12 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	23095	707.5	1	0	24.7	24.0	0.189	0.222	30
						25	0	23.7	22.8	0.149	0.183	
			Left Tilt	23095	707.5	1	0	24.7	24.0	0.065	0.076	
						25	0	23.7	22.8	0.048	0.059	
			Right Touch	23095	707.5	1	0	24.7	24.0	0.142	0.167	
						25	0	23.7	22.8	0.111	0.137	
Right Tilt	23095	707.5	1	0	24.7	24.0	0.058	0.068				
			25	0	23.7	22.8	0.046	0.057				
Body-worn	QPSK	15	Rear	23095	707.5	1	0	24.7	24.0	0.161	0.189	
						25	0	23.7	22.8	0.128	0.157	
			Front	23095	707.5	1	0	24.7	24.0	0.234	0.275	31
						25	0	23.7	22.8	0.183	0.225	
Hotspot	QPSK	10	Rear	23095	707.5	1	0	24.7	24.0	0.162	0.189	
						25	12	23.7	22.7	0.124	0.156	
			Front	23095	707.5	1	0	24.7	24.0	0.270	0.314	
						25	12	23.7	22.7	0.204	0.257	
			Edge 2	23095	707.5	1	0	24.7	24.0	0.134	0.156	
						25	12	23.7	22.7	0.106	0.133	
			Edge 3	23095	707.5	1	0	24.7	24.0	0.104	0.121	
						25	12	23.7	22.7	0.092	0.116	
			Edge 4	23095	707.5	1	0	24.7	24.0	0.357	0.416	32
						25	12	23.7	22.7	0.284	0.358	

10.11. LTE Band 13 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	23230	782.0	1	49	24.0	23.2	0.088	0.106	33
						25	25	23.0	22.2	0.070	0.085	
			Left Tilt	23230	782.0	1	49	24.0	23.2	0.037	0.044	
						25	25	23.0	22.2	0.037	0.045	
			Right Touch	23230	782.0	1	49	24.0	23.2	0.065	0.078	
						25	25	23.0	22.2	0.051	0.061	
Right Tilt	23230	782.0	1	49	24.0	23.2	0.037	0.044				
			25	25	23.0	22.2	0.028	0.034				
Body-worn	QPSK	15	Rear	23230	782.0	1	49	24.0	23.2	0.076	0.092	
						25	25	23.0	22.2	0.060	0.072	
			Front	23230	782.0	1	49	24.0	23.2	0.121	0.146	34
						25	25	23.0	22.2	0.096	0.116	
Hotspot	QPSK	10	Rear	23230	782.0	1	49	24.0	23.4	0.078	0.089	
						25	0	23.0	22.2	0.062	0.075	
			Front	23230	782.0	1	49	24.0	23.4	0.111	0.127	
						25	0	23.0	22.2	0.087	0.105	
			Edge 2	23230	782.0	1	49	24.0	23.4	0.068	0.078	
						25	0	23.0	22.2	0.052	0.063	
			Edge 3	23230	782.0	1	49	24.0	23.4	0.055	0.063	
						25	0	23.0	22.2	0.043	0.052	
			Edge 4	23230	782.0	1	49	24.0	23.4	0.204	0.233	35
						25	0	23.0	22.2	0.137	0.165	

10.12. LTE Band 17 (10MHz Bandwidth)

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

10.13. LTE Band 26 (15MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	26865	831.5	1	74	24.5	23.3	0.427	0.563	36
						36	20	23.5	22.4	0.349	0.450	
			Left Tilt	26865	831.5	1	74	24.5	23.3	0.225	0.297	
						36	20	23.5	22.4	0.171	0.220	
			Right Touch	26865	831.5	1	74	24.5	23.3	0.295	0.389	
						36	20	23.5	22.4	0.223	0.287	
Right Tilt	26865	831.5	1	74	24.5	23.3	0.183	0.241				
			36	20	23.5	22.4	0.140	0.180				
Body-worn & Hotspot	QPSK	15	Rear	26865	831.5	1	74	24.5	23.4	0.285	0.367	
						36	20	23.5	22.4	0.225	0.290	
			Front	26865	831.5	1	74	24.5	23.4	0.314	0.405	37
						36	20	23.5	22.4	0.249	0.321	
Hotspot	QPSK	10	Rear	26865	831.5	1	37	22.0	21.4	0.082	0.095	
						36	20	22.0	21.5	0.078	0.089	
			Front	26865	831.5	1	37	22.0	21.4	0.181	0.210	38
						36	20	22.0	21.5	0.179	0.203	
			Edge 2	26865	831.5	1	37	22.0	21.4	0.058	0.067	
						36	20	22.0	21.5	0.059	0.067	
			Edge 3	26865	831.5	1	37	22.0	21.4	0.132	0.153	
						36	20	22.0	21.5	0.136	0.154	
Edge 4	26865	831.5	1	37	22.0	21.4	0.147	0.171				
			36	20	22.0	21.5	0.148	0.168				

