SAR EVALUATION REPORT

IEEE Std 1528-2013

For

GSM/CDMA/WCDMA/LTE Phablet with BT/BLE,DTS/UNII a/b/g/n/ac, NFC and ANT+

FCC ID: A3LSMA515U
Model Name: SM-A515U, SM-A515U1, SM-A515W, & SM-S515DL

Report Number: 13171837-S1V2
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Prepared for

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Revision History

Rev.	Date	Revisions	Revised By
V1	2/24/2020	Initial Issue	--
V2	2/27/2020	Section 6.2: Updated to Multi-Slot Class 12	AJ Newcomer

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1. Attestation of Test Results

Applicant Name		Samsung Electronics Co. Ltd			
FCC ID		A3LSMA515U			
Model Name		SM-A515U, SM-A515U1, SM-A515W, & SM-S515DL			
Difference in Model Name		Model SM-A515U1, SM-A515W, and SM-S515DL is electrically identical to Model SM-A515U. Four model numbers are allocated for marketing and logistic purposes, only. SM-A515U was used to perform all final tests.			
Applicable Standards		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		0.776	0.821	0.461	0.022
Body-worn		1.037	0.210	0.431	0.006
Hotspot		1.207	0.429	0.147	0.012
Extremity		2.140	N/A	1.818	N/A
Simultaneous TX	Head	1.210	1.210	1.149	0.788
	Body-worn	1.468	1.247	1.468	1.043
	Hotspot	1.354	1.228	1.354	1.219
	Extremity	3.804	N/A	3.804	N/A
Date Tested		12/27/2019 to 2/14/2020			
Test Results		Pass			

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

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 the U.S. government.

Approved & Released By:	Prepared By:
Devin Chang Senior Test Engineer UL Verification Services Inc.	Coltyce Sanders Senior Test Engineer UL Verification Services Inc.

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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, ANSI C63.10, ANSI C63.26, 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
- 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
- 941225 D07 UMPC Mini Tablet v01r02

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

- TCB workshop October 2014; RF Exposure Procedures (Other LTE Considerations)
- TCB workshop April 2015; RF Exposure Procedures (Overlapping LTE Bands)
- TCB workshop October 2015; RF Exposure Procedures (KDB 941225 D05A)
- TCB workshop April 2016; RF Exposure Procedures (LTE Carrier Aggregation for DL)
- TCB workshop October 2016; RF Exposure Procedures (Bluetooth Duty Factor)
- TCB workshop October 2016; RF Exposure Procedures (DUT Holder Perturbations)
- TCB workshop October 2016; RF Exposure Procedures (LTE Carrier Aggregation for UL)
- TCB workshop May 2017; RF Exposure Procedures (Broadband Liquid Above 3 GHz)
- TCB workshop May 2017; RF Exposure Procedures (LTE Band 41 Power Class 2)
- TCB workshop November 2017; RF Exposure Procedures (LTE UL/DL Carrier Aggregation SAR)
- TCB workshop April 2018; RF Exposure Procedures (LTE DL CA SAR Test Exclusion)
- TCB workshop April 2019; RF Exposure Procedures (Tissue Simulating Liquids (TSL))

3. Facilities and Accreditation

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

47173 Benicia Street	47266 Benicia Street
SAR Lab A	SAR Lab 1
SAR Lab B	SAR Lab 2
SAR Lab C	SAR Lab 3
SAR Lab D	SAR Lab 4
SAR Lab E	SAR Lab 5
SAR Lab F	SAR Lab 6
SAR Lab G	SAR Lab 7
SAR Lab H	SAR Lab 8

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

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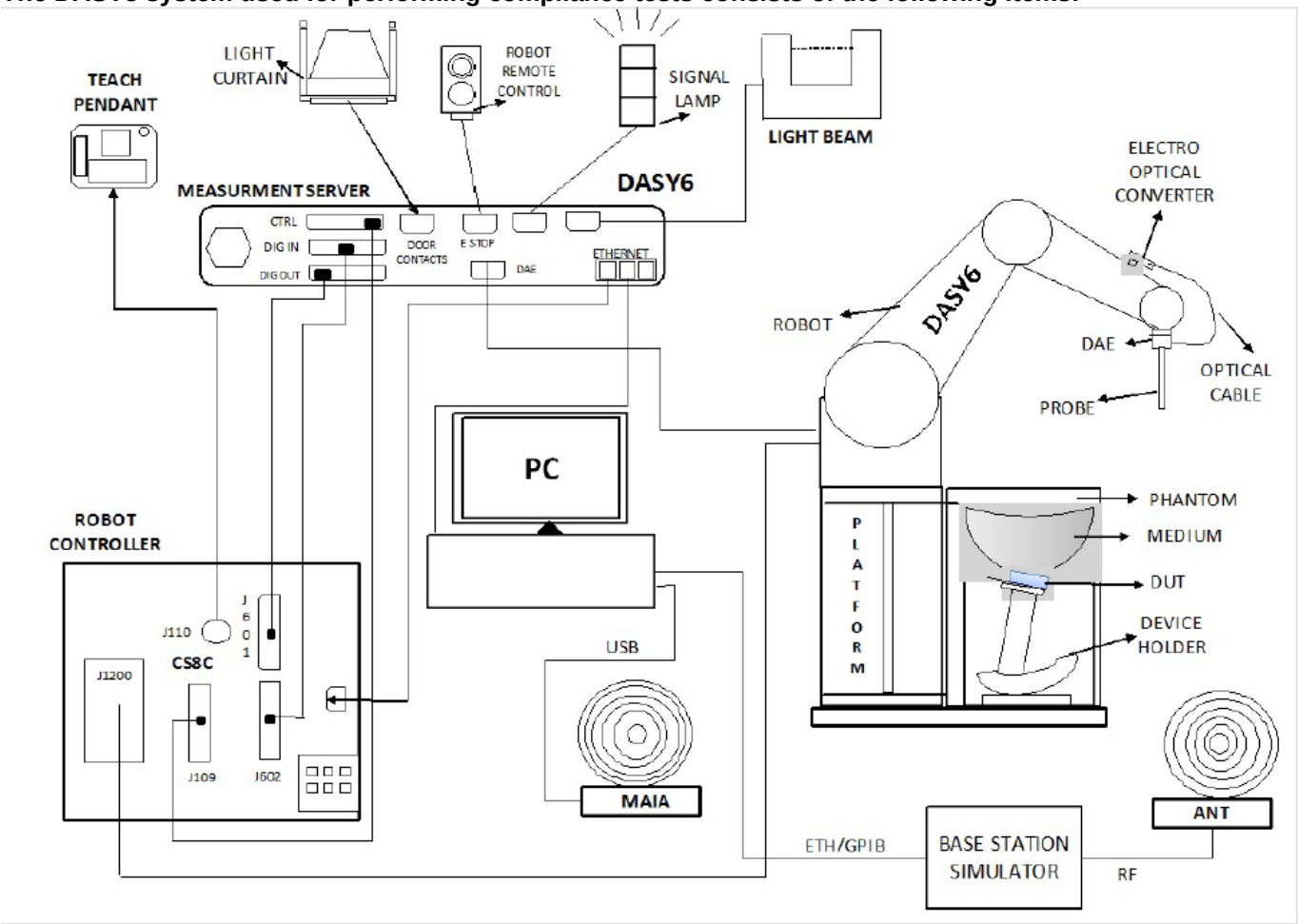
4. SAR Measurement System & Test Equipment

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.

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

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Step 3: Zoom Scan

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

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

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

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

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

Step 4: Power drift measurement

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

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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
Vector Network Analyzer	R&S	ZNLE6	101273-VA	4/24/2020
Dielectric Probe kit*	SPEAG	DAK-3.5	1103	2/12/2020
Shorting Block*	SPEAG	DAK-1.2/3.5 Short	SMDAK 200 BA	2/12/2020
Thermometer	Fisher Scientific	Traceable	170064398	5/21/2020

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Signal Generator*	R&S	SMB100A	180968-gx	2/14/2020
Power Meter	Agilent (Keysight)	N1912A	MY50001018	1/22/2021
Power Sensor	Agilent (Keysight)	N1921A	MY53020038	7/17/2020
Power Sensor*	R&S	NRP18A	100992-iu	2/15/2020
Bi-directional coupler	Werlatone, Inc.	C8060-102	4064	N/A
Signal Generator*	R&S	SMB100A	180970-zC	2/13/2020
Power Meter	Agilent (Keysight)	N1912A	MY55196007	1/22/2021
Power Sensor	Agilent (Keysight)	E9323A	MY53070005	8/2/2020
Power Sensor*	R&S	NRP18A	100994-RE	2/13/2020
Bi-directional coupler	Werlatone, Inc.	C8060-102	2711	N/A

Lab Equipment

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
E-Field Probe (SAR Lab 1)	SPEAG	EX3DV4	7501	5/21/2020
E-Field Probe (SAR Lab 2)	SPEAG	EX3DV4	7498	4/18/2020
E-Field Probe (SAR Lab 3)	SPEAG	EX3DV4	3990	8/27/2020
Data Acquisition Electronics (SAR Lab 1)	SPEAG	DAE4	1239	7/10/2020
Data Acquisition Electronics (SAR Lab 2)*	SPEAG	DAE4	1359	2/15/2020
Data Acquisition Electronics (SAR Lab 3)	SPEAG	DAE4	1544	3/19/2020
System Validation Dipole	SPEAG	D750V3	1024	5/15/2020
System Validation Dipole	SPEAG	D750V3	1071	11/20/2020
System Validation Dipole	SPEAG	D835V2	4d002	11/20/2020
System Validation Dipole	SPEAG	D1750V2	1053	10/10/2020
System Validation Dipole	SPEAG	D1900V2	5d043	11/20/2020
System Validation Dipole	SPEAG	D2300V2	1002	3/22/2020
System Validation Dipole	SPEAG	D2450V2	899	3/22/2020
System Validation Dipole	SPEAG	D2600V2	1036	3/22/2020
System Validation Dipole	SPEAG	D5GHzV2	1003	2/19/2020
System Validation Dipole	SPEAG	D5GHzV2	1168	11/23/2020
Thermometer (SAR Labs 1/2/3)	Traceable	15557603	181062309	2/21/2020

Other

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Power Meter	Agilent (Keysight)	N1911A	MY55196017	1/22/2021
Power Sensor*	Agilent (Keysight)	N1921A	MY55200004	2/6/2020
Power Sensor	Agilent (Keysight)	N1921A	MY55200006	3/1/2020
Base Station Simulator	R & S	R & S	164541-Ci	2/18/2020
Base Station Simulator	R & S	R & S	125236-eS	4/10/2020
Bluetooth Tester	R & S	CBT	100900	2/14/2020

Notes:

*Equipment not used past calibration due date.

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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 and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

Therefore, the measurement uncertainty is not required.

6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	Overall (Length x Width): 158.5 mm x 74.5 mm Overall Diagonal: 166 mm Display Diagonal: 160 mm This is a Phablet Device (display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm)		
Back Cover	The Back Cover is not removable		
Battery Options	The rechargeable battery is not user accessible.		
Accessory	Headset		
Wireless Router (Hotspot)	Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices. ☒ Mobile Hotspot (Wi-Fi 2.4 GHz) ☒ Mobile Hotspot (Wi-Fi 5.8 GHz)		
Wi-Fi Direct	Wi-Fi Direct is only available in hand use configuration ☒ Wi-Fi Direct (Wi-Fi 2.4 GHz) ☒ Wi-Fi Direct (Wi-Fi 5.2/5.8 GHz)		
Bluetooth Tethering (Hotspot)	BT Tethering mode permits the device to share its cellular data connection with other devices. ☒ BT Tethering (Bluetooth 2.4 GHz)		
Test sample information	**S/N**	**IMEI**	**Notes**
	R38MB04NMLJ	353327110208857	WWAN Conducted
	R38MB0B6L9J	353327110230406	WWAN Conducted
	R38MB0B5QVN	353327110221025	WLAN Conducted
	R38MB04PN7J	353327110219946	WLAN Conducted
	R38MB04PMZT	353327110219862	Radiated
	R38MB04PN3W	353327110219904	Radiated
Hardware Version	REV1.0		

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6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode		Duty Cycle used for SAR testing
GSM	850 1900	Voice (GMSK) GPRS (GMSK) EDGE (8PSK)	GSM Class : B Multi-Slot Class: Class 12 - 4 Up, 4 Down	GSM Voice: 12.5% (E)GPRS: 1 Slot: 12.5% 2 Slots: 25% 3 Slots: 37.5% 4 Slots: 50%
	Does this device support DTM (Dual Transfer Mode)? ☐ Yes ☒ No			
CDMA (CDMA2000)	BC0 BC1 BC10	1xRTT (Voice & Data) 1xEV-DO Rel. 0 1xEV-DO Rev. A 1xAdvanced		100%
	Does this device support SV-DO (1xRTT-1xEVDO)? ☐ Yes ☒ No			
W-CDMA (UMTS)	Band II Band IV Band V	UMTS Rel. 99 (Voice & Data) HSDPA (Cat. 24) HSUPA (Cat. 6) DC-HSDPA (Rel. 9) HSPA+ (Rel. 9) DL only		100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 7 FDD Band 12 FDD Band 13 FDD Band 14 FDD Band 25 FDD Band 26 FDD Band 29 (Rx only) FDD Band 30 TDD Band 38 TDD Band 41 [4] FDD Band 66 FDD Band 71	QPSK 16QAM 64QAM Rel. 12 Carrier Aggregation (2 Uplink and 3 Downlinks)		100% (FDD) 63.3% (TDD) Power Class 3 43.3% (TDD) Power Class 2 Refer to §6.4
	Does this device support SV-LTE (1xRTT-LTE)? ☐ Yes ☒ No			
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20)		98.74% (802.11b) [1]
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80)		92.57% (802.11a) [1]
	Does this device support bands 5.60 ~ 5.65 GHz? ☒ Yes ☐ No			
	Does this device support Band gap channel(s)? ☒ Yes ☐ No			
Bluetooth	2.4 GHz	BR, EDR, LE, and HDR		76.7% (GFSK) [2]
NFC	13.56 MHz	Type A/B/F		N/A[3]

Notes:

1. Duty cycles for WLAN are referenced from the DTS and UNII reports.
2. Duty cycle for Bluetooth is referenced from the BT report.
3. Measured Duty Cycle is not required due to SAR test exemption.
4. This device supports Power Class 2 (HPUE) and Power Class 3 for LTE Band 41.

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6.3. General LTE SAR Test and Reporting Considerations

Item	Description						
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 2	Frequency range: 1850 - 1910 MHz (BW = 60 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 (BW = 45 MHz)					
		Channel Bandwidth					
		20 MHz [1]	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	20050/ 1720	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	20300/ 1745	20325/ 1747.5	20350/ 1750	20375/ 1752.5	20385/ 1753.5	20393/ 1754.3
	Band 5	Frequency range: 824 - 849 MHz (BW = 25 MHz)					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz [1]	5 MHz	3 MHz	1.4 MHz
	Low			20450/ 829	20425/ 826.5	20415/ 825.5	20407/ 824.7
	Mid			**20525/ 836.5**	20525/ 836.5	20525/ 836.5	20525/ 836.5
	High			20600/ 844	20625/ 846.5	20635/ 847.5	20643/ 848.3
	Band 7	Frequency range: 2500 - 2570 MHz (BW = 70 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 (BW = 17 MHz)					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz [1]	5 MHz	3 MHz	1.4 MHz
	Low			23060/ 704	23035/ 701.5	23025/ 700.5	23017/ 699.7
	Mid			**23095/ 707.5**	23095/ 707.5	23095/ 707.5	23095/ 707.5
	High			23130/ 711	23155/ 713.5	23165/ 714.5	23173/ 715.3
	Band 13	Frequency range: 777 - 787 MHz (BW = 10 MHz)					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz [1]	5 MHz [1]	3 MHz	1.4 MHz
	Low				23205/ 779.5		
	Mid			**23230/ 782**	23230/ 782		
	High				23255/ 784.5		

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General LTE SAR Test and Reporting Considerations (continued):

Frequency range, Channel Bandwidth, Numbers and Frequencies

Band 14	Frequency range: 788 - 798 MHz (BW = 10 MHz)					
	Channel Bandwidth					
	20 MHz	15 MHz	10 MHz [1]	5 MHz [1]	3 MHz	1.4 MHz
Low				23305/ 790.5		
Mid			**23330/ 793**	23330/ 793		
High				23355/ 795.5		

Band 25	Frequency range: 1850 - 1915 MHz (BW = 65 MHz)					
	Channel Bandwidth					
	20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
Low	**26140/ 1860**	26115/ 1857.5	26090/ 1855	26065/ 1852.5	26055/ 1851.5	26047/ 1850.7
Mid	**26365/ 1882.5**	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5	26365/ 1882.5
High	**26590/ 1905**	26615/ 1907.5	26640/ 1910	26665/ 1912.5	26675/ 1913.5	26683/ 1914.3

Band 26	Frequency range: 814 - 849 MHz (BW = 35 MHz)					
	Channel Bandwidth					
	20 MHz	15 MHz [1]	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 30	Frequency range: 2305 - 2315 MHz (BW = 10 MHz)					
	Channel Bandwidth					
	20 MHz	15 MHz	10 MHz [1]	5 MHz [1]	3 MHz	1.4 MHz
Low				27685/ 2307.5		
Mid			**27710/ 2310**	27710/ 2310		
High				27735/ 2312.5		

Band 38	Frequency range: 2570 - 2620 MHz (BW = 50 MHz)					
	Channel Bandwidth					
	20 MHz [1]	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
Low	37850/ 2580	37825/ 2577.5	37800/ 2575	37775/ 2572.5		
Mid	**38000/ 2595**	38000/ 2595	38000/ 2595	38000/ 2595		
High	38150 2610	38175/ 2612.5	38200/ 2615	38225/ 2617.5		

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General LTE SAR Test and Reporting Considerations (continued):

Frequency range, Channel Bandwidth, Numbers and Frequencies

Band 41[2]	Frequency range: 2496 - 2690 MHz (BW = 194 MHz)					
	Channel Bandwidth					
	20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
Low	**39750 / 2506.0**					
Mid- Low	**40185 / 2549.5**					
Mid	**40620 / 2593.0**					
Mid-High	**41055 / 2636.5**					
High	**41490 / 2680.0**					

Band 66	Frequency range: 1710 - 1780 MHz (BW = 70 MHz)					
	Channel Bandwidth					
	20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
Low	**132072/ 1720**	132047/ 1717.5	132022/ 1715	131997/ 1712.5	131987/ 1711.5	131979/ 1710.7
Mid	**132322/ 1745**	132322/ 1745	132322/ 1745	132322/ 1745	132322/ 1745	132322/ 1745
High	**132572/ 1770**	132597/ 1772.5	132622/ 1775	132647/ 1777.5	132657/ 1778.5	132665/ 1779.3

Band 71	Frequency range: 663 - 698 MHz (BW = 35 MHz)					
	Channel Bandwidth					
	20 MHz [1]	15 MHz [1]	10 MHz	5 MHz	3 MHz	1.4 MHz
Low	133222/ 673	133197/ 670.5	133172/ 668	133147/ 665.5		
Mid	**133297/ 680.5**	133297/ 680.5	133297/ 680.5	133297/ 680.5		
High	133372/ 688	133397/ 690.5	133422/ 693	133447/ 695.5		

LTE transmitter and antenna implementation

Refer to Appendix A.

Maximum power reduction (MPR)

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{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
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

MPR Built-in by design

The manufacturer MPR values are always within the 3GPP maximum MPR allowance but may not follow the default MPR values.

A-MPR (additional MPR) was disabled during SAR testing

Power reduction

Yes

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.

Notes:

1. Maximum bandwidth does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE Devices.
2. LTE band 41 test channels in accordance with October 2014 TCB workshop for all channel bandwidths.
3. SAR Testing for LTE was performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

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6.4. 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.

LTE TDD Bands support 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	$6592 \cdot T_s$	$(1+X) \cdot 2192 \cdot T_s$	$(1+X) \cdot 2560 \cdot T_s$	$7680 \cdot T_s$	$(1+X) \cdot 2192 \cdot T_s$	$(1+X) \cdot 2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$(2+X) \cdot 2192 \cdot T_s$	$(2+X) \cdot 2560 \cdot T_s$
5	$6592 \cdot T_s$	$(2+X) \cdot 2192 \cdot T_s$	$(2+X) \cdot 2560 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-
10	$13168 \cdot T_s$	$13152 \cdot T_s$	$12800 \cdot T_s$	-	-	-

Table 4.2-2: Uplink-downlink configurations & 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	63.3%
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.3%
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.3%
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.7%
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.7%
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.7%
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.3%

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

Note(s):

This device supports uplink-downlink configurations 0-6. The configuration with highest duty cycle was used for SAR Testing: configuration 0 at 63.3% (Power Class 3) and configuration 1 at 43.3% (Power Class 2)duty cycle.

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6.5. Power Back-off Operation

This device supports multiple power back-off modes: WWAN (Ear-jack), WWAN (Hotspot), WWAN (Grip Sensor), and WWAN (RCV). Each of the power back-off operates within specific exposure conditions for certain technologies. For full details on how each power back-off mode operates, refer to the Operational Description.

Power Back-off mode	Technologies Supported	Exposure Conditions Active			
		Head	Body-worn	Hotspot	Product Specific 10g (Extremity)
WWAN (Ear-jack)[1]	W-CDMA B2/4 LTE B2/4/7[3]/25/30/38/40/41[4]/66/71	N/A	✓	N/A	N/A
WWAN (Hotspot)[1]	W-CDMA B2/4 LTE B2/4/7/25/30/38/40/41[4]/66/71	N/A	N/A	✓	N/A
WWAN (Grip Sensor)[1]	W-CDMA B2/4 LTE B2/4/7/25/30/38/40/41[4]/66/71	N/A	N/A	N/A	✓
WWAN (RCV)[1]	LTE B7/30/38/40/41[4]	✓	N/A	N/A	N/A

Note(s):

1. Tune-Up Limits for WWAN (Hotspot), WWAN (Grip Sensor), and WWAN (RCV) are all Reduced Average Powers. Please refer to §9 for all conducted power measurements.
2. Back-off priority: RCV → Ear-jack → Grip Sensor → Hotspot
3. Body-worn SAR with ear-jack connected at reduced power is tested when Body-worn measured at max power is > 1.2 W/kg.
4. LTE Band 41 Power Class 3.

Product Specific 10g (Extremity) Adjusted SAR Calculation

Wireless technologies	Max Tune-up Limit (dBm)	Reduced Tune-Up Limit (dBm)	Pow er Factor	Reported SAR Limit (W/kg)
W-CDMA B2	25.0	22.0	1.995	0.601
W-CDMA B4	25.0	22.0	1.995	0.601
LTE B2	25.0	23.0	1.585	0.757
LTE B4	25.0	23.0	1.585	0.757
LTE B7	23.5	19.0	2.818	0.426
LTE B25	25.0	23.0	1.585	0.757
LTE B30	24.9	21.0	2.455	0.489
LTE B38	24.0	20.0	2.512	0.478
LTE B41 (PC3)	24.5	20.5	2.512	0.478
LTE B66	25.0	23.0	1.585	0.757
LTE B71	25.5	23.5	1.585	0.757

Note(s):

1. Hotspot mode supports power reduction. When the measured SAR is scaled to the maximum tune-up limit, the adjusted SAR is < 1.2 W/kg, Product Specific 10g (Extremity) SAR testing is not required for this band in accordance with KDB 648474 §2.5 b. Refer to §10 for Reported SAR results. If the Reported SAR 1g value in §10 is less than the Reported SAR Limit listed above, then Product Specific 10g (Extremity) SAR is not required.
2. LTE 50% RB is scaled up to the Max Tune-Up Limit with MPR included.

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7. RF Exposure Conditions (Test Configurations)

Refer to Appendix A for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

Wireless technologies	RF Exposure Conditions	Antenna-to-User Separation	Test Position	Antenna-to-edge/surface	SAR Required	Note
WWAN (Main Ant. 1: GSM850/1900, CDMA BC0/1/10, W-CDMA B2/4/5, and LTE B2/4/5/12/13/25/26/66/71)	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	
	Extremity (Product Specific 10g)	0 mm	Rear	Refer to notes 2 & 3		
			Front			
			Edge 1 (Top)			
			Edge 2 (Right)			
			Edge 3 (Bottom)			
			Edge 4 (Left)			
WWAN (Main Ant. 2: LTE B7/30/38/41)	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	Yes	
			Edge 2 (Right)	> 25 mm	No	1
			Edge 3 (Bottom)	> 25 mm	No	1
			Edge 4 (Left)	< 25 mm	Yes	
	Extremity (Product Specific 10g)	0 mm	Rear	Refer to notes 2 & 3		
			Front			
			Edge 1 (Top)			
			Edge 2 (Right)			
			Edge 3 (Bottom)			
			Edge 4 (Left)			

Notes:

1. SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.
2. For Phablet devices: when hotspot mode applies, Product Specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.
3. For Phablet devices: when hotspot mode applies and power reduction applies to hotspot mode, Product Specific 10-g SAR is required for each test position that has an adjusted SAR to maximum power that is > 1.2 W/kg.

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Wireless technologies	RF Exposure Conditions	DUT-to-User Separation	Test Position	Antenna-to-edge/surface	SAR Required	Note
WLAN	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	Yes	
			Edge 2 (Right)	< 25 mm	Yes	
			Edge 3 (Bottom)	> 25 mm	No	1
			Edge 4 (Left)	> 25 mm	No	1
	Extremity (Product Specific 10g)	0 mm	Rear	Refer to notes 2 & 3		
			Front			
			Edge 1 (Top)			
			Edge 2 (Right)			
			Edge 3 (Bottom)			
			Edge 4 (Left)			

Notes:

1. SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.
2. For Phablet devices: when Hotspot Mode is not supported, Product Specific 10-g SAR is required for all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions.
3. For Phablet devices: when hotspot mode applies, Product Specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.
4. Wi-Fi Direct only supported during Hand use conditions.

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8. Dielectric Property Measurements & System Check

8.1. Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized.
The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.
Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.
The dielectric constant (ε_r) and conductivity (σ) of typical tissue-equivalent media recipes are expected to be within ± 5% of the required target values; but 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 ± 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	
	ε_r	σ (S/m)
150	52.3	0.76
300	45.3	0.87
450	43.5	0.87
835	41.5	0.90
900	41.5	0.97
915	41.5	0.98
1450	40.5	1.20
1610	40.3	1.29
1800 – 2000	40.0	1.40
2450	39.2	1.80
3000	38.5	2.40
5000	36.2	4.45
5100	36.1	4.55
5200	36.0	4.66
5300	35.9	4.76
5400	35.8	4.86
5500	35.6	4.96
5600	35.5	5.07
5700	35.4	5.17
5800	35.3	5.27

IEEE Std 1528-2013
Refer to Table 3 within the IEEE Std 1528-2013

IEC 62209-1
Refer to Table A.3 within the IEC 62209-1

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Dielectric Property Measurements Results:

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity (εr)			Conductivity (σ)		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
1	12/30/2019	750	Head	750	40.93	41.96	-2.46	0.89	0.89	-0.38
				660	41.46	42.42	-2.27	0.86	0.89	-3.03
				800	40.83	41.71	-2.10	0.91	0.90	1.39
1	1/2/2020	835	Head	835	41.47	41.50	-0.07	0.89	0.90	-1.44
				805	41.49	41.68	-0.45	0.88	0.90	-2.20
				850	41.42	41.50	-0.19	0.89	0.92	-2.59
1	1/6/2020	835	Head	835	40.65	41.50	-2.05	0.88	0.90	-2.12
				805	40.85	41.68	-1.99	0.88	0.90	-2.32
				850	40.54	41.50	-2.31	0.88	0.92	-3.36
1	1/6/2020	750	Head	750	40.22	41.96	-4.15	0.90	0.89	0.50
				660	43.75	42.42	3.13	0.85	0.89	-4.23
				800	42.20	41.71	1.19	0.91	0.90	1.03
1	1/7/2020	2300	Head	2300	39.22	39.47	-0.64	1.65	1.66	-0.95
				2350	39.12	39.38	-0.67	1.69	1.71	-1.27
				2400	39.06	39.30	-0.60	1.72	1.75	-1.86
1	1/9/2020	2450	Head	2450	38.34	39.20	-2.19	1.74	1.80	-3.11
				2400	38.33	39.30	-2.46	1.70	1.75	-3.06
				2480	38.31	39.16	-2.18	1.75	1.83	-4.39
1	1/14/2020	835	Head	835	40.88	41.50	-1.49	0.93	0.90	3.10
				805	40.81	41.68	-2.09	0.91	0.90	1.95
				850	40.80	41.50	-1.69	0.93	0.92	2.04
1	1/21/2020	2450	Head	2450	37.84	39.20	-3.47	1.88	1.80	4.17
				2400	37.90	39.30	-3.55	1.83	1.75	4.59
				2480	37.74	39.16	-3.63	1.89	1.83	3.03
1	1/22/2020	835	Head	835	41.58	41.50	0.19	0.93	0.90	3.79
				805	41.57	41.68	-0.26	0.92	0.90	2.94
				850	41.53	41.50	0.07	0.94	0.92	2.80
1	2/6/2020	2300	Head	2300	39.90	39.47	1.08	1.60	1.66	-3.95
				2350	40.02	39.38	1.61	1.66	1.71	-2.62
				2400	39.75	39.30	1.15	1.68	1.75	-4.15
2	12/27/2019	1900	Head	1900	39.30	40.00	-1.75	1.40	1.40	-0.14
				1850	39.35	40.00	-1.63	1.37	1.40	-2.21
				1920	39.28	40.00	-1.80	1.41	1.40	0.50
2	12/31/2019	1900	Head	1900	39.81	40.00	-0.47	1.38	1.40	-1.79
				1850	39.87	40.00	-0.33	1.36	1.40	-3.14
				1920	39.83	40.00	-0.43	1.39	1.40	-0.86
2	1/2/2020	1750	Head	1750	39.21	40.08	-2.18	1.38	1.37	1.10
				1710	39.29	40.15	-2.13	1.36	1.35	1.08
				1755	39.21	40.08	-2.16	1.39	1.37	1.11
2	1/6/2020	2600	Head	2600	38.28	39.01	-1.87	1.95	1.96	-0.57
				2495	38.47	39.14	-1.72	1.86	1.85	0.83
				2690	38.09	38.90	-2.08	2.02	2.06	-1.82

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Dielectric Property Measurements Results (continued):

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity (εr)			Conductivity (σ)		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
2	1/10/2020	2600	Head	2600	38.12	39.01	-2.28	1.85	1.96	-5.92
				2495	38.27	39.14	-2.23	1.75	1.85	-5.61
				2690	37.93	38.90	-2.49	1.90	2.06	-7.79
2	1/14/2020	1900	Head	1900	38.93	40.00	-2.68	1.46	1.40	4.00
				1850	39.01	40.00	-2.48	1.43	1.40	2.21
				1920	38.87	40.00	-2.83	1.46	1.40	4.29
2	1/16/2020	750	Head	750	38.55	41.96	-8.13	0.85	0.89	-4.29
				700	38.57	42.22	-8.64	0.83	0.89	-7.17
				800	38.52	41.71	-7.64	0.88	0.90	-1.52
2	1/21/2020	5250	Head	5250	36.30	35.93	1.02	4.67	4.70	-0.60
				5150	36.40	36.05	0.98	4.56	4.60	-0.93
				5350	36.14	35.82	0.90	4.77	4.80	-0.65
2	1/21/2020	5600	Head	5600	35.62	35.53	0.24	5.05	5.06	-0.26
				5500	35.84	35.65	0.54	4.92	4.96	-0.81
				5725	35.32	35.39	-0.20	5.21	5.19	0.32
2	1/21/2020	5750	Head	5750	35.32	35.36	-0.12	5.23	5.21	0.39
				5700	35.42	35.42	0.00	5.16	5.16	-0.13
				5850	35.11	35.30	-0.54	5.35	5.27	1.59
2	1/22/2020	1900	Head	1900	38.39	40.00	-4.03	1.47	1.40	4.64
				1850	38.48	40.00	-3.80	1.44	1.40	2.64
				1920	38.35	40.00	-4.13	1.47	1.40	5.00
2	1/23/2020	2600	Head	2600	37.27	39.01	-4.46	1.88	1.96	-3.98
				2495	37.37	39.14	-4.53	1.80	1.85	-2.47
				2690	37.04	38.90	-4.77	1.96	2.06	-4.83
2	2/7/2020	2600	Head	2600	39.73	39.01	1.84	1.90	1.96	-3.22
				2495	39.92	39.14	1.98	1.83	1.85	-1.01
				2690	39.62	38.90	1.86	1.97	2.06	-4.44
3	2/7/2020	2600	Head	2600	38.93	39.01	-0.21	1.96	1.96	-0.31
				2495	39.10	39.14	-0.11	1.87	1.85	0.99
				2690	38.74	38.90	-0.40	2.02	2.06	-1.87
3	2/11/2020	2300	Head	2300	38.37	39.47	-2.79	1.62	1.66	-2.57
				2350	38.23	39.38	-2.93	1.66	1.71	-2.62
				2400	38.17	39.30	-2.87	1.70	1.75	-2.89
3	2/11/2020	2600	Head	2600	37.52	39.01	-3.82	1.90	1.96	-3.37
				2495	37.62	39.14	-3.89	1.82	1.85	-1.82
				2690	37.38	38.90	-3.90	1.97	2.06	-4.15

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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.

