SAR EVALUATION REPORT

IEEE Std 1528-2013

For

GSM/WCDMA/LTE phone with BT, DTS/UNII a/b/g/n/ac/11ax HE 20/40/80, ANT+ and NFC

FCC ID: AL3SMG970F
Model Name: SM-G970F/DS, SM-G970F

Report Number: 12563734-S1V3
Issue Date: 1/29/2019

Prepared for

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Date	Revisions	Revised By
V1	12/31/2018	Initial Issue	--
V2	1/17/2019	Address TCB's questions and updated appendix A, B, C and G	Devin Chang
V3	1/29/2019	Address TCB's questions and updated appendix B, C and G	Devin Chang

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1. Attestation of Test Results

Applicant Name		Samsung Electronics Co., Ltd.			
FCC ID		AL3SMG970F			
Model Name		SM-G970F/DS, SM-G970F			
Applicable Standards		FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013			
Exposure Category		SAR Limits (W/Kg)			
		Peak spatial-average (1g of tissue)		Extremities (hands, wrists, ankles, etc.) (10g of tissue)	
General population / Uncontrolled exposure		1.6		4	
RF Exposure Conditions		Equipment Class - Highest Reported SAR (W/kg)			
		PCE	DTS	NII	DSS
Head		0.340	0.447	0.557	0.502
Body-worn		0.703	0.093	0.418	0.051
Hotspot		1.279	0.214	0.540	0.107
Simultaneous TX	Head	1.367	1.367	1.367	1.347
	Body-worn	1.474	1.221	1.474	1.474
	Hotspot	1.585	1.553	1.585	1.585
Date Tested		11/6/2018 to 1/29/2019			
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.	Lance Fleischer Laboratory Engineer UL Verification Services Inc.

2. Test Specification, Methods and Procedures

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

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

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

- TCB workshop October 2014; 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 May 2017; RF Exposure Procedures (Broadband Liquid Above 3 GHz)
- TCB workshop October 2017; RF Exposure Procedures (LTE UL/DL Carrier Aggregation SAR)
- TCB workshop April 2018; RF Exposure Procedures (LTE DL CA SAR Test Exclusion)

3. Facilities and Accreditation

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

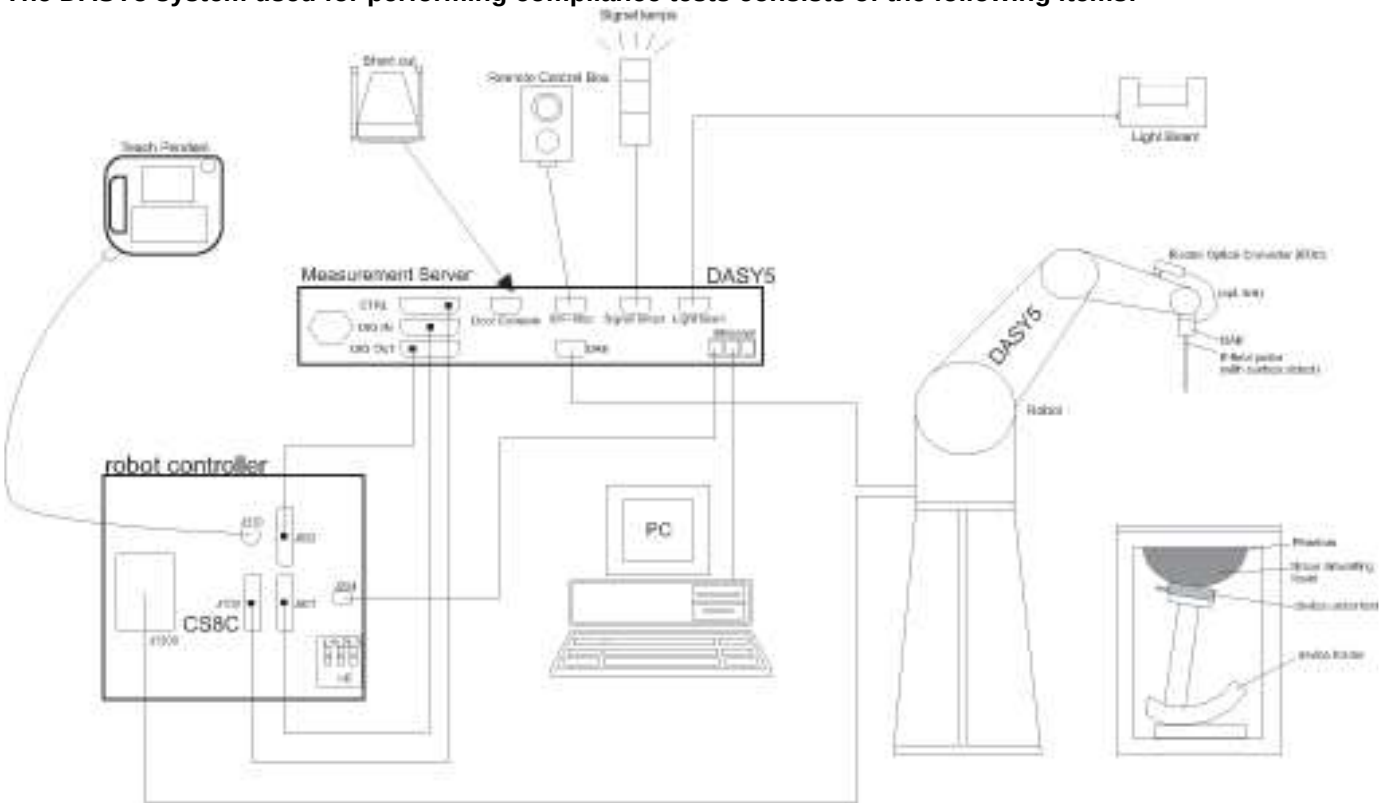
47173 Benicia Street	47266 Benicia Street
SAR Lab A	SAR Lab 1
SAR Lab B	SAR Lab 2
SAR Lab C	SAR Lab 3
SAR Lab D	SAR Lab 4
SAR Lab E	SAR Lab 5
SAR Lab F	
SAR Lab G	
SAR Lab H	

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

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

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



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

4.2. SAR Scan Procedures

Step 1: Power Reference Measurement

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

Step 2: Area Scan

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

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

	≤ 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.	

Step 3: Zoom Scan

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

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

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

4.3. Test Equipment

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

Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	Agilent	ZNLE6	1323	7/16/2019
Dielectric Probe kit	SPEAG	DAK-3.5	1082	9/11/2019
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	9/11/2019
Thermometer	Traceable Calibration Control Co.	4242	18113673	4/3/2019

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Synthesized Signal Generator	Agilent	N5181A	MY50140610	6/7/2019
Power Meter	Keysight	N1912A	MY55196007	7/23/2019
Power Sensor	Agilent	N1921A	MY53020038	4/23/2019
Power Sensor	Agilent	N1921A	MY53260010	10/17/2019
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1795093	N/A
Directional coupler	Werlatone	C8060-102	2148	N/A
DC Power Supply	Sorensen	1611	1817A2680	N/A
Synthesized Signal Generator	Agilent	N5181A	MY50240680	5/25/2019
Power Meter	Keysight	N1912A	MY55196004	7/26/2019
Power Sensor	Agilent	N1921A	MY52200012	10/18/2019
Power Sensor	Agilent	N1921A	MY52270022	12/28/2018*
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1795092	N/A
Directional coupler	Werlatone	C8060-102	2141	N/A
DC Power Supply	BK Precision	XT 15-4	215-02292	N/A
Synthesized Signal Generator	R & S	SMB 100A	1406	7/4/2019
Power Sensor	R & S	NRP18A	1424	6/19/2019

Note(s):

*Equipment not used past calibration due date.

Lab Equipment

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
E-Field Probe (SAR Lab A)	SPEAG	EX3DV4	3885	9/18/2019
E-Field Probe (SAR Lab B)	SPEAG	EX3DV4	3772	2/13/2019
E-Field Probe (SAR Lab F)	SPEAG	EX3DV4	3902	5/24/2019
E-Field Probe (SAR Lab G)	SPEAG	EX3DV4	7463	7/20/2019
E-Field Probe (SAR Lab H)	SPEAG	EX3DV4	7482	7/23/2019
Data Acquisition Electronics (SAR Lab A)	SPEAG	DAE4	1540	2/23/2019
Data Acquisition Electronics (SAR Lab B)	SPEAG	DAE4	1377	9/14/2019
Data Acquisition Electronics (SAR Lab F)	SPEAG	DAE4	1439	7/10/2019
Data Acquisition Electronics (SAR Lab G)	SPEAG	DAE4	1359	2/9/2019
Data Acquisition Electronics (SAR Lab H)	SPEAG	DAE4	1239	7/11/2019
System Validation Dipole	SPEAG	D750V3	1024	5/16/2019
System Validation Dipole	SPEAG	D835V2	4d117	5/16/2019
System Validation Dipole	SPEAG	D835V2	4d142	8/23/2019
System Validation Dipole	SPEAG	D1750V2	1050	4/10/2019
System Validation Dipole	SPEAG	D1900V2	5d140	4/11/2019
System Validation Dipole	SPEAG	D2450V2	899	3/16/2019
System Validation Dipole	SPEAG	D2450V2	706	5/18/2019
System Validation Dipole	SPEAG	D2600V2	1036	3/16/2019
System Validation Dipole	SPEAG	D5GHzV2	1138	8/21/2019
System Validation Dipole	SPEAG	D5GHzV2	1003	3/13/2019

Other

Name of Equipment	Manufacturer	Type/Model	T Number	Serial No.	Cal. Due Date
Power Meter	Agilent	N1911A	T733	MY50001018	10/18/2019
Power Sensor	Agilent	N1921A	T734	MY52200012	10/18/2019
Power Sensor	Agilent	N1921A	T751	MY53260010	10/17/2019
Base Station Simulator	R & S	CMW500	T1871	164541-Ci	2/19/2019
Base Station Simulator	R & S	CMW500	T959	135384-WG	6/1/2019
Spectrum Analyzer/PXA	Agilent	N9030A	T1454	MY55410147	1/8/2019
Spectrum Analyzer/PXA	Agilent	N9030A	T1466	MY54410193	4/16/2019

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	Refer to Appendix A This is a general size smart phone
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 enabled devices transfer data directly between each other. 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	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** R38K90E1KRB / 352248100239093 / WWAN Conducted R38KA0BFXEF / 352248100250272 / WLAN/BT Conducted R38KA0H49TL / 352248100263093 / WLAN/BT Conducted R38KA0H4ATN / 352248100263424 / WWAN Radiated R38KA0H4AME / 352248100263366 / WWAN Radiated R38KA0H4B9Z / 352248100263572 / WWAN Radiated R38KB05BDYN / 352248100288025 / WWAN Radiated R38KA0H49GY / 352248100262988 / WWAN Radiated R38KA0H49XX / 352248100263127 / WWAN Radiated R38KB05BJQB / 352248100289601 / WLAN Radiated R38KB05BJAX / 352248100289460 / WLAN Radiated
Hardware Version	REV0.3
Software Version	G970F.001

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 33 - 4 Up, 5 Down	GSM Voice: 12.5% (E)GPRS: 1 Slot: 12.5% 2 Slots: 25% 3 Slots: 37.5% 4 Slots: 50%
	Does this device support DTM (Dual Transfer Mode)? ☐ 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. 8) HSPA+ (DL only)		100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 7 FDD Band 12 FDD Band 13 FDD Band 17 FDD Band 25 FDD Band 26 TDD Band 38 TDD Band 41 FDD Band 66	QPSK 16QAM 64AQM Rel. 14 Carrier Aggregation (1 Uplink and 4 Downlinks)		100% (FDD) 63.3% (TDD) 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) 802.11ax (HE20)		98.92% (802.11b) Ant 1 [1] 98.87% (802.11b) Ant 2 [1]
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80) 802.11ax (HE20) 802.11ax (HE40) 802.11ax (HE80)		93.46% (802.11a) [2] 87.14% (802.11n HT40) [2] 63.79% (802.11ac VHT80) [2]
	Does this device support bands 5.60 ~ 5.65 GHz? ☒ Yes ☐ No			
	Does this device support Band gap channel(s)? ☒ Yes ☐ No			
Bluetooth	2.4 GHz	Version 5.0 LE		76.84% (GFSK) [3]
NFC	13.56 MHz	Type A/B/F		N/A[4]

Notes:

1. Duty cycle for DTS is referenced from §9.5
2. Duty cycle for UNII is referenced from §9.6
3. Duty cycle for Bluetooth is referenced from §9.7
4. Measured Duty Cycle is not required due to SAR test exemption.