10.14. LTE Band 41 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Head	QPSK	0	Left Touch	40620	2593.0	1	49	24.5	23.9	0.076	0.087	39
						50	24	23.5	22.9	0.067	0.077	
			Left Tilt	40620	2593.0	1	49	24.5	23.9	0.020	0.023	
						50	24	23.5	22.9	0.017	0.019	
			Right Touch	40620	2593.0	1	49	24.5	23.9	0.062	0.071	
						50	24	23.5	22.9	0.049	0.056	
Right Tilt	40620	2593.0	1	49	24.5	23.9	0.018	0.021				
			50	24	23.5	22.9	0.018	0.021				
Body-worn & Hotspot	QPSK	15	Rear	40620	2593.0	1	49	24.5	23.9	0.023	0.026	
						50	24	23.5	22.9	0.007	0.008	
			Front	40620	2593.0	1	49	24.5	23.9	0.101	0.116	40
						50	24	23.5	22.9	0.015	0.017	
Hotspot	QPSK	10	Rear	40620	2593.0	1	49	22.0	20.9	<.001	<.001	
						50	24	22.0	20.9	0.027	0.035	
			Front	40620	2593.0	1	49	22.0	20.9	0.109	0.140	41
						50	24	22.0	20.9	0.116	0.149	
			Edge 2	40620	2593.0	1	49	22.0	20.9	0.025	0.032	
						50	24	22.0	20.9	0.025	0.032	
			Edge 3	40620	2593.0	1	49	22.0	20.9	0.068	0.088	
						50	24	22.0	20.9	0.066	0.085	
Edge 4	40620	2593.0	1	49	22.0	20.9	0.018	0.023				
			50	24	22.0	20.9	0.017	0.022				

10.15. Wi-Fi (DTS Band)

Frequency Band	Mode & Ant.	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
2.4GHz	SISO Chain 0 802.11b 1 Mbps	Head	0	Left Touch	1	2412.0	0.425	13.2	12.5	0.293	0.344	42
				Left Tilt	1	2412.0	0.086	13.2	12.5			
				Right Touch	1	2412.0	0.150	13.2	12.5			
				Right Tilt	1	2412.0	0.051	13.2	12.5			
		Body-worn	15	Rear	1	2412.0	0.023	13.2	12.5			
				Front	1	2412.0	0.030	13.2	12.5	0.020	0.023	43
		Body-worn & Hotspot & Wi-Fi Direct	10	Rear	1	2412.0	0.043	13.2	12.5			
				Front	1	2412.0	0.060	13.2	12.5			
				Edge 2	1	2412.0	0.106	13.2	12.5	0.083	0.098	44

Chain 1 SAR Test Exclusion

Max. tune-up tolerance limit		Min. test separation distance (mm)	Frequency (GHz)	SAR test exclusion Result*	RF Exposure Conditions	Estimated 1-g SAR (W/kg)
(dBm)	(mW)					
8.5	7	5	2.437	2.2	Head	0.291
Max. tune-up tolerance limit		Min. test separation distance (mm)	Frequency (GHz)	SAR test exclusion Result*	RF Exposure Conditions	Estimated 1-g SAR (W/kg)
(dBm)	(mW)					
8.5	7	15	2.437	0.7	Body-w orn	0.097
Max. tune-up tolerance limit		Min. test separation distance (mm)	Frequency (GHz)	SAR test exclusion Result*	RF Exposure Conditions	Estimated 1-g SAR (W/kg)
(dBm)	(mW)					
8.5	7	10	2.437	1.1	Hotspot	0.146

Conclusion:

*: The computed value is ≤ 3.0; therefore, Wi-Fi 2.4GHz qualifies for Standalone SAR test exclusion.