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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. Refer to Appendix B for the SAR System Check Plots.

SAR Lab	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 %	
1	12/30/2019	Head	D750V3 SN:1024	5/15/2020	0.839	8.39	8.33	0.72	0.557	5.57	5.44	2.39	
1	1/2/2020	Head	D835V2 SN:4d002	11/20/2020	0.949	9.49	9.78	-2.97	0.624	6.24	6.37	-2.04	
1	1/6/2020	Head	D835V2 SN:4d002	11/20/2020	0.943	9.43	9.78	**-3.58**	0.619	6.19	6.37	**-2.83**	1,2
1	1/6/2020	Head	D750V3 SN:1024	5/15/2020	0.853	8.53	8.33	**2.40**	0.563	5.63	5.44	**3.49**	3,4
1	1/7/2020	Head	D2300V2 SN:1002	3/22/2020	4.740	47.40	48.30	-1.86	2.250	22.50	23.30	-3.43	
1	1/9/2020	Head	D2450V2 SN:899	3/22/2020	5.190	51.90	51.60	0.58	2.420	24.20	24.10	0.41	
1	1/14/2020	Head	D835V2 SN:4d002	11/20/2020	0.977	9.77	9.78	-0.10	0.638	6.38	6.37	0.16	
1	1/21/2020	Head	D2450V2 SN:899	3/22/2020	5.410	54.10	51.60	**4.84**	2.510	25.10	24.10	**4.15**	5,6
1	1/22/2020	Head	D835V2 SN:4d002	11/20/2020	0.960	9.60	9.78	-1.84	0.629	6.29	6.37	-1.26	
1	2/6/2020	Head	D2300V2 SN:1002	3/22/2020	4.800	48.00	48.30	**-0.62**	2.290	22.90	23.30	**-1.72**	7,8
2	12/27/2019	Head	D1900V2 SN:5d043	11/20/2020	4.010	40.10	40.40	-0.74	2.060	20.60	21.10	-2.37	
2	12/31/2019	Head	D1900V2 SN:5d043	11/20/2020	3.870	38.70	40.40	**-4.21**	1.990	19.90	21.10	**-5.69**	9,10
2	1/2/2020	Head	D1750V2 SN:1053	10/10/2020	3.720	37.20	37.20	**0.00**	1.970	19.70	19.60	**0.51**	11,12
2	1/6/2019	Head	D2600V2 SN:1036	3/22/2020	6.030	60.30	55.90	**7.87**	2.690	26.90	24.80	**8.47**	13,14
2	1/10/2020	Head	D2600V2 SN:1036	3/22/2020	5.560	55.60	55.90	-0.54	2.480	24.80	24.80	0.00	
2	1/14/2020	Head	D1900V2 SN:5d043	11/20/2020	4.140	41.40	40.40	2.48	2.130	21.30	21.10	0.95	
2	1/16/2020	Head	D750V3 SN:1071	11/20/2020	0.834	8.34	8.52	**-2.11**	0.547	5.47	5.56	**-1.62**	15,16
2	1/21/2020	Head	D5GHzV2 SN:1003 (5.25 GHz)	2/19/2020	8.130	81.30	80.80	**0.62**	2.320	23.20	23.30	**-0.43**	17,18
2	1/21/2020	Head	D5GHzV2 SN:1168 (5.6 GHz)	11/23/2020	8.950	89.50	83.80	**6.80**	2.540	25.40	23.70	**7.17**	19,20
2	1/21/2020	Head	D5GHzV2 SN:1003 (5.75 GHz)	2/19/2020	8.250	82.50	80.70	**2.23**	2.350	23.50	23.00	**2.17**	21,22
2	1/22/2020	Head	D1900V2 SN:5d043	11/20/2020	4.130	41.30	40.40	2.23	2.120	21.20	21.10	0.47	
2	1/23/2020	Head	D2600V2 SN:1036	3/22/2020	5.590	55.90	55.90	0.00	2.500	25.00	24.80	0.81	
2	2/7/2020	Head	D2600V2 SN:1036	3/22/2020	6.000	60.00	55.90	7.33	2.690	26.90	24.80	8.47	
3	2/7/2020	Head	D2600V2 SN:1036	3/22/2020	5.860	58.60	55.90	**4.83**	2.630	26.30	24.80	**6.05**	23,24
3	2/11/2020	Head	D2300V2 SN:1002	3/22/2020	4.960	49.60	48.30	2.69	2.360	23.60	23.30	1.29	
3	2/11/2020	Head	D2600V2 SN:1036	3/22/2020	5.840	58.40	55.90	4.47	2.610	26.10	24.80	5.24	

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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.

When different maximum output power applies to GSM voice or GPRS/EDGE time slots, GSM voice and GPRS/EDGE time slots should be tested separately to determine compliance by summing the corresponding reported SAR.

The GMSK EDGE configurations are grouped with GPRS and considered with respect to time-averaged maximum output power to determine compliance

Per October 2013 TCB Workshop:
When the maximum frame-averaged powers levels are within 0.25 dB of each other, test the configuration with the greatest number of time slots.

Maximum Output Power (Tune-up Limit) for GSM

SAR is not required for EDGE (8PSK) mode because the maximum output power and tune-up limit is ≤ 1/4dB higher than GPRS/EDGE (GMSK) or the adjusted SAR of the highest reported SAR of GPRS/EDGE (GMSK) is ≤ 1.2W/kg.

RF Air interface	Mode	Tune-up Power Limit (dBm)
		Main Antenna 1
		Maximum
GSM850	Voice/GPRS (1 slot)	34.0
	GPRS 2 slots	31.5
	GPRS 3 slots	30.2
	GPRS 4 slots	29.1
	EGPRS 1 slot	27.0
	EGPRS 2 slot	25.0
	EGPRS 3 slot	23.8
	EGPRS 4 slots	22.6
GSM1900	Voice/GPRS (1 slot)	31.5
	GPRS 2 slots	28.5
	GPRS 3 slots	27.0
	GPRS 4 slots	25.5
	EGPRS 1 slot	27.0
	EGPRS 2 slot	25.0
	EGPRS 3 slot	23.8
	EGPRS 4 slots	22.6

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GSM850 Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Average Power (dBm)			
					Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GPRS/EDGE (GMSK)	CS1	1	128	824.2	32.4	23.3	34.0	25.0
			190	836.6	32.7	23.7		
			251	848.8	32.7	23.7		
		2	128	824.2	30.9	24.9	31.5	25.5
			190	836.6	30.9	24.8		
			251	848.8	30.8	24.8		
		3	128	824.2	29.5	25.2	30.2	25.9
			190	836.6	29.5	25.2		
			251	848.8	29.2	24.9		
		4	128	824.2	28.0	25.0	29.1	**26.1**
			190	836.6	28.0	25.0		
			251	848.8	28.0	25.0		
EDGE (8PSK)	MCS5	1	128	824.2	26.6	17.6	27.0	18.0
			190	836.6	26.6	17.6		
			251	848.8	26.4	17.4		
		2	128	824.2	24.4	18.4	25.0	19.0
			190	836.6	24.3	18.3		
			251	848.8	24.2	18.2		
		3	128	824.2	23.8	19.5	23.8	19.5
			190	836.6	23.8	19.5		
			251	848.8	23.8	19.5		
		4	128	824.2	22.4	19.4	22.6	19.6
			190	836.6	22.4	19.4		
			251	848.8	22.4	19.4		

Notes:

- Based on the Tune-up Procedure, GPRS/EDGE (GMSK) mode with 4 time slots have maximum frame-averaged power.

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GSM1900 Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Average Power (dBm)			
					Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GPRS/EDGE (GMSK)	CS1	1	512	1850.2	31.0	22.0	31.5	22.5
			661	1880.0	30.2	21.2		
			810	1909.8	29.6	20.6		
		2	512	1850.2	28.5	22.5	28.5	22.5
			661	1880.0	28.0	22.0		
			810	1909.8	27.2	21.2		
		3	512	1850.2	26.4	22.1	27.0	**22.7**
			661	1880.0	26.3	22.0		
			810	1909.8	25.6	21.3		
		4	512	1850.2	24.1	21.1	25.5	22.5
			661	1880.0	24.4	21.4		
			810	1909.8	24.5	21.5		
EDGE (8PSK)	MCS5	1	512	1850.2	25.1	16.1	27.0	18.0
			661	1880.0	25.3	16.3		
			810	1909.8	25.3	16.3		
		2	512	1850.2	23.6	17.6	25.0	19.0
			661	1880.0	23.7	17.7		
			810	1909.8	23.8	17.8		
		3	512	1850.2	22.0	17.7	23.8	19.5
			661	1880.0	22.3	18.0		
			810	1909.8	22.1	17.8		
		4	512	1850.2	21.2	18.2	22.6	19.6
			661	1880.0	21.3	18.3		
			810	1909.8	21.4	18.4		

Notes:

- Based on the Tune-up Procedure, GPRS/EDGE (GMSK) mode with 3 time slots have maximum frame-averaged power.

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9.2. W-CDMA

Per KDB 941225 D01 3G SAR Procedures for W-CDMA:

Maximum output power is verified on the high, middle and low channels and using the appropriate 12.2 kbps RMC with TPC (transmit power control) set to all "1's"

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. A summary of these settings is illustrated below:

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

HSDPA Setup Procedures used to establish the test signals

The following 4 Sub-tests were completed according to procedures in table C.10.1.4 of 3GPP TS 34.121-1
A summary of these settings is illustrated below:

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

HSUPA Setup Procedures used to establish the test signals

The following 5 Sub-tests were completed according to procedures in table C.11.1.3 of 3GPP TS 34.121-1. A summary of these settings is illustrated below:

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c.

Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

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DC-HSDPA Setup Procedures used to establish the test signals

The following 4 Sub-tests for DC-HSDPA were completed according to procedures in table C08.1.12 of 3GPP TS 34.121-1. A summary of subtest settings is illustrated below:

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

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

HSPA+ Setup Procedures used to establish the test signals

The following 1 Sub-test was completed according to procedures in table C.11.1.4 of 3GPP TS34.121. A summary of these settings is illustrated below:

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	$\beta_{ed}1$: 30/15 $\beta_{ed}2$: 30/15	$\beta_{ed}3$: 24/15 $\beta_{ed}4$: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

DUT supports HSPA+ DL only. Therefore, conducted power measurements is not required.

Maximum Output Power (Tune-up Limit) for W-CDMA

SAR measurement is not required for the HSDPA, HSUPA, DC-HSDPA and HSPA+. When primary mode and the adjusted SAR is ≤ 1.2 W/kg and secondary mode is ≤ ¼ dB higher than the primary mode

RF Air interface	Mode	Tune-up Power Limit (dBm)	
		Main Antenna 1	
		Maximum	Reduced
W-CDMA Band 2	R99	25.0	22.0
	HSDPA	24.0	22.0
	HSUPA	23.0	21.0
	DC-HSDPA	24.0	22.0
W-CDMA Band 4	R99	25.0	22.0
	HSDPA	23.0	21.0
	HSUPA	21.5	19.5
	DC-HSDPA	24.0	22.0
W-CDMA Band 5	R99	25.5	
	HSDPA	24.0	
	HSUPA	22.6	
	DC-HSDPA	24.0	

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W-CDMA Band II Measured Results

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)			Reduced Average Power (dBm)		
				Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	24.0	N/A	25.0	21.9	N/A	22.0
		9400	1880.0	24.0			21.7		
		9538	1907.6	24.0			21.7		
HSDPA	Subtest 1	9262	1852.4	22.9	0	24.0	21.9	0	22.0
		9400	1880.0	23.0			22.0		
		9538	1907.6	22.7			21.9		
	Subtest 2	9262	1852.4	22.0	0	24.0	22.0	0	22.0
		9400	1880.0	22.0			22.0		
		9538	1907.6	22.0			22.0		
	Subtest 3	9262	1852.4	22.0	0.5	23.5	22.0	0	22.0
		9400	1880.0	22.0			22.0		
		9538	1907.6	21.9			22.0		
	Subtest 4	9262	1852.4	22.0	0.5	23.5	22.0	0	22.0
		9400	1880.0	22.0			22.0		
		9538	1907.6	21.8			22.0		
HSUPA	Subtest 1	9262	1852.4	22.8	0	23.0	20.8	0	21.0
		9400	1880.0	23.0			21.0		
		9538	1907.6	22.8			20.8		
	Subtest 2	9262	1852.4	20.9	2	21.0	18.9	2	19.0
		9400	1880.0	21.0			19.0		
		9538	1907.6	20.8			18.8		
	Subtest 3	9262	1852.4	21.9	1	22.0	20.0	1	20.0
		9400	1880.0	22.0			20.0		
		9538	1907.6	22.0			20.0		
	Subtest 4	9262	1852.4	20.8	2	21.0	19.0	2	19.0
		9400	1880.0	21.0			19.0		
		9538	1907.6	20.9			19.0		
	Subtest 5	9262	1852.4	23.0	0	23.0	21.0	0	21.0
		9400	1880.0	23.0			21.0		
		9538	1907.6	23.0			21.0		
DC-HSDPA	Subtest 1	9262	1852.4	22.9	0	24.0	21.9	0	22.0
		9400	1880.0	23.0			22.0		
		9538	1907.6	22.7			22.0		
	Subtest 2	9262	1852.4	22.1	0	24.0	22.0	0	22.0
		9400	1880.0	22.0			22.0		
		9538	1907.6	22.0			22.0		
	Subtest 3	9262	1852.4	22.0	0.5	23.5	22.0	0	22.0
		9400	1880.0	22.0			21.9		
		9538	1907.6	21.9			22.0		
	Subtest 4	9262	1852.4	22.0	0.5	23.5	22.0	0	22.0
		9400	1880.0	22.0			22.0		
		9538	1907.6	21.9			22.0		

Note(s):

It is expected by the manufacturer that MPR for some HSPA subtests may be up to 3dB more than specified by3GPP, but also as low as 0dB according to the chipset implementation in this model.

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W-CDMA Band IV Measured Results

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)			Reduced Average Power (dBm)		
				Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	1312	1712.4	23.5	N/A	25.0	21.4	N/A	22.0
		1413	1732.6	23.7			21.5		
		1513	1752.6	23.8			21.7		
HSDPA	Subtest 1	1312	1712.4	22.3	0	23.0	20.3	0	21.0
		1413	1732.6	22.4			20.7		
		1513	1752.6	22.2			20.5		
	Subtest 2	1312	1712.4	21.3	0	23.0	20.1	0	21.0
		1413	1732.6	21.3			20.2		
		1513	1752.6	21.3			20.2		
	Subtest 3	1312	1712.4	21.3	0.5	22.5	20.2	0.5	20.5
		1413	1732.6	21.5			20.4		
		1513	1752.6	21.8			20.5		
	Subtest 4	1312	1712.4	21.3	0.5	22.5	20.2	0.5	20.5
		1413	1732.6	21.5			20.4		
		1513	1752.6	21.8			20.5		
HSUPA	Subtest 1	1312	1712.4	19.8	0	21.5	19.5	0	19.5
		1413	1732.6	20.0			19.5		
		1513	1752.6	20.3			19.5		
	Subtest 2	1312	1712.4	17.8	2	19.5	17.5	2	17.5
		1413	1732.6	18.0			17.5		
		1513	1752.6	18.2			17.5		
	Subtest 3	1312	1712.4	20.3	1	20.5	18.5	1	18.5
		1413	1732.6	20.5			18.5		
		1513	1752.6	20.5			18.5		
	Subtest 4	1312	1712.4	17.8	2	19.5	17.5	2	17.5
		1413	1732.6	18.0			17.5		
		1513	1752.6	18.2			17.5		
	Subtest 5	1312	1712.4	20.8	0	21.5	19.5	0	19.5
		1413	1732.6	21.0			19.5		
		1513	1752.6	21.2			19.5		
DC-HSDPA	Subtest 1	1312	1712.4	23.4	0	24.0	22.0	0	22.0
		1413	1732.6	23.5			22.0		
		1513	1752.6	23.3			22.0		
	Subtest 2	1312	1712.4	22.4	0	24.0	21.3	0	22.0
		1413	1732.6	22.4			21.3		
		1513	1752.6	22.4			21.3		
	Subtest 3	1312	1712.4	22.4	0.5	23.5	21.1	0.5	21.5
		1413	1732.6	22.6			21.3		
		1513	1752.6	22.9			21.5		
	Subtest 4	1312	1712.4	22.4	0.5	23.5	21.1	0.5	21.5
		1413	1732.6	22.6			21.3		
		1513	1752.6	22.9			21.5		

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W-CDMA Band V Measured Results

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	4132	826.4	24.0	N/A	25.5
		4183	836.6	24.0		
		4233	846.6	24.0		
HSDPA	Subtest 1	4132	826.4	23.0	0	24.0
		4183	836.6	23.0		
		4233	846.6	23.0		
	Subtest 2	4132	826.4	23.0	0	24.0
		4183	836.6	23.0		
		4233	846.6	22.9		
	Subtest 3	4132	826.4	22.1	0.5	23.5
		4183	836.6	22.2		
		4233	846.6	22.2		
	Subtest 4	4132	826.4	22.2	0.5	23.5
		4183	836.6	22.2		
		4233	846.6	22.2		
HSUPA	Subtest 1	4132	826.4	21.1	0	22.6
		4183	836.6	21.2		
		4233	846.6	21.2		
	Subtest 2	4132	826.4	19.1	2	20.6
		4183	836.6	19.3		
		4233	846.6	19.2		
	Subtest 3	4132	826.4	21.1	1	21.6
		4183	836.6	21.2		
		4233	846.6	21.2		
	Subtest 4	4132	826.4	19.2	2	20.6
		4183	836.6	19.3		
		4233	846.6	19.2		
	Subtest 5	4132	826.4	22.6	0	22.6
		4183	836.6	22.6		
		4233	846.6	22.6		
DC-HSDPA	Subtest 1	4132	826.4	23.1	0	24.0
		4183	836.6	23.1		
		4233	846.6	23.1		
	Subtest 2	4132	826.4	23.1	0	24.0
		4183	836.6	23.1		
		4233	846.6	23.0		
	Subtest 3	4132	826.4	22.2	0.5	23.5
		4183	836.6	22.3		
		4233	846.6	22.3		
	Subtest 4	4132	826.4	22.3	0.5	23.5
		4183	836.6	22.3		
		4233	846.6	22.3		

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9.3. CDMA

1x Advanced Setup Procedures used to establish the test signals

Call box setup procedure

- Protocol Rev > 6 (IS-2000-0)
- System ID: 331; NID: 65535, Reg. Ch. #.:
- Radio Config (RC) > Fwd11, Rvs8
- Service Option (SO) Setup > SO75 (Loopback)
- Traffic Data Rate > Full
- Rvs Power Ctrl > All Up bits (Maximum Tx Pout)
- Reverse Power Control Mode: 00-200 to 400 bps
- Smart blanking was disabled.

Maximum Output Power (Tune-up Limit) for CDMA

SAR for next to the ear head exposure is measured in RC3 with the handset configured to transmit at full rate in SO55. The 3G SAR test reduction procedure is applied to RC1 with RC3 as the primary mode

Body-worn accessory SAR is measured in RC3 with the handset configured in TDSO/SO32 to transmit at full rate on FCH only with all other code channels disabled. The body-worn accessory procedures in KDB Publication 447498 D01 are applied. The 3G SAR test reduction procedure is applied to the multiple code channel configuration (FCH+SCHn), with FCH only as the primary mode.

When VOIP is supported by Ev-Do devices for next to the ear use, head exposure SAR is required.

SAR measurement is not required for the 1xEVDO Rev. A and 1x-Advanced. When primary mode and the adjusted SAR is ≤ 1.2 W/kg and secondary mode is ≤ ¼ dB higher than the primary mode.

RF Air interface	Mode	Tune-up Power Limit (dBm)
		Main Antenna 1
		Maximum
CDMA BC0	1xRTT	25.5
	1xAdvanced	25.5
	1xEVDO Rel. 0	25.5
	1xEVDO Rev. A	25.5
CDMA BC1	1xRTT	25.0
	1xAdvanced	25.0
	1xEVDO Rel. 0	25.0
	1xEVDO Rev. A	25.0
CDMA BC10	1xRTT	25.5
	1xAdvanced	25.5
	1xEVDO Rel. 0	25.5
	1xEVDO Rev. A	25.5

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CDMA BC0 Measured Results

Mode		Channel	Freq. (MHz)	Maximum Average Power (dBm)	
				Measured Pwr	Tune-up Limit
1xRTT	RC1, SO55 (Loopback)	1013	824.70	24.5	25.5
		384	836.52	24.3	
		777	848.31	24.2	
	RC3, SO55 (Loopback)	1013	824.70	24.5	
		384	836.52	24.3	
		777	848.31	24.2	
	RC3, SO32 (+F-SCH)	1013	824.70	24.5	
		384	836.52	24.3	
		777	848.31	24.2	
1xAdvanced	Fwd11/Rvs8 SO75 (Loopback)	1013	824.70	24.5	25.5
		384	836.52	24.3	
		777	848.31	24.2	
1xEv-Do Rel. 0	307.2 kbps (2 slot, QPSK)	1013	824.70	24.3	25.5
		384	836.52	24.2	
		777	848.31	24.1	
1xEv-Do Rev. A	307.2k, QPSK/ ACK channel is transmitted at all the slots	1013	824.70	24.5	25.5
		384	836.52	24.3	
		777	848.31	24.1	

CDMA BC1 Measured Results

Mode		Channel	Freq. (MHz)	Maximum Average Power (dBm)	
				Measured Pwr	Tune-up Limit
1xRTT	RC1, SO55 (Loopback)	25	1851.25	23.8	25.0
		600	1880.00	23.8	
		1175	1908.75	23.9	
	RC3, SO55 (Loopback)	25	1851.25	23.8	
		600	1880.00	23.8	
		1175	1908.75	23.9	
	RC3, SO32 (+F-SCH)	25	1851.25	23.7	
		600	1880.00	23.8	
		1175	1908.75	23.9	
1xAdvanced	Fwd11/Rvs8 SO75 (Loopback)	25	1851.25	23.7	25.0
		600	1880	23.8	
		1175	1908.75	23.9	
1xEv-Do Rel. 0	307.2 kbps (2 slot, QPSK)	25	1851.25	23.7	25.0
		600	1880.00	23.8	
		1175	1908.75	23.8	
1xEv-Do Rev. A	307.2k, QPSK/ ACK channel is transmitted at all the slots	25	1851.25	23.8	25.0
		600	1880	23.8	
		1175	1908.75	23.9	

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CDMA BC10 Measured Results

Mode		Channel	Freq. (MHz)	Maximum Average Power (dBm)	
				Measured Pwr	Tune-up Limit
1xRTT	RC1, SO55 (Loopback)	450	817.25	24.4	25.5
		560	820.00	24.4	
		670	822.75	24.4	
	RC3, SO55 (Loopback)	450	817.25	24.4	
		560	820.00	24.4	
		670	822.75	24.4	
	RC3, SO32 (+F-SCH)	450	817.25	24.4	
		560	820.00	24.4	
		670	822.75	24.3	
1xAdvanced	Fwd11/Rvs8 SO75 (Loopback)	450	817.25	24.4	25.5
		560	820	24.4	
		670	822.75	24.3	
1xEv-Do Rel. 0	307.2 kbps (2 slot, QPSK)	450	817.25	24.3	25.5
		560	820.00	24.3	
		670	822.75	24.2	
1xEv-Do Rev. A	307.2k, QPSK/ ACK channel is transmitted at all the slots	450	817.25	24.4	25.5
		560	820	24.3	
		670	822.75	24.3	

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9.4. LTE

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

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

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{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
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

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 (subclause)	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	N/A

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Maximum Output Power (Tune-up Limit) for LTE

According to April 2015 TCB workshop, SAR test exclusion can be applied for testing overlapping LTE bands as follows:

a) The maximum output power, including tolerance, for the smaller band must be ≤ the larger band to qualify for the SAR test exclusion.
b) The channel bandwidth and other operating parameters for the smaller band must be fully supported by the larger band.
   - LTE Band 2 (1850-1910 MHz) is covered by LTE Band 25 (1850-1915 MHz)
   - LTE Band 4 (1710-1755 MHz) is covered by LTE Band 66 (1710-1780 MHz)
   - LTE Band 38 (2570-2620 MHz) is covered by LTE Band 41 (2496-2690 MHz)

Some LTE bands have maximum bandwidths that do not support at least three non-overlapping channels in certain channel bandwidths. When a device supports LTE bands that have 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 QPSK configuration has the highest maximum average output power per 3GPP standard.

SAR measurement is not required for the 16QAM and 64QAM, when the highest maximum output power for 16QAM and 64QAM is ≤ ½ dB higher than the QPSK or when the reported SAR for the QPSK configuration is ≤ 1.45 W/kg.

Please refer to section 6.3. for LTE detail test channels.