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		

General LTE SAR Test and Reporting Considerations (Continued)

Frequency range, Channel Bandwidth, Numbers and Frequencies

Band 17	Frequency range: 704 - 716 MHz (BW = 12 MHz)					
	Channel Bandwidth					
	20 MHz	15 MHz	10 MHz [1]	5 MHz [1]	3 MHz	1.4 MHz
Low			23780/ 709	23755/ 706.5		
Mid			**23790/ 710**	23790/ 710		
High			23800/ 711	23825/ 713.5		

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	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 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		

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**					
Low-Mid	**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

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** 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.

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

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 channels bandwidths.
3. SAR Testing for LTE was performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

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% duty cycle.

6.5. Dynamic Antenna Tuning Test Considerations & Procedure

This Device supports an AIT (Antenna impedance tuner) feature which optimizes antenna matching for actual certain use conditions. The device supports two states of Dynamic Antenna Tuning: default state and auto tuner state.

Default State operates using Index 1 as an intermediate process to initialize itself. Afterwards, it fully transitions into the Default State using the Open Loop Mode Tuner ID and XGND, which remains static. Auto tuner state will dynamically change the impedance of the device to reach the optimal radiated state. Dynamic Antenna Tuning is supported only for LTE Band 5/7. Please refer to the Dynamic Antenna Tuning Operation Description for full details.

Single point measurements were performed using a time-sweep method on the worst case test position per test configuration for LTE Band 5/7 to determine which Index produced the highest result.

Band	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Reported SAR	Single Point Measurement											
							Default state				Auto Tuner States				Auto Tuner States			
						(W/kg)	Index	Tuner	XGND	(W/kg)	Index	Tuner	XGND	(W/kg)	Index	Tuner	XGND	(W/kg)
LTE B5	Head	0	Right Touch	20525	836.5	0.254	2	39F7	8000	0.317	1	1200	8100	0.301	20	31FF	8100	0.316
	Body-worn	15	Rear	20525	836.5	0.349	2	39F7	8000	0.388	1	1200	8100	0.386	20	31FF	8100	0.384
	Hotspot	10	Rear	20525	836.5	0.487	2	39F7	8000	0.631	1	1200	8100	0.625	20	31FF	8100	0.624
Band	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Reported SAR	Single Point Measurement											
							Default state				Auto Tuner States				Auto Tuner States			
						(W/kg)	Index	Tuner	XGND	(W/kg)	Index	Tuner	XGND	(W/kg)	Index	Tuner	XGND	(W/kg)
LTE B7	Head	0	Right Touch	21100	2535.0	0.208	2	2C00	10E00	0.318	1	3C00	10E00	0.299	20	2C00	17E00	0.293
	Body-worn	15	Rear	21100	2535.0	0.694	2	2C00	10E00	0.845	1	3C00	10E00	0.764	20	2C00	17E00	0.828
	Hotspot	10	Edge 3	21100	2535.0	1.279	2	2C00	10E00	1.494	1	3C00	10E00	1.219	20	2C00	17E00	0.977

Conclusion:

Testing was performed on Indexes that had unique Tuner ID and XGND codes, as shown in the Dynamic Antenna Tuning Operational Description and on Default state. From these single point measurement results, the Default state was determined to be the worst case. Full SAR testing was performed on Default state.

6.6. Wi-Fi RSDB (Real Simultaneous Dual Band) Activation Conditions

Please refer to table below for activation conditions for RSDB output power levels. These simultaneous conditions apply during both Max and Reduced Power. Refer to §9.5 and §9.6 RSDB Output Power Results for further details.

	# TX	5GHz WIFI		2.4GHz WIFI		802.11 Modes
		Ant1	Ant2	Ant1	Ant2	
2.4 GHz + 5 GHz RSDB Only	2	✓	-	-	✓	2.4 GHz: b, g, n, ax 5 GHz: a, n, ac, ax
	2	-	✓	✓	-	
	2	✓	-	✓	-	
	2	-	✓	-	✓	
2.4 GHz + 5 GHz RSDB & MIMO	3	✓	✓	✓	-	2.4 GHz: b, g, n, ax 5 GHz: a, n, ac, ax (CDD+STBC Only)
	3	✓	✓	-	✓	
	3	✓	-	✓	✓	2.4 GHz: b, g, n, ax(CDD+STBC Only), 5 GHz: a, n, ac, ax
	3	-	✓	✓	✓	
2.4 GHz + 5 GHz RSDB MIMO	4	✓	✓	✓	✓	2.4 GHz: b, g, n, ax (CDD+STBC Only) 5 GHz: a, n, ac, ax (CDD+STBC Only)

Simultaneous TX condition Bluetooth with 5GHz WIFI (not RSDB)

	# TX	5GHz WIFI		2.4GHz BT
		Ant1	Ant2	Ant 1
2.4 GHz BT + 5 GHz WIFI (Not RSDB)	2	A	-	B
	2	-	A	B
	3	A	A	B

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	DUT-to-User Separation	Test Position	Antenna-to-edge/surface	SAR Required	Note
WWAN (Main Ant. 1-1)	Head	0 mm	Left Touch	N/A	Yes	
			Left Tilt (15°)	N/A	Yes	
			Right Touch	N/A	Yes	
			Right Tilt (15°)	N/A	Yes	
	Body	15 mm	Rear	N/A	Yes	
			Front	N/A	Yes	
	Hotspot	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	
WWAN (Main Ant. 1-2)	Head	0 mm	Left Touch	N/A	Yes	
			Left Tilt (15°)	N/A	Yes	
			Right Touch	N/A	Yes	
			Right Tilt (15°)	N/A	Yes	
	Body	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	No	1
			Edge 3 (Bottom)	< 25 mm	Yes	
			Edge 4 (Left)	< 25 mm	Yes	

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. Main Antenna 1-1 supports GSM 850/1900 and W-CDMA bands 2/4/5 and LTE Bands 2/4/5/12/13/17/25/26/66.
3. Main Antenna 1-2 supports LTE Bands 7/38/41.

Wireless technologies	RF Exposure Conditions	DUT-to-User Separation	Test Position	Antenna-to-edge/surface	SAR Required	Note
WLAN Antenna 1 (2.4/5 GHz and BT)	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 (2.4/5.8 GHz Bands)	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	
WLAN Antenna 2 (2.4 GHz)	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	
WLAN Antenna 2 (5 GHz)	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 (5.8 GHz only)	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	

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. Wi-Fi Direct is only available in Hand use configuration

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

IEEE Std 1528-2013

Refer to Table 3 within the IEEE Std 1528-2013

Dielectric Property Measurements Results:

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity (εr)			Conductivity (σ)		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
A	11/12/2018	2600	Head	2600	37.78	39.01	-3.16	1.99	1.96	1.42
				2495	37.94	39.14	-3.07	1.84	1.85	-0.74
				2690	37.59	38.90	-3.36	2.01	2.06	-2.64
A	11/12/2018	2600	Body	2600	51.56	52.51	-1.81	2.20	2.16	1.58
				2495	51.86	52.64	-1.49	2.07	2.01	2.57
				2690	51.25	52.40	-2.19	2.31	2.29	0.95
A	11/15/2018	5600	Head	5600	34.07	35.53	-4.12	4.92	5.06	-2.77
				5500	34.25	35.65	-3.92	4.81	4.96	-3.08
				5725	33.80	35.39	-4.50	5.07	5.19	-2.24
A	11/19/2018	5250	Head	5250	35.90	35.93	-0.09	4.57	4.70	-2.73
				5150	36.06	36.05	0.04	4.45	4.60	-3.17
				5350	35.69	35.82	-0.36	4.69	4.80	-2.30
A	11/19/2018	5250	Body	5250	47.04	48.95	-3.91	5.46	5.35	1.96
				5150	47.18	49.09	-3.89	5.30	5.24	1.29
				5350	46.84	48.82	-4.05	5.61	5.47	2.49
A	11/26/2018	5750	Head	5750	35.39	35.36	0.08	5.02	5.21	-3.79
				5700	35.49	35.42	0.20	4.94	5.16	-4.27
				5850	35.24	35.30	-0.17	5.11	5.27	-3.00
A	11/26/2018	5750	Body	5750	46.24	48.27	-4.21	6.04	5.94	1.70
				5700	46.31	48.34	-4.20	5.95	5.88	1.27
				5850	46.07	48.20	-4.42	6.16	6.00	2.67
A	12/5/2018	5250	Head	5250	36.41	35.93	1.33	4.52	4.70	-3.79
				5150	36.59	36.05	1.51	4.42	4.60	-3.97
				5350	36.23	35.82	1.15	4.64	4.80	-3.40
SAR Lab	**Date**	**Band (MHz)**	**Tissue Type**	**Frequency (MHz)**	**Relative Permittivity (εr)**			**Conductivity (σ)**		
					Measured	**Target**	**Delta (%)**	**Measured**	**Target**	**Delta (%)**
B	11/12/2018	2450	Head	2450	37.50	39.20	-4.34	1.82	1.80	1.00
				2400	37.56	39.30	-4.42	1.78	1.75	1.56
				2480	37.48	39.16	-4.30	1.84	1.83	0.30
B	11/12/2018	2450	Body	2450	51.54	52.70	-2.20	2.04	1.95	4.77
				2400	51.72	52.77	-1.99	1.98	1.90	4.11
				2480	51.43	52.66	-2.34	2.09	1.99	4.81
SAR Lab	**Date**	**Band (MHz)**	**Tissue Type**	**Frequency (MHz)**	**Relative Permittivity (εr)**			**Conductivity (σ)**		
					Measured	**Target**	**Delta (%)**	**Measured**	**Target**	**Delta (%)**
F	11/30/2018	835	Head	835	40.01	41.50	-3.59	0.92	0.90	1.86
				805	40.09	41.68	-3.81	0.91	0.90	1.12
				850	39.97	41.50	-3.69	0.92	0.92	0.78
F	11/30/2018	835	Body	835	52.65	55.20	-4.62	1.00	0.97	3.30
				805	52.70	55.33	-4.76	0.99	0.97	2.55
				850	52.61	55.16	-4.62	1.01	0.99	2.11
F	1/9/2019	5250	Body	5250	49.11	48.95	0.32	5.21	5.35	-2.62
				5150	49.08	49.09	-0.01	5.11	5.24	-2.49
				5350	48.97	48.82	0.31	5.40	5.47	-1.35

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 (%)
G	11/6/2018	835	Head	835	40.73	41.50	-1.86	0.91	0.90	1.33
				805	40.82	41.68	-2.06	0.90	0.90	0.56
				850	40.68	41.50	-1.98	0.92	0.92	0.22
G	11/6/2018	835	Body	835	52.53	55.20	-4.84	1.00	0.97	3.51
				805	52.69	55.33	-4.78	0.99	0.97	2.57
				850	52.50	55.16	-4.82	1.01	0.99	2.32
G	11/8/2018	750	Head	750	41.69	41.96	-0.65	0.91	0.89	1.63
				660	42.21	42.42	-0.50	0.87	0.89	-1.38
				800	41.70	41.71	-0.01	0.92	0.90	3.03
G	11/8/2018	750	Body	750	53.29	55.55	-4.06	0.95	0.96	-1.48
				660	53.96	55.89	-3.46	0.91	0.96	-4.45
				800	53.45	55.35	-3.44	0.96	0.97	-0.32
G	1/29/2019	5750	Body	5750	46.52	48.27	-3.63	6.03	5.94	1.52
				5700	46.43	48.34	-3.96	6.13	5.88	4.26
				5850	46.23	48.20	-4.09	6.26	6.00	4.33

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity (εr)			Conductivity (σ)		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
H	11/6/2018	1900	Head	1900	38.91	40.00	-2.73	1.41	1.40	0.79
				1850	38.95	40.00	-2.62	1.38	1.40	-1.14
				1920	38.91	40.00	-2.73	1.43	1.40	1.79
H	11/6/2018	1900	Body	1900	51.56	53.30	-3.26	1.57	1.52	3.22
				1850	51.59	53.30	-3.21	1.54	1.52	1.18
				1920	51.57	53.30	-3.25	1.59	1.52	4.28
H	11/8/2018	1750	Head	1750	39.02	40.08	-2.66	1.34	1.37	-2.48
				1710	39.06	40.15	-2.71	1.31	1.35	-2.70
				1755	39.01	40.08	-2.66	1.34	1.37	-2.54
H	11/8/2018	1750	Body	1750	51.97	53.44	-2.75	1.46	1.49	-1.63
				1710	52.00	53.54	-2.88	1.43	1.46	-2.02
				1755	51.96	53.43	-2.75	1.47	1.49	-1.63
H	11/27/2018	5600	Body	5600	46.43	48.48	-4.22	5.77	5.76	0.10
				5500	46.62	48.61	-4.10	5.62	5.64	-0.49
				5725	46.17	48.31	-4.43	5.96	5.91	0.83
H	11/28/2018	2450	Body	2450	51.16	52.70	-2.92	2.02	1.95	3.38
				2400	51.18	52.77	-3.02	1.97	1.90	3.74
				2480	51.14	52.66	-2.89	2.04	1.99	2.30
H	11/29/2018	2450	Head	2450	38.06	39.20	-2.91	1.86	1.80	3.28
				2400	38.10	39.30	-3.05	1.82	1.75	3.67
				2480	38.04	39.16	-2.87	1.88	1.83	2.60
H	12/3/2018	835	Head	835	40.17	41.50	-3.20	0.93	0.90	3.46
				805	40.33	41.68	-3.24	0.92	0.90	2.61
				850	40.17	41.50	-3.20	0.94	0.92	2.37
H	12/3/2018	835	Body	835	54.01	55.20	-2.16	0.99	0.97	2.21
				805	54.14	55.33	-2.16	0.98	0.97	1.30
				850	54.02	55.16	-2.06	1.00	0.99	1.04
H	1/8/2019	5800	Body	5800	46.98	48.20	-2.53	6.08	6.00	1.30
				5700	47.01	48.34	-2.76	5.86	5.88	-0.30
				5850	46.38	48.20	-3.78	6.13	6.00	2.20