10.16. Wi-Fi (U-NII Band)

Frequency Band	Mode & Ant.	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
5.3 GHz U-NII 2A	Chain 0 802.11n VHT40	Head	0	Left Touch	54	5270	0.831	11.4	10.7	0.434	0.510	45
				Left Tilt	54	5270	0.084	11.4	10.7			
				Right Touch	54	5270	0.245	11.4	10.7	0.137	0.161	
				Right Tilt	54	5270	0.073	11.4	10.7			
		Body-worn	15	Rear	54	5270	0.043	11.4	10.7			
				Front	54	5270	0.073	11.4	10.7	<.001	<.001	46
Frequency Band	Mode & Ant.	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.
5.5 GHz U-NII 2C	Chain 0 802.11ac VHT80	Head	0	Left Touch	138	5690	0.803	11.9	10.9	0.379	0.477	47
				Left Tilt	138	5690	0.074	11.9	10.9			
				Right Touch	138	5690	0.229	11.9	10.9	0.107	0.135	
				Right Tilt	138	5690	0.055	11.9	10.9			
		Body-worn	15	Rear	138	5690	0.021	11.9	10.9			
				Front	138	5690	0.049	11.9	10.9	0.016	0.020	48
Frequency Band	Mode & Ant.	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.
5.8 GHz U-NII 3	Chain 0 802.11n HT40	Head	0	Left Touch	159	5795	0.305	11.6	11.3	0.113	0.121	49
				Left Tilt	159	5795	0.028	11.6	11.3			
				Right Touch	159	5795	0.066	11.6	11.3			
				Right Tilt	159	5795	0.015	11.6	11.3			
		Body-worn	15	Rear	159	5795	0.007	11.6	11.3			
				Front	159	5795	0.012	11.6	11.3	<.001	<.001	50

Chain 1 SAR Test Exclusion

Max. tune-up tolerance limit		Min. test separation distance (mm)	Frequency (GHz)	SAR test exclusion Result*	RF Exposure Conditions	Estimated 1-g SAR (W/kg)
(dBm)	(mW)					
5.9	4	5	5.670	1.9	Head	0.254
Max. tune-up tolerance limit		Min. test separation distance (mm)	Frequency (GHz)	SAR test exclusion Result*	RF Exposure Conditions	Estimated 1-g SAR (W/kg)
(dBm)	(mW)					
5.9	4	15	5.670	0.6	Body-worn	0.085

Conclusion:

*: The computed value is ≤ 3.0 ; therefore, Wi-Fi 5GHz qualifies for Standalone SAR test exclusion.

10.17. Bluetooth

Standalone SAR Test Exclusion Considerations & Estimated SAR

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

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

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

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

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

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

Body-worn

Max. tune-up tolerance limit		Min. test separation distance (mm)	Frequency (GHz)	SAR test exclusion Result*	RF Exposure Conditions	Estimated 1-g SAR (W/kg)
(dBm)	(mW)					
10.9	12	15	2.480	1.3	Body-worn	0.168

Conclusion:

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

11. SAR Measurement Variability

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

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

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	First Repeated		Second Repeated		Third Repeated
						Measured SAR (W/kg)	Largest to Smallest SAR Ratio	Measured SAR (W/kg)	Largest to Smallest SAR Ratio	Measured SAR (W/kg)
700	LTE Band 12	Hotspot	Edge 4	No	0.357	N/A	N/A	N/A	N/A	N/A
	LTE Band 13	Hotspot	Edge 4	No	0.204	N/A	N/A	N/A	N/A	N/A
850	GSM 850	Head	Left Touch	No	0.351	N/A	N/A	N/A	N/A	N/A
	WCDMA Band V	Head	Left Touch	No	0.415	N/A	N/A	N/A	N/A	N/A
	LTE Band 5	Head	Left Touch	No	0.471	N/A	N/A	N/A	N/A	N/A
	LTE Band 26	Head	Left Touch	No	0.427	N/A	N/A	N/A	N/A	N/A
1750	W-CDMA Band IV	Body	Front	No	0.569	N/A	N/A	N/A	N/A	N/A
	LTE Band 4	Body	Front	No	0.496	N/A	N/A	N/A	N/A	N/A
1900	GSM 1900	Body	Front	No	0.309	N/A	N/A	N/A	N/A	N/A
	W-CDMA Band II	Body	Front	No	0.520	N/A	N/A	N/A	N/A	N/A
	LTE Band 2	Body	Front	No	0.378	N/A	N/A	N/A	N/A	N/A
2400	Wi-Fi 802.11b/g/n	Head	Left Touch	No	0.293	N/A	N/A	N/A	N/A	N/A
2600	LTE Band 7	Hotspot	Front	No	0.242	N/A	N/A	N/A	N/A	N/A
	LTE Band 41	Hotspot	Front	No	0.116	N/A	N/A	N/A	N/A	N/A
5300	Wi-Fi 802.11a/n/ac	Head	Left Touch	No	0.434	N/A	N/A	N/A	N/A	N/A
5500	Wi-Fi 802.11a/n/ac	Head	Left Touch	No	0.379	N/A	N/A	N/A	N/A	N/A
5800	Wi-Fi 802.11a/n/ac	Head	Left Touch	No	0.113	N/A	N/A	N/A	N/A	N/A

Note(s):

Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not > 1.20 or 3 (1-g or 10-g respectively).