RF Air interface	Mode	Tune-up Pow erLimit (dBm)			
		Main Antenna 1		Main Antenna 2	
		Maximum	Reduced	Maximum	Reduced
LTE Band 2	QPSK	25.0	23.0		
LTE Band 4	QPSK	25.0	23.0		
LTE Band 5	QPSK	25.5			
LTE Band 7	QPSK			23.5	19.0
LTE Band 12	QPSK	25.5			
LTE Band 13	QPSK	25.5			
LTE Band 14	QPSK	25.5			
LTE Band 25	QPSK	25.0	23.0		
LTE Band 26	QPSK	25.0			
LTE Band 30	QPSK			24.9	20.0
LTE Band 38	QPSK			24.0	20.0
LTE Band 41	QPSK			24.5	20.5
LTE Band 41 (HPUE)	QPSK			27.5	
LTE Band 66	QPSK	25.0	23.0		
LTE Band 71	QPSK	25.5	23.5		

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LTE Band 5 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	20525 836.5 MHz	[redacted]		
10 MHz	QPSK	1	0	[redacted]	24.5	[redacted]	0	25.5
		1	25	[redacted]	24.5	[redacted]	0	25.5
		1	49	[redacted]	24.5	[redacted]	0	25.5
		25	0	[redacted]	23.4	[redacted]	1	24.5
		25	12	[redacted]	23.4	[redacted]	1	24.5
		25	25	[redacted]	23.4	[redacted]	1	24.5
		50	0	[redacted]	23.4	[redacted]	1	24.5
	16QAM	1	0	[redacted]	23.4	[redacted]	1	24.5
		1	25	[redacted]	23.3	[redacted]	1	24.5
		1	49	[redacted]	23.2	[redacted]	1	24.5
		25	0	[redacted]	22.4	[redacted]	2	23.5
		25	12	[redacted]	22.4	[redacted]	2	23.5
		25	25	[redacted]	22.4	[redacted]	2	23.5
		50	0	[redacted]	22.4	[redacted]	2	23.5
	64QAM	1	0	[redacted]	22.1	[redacted]	2	23.5
		1	25	[redacted]	22.1	[redacted]	2	23.5
		1	49	[redacted]	22.1	[redacted]	2	23.5
		25	0	[redacted]	21.5	[redacted]	3	22.5
		25	12	[redacted]	21.4	[redacted]	3	22.5
		25	25	[redacted]	21.4	[redacted]	3	22.5
		50	0	[redacted]	21.4	[redacted]	3	22.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				20425 826.5 MHz	20525 836.5 MHz	20625 846.5 MHz		
5 MHz	QPSK	1	0	24.4	24.4	24.4	0	25.5
		1	12	24.4	24.4	24.4	0	25.5
		1	24	24.4	24.4	24.4	0	25.5
		12	0	23.4	23.5	23.4	1	24.5
		12	7	23.4	23.4	23.4	1	24.5
		12	13	23.4	23.4	23.4	1	24.5
		25	0	23.4	23.4	23.4	1	24.5
	16QAM	1	0	23.3	23.2	23.1	1	24.5
		1	12	23.3	23.2	23.3	1	24.5
		1	24	23.3	23.1	23.1	1	24.5
		12	0	22.4	22.5	22.4	2	23.5
		12	7	22.4	22.5	22.3	2	23.5
		12	13	22.4	22.5	22.3	2	23.5
		25	0	22.4	22.4	22.4	2	23.5
	64QAM	1	0	22.4	22.0	22.4	2	23.5
		1	12	22.3	22.0	22.4	2	23.5
		1	24	22.3	21.9	22.4	2	23.5
		12	0	21.3	21.3	21.3	3	22.5
		12	7	21.3	21.3	21.3	3	22.5
		12	13	21.3	21.3	21.3	3	22.5
		25	0	21.3	21.4	21.4	3	22.5

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LTE Band 5 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				20415	20525	20635		
				825.5 MHz	836.5 MHz	847.5 MHz		
3 MHz	QPSK	1	0	24.5	24.5	24.4	0	25.5
		1	8	24.5	24.5	24.4	0	25.5
		1	14	24.5	24.5	24.5	0	25.5
		8	0	23.4	23.4	23.4	1	24.5
		8	4	23.4	23.4	23.4	1	24.5
		8	7	23.4	23.4	23.4	1	24.5
		15	0	23.4	23.4	23.3	1	24.5
	16QAM	1	0	23.3	23.2	23.4	1	24.5
		1	8	23.3	23.1	23.4	1	24.5
		1	14	23.3	23.1	23.4	1	24.5
		8	0	22.3	22.4	22.4	2	23.5
		8	4	22.3	22.4	22.4	2	23.5
		8	7	22.3	22.4	22.4	2	23.5
		15	0	22.4	22.4	22.3	2	23.5
	64QAM	1	0	22.0	22.5	22.1	2	23.5
		1	8	22.0	22.5	22.0	2	23.5
		1	14	22.1	22.5	21.8	2	23.5
		8	0	21.3	21.4	21.3	3	22.5
		8	4	21.2	21.3	21.3	3	22.5
		8	7	21.3	21.4	21.3	3	22.5
		15	0	21.5	21.3	21.4	3	22.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				20407	20525	20643		
				824.7 MHz	836.5 MHz	848.3 MHz		
1.4 MHz	QPSK	1	0	24.5	24.5	24.3	0	25.5
		1	3	24.5	24.4	24.3	0	25.5
		1	5	24.5	24.5	24.3	0	25.5
		3	0	24.4	24.4	24.3	0	25.5
		3	1	24.4	24.4	24.3	0	25.5
		3	3	24.4	24.4	24.3	0	25.5
		6	0	23.4	23.4	23.4	1	24.5
	16QAM	1	0	23.4	23.2	23.3	1	24.5
		1	3	23.4	23.2	23.4	1	24.5
		1	5	23.3	23.3	23.3	1	24.5
		3	0	23.4	23.4	23.3	1	24.5
		3	1	23.4	23.4	23.3	1	24.5
		3	3	23.4	23.4	23.3	1	24.5
		6	0	22.4	22.5	22.3	2	23.5
	64QAM	1	0	22.4	22.7	21.9	2	23.5
		1	3	21.9	22.4	22.0	2	23.5
		1	5	22.2	22.6	21.8	2	23.5
		3	0	22.5	22.6	22.4	2	23.5
		3	1	22.6	22.6	22.3	2	23.5
		3	3	22.6	22.6	22.3	2	23.5
		6	0	21.3	21.4	21.5	3	22.5

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LTE Band 7 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				20850	21100	21350	MPR	Tune-up Limit	20850	21100	21350	MPR	Tune-up Limit
				2510 MHz	2535 MHz	2560 MHz			2510 MHz	2535 MHz	2560 MHz		
20 MHz	QPSK	1	0	22.5	22.6	22.5	0	23.5	17.6	18.1	18.6	0	19
		1	49	22.4	22.5	22.3	0	23.5	17.6	18.1	18.5	0	19
		1	99	22.3	22.5	22.3	0	23.5	17.5	18.0	18.4	0	19
		50	0	21.5	21.5	21.4	1	22.5	17.6	18.2	18.4	0	19
		50	24	21.4	21.4	21.4	1	22.5	17.6	18.0	18.4	0	19
		50	50	21.4	21.4	21.3	1	22.5	17.5	18.0	18.4	0	19
		100	0	21.4	21.5	21.3	1	22.5	17.6	18.0	18.4	0	19
	16QAM	1	0	21.4	21.6	21.4	1	22.5	17.5	18.0	18.3	0	19
		1	49	21.3	21.5	21.3	1	22.5	17.4	18.0	18.3	0	19
		1	99	21.2	21.5	21.3	1	22.5	17.4	17.9	18.2	0	19
		50	0	20.5	20.6	20.5	2	21.5	17.6	18.1	18.4	0	19
		50	24	20.5	20.5	20.5	2	21.5	17.5	18.1	18.4	0	19
		50	50	20.4	20.5	20.4	2	21.5	17.5	18.0	18.4	0	19
		100	0	20.5	20.6	20.5	2	21.5	17.6	18.1	18.4	0	19
	64QAM	1	0	20.8	20.9	20.6	2	21.5	17.8	18.1	18.5	0	19
		1	49	20.6	20.8	20.5	2	21.5	17.5	18.0	18.4	0	19
		1	99	20.4	20.8	20.4	2	21.5	17.5	18.0	18.4	0	19
		50	0	19.5	19.6	19.5	3	20.5	17.8	18.2	18.6	0	19
		50	24	19.5	19.6	19.5	3	20.5	17.7	18.2	18.5	0	19
		50	50	19.5	19.5	19.5	3	20.5	17.7	18.2	18.5	0	19
		100	0	19.5	19.5	19.4	3	20.5	17.8	18.2	18.6	0	19

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				20825	21100	21375	MPR	Tune-up Limit	20825	21100	21375	MPR	Tune-up Limit
				2507.5 MHz	2535 MHz	2562.5 MHz			2507.5 MHz	2535 MHz	2562.5 MHz		
15 MHz	QPSK	1	0	22.6	22.6	22.5	0	23.5	17.6	18.2	18.6	0	19
		1	37	22.5	22.5	22.4	0	23.5	17.6	18.2	18.5	0	19
		1	74	22.5	22.5	22.4	0	23.5	17.5	18.1	18.5	0	19
		36	0	21.5	21.5	21.5	1	22.5	17.5	18.1	18.5	0	19
		36	20	21.5	21.5	21.4	1	22.5	17.5	18.1	18.5	0	19
		36	39	21.5	21.5	21.4	1	22.5	17.5	18.0	18.5	0	19
		75	0	21.5	21.5	21.4	1	22.5	17.5	18.0	18.5	0	19
	16QAM	1	0	21.4	21.4	21.6	1	22.5	17.4	17.8	18.6	0	19
		1	37	21.4	21.3	21.6	1	22.5	17.4	17.9	18.5	0	19
		1	74	21.3	21.3	21.5	1	22.5	17.3	17.8	18.5	0	19
		36	0	20.5	20.6	20.6	2	21.5	17.5	18.1	18.5	0	19
		36	20	20.5	20.6	20.5	2	21.5	17.5	18.0	18.5	0	19
		36	39	20.5	20.5	20.5	2	21.5	17.4	18.0	18.5	0	19
		75	0	20.5	20.5	20.5	2	21.5	17.5	18.1	18.5	0	19
	64QAM	1	0	20.6	20.8	20.7	2	21.5	17.7	18.2	18.3	0	19
		1	37	20.5	20.7	20.6	2	21.5	17.6	18.2	18.2	0	19
		1	74	20.5	20.7	20.5	2	21.5	17.6	18.1	18.4	0	19
		36	0	19.5	19.6	19.6	3	20.5	17.6	18.3	18.6	0	19
		36	20	19.5	19.6	19.6	3	20.5	17.6	18.3	18.7	0	19
		36	39	19.5	19.6	19.6	3	20.5	17.6	18.3	18.7	0	19
		75	0	19.5	19.5	19.5	3	20.5	17.6	18.2	18.6	0	19

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LTE Band 7 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				20800	21100	21400	MPR	Tune-up Limit	20800	21100	21400	MPR	Tune-up Limit
				2505 MHz	2535 MHz	2565 MHz			2505 MHz	2535 MHz	2565 MHz		
10 MHz	QPSK	1	0	22.6	22.6	22.6	0	23.5	17.6	18.2	18.5	0	19
		1	25	22.5	22.6	22.5	0	23.5	17.6	18.1	18.5	0	19
		1	49	22.5	22.5	22.5	0	23.5	17.6	18.2	18.5	0	19
		25	0	21.5	21.5	21.4	1	22.5	17.5	18.1	18.5	0	19
		25	12	21.5	21.5	21.4	1	22.5	17.5	18.0	18.4	0	19
		25	25	21.4	21.5	21.4	1	22.5	17.4	18.0	18.5	0	19
		50	0	21.5	21.5	21.4	1	22.5	17.4	18.1	18.5	0	19
	16QAM	1	0	21.4	21.3	21.8	1	22.5	17.3	17.8	18.7	0	19
		1	25	21.5	21.3	21.7	1	22.5	17.3	17.8	18.6	0	19
		1	49	21.5	21.2	21.7	1	22.5	17.3	17.6	18.7	0	19
		25	0	20.6	20.6	20.6	2	21.5	17.5	18.1	18.6	0	19
		25	12	20.5	20.6	20.6	2	21.5	17.5	18.1	18.6	0	19
		25	25	20.5	20.6	20.6	2	21.5	17.5	18.1	18.5	0	19
		50	0	20.5	20.6	20.5	2	21.5	17.5	18.1	18.4	0	19
	64QAM	1	0	20.4	20.7	20.4	2	21.5	17.3	18.0	18.3	0	19
		1	25	20.4	20.7	20.4	2	21.5	17.2	18.0	18.3	0	19
		1	49	20.4	20.7	20.5	2	21.5	17.2	18.0	18.2	0	19
		25	0	19.6	19.6	19.5	3	20.5	17.6	18.3	18.7	0	19
		25	12	19.5	19.6	19.5	3	20.5	17.6	18.3	18.7	0	19
		25	25	19.5	19.6	19.5	3	20.5	17.6	18.3	18.6	0	19
		50	0	19.5	19.5	19.5	3	20.5	17.7	18.2	18.6	0	19

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				20775	21100	21425	MPR	Tune-up Limit	20775	21100	21425	MPR	Tune-up Limit
				2502.5 MHz	2535 MHz	2567.5 MHz			2502.5 MHz	2535 MHz	2567.5 MHz		
5 MHz	QPSK	1	0	22.3	22.5	22.5	0	23.5	17.4	18.0	18.5	0	19
		1	12	22.3	22.5	22.5	0	23.5	17.4	18.0	18.5	0	19
		1	24	22.3	22.5	22.5	0	23.5	17.4	18.0	18.5	0	19
		12	0	21.4	21.5	21.4	1	22.5	17.4	18.0	18.5	0	19
		12	7	21.4	21.5	21.4	1	22.5	17.4	18.1	18.5	0	19
		12	13	21.4	21.5	21.4	1	22.5	17.4	18.0	18.5	0	19
		25	0	21.4	21.5	21.4	1	22.5	17.4	18.0	18.5	0	19
	16QAM	1	0	21.2	21.3	21.6	1	22.5	17.1	17.5	18.4	0	19
		1	12	21.1	21.3	21.6	1	22.5	17.1	17.5	18.4	0	19
		1	24	21.1	21.3	21.6	1	22.5	17.1	17.6	18.4	0	19
		12	0	20.4	20.6	20.6	2	21.5	17.4	18.0	18.5	0	19
		12	7	20.4	20.5	20.5	2	21.5	17.4	18.0	18.5	0	19
		12	13	20.4	20.6	20.5	2	21.5	17.4	18.0	18.5	0	19
		25	0	20.4	20.6	20.5	2	21.5	17.4	18.1	18.5	0	19
	64QAM	1	0	20.6	20.5	20.8	2	21.5	17.5	17.9	18.7	0	19
		1	12	20.5	20.5	20.8	2	21.5	17.4	17.9	18.7	0	19
		1	24	20.5	20.5	20.8	2	21.5	17.4	17.9	18.7	0	19
		12	0	19.4	19.5	19.4	3	20.5	17.5	18.2	18.6	0	19
		12	7	19.4	19.5	19.4	3	20.5	17.5	18.1	18.7	0	19
		12	13	19.4	19.4	19.4	3	20.5	17.5	18.1	18.7	0	19
		25	0	19.4	19.5	19.5	3	20.5	17.5	18.2	18.7	0	19

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LTE Band 12 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	23095	[redacted]		
					707.5 MHz			
10 MHz	QPSK	1	0		24.4		0	25.5
		1	25		24.4		0	25.5
		1	49		24.4		0	25.5
		25	0		23.4		1	24.5
		25	12		23.4		1	24.5
		25	25		23.4		1	24.5
		50	0		23.4		1	24.5
	16QAM	1	0		23.4		1	24.5
		1	25		23.3		1	24.5
		1	49		23.3		1	24.5
		25	0		22.4		2	23.5
		25	12		22.4		2	23.5
		25	25		22.4		2	23.5
		50	0		22.4		2	23.5
	64QAM	1	0		22.7		2	23.5
		1	25		22.6		2	23.5
		1	49		22.6		2	23.5
		25	0		21.6		3	22.5
		25	12		21.6		3	22.5
		25	25		21.6		3	22.5
		50	0		21.6		3	22.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				23035	23095	23155		
				701.5 MHz	707.5 MHz	713.5 MHz		
5 MHz	QPSK	1	0	24.4	24.5	24.4	0	25.5
		1	12	24.3	24.4	24.3	0	25.5
		1	24	24.3	24.4	24.3	0	25.5
		12	0	23.3	23.4	23.4	1	24.5
		12	7	23.3	23.4	23.4	1	24.5
		12	13	23.3	23.4	23.3	1	24.5
		25	0	23.3	23.4	23.3	1	24.5
	16QAM	1	0	23.1	23.2	23.4	1	24.5
		1	12	23.1	23.2	23.3	1	24.5
		1	24	23.1	23.2	23.4	1	24.5
		12	0	22.2	22.3	22.3	2	23.5
		12	7	22.2	22.3	22.4	2	23.5
		12	13	22.2	22.3	22.4	2	23.5
		25	0	22.3	22.4	22.3	2	23.5
	64QAM	1	0	22.3	22.2	22.6	2	23.5
		1	12	22.1	22.2	22.5	2	23.5
		1	24	22.1	22.2	22.6	2	23.5
		12	0	21.4	21.5	21.4	3	22.5
		12	7	21.3	21.5	21.4	3	22.5
		12	13	21.4	21.5	21.4	3	22.5
		25	0	21.4	21.5	21.5	3	22.5

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LTE Band 12 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				23025	23095	23165		
				700.5 MHz	707.5 MHz	714.5 MHz		
3 MHz	QPSK	1	0	24.4	24.5	24.5	0	25.5
		1	8	24.4	24.5	24.5	0	25.5
		1	14	24.3	24.5	24.5	0	25.5
		8	0	23.3	23.4	23.4	1	24.5
		8	4	23.2	23.4	23.4	1	24.5
		8	7	23.3	23.4	23.4	1	24.5
		15	0	23.3	23.4	23.4	1	24.5
	16QAM	1	0	23.5	23.5	23.3	1	24.5
		1	8	23.5	23.3	23.4	1	24.5
		1	14	23.5	23.4	23.4	1	24.5
		8	0	22.1	22.5	22.4	2	23.5
		8	4	22.1	22.5	22.4	2	23.5
		8	7	22.1	22.5	22.4	2	23.5
		15	0	22.2	22.4	22.4	2	23.5
	64QAM	1	0	22.3	22.4	22.3	2	23.5
		1	8	22.2	22.4	22.2	2	23.5
		1	14	22.2	22.2	22.3	2	23.5
		8	0	21.3	21.5	21.4	3	22.5
		8	4	21.3	21.5	21.4	3	22.5
		8	7	21.2	21.5	21.4	3	22.5
		15	0	21.4	21.4	21.4	3	22.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				23017	23095	23173		
				699.7 MHz	707.5 MHz	715.3 MHz		
1.4 MHz	QPSK	1	0	24.3	24.4	24.4	0	25.5
		1	3	24.3	24.4	24.4	0	25.5
		1	5	24.3	24.5	24.5	0	25.5
		3	0	24.3	24.3	24.4	0	25.5
		3	1	24.3	24.4	24.4	0	25.5
		3	3	24.3	24.4	24.4	0	25.5
		6	0	23.3	23.4	23.4	1	24.5
	16QAM	1	0	23.3	23.2	23.4	1	24.5
		1	3	23.3	23.2	23.4	1	24.5
		1	5	23.4	23.2	23.4	1	24.5
		3	0	23.3	23.3	23.4	1	24.5
		3	1	23.3	23.3	23.4	1	24.5
		3	3	23.3	23.3	23.4	1	24.5
		6	0	22.3	22.4	22.4	2	23.5
	64QAM	1	0	22.4	22.1	22.1	2	23.5
		1	3	22.1	22.2	22.1	2	23.5
		1	5	22.1	22.1	22.1	2	23.5
		3	0	22.5	22.3	22.5	2	23.5
		3	1	22.5	22.3	22.6	2	23.5
		3	3	22.5	22.3	22.5	2	23.5
		6	0	21.3	21.6	21.3	3	22.5

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LTE Band 13 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	23230 782 MHz	[redacted]		
10 MHz	QPSK	1	0	[redacted]	24.4	[redacted]	0	25.5
		1	25	[redacted]	24.4	[redacted]	0	25.5
		1	49	[redacted]	24.3	[redacted]	0	25.5
		25	0	[redacted]	23.4	[redacted]	1	24.5
		25	12	[redacted]	23.4	[redacted]	1	24.5
		25	25	[redacted]	23.3	[redacted]	1	24.5
		50	0	[redacted]	23.3	[redacted]	1	24.5
	16QAM	1	0	[redacted]	23.4	[redacted]	1	24.5
		1	25	[redacted]	23.4	[redacted]	1	24.5
		1	49	[redacted]	23.4	[redacted]	1	24.5
		25	0	[redacted]	22.4	[redacted]	2	23.5
		25	12	[redacted]	22.4	[redacted]	2	23.5
		25	25	[redacted]	22.4	[redacted]	2	23.5
		50	0	[redacted]	22.4	[redacted]	2	23.5
	64QAM	1	0	[redacted]	22.3	[redacted]	2	23.5
		1	25	[redacted]	22.2	[redacted]	2	23.5
		1	49	[redacted]	22.2	[redacted]	2	23.5
		25	0	[redacted]	21.5	[redacted]	3	22.5
		25	12	[redacted]	21.5	[redacted]	3	22.5
		25	25	[redacted]	21.5	[redacted]	3	22.5
		50	0	[redacted]	21.5	[redacted]	3	22.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	23230 782 MHz	[redacted]		
5 MHz	QPSK	1	0	[redacted]	24.4	[redacted]	0	25.5
		1	12	[redacted]	24.4	[redacted]	0	25.5
		1	24	[redacted]	24.4	[redacted]	0	25.5
		12	0	[redacted]	23.4	[redacted]	1	24.5
		12	7	[redacted]	23.4	[redacted]	1	24.5
		12	13	[redacted]	23.3	[redacted]	1	24.5
		25	0	[redacted]	23.3	[redacted]	1	24.5
	16QAM	1	0	[redacted]	23.2	[redacted]	1	24.5
		1	12	[redacted]	23.2	[redacted]	1	24.5
		1	24	[redacted]	23.2	[redacted]	1	24.5
		12	0	[redacted]	22.4	[redacted]	2	23.5
		12	7	[redacted]	22.3	[redacted]	2	23.5
		12	13	[redacted]	22.3	[redacted]	2	23.5
		25	0	[redacted]	22.4	[redacted]	2	23.5
	64QAM	1	0	[redacted]	22.2	[redacted]	2	23.5
		1	12	[redacted]	22.2	[redacted]	2	23.5
		1	24	[redacted]	22.2	[redacted]	2	23.5
		12	0	[redacted]	21.3	[redacted]	3	22.5
		12	7	[redacted]	21.3	[redacted]	3	22.5
		12	13	[redacted]	21.3	[redacted]	3	22.5
		25	0	[redacted]	21.4	[redacted]	3	22.5

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LTE Band 14 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	23330	[redacted]		
					793 MHz			
10 MHz	QPSK	1	0		24.3		0	25.5
		1	25		24.3		0	25.5
		1	49		24.3		0	25.5
		25	0		23.4		1	24.5
		25	12		23.4		1	24.5
		25	25		23.4		1	24.5
		50	0		23.4		1	24.5
	16QAM	1	0		22.9		1	24.5
		1	25		22.9		1	24.5
		1	49		22.9		1	24.5
		25	0		22.4		2	23.5
		25	12		22.3		2	23.5
		25	25		22.3		2	23.5
		50	0		22.4		2	23.5
	64QAM	1	0		22.1		2	23.5
		1	25		22.2		2	23.5
		1	49		22.2		2	23.5
		25	0		21.4		3	22.5
		25	12		21.3		3	22.5
		25	25		21.3		3	22.5
		50	0		21.3		3	22.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	23330	[redacted]		
					793 MHz			
5 MHz	QPSK	1	0		24.3		0	25.5
		1	12		24.2		0	25.5
		1	24		24.2		0	25.5
		12	0		23.4		1	24.5
		12	7		23.4		1	24.5
		12	13		23.3		1	24.5
		25	0		23.3		1	24.5
	16QAM	1	0		23.2		1	24.5
		1	12		23.2		1	24.5
		1	24		23.3		1	24.5
		12	0		22.3		2	23.5
		12	7		22.3		2	23.5
		12	13		22.3		2	23.5
		25	0		22.3		2	23.5
	64QAM	1	0		22.5		2	23.5
		1	12		22.4		2	23.5
		1	24		22.3		2	23.5
		12	0		21.3		3	22.5
		12	7		21.2		3	22.5
		12	13		21.2		3	22.5
		25	0		21.3		3	22.5

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LTE Band 25 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				26140	26365	26590	MPR	Tune-up Limit	26140	26365	26590	MPR	Tune-up Limit
				1860 MHz	1882.5 MHz	1905 MHz			1860 MHz	1882.5 MHz	1905 MHz		
20 MHz	QPSK	1	0	23.9	23.9	23.6	0	25	21.9	21.9	21.6	0	23
		1	49	23.9	23.9	23.6	0	25	21.9	21.9	21.6	0	23
		1	99	23.9	23.9	23.6	0	25	21.9	22.0	21.6	0	23
		50	0	22.9	22.8	22.7	1	24	22.0	21.9	21.7	0	23
		50	24	22.9	22.9	22.7	1	24	22.0	21.9	21.7	0	23
		50	50	22.9	22.9	22.7	1	24	22.0	21.9	21.7	0	23
		100	0	22.9	22.8	22.7	1	24	22.0	21.9	21.7	0	23
	16QAM	1	0	22.8	22.8	22.5	1	24	21.9	22.0	21.8	0	23
		1	49	22.8	22.8	22.5	1	24	22.0	22.0	21.8	0	23
		1	99	22.8	22.8	22.5	1	24	22.0	22.0	21.9	0	23
		50	0	21.9	21.8	21.7	2	23	21.9	21.9	21.7	0	23
		50	24	21.9	21.8	21.7	2	23	21.9	21.9	21.7	0	23
		50	50	21.9	21.8	21.6	2	23	21.9	21.9	21.7	0	23
		100	0	22.0	21.9	21.7	2	23	22.0	21.9	21.7	0	23
	64QAM	1	0	21.9	21.8	21.5	2	23	21.8	21.8	21.6	0	23
		1	49	21.9	21.8	21.5	2	23	21.9	21.9	21.6	0	23
		1	99	21.9	21.8	21.6	2	23	22.0	21.9	21.6	0	23
		50	0	21.0	20.9	20.7	3	22	21.0	20.9	20.7	0	23
		50	24	21.0	20.9	20.7	3	22	21.0	20.9	20.7	0	23
		50	50	21.0	20.9	20.7	3	22	21.0	20.9	20.7	0	23
		100	0	21.0	20.9	20.7	3	22	21.0	20.9	20.7	0	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				26115	26365	26615	MPR	Tune-up Limit	26115	26365	26615	MPR	Tune-up Limit
				1857.5 MHz	1882.5 MHz	1907.5 MHz			1857.5 MHz	1882.5 MHz	1907.5 MHz		
15 MHz	QPSK	1	0	23.9	23.9	23.6	0	25	21.9	21.9	21.6	0	23
		1	37	23.9	23.9	23.6	0	25	21.9	21.9	21.7	0	23
		1	74	23.9	23.9	23.7	0	25	21.9	21.9	21.6	0	23
		36	0	22.9	22.9	22.7	1	24	22.0	21.9	21.7	0	23
		36	20	22.9	22.9	22.7	1	24	22.0	21.9	21.7	0	23
		36	39	22.9	22.9	22.7	1	24	21.9	21.9	21.7	0	23
		75	0	22.9	22.9	22.6	1	24	21.9	21.9	21.7	0	23
	16QAM	1	0	23.2	22.7	22.7	1	24	22.2	21.6	21.7	0	23
		1	37	23.3	22.6	22.7	1	24	22.2	21.7	21.7	0	23
		1	74	23.2	22.7	22.8	1	24	22.2	21.7	21.7	0	23
		36	0	21.9	21.8	21.7	2	23	21.9	21.9	21.7	0	23
		36	20	21.9	21.8	21.7	2	23	21.9	21.9	21.7	0	23
		36	39	21.9	21.9	21.7	2	23	21.9	21.9	21.7	0	23
		75	0	21.9	21.9	21.7	2	23	21.9	21.9	21.6	0	23
	64QAM	1	0	21.9	21.8	21.4	2	23	21.8	21.8	21.5	0	23
		1	37	21.9	21.8	21.4	2	23	21.9	21.8	21.5	0	23
		1	74	21.9	21.9	21.4	2	23	21.9	21.9	21.5	0	23
		36	0	20.9	20.9	20.7	3	22	20.9	20.9	20.6	0	23
		36	20	20.9	20.9	20.7	3	22	20.9	20.9	20.7	0	23
		36	39	20.9	20.9	20.7	3	22	20.9	20.9	20.7	0	23
		75	0	20.9	20.8	20.6	3	22	20.9	20.8	20.6	0	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				26090	26365	26640	MPR	Tune-up Limit	26090	26365	26640	MPR	Tune-up Limit
				1855 MHz	1882.5 MHz	1910 MHz			1855 MHz	1882.5 MHz	1910 MHz		
10 MHz	QPSK	1	0	23.9	23.8	23.7	0	25	21.9	21.9	21.7	0	23
		1	25	23.9	23.9	23.6	0	25	21.9	21.9	21.7	0	23
		1	49	24.0	23.9	23.7	0	25	21.9	21.9	21.7	0	23
		25	0	22.9	22.9	22.6	1	24	21.9	21.9	21.7	0	23
		25	12	22.9	22.9	22.7	1	24	21.9	21.9	21.6	0	23
		25	25	22.9	22.9	22.7	1	24	21.9	21.9	21.7	0	23
		50	0	22.9	22.9	22.7	1	24	21.9	21.9	21.7	0	23
	16QAM	1	0	22.9	22.8	22.7	1	24	21.9	21.8	21.7	0	23
		1	25	22.9	22.8	22.7	1	24	21.9	21.8	21.7	0	23
		1	49	23.0	22.8	22.8	1	24	21.9	21.9	21.7	0	23
		25	0	21.9	21.9	21.7	2	23	21.9	22.0	21.6	0	23
		25	12	21.9	21.9	21.7	2	23	21.9	22.0	21.6	0	23
		25	25	21.9	21.9	21.7	2	23	22.0	22.0	21.7	0	23
		50	0	21.9	21.9	21.6	2	23	21.9	21.9	21.7	0	23
	64QAM	1	0	21.6	21.5	21.6	2	23	21.6	21.7	21.3	0	23
		1	25	21.7	21.6	21.6	2	23	21.7	21.8	21.3	0	23
		1	49	21.7	21.7	21.6	2	23	21.7	21.8	21.3	0	23
		25	0	20.9	20.9	20.7	3	22	20.9	20.9	20.6	0	23
		25	12	20.9	20.9	20.7	3	22	20.9	20.9	20.6	0	23
		25	25	20.9	20.9	20.7	3	22	20.9	20.9	20.7	0	23
		50	0	20.9	20.9	20.6	3	22	20.9	20.9	20.7	0	23