8.2. System Check

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

System Performance Check Measurement Conditions:

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

System Check Results

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within ±10% of the manufacturer calibrated dipole SAR target. 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 %	
A	11/12/2018	Head	D2600V2 SN:1036	3/16/2019	5.870	58.70	54.54	7.63	2.620	26.20	24.56	6.68	
A	11/12/2018	Body	D2600V2 SN:1036	3/16/2019	6.120	61.20	56.13	9.03	2.650	26.50	25.04	5.83	1,2
A	11/15/2018	Head	D5GHzV2 SN:1003 (5.60 GHz)	3/13/2019	8.210	82.10	84.50	-2.84	2.320	23.20	24.00	-3.33	3,4
A	11/19/2018	Head	D5GHzV2 SN:1003 (5.25 GHz)	3/13/2019	7.890	78.90	80.60	-2.11	2.250	22.50	23.20	-3.02	
A	11/19/2018	Body	D5GHzV2 SN:1003 (5.25 GHz)	3/13/2019	8.060	80.60	73.60	9.51	2.240	22.40	20.50	9.27	5,6
A	11/26/2018	Head	D5GHzV2 SN:1003 (5.75 GHz)	3/13/2019	7.610	76.10	78.40	-2.93	2.170	21.70	22.20	-2.25	
A	11/26/2018	Body	D5GHzV2 SN:1003 (5.75 GHz)	3/13/2019	7.850	78.50	73.90	6.22	2.180	21.80	20.60	5.83	7,8
A	12/5/2018	Head	D5GHzV2 SN:1003 (5.25 GHz)	3/13/2019	8.390	83.90	80.60	4.09	2.410	24.10	23.20	3.88	
B	11/12/2018	Head	D2450V2 SN:899	3/16/2019	5.190	51.90	51.75	0.29	2.410	24.10	24.20	-0.41	
B	11/12/2018	Body	D2450V2 SN:899	3/16/2019	5.510	55.10	50.55	9.00	2.480	24.80	23.20	6.90	9,10
F	11/30/2018	Head	D835V2 SN:4d117	5/16/2019	0.962	9.62	9.87	-2.53	0.625	6.25	6.40	-2.34	
F	11/30/2018	Body	D835V2 SN:4d117	5/16/2019	0.952	9.52	10.31	-7.66	0.621	6.21	6.84	-9.21	11,12
F	1/9/2019	Body	D5GHzV2 SN:1003 (5.25 GHz)	3/13/2019	7.480	74.80	73.60	1.63	2.120	21.20	20.50	3.41	13,14
G	11/6/2018	Head	D835V2 SN:4d117	5/16/2019	0.973	9.73	9.87	-1.42	0.641	6.41	6.40	0.16	15,16
G	11/6/2018	Body	D835V2 SN:4d117	5/16/2019	1.030	10.30	10.31	-0.10	0.683	6.83	6.84	-0.15	
G	11/8/2018	Head	D750V3 SN:1024	5/16/2019	0.834	8.34	8.28	0.72	0.552	5.52	5.41	2.03	
G	11/8/2018	Body	D750V3 SN:1024	5/16/2019	0.869	8.69	9.03	-3.77	0.577	5.77	6.05	-4.63	17,18
G	1/29/2019	Body	D5GHzV2 SN:1003 (5.75 GHz)	3/13/2019	7.670	76.70	73.90	3.79	2.160	21.60	20.60	4.85	31,32
H	11/6/2018	Head	D1900V2 SN:5d140	4/11/2019	4.210	42.10	38.93	8.14	2.170	21.70	20.14	7.75	19,20
H	11/6/2018	Body	D1900V2 SN:5d140	4/11/2019	4.360	43.60	41.00	6.34	2.260	22.60	21.05	7.36	
H	11/8/2018	Body	D1750V2 SN:1050	4/10/2019	3.810	38.10	37.18	2.47	2.030	20.30	19.74	2.84	21,22
H	11/8/2018	Head	D1750V2 SN:1050	4/10/2019	3.710	37.10	36.50	1.64	1.970	19.70	19.42	1.44	
H	11/27/2018	Body	D5GHzV2 SN:1138 (5.6 GHz)	8/21/2019	8.330	83.30	79.50	4.78	2.340	23.40	22.20	5.41	23,24
H	11/28/2018	Body	D2450V2 SN:899	3/16/2019	5.430	54.30	50.55	7.42	2.480	24.80	23.20	6.90	
H	11/29/2018	Head	D2450V2 SN:706	5/18/2019	5.660	56.60	52.60	7.60	2.610	26.10	24.60	6.10	25,26
H	12/3/2018	Head	D835V2 SN:4d142	8/23/2019	0.996	9.96	9.48	5.06	0.648	6.48	6.10	6.23	27,28
H	12/3/2018	Body	D835V2 SN:4d142	8/23/2019	0.927	9.27	9.68	-4.24	0.607	6.07	6.36	-4.56	
H	1/8/2019	Body	D5GHzV2 SN:1138 (5.75 GHz)	8/21/2019	7.940	79.40	74.10	7.15	2.210	22.10	20.60	7.28	29,30

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 most number of time slots.

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.

GSM 850 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	33.59	24.56	34.00	24.97
			190	836.6	33.62	24.59		
			251	848.8	33.60	24.57		
		2	128	824.2	31.12	25.10	32.00	25.98
			190	836.6	31.12	25.10		
			251	848.8	31.07	25.05		
		3	128	824.2	29.81	25.55	30.50	**26.24**
			190	836.6	29.80	25.54		
			251	848.8	29.79	25.53		
		4	128	824.2	28.58	25.57	29.00	25.99
			190	836.6	28.55	25.54		
			251	848.8	28.63	25.62		
EDGE (8PSK)	MCS5	1	128	824.2	26.62	17.59	27.50	18.47
			190	836.6	26.62	17.59		
			251	848.8	26.71	17.68		
		2	128	824.2	24.52	18.50	25.50	19.48
			190	836.6	24.50	18.48		
			251	848.8	24.50	18.48		
		3	128	824.2	23.60	19.34	24.50	20.24
			190	836.6	24.00	19.74		
			251	848.8	23.70	19.44		
		4	128	824.2	22.40	19.39	23.00	19.99
			190	836.6	22.50	19.49		
			251	848.8	22.40	19.39		

Notes:

1. Head and Body-worn RF Exposure Conditions only supports GMSK Voice mode. SAR testing was performed on GMSK Voice mode
2. Hotspot RF Exposure Condition supports GPRS/EDGE (GMSK) mode. SAR testing was performed on GPRS/EDGE (GMSK) mode with 3 time slots for Max power based on the Tune-up Procedure.

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	30.38	21.35	**31.00**	**21.97**
			661	1880.0	30.40	21.37		
			810	1909.8	30.45	21.42		
		2	512	1850.2	27.08	21.06	27.50	21.48
			661	1880.0	26.76	20.74		
			810	1909.8	26.85	20.83		
		3	512	1850.2	25.76	21.50	26.00	21.74
			661	1880.0	25.85	21.59		
			810	1909.8	25.87	21.61		
		4	512	1850.2	24.25	21.24	24.50	21.49
			661	1880.0	24.36	21.35		
			810	1909.8	24.42	21.41		
EDGE (8PSK)	MCS5	1	512	1850.2	25.71	16.68	26.50	17.47
			661	1880.0	25.40	16.37		
			810	1909.8	25.70	16.67		
		2	512	1850.2	23.20	17.18	24.50	18.48
			661	1880.0	23.40	17.38		
			810	1909.8	23.50	17.48		
		3	512	1850.2	21.80	17.54	22.50	18.24
			661	1880.0	21.90	17.64		
			810	1909.8	22.00	17.74		
		4	512	1850.2	20.10	17.09	21.00	17.99
			661	1880.0	20.20	17.19		
			810	1909.8	20.50	17.49		

Notes:

Voice and GPRS/EDGE (GMSK) modes with 1 time slot for Max power based on the Tune-up Procedure.

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	β_{ed}1: 47/15 β_{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.

DC-HSDPA Setup Procedures used to establish the test signals

The following 4 Sub-tests for DC-HSDPA were completed according to Release 8 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	Proces ses	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 $\beta_{hs} = 30/15 * \beta_c$.
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.

Since is not support for uplink, the uplink Category and release is same as HSUPA. Therefore, the RF conducted power is not measured.

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

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	24.28	N/A	25.00	21.50	N/A	22.00
		9400	1880.0	24.32			21.34		
		9538	1907.6	24.45			21.66		
HSDPA	Subtest 1	9262	1852.4	23.52	0	24.00	21.43	0	22.00
		9400	1880.0	23.48			21.32		
		9538	1907.6	23.85			21.30		
	Subtest 2	9262	1852.4	22.60	0	24.00	21.30	0	22.00
		9400	1880.0	22.90			21.30		
		9538	1907.6	23.10			21.50		
	Subtest 3	9262	1852.4	22.30	0.5	23.50	21.30	0	22.00
		9400	1880.0	22.20			21.20		
		9538	1907.6	22.80			21.30		
	Subtest 4	9262	1852.4	22.00	0.5	23.50	21.30	0	22.00
		9400	1880.0	21.90			21.20		
		9538	1907.6	22.20			21.50		
HSUPA	Subtest 1	9262	1852.4	22.34	0	24.00	20.40	1	21.00
		9400	1880.0	22.48			20.28		
		9538	1907.6	22.85			20.70		
	Subtest 2	9262	1852.4	21.49	2	22.00	20.40	1	21.00
		9400	1880.0	21.42			20.30		
		9538	1907.6	21.73			20.56		
	Subtest 3	9262	1852.4	22.58	1	23.00	20.30	1	21.00
		9400	1880.0	22.47			20.20		
		9538	1907.6	22.82			20.50		
	Subtest 4	9262	1852.4	20.26	2	22.00	20.29	1	21.00
		9400	1880.0	20.15			20.20		
		9538	1907.6	20.49			20.66		
	Subtest 5	9262	1852.4	22.34	1	23.00	20.40	1	21.00
		9400	1880.0	22.48			20.28		
		9538	1907.6	22.85			20.70		
DC-HSDPA	Subtest 1	9262	1852.4	24.40	0	25.00	21.30	0	22.00
		9400	1880.0	24.30			21.30		
		9538	1907.6	24.70			21.50		
	Subtest 2	9262	1852.4	24.33	0	25.00	20.00	1.5	20.50
		9400	1880.0	24.35			19.80		
		9538	1907.6	24.70			20.10		
	Subtest 3	9262	1852.4	24.40	0	25.00	20.00	1.5	20.50
		9400	1880.0	24.33			19.30		
		9538	1907.6	24.58			20.00		
	Subtest 4	9262	1852.4	24.30	0	25.00	20.00	1.5	20.50
		9400	1880.0	24.33			19.40		
		9538	1907.6	24.70			19.50		