12. Simultaneous Transmission SAR Analysis

Simultaneous Transmission Condition

Case	Cellular	WLAN/BT Main	WLAN/BT Sub	Note
1	GSM/GPRS/EDGE	BT/BLE	(None)	
2	GSM/GPRS/EDGE	WLAN 2.4G	WLAN 2.4G	
3	GSM/GPRS/EDGE	WLAN 5G	WLAN 5G	
4	UMTS/HSPA	BT/BLE	(None)	
5	UMTS/HSPA	WLAN 2.4G	WLAN 2.4G	
6	UMTS/HSPA	WLAN 5G	WLAN 5G	
7	LTE	BT/BLE	(None)	
8	LTE	WLAN 2.4G	WLAN 2.4G	
9	LTE	WLAN 5G	WLAN 5G	
10	(None)	BT WLAN 5G	WLAN 5G	
11	GSM/GPRS/EDGE	BT WLAN 5G	WLAN 5G	
12	UMTS/HSPA	BT WLAN 5G	WLAN 5G	
13	LTE	BT WLAN 5G	WLAN 5G	
14	GSM/GPRS/EDGE	WLAN 2.4G	WLAN 5G	
15	GSM/GPRS/EDGE	WLAN 5G	WLAN 2.4G	
16	GSM/GPRS/EDGE	BT WLAN 5G	WLAN 2.4G	
17	UMTS/HSPA	WLAN 2.4G	WLAN 5G	
18	UMTS/HSPA	WLAN 5G	WLAN 2.4G	
19	UMTS/HSPA	BT WLAN 5G	WLAN 2.4G	
20	LTE	WLAN 2.4G	WLAN 5G	
21	LTE	WLAN 5G	WLAN 2.4G	
22	LTE	BT WLAN 5G	WLAN 2.4G	

12.1. Sum of the SAR for WWAN & Wi-Fi DTS

RF Exposure conditions	Standalone SAR (W/kg)			Σ 1-g SAR (W/kg)
	WWAN ①	DTS Chain 0 ②	DTS Chain 1 ③	WWAN + DTS ① + ② + ③
Head	0.579	0.344	0.291	1.214
Body-worn	0.669	0.023	0.097	0.789
Hotspot	0.422	0.098	0.146	0.666

12.2. Sum of the SAR for WWAN & Wi-Fi U-NII & BT

RF Exposure conditions	Standalone SAR (W/kg)				Σ 1-g SAR (W/kg)	
	WWAN ①	U-NII Chain 0 ②	U-NII Chain 1 ③	BT ④	WWAN + U-NII ① + ② + ③	WWAN + U-NII + BT ① + ② + ③ + ④
Head	0.579	0.510	0.254		1.343	
Body-worn	0.669	0.020	0.085	0.168	0.774	0.942

12.3. Sum of the SAR for WWAN & Wi-Fi DTS Chain 0 & Wi-Fi U-NII Chain 1

RF Exposure conditions	Standalone SAR (W/kg)			Σ 1-g SAR (W/kg)
	WWAN ①	DTS Chain 0 ②	U-NII Chain 1 ③	WWAN + DTS + U-NII ① + ② + ③
Head	0.579	0.344	0.254	1.177
Body-worn	0.669	0.023	0.085	0.777
Hotspot	0.422	0.098		0.520

12.4. Sum of the SAR for WWAN & Wi-Fi DTS Chain 1 & Wi-Fi U-NII Chain 0 & BT

RF Exposure conditions	Standalone SAR (W/kg)				Σ 1-g SAR (W/kg)	
	WWAN ①	DTS Chain 1 ②	U-NII Chain 0 ③	BT ④	WWAN + DTS + U-NII ① + ② + ③	WWAN + DTS + U-NII + BT ① + ② + ③ + ④
Head	0.579	0.291	0.510		1.380	
Body-worn	0.669	0.097	0.020	0.168	0.786	0.954
Hotspot	0.422	0.146			0.568	

Conclusion:

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

Appendixes

Refer to separated files for the following appendixes.

16J22997-S4V1 SAR_App A Setup Photos

16J22997-S4V1 SAR_App B System Check Plots

16J22997-S4V1 SAR_App C Highest Test Plots

16J22997-S4V1 SAR_App D Tissue Ingredients

16J22997-S4V1 SAR_App E Probe Cal. Certificates

16J22997-S4V1 SAR_App F Dipole Cal. Certificates

END OF REPORT