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LTE Band 25 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit	Reduced Average Power (dBm)			MPR	Tune-up Limit
				26065	26365	26665			26065	26365	26665		
				1852.5 MHz	1882.5 MHz	1912.5 MHz			1852.5 MHz	1882.5 MHz	1912.5 MHz		
5 MHz	QPSK	1	0	23.9	23.9	23.7	0	25	21.9	21.9	21.6	0	23
		1	12	24.0	23.9	23.7	0	25	21.9	21.9	21.6	0	23
		1	24	23.9	23.9	23.7	0	25	21.9	22.0	21.6	0	23
		12	0	22.9	22.9	22.7	1	24	21.9	21.9	21.7	0	23
		12	7	22.9	22.9	22.7	1	24	21.9	21.9	21.7	0	23
		12	13	22.9	22.9	22.7	1	24	21.9	21.9	21.7	0	23
		25	0	22.9	22.9	22.7	1	24	21.9	21.9	21.7	0	23
	16QAM	1	0	22.7	22.7	22.7	1	24	21.9	21.9	21.7	0	23
		1	12	22.7	22.7	22.7	1	24	21.9	21.9	21.7	0	23
		1	24	22.8	22.8	22.7	1	24	21.9	21.9	21.8	0	23
		12	0	21.8	21.8	21.7	2	23	21.9	21.8	21.7	0	23
		12	7	21.8	21.8	21.7	2	23	21.9	21.8	21.7	0	23
		12	13	21.9	21.8	21.7	2	23	21.9	21.8	21.7	0	23
		25	0	21.9	22.0	21.7	2	23	21.9	22.0	21.7	0	23
	64QAM	1	0	21.6	21.7	21.6	2	23	21.8	21.6	21.5	0	23
		1	12	21.6	21.7	21.6	2	23	21.7	21.6	21.5	0	23
		1	24	21.7	21.7	21.6	2	23	21.8	21.6	21.6	0	23
		12	0	20.7	20.8	20.7	3	22	20.7	20.8	20.7	0	23
		12	7	20.8	20.8	20.6	3	22	20.8	20.8	20.7	0	23
		12	13	20.8	20.8	20.6	3	22	20.8	20.8	20.7	0	23
		25	0	20.8	20.9	20.7	3	22	20.8	20.9	20.7	0	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit	Reduced Average Power (dBm)			MPR	Tune-up Limit
				26055	26365	26675			26055	26365	26675		
				1851.5 MHz	1882.5 MHz	1913.5 MHz			1851.5 MHz	1882.5 MHz	1913.5 MHz		
3 MHz	QPSK	1	0	24.0	23.9	23.7	0	25	22.0	21.9	21.7	0	23
		1	8	24.0	23.9	23.7	0	25	22.0	21.9	21.7	0	23
		1	14	24.0	23.9	23.7	0	25	21.9	21.9	21.7	0	23
		8	0	22.9	22.8	22.7	1	24	21.9	21.8	21.7	0	23
		8	4	22.9	22.8	22.7	1	24	21.9	21.8	21.7	0	23
		8	7	22.9	22.9	22.6	1	24	21.9	21.9	21.7	0	23
		15	0	22.9	22.9	22.7	1	24	21.9	21.9	21.6	0	23
	16QAM	1	0	23.0	22.9	22.7	1	24	22.0	21.7	21.8	0	23
		1	8	23.0	22.9	22.7	1	24	22.1	21.8	21.9	0	23
		1	14	23.0	22.8	22.7	1	24	22.0	21.7	21.9	0	23
		8	0	21.8	21.8	21.6	2	23	21.8	21.8	21.7	0	23
		8	4	21.8	21.8	21.7	2	23	21.8	21.9	21.7	0	23
		8	7	21.8	21.8	21.7	2	23	21.8	21.8	21.7	0	23
		15	0	21.9	21.8	21.7	2	23	21.8	21.9	21.7	0	23
	64QAM	1	0	21.5	21.8	21.5	2	23	21.8	21.6	21.6	0	23
		1	8	21.7	22.0	21.5	2	23	21.5	21.9	21.6	0	23
		1	14	21.6	22.0	21.3	2	23	21.6	21.9	21.5	0	23
		8	0	20.8	20.8	20.5	3	22	20.7	20.9	20.5	0	23
		8	4	20.8	20.8	20.6	3	22	20.7	20.9	20.5	0	23
		8	7	20.8	20.8	20.5	3	22	20.7	20.9	20.6	0	23
		15	0	20.9	20.8	20.7	3	22	20.9	20.9	20.6	0	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit	Reduced Average Power (dBm)			MPR	Tune-up Limit
				26047	26365	26683			26047	26365	26683		
				1850.7 MHz	1882.5 MHz	1914.3 MHz			1850.7 MHz	1882.5 MHz	1914.3 MHz		
1.4 MHz	QPSK	1	0	23.9	24.0	23.8	0	25	21.9	21.9	21.7	0	23
		1	3	23.8	23.9	23.8	0	25	21.9	21.9	21.7	0	23
		1	5	23.9	23.9	23.8	0	25	21.9	21.9	21.8	0	23
		3	0	23.8	23.9	23.7	0	25	21.8	21.9	21.7	0	23
		3	1	23.9	23.9	23.7	0	25	21.9	21.9	21.7	0	23
		3	3	23.9	23.9	23.7	0	25	21.9	21.9	21.7	0	23
		6	0	22.8	22.9	22.7	1	24	21.8	21.8	21.7	0	23
	16QAM	1	0	22.8	22.9	22.6	1	24	21.7	21.7	21.6	0	23
		1	3	22.7	23.0	22.6	1	24	21.9	21.7	21.6	0	23
		1	5	22.9	22.9	22.6	1	24	21.7	21.8	21.6	0	23
		3	0	22.9	22.8	22.6	1	24	21.7	21.9	21.8	0	23
		3	1	22.9	22.8	22.6	1	24	21.8	21.9	21.7	0	23
		3	3	22.9	22.8	22.6	1	24	21.8	21.9	21.8	0	23
		6	0	21.8	21.8	21.6	2	23	21.8	21.8	21.6	0	23
	64QAM	1	0	21.5	21.4	21.6	2	23	21.6	21.7	21.4	0	23
		1	3	21.4	21.7	21.8	2	23	21.3	21.7	21.4	0	23
		1	5	21.4	21.3	21.6	2	23	21.5	21.7	21.4	0	23
		3	0	21.9	22.0	21.8	2	23	22.0	22.0	21.7	0	23
		3	1	21.9	22.1	21.9	2	23	22.0	22.0	21.7	0	23
		3	3	21.9	22.1	21.8	2	23	22.0	21.9	21.7	0	23
		6	0	21.0	20.7	20.6	3	22	20.7	20.8	20.8	0	23

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LTE Band 26 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	26865	[redacted]		
					831.5 MHz			
15 MHz	QPSK	1	0		24.0		0	25
		1	37		23.9		0	25
		1	74		23.9		0	25
		36	0		22.9		1	24
		36	20		22.9		1	24
		36	39		22.9		1	24
		75	0		22.9		1	24
	16QAM	1	0		23.0		1	24
		1	37		22.9		1	24
		1	74		22.8		1	24
		36	0		22.0		2	23
		36	20		21.9		2	23
		36	39		21.9		2	23
		75	0		21.9		2	23
	64QAM	1	0		22.0		2	23
		1	37		21.9		2	23
		1	74		21.9		2	23
		36	0		21.0		3	22
		36	20		21.0		3	22
		36	39		21.0		3	22
		75	0		21.0		3	22

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				26740	26865	26990		
				819 MHz	831.5 MHz	844 MHz		
10 MHz	QPSK	1	0	24.2	24.1	24.0	0	25
		1	25	24.2	24.0	23.9	0	25
		1	49	24.2	24.0	23.9	0	25
		25	0	23.1	22.9	22.9	1	24
		25	12	23.1	22.9	22.9	1	24
		25	25	23.1	22.9	22.9	1	24
		50	0	23.1	22.9	22.9	1	24
	16QAM	1	0	23.2	22.7	23.1	1	24
		1	25	23.2	22.7	23.0	1	24
		1	49	23.1	22.8	23.0	1	24
		25	0	22.2	21.9	21.9	2	23
		25	12	22.2	21.9	21.9	2	23
		25	25	22.2	21.9	21.9	2	23
		50	0	22.1	21.9	21.9	2	23
	64QAM	1	0	21.9	21.9	21.8	2	23
		1	25	21.8	21.9	21.7	2	23
		1	49	21.8	21.9	21.7	2	23
		25	0	21.2	21.0	21.0	3	22
		25	12	21.2	21.0	21.0	3	22
		25	25	21.2	21.0	21.0	3	22
		50	0	21.2	21.0	21.0	3	22

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LTE Band 26 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				26715	26865	27015		
				816.5 MHz	831.5 MHz	846.5 MHz		
5 MHz	QPSK	1	0	24.1	23.9	23.9	0	25
		1	12	24.1	23.9	23.9	0	25
		1	24	24.1	23.9	23.9	0	25
		12	0	23.1	22.9	23.0	1	24
		12	7	23.1	22.9	22.9	1	24
		12	13	23.1	22.9	22.9	1	24
		25	0	23.1	22.9	22.9	1	24
	16QAM	1	0	22.9	22.9	22.9	1	24
		1	12	22.8	22.9	22.9	1	24
		1	24	22.9	22.9	22.9	1	24
		12	0	22.0	21.8	21.9	2	23
		12	7	22.0	21.8	21.9	2	23
		12	13	22.0	21.8	21.9	2	23
		25	0	22.1	22.0	21.9	2	23
	64QAM	1	0	22.0	21.7	21.8	2	23
		1	12	22.0	21.7	21.8	2	23
		1	24	22.0	21.7	21.8	2	23
		12	0	21.1	20.9	20.9	3	22
		12	7	21.1	20.9	20.9	3	22
		12	13	21.1	20.9	20.9	3	22
		25	0	21.1	20.9	21.0	3	22

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				26705	26865	27025		
				815.5 MHz	831.5 MHz	847.5 MHz		
3 MHz	QPSK	1	0	24.1	24.0	24.1	0	25
		1	8	24.1	24.1	24.0	0	25
		1	14	24.1	24.0	24.1	0	25
		8	0	23.1	22.9	22.9	1	24
		8	4	23.1	22.9	23.0	1	24
		8	7	23.1	22.9	22.9	1	24
		15	0	23.1	22.9	23.0	1	24
	16QAM	1	0	23.1	22.8	22.9	1	24
		1	8	23.1	22.8	23.0	1	24
		1	14	23.1	22.8	23.0	1	24
		8	0	22.0	21.8	21.9	2	23
		8	4	22.0	21.8	21.9	2	23
		8	7	22.0	21.8	21.9	2	23
		15	0	22.0	21.9	21.9	2	23
	64QAM	1	0	21.8	21.8	21.6	2	23
		1	8	21.6	21.9	21.7	2	23
		1	14	21.8	21.9	21.6	2	23
		8	0	21.0	20.9	20.9	3	22
		8	4	21.0	20.9	20.9	3	22
		8	7	21.0	20.9	20.9	3	22
		15	0	21.2	21.0	21.0	3	22

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LTE Band 26 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				26697	26865	27033		
				814.7 MHz	831.5 MHz	848.3 MHz		
1.4 MHz	QPSK	1	0	24.2	24.0	24.1	0	25
		1	3	24.2	24.0	24.1	0	25
		1	5	24.2	24.0	24.1	0	25
		3	0	24.1	23.9	24.0	0	25
		3	1	24.1	23.9	24.0	0	25
		3	3	24.1	23.9	24.0	0	25
		6	0	23.1	22.9	22.9	1	24
	16QAM	1	0	23.2	22.8	23.1	1	24
		1	3	23.2	22.6	23.1	1	24
		1	5	23.2	22.7	23.2	1	24
		3	0	23.2	22.9	22.9	1	24
		3	1	23.2	22.9	23.0	1	24
		3	3	23.1	22.9	22.9	1	24
		6	0	22.2	21.9	21.9	2	23
	64QAM	1	0	21.7	21.8	21.5	2	23
		1	3	21.7	21.9	21.6	2	23
		1	5	21.7	21.6	21.5	2	23
		3	0	22.2	22.1	21.9	2	23
		3	1	22.2	22.1	22.0	2	23
		3	3	22.2	22.1	21.9	2	23
		6	0	21.1	20.9	21.2	3	22

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LTE Band 30 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			Reduced Average Power (dBm)		
				27710 2310 MHz	MPR	Tune-up Limit	27710 2310 MHz	MPR	Tune-up Limit
10 MHz	QPSK	1	0	23.6	0	24.9	18.7	0	20
		1	25	23.5	0	24.9	18.7	0	20
		1	49	23.5	0	24.9	18.6	0	20
		25	0	22.5	1	23.9	18.6	0	20
		25	12	22.4	1	23.9	18.6	0	20
		25	25	22.4	1	23.9	18.6	0	20
		50	0	22.4	1	23.9	18.6	0	20
	16QAM	1	0	22.4	1	23.9	18.7	0	20
		1	25	22.3	1	23.9	18.7	0	20
		1	49	22.2	1	23.9	18.7	0	20
		25	0	21.5	2	22.9	18.7	0	20
		25	12	21.5	2	22.9	18.7	0	20
		25	25	21.5	2	22.9	18.7	0	20
		50	0	21.4	2	22.9	18.6	0	20
	64QAM	1	0	21.4	2	22.9	18.8	0	20
		1	25	21.3	2	22.9	18.8	0	20
		1	49	21.2	2	22.9	18.7	0	20
		25	0	20.6	3	21.9	18.8	0	20
		25	12	20.6	3	21.9	18.8	0	20
		25	25	20.6	3	21.9	18.7	0	20
		50	0	20.5	3	21.9	18.8	0	20

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			Reduced Average Power (dBm)		
				27710 2310 MHz	MPR	Tune-up Limit	27710 2310 MHz	MPR	Tune-up Limit
5 MHz	QPSK	1	0	23.5	0	24.9	18.7	0	20
		1	12	23.4	0	24.9	18.7	0	20
		1	24	23.4	0	24.9	18.7	0	20
		12	0	22.4	1	23.9	18.7	0	20
		12	7	22.4	1	23.9	18.7	0	20
		12	13	22.4	1	23.9	18.7	0	20
		25	0	22.4	1	23.9	18.7	0	20
	16QAM	1	0	22.5	1	23.9	18.4	0	20
		1	12	22.5	1	23.9	18.4	0	20
		1	24	22.4	1	23.9	18.3	0	20
		12	0	21.4	2	22.9	18.6	0	20
		12	7	21.4	2	22.9	18.7	0	20
		12	13	21.4	2	22.9	18.6	0	20
		25	0	21.5	2	22.9	18.7	0	20
	64QAM	1	0	21.4	2	22.9	18.7	0	20
		1	12	21.4	2	22.9	18.7	0	20
		1	24	21.3	2	22.9	18.6	0	20
		12	0	20.5	3	21.9	18.6	0	20
		12	7	20.5	3	21.9	18.6	0	20
		12	13	20.4	3	21.9	18.6	0	20
		25	0	20.5	3	21.9	18.7	0	20

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LTE Band 41 (PC3) Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)							Reduced Average Power (dBm)						
				39750	40185	40620	41055	41490	MPR	Tune-up Limit	39750	40185	40620	41055	41490	MPR	Tune-up Limit
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz			2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
20 MHz	QPSK	1	0	23.1	23.9	24.0	23.6	23.4	0	24.5	18.5	18.6	18.9	18.5	19.2	0	20.5
		1	49	23.3	23.9	23.9	23.5	23.3	0	24.5	19.5	19.7	20.1	19.8	20.1	0	20.5
		1	99	23.2	23.8	23.9	23.5	23.2	0	24.5	18.9	18.5	18.9	18.7	18.7	0	20.5
		50	0	22.2	22.9	23.1	22.5	22.2	1	23.5	19.4	19.7	20.1	19.8	20.3	0	20.5
		50	24	22.1	22.9	23.0	22.5	22.2	1	23.5	20.0	20.0	20.4	20.2	20.4	0	20.5
		50	50	22.2	22.8	23.0	22.5	22.1	1	23.5	19.9	19.6	20.2	19.9	20.0	0	20.5
		100	0	22.1	22.9	23.0	22.5	22.2	1	23.5	19.7	19.6	20.1	19.8	20.1	0	20.5
	16QAM	1	0	22.1	22.8	23.0	22.3	22.0	1	23.5	18.7	18.6	18.8	18.7	19.3	0	20.5
		1	49	22.1	22.8	23.0	22.2	21.9	1	23.5	19.9	19.5	20.2	19.8	20.1	0	20.5
		1	99	22.0	22.7	22.9	22.2	21.9	1	23.5	18.9	18.6	19.0	18.7	18.8	0	20.5
		50	0	21.2	21.9	22.1	21.5	21.3	2	22.5	19.4	19.7	20.1	19.8	20.2	0	20.5
		50	24	21.1	21.9	22.1	21.5	21.2	2	22.5	20.0	19.9	20.4	20.1	20.4	0	20.5
		50	50	21.1	21.9	22.0	21.4	21.2	2	22.5	19.9	19.5	20.1	19.9	20.0	0	20.5
		100	0	21.1	21.8	22.0	21.4	21.2	2	22.5	19.6	19.5	20.1	19.8	20.0	0	20.5
	64QAM	1	0	21.2	21.8	22.0	21.4	21.2	2	22.5	19.3	18.9	18.8	19.0	19.2	0	20.5
		1	49	21.1	21.7	22.0	21.4	21.2	2	22.5	20.1	19.6	20.3	19.8	19.9	0	20.5
		1	99	21.1	21.7	21.9	21.3	21.1	2	22.5	19.3	18.8	19.0	18.8	18.7	0	20.5
		50	0	20.1	20.9	21.1	20.6	20.4	3	21.5	19.4	19.7	20.1	19.8	20.3	0	20.5
		50	24	20.0	20.9	21.1	20.6	20.3	3	21.5	20.0	19.9	20.4	20.1	20.4	0	20.5
		50	50	20.0	20.9	21.1	20.5	20.3	3	21.5	19.9	19.6	20.2	19.9	20.0	0	20.5
		100	0	20.0	20.9	21.1	20.5	20.3	3	21.5	19.6	19.6	20.1	19.8	20.1	0	20.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)							Reduced Average Power (dBm)						
				39750	40185	40620	41055	41490	MPR	Tune-up Limit	39750	40185	40620	41055	41490	MPR	Tune-up Limit
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz			2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
15 MHz	QPSK	1	0	23.3	23.9	24.0	23.6	23.3	0	24.5	18.5	19.0	19.5	18.7	19.5	0	20.5
		1	37	23.2	23.9	24.0	23.5	23.2	0	24.5	19.6	19.5	20.0	19.5	19.9	0	20.5
		1	74	23.1	23.9	23.9	23.4	23.2	0	24.5	19.1	18.6	19.3	18.9	19.1	0	20.5
		36	0	22.2	22.9	23.0	22.5	22.2	1	23.5	19.6	19.8	20.2	19.7	20.2	0	20.5
		36	20	22.2	22.9	23.0	22.5	22.2	1	23.5	20.0	19.9	20.4	19.9	20.3	0	20.5
		36	39	22.2	22.9	23.0	22.5	22.2	1	23.5	20.0	19.7	20.2	19.8	20.2	0	20.5
		75	0	22.2	22.9	23.1	22.5	22.2	1	23.5	19.8	19.7	20.2	19.7	20.1	0	20.5
	16QAM	1	0	22.0	22.6	22.8	22.2	22.1	1	23.5	18.8	19.2	19.1	18.8	19.4	0	20.5
		1	37	21.9	22.5	22.8	22.2	22.0	1	23.5	19.7	19.6	20.0	19.3	19.9	0	20.5
		1	74	21.9	22.5	22.7	22.1	22.0	1	23.5	19.2	18.8	19.2	18.7	19.2	0	20.5
		36	0	21.2	21.8	22.0	21.5	21.2	2	22.5	19.6	19.8	20.2	19.6	20.2	0	20.5
		36	20	21.2	21.9	22.0	21.6	21.2	2	22.5	20.0	19.9	20.3	19.8	20.3	0	20.5
		36	39	21.2	21.8	22.0	21.5	21.2	2	22.5	20.0	19.7	20.2	19.8	20.1	0	20.5
		75	0	21.1	21.8	22.1	21.5	21.2	2	22.5	19.7	19.6	20.1	19.6	20.1	0	20.5
	64QAM	1	0	21.0	21.9	21.5	21.7	21.2	2	22.5	18.8	18.9	19.3	18.5	19.4	0	20.5
		1	37	21.0	21.9	21.5	21.6	21.3	2	22.5	19.6	19.7	19.8	19.5	20.0	0	20.5
		1	74	20.9	21.9	21.4	21.6	21.2	2	22.5	19.1	18.8	19.2	18.9	19.2	0	20.5
		36	0	20.1	21.0	21.1	20.5	20.3	3	21.5	19.5	19.8	20.0	19.6	20.2	0	20.5
		36	20	20.0	20.9	21.1	20.5	20.2	3	21.5	19.9	19.9	20.2	19.8	20.3	0	20.5
		36	39	20.0	20.9	21.1	20.5	20.2	3	21.5	19.9	19.7	20.1	19.8	20.1	0	20.5
		75	0	20.0	20.9	21.1	20.5	20.3	3	21.5	19.7	19.6	20.0	19.6	20.1	0	20.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)							Reduced Average Power (dBm)						
				39750	40185	40620	41055	41490	MPR	Tune-up Limit	39750	40185	40620	41055	41490	MPR	Tune-up Limit
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz			2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
10 MHz	QPSK	1	0	23.2	23.8	24.2	23.5	23.2	0	24.5	18.5	18.6	18.5	18.6	18.7	0	20.5
		1	25	23.2	23.8	24.1	23.5	23.2	0	24.5	18.5	18.6	18.5	18.5	18.7	0	20.5
		1	49	23.2	23.8	24.1	23.5	23.2	0	24.5	18.5	18.5	18.5	18.5	18.7	0	20.5
		25	0	22.2	22.9	23.0	22.5	22.2	1	23.5	18.9	18.9	18.9	18.8	19.1	0	20.5
		25	12	22.2	22.9	23.0	22.5	22.2	1	23.5	18.9	18.9	19.0	18.7	19.1	0	20.5
		25	25	22.2	22.9	23.0	22.5	22.2	1	23.5	18.8	18.9	18.9	18.7	19.0	0	20.5
		50	0	22.2	22.9	23.0	22.5	22.2	1	23.5	18.8	18.9	18.9	18.7	19.0	0	20.5
	16QAM	1	0	22.0	22.8	23.0	22.4	21.9	1	23.5	18.8	18.9	18.8	19.0	19.3	0	20.5
		1	25	22.0	22.8	23.0	22.4	21.9	1	23.5	18.8	18.8	18.8	18.9	19.2	0	20.5
		1	49	22.0	22.7	23.0	22.4	22.0	1	23.5	18.7	18.8	18.7	18.9	19.2	0	20.5
		25	0	21.1	21.9	22.0	21.5	21.2	2	22.5	19.0	19.0	19.0	18.9	19.0	0	20.5
		25	12	21.1	21.9	22.0	21.5	21.3	2	22.5	19.0	19.0	19.0	18.9	19.0	0	20.5
		25	25	21.1	21.9	22.0	21.5	21.3	2	22.5	19.0	19.0	18.9	18.9	19.0	0	20.5
		50	0	21.1	21.9	22.1	21.5	21.2	2	22.5	18.9	18.9	18.9	18.8	19.0	0	20.5
	64QAM	1	0	20.7	21.9	22.2	21.2	21.0	2	22.5	18.5	18.6	18.7	18.7	18.9	0	20.5
		1	25	20.7	21.9	22.1	21.1	21.2	2	22.5	18.5	18.6	18.7	18.6	18.9	0	20.5
		1	49	20.7	21.9	22.1	21.2	21.3	2	22.5	18.5	18.5	18.6	18.6	18.9	0	20.5
		25	0	20.0	20.8	21.1	20.5	20.2	3	21.5	18.9	19.0	18.9	18.8	19.0	0	20.5
		25	12	20.0	20.8	21.1	20.5	20.2	3	21.5	18.9	19.0	18.9	18.8	19.0	0	20.5
		25	25	20.0	20.8	21.1	20.5	20.2	3	21.5	18.9	18.9	18.9	18.8	18.9	0	20.5
		50	0	20.0	20.9	21.0	20.5	20.2	3	21.5	19.0	19.0	18.9	18.9	19.0	0	20.5

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LTE Band 41 (PC3) Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)							Reduced Average Power (dBm)						
				39750	40185	40620	41055	41490	MPR	Tune-up Limit	39750	40185	40620	41055	41490	MPR	Tune-up Limit
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz			2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
5 MHz	QPSK	1	0	23.2	23.7	23.9	23.4	23.1	0	24.5	18.6	18.7	18.6	18.5	18.7	0	20.5
		1	12	23.2	23.7	23.9	23.4	23.1	0	24.5	18.6	18.6	18.6	18.5	18.6	0	20.5
		1	24	23.2	23.7	23.9	23.4	23.1	0	24.5	18.6	18.6	18.5	18.5	18.6	0	20.5
		12	0	22.2	22.9	23.1	22.5	22.2	1	23.5	18.9	18.9	18.9	18.8	19.0	0	20.5
		12	7	22.2	22.9	23.0	22.5	22.2	1	23.5	18.9	18.9	18.9	18.7	19.0	0	20.5
		12	13	22.2	22.9	23.0	22.5	22.2	1	23.5	18.9	18.9	18.9	18.7	19.0	0	20.5
		25	0	22.2	22.9	23.0	22.5	22.2	1	23.5	18.9	18.9	18.8	18.7	19.0	0	20.5
	16QAM	1	0	22.1	22.3	22.8	22.3	22.4	1	23.5	18.5	18.7	18.6	18.6	18.9	0	20.5
		1	12	22.1	22.2	22.7	22.3	22.4	1	23.5	18.5	18.6	18.6	18.6	19.0	0	20.5
		1	24	22.1	22.2	22.7	22.3	22.4	1	23.5	18.5	18.6	18.6	18.5	18.9	0	20.5
		12	0	21.3	21.8	21.9	21.6	21.1	2	22.5	19.0	19.0	19.0	18.8	19.0	0	20.5
		12	7	21.3	21.8	21.9	21.5	21.1	2	22.5	19.0	19.0	19.0	18.8	19.0	0	20.5
		12	13	21.2	21.8	21.9	21.5	21.1	2	22.5	18.9	19.0	18.9	18.8	18.9	0	20.5
		25	0	21.2	21.9	22.1	21.5	21.2	2	22.5	18.9	18.9	18.9	18.8	18.9	0	20.5
	64QAM	1	0	20.5	21.6	21.4	20.8	21.1	2	22.5	18.6	18.6	18.9	18.6	19.1	0	20.5
		1	12	20.5	21.6	21.4	20.9	20.9	2	22.5	18.7	18.6	18.9	18.6	19.1	0	20.5
		1	24	20.5	21.6	21.4	20.8	20.9	2	22.5	18.5	18.5	18.8	18.6	19.1	0	20.5
		12	0	19.9	20.9	21.0	20.5	20.3	3	21.5	19.0	19.0	19.0	18.9	19.0	0	20.5
		12	7	19.9	20.9	21.0	20.4	20.3	3	21.5	19.0	19.0	19.0	18.9	19.0	0	20.5
		12	13	19.9	20.9	21.0	20.4	20.3	3	21.5	19.0	19.0	19.0	18.9	19.0	0	20.5
		25	0	20.1	20.8	21.0	20.5	20.2	3	21.5	18.9	18.9	18.8	18.7	18.9	0	20.5

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LTE Band 41 (HPUE) Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
20 MHz	QPSK	1	0	26.6	27.0	27.2	26.7	26.5	0	27.5
		1	49	26.3	27.0	27.1	26.6	26.3	0	27.5
		1	99	26.3	26.9	27.1	26.6	26.4	0	27.5
		50	0	25.5	25.9	26.1	25.5	25.3	1	26.5
		50	24	25.2	25.9	26.1	25.5	25.3	1	26.5
		50	50	25.2	25.9	26.0	25.5	25.2	1	26.5
		100	0	25.2	25.9	26.1	25.5	25.3	1	26.5
	16QAM	1	0	25.0	25.7	26.2	25.6	25.2	1	26.5
		1	49	25.1	25.7	26.2	25.6	25.1	1	26.5
		1	99	25.0	25.6	26.1	25.5	25.1	1	26.5
		50	0	24.1	24.9	25.2	24.6	24.3	2	25.5
		50	24	24.2	24.9	25.1	24.5	24.2	2	25.5
		50	50	24.1	24.9	25.1	24.5	24.2	2	25.5
		100	0	24.0	24.9	25.0	24.5	24.2	2	25.5
	64QAM	1	0	24.3	24.9	25.3	24.8	25.1	2	25.5
		1	49	24.2	24.9	25.2	24.7	24.9	2	25.5
		1	99	24.2	24.9	25.2	24.7	25.0	2	25.5
		50	0	23.4	24.0	24.2	23.6	23.3	3	24.5
		50	24	23.4	23.9	24.1	23.6	23.2	3	24.5
		50	50	23.3	23.9	24.1	23.6	23.2	3	24.5
		100	0	23.4	23.9	24.1	23.6	23.3	3	24.5
BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
15 MHz	QPSK	1	0	26.4	27.0	27.1	26.7	26.4	0	27.5
		1	37	26.4	27.0	27.1	26.7	26.3	0	27.5
		1	74	26.3	27.0	27.1	26.6	26.2	0	27.5
		36	0	25.5	25.9	26.1	25.6	25.3	1	26.5
		36	20	25.2	25.9	26.1	25.6	25.3	1	26.5
		36	39	25.2	25.9	26.1	25.5	25.3	1	26.5
		75	0	25.2	25.9	26.1	25.6	25.3	1	26.5
	16QAM	1	0	25.1	26.1	26.1	25.5	25.5	1	26.5
		1	37	25.2	26.0	26.1	25.5	25.4	1	26.5
		1	74	25.2	26.0	26.0	25.4	25.4	1	26.5
		36	0	24.1	24.9	25.0	24.6	24.3	2	25.5
		36	20	24.2	24.8	25.0	24.5	24.3	2	25.5
		36	39	24.1	24.8	25.0	24.5	24.3	2	25.5
		75	0	24.0	24.8	25.1	24.6	24.3	2	25.5
	64QAM	1	0	24.4	24.9	25.1	24.9	24.2	2	25.5
		1	37	24.3	24.9	25.1	24.9	24.2	2	25.5
		1	74	24.3	24.8	25.0	24.8	24.1	2	25.5
		36	0	23.2	23.9	24.2	23.5	23.3	3	24.5
		36	20	23.2	23.9	24.1	23.5	23.3	3	24.5
		36	39	23.2	23.9	24.1	23.5	23.3	3	24.5
		75	0	23.2	23.9	24.1	23.5	23.3	3	24.5

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LTE Band 41 (HPUE) Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
10 MHz	QPSK	1	0	26.3	26.9	27.2	26.7	26.4	0	27.5
		1	25	26.3	26.9	27.2	26.6	26.3	0	27.5
		1	49	26.3	26.9	27.1	26.7	26.3	0	27.5
		25	0	25.2	25.9	26.1	25.6	25.3	1	26.5
		25	12	25.2	25.9	26.1	25.6	25.3	1	26.5
		25	25	25.2	25.9	26.1	25.5	25.3	1	26.5
		50	0	25.2	25.9	26.1	25.5	25.3	1	26.5
	16QAM	1	0	25.4	25.9	25.9	25.9	25.2	1	26.5
		1	25	25.4	25.9	25.9	25.9	25.2	1	26.5
		1	49	25.4	25.9	25.9	25.9	25.2	1	26.5
		25	0	24.3	25.0	25.1	24.6	24.4	2	25.5
		25	12	24.2	25.0	25.1	24.5	24.3	2	25.5
		25	25	24.2	25.0	25.1	24.5	24.3	2	25.5
		50	0	24.2	24.9	25.1	24.5	24.3	2	25.5
	64QAM	1	0	23.8	25.1	25.2	24.7	24.4	2	25.5
		1	25	23.8	25.1	25.3	24.7	24.4	2	25.5
		1	49	23.8	25.0	25.2	24.7	24.4	2	25.5
		25	0	23.3	24.0	24.0	23.5	23.4	3	24.5
		25	12	23.2	24.0	24.0	23.5	23.3	3	24.5
		25	25	23.2	24.0	24.0	23.5	23.3	3	24.5
		50	0	23.3	24.0	24.0	23.6	23.3	3	24.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
5 MHz	QPSK	1	0	26.1	27.0	27.2	26.5	26.4	0	27.5
		1	12	26.1	27.0	27.2	26.6	26.5	0	27.5
		1	24	26.1	27.0	27.1	26.5	26.4	0	27.5
		12	0	25.2	25.9	26.1	25.6	25.3	1	26.5
		12	7	25.2	25.9	26.1	25.6	25.3	1	26.5
		12	13	25.2	25.9	26.1	25.5	25.3	1	26.5
		25	0	25.2	25.9	26.1	25.5	25.3	1	26.5
	16QAM	1	0	24.9	25.9	25.9	25.4	25.3	1	26.5
		1	12	24.9	25.9	25.9	25.4	25.3	1	26.5
		1	24	24.9	25.9	25.9	25.3	25.3	1	26.5
		12	0	24.1	25.0	25.0	24.4	24.5	2	25.5
		12	7	24.1	25.0	25.0	24.4	24.5	2	25.5
		12	13	24.1	25.0	25.0	24.4	24.4	2	25.5
		25	0	24.3	24.9	25.1	24.5	24.3	2	25.5
	64QAM	1	0	24.2	24.6	24.7	24.5	24.0	2	25.5
		1	12	24.4	24.7	24.7	24.5	24.0	2	25.5
		1	24	24.3	24.6	24.7	24.5	23.9	2	25.5
		12	0	23.2	23.9	24.0	23.5	23.3	3	24.5
		12	7	23.2	23.9	24.0	23.5	23.2	3	24.5
		12	13	23.2	23.9	24.0	23.6	23.3	3	24.5
		25	0	23.2	23.9	24.2	23.5	23.2	3	24.5