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	24.08	N/A	25.00	21.12	N/A	22.00
		1413	1732.6	24.27			21.40		
		1513	1752.6	24.33			21.40		
HSDPA	Subtest 1	1312	1712.4	24.20	0	25.00	21.10	0	22.00
		1413	1732.6	24.40			21.40		
		1513	1752.6	24.40			21.40		
	Subtest 2	1312	1712.4	23.40	1	24.00	21.10	0	22.00
		1413	1732.6	23.50			21.30		
		1513	1752.6	23.50			21.30		
	Subtest 3	1312	1712.4	22.20	2	23.00	21.00	0	22.00
		1413	1732.6	22.30			21.30		
		1513	1752.6	22.50			21.20		
	Subtest 4	1312	1712.4	22.30	2	23.00	21.00	0	22.00
		1413	1732.6	22.40			21.30		
		1513	1752.6	22.50			21.30		
HSUPA	Subtest 1	1312	1712.4	22.40	1	23.00	20.14	1	21.00
		1413	1732.6	22.53			20.37		
		1513	1752.6	22.60			20.40		
	Subtest 2	1312	1712.4	21.27	2	22.00	20.17	1	21.00
		1413	1732.6	21.63			20.38		
		1513	1752.6	21.64			20.41		
	Subtest 3	1312	1712.4	19.99	2	22.00	20.15	1	21.00
		1413	1732.6	20.22			20.37		
		1513	1752.6	20.25			20.40		
	Subtest 4	1312	1712.4	22.38	1	23.00	20.30	1	21.00
		1413	1732.6	22.58			20.20		
		1513	1752.6	22.63			20.13		
	Subtest 5	1312	1712.4	22.40	1	23.00	20.14	1	21.00
		1413	1732.6	22.53			20.37		
		1513	1752.6	22.60			20.40		
DC-HSDPA	Subtest 1	1312	1712.4	24.20	0	25.00	21.00	0	22.00
		1413	1732.6	24.40			21.25		
		1513	1752.6	24.40			21.30		
	Subtest 2	1312	1712.4	24.17	0	25.00	19.80	1	21.00
		1413	1732.6	24.35			19.90		
		1513	1752.6	24.40			20.20		
	Subtest 3	1312	1712.4	24.40	0.5	24.50	20.10	1	21.00
		1413	1732.6	24.36			19.00		
		1513	1752.6	24.40			20.00		
	Subtest 4	1312	1712.4	24.17	0.5	24.50	19.00	1	21.00
		1413	1732.6	24.37			20.00		
		1513	1752.6	24.40			19.00		

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	24.78	N/A	25.00
		4183	836.6	24.78		
		4233	846.6	24.87		
HSDPA	Subtest 1	4132	826.4	23.50	0	24.00
		4183	836.6	23.47		
		4233	846.6	23.50		
	Subtest 2	4132	826.4	22.50	0.5	23.50
		4183	836.6	22.30		
		4233	846.6	22.30		
	Subtest 3	4132	826.4	22.30	0.5	23.50
		4183	836.6	22.30		
		4233	846.6	22.40		
	Subtest 4	4132	826.4	22.30	0.5	23.50
		4183	836.6	22.20		
		4233	846.6	22.30		
HSUPA	Subtest 1	4132	826.4	22.52	0.5	23.50
		4183	836.6	22.48		
		4233	846.6	22.53		
	Subtest 2	4132	826.4	21.51	1.5	22.50
		4183	836.6	21.47		
		4233	846.6	21.60		
	Subtest 3	4132	826.4	21.51	1.5	22.50
		4183	836.6	21.48		
		4233	846.6	21.59		
	Subtest 4	4132	826.4	21.51	1.5	22.50
		4183	836.6	21.51		
		4233	846.6	21.60		
	Subtest 5	4132	826.4	22.52	0.5	23.50
		4183	836.6	22.48		
		4233	846.6	22.53		
DC-HSDPA	Subtest 1	4132	826.4	24.82	0	25.00
		4183	836.6	24.80		
		4233	846.6	24.87		
	Subtest 2	4132	826.4	24.80	0	25.00
		4183	836.6	24.80		
		4233	846.6	24.90		
	Subtest 3	4132	826.4	24.80	0	25.00
		4183	836.6	24.80		
		4233	846.6	24.90		
	Subtest 4	4132	826.4	24.80	0	25.00
		4183	836.6	24.80		
		4233	846.6	24.90		

9.3. LTE

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

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

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

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 17 (704-716 MHz) is covered by LTE Band 12 (699-716 MHz)
   - LTE Band 38 (2570-2620 MHz) is covered by LTE Band 41 (2496-2690 MHz)

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.

LTE Band 5 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	20525	[redacted]		
					836.5 MHz			
10 MHz	QPSK	1	0		24.72		0	25
		1	25		24.59		0	25
		1	49		24.53		0	25
		25	0		22.15		1	24
		25	12		22.10		1	24
		25	25		22.09		1	24
		50	0		22.11		1	24
	16QAM	1	0		22.34		1	24
		1	25		22.04		1	24
		1	49		22.17		1	24
		25	0		21.13		2	23
		25	12		21.09		2	23
		25	25		21.06		2	23
		50	0		21.09		2	23
	64QAM	1	0		21.45		2	23
		1	25		21.30		2	23
		1	49		21.39		2	23
		25	0		20.13		3	22
		25	12		20.12		3	22
		25	25		20.09		3	22
		50	0		20.08		3	22

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				20425	20525	20625		
				826.5 MHz	836.5 MHz	846.5 MHz		
5 MHz	QPSK	1	0	24.75	24.64	24.61	0	25
		1	12	24.69	24.56	24.46	0	25
		1	24	24.73	24.60	24.57	0	25
		12	0	22.25	22.14	22.13	1	24
		12	7	22.20	22.11	22.11	1	24
		12	13	22.19	22.11	22.11	1	24
		25	0	22.21	22.11	22.12	1	24
	16QAM	1	0	22.67	22.69	22.60	1	24
		1	12	22.72	22.65	22.58	1	24
		1	24	22.59	22.58	22.49	1	24
		12	0	21.24	21.18	21.02	2	23
		12	7	21.21	21.08	21.07	2	23
		12	13	21.19	21.12	21.09	2	23
		25	0	21.18	21.07	21.09	2	23
	64QAM	1	0	21.74	21.59	21.67	2	23
		1	12	21.61	21.43	21.49	2	23
		1	24	21.62	21.44	21.54	2	23
		12	0	20.22	20.20	20.22	3	22
		12	7	20.20	20.18	20.15	3	22
		12	13	20.21	20.21	20.17	3	22
		25	0	20.22	20.13	20.09	3	22

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	24.79	24.69	24.67	0	25
		1	8	25.00	24.86	24.98	0	25
		1	14	24.82	24.67	24.68	0	25
		8	0	22.23	22.13	22.13	1	24
		8	4	22.24	22.12	22.11	1	24
		8	7	22.21	22.11	22.11	1	24
		15	0	22.23	22.13	22.14	1	24
	16QAM	1	0	22.51	22.60	22.50	1	24
		1	8	22.58	22.93	22.68	1	24
		1	14	22.38	22.74	22.53	1	24
		8	0	21.28	21.20	21.14	2	23
		8	4	21.26	21.20	21.10	2	23
		8	7	21.26	21.18	21.12	2	23
		15	0	21.25	21.11	21.12	2	23
	64QAM	1	0	21.33	21.48	21.32	2	23
		1	8	21.78	21.17	21.42	2	23
		1	14	21.70	21.31	21.32	2	23
		8	0	20.38	20.12	20.19	3	22
		8	4	20.33	20.11	20.17	3	22
		8	7	20.34	20.10	20.16	3	22
		15	0	20.22	20.10	20.16	3	22

LTE Band 5 Measured Results (continued)

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	24.82	24.68	24.69	0	25
		1	3	24.73	24.59	24.57	0	25
		1	5	24.74	24.61	24.63	0	25
		3	0	24.60	24.51	24.57	0	25
		3	1	24.62	24.56	24.50	0	25
		3	3	24.66	24.57	24.52	0	25
		6	0	22.19	22.10	22.12	1	24
	16QAM	1	0	22.45	22.72	22.40	1	24
		1	3	22.70	22.64	22.27	1	24
		1	5	22.35	22.57	22.29	1	24
		3	0	22.21	22.15	22.05	1	24
		3	1	22.31	22.28	21.99	1	24
		3	3	22.28	22.25	22.15	1	24
		6	0	21.17	21.05	21.11	2	23
	64QAM	1	0	21.60	21.33	21.59	2	23
		1	3	21.54	21.28	21.56	2	23
		1	5	21.56	21.20	21.42	2	23
		3	0	21.22	21.02	21.08	2	23
		3	1	21.22	21.05	21.07	2	23
		3	3	21.23	20.99	21.10	2	23
		6	0	20.22	20.13	20.17	3	22

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	24.52	24.49	24.34	0	25	21.70	21.60	21.53	0	22
		1	49	24.18	24.31	24.11	0	25	21.50	21.20	21.34	0	22
		1	99	24.31	24.20	24.10	0	25	21.40	21.30	21.22	0	22
		50	0	22.47	22.41	22.26	1	24	20.60	20.55	20.44	0	22
		50	24	22.40	22.32	22.21	1	24	20.50	20.46	20.36	0	22
		50	50	22.32	22.26	22.15	1	24	20.45	20.40	20.33	0	22
		100	0	22.37	22.30	22.20	1	24	20.50	20.48	20.36	0	22
	16QAM	1	0	23.03	22.85	22.72	1	24	20.99	21.04	20.83	0	22
		1	49	22.66	22.51	22.31	1	24	20.58	20.74	20.60	0	22
		1	99	22.73	22.51	22.57	1	24	20.72	20.70	20.67	0	22
		50	0	21.50	21.41	21.23	2	23	20.64	20.59	20.47	0	22
		50	24	21.41	21.31	21.22	2	23	20.53	20.51	20.45	0	22
		50	50	21.33	21.21	21.20	2	23	20.45	20.39	20.42	0	22
		100	0	21.35	21.25	21.20	2	23	20.52	20.43	20.38	0	22
	64QAM	1	0	21.66	21.54	21.35	2	23	20.80	21.03	20.70	0	22
		1	49	21.35	21.17	21.05	2	23	20.60	20.70	20.45	0	22
		1	99	21.30	21.20	21.17	2	23	20.58	20.68	20.49	0	22
		50	0	21.25	21.17	20.99	3	22	20.50	20.54	20.39	0	22
		50	24	21.14	21.08	20.98	3	22	20.38	20.46	20.37	0	22
		50	50	21.05	21.00	20.97	3	22	20.39	20.37	20.35	0	22
		100	0	21.13	21.08	20.97	3	22	20.20	20.33	20.34	0	22

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	24.45	24.40	24.36	0	25	21.68	21.61	21.49	0	22
		1	37	24.54	24.22	24.50	0	25	21.86	21.45	21.53	0	22
		1	74	24.27	24.19	24.15	0	25	21.49	21.41	21.27	0	22
		36	0	22.42	22.36	22.25	1	24	20.61	20.53	20.43	0	22
		36	20	22.38	22.29	22.19	1	24	20.57	20.48	20.35	0	22
		36	39	22.33	22.26	22.16	1	24	20.54	20.43	20.32	0	22
		75	0	22.42	22.35	22.25	1	24	20.62	20.54	20.43	0	22
	16QAM	1	0	22.86	22.78	22.76	1	24	21.08	20.90	20.78	0	22
		1	37	22.94	22.62	22.86	1	24	21.15	20.82	20.88	0	22
		1	74	22.64	22.54	22.59	1	24	20.82	20.64	20.64	0	22
		36	0	21.43	21.34	21.25	2	23	20.64	20.58	20.42	0	22
		36	20	21.37	21.26	21.19	2	23	20.57	20.52	20.37	0	22
		36	39	21.34	21.23	21.17	2	23	20.55	20.48	20.34	0	22
		75	0	21.41	21.32	21.25	2	23	20.61	20.55	20.45	0	22
	64QAM	1	0	21.45	21.53	21.54	2	23	20.87	20.92	20.90	0	22
		1	37	21.55	21.46	21.51	2	23	20.82	20.96	20.80	0	22
		1	74	21.18	21.26	21.44	2	23	20.62	20.64	20.78	0	22
		36	0	21.21	21.14	21.04	3	22	20.57	20.49	20.41	0	22
		36	20	21.15	21.07	20.98	3	22	20.51	20.42	20.37	0	22
		36	39	21.12	21.02	20.95	3	22	20.48	20.37	20.35	0	22
		75	0	21.17	21.14	21.02	3	22	20.57	20.50	20.39	0	22

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	24.39	24.37	24.21	0	25	21.54	21.54	21.40	0	22
		1	25	24.32	24.18	24.11	0	25	21.42	21.31	21.30	0	22
		1	49	24.34	24.21	24.14	0	25	21.49	21.39	21.32	0	22
		25	0	22.40	22.33	22.22	1	24	20.59	20.54	20.41	0	22
		25	12	22.36	22.29	22.19	1	24	20.57	20.47	20.36	0	22
		25	25	22.34	22.25	22.16	1	24	20.53	20.47	20.36	0	22
		50	0	22.38	22.30	22.19	1	24	20.57	20.49	20.37	0	22
	16QAM	1	0	22.50	22.68	22.72	1	24	20.96	20.98	20.61	0	22
		1	25	22.31	22.38	22.57	1	24	20.81	20.63	20.38	0	22
		1	49	22.43	22.49	22.67	1	24	20.88	20.75	20.53	0	22
		25	0	21.47	21.36	21.27	2	23	20.60	20.56	20.41	0	22
		25	12	21.44	21.30	21.26	2	23	20.58	20.51	20.38	0	22
		25	25	21.40	21.27	21.20	2	23	20.56	20.48	20.37	0	22
		50	0	21.41	21.30	21.21	2	23	20.58	20.48	20.39	0	22
	64QAM	1	0	21.31	21.34	21.27	2	23	20.90	20.80	20.68	0	22
		1	25	21.20	21.07	21.08	2	23	20.76	20.59	20.47	0	22
		1	49	21.29	21.23	21.13	2	23	20.86	20.71	20.54	0	22
		25	0	21.19	21.16	21.00	3	22	20.55	20.53	20.40	0	22
		25	12	21.16	21.12	20.99	3	22	20.54	20.50	20.41	0	22
		25	25	21.14	21.08	20.98	3	22	20.52	20.44	20.38	0	22
		50	0	21.14	21.10	20.99	3	22	20.53	20.48	20.38	0	22