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LTE Band 66 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				132072	132322	132572	MPR	Tune-up Limit	132072	132322	132572	MPR	Tune-up Limit
				1720 MHz	1745 MHz	1770 MHz			1720 MHz	1745 MHz	1770 MHz		
20 MHz	QPSK	1	0	23.3	23.5	24.0	0	25	21.4	21.5	21.9	0	23
		1	49	23.3	23.6	24.0	0	25	21.3	21.6	22.0	0	23
		1	99	23.4	23.6	24.1	0	25	21.3	21.6	22.0	0	23
		50	0	22.3	22.5	23.0	1	24	21.3	21.5	22.0	0	23
		50	24	22.3	22.5	23.0	1	24	21.3	21.5	22.0	0	23
		50	50	22.3	22.6	23.0	1	24	21.3	21.5	22.1	0	23
		100	0	22.3	22.5	23.0	1	24	21.3	21.5	22.0	0	23
	16QAM	1	0	22.0	22.5	23.2	1	24	21.2	21.5	22.2	0	23
		1	49	22.1	22.4	23.3	1	24	21.3	21.4	22.2	0	23
		1	99	22.1	22.6	23.3	1	24	21.3	21.6	22.3	0	23
		50	0	21.3	21.5	22.0	2	23	21.3	21.5	22.0	0	23
		50	24	21.3	21.5	22.0	2	23	21.3	21.5	22.1	0	23
		50	50	21.3	21.5	22.1	2	23	21.3	21.5	22.1	0	23
		100	0	21.3	21.5	22.1	2	23	21.3	21.5	22.1	0	23
	64QAM	1	0	21.1	21.5	22.1	2	23	21.1	21.4	22.0	0	23
		1	49	21.1	21.5	22.1	2	23	21.1	21.5	22.1	0	23
		1	99	21.2	21.5	22.2	2	23	21.2	21.5	22.1	0	23
		50	0	20.2	20.5	21.0	3	22	20.5	20.5	21.0	0	23
		50	24	20.3	20.5	21.0	3	22	20.5	20.5	21.0	0	23
		50	50	20.3	20.5	21.1	3	22	20.5	20.5	21.1	0	23
		100	0	20.2	20.5	21.0	3	22	20.5	20.5	21.0	0	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				132047	132322	132597	MPR	Tune-up Limit	132047	132322	132597	MPR	Tune-up Limit
				1717.5 MHz	1745 MHz	1772.5 MHz			1717.5 MHz	1745 MHz	1772.5 MHz		
15 MHz	QPSK	1	0	23.3	23.5	24.1	0	25	21.3	21.4	22.1	0	23
		1	37	23.3	23.5	24.2	0	25	21.3	21.4	22.1	0	23
		1	74	23.3	23.5	24.2	0	25	21.3	21.5	22.1	0	23
		36	0	22.3	22.5	23.1	1	24	21.3	21.5	22.1	0	23
		36	20	22.3	22.5	23.1	1	24	21.3	21.5	22.2	0	23
		36	39	22.3	22.5	23.2	1	24	21.3	21.5	22.2	0	23
		75	0	22.3	22.5	23.1	1	24	21.3	21.5	22.2	0	23
	16QAM	1	0	22.5	22.6	23.1	1	24	21.3	21.5	22.1	0	23
		1	37	22.5	22.6	23.2	1	24	21.4	21.5	22.1	0	23
		1	74	22.5	22.6	23.2	1	24	21.4	21.5	22.1	0	23
		36	0	21.2	21.5	22.2	2	23	21.2	21.5	22.1	0	23
		36	20	21.3	21.5	22.2	2	23	21.3	21.5	22.2	0	23
		36	39	21.3	21.6	22.2	2	23	21.3	21.5	22.2	0	23
		75	0	21.3	21.5	22.1	2	23	21.3	21.5	22.1	0	23
	64QAM	1	0	21.2	21.5	22.0	2	23	21.2	21.5	21.8	0	23
		1	37	21.2	21.5	22.0	2	23	21.2	21.6	21.9	0	23
		1	74	21.3	21.5	22.1	2	23	21.2	21.6	21.9	0	23
		36	0	20.2	20.6	21.2	3	22	20.5	20.5	21.2	0	23
		36	20	20.2	20.6	21.2	3	22	20.5	20.6	21.2	0	23
		36	39	20.2	20.6	21.2	3	22	20.5	20.6	21.2	0	23
		75	0	20.2	20.5	21.2	3	22	20.5	20.5	21.2	0	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				132022	132322	132622	MPR	Tune-up Limit	132022	132322	132622	MPR	Tune-up Limit
				1715 MHz	1745 MHz	1775 MHz			1715 MHz	1745 MHz	1775 MHz		
10 MHz	QPSK	1	0	23.3	23.5	24.1	0	25	21.1	21.5	22.1	0	23
		1	25	23.3	23.5	24.1	0	25	21.2	21.5	22.2	0	23
		1	49	23.3	23.5	24.1	0	25	21.2	21.5	22.2	0	23
		25	0	22.2	22.5	23.1	1	24	21.2	21.5	22.1	0	23
		25	12	22.3	22.5	23.1	1	24	21.2	21.5	22.1	0	23
		25	25	22.3	22.5	23.1	1	24	21.2	21.5	22.1	0	23
		50	0	22.3	22.5	23.1	1	24	21.2	21.5	22.1	0	23
	16QAM	1	0	22.3	22.5	23.2	1	24	21.1	21.5	22.0	0	23
		1	25	22.3	22.5	23.2	1	24	21.2	21.5	22.0	0	23
		1	49	22.4	22.5	23.3	1	24	21.2	21.5	22.0	0	23
		25	0	21.3	21.5	22.1	2	23	21.2	21.6	22.1	0	23
		25	12	21.3	21.5	22.1	2	23	21.2	21.6	22.1	0	23
		25	25	21.3	21.5	22.1	2	23	21.3	21.6	22.1	0	23
		50	0	21.2	21.5	22.1	2	23	21.2	21.5	22.1	0	23
	64QAM	1	0	20.9	21.5	21.7	2	23	21.2	21.4	21.8	0	23
		1	25	20.9	21.5	21.8	2	23	21.3	21.4	21.9	0	23
		1	49	20.9	21.6	21.8	2	23	21.4	21.4	21.9	0	23
		25	0	20.2	20.5	21.1	3	22	20.5	20.5	21.1	0	23
		25	12	20.2	20.5	21.1	3	22	20.5	20.5	21.1	0	23
		25	25	20.2	20.6	21.2	3	22	20.5	20.5	21.1	0	23
		50	0	20.2	20.5	21.1	3	22	20.5	20.5	21.1	0	23

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LTE Band 66 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				131997	132322	132647	MPR	Tune-up Limit	131997	132322	132647	MPR	Tune-up Limit
				1712.5 MHz	1745 MHz	1777.5 MHz			1712.5 MHz	1745 MHz	1777.5 MHz		
5 MHz	QPSK	1	0	23.2	23.5	24.1	0	25	21.1	21.6	22.1	0	23
		1	12	23.2	23.5	24.1	0	25	21.2	21.6	22.1	0	23
		1	24	23.3	23.6	24.1	0	25	21.2	21.6	22.1	0	23
		12	0	22.2	22.5	23.1	1	24	21.2	21.5	22.1	0	23
		12	7	22.2	22.5	23.1	1	24	21.2	21.5	22.1	0	23
		12	13	22.2	22.5	23.1	1	24	21.2	21.5	22.2	0	23
		25	0	22.2	22.5	23.1	1	24	21.2	21.5	22.1	0	23
	16QAM	1	0	22.1	22.3	23.1	1	24	21.0	21.4	22.0	0	23
		1	12	22.1	22.3	23.1	1	24	21.0	21.4	22.0	0	23
		1	24	22.1	22.4	23.2	1	24	21.0	21.4	22.1	0	23
		12	0	21.1	21.4	22.1	2	23	21.2	21.4	22.1	0	23
		12	7	21.1	21.4	22.1	2	23	21.1	21.4	22.1	0	23
		12	13	21.1	21.4	22.1	2	23	21.1	21.4	22.1	0	23
		25	0	21.2	21.6	22.1	2	23	21.2	21.6	22.2	0	23
	64QAM	1	0	21.2	21.1	22.1	2	23	21.0	21.4	22.2	0	23
		1	12	21.1	21.2	22.1	2	23	21.1	21.4	22.2	0	23
		1	24	21.2	21.2	22.2	2	23	21.1	21.4	22.2	0	23
		12	0	20.1	20.3	21.1	3	22	20.5	20.5	21.0	0	23
		12	7	20.1	20.4	21.1	3	22	20.5	20.5	21.0	0	23
		12	13	20.1	20.4	21.1	3	22	20.5	20.5	21.0	0	23
		25	0	20.1	20.5	21.1	3	22	20.5	20.5	21.2	0	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				131987	132322	132657	MPR	Tune-up Limit	131987	132322	132657	MPR	Tune-up Limit
				1711.5 MHz	1745 MHz	1778.5 MHz			1711.5 MHz	1745 MHz	1778.5 MHz		
3 MHz	QPSK	1	0	23.3	23.5	24.2	0	25	21.2	21.5	22.3	0	23
		1	8	23.2	23.5	24.2	0	25	21.2	21.6	22.3	0	23
		1	14	23.3	23.5	24.2	0	25	21.3	21.6	22.3	0	23
		8	0	22.2	22.5	23.1	1	24	21.2	21.5	22.1	0	23
		8	4	22.2	22.5	23.1	1	24	21.1	21.5	22.2	0	23
		8	7	22.2	22.5	23.1	1	24	21.2	21.5	22.2	0	23
		15	0	22.2	22.5	23.1	1	24	21.2	21.5	22.2	0	23
	16QAM	1	0	22.3	22.4	23.3	1	24	21.0	21.4	22.2	0	23
		1	8	22.2	22.5	23.3	1	24	21.0	21.5	22.2	0	23
		1	14	22.4	22.5	23.3	1	24	21.0	21.5	22.2	0	23
		8	0	21.0	21.5	22.1	2	23	21.2	21.5	22.1	0	23
		8	4	21.0	21.5	22.2	2	23	21.2	21.5	22.0	0	23
		8	7	21.0	21.5	22.2	2	23	21.2	21.5	22.0	0	23
		15	0	21.2	21.5	22.2	2	23	21.2	21.5	22.1	0	23
	64QAM	1	0	21.0	21.4	21.9	2	23	21.1	21.4	22.1	0	23
		1	8	21.0	21.4	22.1	2	23	21.1	21.4	22.1	0	23
		1	14	21.0	21.4	21.9	2	23	21.1	21.5	22.1	0	23
		8	0	20.0	20.5	21.0	3	22	20.5	20.5	21.0	0	23
		8	4	20.0	20.5	21.1	3	22	20.5	20.5	21.0	0	23
		8	7	20.0	20.5	21.0	3	22	20.5	20.5	21.0	0	23
		15	0	20.1	20.5	21.2	3	22	20.5	20.5	21.2	0	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				131979	132322	132665	MPR	Tune-up Limit	131979	132322	132665	MPR	Tune-up Limit
				1710.7 MHz	1745 MHz	1779.3 MHz			1710.7 MHz	1745 MHz	1779.3 MHz		
1.4 MHz	QPSK	1	0	23.2	23.5	24.2	0	25	21.2	21.5	22.2	0	23
		1	3	23.1	23.5	24.2	0	25	21.2	21.6	22.2	0	23
		1	5	23.2	23.5	24.2	0	25	21.2	21.6	22.3	0	23
		3	0	23.2	23.5	24.1	0	25	21.1	21.5	22.2	0	23
		3	1	23.2	23.5	24.2	0	25	21.2	21.5	22.2	0	23
		3	3	23.2	23.5	24.2	0	25	21.2	21.5	22.2	0	23
		6	0	22.2	22.5	23.1	1	24	21.1	21.5	22.1	0	23
	16QAM	1	0	22.1	22.5	23.1	1	24	21.0	21.3	22.2	0	23
		1	3	22.2	22.5	23.2	1	24	21.2	21.3	22.3	0	23
		1	5	22.3	22.5	23.1	1	24	21.1	21.3	22.3	0	23
		3	0	22.1	22.5	23.1	1	24	21.1	21.5	22.2	0	23
		3	1	22.2	22.6	23.1	1	24	21.1	21.5	22.2	0	23
		3	3	22.2	22.5	23.1	1	24	21.1	21.5	22.2	0	23
		6	0	21.1	21.3	22.2	2	23	21.1	21.5	22.1	0	23
	64QAM	1	0	20.8	21.3	21.8	2	23	20.8	21.3	21.9	0	23
		1	3	20.9	21.4	21.9	2	23	20.9	21.4	21.8	0	23
		1	5	20.9	21.3	21.8	2	23	20.8	21.3	21.9	0	23
		3	0	21.3	21.8	22.1	2	23	21.3	21.6	22.2	0	23
		3	1	21.3	21.8	22.1	2	23	21.3	21.7	22.2	0	23
		3	3	21.3	21.8	22.1	2	23	21.3	21.7	22.1	0	23
		6	0	20.1	20.5	21.3	3	22	20.5	20.5	21.3	0	23

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LTE Band 71 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
					133297		MPR	Tune-up Limit		133297		MPR	Tune-up Limit
					680.5 MHz					680.5 MHz			
20 MHz	QPSK	1	0		24.5		0	25.5		22.4		0	23.5
		1	49		24.5		0	25.5		22.3		0	23.5
		1	99		24.4		0	25.5		22.2		0	23.5
		50	0		23.4		1	24.5		22.4		0	23.5
		50	24		23.4		1	24.5		22.4		0	23.5
		50	50		23.3		1	24.5		22.3		0	23.5
		100	0		23.3		1	24.5		22.4		0	23.5
	16QAM	1	0		23.5		1	24.5		22.4		0	23.5
		1	49		23.4		1	24.5		22.3		0	23.5
		1	99		23.3		1	24.5		22.2		0	23.5
		50	0		22.4		2	23.5		22.4		0	23.5
		50	24		22.4		2	23.5		22.4		0	23.5
		50	50		22.3		2	23.5		22.3		0	23.5
		100	0		22.3		2	23.5		22.4		0	23.5
	64QAM	1	0		22.1		2	23.5		22.3		0	23.5
		1	49		22.1		2	23.5		22.2		0	23.5
		1	99		22.0		2	23.5		22.1		0	23.5
		50	0		21.5		3	22.5		21.4		0	23.5
		50	24		21.4		3	22.5		21.4		0	23.5
		50	50		21.4		3	22.5		21.3		0	23.5
		100	0		21.4		3	22.5		21.3		0	23.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
					133297		MPR	Tune-up Limit		133297		MPR	Tune-up Limit
					680.5 MHz					680.5 MHz			
15 MHz	QPSK	1	0		24.5		0	25.5		22.5		0	23.5
		1	37		24.4		0	25.5		22.4		0	23.5
		1	74		24.3		0	25.5		22.3		0	23.5
		36	0		23.4		1	24.5		22.4		0	23.5
		36	20		23.4		1	24.5		22.4		0	23.5
		36	39		23.4		1	24.5		22.4		0	23.5
		75	0		23.4		1	24.5		22.4		0	23.5
	16QAM	1	0		23.5		1	24.5		22.3		0	23.5
		1	37		23.4		1	24.5		22.3		0	23.5
		1	74		23.3		1	24.5		22.2		0	23.5
		36	0		22.4		2	23.5		22.4		0	23.5
		36	20		22.4		2	23.5		22.4		0	23.5
		36	39		22.3		2	23.5		22.3		0	23.5
		75	0		22.4		2	23.5		22.3		0	23.5
	64QAM	1	0		22.2		2	23.5		22.3		0	23.5
		1	37		22.1		2	23.5		22.3		0	23.5
		1	74		22.0		2	23.5		22.2		0	23.5
		36	0		21.5		3	22.5		21.4		0	23.5
		36	20		21.5		3	22.5		21.4		0	23.5
		36	39		21.4		3	22.5		21.4		0	23.5
		75	0		21.4		3	22.5		21.3		0	23.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				133172	133297	133422	MPR	Tune-up Limit	133172	133297	133422	MPR	Tune-up Limit
				668 MHz	680.5 MHz	693 MHz			668 MHz	680.5 MHz	693 MHz		
10 MHz	QPSK	1	0	24.5	24.4	24.3	0	25.5	22.5	22.4	22.3	0	23.5
		1	25	24.4	24.3	24.3	0	25.5	22.4	22.4	22.3	0	23.5
		1	49	24.4	24.3	24.3	0	25.5	22.4	22.4	22.2	0	23.5
		25	0	23.4	23.4	23.3	1	24.5	22.4	22.4	22.3	0	23.5
		25	12	23.4	23.3	23.3	1	24.5	22.4	22.4	22.3	0	23.5
		25	25	23.4	23.3	23.3	1	24.5	22.4	22.3	22.3	0	23.5
		50	0	23.4	23.4	23.3	1	24.5	22.4	22.3	22.3	0	23.5
	16QAM	1	0	23.5	23.4	23.5	1	24.5	22.6	22.3	22.3	0	23.5
		1	25	23.5	23.4	23.4	1	24.5	22.5	22.3	22.3	0	23.5
		1	49	23.4	23.4	23.4	1	24.5	22.5	22.3	22.2	0	23.5
		25	0	22.5	22.3	22.3	2	23.5	22.5	22.4	22.3	0	23.5
		25	12	22.5	22.3	22.3	2	23.5	22.5	22.3	22.3	0	23.5
		25	25	22.5	22.3	22.3	2	23.5	22.4	22.3	22.3	0	23.5
		50	0	22.4	22.4	22.2	2	23.5	22.4	22.4	22.3	0	23.5
	64QAM	1	0	22.4	22.2	22.0	2	23.5	22.4	22.4	21.9	0	23.5
		1	25	22.2	22.2	21.9	2	23.5	22.3	22.4	21.9	0	23.5
		1	49	22.2	22.1	21.9	2	23.5	22.3	22.4	21.9	0	23.5
		25	0	21.5	21.5	21.3	3	22.5	21.5	21.4	21.3	0	23.5
		25	12	21.5	21.4	21.3	3	22.5	21.5	21.4	21.3	0	23.5
		25	25	21.5	21.4	21.3	3	22.5	21.4	21.4	21.3	0	23.5
		50	0	21.5	21.4	21.3	3	22.5	21.5	21.4	21.3	0	23.5

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LTE Band 71 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				133147	133297	133447	MPR	Tune-up Limit	133147	133297	133447	MPR	Tune-up Limit
				665.5 MHz	680.5 MHz	695.5 MHz			665.5 MHz	680.5 MHz	695.5 MHz		
5 MHz	QPSK	1	0	24.5	24.4	24.2	0	25.5	22.5	22.5	22.2	0	23.5
		1	12	24.5	24.4	24.2	0	25.5	22.4	22.4	22.1	0	23.5
		1	24	24.5	24.4	24.2	0	25.5	22.4	22.4	22.1	0	23.5
		12	0	23.5	23.4	23.2	1	24.5	22.4	22.4	22.2	0	23.5
		12	7	23.4	23.4	23.2	1	24.5	22.4	22.3	22.2	0	23.5
		12	13	23.4	23.3	23.2	1	24.5	22.4	22.3	22.2	0	23.5
		25	0	23.4	23.3	23.2	1	24.5	22.4	22.3	22.2	0	23.5
	16QAM	1	0	23.3	23.3	23.1	1	24.5	22.4	22.1	22.2	0	23.5
		1	12	23.3	23.3	23.0	1	24.5	22.4	22.1	22.2	0	23.5
		1	24	23.3	23.3	23.1	1	24.5	22.3	22.1	22.1	0	23.5
		12	0	22.3	22.3	22.1	2	23.5	22.4	22.3	22.1	0	23.5
		12	7	22.4	22.3	22.1	2	23.5	22.4	22.3	22.2	0	23.5
		12	13	22.4	22.3	22.1	2	23.5	22.4	22.3	22.1	0	23.5
		25	0	22.4	22.4	22.2	2	23.5	22.4	22.4	22.2	0	23.5
	64QAM	1	0	22.4	22.2	22.0	2	23.5	22.2	22.2	22.3	0	23.5
		1	12	22.2	22.2	22.0	2	23.5	22.4	22.2	22.2	0	23.5
		1	24	22.2	22.1	22.0	2	23.5	22.4	22.2	22.2	0	23.5
		12	0	21.5	21.3	21.2	3	22.5	21.4	21.3	21.3	0	23.5
		12	7	21.5	21.3	21.1	3	22.5	21.4	21.3	21.2	0	23.5
		12	13	21.5	21.3	21.1	3	22.5	21.4	21.3	21.2	0	23.5
		25	0	21.4	21.4	21.3	3	22.5	21.5	21.4	21.3	0	23.5

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9.5. LTE Up-Link Carrier Aggregation

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

For inter-band carrier aggregation with uplink assigned to one E-UTRA band (Table 5.6A-1), the requirements in subclause 6.2.3 apply.

For inter-band carrier aggregation with one component carrier per operating band and the uplink active in two E-UTRA bands, the requirements in subclause 6.2.3 apply for each uplink component carrier.

For intra-band contiguous carrier aggregation, the allowed Maximum Power Reduction (MPR) for the maximum output power applicable to the DUT in table below. In case the modulation format is different on different component carriers then the MPR is determined by the rules applied to higher order of those modulations.

Modulation	CA bandwidth Class B and C / Smallest Component Carrier Transmission Bandwidth Configuration				MPR (dB)
	25 RB	50 RB	75 RB	100 RB	
QPSK	> 8 and ≤ 25	> 12 and ≤ 50	> 16 and ≤ 75	> 18 and ≤ 100	≤ 1
QPSK	> 25	> 50	> 75	> 100	≤ 2
16 QAM	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 8 and ≤ 25	> 12 and ≤ 50	> 16 and ≤ 75	> 18 and ≤ 100	≤ 2
16 QAM	> 25	> 50	> 75	> 100	≤ 3
64 QAM	≤ 8 and allocation wholly contained within a single CC	≤ 12 and allocation wholly contained within a single CC	≤ 16 and allocation wholly contained within a single CC	≤ 18 and allocation wholly contained within a single CC	≤ 2
64 QAM	> 8 or allocation extends across two CC's	> 12 or allocation extends across two CC's	> 16 or allocation extends across two CC's	> 18 or allocation extends across two CC's	≤ 3

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For PUCCH and SRS transmissions, the allowed MPR is according to that specified for PUSCH WPDK modulation for the corresponding transmission bandwidth.

For intra-band contiguous carrier aggregation bandwidth class C with non-contiguous resource allocation, the allowed Maximum Power Reduction (MPR) for the maximum output power in Table 6.2.2A-1 is specified as follows

$MPR = CEIL\{\min(M_A, M_{IM5}), 0.5\}$

Where M_A is defined as follows

$M_A =$	8.2	$;0 \le A < 0.025$
	9.2 – 40A	$;0.025 \le A < 0.05$
	8 – 16A	$;0.05 \le A < 0.25$
	4.83 – 3.33A	$;0.25 \le A \le 0.4$
	3.83 – 0.83A	$;0.4 \le A \le 1$

and M_{IM5} is defined as follows

$M_{IM5} =$	4.5	$; \Delta_{IM5} < 1.5 * BW_{Channel_CA}$
	6.0	$; 1.5 * BW_{Channel_CA} \le \Delta_{IM5} < BW_{Channel_CA}/2 + \Delta f_{ooB}$
	M_A	$; \Delta_{IM5} \ge BW_{Channel_CA}/2 + \Delta f_{ooB}$

Where

$A = N_{RB_alloc} / N_{RB_agg}$

$\Delta_{IM5} = \max(\left| F_{C_agg} - (3*F_{agg_alloc_low} - 2*F_{agg_alloc_high}) \right|, \left| F_{C_agg} - (3*F_{agg_alloc_high} - 2*F_{agg_alloc_low}) \right|)$

$CEIL\{M_A, 0.5\}$ means rounding upwards to closest 0.5dB, i.e. MPR ∈ [3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5]

For intra-band carrier aggregation, the MPR is evaluated per slot and given by the maximum value taken over the transmission(s) on all component carriers within the slot; the maximum MPR over the two slots is then applied for the entire subframe.

For intra-band non-contiguous carrier aggregation with one uplink carrier on the PCC, the requirements in the subclause 6.2.3 apply. For intra-band non-contiguous aggregation with two uplink carriers the MPR is defined tfor those E-UTRA bands where maximum possible $W_{GAP} \le 42.2$ MHz as follows

$MPR = CEIL\{M_A, 0.5\}$

Where M_N is defined as follows

$M_N =$	-0.125N + 18.25	$; 2 \le N \le 50$
	-0.0333 N + 13.67	$; 50 < N \le 200$

Where $N = N_{RB_alloc}$ is the number of allocated resource blocks.

For the UE maximum output power modified by MPR, the power limits specified in subclause 6.2.5A apply.

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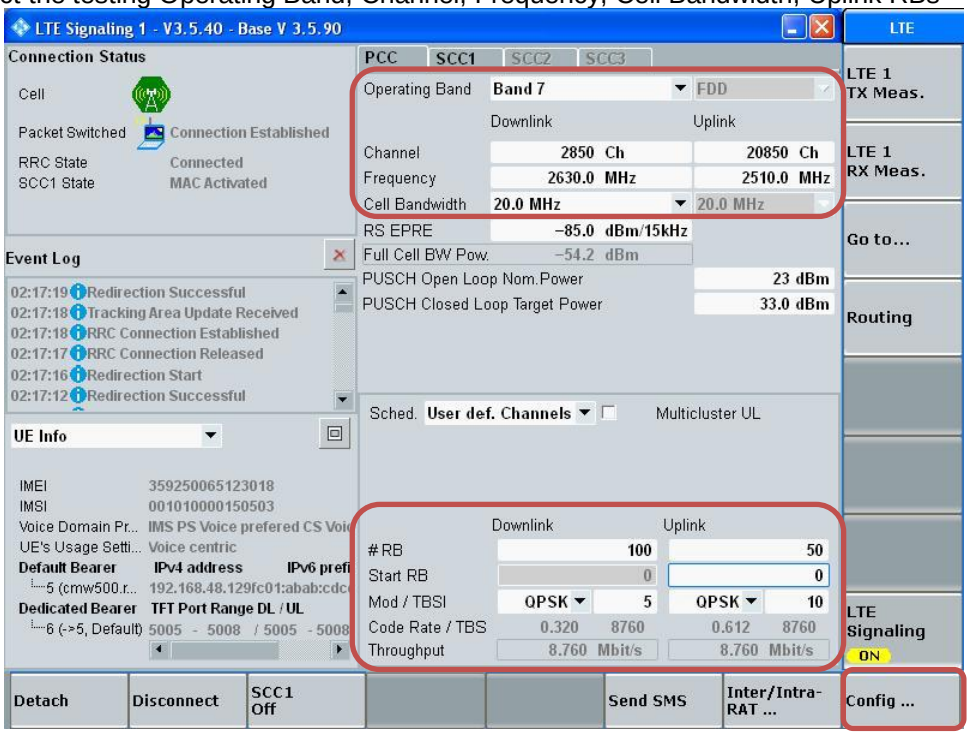
LTE Carrier Aggregation Test Signal Set-up Procedure
(Use normal LTE set-up procedure in addition with the following steps)

Set to CMW-500 with following parameters:

- PCC tab:
  - Select the testing Operating Band, Channel, Frequency, Cell Bandwidth, Uplink RBs
- 

- Go to "Config…."