LTE Band 7 Measured Results (continued)

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	24.34	24.32	24.14	0	25	21.51	21.52	21.31	0	22
		1	12	24.42	24.39	24.10	0	25	21.67	21.59	21.35	0	22
		1	24	24.35	24.31	24.16	0	25	21.51	21.50	21.35	0	22
		12	0	22.33	22.28	22.17	1	24	20.52	20.47	20.36	0	22
		12	7	22.31	22.26	22.14	1	24	20.51	20.44	20.34	0	22
		12	13	22.32	22.23	22.16	1	24	20.49	20.43	20.36	0	22
		25	0	22.31	22.25	22.17	1	24	20.52	20.45	20.36	0	22
	16QAM	1	0	22.70	22.72	22.68	1	24	20.90	20.75	20.74	0	22
		1	12	22.71	22.53	22.75	1	24	20.87	20.83	20.76	0	22
		1	24	22.71	22.70	22.59	1	24	20.92	20.75	20.62	0	22
		12	0	21.33	21.33	21.20	2	23	20.57	20.57	20.41	0	22
		12	7	21.33	21.31	21.18	2	23	20.58	20.51	20.36	0	22
		12	13	21.35	21.30	21.19	2	23	20.61	20.51	20.38	0	22
		25	0	21.30	21.28	21.15	2	23	20.55	20.47	20.38	0	22
	64QAM	1	0	21.17	21.42	21.34	2	23	20.96	20.52	20.55	0	22
		1	12	21.21	21.02	21.14	2	23	20.75	20.62	20.52	0	22
		1	24	21.22	21.44	21.21	2	23	20.85	20.52	20.60	0	22
		12	0	21.11	21.18	21.01	3	22	20.57	20.41	20.31	0	22
		12	7	21.10	21.09	20.93	3	22	20.51	20.39	20.37	0	22
		12	13	21.14	21.10	20.92	3	22	20.53	20.40	20.37	0	22
		25	0	21.11	21.08	19.90	3	22	20.51	20.45	20.37	0	22

LTE Band 12 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	23095	[redacted]		
				[redacted]	707.5 MHz	[redacted]		
10 MHz	QPSK	1	0		24.10		0	25
		1	25		24.02		0	25
		1	49		24.01		0	25
		25	0		22.07		1	24
		25	12		22.03		1	24
		25	25		21.99		1	24
		50	0		22.04		1	24
	16QAM	1	0		22.31		1	24
		1	25		22.06		1	24
		1	49		22.22		1	24
		25	0		21.16		2	23
		25	12		21.12		2	23
		25	25		21.09		2	23
		50	0		21.09		2	23
	64QAM	1	0		21.32		2	23
		1	25		21.05		2	23
		1	49		21.11		2	23
		25	0		20.12		3	22
		25	12		20.05		3	22
		25	25		20.04		3	22
		50	0		20.05		3	22

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	24.07	24.00	24.03	0	25
		1	12	23.97	23.91	24.08	0	25
		1	24	24.09	23.98	24.00	0	25
		12	0	22.11	22.04	22.01	1	24
		12	7	22.09	22.01	21.98	1	24
		12	13	22.10	22.02	21.97	1	24
		25	0	22.11	22.03	21.99	1	24
	16QAM	1	0	22.48	22.43	22.36	1	24
		1	12	22.47	22.44	22.21	1	24
		1	24	22.38	22.31	22.39	1	24
		12	0	21.10	21.11	21.09	2	23
		12	7	21.11	21.05	21.07	2	23
		12	13	21.10	21.08	21.07	2	23
		25	0	21.12	21.11	21.06	2	23
	64QAM	1	0	21.32	21.38	21.40	2	23
		1	12	21.06	21.08	21.34	2	23
		1	24	21.40	21.39	21.27	2	23
		12	0	20.18	20.05	20.07	3	22
		12	7	20.18	20.11	20.09	3	22
		12	13	20.19	20.10	20.12	3	22
		25	0	20.17	20.06	19.98	3	22

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	24.12	24.05	24.01	0	25
		1	8	24.29	24.22	23.72	0	25
		1	14	24.15	24.11	23.89	0	25
		8	0	22.07	21.98	21.96	1	24
		8	4	22.05	21.97	21.93	1	24
		8	7	22.02	21.96	21.91	1	24
		15	0	22.07	22.01	21.98	1	24
	16QAM	1	0	22.42	22.62	22.35	1	24
		1	8	22.72	22.71	22.37	1	24
		1	14	22.46	22.57	22.37	1	24
		8	0	21.12	21.07	21.03	2	23
		8	4	21.13	21.10	21.03	2	23
		8	7	21.12	21.04	21.01	2	23
		15	0	21.16	21.06	21.03	2	23
	64QAM	1	0	21.43	21.33	21.11	2	23
		1	8	21.14	20.99	21.36	2	23
		1	14	21.28	21.16	21.31	2	23
		8	0	20.11	20.06	20.06	3	22
		8	4	20.07	20.04	20.06	3	22
		8	7	20.09	20.05	20.04	3	22
		15	0	20.11	20.06	20.01	3	22

LTE Band 12 Measured Results (continued)

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	24.15	24.08	24.04	0	25
		1	3	24.06	24.02	23.96	0	25
		1	5	24.08	24.02	23.98	0	25
		3	0	23.98	23.96	23.92	0	25
		3	1	24.01	24.02	23.94	0	25
		3	3	24.02	23.98	24.00	0	25
		6	0	22.06	22.02	21.91	1	24
	16QAM	1	0	22.60	22.44	22.36	1	24
		1	3	22.46	22.36	22.21	1	24
		1	5	22.48	22.30	22.25	1	24
		3	0	22.11	22.12	21.99	1	24
		3	1	22.22	22.25	22.13	1	24
		3	3	22.20	22.16	22.07	1	24
		6	0	21.01	20.99	20.99	2	23
	64QAM	1	0	21.18	21.36	21.11	2	23
		1	3	20.97	21.34	21.04	2	23
		1	5	21.33	21.20	20.97	2	23
		3	0	21.10	21.33	21.03	2	23
		3	1	21.15	21.36	21.03	2	23
		3	3	21.17	21.33	21.04	2	23
		6	0	20.01	20.04	20.00	3	22

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]	24.74	[redacted]	0	25
		1	25	[redacted]	24.70	[redacted]	0	25
		1	49	[redacted]	24.65	[redacted]	0	25
		25	0	[redacted]	22.24	[redacted]	1	24
		25	12	[redacted]	22.18	[redacted]	1	24
		25	25	[redacted]	22.16	[redacted]	1	24
		50	0	[redacted]	22.19	[redacted]	1	24
	16QAM	1	0	[redacted]	22.48	[redacted]	1	24
		1	25	[redacted]	22.19	[redacted]	1	24
		1	49	[redacted]	22.33	[redacted]	1	24
		25	0	[redacted]	21.26	[redacted]	2	23
		25	12	[redacted]	21.21	[redacted]	2	23
		25	25	[redacted]	21.19	[redacted]	2	23
		50	0	[redacted]	21.19	[redacted]	2	23
	64QAM	1	0	[redacted]	21.46	[redacted]	2	23
		1	25	[redacted]	21.31	[redacted]	2	23
		1	49	[redacted]	21.37	[redacted]	2	23
		25	0	[redacted]	20.23	[redacted]	3	22
		25	12	[redacted]	20.19	[redacted]	3	22
		25	25	[redacted]	20.16	[redacted]	3	22
		50	0	[redacted]	20.16	[redacted]	3	22

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]	24.66	[redacted]	0	25
		1	12	[redacted]	24.55	[redacted]	0	25
		1	24	[redacted]	24.63	[redacted]	0	25
		12	0	[redacted]	22.18	[redacted]	1	24
		12	7	[redacted]	22.15	[redacted]	1	24
		12	13	[redacted]	22.15	[redacted]	1	24
		25	0	[redacted]	22.16	[redacted]	1	24
	16QAM	1	0	[redacted]	22.58	[redacted]	1	24
		1	12	[redacted]	22.55	[redacted]	1	24
		1	24	[redacted]	22.44	[redacted]	1	24
		12	0	[redacted]	21.19	[redacted]	2	23
		12	7	[redacted]	21.13	[redacted]	2	23
		12	13	[redacted]	21.15	[redacted]	2	23
		25	0	[redacted]	21.17	[redacted]	2	23
	64QAM	1	0	[redacted]	21.54	[redacted]	2	23
		1	12	[redacted]	21.39	[redacted]	2	23
		1	24	[redacted]	21.42	[redacted]	2	23
		12	0	[redacted]	20.34	[redacted]	3	22
		12	7	[redacted]	20.23	[redacted]	3	22
		12	13	[redacted]	20.26	[redacted]	3	22
		25	0	[redacted]	20.17	[redacted]	3	22

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	24.40	24.32	24.56	0	25	21.31	21.20	21.41	0	22
		1	49	24.02	23.95	24.22	0	25	21.09	20.79	21.22	0	22
		1	99	24.14	24.10	24.22	0	25	20.98	20.97	21.10	0	22
		50	0	22.34	22.25	22.54	1	24	21.24	21.10	21.34	1	22
		50	24	22.26	22.20	22.48	1	24	21.16	21.06	21.29	1	22
		50	50	22.14	22.14	22.40	1	24	21.06	21.01	21.20	1	22
		100	0	22.25	22.22	22.47	1	24	21.12	21.05	21.29	1	22
	16QAM	1	0	22.88	22.61	23.11	1	24	21.54	21.57	21.69	1	22
		1	49	22.57	22.34	22.81	1	24	21.22	21.33	21.31	1	22
		1	99	22.57	22.41	22.80	1	24	21.18	21.38	21.40	1	22
		50	0	21.36	21.26	21.56	2	23	21.24	21.11	21.34	2	22
		50	24	21.28	21.21	21.50	2	23	21.14	21.08	21.29	2	22
		50	50	21.19	21.14	21.40	2	23	21.05	21.04	21.21	2	22
		100	0	21.21	21.18	21.43	2	23	21.08	21.05	21.28	2	22
	64QAM	1	0	21.75	21.70	21.94	2	23	21.65	21.44	21.74	2	22
		1	49	21.45	21.33	21.63	2	23	21.28	21.23	21.46	2	22
		1	99	21.41	21.44	21.62	2	23	21.27	21.24	21.44	2	22
		50	0	20.30	20.22	20.49	3	22	20.24	20.07	20.33	3	22
		50	24	20.22	20.16	20.44	3	22	20.14	20.02	20.27	3	22
		50	50	20.13	20.12	20.37	3	22	20.05	19.99	20.19	3	22
		100	0	20.21	20.14	20.42	3	22	20.12	20.02	20.27	3	22

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	24.41	24.27	24.53	0	25	21.30	21.12	21.39	0	22
		1	37	24.55	24.41	24.62	0	25	21.47	20.96	21.50	0	22
		1	74	24.18	24.10	24.22	0	25	21.05	20.93	21.11	0	22
		36	0	22.38	22.26	22.56	1	24	21.26	21.09	21.38	1	22
		36	20	22.31	22.22	22.49	1	24	21.20	21.03	21.31	1	22
		36	39	22.27	22.20	22.44	1	24	21.15	21.00	21.26	1	22
		75	0	22.32	22.23	22.49	1	24	21.25	21.10	21.36	1	22
	16QAM	1	0	22.62	22.58	22.82	1	24	21.62	21.48	21.74	1	22
		1	37	22.52	22.52	22.86	1	24	21.69	21.44	21.83	1	22
		1	74	22.35	22.38	22.56	1	24	21.32	21.33	21.47	1	22
		36	0	21.36	21.25	21.53	2	23	21.27	21.06	21.37	2	22
		36	20	21.28	21.21	21.48	2	23	21.18	21.01	21.30	2	22
		36	39	21.24	21.16	21.42	2	23	21.14	21.00	21.24	2	22
		75	0	21.31	21.21	21.52	2	23	21.20	21.07	21.31	2	22
	64QAM	1	0	21.64	21.63	21.73	2	23	21.52	21.43	21.74	2	22
		1	37	21.54	21.56	21.73	2	23	21.40	21.49	21.75	2	22
		1	74	21.31	21.44	21.50	2	23	21.19	21.28	21.50	2	22
		36	0	20.33	20.23	20.51	3	22	20.25	20.06	20.40	3	22
		36	20	20.24	20.18	20.46	3	22	20.16	20.01	20.33	3	22
		36	39	20.20	20.15	20.40	3	22	20.12	19.98	20.27	3	22
		75	0	20.26	20.21	20.47	3	22	20.19	20.06	20.36	3	22

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	24.35	24.22	24.51	0	25	21.21	21.11	21.37	0	22
		1	25	24.28	24.18	24.42	0	25	21.11	20.95	21.26	0	22
		1	49	24.28	24.19	24.33	0	25	21.09	20.98	21.21	0	22
		25	0	22.28	22.18	22.50	1	24	21.18	21.05	21.33	1	22
		25	12	22.22	22.16	22.45	1	24	21.15	21.00	21.27	1	22
		25	25	22.22	22.14	22.40	1	24	21.13	21.00	21.23	1	22
		50	0	22.24	22.17	22.46	1	24	21.17	21.03	21.27	1	22
	16QAM	1	0	22.56	22.36	22.60	1	24	21.62	21.46	21.58	1	22
		1	25	22.30	22.19	22.31	1	24	21.44	21.16	21.30	1	22
		1	49	22.42	22.33	22.43	1	24	21.51	21.33	21.40	1	22
		25	0	21.28	21.18	21.51	2	23	21.21	21.07	21.37	2	22
		25	12	21.24	21.16	21.45	2	23	21.16	21.03	21.30	2	22
		25	25	21.22	21.14	21.41	2	23	21.15	21.04	21.25	2	22
		50	0	21.24	21.16	21.45	2	23	21.13	21.01	21.26	2	22
	64QAM	1	0	21.57	21.29	21.68	2	23	21.43	21.39	21.59	2	22
		1	25	21.40	21.05	21.51	2	23	21.28	21.20	21.32	2	22
		1	49	21.48	21.15	21.53	2	23	21.37	21.37	21.33	2	22
		25	0	20.27	20.19	20.49	3	22	20.18	20.09	20.42	3	22
		25	12	20.23	20.16	20.44	3	22	20.15	20.06	20.36	3	22
		25	25	20.20	20.13	20.40	3	22	20.12	20.05	20.31	3	22
		50	0	20.20	20.14	20.41	3	22	20.15	20.05	20.32	3	22

LTE Band 25 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				26065	26365	26665	MPR	Tune-up Limit	26065	26365	26665	MPR	Tune-up Limit
				1852.5 MHz	1882.5 MHz	1912.5 MHz			1852.5 MHz	1882.5 MHz	1912.5 MHz		
5 MHz	QPSK	1	0	24.25	24.18	24.41	0	25	21.22	21.06	21.24	0	22
		1	12	24.18	24.07	24.28	0	25	21.39	20.99	21.13	0	22
		1	24	24.28	24.19	24.36	0	25	21.21	21.06	21.20	0	22
		12	0	22.28	22.18	22.44	1	24	21.20	21.01	21.26	1	22
		12	7	22.25	22.15	22.39	1	24	21.18	20.98	21.23	1	22
		12	13	22.25	22.16	22.41	1	24	21.17	21.00	21.21	1	22
		25	0	22.25	22.15	22.40	1	24	21.17	20.99	21.23	1	22
	16QAM	1	0	22.78	22.69	23.07	1	24	21.49	21.30	21.54	1	22
		1	12	22.77	22.76	23.06	1	24	21.22	21.19	21.51	1	22
		1	24	22.65	22.59	22.91	1	24	21.51	21.33	21.36	1	22
		12	0	21.26	21.12	21.43	2	23	21.28	21.06	21.25	2	22
		12	7	21.22	21.15	21.41	2	23	21.24	21.02	21.20	2	22
		12	13	21.23	21.14	21.43	2	23	21.21	21.04	21.19	2	22
		25	0	21.26	21.17	21.43	2	23	21.18	21.01	21.22	2	22
	64QAM	1	0	21.49	21.59	21.63	2	23	21.33	21.47	21.68	2	22
		1	12	21.34	21.36	21.50	2	23	21.40	21.24	21.38	2	22
		1	24	21.56	21.48	21.62	2	23	21.36	21.51	21.49	2	22
		12	0	20.34	20.22	20.46	3	22	20.25	20.07	20.25	3	22
		12	7	20.26	20.14	20.43	3	22	20.20	20.07	20.26	3	22
		12	13	20.27	20.16	20.40	3	22	20.21	20.06	20.24	3	22
		25	0	20.28	20.12	20.42	3	22	20.21	20.02	20.23	3	22

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				26055	26365	26675	MPR	Tune-up Limit	26055	26365	26675	MPR	Tune-up Limit
				1851.5 MHz	1882.5 MHz	1913.5 MHz			1851.5 MHz	1882.5 MHz	1913.5 MHz		
3 MHz	QPSK	1	0	24.37	24.21	24.48	0	25	21.25	21.02	21.28	0	22
		1	8	24.54	24.41	24.66	0	25	21.45	20.85	21.55	0	22
		1	14	24.36	24.24	24.42	0	25	21.23	20.95	21.26	0	22
		8	0	22.29	22.19	22.39	1	24	21.17	20.98	21.23	1	22
		8	4	22.27	22.20	22.41	1	24	21.11	20.95	21.17	1	22
		8	7	22.25	22.15	22.37	1	24	21.15	20.97	21.19	1	22
		15	0	22.26	22.17	22.39	1	24	21.15	20.97	21.21	1	22
	16QAM	1	0	22.43	22.21	22.61	1	24	21.53	21.34	21.46	1	22
		1	8	22.59	22.20	22.75	1	24	21.82	21.25	21.53	1	22
		1	14	22.46	22.29	22.53	1	24	21.59	21.20	21.45	1	22
		8	0	21.33	21.18	21.47	2	23	21.20	21.01	21.29	2	22
		8	4	21.28	21.17	21.46	2	23	21.24	21.05	21.27	2	22
		8	7	21.32	21.18	21.41	2	23	21.21	21.03	21.25	2	22
		15	0	21.26	21.16	21.41	2	23	21.15	21.02	21.24	2	22
	64QAM	1	0	21.30	21.35	21.55	2	23	21.32	21.24	21.63	2	22
		1	8	21.51	21.04	21.76	2	23	21.31	21.39	21.39	2	22
		1	14	21.37	21.19	21.51	2	23	21.47	21.24	21.51	2	22
		8	0	20.26	20.20	20.45	3	22	20.22	20.10	20.28	3	22
		8	4	20.29	20.16	20.45	3	22	20.22	20.09	20.27	3	22
		8	7	20.26	20.15	20.42	3	22	20.18	20.06	20.25	3	22
		15	0	20.22	20.08	20.34	3	22	20.18	20.08	20.27	3	22

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					Reduced Average Power (dBm)				
				26047	26365	26683	MPR	Tune-up Limit	26047	26365	26683	MPR	Tune-up Limit
				1850.7 MHz	1882.5 MHz	1914.3 MHz			1850.7 MHz	1882.5 MHz	1914.3 MHz		
1.4 MHz	QPSK	1	0	24.31	24.23	24.41	0	25	21.26	21.11	21.30	0	22
		1	3	24.23	24.15	24.27	0	25	21.15	20.96	21.20	0	22
		1	5	24.25	24.22	24.34	0	25	21.18	21.02	21.21	0	22
		3	0	24.15	24.10	24.29	0	25	21.12	20.86	21.10	0	22
		3	1	24.14	24.11	24.21	0	25	21.18	20.89	21.13	0	22
		3	3	24.20	24.10	24.31	0	25	21.15	20.90	21.14	0	22
		6	0	22.25	22.14	22.38	1	24	21.16	20.99	21.17	1	22
	16QAM	1	0	22.66	22.63	22.63	1	24	21.29	21.39	21.41	1	22
		1	3	22.55	22.40	22.45	1	24	21.06	21.27	21.38	1	22
		1	5	22.53	22.46	22.44	1	24	21.25	21.25	21.34	1	22
		3	0	22.23	22.20	22.25	1	24	21.18	20.95	21.11	1	22
		3	1	22.31	22.13	22.23	1	24	21.19	21.07	21.06	1	22
		3	3	22.32	22.15	22.40	1	24	21.13	21.10	21.19	1	22
		6	0	21.17	21.20	21.45	2	23	21.17	20.99	21.27	2	22
	64QAM	1	0	21.47	21.45	21.47	2	23	21.42	21.24	21.72	2	22
		1	3	21.21	21.36	21.41	2	23	21.30	21.12	21.65	2	22
		1	5	21.24	21.36	21.40	2	23	21.57	21.11	21.52	2	22
		3	0	21.38	21.20	21.43	2	23	21.11	21.08	21.28	2	22
		3	1	21.37	21.18	21.48	2	23	21.15	21.12	21.27	2	22
		3	3	21.40	21.19	21.48	2	23	21.18	21.13	21.32	2	22
		6	0	20.24	20.10	20.34	3	22	20.19	20.00	20.26	3	22

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		24.40		0	25
		1	37		24.51		0	25
		1	74		24.10		0	25
		36	0		22.35		1	24
		36	20		22.26		1	24
		36	39		22.22		1	24
		75	0		22.34		1	24
	16QAM	1	0		22.63		1	24
		1	37		22.70		1	24
		1	74		22.39		1	24
		36	0		21.36		2	23
		36	20		21.27		2	23
		36	39		21.24		2	23
		75	0		21.32		2	23
	64QAM	1	0		21.68		2	23
		1	37		21.62		2	23
		1	74		21.46		2	23
		36	0		20.32		3	22
		36	20		20.23		3	22
		36	39		20.18		3	22
		75	0		20.30		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	24.43	24.32	24.29	0	25
		1	25	24.33	24.22	24.16	0	25
		1	49	24.30	24.18	24.12	0	25
		25	0	22.35	22.26	22.20	1	24
		25	12	22.33	22.18	22.15	1	24
		25	25	22.28	22.19	22.12	1	24
		50	0	22.35	22.20	22.17	1	24
	16QAM	1	0	22.66	22.30	22.38	1	24
		1	25	22.36	22.06	22.15	1	24
		1	49	22.55	22.18	22.25	1	24
		25	0	21.38	21.27	21.19	2	23
		25	12	21.33	21.22	21.14	2	23
		25	25	21.30	21.20	21.13	2	23
		50	0	21.34	21.22	21.18	2	23
	64QAM	1	0	21.58	21.51	21.49	2	23
		1	25	21.38	21.27	21.29	2	23
		1	49	21.53	21.28	21.41	2	23
		25	0	20.38	20.26	20.27	3	22
		25	12	20.34	20.20	20.24	3	22
		25	25	20.30	20.18	20.24	3	22
		50	0	20.34	20.24	20.24	3	22

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	24.41	24.22	24.23	0	25
		1	12	24.34	24.19	24.22	0	25
		1	24	24.41	24.21	24.23	0	25
		12	0	22.38	22.24	22.19	1	24
		12	7	22.36	22.22	22.16	1	24
		12	13	22.37	22.20	22.18	1	24
		25	0	22.35	22.21	22.15	1	24
	16QAM	1	0	22.77	22.47	22.71	1	24
		1	12	22.73	22.51	22.77	1	24
		1	24	22.66	22.37	22.60	1	24
		12	0	21.43	21.22	21.23	2	23
		12	7	21.35	21.20	21.15	2	23
		12	13	21.37	21.21	21.17	2	23
		25	0	21.34	21.21	21.19	2	23
	64QAM	1	0	21.84	21.64	21.38	2	23
		1	12	21.58	21.35	21.16	2	23
		1	24	21.70	21.63	21.40	2	23
		12	0	20.39	20.17	20.31	3	22
		12	7	20.40	20.22	20.19	3	22
		12	13	20.43	20.22	20.19	3	22
		25	0	20.38	20.25	20.20	3	22

LTE Band 26 Measured Results (continued)

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	24.49	24.28	24.21	0	25
		1	8	24.37	24.48	24.33	0	25
		1	14	24.40	24.28	24.21	0	25
		8	0	22.43	22.23	22.18	1	24
		8	4	22.44	22.21	22.16	1	24
		8	7	22.41	22.19	22.14	1	24
		15	0	22.43	22.21	22.17	1	24
	16QAM	1	0	22.92	22.42	22.50	1	24
		1	8	22.74	22.52	22.92	1	24
		1	14	22.76	22.41	22.65	1	24
		8	0	21.47	21.26	21.21	2	23
		8	4	21.43	21.25	21.24	2	23
		8	7	21.45	21.26	21.19	2	23
		15	0	21.45	21.24	21.17	2	23
	64QAM	1	0	21.30	21.66	21.27	2	23
		1	8	21.68	21.07	21.36	2	23
		1	14	21.56	21.49	21.33	2	23
		8	0	20.38	20.21	20.18	3	22
		8	4	20.42	20.19	20.22	3	22
		8	7	20.36	20.18	20.17	3	22
		15	0	20.36	20.24	20.15	3	22