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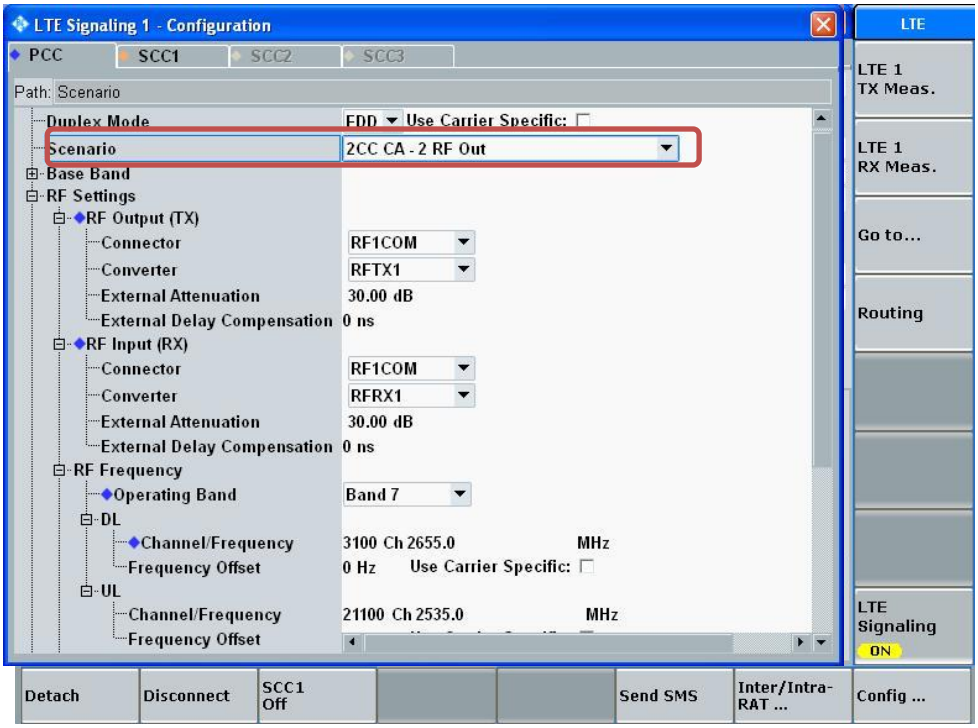
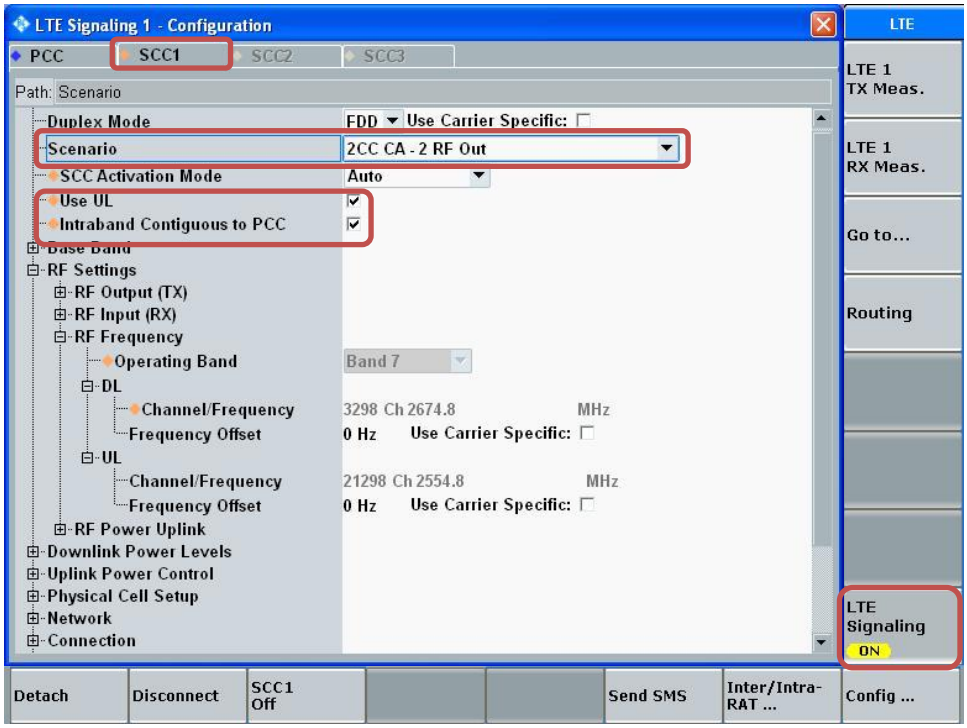
- Go to “Scenario”
- Set to “2CC CA – 2 RF Out”



- Select “SCC1” tab
- Go to “Scenario”
- Set to “2CC CA – 2 RF Out”
- Enable “Use UL”
- Enable “Intraband Contiguous to PCC”
- Select “LTE Signaling” button



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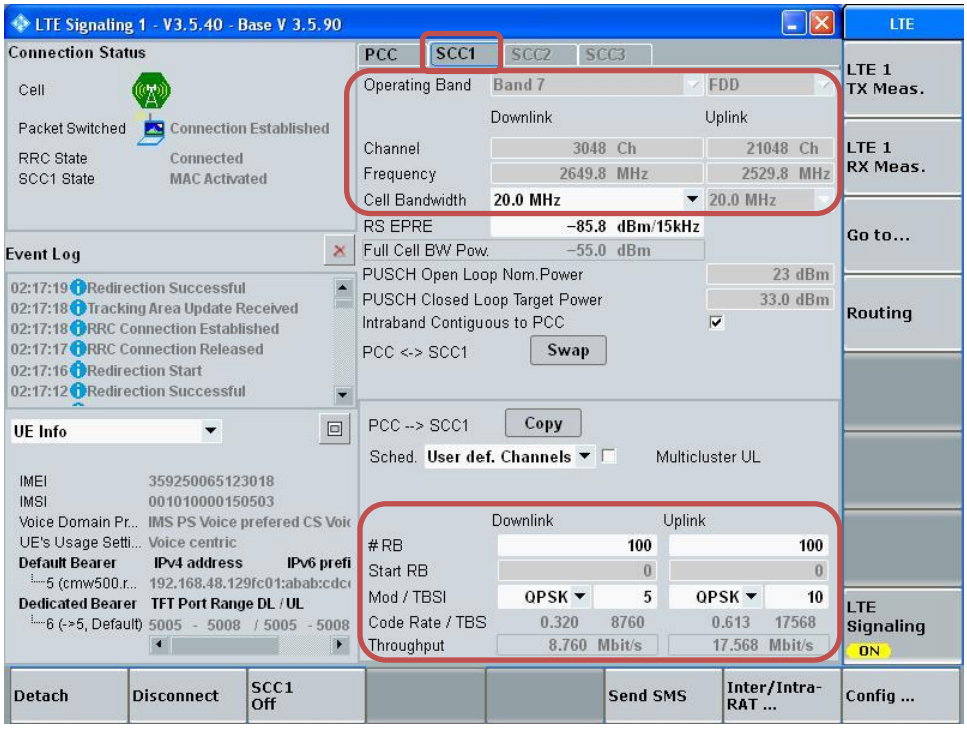
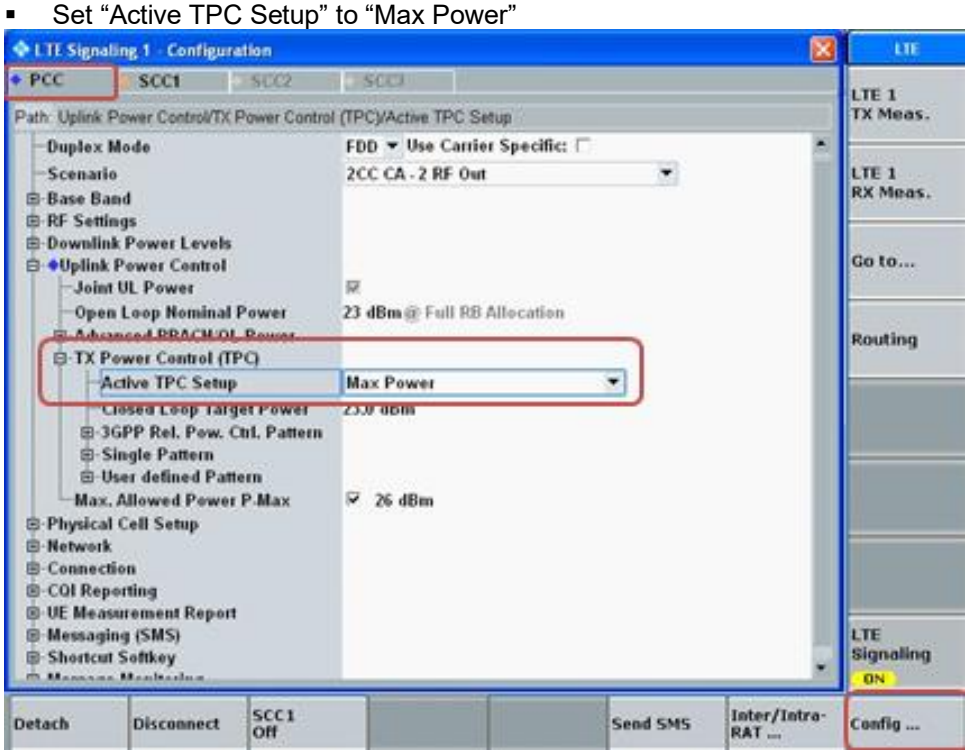
- Select “SCC1” tab
  - Select the testing Cell Bandwidth, Uplink RBs



Max Power Setting

- Select “Config …” button
- Select PCC tab
- Set “Active TPC Setup” to “Max Power”



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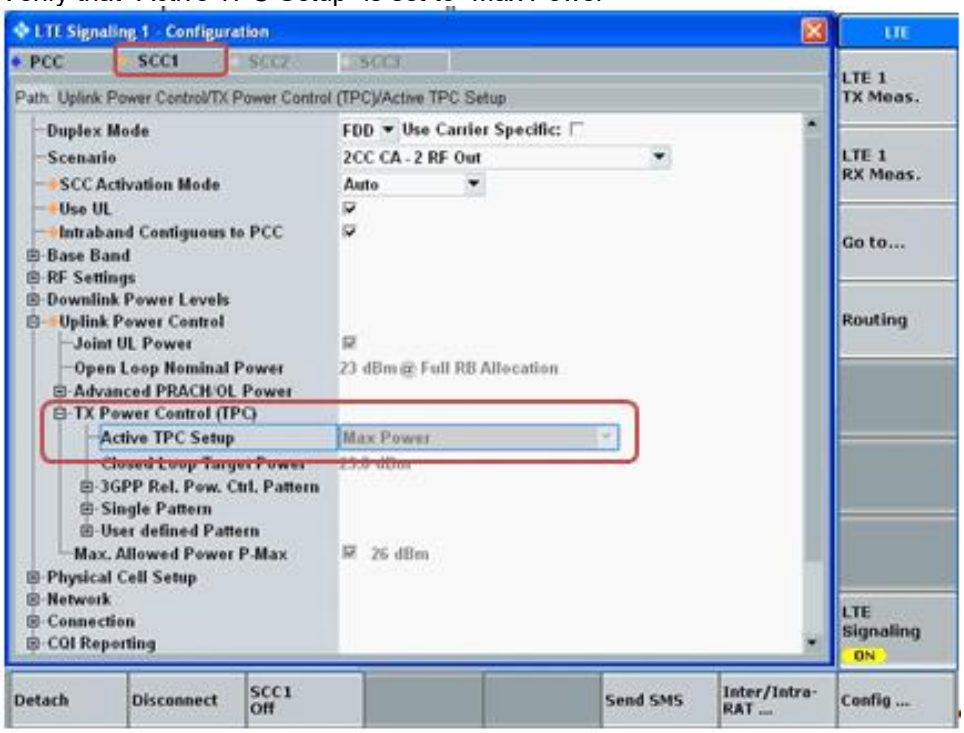
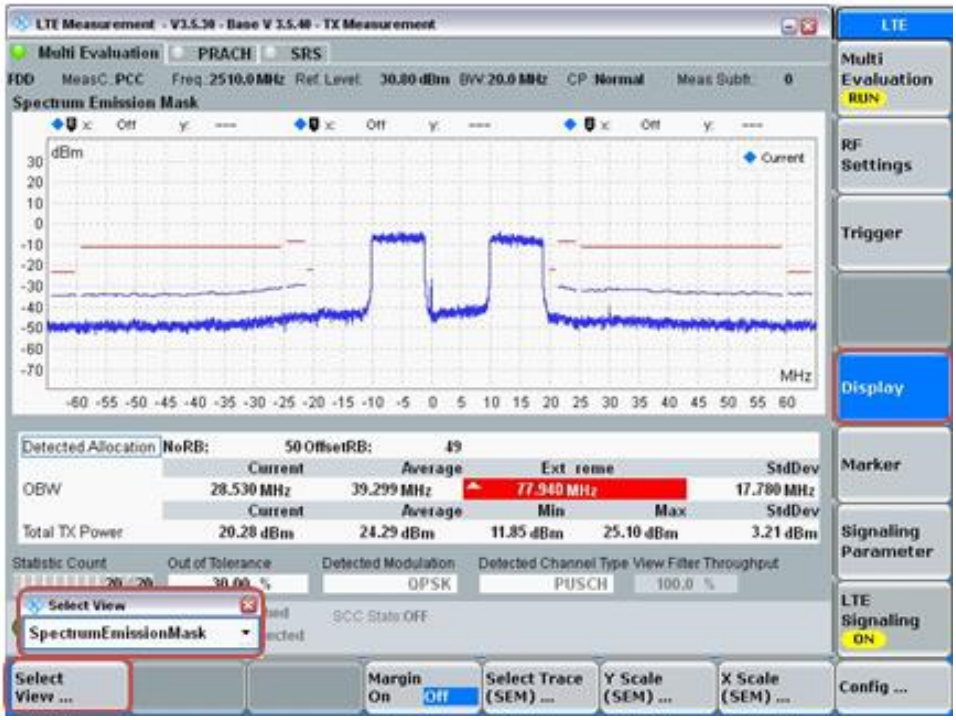
- Select SCC1 tab
- Verify that “Active TPC Setup” is set to “Max Power”



View TX Power

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



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LTE Intra-Band Contiguous Carrier Aggregation

UL CA shall be tested based on the worst-case SAR configuration determined from non-CA SAR testing result. The channel BW, channel number, RB allocation, etc. would be selected to allow contiguous CA of PCC and SCC. Uplink output power for UL CA is the total power measured across the PCC and SCC.

UL CA power measurements were performed for each applicable antenna with QPSK as its modulation, based on the worst-case standalone SAR.

The UL CA power measurements represent the total power across both carriers. Measurements were made for all supported PCC bandwidths using the channel/RB combination resulting in the highest standalone output power at the least MPR (0 dB). SCCs were set to use configurations similar to the PCC to establish conservative, or worst-case, equivalent SAR test conditions (highest maximum power with MPR of 0 dB and RB allocation setting).

The standalone power measurement is the power for the PCC in the non-CA mode (i.e. single carrier power). In all cases the UL CA power is less than or equal to the standalone power, which is in accordance with the tune-up limits in the table below.

According to November 2017 TCB workshop, Uplink CA SAR Test Guidance as follows:

a) When the maximum output for UL CA is ≤ standalone LTE mode (without CA)
   - PCC is configured according to the highest standalone SAR configuration tested
   - SCC and subsequent CCs are configured according to procedures used for power measurement and parameters (BW, RB etc.) similar to that used for the PCC

b) When the Reported SAR for UL CA configuration, described above, is > 1.2 W/kg, UL CA SAR is also required for all required test channels (PCC based)

c) UL CA SAR is also required for standalone SAR configurations > 1.2 W/kg when they are scaled to the UL CA power level

Maximum Output Power (Tune-up Limit) for LTE UL Carrier Aggregation

RF Air interface	Mode	Tune-up Pow erLimit (dBm)	
		Main Antenna #2	
		Maximum	Reduced
CA_41C (PC 3)	QPSK	24.50	20.50

LTE CA_41C (PC3) Measured Results

UL CA Combination	Pow er Mode	Modulation	Pow er Back-off	PCC					SCC					Standalone Pow er		(PCC + SCC) UL CA Pow er		
				BW (MHz)	Channel	Freq	RB	Offset	BW (MHz)	Channel	Freq	RB	Offset	Tune-Up Limit (dBm)	UL CA Inactive (dBm)	Tune-Up Limit (dBm)	UL CA active (dBm)	Delta
CA_41C	PC3	QPSK	ON	20	39750	2506.0	1	99	20	39948	2525.8	1	0	20.50	19.70	20.50	19.70	0.0
CA_41C	PC3	QPSK	ON	20	40521	2583.1	1	99	20	40719	2602.9	1	0	20.50	19.80	20.50	19.90	0.1
CA_41C	PC3	QPSK	ON	20	41292	2660.2	1	99	20	41490	2680.0	1	0	20.50	19.70	20.50	19.70	0.0
CA_41C	PC3	QPSK	N/A	20	39750	2506.0	1	99	20	39948	2525.8	1	0	24.50	23.10	24.50	22.70	-0.4
CA_41C	PC3	QPSK	N/A	20	40521	2583.1	1	99	20	40719	2602.9	1	0	24.50	23.30	24.50	22.90	-0.4
CA_41C	PC3	QPSK	N/A	20	41292	2660.2	1	99	20	41490	2680.0	1	0	24.50	22.90	24.50	22.50	-0.4

Note(s):

1. PCC RB allocation setting for UL CA has been adjusted based on the worst-case power.

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9.6. LTE Down-Link Carrier Aggregation

The tables below show the supported frequency bands of the device for DL Inter-band and DL Intra-band combinations.

Power measurements were performed on the channel with the highest maximum output power from the Tune-up Procedure on their respective antenna.

When carrier aggregation is limited to downlink only, uplink maximum output power (single carrier) is measured for the supported combinations of downlink carrier aggregation listed in the table below. In applying the power measurement procedures of KDB 941225 D05A and April 2018 TCB workshop for DL CA to qualify for UL SAR test exclusion, power measurement is required only for the subset in each row with the largest combination of frequency bands and CCs (far right most configuration highlighted in the table below).

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Index	2CC	Restriction	Completely Covered by Measurement Superset
2CC # 1	CA_2C	N/A	No
2CC # 2	CA_5B	N/A	3CC #41
2CC # 3	CA_12B	N/A	No
2CC # 4	CA_41C	N/A	No
2CC # 5	CA_66B	N/A	No
2CC # 6	CA_66C	N/A	3CC #54
2CC # 7	CA_2A-2A	N/A	3CC #2
2CC # 8	CA_4A-4A	N/A	3CC #29
2CC # 9	CA_5A-5A	N/A	3CC #38
2CC # 10	CA_7A-7A	N/A	No
2CC # 11	CA_25A-25A	N/A	3CC #49
2CC # 12	CA_41A-41A	N/A	3CC #51
2CC # 13	CA_66A-66A	N/A	3CC #52
2CC # 14	CA_2A-4A	N/A	3CC #8
2CC # 15	CA_2A-5A	N/A	3CC #14
2CC # 16	CA_2A-7A	N/A	3CC #16
2CC # 17	CA_2A-12A	N/A	3CC #19
2CC # 18	CA_2A-13A	N/A	3CC #21
2CC # 19	CA_2A-29A	N/A	3CC #22
2CC # 20	CA_2A-30A	N/A	3CC #22
2CC # 21	CA_2A-66A	N/A	3CC #23
2CC # 22	CA_2A-71A	N/A	3CC #24
2CC # 23	CA_4A-5A	N/A	3CC #29
2CC # 24	CA_4A-7A	N/A	3CC #35
2CC # 25	CA_4A-12A	N/A	3CC #33
2CC # 26	CA_4A-13A	N/A	3CC #30
2CC # 27	CA_4A-71A	N/A	3CC #34
2CC # 28	CA_5A-7A	N/A	No
2CC # 29	CA_5A-30A	N/A	No
2CC # 30	CA_5A-66A	N/A	3CC #38
2CC # 31	CA_7A-12A	N/A	3CC #43
2CC # 32	CA_7A-66A	N/A	No
2CC # 33	CA_12A-30A	N/A	No
2CC # 34	CA_12A-66A	N/A	3CC #44
2CC # 35	CA_13A-66A	N/A	3CC #45
2CC # 36	CA_25A-26A	N/A	3CC #49
2CC # 37	CA_25A-41A	N/A	3CC #48
2CC # 38	CA_26A-41A	N/A	3CC #50
2CC # 39	CA_29A-30A	N/A	No
2CC # 40	CA_66A-71A	N/A	3CC #53

Index	3CC	Restriction	Completely Covered by Measurement Superset
3CC # 1	CA_41D	N/A	No
3CC # 2	CA_2A-2A-4A	N/A	No
3CC # 3	CA_2A-2A-5A	N/A	No
3CC # 4	CA_2A-2A-12A	N/A	No
3CC # 5	CA_2A-2A-13A	N/A	No
3CC # 6	CA_2A-2A-66A	N/A	No
3CC # 7	CA_2A-2A-71A	N/A	No
3CC # 8	CA_2A-4A-4A	N/A	No
3CC # 9	CA_2A-4A-5A	N/A	No
3CC # 10	CA_2A-4A-7A	N/A	No
3CC # 11	CA_2A-4A-12A	N/A	No
3CC # 12	CA_2A-4A-13A	N/A	No
3CC # 13	CA_2A-4A-71A	N/A	No
3CC # 14	CA_2A-5A-66A	N/A	No
3CC # 15	CA_2A-5A-30A	N/A	No
3CC # 16	CA_2A-7A-7A	N/A	No
3CC # 17	CA_2A-7A-12A	N/A	No
3CC # 18	CA_2A-5B	N/A	No
3CC # 19	CA_2A-12A-30A	N/A	No
3CC # 20	CA_2A-12A-66A	N/A	No
3CC # 21	CA_2A-13A-66A	N/A	No
3CC # 22	CA_2A-29A-30A	N/A	No
3CC # 23	CA_2A-66A-66A	N/A	No
3CC # 24	CA_2A-66A-71A	N/A	No
3CC # 25	CA_2A-66B	N/A	No
3CC # 26	CA_2A-66C	N/A	No
3CC # 27	CA_2C-66A	N/A	No
3CC # 28	CA_2A-12B	N/A	No
3CC # 29	CA_4A-4A-5A	N/A	No
3CC # 30	CA_4A-4A-13A	N/A	No
3CC # 31	CA_4A-5B	N/A	No
3CC # 32	CA_4A-4A-7A	N/A	No
3CC # 33	CA_4A-4A-12A	N/A	No
3CC # 34	CA_4A-4A-71A	N/A	No
3CC # 35	CA_4A-7A-7A	N/A	No
3CC # 36	CA_4A-7A-12A	N/A	No
3CC # 37	CA_4A-12B	N/A	No
3CC # 38	CA_5A-5A-66A	N/A	No
3CC # 39	CA_5A-66B	N/A	No
3CC # 40	CA_5A-66C	N/A	No
3CC # 41	CA_5B-66A	N/A	No
3CC # 42	CA_5A-66A-66A	N/A	No
3CC # 43	CA_7A-12B	N/A	No
3CC # 44	CA_12A-66A-66A	N/A	No
3CC # 45	CA_13A-66A-66A	N/A	No
3CC # 46	CA_13A-66B	N/A	No
3CC # 47	CA_13A-66C	N/A	No
3CC # 48	CA_25A-41C	N/A	No
3CC # 49	CA_25A-25A-26A	N/A	No
3CC # 50	CA_26A-41C	N/A	No
3CC # 51	CA_41A-41C	N/A	No
3CC # 52	CA_66A-66A-66A	N/A	No
3CC # 53	CA_66A-66A-71A	N/A	No
3CC # 54	CA_66A-66C	N/A	No

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In applying the power measurement procedures of KDB 941225 D05A for DL CA to qualify for UL SAR test exclusion, power measurement is required only for the CA configuration with the largest aggregated DL CA BW in each frequency band, independently for contiguous and non-contiguous CA; however, if the same frequency band is used for both contiguous and non-contiguous CA, power measurement was performed using the configuration with the largest aggregated BW and maximum output power among contiguous and non-contiguous CA.

2CC DL CA Measured Results

E-UTRA CA configuration	CC1 (UL)					CC2 (DL)			Aggregated BW	CA Inactive (dBm)	CA Active (dBm)	Delta	2CC #
	Mode	BW (MHz)	Channel	Freq (MHz)	RB,Offset	BW (MHz)	Channel	Freq (MHz)					
CA_2C	QPSK	20	18801	1870.1	1,0	20	999	1969.9	40	24.1	24.0	-0.04	1
CA_12B	QPSK	5	23048	702.8	1,0	10	5120	740	15	24.5	24.4	-0.08	3
CA_41C	QPSK	20	39750	2506	1,0	20	39948	2525.8	40	23.2	23.4	0.15	4
CA_66B	QPSK	10	132022	1715	1,0	10	66585	2124.9	20	23.2	23.1	-0.08	5
CA_7A-7A	QPSK	20	20850	2510	1,0	20	3350	2680	40	22.8	22.6	-0.23	10
CA_5A-7A	QPSK	10	20450	829	1,0	20	3100	2655	30	24.5	24.5	-0.06	28
CA_5A-30A	QPSK	10	20525	836.5	1,0	10	9820	2355	20	24.7	24.3	-0.37	29
CA_7A-66A	QPSK	20	20850	2510	1,0	20	67236	2190	40	22.8	22.7	-0.08	32
CA_12A-30A	QPSK	10	23095	707.5	1,0	10	9820	2355	20	24.6	24.5	-0.07	33

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3CC DL CA Measured Results

E-UTRA CA configuration	CC1 (UL)					CC2 (DL)			CC3 (DL)			Aggregated BW	CA Inactive (dBm)	CA Active (dBm)	Delta	3CC #
	Mode	BW (MHz)	Channel	Freq (MHz)	RB,Offset	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)					
CA_41D	QPSK	20	40422	2573.2	1,0	20	40620	2593	20	40818	2612.8	60	23.6	23.4	-0.17	1
CA_2A-2A-4A	QPSK	20	18900	1880	1,0	20	1100	1980	20	2175	2132.5	60	23.9	24.0	0.06	2
CA_2A-2A-5A	QPSK	20	18900	1880	1,0	20	1100	1980	10	2525	881.5	50	24.0	24.0	-0.02	3
CA_2A-2A-12A	QPSK	20	18900	1880	1,0	20	1100	1980	10	5095	737.5	50	23.9	23.8	-0.12	4
CA_2A-2A-13A	QPSK	20	18700	1860	1,0	20	1100	1980	10	5230	751	50	24.0	23.8	-0.15	5
CA_2A-2A-66A	QPSK	20	18900	1880	1,0	20	1100	1980	20	67236	2190	60	24.0	23.9	-0.15	6
CA_2A-2A-71A	QPSK	20	18900	1880	1,0	20	1100	1980	20	68761	634.5	60	24.0	23.9	-0.14	7
CA_2A-4A-4A	QPSK	20	18700	1860	1,0	20	2050	2120	20	2300	2145	60	24.2	23.9	-0.30	8
CA_2A-4A-5A	QPSK	20	18700	1860	1,0	20	2050	2120	10	2525	881.5	50	24.0	24.0	-0.01	9
CA_2A-4A-7A	QPSK	20	18700	1860	1,0	20	2050	2120	20	3100	2655	60	24.0	24.0	-0.03	10
CA_2A-4A-12A	QPSK	20	18700	1860	1,0	20	2050	2120	10	5095	737.5	50	24.0	23.9	-0.14	11
CA_2A-4A-13A	QPSK	20	18900	1880	1,0	20	2300	2145	10	5230	751	50	24.1	24.0	-0.08	12
CA_2A-4A-71A	QPSK	20	18900	1880	1,0	20	2300	2145	20	68761	634.5	60	24.1	23.9	-0.22	13
CA_2A-5A-66A	QPSK	20	18900	1880	1,0	10	2525	881.5	20	66886	2155	50	22.4	22.0	-0.36	14
CA_2A-5A-30A	QPSK	20	18900	1880	1,0	10	2525	881.5	10	9820	2355	40	24.1	24.0	-0.10	15
CA_2A-7A-7A	QPSK	20	18700	1860	1,0	20	2850	2630	20	3350	2680	60	24.0	23.8	-0.16	16
CA_2A-7A-12A	QPSK	20	18700	1860	1,0	20	2850	2630	10	5095	737.5	50	24.1	23.8	-0.29	17
CA_2A-5B	QPSK	20	18900	1880	1,0	10	2476	876.6	10	2600	889	40	24.0	24.0	-0.01	18
CA_2A-12A-30A	QPSK	20	18900	1880	1,0	10	5095	737.5	10	9820	2355	40	24.0	23.9	-0.03	19
CA_2A-12A-66A	QPSK	20	18900	1880	1,0	10	5095	737.5	20	66886	2155	50	24.0	23.8	-0.14	20
CA_2A-13A-66A	QPSK	20	18900	1880	1,0	10	5230	751	20	66886	2155	50	24.1	23.8	-0.23	21
CA_2A-29A-30A	QPSK	20	18900	1880	1,0	10	900	1960	10	9820	2355	40	24.1	24.0	-0.10	22
CA_2A-66A-66A	QPSK	20	18900	1880	1,0	20	66536	2120	20	66886	2155	60	24.0	24.0	-0.03	23
CA_2A-66A-71A	QPSK	20	18900	1880	1,0	20	67236	2190	20	68761	634.5	60	24.1	23.8	-0.21	24
CA_2A-66B	QPSK	20	18900	1880	1,0	10	66837	2150.1	10	67185	2184.9	40	24.1	23.9	-0.22	25
CA_2A-66C	QPSK	20	18900	1880	1,0	20	66787	2145.1	20	66985	2164.9	60	23.9	23.9	-0.06	26
CA_2C-66A	QPSK	20	18801	1870.1	1,0	20	999	1969.9	20	66886	2155	60	24.2	23.9	-0.29	27
CA_2A-12B	QPSK	20	18900	1880	1,0	5	5035	731.5	10	5107	738.7	35	24.0	23.9	-0.17	28
CA_4A-4A-5A	QPSK	20	20050	1720	1,0	20	2300	2145	10	2525	881.5	50	23.2	23.1	-0.11	29
CA_4A-4A-13A	QPSK	20	20050	1720	1,0	20	2300	2145	10	5230	751	50	23.2	23.0	-0.20	30
CA_4A-5B	QPSK	20	20050	1720	1,0	10	2476	876.6	10	2600	889	40	23.2	23.2	0.02	31
CA_4A-4A-7A	QPSK	20	20050	1720	1,0	20	2300	2145	20	3100	2655	60	23.1	23.2	0.08	32
CA_4A-4A-12A	QPSK	20	20050	1720	1,0	20	2300	2145	10	5095	737.5	50	23.2	23.2	-0.04	33
CA_4A-4A-71A	QPSK	20	20050	1720	1,0	20	2300	2145	20	68761	634.5	60	23.3	23.2	-0.08	34
CA_4A-7A-7A	QPSK	20	20050	1720	1,0	20	2850	2630	20	3350	2680	60	23.2	23.0	-0.18	35
CA_4A-7A-12A	QPSK	20	20050	1720	1,0	20	2850	2630	10	5095	737.5	50	23.3	23.1	-0.20	36
CA_4A-12B	QPSK	20	20050	1720	1,0	5	5058	733.8	10	5130	741	35	23.3	23.2	-0.08	37
CA_5A-5A-66A	QPSK	10	20450	829	1,0	10	2600	889	20	66886	2155	40	24.5	24.4	-0.08	38
CA_5A-66B	QPSK	10	20450	829	1,0	10	66837	2150.1	10	67185	2184.9	30	24.6	24.5	-0.07	39
CA_5A-66C	QPSK	10	20450	829	1,0	20	66787	2145.1	20	66985	2164.9	50	24.6	24.5	-0.13	40
CA_5B-66A	QPSK	10	20476	831.6	1,0	10	2575	886.5	20	66886	2155	40	24.5	24.4	-0.17	41
CA_5A-66A-66A	QPSK	10	20450	829	1,0	20	66536	2120	20	66886	2155	50	24.5	24.4	-0.16	42
CA_7A-12B	QPSK	20	20850	2510	1,0	5	5058	733.8	10	5130	741	35	22.9	22.6	-0.24	43
CA_12A-66A-66A	QPSK	10	23095	707.5	1,0	20	66536	2120	20	67236	2190	50	24.5	24.5	-0.08	44
CA_13A-66A-66A	QPSK	10	23230	782	1,0	20	66536	2120	20	67236	2190	50	24.5	24.4	-0.06	45
CA_13A-66B	QPSK	10	23230	782	1,0	10	66837	2150.1	10	67185	2184.9	30	24.5	24.5	-0.08	46
CA_13A-66C	QPSK	10	23230	782	1,0	20	66787	2145.1	20	66985	2164.9	50	24.6	24.4	-0.20	47
CA_25A-41C	QPSK	20	26140	1860	1,0	20	41292	2660.2	20	41490	2680	60	24.0	23.9	-0.15	48
CA_25A-25A-26A	QPSK	20	26140	1860	1,0	20	8590	1985	5	8715	861.5	45	24.1	23.9	-0.16	49
CA_26A-41C	QPSK	15	26765	821.5	1,0	20	41292	2660.2	20	41490	2680	55	24.9	24.7	-0.13	50
CA_41A-41C	QPSK	20	39750	2506	1,0	20	41292	2660.2	20	41490	2680	60	23.3	22.9	-0.40	51
CA_66A-66A-66A	QPSK	20	132072	1720	1,0	20	66536	2120	20	67236	2190	60	23.3	23.2	-0.08	52
CA_66A-66A-71A	QPSK	20	132072	1720	1,0	20	66536	2120	20	68761	634.5	60	23.2	23.1	-0.16	53
CA_66A-66C	QPSK	20	132072	1720	1,0	20	66787	2145.1	20	66985	2164.9	60	23.2	23.2	0.01	54

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9.7. Wi-Fi 2.4GHz (DTS Band)

Maximum Output Power (Tune-up Limit) for Wi-Fi 2.4 GHz

The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures.