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	24.52	24.31	24.28	0	25
		1	3	24.45	24.25	24.19	0	25
		1	5	24.43	24.22	24.23	0	25
		3	0	24.41	24.23	24.18	0	25
		3	1	24.40	24.24	24.06	0	25
		3	3	24.40	24.21	24.11	0	25
		6	0	22.42	22.23	22.19	1	24
	16QAM	1	0	22.47	22.54	22.53	1	24
		1	3	22.48	22.33	22.41	1	24
		1	5	22.52	22.37	22.34	1	24
		3	0	22.45	22.27	22.16	1	24
		3	1	22.37	22.12	22.17	1	24
		3	3	22.46	22.21	22.26	1	24
		6	0	21.45	21.26	21.24	2	23
	64QAM	1	0	21.68	21.85	21.45	2	23
		1	3	21.67	21.76	21.35	2	23
		1	5	21.55	21.47	21.41	2	23
		3	0	21.52	21.30	21.16	2	23
		3	1	21.55	21.21	21.25	2	23
		3	3	21.53	21.23	21.26	2	23
		6	0	20.44	20.27	20.24	3	22

LTE Band 41 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					MPR	Tune-up Limit	Reduced Average Power (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490			39750	40185	40620	41055	41490		
				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	23.83	23.63	23.74	23.69	23.91	0	24	20.53	20.37	20.45	20.45	20.55	0	21.5
		1	49	23.62	23.47	23.53	23.39	23.71	0	24	20.43	20.14	20.20	20.16	20.50	0	21.5
		1	99	23.55	23.43	23.40	23.28	23.70	0	24	20.18	20.05	20.22	20.19	20.30	0	21.5
		50	0	21.74	21.59	21.61	21.52	21.73	1	23	21.01	20.83	20.94	20.92	21.12	0	21.5
		50	24	21.67	21.51	21.54	21.50	21.67	1	23	20.95	20.77	20.88	20.86	21.05	0	21.5
		50	50	21.62	21.50	21.50	21.50	21.61	1	23	20.89	20.71	20.82	20.80	21.01	0	21.5
		100	0	21.66	21.50	21.53	21.50	21.65	1	23	20.93	20.75	20.86	20.86	21.06	0	21.5
	16QAM	1	0	21.98	21.67	21.81	21.70	21.88	1	23	20.46	20.34	20.56	20.59	20.64	0	21.5
		1	49	21.60	21.98	21.50	21.55	22.03	1	23	20.55	20.56	20.25	20.58	20.65	0	21.5
		1	99	21.77	21.54	21.59	21.50	21.56	1	23	20.15	20.23	20.19	20.52	20.75	0	21.5
		50	0	20.70	20.64	20.62	20.50	20.75	2	22	21.01	20.88	20.98	20.92	21.11	0	21.5
		50	24	20.67	20.50	20.55	20.50	20.66	2	22	20.96	20.76	20.82	20.86	21.11	0	21.5
		50	50	20.58	20.50	20.50	20.50	20.64	2	22	20.86	20.72	20.85	20.85	21.04	0	21.5
		100	0	20.63	20.50	20.52	20.50	20.63	2	22	20.90	20.73	20.85	20.81	20.99	0	21.5
	64QAM	1	0	20.84	20.79	20.62	20.50	21.20	2	22	21.04	20.94	20.55	20.82	20.59	0	21.5
		1	49	20.65	20.50	20.50	21.03	20.50	2	22	21.11	20.44	20.04	20.78	20.80	0	21.5
		1	99	20.60	20.50	20.53	20.63	20.95	2	22	20.95	20.43	20.80	20.72	20.91	0	21.5
		50	0	19.76	19.68	19.66	19.63	19.83	3	21	19.89	19.74	19.78	19.66	19.90	0	21.5
		50	24	19.71	19.59	19.62	19.50	19.77	3	21	19.77	19.71	19.73	19.61	19.87	0	21.5
		50	50	19.65	19.51	19.57	19.50	19.73	3	21	19.73	19.63	19.73	19.54	19.81	0	21.5
		100	0	19.68	19.52	19.57	19.50	19.76	3	21	19.77	19.65	19.63	19.57	19.83	0	21.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					MPR	Tune-up Limit	Reduced Average Power (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490			39750	40185	40620	41055	41490		
				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	23.83	23.66	23.61	23.51	23.82	0	24	20.41	20.27	20.39	20.34	20.62	0	21.5
		1	37	23.61	23.36	23.33	23.34	23.54	0	24	20.29	19.95	20.14	20.22	20.36	0	21.5
		1	74	23.57	23.39	23.40	23.41	23.57	0	24	20.14	20.06	20.20	20.09	20.32	0	21.5
		36	0	21.73	21.55	21.57	21.50	21.72	1	23	20.95	20.76	20.87	20.86	21.08	0	21.5
		36	20	21.66	21.51	21.52	21.50	21.67	1	23	20.91	20.70	20.83	20.80	21.05	0	21.5
		36	39	21.62	21.50	21.50	21.50	21.63	1	23	20.86	20.66	20.78	20.76	21.01	0	21.5
		75	0	21.72	21.55	21.57	21.50	21.72	1	23	20.96	20.76	20.87	20.87	21.11	0	21.5
	16QAM	1	0	21.62	21.70	21.50	21.57	22.00	1	23	20.56	20.16	20.50	20.45	20.65	0	21.5
		1	37	21.60	21.50	21.50	21.50	21.62	1	23	20.35	20.19	20.04	20.26	20.35	0	21.5
		1	74	21.50	21.50	21.50	21.50	21.63	1	23	20.09	20.14	20.13	20.26	20.50	0	21.5
		36	0	20.71	20.50	20.54	20.53	20.71	2	22	21.00	20.74	20.84	20.83	21.03	0	21.5
		36	20	20.66	20.50	20.50	20.50	20.61	2	22	20.87	20.69	20.83	20.86	21.03	0	21.5
		36	39	20.63	20.50	20.50	20.50	20.61	2	22	20.83	20.64	20.78	20.75	20.95	0	21.5
		75	0	20.70	20.50	20.57	20.50	20.64	2	22	20.98	20.72	20.89	20.89	21.09	0	21.5
	64QAM	1	0	20.79	20.69	20.95	20.75	20.85	2	22	21.08	20.67	20.63	20.81	20.85	0	21.5
		1	37	20.70	20.76	20.52	20.50	20.72	2	22	20.73	20.31	20.42	20.53	20.71	0	21.5
		1	74	20.66	20.70	20.75	20.50	20.56	2	22	20.74	20.47	20.47	20.91	20.77	0	21.5
		36	0	19.66	19.60	19.56	19.50	19.75	3	21	19.83	19.66	19.68	19.53	19.83	0	21.5
		36	20	19.60	19.50	19.51	19.50	19.68	3	21	19.75	19.61	19.61	19.50	19.78	0	21.5
		36	39	19.56	19.50	19.50	19.50	19.67	3	21	19.65	19.59	19.61	19.50	19.73	0	21.5
		75	0	19.74	19.57	19.58	19.56	19.77	3	21	19.84	19.70	19.68	19.63	19.84	0	21.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					MPR	Tune-up Limit	Reduced Average Power (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490			39750	40185	40620	41055	41490		
				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	23.72	23.55	23.64	23.48	23.69	0	24	20.38	20.18	20.36	20.34	20.51	0	21.5
		1	25	23.50	23.54	23.60	23.27	23.68	0	24	20.17	20.18	20.32	20.11	20.50	0	21.5
		1	49	23.58	23.46	23.47	23.33	23.62	0	24	20.20	20.07	20.16	20.13	20.40	0	21.5
		25	0	21.71	21.54	21.56	21.50	21.69	1	23	20.95	20.76	20.87	20.88	21.09	0	21.5
		25	12	21.68	21.50	21.51	21.50	21.66	1	23	20.93	20.74	20.82	20.84	21.06	0	21.5
		25	25	21.64	21.50	21.50	21.50	21.63	1	23	20.88	20.70	20.81	20.81	21.04	0	21.5
		50	0	21.66	21.51	21.53	21.50	21.67	1	23	20.91	20.74	20.84	20.85	21.05	0	21.5
	16QAM	1	0	21.96	21.50	21.53	21.70	21.69	1	23	20.57	20.10	20.23	20.54	20.53	0	21.5
		1	25	21.83	21.50	21.50	21.63	21.54	1	23	20.42	19.92	20.09	20.40	20.40	0	21.5
		1	49	21.89	21.50	21.50	21.62	21.56	1	23	20.49	19.94	20.11	20.41	20.37	0	21.5
		25	0	20.72	20.55	20.54	20.50	20.69	2	22	20.96	20.80	20.89	20.91	21.13	0	21.5
		25	12	20.67	20.50	20.51	20.50	20.69	2	22	20.94	20.76	20.84	20.88	21.12	0	21.5
		25	25	20.64	20.50	20.50	20.50	20.65	2	22	20.91	20.74	20.85	20.86	21.10	0	21.5
		50	0	20.64	20.51	20.51	20.50	20.68	2	22	20.91	20.77	20.84	20.85	21.10	0	21.5
	64QAM	1	0	20.64	20.66	20.93	20.50	20.72	2	22	20.82	20.63	21.04	20.55	20.79	0	21.5
		1	25	20.50	20.57	20.81	20.50	20.68	2	22	20.64	20.52	20.92	20.32	20.71	0	21.5
		1	49	20.60	20.50	20.78	20.50	20.58	2	22	20.77	20.46	20.89	20.48	20.66	0	21.5
		25	0	19.79	19.60	19.66	19.57	19.78	3	21	19.91	19.73	19.76	19.68	19.92	0	21.5
		25	12	19.73	19.55	19.61	19.53	19.75	3	21	19.86	19.70	19.73	19.64	19.89	0	21.5
		25	25	19.71	19.53	19.60	19.52	19.74	3	21	19.84	19.68	19.70	19.61	19.87	0	21.5
		50	0	19.75	19.56	19.64	19.55	19.78	3	21	19.84	19.70	19.75	19.63	19.87	0	21.5

LTE Band 41 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	23.72	23.52	23.58	23.53	23.66	0	24	20.37	20.24	20.36	20.34	20.55	0	21.5
		1	12	23.50	23.33	23.41	23.32	23.53	0	24	20.20	20.06	20.19	20.16	20.39	0	21.5
		1	24	23.64	23.40	23.48	23.44	23.56	0	24	20.30	20.11	20.25	20.22	20.41	0	21.5
		12	0	21.65	21.50	21.50	21.50	21.63	1	23	20.91	20.74	20.83	20.83	21.05	0	21.5
		12	7	21.62	21.50	21.50	21.50	21.59	1	23	20.86	20.69	20.79	20.79	21.02	0	21.5
		12	13	21.61	21.50	21.50	21.50	21.59	1	23	20.87	20.68	20.79	20.80	20.99	0	21.5
		25	0	21.63	21.50	21.50	21.50	21.63	1	23	20.90	20.73	20.82	20.83	21.05	0	21.5
	16QAM	1	0	21.50	21.63	21.51	21.50	21.73	1	23	20.35	20.37	20.43	20.24	20.45	0	21.5
		1	12	21.50	21.50	21.50	21.50	21.50	1	23	20.21	20.23	20.29	20.11	20.29	0	21.5
		1	24	21.51	21.62	21.50	21.50	21.74	1	23	20.36	20.34	20.32	20.23	20.44	0	21.5
		12	0	20.61	20.50	20.54	20.50	20.60	2	22	20.87	20.69	20.84	20.79	20.98	0	21.5
		12	7	20.58	20.50	20.51	20.50	20.59	2	22	20.85	20.66	20.81	20.77	20.95	0	21.5
		12	13	20.60	20.50	20.50	20.50	20.58	2	22	20.82	20.66	20.80	20.77	20.95	0	21.5
		25	0	20.62	20.50	20.50	20.50	20.63	2	22	20.87	20.72	20.82	20.81	21.06	0	21.5
	64QAM	1	0	21.72	20.76	20.66	20.50	20.94	2	22	20.89	20.73	20.70	20.56	21.05	0	21.5
		1	12	20.53	20.63	20.50	20.60	20.83	2	22	20.67	20.59	20.50	20.29	20.97	0	21.5
		1	24	20.61	20.78	20.50	20.50	20.98	2	22	20.77	20.74	20.56	20.43	21.05	0	21.5
		12	0	19.77	19.50	19.63	19.51	19.73	3	21	19.80	19.66	19.72	19.60	19.83	0	21.5
		12	7	19.72	19.50	19.60	19.50	19.70	3	21	19.77	19.62	19.69	19.58	19.81	0	21.5
		12	13	19.73	19.50	19.59	19.50	19.71	3	21	19.76	19.62	19.68	19.58	19.82	0	21.5
		25	0	19.70	19.57	19.57	19.50	19.76	3	21	19.81	19.65	19.69	19.57	19.85	0	21.5