For “Not required”, SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11b/g/n mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band. Additional output power measurements were not deemed necessary.

SAR testing is not required for OFDM mode(s) 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.

Mode	Bandwidth	Channel	Frequency (MHz)	Tune-up Power Limit (dBm)
				WLAN Antenna
				Maximum
802.11b DSSS (SISO)	20 MHz	1	2412	20.5
		6	2437	20.5
		11	2462	20.5
		12	2467	8.0
		13	2472	8.0
802.11g OFDM (SISO)	20 MHz	1	2412	19.0
		6	2437	19.0
		11	2462	19.0
		12	2467	10.0
		13	2472	7.0
802.11n OFDM (SISO)	20 MHz	1	2412	19.0
		6	2437	19.0
		11	2462	19.0
		12	2467	10.0
		13	2472	7.0

Wi-Fi 2.4GHz Measured Results

Band	Mode	Ch #	Freq. (MHz)	Maximum Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)
DSSS 2.4 GHz	802.11b	1	2412	18.5	20.5	Yes
		6	2437	19.3	20.5	
		11	2462	19.1	20.5	
		12	2467		8.0	
		13	2472		8.0	

Note(s):

SAR is not required for channel 12 and 13 because the tune-up limit for these two channels are less than those for the default test channels. Refer to KDB 248227 D01 section 3.1

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

Maximum Output Power (Tune-up Limit) for Wi-Fi 5 GHz

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 transmission mode is selected.
The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures.

SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band. Additional output power measurements were not deemed necessary.

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.

Mode	Bandwidth	Channel	Frequency (MHz)	Tune-up Power Limit (dBm)
				WLAN Antenna
				Maximum
U-NII-1 5.2 GHz	802.11a/n/ac 20 MHz	36	5180	17.5
		40	5200	17.5
		44	5220	17.5
		48	5240	17.5
	802.11n/ac 40 MHz	38	5190	17.0
		46	5230	17.0
	802.11ac 80 MHz	42	5210	14.5
U-NII-2A 5.3 GHz	802.11a/n/ac 20 MHz	52	5260	17.5
		56	5280	17.5
		60	5300	17.5
		64	5320	17.5
	802.11n/ac 40 MHz	54	5270	17.0
		62	5310	17.0
	802.11ac 80 MHz	58	5290	14.5
U-NII-2C 5.5 GHz	802.11a/n/ac 20 MHz	100	5500	17.5
		116	5580	17.5
		124	5620	17.5
		144	5720	17.5
	802.11n/ac 40 MHz	102	5510	17.0
		118	5590	17.0
		126	5630	17.0
		142	5710	17.0
	802.11ac 80 MHz	106	5530	14.5
		122	5610	14.5
		138	5690	14.5
U-NII-3 5.8 GHz	802.11a/n/ac 20 MHz	149	5745	17.5
		157	5785	17.5
		165	5825	17.5
	802.11n/ac 40 MHz	151	5755	17.0
		159	5795	17.0
	802.11ac 80 MHz	155	5775	14.5

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Wi-Fi 5 GHz Measured Results

Band	Mode	Ch #	Freq. (MHz)	Maximum Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-1 5.2 GHz	802.11a	36	5180	16.5	17.5	Yes
		40	5200	16.7	17.5	
		48	5240	16.6	17.5	
	802.11n (HT20)	36	5180	16.3	17.5	No
		40	5200	16.6	17.5	
		48	5240	16.7	17.5	
	802.11ac (VHT20)	36	5180	16.3	17.5	No
		40	5200	16.6	17.5	
		48	5240	16.7	17.5	
Band	Mode	Ch #	Freq. (MHz)	Maximum Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-2A 5.3 GHz	802.11a	52	5260	16.3	17.5	Yes
		60	5300	16.9	17.5	
		64	5320	17.0	17.5	
	802.11n (HT20)	52	5260	16.5	17.5	No
		60	5300	16.9	17.5	
		64	5320	16.8	17.5	
	802.11ac (VHT20)	52	5260	16.5	17.5	No
		60	5300	16.9	17.5	
		64	5320	16.8	17.5	

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Band	Mode	Ch #	Freq. (MHz)	Maximum Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-2C 5.5 GHz	802.11a	100	5500	17.0	17.5	Yes
		116	5580	16.8	17.5	
		124	5620	16.4	17.5	
		144	5720	16.6	17.5	
	802.11n (HT20)	100	5500	17.1	17.5	No
		116	5580	16.5	17.5	
		140	5700	16.4	17.5	
		144	5720	16.3	17.5	
	802.11ac (VHT20)	100	5500	17.1	17.5	No
		116	5580	16.5	17.5	
		144	5720	16.4	17.5	
Band	Mode	Ch #	Freq. (MHz)	Maximum Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-3 5.8 GHz	802.11a	149	5745	16.3	17.5	Yes
		157	5785	16.5	17.5	
		165	5825	16.3	17.5	
	802.11n (HT20)	149	5745	16.3	17.5	No
		157	5785	16.3	17.5	
		165	5825	16.2	17.5	
	802.11ac (VHT20)	149	5745	16.3	17.5	No
		157	5785	16.3	17.5	
		165	5825	16.2	17.5	

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9.9. Bluetooth

Maximum Output Power (Tune-up Limit) for Bluetooth

SAR measurement is not required for the EDR and LE. When the secondary mode is ≤ ¼ dB higher than the primary mode.

Band	Mode	Channel	Frequency (MHz)	Tune-up Power Limit (dBm) BT Antenna Maximum
Bluetooth 2.4 GHz	BR	0	2402	10.5
		39	2441	10.5
		78	2480	10.5
	EDR	0	2402	8.0
		39	2441	8.0
		78	2480	8.0
	LE	0	2402	7.0
		19	2440	7.0
		39	2480	7.0

Bluetooth Measured Results:

Band	Mode	Ch #	Freq. (MHz)	Meas Pwr	Tune-up	SAR Test (Yes/No)
2.4	BR GFSK	0	2402	9.2	10.5	Yes
		39	2441	8.5	10.5	
		78	2480	8.8	10.5	
	EDR, π/4 DQPSK	0	2402	6.5	8.0	No
		39	2441	5.7	8.0	
		78	2480	5.9	8.0	
	EDR, 8-DPSK	0	2402	6.5	8.0	No
		39	2441	5.7	8.0	
		78	2480	6.0	8.0	
	LE, GFSK	0	2402	6.8	7.0	No
		19	2440	6.1	7.0	
		39	2480	6.2	7.0	

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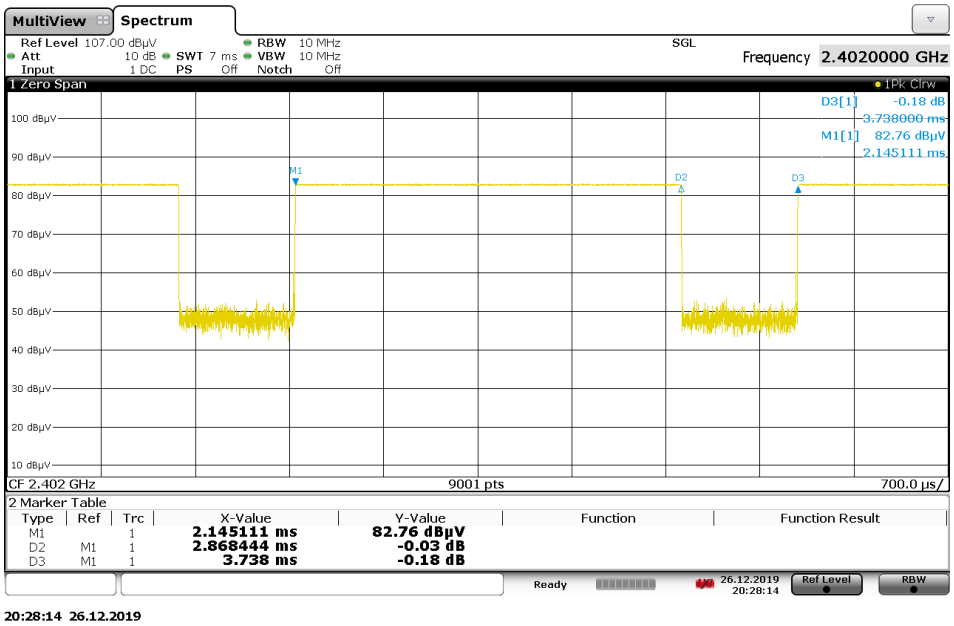
Bluetooth Duty Cycle Plot



Mode	ON Time (msec)	Period (msec)	Duty Cycle (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
Bluetooth GFSK	2.87	3.74	0.767	76.7	1.15	0.349

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10. Measured and Reported (Scaled) SAR Results

SAR Test Reduction criteria are as follows:

- Reported SAR(W/kg) for WWAN and Bluetooth = Measured SAR *Tune-up Scaling Factor
- Reported SAR(W/kg) for Wi-Fi and Bluetooth = Measured SAR * Tune-up scaling factor * Duty Cycle scaling factor
- Duty Cycle scaling factor = 1 / Duty cycle (%)

KDB 447498 D01 General RF Exposure Guidance:

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

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

KDB 648474 D04 Handset SAR:

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

KDB 648474 D04 Handset SAR (Phablet Only):

For smart phones, with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm.
When hotspot mode does not apply, 10-g Extremity SAR is required for all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.

Additional 1-g SAR testing at 5 mm is not required when hotspot mode 10-g extremity SAR is not required for the surfaces and edges; since all 1-g reported SAR < 1.2 W/kg.

KDB 941225 D01 SAR test for 3G devices:

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

KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

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

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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). Initial Test Position SAR Test Reduction Procedure is outlined in KDB 248227 D01 §5.1.1. 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*.

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10.1. GSM 850

RF Exposure Conditions	Mode	Power Back-off	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	N/A	0	Left Touch	190	836.6	29.1	28.0	0.186	0.240	
				Left Tilt	190	836.6	29.1	28.0	0.100	0.129	
				Right Touch	190	836.6	29.1	28.0	0.222	**0.286**	1
				Right Tilt	190	836.6	29.1	28.0	0.101	0.130	
Body-worn	GPRS 4 Slots	N/A	15	Rear	190	836.6	29.1	28.0	0.292	**0.376**	2
				Front	190	836.6	29.1	28.0	0.185	0.238	
Hotspot	GPRS 4 Slots	N/A	10	Rear	190	836.6	29.1	28.0	0.579	**0.746**	3
				Front	190	836.6	29.1	28.0	0.182	0.234	
				Edge 2	190	836.6	29.1	28.0	0.292	0.376	
				Edge 3	190	836.6	29.1	28.0	0.194	0.250	
				Edge 4	190	836.6	29.1	28.0	0.131	0.169	

10.2. GSM 1900

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
Head	GPRS 3 Slots	N/A	0	Left Touch	661	1880.0	27.0	26.30	0.060	**0.070**	4
				Left Tilt	661	1880.0	27.0	26.30	0.037	0.043	
				Right Touch	661	1880.0	27.0	26.30	0.043	0.051	
				Right Tilt	661	1880.0	27.0	26.30	0.030	0.035	
Body-worn	GPRS 3 Slots	N/A	15	Rear	661	1880.0	27.0	26.30	0.109	**0.128**	5
				Front	661	1880.0	27.0	26.30	0.062	0.073	
Hotspot	GPRS 3 Slots	N/A	10	Rear	661	1880.0	27.0	26.30	0.249	**0.293**	6
				Front	661	1880.0	27.0	26.30	0.117	0.137	
				Edge 2	661	1880.0	27.0	26.30	0.032	0.038	
				Edge 3	661	1880.0	27.0	26.30	0.176	0.207	
				Edge 4	661	1880.0	27.0	26.30	0.105	0.123	

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10.3. W-CDMA Band II

RF Exposure Conditions	Mode	Power Back-off	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 12.2 kbps	N/A	0	Left Touch	9400	1880.0	25.0	24.0	0.128	**0.161**	7
				Left Tilt	9400	1880.0	25.0	24.0	0.074	0.093	
				Right Touch	9400	1880.0	25.0	24.0	0.075	0.094	
				Right Tilt	9400	1880.0	25.0	24.0	0.076	0.096	
Body-worn	Rel 99 RMC 12.2 kbps	N/A	15	Rear	9400	1880.0	25.0	24.0	0.211	**0.266**	8
				Front	9400	1880.0	25.0	24.0	0.124	0.156	
Hotspot	Rel 99 RMC 12.2 kbps	ON	10	Rear	9400	1880.0	22.0	21.7	0.293	0.314	
				Front	9400	1880.0	22.0	21.7	0.143	0.153	
				Edge 2	9400	1880.0	22.0	21.7	0.039	0.042	
				Edge 3	9400	1880.0	22.0	21.7	0.297	**0.318**	9
				Edge 4	9400	1880.0	22.0	21.7	0.120	0.129	

10.4. W-CDMA Band IV

RF Exposure Conditions	Mode	Pwr Back-off	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 12.2 kbps	N/A	0	Left Touch	1413	1732.6	25.0	23.7	0.225	**0.304**	10
				Left Tilt	1413	1732.6	25.0	23.7	0.120	0.162	
				Right Touch	1413	1732.6	25.0	23.7	0.207	0.279	
				Right Tilt	1413	1732.6	25.0	23.7	0.160	0.216	
Body-worn	Rel 99 RMC 12.2 kbps	N/A	15	Rear	1413	1732.6	25.0	23.7	0.430	**0.580**	11
				Front	1413	1732.6	25.0	23.7	0.395	0.533	
Hotspot	Rel 99 RMC 12.2 kbps	ON	10	Rear	1413	1732.6	22.0	21.5	0.470	**0.527**	12
				Front	1413	1732.6	22.0	21.5	0.342	0.384	
				Edge 2	1413	1732.6	22.0	21.5	0.086	0.096	
				Edge 3	1413	1732.6	22.0	21.5	0.328	0.368	
				Edge 4	1413	1732.6	22.0	21.5	0.196	0.220	

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10.5. W-CDMA Band V

RF Exposure Conditions	Mode	Power Back-off	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 12.2 kbps	N/A	0	Left Touch	4183	836.6	25.5	24.0	0.179	0.253	
				Left Tilt	4183	836.6	25.5	24.0	0.113	0.160	
				Right Touch	4183	836.6	25.5	24.0	0.212	**0.299**	13
				Right Tilt	4183	836.6	25.5	24.0	0.111	0.157	
Body-worn	Rel 99 RMC 12.2 kbps	N/A	15	Rear	4183	836.6	25.5	24.0	0.253	**0.357**	14
				Front	4183	836.6	25.5	24.0	0.178	0.251	
Hotspot	Rel 99 RMC 12.2 kbps	N/A	10	Rear	4183	836.6	25.5	24.0	0.455	**0.643**	15
				Front	4183	836.6	25.5	24.0	0.173	0.244	
				Edge 2	4183	836.6	25.5	24.0	0.268	0.379	
				Edge 3	4183	836.6	25.5	24.0	0.194	0.274	
				Edge 4	4183	836.6	25.5	24.0	0.105	0.148	

10.6. CDMA BC0

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
Head	1xRTT RC3 SO55	N/A	0	Left Touch	384	836.5	25.5	24.3	0.174	0.229	
				Left Tilt	384	836.5	25.5	24.3	0.101	0.133	
				Right Touch	384	836.5	25.5	24.3	0.225	**0.297**	16
				Right Tilt	384	836.5	25.5	24.3	0.100	0.132	
Head	1xEVDO Rel. 0	N/A	0	Left Touch	384	836.5	25.5	24.2	0.156	0.210	
				Left Tilt	384	836.5	25.5	24.2	0.098	0.132	
				Right Touch	384	836.5	25.5	24.2	0.192	**0.259**	17
				Right Tilt	384	836.5	25.5	24.2	0.103	0.139	
Body-worn	1xRTT RC3 SO32	N/A	15	Rear	384	836.5	25.5	24.3	0.240	**0.316**	18
				Front	384	836.5	25.5	24.3	0.149	0.196	
Hotspot	1xEVDO Rel. 0	N/A	10	Rear	384	836.5	25.5	24.2	0.417	**0.563**	19
				Front	384	836.5	25.5	24.2	0.142	0.192	
				Edge 2	384	836.5	25.5	24.2	0.217	0.293	
				Edge 3	384	836.5	25.5	24.2	0.177	0.239	
				Edge 4	384	836.5	25.5	24.2	0.090	0.121	

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10.7. CDMA BC1

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
Head	1xRTT RC3 SO55	N/A	0	Left Touch	600	1880.0	25.0	23.8	0.177	**0.233**	20
				Left Tilt	600	1880.0	25.0	23.8	0.101	0.133	
				Right Touch	600	1880.0	25.0	23.8	0.140	0.185	
				Rightt Tilt	600	1880.0	25.0	23.8	0.126	0.166	
Head	1xEVDO Rel. 0	N/A	0	Left Touch	600	1880.0	25.0	23.8	0.158	**0.208**	21
				Left Tilt	600	1880.0	25.0	23.8	0.099	0.131	
				Right Touch	600	1880.0	25.0	23.8	0.126	0.166	
				Right Tilt	600	1880.0	25.0	23.8	0.113	0.149	
Body-worn	1xRTT RC3 SO32	N/A	15	Rear	600	1880.0	25.0	23.8	0.289	**0.381**	22
				Front	600	1880.0	25.0	23.8	0.203	0.268	
Hotsopt	1xEVDO Rel. 0	N/A	10	Rear	600	1880.0	25.0	23.8	0.606	**0.799**	23
				Front	600	1880.0	25.0	23.8	0.289	0.381	
				Edge 2	600	1880.0	25.0	23.8	0.118	0.156	
				Edge 3	600	1880.0	25.0	23.8	0.465	0.613	
				Edge 4	600	1880.0	25.0	23.8	0.280	0.369	

10.8. CDMA BC10

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
Head	1xRTT RC3 SO55	N/A	0	Left Touch	560	820.0	25.5	24.4	0.167	**0.215**	24
				Left Tilt	560	820.0	25.5	24.4	0.095	0.122	
				Right Touch	560	820.0	25.5	24.4	0.146	0.188	
				Right Tilt	560	820.0	25.5	24.4	0.081	0.104	
Head	1xEVDO Rel. 0	N/A	0	Left Touch	560	820.0	25.5	24.3	0.117	0.154	
				Left Tilt	560	820.0	25.5	24.3	0.075	0.099	
				Right Touch	560	820.0	25.5	24.3	0.138	**0.182**	25
				Right Tilt	560	820.0	25.5	24.3	0.074	0.098	
Body-worn	1xRTT RC3 SO32	N/A	15	Rear	560	820.0	25.5	24.4	0.228	**0.294**	26
				Front	560	820.0	25.5	24.4	0.154	0.198	
Hotspot	1xEVDO Rel. 0	N/A	10	Rear	560	820.0	25.5	24.3	0.288	**0.380**	27
				Front	560	820.0	25.5	24.3	0.109	0.144	
				Edge 2	560	820.0	25.5	24.3	0.177	0.233	
				Edge 3	560	820.0	25.5	24.3	0.128	0.169	
				Edge 4	560	820.0	25.5	24.3	0.068	0.090	

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10.9. LTE Band 5 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	N/A	0	Left Touch	20525	836.5	1	0	25.5	24.5	0.166	0.209	
							25	0	24.5	23.4	0.126	0.162	
				Left Tilt (15°)	20525	836.5	1	0	25.5	24.5	0.098	0.123	
							25	0	24.5	23.4	0.075	0.097	
				Right Touch	20525	836.5	1	0	25.5	24.5	0.196	**0.247**	28
							25	0	24.5	23.4	0.149	0.192	
				Right Tilt (15°)	20525	836.5	1	0	25.5	24.5	0.121	0.152	
							25	0	24.5	23.4	0.092	0.119	
Body-worn	QPSK	N/A	15	Rear	20525	836.5	1	0	25.5	24.5	0.245	**0.308**	29
							25	0	24.5	23.4	0.188	0.242	
				Front	20525	836.5	1	0	25.5	24.5	0.176	0.222	
							25	0	24.5	23.4	0.131	0.169	
Hotspot	QPSK	N/A	10	Rear	20525	836.5	1	0	25.5	24.5	0.441	**0.555**	30
							25	0	24.5	23.4	0.350	0.451	
				Front	20525	836.5	1	0	25.5	24.5	0.173	0.218	
							25	0	24.5	23.4	0.128	0.165	
				Edge 2	20525	836.5	1	0	25.5	24.5	0.277	0.349	
							25	0	24.5	23.4	0.207	0.267	
				Edge 3	20525	836.5	1	0	25.5	24.5	0.170	0.214	
							25	0	24.5	23.4	0.133	0.171	
				Edge 4	20525	836.5	1	0	25.5	24.5	0.125	0.157	
							25	0	24.5	23.4	0.092	0.119	

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10.10. LTE Band 7 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	ON	0	Left Touch	21100	2535.0	1	0	19.0	18.1	0.142	0.175	
							50	0	19.0	18.1	0.143	0.176	
				Left Tilt	21100	2535.0	1	0	19.0	18.1	0.050	0.062	
							50	0	19.0	18.1	0.048	0.059	
				Right Touch	21100	2535.0	1	0	19.0	18.1	0.631	**0.776**	31
							50	0	19.0	18.1	0.625	0.769	
				Right Tilt	21100	2535.0	1	0	19.0	18.1	0.152	0.187	
							50	0	19.0	18.1	0.148	0.182	
Body-worn	QPSK	N/A	15	Rear	21100	2535.0	1	0	23.5	22.6	0.499	**0.614**	32
							50	0	22.5	21.5	0.464	0.584	
				Front	21100	2535.0	1	0	23.5	22.6	0.200	0.246	
							50	0	22.5	21.5	0.145	0.183	
Hotspot	QPSK	ON	10	Rear	20850	2510.0	1	0	19.0	17.6	0.786	1.085	
							50	0	19.0	17.6	0.802	1.107	
					21100	2535.0	1	0	19.0	18.1	0.966	1.188	
							50	0	19.0	18.1	0.981	**1.207**	33
					21350	2560.0	1	0	19.0	18.6	0.998	1.094	
							50	0	19.0	18.4	1.050	1.206	
							100	0	19.0	18.4	1.030	1.183	
				Front	21100	2535.0	1	0	19.0	18.1	0.121	0.149	
							50	0	19.0	18.1	0.118	0.145	
				Edge 1	21100	2535.0	1	0	19.0	18.1	0.033	0.041	
							50	0	19.0	18.1	0.034	0.042	
				Edge 4	20850	2510.0	1	0	19.0	17.6	0.667	0.921	
							50	0	19.0	17.6	0.696	0.961	
					21100	2535.0	1	0	19.0	18.1	0.806	0.992	
							50	0	19.0	18.1	0.834	1.026	
					21350	2560.0	1	0	19.0	18.6	0.839	0.920	
							50	0	19.0	18.4	0.828	0.951	
							100	0	19.0	18.4	0.816	0.937	

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	QPSK	ON	0	Rear	21100	2535.0	1	0	19.0	18.1	1.170	1.439	
							50	0	19.0	18.1	1.090	1.341	
				Edge 4	20850	2510.0	50	0	19.0	17.6	1.550	**2.140**	34
					21100	2535.0	1	0	19.0	18.1	1.610	1.981	
							50	0	19.0	18.1	1.630	2.005	
					21350	2560.0	50	0	19.0	18.4	1.090	1.251	
Extremity	QPSK	OFF	9	Rear	21100	2535.0	1	0	23.5	22.6	1.150	1.415	
							50	0	22.5	21.5	1.100	**1.385**	35
			7	Edge 4	21100	2535.0	1	0	23.5	22.6	1.160	**1.427**	
							50	0	22.5	21.5	1.130	1.423	

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10.11. LTE Band 12 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	N/A	0	Left Touch	23095	707.5	1	25	25.5	24.4	0.037	0.048	
							25	0	24.5	23.4	0.031	0.040	
				Left Tilt (15°)	23095	707.5	1	25	25.5	24.4	0.024	0.031	
							25	0	24.5	23.4	0.020	0.026	
				Right Touch	23095	707.5	1	25	25.5	24.4	0.045	**0.058**	36
							25	0	24.5	23.4	0.039	0.050	
				Right Tilt (15°)	23095	707.5	1	25	25.5	24.4	0.025	0.032	
							25	0	24.5	23.4	0.020	0.026	
Body-worn	QPSK	N/A	15	Rear	23095	707.5	1	25	25.5	24.4	0.114	**0.147**	37
							25	0	24.5	23.4	0.095	0.122	
				Front	23095	707.5	1	25	25.5	24.4	0.067	0.086	
							25	0	24.5	23.4	0.056	0.072	
Hotspot	QPSK	N/A	10	Rear	23095	707.5	1	25	25.5	24.4	0.126	0.162	
							25	0	24.5	23.4	0.105	0.135	
				Front	23095	707.5	1	25	25.5	24.4	0.059	0.076	
							25	0	24.5	23.4	0.050	0.064	
				Edge 2	23095	707.5	1	25	25.5	24.4	0.138	**0.178**	38
							25	0	24.5	23.4	0.112	0.144	
				Edge 3	23095	707.5	1	25	25.5	24.4	0.033	0.043	
							25	0	24.5	23.4	0.028	0.036	
				Edge 4	23095	707.5	1	25	25.5	24.4	0.094	0.121	
							25	0	24.5	23.4	0.077	0.099	

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10.12. LTE Band 13 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	N/A	0	Left Touch	23230	782.0	1	25	25.5	24.4	0.079	0.102	
							25	12	24.5	23.4	0.060	0.077	
				Left Tilt (15°)	23230	782.0	1	25	25.5	24.4	0.051	0.066	
							25	12	24.5	23.4	0.040	0.052	
				Right Touch	23230	782.0	1	25	25.5	24.4	0.097	**0.125**	39
							25	12	24.5	23.4	0.073	0.094	
				Right Tilt (15°)	23230	782.0	1	25	25.5	24.4	0.054	0.070	
							25	12	24.5	23.4	0.041	0.053	
Body-worn	QPSK	N/A	15	Rear	23230	782.0	1	25	25.5	24.4	0.167	**0.215**	40
							25	12	24.5	23.4	0.126	0.162	
				Front	23230	782.0	1	25	25.5	24.4	0.105	0.135	
							25	12	24.5	23.4	0.080	0.103	
Hotspot	QPSK	N/A	10	Rear	23230	782.0	1	25	25.5	24.4	0.209	**0.269**	41
							25	12	24.5	23.4	0.156	0.201	
				Front	23230	782.0	1	25	25.5	24.4	0.073	0.094	
							25	12	24.5	23.4	0.058	0.075	
				Edge 2	23230	782.0	1	25	25.5	24.4	0.174	0.224	
							25	12	24.5	23.4	0.134	0.173	
				Edge 3	23230	782.0	1	25	25.5	24.4	0.070	0.090	
							25	12	24.5	23.4	0.054	0.070	
				Edge 4	23230	782.0	1	25	25.5	24.4	0.079	0.102	
							25	12	24.5	23.4	0.061	0.079	

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10.13. LTE Band 14 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	N/A	0	Left Touch	23330	793.0	1	0	25.5	24.3	0.086	0.113	
							25	0	24.5	23.4	0.081	0.104	
				Left Tilt (15°)	23330	793.0	1	0	25.5	24.3	0.056	0.074	
							25	0	24.5	23.4	0.044	0.057	
				Right Touch	23330	793.0	1	0	25.5	24.3	0.117	**0.154**	42
							25	0	24.5	23.4	0.092	0.119	
				Right Tilt (15°)	23330	793.0	1	0	25.5	24.3	0.053	0.070	
							25	0	24.5	23.4	0.040	0.052	
Body-worn	QPSK	N/A	15	Rear	23330	793.0	1	0	25.5	24.3	0.178	**0.235**	43
							25	0	24.5	23.4	0.136	0.175	
				Front	23330	793.0	1	0	25.5	24.3	0.119	0.157	
							25	0	24.5	23.4	0.099	0.128	
Hotspot	QPSK	N/A	10	Rear	23330	793.0	1	0	25.5	24.3	0.210	**0.277**	44
							25	0	24.5	23.4	0.175	0.225	
				Front	23330	793.0	1	0	25.5	24.3	0.117	0.154	
							25	0	24.5	23.4	0.087	0.112	
				Edge 2	23330	793.0	1	0	25.5	24.3	0.188	0.248	
							25	0	24.5	23.4	0.142	0.183	
				Edge 3	23330	793.0	1	0	25.5	24.3	0.072	0.095	
							25	0	24.5	23.4	0.057	0.073	
				Edge 4	23330	793.0	1	0	25.5	24.3	0.095	0.125	
							25	0	24.5	23.4	0.071	0.091	

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10.14. LTE Band 25 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	N/A	0	Left Touch	26365	1882.5	1	99	25.0	23.9	0.113	**0.146**	45
							50	50	24.0	22.9	0.091	0.117	
				Left Tilt	26365	1882.5	1	99	25.0	23.9	0.061	0.079	
							50	50	24.0	22.9	0.049	0.063	
				Right Touch	26365	1882.5	1	99	25.0	23.9	0.069	0.089	
							50	50	24.0	22.9	0.055	0.071	
				Right Tilt	26365	1882.5	1	99	25.0	23.9	0.057	0.073	
							50	50	24.0	22.9	0.047	0.061	
Body-worn	QPSK	N/A	15	Rear	26365	1882.5	1	99	25.0	23.9	0.235	**0.303**	46
							50	50	24.0	22.9	0.174	0.224	
				Front	26365	1882.5	1	99	25.0	23.9	0.089	0.115	
							50	50	24.0	22.9	0.087	0.112	
Hotspot	QPSK	ON	10	Rear	26365	1882.5	1	99	23.0	22.0	0.281	0.354	
							50	24	23.0	21.9	0.278	0.358	
				Front	26365	1882.5	1	99	23.0	22.0	0.131	0.165	
							50	24	23.0	21.9	0.130	0.167	
				Edge 2	26365	1882.5	1	99	23.0	22.0	0.021	0.026	
							50	24	23.0	21.9	0.022	0.028	
				Edge 3	26365	1882.5	1	99	23.0	22.0	0.289	0.364	
							50	24	23.0	21.9	0.284	**0.366**	47
				Edge 4	26365	1882.5	1	99	23.0	22.0	0.113	0.142	
							50	24	23.0	21.9	0.120	0.155	

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10.15. LTE Band 26 (15MHz Bandwidth)

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	N/A	0	Left Touch	26865	831.5	1	0	25.0	24.0	0.161	0.203	
							36	0	24.0	22.9	0.149	0.192	
				Left Tilt (15°)	26865	831.5	1	0	25.0	24.0	0.100	0.126	
							36	0	24.0	22.9	0.078	0.100	
				Right Touch	26865	831.5	1	0	25.0	24.0	0.182	**0.229**	48
							36	0	24.0	22.9	0.139	0.179	
				Right Tilt (15°)	26865	831.5	1	0	25.0	24.0	0.089	0.112	
							36	0	24.0	22.9	0.069	0.089	
Body-worn	QPSK	N/A	15	Rear	26865	831.5	1	0	25.0	24.0	0.225	**0.283**	49
							36	0	24.0	22.9	0.172	0.222	
				Front	26865	831.5	1	0	25.0	24.0	0.156	0.196	
							36	0	24.0	22.9	0.119	0.153	
Hotspot	QPSK	N/A	10	Rear	26865	831.5	1	0	25.0	24.0	0.358	**0.451**	50
							36	0	24.0	22.9	0.288	0.371	
				Front	26865	831.5	1	0	25.0	24.0	0.151	0.190	
							36	0	24.0	22.9	0.115	0.148	
				Edge 2	26865	831.5	1	0	25.0	24.0	0.226	0.285	
							36	0	24.0	22.9	0.177	0.228	
				Edge 3	26865	831.5	1	0	25.0	24.0	0.137	0.172	
							36	0	24.0	22.9	0.113	0.146	
				Edge 4	26865	831.5	1	0	25.0	24.0	0.108	0.136	
							36	0	24.0	22.9	0.082	0.106	

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10.16. LTE Band 30 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	ON	0	Left Touch	27710	2310.0	1	0	20.0	18.7	0.148	0.200	
							25	0	20.0	18.6	0.151	0.208	
				Left Tilt (15°)	27710	2310.0	1	0	20.0	18.7	0.098	0.132	
							25	0	20.0	18.6	0.078	0.108	
				Right Touch	27710	2310.0	1	0	20.0	18.7	0.479	0.646	
							25	0	20.0	18.6	0.484	**0.668**	51
				Right Tilt (15°)	27710	2310.0	1	0	20.0	18.7	0.157	0.212	
							25	0	20.0	18.6	0.145	0.200	
Body-worn	QPSK	N/A	15	Rear	27710	2310.0	1	0	24.9	23.6	0.581	**0.784**	52
							25	0	23.9	22.5	0.464	0.640	
				Front	27710	2310.0	1	0	24.9	23.6	0.157	0.212	
							25	0	23.9	22.5	0.129	0.178	
Hotspot	QPSK	ON	10	Rear	27710	2310.0	1	0	20.0	18.7	0.574	0.774	
							25	0	20.0	18.6	0.590	**0.814**	53
				Front	27710	2310.0	1	0	20.0	18.7	0.099	0.134	
							25	0	20.0	18.6	0.108	0.149	
				Edge 1	27710	2310.0	1	0	20.0	18.7	0.050	0.067	
							25	0	20.0	18.6	0.046	0.063	
				Edge 4	27710	2310.0	1	0	20.0	18.7	0.267	0.360	
							25	0	20.0	18.6	0.272	0.375	
RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	QPSK	ON	0	Rear	27710	2310.0	1	0	20.0	18.7	1.060	1.430	
							25	0	20.0	18.6	1.240	**1.712**	54
		OFF	9	Rear	27710	2310.0	1	0	24.9	23.6	0.892	1.203	
							25	0	23.9	22.5	0.894	**1.234**	55

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10.17. LTE Band 41 (20MHz Bandwidth)

LTE Band 41 Power Class 3 Measured Results:

RF Exposure Conditions	Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	ON	0	Left Touch	40620	2593.0	1	49	20.5	20.1	0.079	0.087	
							50	24	20.5	20.4	0.079	0.081	
				Left Tilt	40620	2593.0	1	49	20.5	20.1	0.023	0.025	
							50	24	20.5	20.4	0.021	0.021	
				Right Touch	40620	2593.0	1	49	20.5	20.1	0.340	**0.373**	56
							50	24	20.5	20.4	0.344	0.352	
				Right Tilt	40620	2593.0	1	49	20.5	20.1	0.336	0.368	
							50	24	20.5	20.4	0.339	0.347	
Body-worn	QPSK	N/A	15	Rear	39750	2506.0	1	49	24.5	23.3	0.754	0.994	
					40185	2549.5	1	0	24.5	23.9	0.903	**1.037**	57
					40620	2593.0	1	0	24.5	24.0	0.741	0.831	
							50	0	23.5	23.1	0.531	0.582	
					41055	2636.5	1	0	24.5	23.6	0.352	0.433	
					41490	2680.0	1	0	24.5	23.4	0.151	0.195	
				Front	40620	2593.0	1	0	24.5	24.0	0.088	0.098	
							50	0	23.5	23.1	0.061	0.067	
Hotspot	QPSK	ON	10	Rear	40620	2593.0	1	49	20.5	20.1	0.691	0.758	
							50	24	20.5	20.4	0.747	**0.764**	58
				Front	40620	2593.0	1	49	20.5	20.1	0.054	0.059	
							50	24	20.5	20.4	0.066	0.068	
				Edge 1	40620	2593.0	1	49	20.5	20.1	0.013	0.015	
							50	24	20.5	20.4	0.014	0.014	
				Edge 4	40620	2593.0	1	49	20.5	20.1	0.435	0.477	
							50	24	20.5	20.4	0.435	0.445	
RF Exposure Conditions	Mode	Pwr Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	QPSK	ON	0	Rear	40620	2593.0	1	49	20.5	20.1	1.170	**1.283**	59
							50	24	20.5	20.4	1.160	1.187	
		OFF	9	Rear	40620	2593.0	1	0	24.5	24.0	1.770	**1.986**	60
							50	0	23.5	23.1	1.420	1.557	

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LTE Band 41 Power Class 2 HPUE Results:

From May 2017 TCB Workshop, SAR testing was performed using Power Class 3. Power Class 3 is expected to be the dominant use configuration; therefore, SAR is tested as normally required.

SAR for Power Class 2 is performed using the highest SAR test configuration in Power Class 3 for each LTE configuration and exposure condition combination.

For Power Class 2 SAR testing, the highest time averaged power for UL/DL TDD configurations is subframe configuration #1 with a duty cycle of 43.3%.

Additional SAR testing for Power Class 2 is not required when:

- The reported SAR vs, output power can be linearly scaled with < 10% discrepancy between power classes and all reported SAR is < 1.4 W/kg

RF Exposure Conditions	Power Class 2				Power Class 3				PC2 linearly scaled Reported SAR (W/kg)	Linearly scaled (<10%)
	Duty Cycle	Tune-up Power (dBm)	Frame Avg. Power (mW)	Reported 1-g SAR (W/kg)	Duty Cycle	Tune-up Power (dBm)	Frame Avg. Power (mW)	Reported 1-g SAR (W/kg)		
Head	43.3%	27.50	243.49	1.297	63.3%	20.50	71.02	0.373	1.279	1.43%
Body	43.3%	27.50	243.49	1.447	63.3%	24.50	178.40	1.037	1.415	2.24%
Hotspot	43.3%	27.50	243.49	0.766	63.3%	20.50	71.02	0.764	2.619	-70.76%
RF Exposure Conditions	Power Class 2				Power Class 3				PC2 linearly scaled Reported SAR (W/kg)	Linearly scaled (<10%)
	Duty Cycle	Tune-up Power (dBm)	Frame Avg. Power (mW)	Reported 10-g SAR (W/kg)	Duty Cycle	Tune-up Power (dBm)	Frame Avg. Power (mW)	Reported 10-g SAR (W/kg)		
Extremity	43.3%	27.50	243.49	1.049	63.3%	20.50	71.02	1.170	4.011	-73.85%
	43.3%	27.50	243.49	0.484	63.3%	24.50	178.40	1.770	2.416	-79.97%

Conclusion:

SAR test for Power Class 2 (HPUE) is not required because the PC3 Reported SAR is <1.4 W/kg and the PC2 estimated SAR compared to the PC2 measured SAR is <10%.

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10.18. LTE Band 41C ULCA

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	PCC				SCC				Power (dBm)		1-g SAR (W/kg)		Plot No.
					Ch #.	Freq. (MHz)	RB Allocation	RB offest	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	ON	0	Right Touch	40521	2583.1	1	99	40719	2602.9	1	0	20.5	19.9	0.231	**0.265**	61
Body-worn	QPSK	N/A	15	Rear	40521	2583.1	1	99	40719	2602.9	1	0	24.5	22.9	0.589	**0.851**	62
Hotspot	QPSK	ON	10	Rear	40521	2583.1	1	99	40719	2602.9	1	0	20.5	19.9	0.621	**0.713**	63
RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	PCC				SCC				Power (dBm)		10-g SAR (W/kg)		Plot No.
					Ch #.	Freq. (MHz)	RB Allocation	RB offest	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	QPSK	ON	0	Rear	40521	2583.1	1	99	40719	2602.9	1	0	20.5	19.9	0.907	**1.041**	64
		OFF	9	Rear	40521	2583.1	1	99	40719	2602.9	1	0	24.5	22.9	0.852	**1.232**	65

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	PC3 1-g	UL CA 1-g	Delta
Head	QPSK	ON	0	Right Touch	0.373	0.265	-29%
Body-worn	QPSK	N/A	15	Rear	1.037	0.851	-18%
Hotspot	QPSK	ON	10	Rear	0.764	0.713	-7%
RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	PC3 10-g	UL CA 10-g	Delta
Extremity	QPSK	ON	0	Rear	1.283	1.041	-19%
	QPSK	OFF	9	Rear	1.986	1.232	-38%

Conclusion:

Full SAR test for 41C ULCA is not required because the 41C ULCA Reported SAR is less than LTE Band 41 PC3 Reported SAR.

10.19. LTE Band 66 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	N/A	0	Left Touch	132322	1745.0	1	99	25.0	23.6	0.194	**0.268**	66
							50	50	24.0	22.6	0.170	0.235	
				Left Tilt (15°)	132322	1745.0	1	99	25.0	23.6	0.102	0.141	
							50	50	24.0	22.6	0.091	0.126	
				Right Touch	132322	1745.0	1	99	25.0	23.6	0.172	0.237	
							50	50	24.0	22.6	0.158	0.218	
				Right Tilt (15°)	132322	1745.0	1	99	25.0	23.6	0.113	0.156	
							50	50	24.0	22.6	0.104	0.144	
Body-worn	QPSK	N/A	15	Rear	132322	1745.0	1	99	25.0	23.6	0.439	**0.606**	67
							50	50	24.0	22.6	0.382	0.527	
				Front	132322	1745.0	1	99	25.0	23.6	0.387	0.534	
							50	50	24.0	22.6	0.340	0.469	
Hotspot	QPSK	ON	10	Rear	132322	1745.0	1	99	23.0	21.6	0.501	0.692	
							50	50	23.0	21.5	0.496	**0.701**	68
				Front	132322	1745.0	1	99	23.0	21.6	0.368	0.508	
							50	50	23.0	21.5	0.363	0.513	
				Edge 2	132322	1745.0	1	99	23.0	21.6	0.084	0.116	
							50	50	23.0	21.5	0.085	0.120	
				Edge 3	132322	1745.0	1	99	23.0	21.6	0.378	0.522	
							50	50	23.0	21.5	0.388	0.548	
				Edge 4	132322	1745.0	1	99	23.0	21.6	0.185	0.255	
							50	50	23.0	21.5	0.188	0.266	

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10.20. LTE Band 71 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	N/A	0	Left Touch	133297	680.5	1	0	25.5	24.5	0.030	0.038	
							50	0	24.5	23.4	0.027	0.035	
				Left Tilt (15°)	133297	680.5	1	0	25.5	24.5	0.017	0.021	
							50	0	24.5	23.4	0.015	0.019	
				Right Touch	133297	680.5	1	0	25.5	24.5	0.033	**0.042**	69
							50	0	24.5	23.4	0.029	0.037	
				Right Tilt (15°)	133297	680.5	1	0	25.5	24.5	0.017	0.021	
							50	0	24.5	23.4	0.015	0.019	
Body-worn	QPSK	N/A	15	Rear	133297	680.5	1	0	25.5	24.5	0.082	**0.103**	70
							50	0	24.5	23.4	0.057	0.073	
				Front	133297	680.5	1	0	25.5	24.5	0.042	0.053	
							50	0	24.5	23.4	0.037	0.048	
Hotspot	QPSK	ON	10	Rear	133297	680.5	1	0	23.5	22.4	0.094	**0.121**	71
							50	0	23.5	22.4	0.081	0.104	
				Front	133297	680.5	1	0	23.5	22.4	0.040	0.052	
							50	0	23.5	22.4	0.035	0.045	
				Edge 2	133297	680.5	1	0	23.5	22.4	0.046	0.059	
							50	0	23.5	22.4	0.040	0.052	
				Edge 3	133297	680.5	1	0	23.5	22.4	0.016	0.021	
							50	0	23.5	22.4	0.015	0.019	
				Edge 4	133297	680.5	1	0	23.5	22.4	0.062	0.080	
							50	0	23.5	22.4	0.055	0.071	

10.21. Wi-Fi (DTS Band)

When the 802.11b reported SAR of the highest measured maximum output power channel is ≤ 0.8 W/kg, no further SAR testing is required. If SAR is > 0.8 W/kg and ≤ 1.2 W/kg, SAR is required for the next highest measured output power channel. Finally, if SAR is > 1.2 W/kg, SAR is required for the third channel.

SAR testing is not required for OFDM mode(s) 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.

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11b 1 Mbps	N/A	0	Left Touch	6	2437	98.74%	1.140	20.5	19.3	0.615	**0.821**	72
					11	2462	98.74%	0.974	20.5	19.1	0.561	0.784	
				Left Tilt	6	2437	98.74%	1.120	20.5	19.3	0.607	0.810	
					11	2462	98.74%	1.080	20.5	19.1	0.582	0.814	
				Right Touch	6	2437	98.74%	0.518	20.5	19.3	0.325	0.434	
				Right Tilt	6	2437	98.74%	0.502	20.5	19.3	0.311	0.415	
Body-worn	802.11b 1 Mbps	N/A	15	Rear	6	2437	98.74%	0.252	20.5	19.3	0.157	**0.210**	73
				Front	6	2437	98.74%	0.116	20.5	19.3	0.073	0.097	
Hotspot	802.11b 1 Mbps	N/A	10	Rear	6	2437	98.74%	0.543	20.5	19.3	0.321	**0.429**	74
				Front	6	2437	98.74%	0.203	20.5	19.3	0.126	0.168	
				Edge 1	6	2437	98.74%	0.409	20.5	19.3	0.242	0.323	
				Edge 2	6	2437	98.74%	0.152	20.5	19.3	0.095	0.127	

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10.22. Wi-Fi (U-NII Band)

UNII-1 &2A

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.

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11a	N/A	0	Left Touch	64	5320	92.57%	0.575	17.5	17.0	0.299	0.362	
				Left Tilt	64	5320	92.57%	**0.814**	17.5	17.0	0.380	**0.461**	75
				Right Touch	64	5320	92.57%	0.619	17.5	17.0	0.308	0.373	
				Right Tilt	64	5320	92.57%	0.671	17.5	17.0	0.370	0.448	
Body-worn	802.11a	N/A	15	Rear	64	5320	92.57%	**0.740**	17.5	17.0	0.356	**0.431**	76
				Front	64	5320	92.57%	0.057	17.5	17.0	0.022	0.027	
RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Area Scan Max. SAR (W/kg)	Power (dBm)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	802.11a	N/A	0	Rear	64	5320	92.57%	**29.100**	17.5	17.0	1.500	**1.818**	77
				Front	64	5320	92.57%	0.940	17.5	17.0			
				Edge 1	64	5320	92.57%	7.170	17.5	17.0	0.403	0.488	
				Edge 2	64	5320	92.57%	0.041	17.5	17.0			

Note(s):

1. Reported SAR is < 1.2 W/kg and 3.0 W/kg (1g and 10g respectively), therefore SAR is not required for UNII band I.

UNII-2C

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11a	N/A	0	Left Touch	100	5500	92.57%	0.388	17.5	17.0	0.149	0.181	
				Left Tilt	100	5500	92.57%	0.487	17.5	17.0	0.195	0.236	
				Right Touch	100	5500	92.57%	0.407	17.5	17.0	0.168	0.204	
				Right Tilt	100	5500	92.57%	**0.502**	17.5	17.0	0.197	**0.239**	78
Body-worn	802.11a	N/A	15	Rear	100	5500	92.57%	**0.401**	17.5	17.0	0.164	**0.199**	79
				Front	100	5500	92.57%	0.073	17.5	17.0	0.024	0.029	
RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Area Scan Max. SAR (W/kg)	Power (dBm)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	802.11a	N/A	0	Rear	100	5500	92.57%	**16.600**	17.5	17.0	1.440	**1.745**	80
				Front	100	5500	92.57%	1.440	17.5	17.0			
				Edge 1	100	5500	92.57%	10.500	17.5	17.0	0.705	0.855	
				Edge 2	100	5500	92.57%	0.042	17.5	17.0			

UNII-3

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Area Scan Max. SAR (W/kg)	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11a	N/A	0	Left Touch	157	5785	92.57%	0.088	17.5	16.5			
				Left Tilt	157	5785	92.57%	0.133	17.5	16.5	0.048	**0.065**	81
				Right Touch	157	5785	92.57%	0.096	17.5	16.5			
				Right Tilt	157	5785	92.57%	0.131	17.5	16.5			
Body-worn	802.11a	N/A	15	Rear	157	5785	92.57%	0.130	17.5	16.5	0.055	**0.075**	82
				Front	157	5785	92.57%	0.004	17.5	16.5			
Hotspot	802.11a	N/A	10	Rear	157	5785	92.57%	0.222	17.5	16.5			
				Front	157	5785	92.57%	0.011	17.5	16.5			
				Edge 1	157	5785	92.57%	0.254	17.5	16.5	0.108	**0.147**	83
				Edge 2	157	5785	92.57%	0.007	17.5	16.5			

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10.23. Bluetooth

RF Exposure Conditions	Mode	Power Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
Head	GFSK	N/A	0	Left Touch	0	2402	10.50	9.20	0.014	0.019	
				Left Tilt	0	2402	10.50	9.20	0.016	**0.022**	84
				Right Touch	0	2402	10.50	9.20	0.009	0.012	
				Right Tilt	0	2402	10.50	9.20	0.008	0.010	
Body-worn	GFSK	N/A	15	Rear	0	2402	10.50	9.20	0.004	**0.006**	85
				Front	0	2402	10.50	9.20	0.001	0.002	
BT Tethering (Hotspot)	GFSK	N/A	10	Rear	0	2402	10.50	9.20	0.009	**0.012**	86
				Front	0	2402	10.50	9.20	0.004	0.005	
				Edge 1	0	2402	10.50	9.20	0.006	0.008	
				Edge 2	0	2402	10.50	9.20	0.002	0.003	

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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 when the original or repeated measurement is ≥ 1.45 or 3.6 W/kg (~ 10% from the 1-g or 10-g respective SAR limit).
4) Perform a third repeated measurement only if the original, first, or second repeated measurement is ≥ 1.5 or 3.75 W/kg (1-g or 10-g respectively) and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

1-g Measurement Variability

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)
2500	LTE Band 7	Body	Rear	Yes	1.050	0.825	1.27	0.749	1.40	N/A
2600	LTE Band 41	Hotspot	Rear	Yes	0.903	0.755	1.20	N/A	N/A	N/A

Note(s):

- Second Repeated measurement was performed due to the ratio of largest to smallest SAR for the original and first repeated measurements > 1.20
- Third Repeated Measurement is not required since the original, first and second repeated measurement is < 1.5 W/kg.

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12. Simultaneous Transmission Conditions

RF Exposure Condition	Item	Capable Transmit Configurations		
Head	1	GSM (Voice)	+	DTS
	2	GSM (Voice)	+	U-NII
	3	GSM (Voice)	+	BT
	4	GSM (GPRS/EDGE)	+	DTS
	5	GSM (GPRS/EDGE)	+	U-NII
	6	GSM (GPRS/EDGE)	+	BT
	7	CDMA (1xRTT)	+	DTS
	8	CDMA (1xRTT)	+	U-NII
	9	CDMA (1xRTT)	+	BT
	10	CDMA (EVDO)	+	DTS
	11	CDMA (EVDO)	+	U-NII
	12	CDMA (EVDO)	+	BT
	13	W-CDMA	+	DTS
	14	W-CDMA	+	U-NII
	15	W-CDMA	+	BT
	16	LTE	+	DTS
	17	LTE	+	U-NII
	18	LTE	+	BT
Body-worn & Phablet 10g	19	GSM (Voice)	+	DTS
	20	GSM (Voice)	+	U-NII
	21	GSM (Voice)	+	BT
	22	GSM (GPRS/EDGE)	+	DTS
	23	GSM (GPRS/EDGE)	+	U-NII
	24	GSM (GPRS/EDGE)	+	BT
	25	CDMA (1xRTT)	+	DTS
	26	CDMA (1xRTT)	+	U-NII
	27	CDMA (1xRTT)	+	BT
	28	CDMA (EVDO)	+	DTS
	29	CDMA (EVDO)	+	U-NII
	30	CDMA (EVDO)	+	BT
	31	W-CDMA	+	DTS
	32	W-CDMA	+	U-NII
	33	W-CDMA	+	BT
	34	LTE	+	DTS
	35	LTE	+	U-NII
	36	LTE	+	BT
Hotspot	37	GSM (GPRS/EDGE)	+	DTS
	38	GSM (GPRS/EDGE)	+	U-NII
	39	GSM (GPRS/EDGE)	+	BT
	40	CDMA (EVDO)	+	DTS
	41	CDMA (EVDO)	+	U-NII
	42	CDMA (EVDO)	+	BT
	43	W-CDMA	+	DTS
	44	W-CDMA	+	U-NII
	45	W-CDMA	+	BT
	46	LTE	+	DTS
	47	LTE	+	U-NII
	48	LTE	+	BT

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12.1. Simultaneous transmission SAR test exclusion considerations

KDB 447498 D01 General RF Exposure Guidance provides two procedures for determining simultaneous transmission SAR test exclusion: Sum of SAR and SAR to Peak Location Ratio (SPLSR)

12.1.1. Sum of SAR

To qualify for simultaneous transmission SAR test exclusion based upon Sum of SAR the sum of the reported standalone SARs for all simultaneously transmitting antennas shall be below the applicable standalone SAR limit. If the sum of the SARs is above the applicable limit, then simultaneous transmission SAR test exclusion may still apply if the requirements of the SAR to Peak Location Ratio (SPLSR) evaluation are met.

12.1.2. SAR to Peak Location Ratio (SPLSR)

KDB 447498 D01 General RF Exposure Guidance explains how to calculate the SAR to Peak Location Ratio (SPLSR) between pairs of simultaneously transmitting antennas:

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

Where:

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

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

Ri is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of

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

In order for a pair of simultaneous transmitting antennas with the sum of 1-g SAR > 1.6 W/kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:

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

When an individual antenna transmits at on two bands simultaneously, the sum of the highest <u>*reported*</u> SAR for the frequency bands should be used to determine SAR_1.or SAR_2. When SPLSR is necessary, the smallest distance between the peak SAR locations for the antenna pair with respect to the peaks from each antenna should be used.

The antennas in all antenna pairs that do not qualify for simultaneous transmission SAR test exclusion must be tested for SAR compliance, according to the enlarged zoom scan and volume scan post-processing procedures in KDB Publication 865664 D01

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12.1.3. Simultaneous transmission SAR measurement

When simultaneous transmission SAR measurements are required in different frequency bands not covered by a single probe calibration point then separate tests for each frequency band are performed. The tests are performed using enlarged zoom scans which are processed, by means of superposition, using the DASY5 volume scan post-processing procedures to determine the 1-g SAR for the aggregate SAR distribution.

The spatial resolution used for all enlarged zoom scans is the same as used for the most stringent zoom scans. I.E. the scan parameters required for the highest frequency assessed are used for all enlarged zoom scans. The scans cover the complete area of the device to ensure all transmitting antennas and radiating structures are assessed.

DASY5 provides the ability to perform Multiband Evaluations according to the latest standards using the Volume Scan job as well as appropriate routines for the Post-processing.

In order to extract and process measurements within different frequency bands, the SEMCAD X Post-processor performs the combination and subsequent superposition of these measurement data via DASY5= Combined MultiBand Averaged SAR.

Combined Multi Band Averaged SAR allows - in addition to the data extraction - an evaluation of the 1 g, 10 g and/or arbitrary averaged mass SAR.
Power Scaling Factor is used to allow the volume scans to be scaled by a value other than "1", this is important when the results need to be scaled to different maximum power levels. The Power Scaling Factor is applied to each individual point of the scan. When power scaling is used in multi-band combinations the scaling factor is applied to each individual point of the first scan, the second factor is then applied to each individual point of the second scan and so on. The scans are then combined.

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

RF Exposure conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)					
		1	2	3	4	5	1+3	1+4	1+5	2+3	2+4	2+5
		LTE Band 7	Worst-case WWAN	Wi-Fi 2.4G	Wi-Fi 5G	BT						
Head	Left Touch	0.176	0.304	0.821	0.362	0.019	0.997	0.538	0.195	1.125	0.666	0.323
	Left Tilt	0.062	0.162	0.814	0.461	0.022	0.876	0.523	0.084	0.976	0.623	0.184
	Right Touch	0.776	0.531	0.434	0.373	0.012	**1.210**	**1.149**	**0.788**	0.965	0.904	0.543
	Right Tilt	0.187	0.368	0.415	0.448	0.010	0.602	0.635	0.197	0.783	0.816	0.378
Body-worn	Rear	0.614	1.037	0.210	0.431	0.006	0.824	1.045	0.620	**1.247**	**1.468**	**1.043**
	Front	0.246	0.534	0.097	0.029	0.002	0.343	0.275	0.248	0.631	0.563	0.536
Hotspot	Rear	1.207	0.799	0.429	0.147	0.012	1.636	**1.354**	**1.219**	**1.228**	0.946	0.811
	Front	0.149	0.513	0.168	0.147	0.005	0.317	0.296	0.154	0.681	0.660	0.518
	Edge 1	0.042	0.054	0.323	0.147	0.008	0.365	0.189	0.050	0.377	0.201	0.062
	Edge 2		0.379	0.127	0.147	0.003				0.506	0.526	0.382
	Edge 3		0.613									
	Edge 4	1.026	0.477									

Conclusion:

SPLSR analysis is required for LTE Band 7 due to Sum of SAR > 1.6 W/kg; refer to §12.3 for SPLSR analysis. All other scenarios are excluded from SPLSR analysis due to Sum of SAR < 1.6 W/kg.

RF Exposure conditions	Test Position	Standalone SAR (W/kg)		∑ 10-g SAR (W/kg)
		1	4	1+4
		Worst-case WWAN	Wi-Fi 5G	
Extremity	Rear	1.986	1.818	**3.804**
	Edge 1		0.855	0.855
	Edge 4	2.140	0.855	2.995

Conclusion:

SPLSR analysis is not required due to Sum of SAR < 4.0 W/kg.

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12.3. SAR to Peak Location Ratio (SPLSR) Analysis

LTE Band 7 Hotspot:

RF Exposure Conditions	Test Position	Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
				W/kg	m	m	m		
Hotspot	Rear	LTE Band 7	①	1.690	0.010	0.050	-0.207	① + ②	54.5
		Wi-Fi 2.4GHz	②	0.543	-0.038	0.076	-0.208		

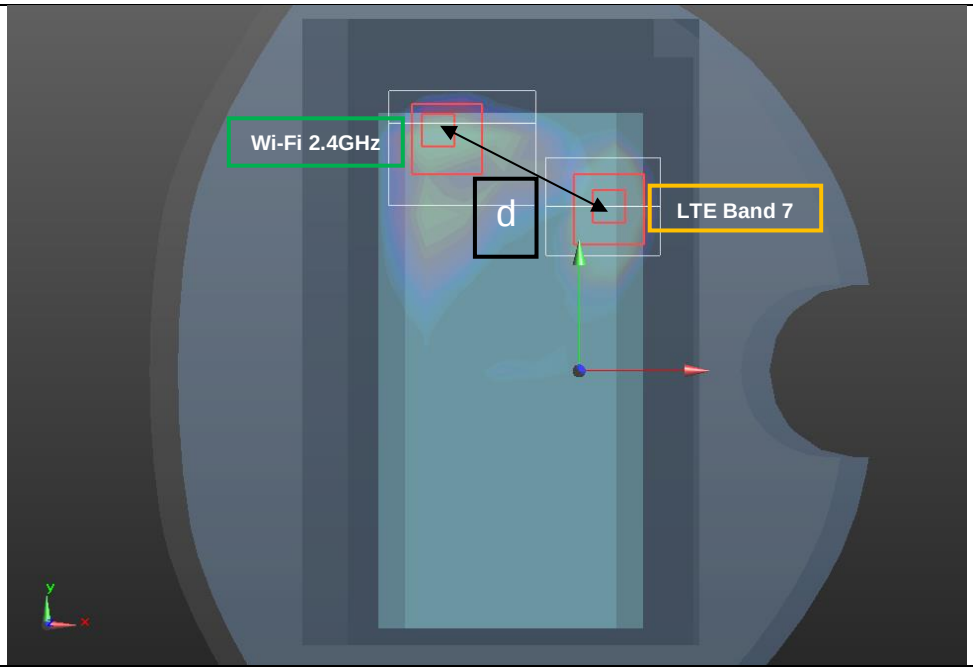
The Peak Location Separation Distance is computed by using the formula: SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

RF Exposure Conditions	Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
		1	2	3	4						
		WWAN	Wi-Fi 2.4G	Wi-Fi 5G	BT						
Hotspot	Rear	1.207	0.429			① + ②	1.636	54.5	0.04	No	1

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the SPLSR is ≤ 0.04.

Figure (1)



Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
		W/kg	m	m	m		
LTE Band 7	①	1.69	0.0098	0.0504	-0.207	① + ②	54.5
Wi-Fi 2.4GHz	②	0.543	-0.0384	0.0758	-0.208		

The Peak Location Separation Distance is computed by using the formula below:
SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

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Appendixes

Refer to separated files for the following appendixes.

Appendix A: SAR Setup Photos

Appendix B: SAR System Check Plots

Appendix C: SAR Highest Test Plots

Appendix D: SAR Tissue Ingredients

Appendix E: SAR Probe Certificates

Appendix F: SAR Dipole Certificates

END OF REPORT

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