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	23.99	24.14	24.17	0	25	21.05	21.16	21.18	0	22
		1	49	23.55	23.73	23.81	0	25	20.61	20.77	20.79	0	22
		1	99	23.70	23.92	23.89	0	25	20.76	20.94	20.92	0	22
		50	0	21.96	22.08	22.14	1	24	20.94	21.08	21.15	0	22
		50	24	21.87	22.03	22.10	1	24	20.87	21.03	21.10	0	22
		50	50	21.79	21.96	22.02	1	24	20.80	20.98	21.02	0	22
		100	0	21.86	22.01	22.09	1	24	20.88	21.04	21.09	0	22
	16QAM	1	0	22.50	22.56	22.54	1	24	21.54	21.59	21.72	0	22
		1	49	22.17	22.27	22.31	1	24	21.26	21.26	21.39	0	22
		1	99	22.19	22.34	22.30	1	24	21.29	21.37	21.47	0	22
		50	0	20.93	21.09	21.14	2	23	20.93	21.10	21.17	0	22
		50	24	20.86	21.02	21.09	2	23	20.86	21.04	21.11	0	22
		50	50	20.79	20.99	21.04	2	23	20.79	20.99	21.07	0	22
		100	0	20.82	21.01	21.08	2	23	20.84	20.99	21.09	0	22
	64QAM	1	0	21.31	21.50	21.67	2	23	21.25	21.59	21.46	0	22
		1	49	21.09	21.31	21.47	2	23	20.89	21.39	21.16	0	22
		1	99	21.05	21.25	21.42	2	23	21.01	21.36	21.20	0	22
		50	0	19.87	20.06	20.11	3	22	19.89	20.07	20.12	0	22
		50	24	19.79	19.99	20.04	3	22	19.82	20.01	20.06	0	22
		50	50	19.74	19.96	20.01	3	22	19.77	19.96	20.02	0	22
		100	0	19.81	20.00	20.07	3	22	19.81	20.02	20.07	0	22

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	23.90	24.10	24.16	0	25	20.94	21.09	21.20	0	22
		1	37	24.02	24.26	24.27	0	25	21.01	21.26	21.28	0	22
		1	74	23.68	23.93	23.92	0	25	20.70	20.90	20.97	0	22
		36	0	21.92	22.11	22.15	1	24	20.91	21.07	21.15	0	22
		36	20	21.84	22.07	22.08	1	24	20.84	21.02	21.08	0	22
		36	39	21.80	22.04	22.05	1	24	20.81	21.00	21.06	0	22
		75	0	21.86	22.09	22.12	1	24	20.89	21.08	21.14	0	22
	16QAM	1	0	22.25	22.44	22.58	1	24	21.19	21.35	21.36	0	22
		1	37	22.26	22.38	22.63	1	24	21.13	21.39	21.42	0	22
		1	74	22.05	22.26	22.37	1	24	20.97	21.18	21.16	0	22
		36	0	20.89	21.07	21.12	2	23	20.88	21.05	21.15	0	22
		36	20	20.83	21.02	21.06	2	23	20.81	20.99	21.09	0	22
		36	39	20.79	20.97	21.03	2	23	20.77	20.94	21.06	0	22
		75	0	20.85	21.07	21.10	2	23	20.85	21.03	21.12	0	22
	64QAM	1	0	21.27	21.41	21.61	2	23	21.22	21.32	21.47	0	22
		1	37	21.38	21.38	21.57	2	23	21.16	21.27	21.36	0	22
		1	74	21.04	21.20	21.37	2	23	20.99	21.18	21.30	0	22
		36	0	19.88	20.10	20.13	3	22	19.88	20.03	20.15	0	22
		36	20	19.82	20.05	20.08	3	22	19.83	19.99	20.11	0	22
		36	39	19.80	20.02	20.04	3	22	19.80	19.95	20.07	0	22
		75	0	19.82	20.05	20.10	3	22	19.83	20.03	20.12	0	22

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	23.82	24.04	24.14	0	25	20.89	21.11	21.15	0	22
		1	25	23.73	23.98	24.05	0	25	20.81	21.02	21.06	0	22
		1	49	23.73	23.98	24.04	0	25	20.81	21.03	21.05	0	22
		25	0	21.85	22.04	22.12	1	24	20.85	21.05	21.13	0	22
		25	12	21.80	21.99	22.08	1	24	20.82	21.01	21.10	0	22
		25	25	21.77	22.00	22.07	1	24	20.79	21.00	21.07	0	22
		50	0	21.80	22.01	22.08	1	24	20.82	21.02	21.09	0	22
	16QAM	1	0	21.97	22.20	22.32	1	24	21.02	21.21	21.32	0	22
		1	25	21.72	21.99	22.06	1	24	20.79	20.95	21.08	0	22
		1	49	21.88	22.13	22.23	1	24	20.92	21.15	21.20	0	22
		25	0	20.85	21.08	21.16	2	23	20.87	21.08	21.16	0	22
		25	12	20.82	21.04	21.12	2	23	20.85	21.05	21.13	0	22
		25	25	20.80	21.04	21.08	2	23	20.82	21.05	21.10	0	22
		50	0	20.79	20.99	21.05	2	23	20.81	21.02	21.12	0	22
	64QAM	1	0	20.97	21.25	21.42	2	23	21.16	21.24	21.38	0	22
		1	25	20.80	21.10	21.24	2	23	20.97	21.03	21.15	0	22
		1	49	20.94	21.23	21.22	2	23	21.13	21.09	21.18	0	22
		25	0	19.82	20.02	20.11	3	22	19.82	20.04	20.12	0	22
		25	12	19.78	20.01	20.07	3	22	19.80	20.02	20.06	0	22
		25	25	19.75	19.98	20.06	3	22	19.77	20.01	20.06	0	22
		50	0	19.74	19.98	20.05	3	22	19.77	20.01	20.09	0	22

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	23.77	23.98	24.08	0	25	20.81	20.95	21.16	0	22
		1	12	23.66	24.00	24.18	0	25	20.65	20.89	21.02	0	22
		1	24	23.77	24.01	24.14	0	25	20.80	20.98	21.13	0	22
		12	0	21.80	22.01	22.15	1	24	20.80	21.01	21.15	0	22
		12	7	21.78	21.98	22.13	1	24	20.79	20.97	21.12	0	22
		12	13	21.79	22.00	22.13	1	24	20.81	20.99	21.12	0	22
		25	0	21.77	22.00	22.14	1	24	20.80	20.98	21.13	0	22
	16QAM	1	0	22.22	22.36	22.45	1	24	21.32	21.29	21.63	0	22
		1	12	22.16	22.41	22.57	1	24	21.40	21.34	21.63	0	22
		1	24	22.13	22.27	22.46	1	24	21.21	21.19	21.51	0	22
		12	0	20.77	20.94	21.16	2	23	20.80	21.00	21.10	0	22
		12	7	20.75	20.94	21.13	2	23	20.80	20.97	21.08	0	22
		12	13	20.78	20.94	21.14	2	23	20.81	20.97	21.10	0	22
		25	0	20.80	20.99	21.12	2	23	20.84	20.94	21.08	0	22
	64QAM	1	0	21.14	21.15	21.25	2	23	21.15	21.23	21.46	0	22
		1	12	20.87	21.29	21.48	2	23	21.09	21.06	21.34	0	22
		1	24	21.02	21.18	21.24	2	23	21.02	21.28	21.31	0	22
		12	0	19.77	20.04	20.15	3	22	19.87	20.03	20.18	0	22
		12	7	19.75	20.00	20.14	3	22	19.83	19.97	20.11	0	22
		12	13	19.77	20.01	20.14	3	22	19.83	19.99	20.12	0	22
		25	0	19.75	19.99	20.15	3	22	19.77	19.97	20.07	0	22

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	23.81	24.05	24.06	0	25	20.95	21.03	21.19	0	22
		1	8	24.06	24.28	23.97	0	25	20.97	21.29	21.40	0	22
		1	14	23.80	24.07	24.05	0	25	20.83	21.05	21.23	0	22
		8	0	22.79	22.98	23.15	1	24	20.81	21.03	21.16	0	22
		8	4	22.76	23.00	23.15	1	24	20.78	21.03	21.12	0	22
		8	7	22.75	22.96	23.12	1	24	20.77	21.00	21.11	0	22
		15	0	22.79	22.98	23.11	1	24	20.80	21.02	21.13	0	22
	16QAM	1	0	21.94	22.18	22.42	1	24	21.19	21.42	21.48	0	22
		1	8	22.02	22.26	22.47	1	24	21.43	21.71	21.57	0	22
		1	14	21.96	22.25	22.38	1	24	21.41	21.47	21.51	0	22
		8	0	21.84	22.04	22.17	2	23	20.84	21.03	21.20	0	22
		8	4	21.83	22.04	22.20	2	23	20.85	20.99	21.18	0	22
		8	7	21.82	22.04	22.18	2	23	20.82	21.03	21.19	0	22
		15	0	21.77	22.00	22.12	2	23	20.81	21.03	21.12	0	22
	64QAM	1	0	22.08	22.12	22.39	2	23	21.09	21.39	21.52	0	22
		1	8	22.36	22.34	22.48	2	23	21.15	20.97	21.25	0	22
		1	14	22.21	22.13	22.47	2	23	21.14	21.19	21.27	0	22
		8	0	19.84	19.91	20.17	3	22	19.85	20.03	20.13	0	22
		8	4	19.83	19.96	20.14	3	22	19.82	20.01	20.12	0	22
		8	7	19.82	19.93	20.13	3	22	19.79	20.01	20.12	0	22
		15	0	19.82	19.98	20.15	3	22	19.83	20.00	20.10	0	22

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	23.90	24.11	24.06	0	25	20.87	21.10	20.99	0	22
		1	3	23.82	24.02	23.92	0	25	20.79	21.06	20.88	0	22
		1	5	23.83	24.03	23.92	0	25	20.82	21.02	20.92	0	22
		3	0	22.66	22.89	22.85	0	25	20.66	20.90	20.79	0	22
		3	1	22.63	22.86	22.92	0	25	20.67	20.86	20.72	0	22
		3	3	22.73	22.92	22.91	0	25	20.70	20.95	20.81	0	22
		6	0	22.77	23.02	22.89	1	24	20.76	20.99	20.88	0	22
	16QAM	1	0	22.34	22.54	22.16	1	24	21.24	21.55	21.16	0	22
		1	3	22.12	22.30	21.93	1	24	21.11	21.46	21.04	0	22
		1	5	22.22	22.43	22.06	1	24	21.12	21.42	21.05	0	22
		3	0	21.80	21.99	21.97	1	24	20.82	21.03	20.88	0	22
		3	1	21.89	22.11	21.91	1	24	20.90	21.13	20.76	0	22
		3	3	21.90	22.10	21.95	1	24	20.90	21.17	20.92	0	22
		6	0	21.72	21.92	22.02	2	23	20.80	21.06	21.01	0	22
	64QAM	1	0	22.09	22.26	22.23	2	23	21.04	21.12	21.05	0	22
		1	3	22.06	22.13	22.20	2	23	20.98	21.03	20.98	0	22
		1	5	21.96	22.09	22.08	2	23	20.87	20.96	21.18	0	22
		3	0	20.87	21.03	20.93	2	23	20.79	20.97	20.84	0	22
		3	1	20.89	21.09	20.95	2	23	20.82	21.02	20.78	0	22
		3	3	20.90	21.04	20.94	2	23	20.84	21.02	20.90	0	22
		6	0	19.81	20.00	19.92	3	22	19.84	20.04	19.92	0	22

9.4. LTE 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

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

$$M_A = \begin{cases} 8.2 & ;0 \le A < 0.025 \\ 9.2 - 40A & ;0.025 \le A < 0.05 \\ 8 - 16A & ;0.05 \le A < 0.25 \\ 4.83 - 3.33A & ;0.25 \le A \le 0.4 \end{cases}$$

$$3.83 - 0.83A \quad ;0.4 \le A \le 1$$

and M_{IM5} is defined as follows

$$M_{IM5} = \begin{cases} 4.5 & ; \Delta_{IM5} < 1.5 * BW_{Channel\_CA} \\ 6.0 & ; 1.5 * BW_{Channel\_CA} \le \Delta_{IM5} < BW_{Channel\_CA}/2 + \Delta f_{ooB} \\ M_A & ; \Delta_{IM5} \ge BW_{Channel\_CA}/2 + \Delta f_{ooB} \end{cases}$$

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

$$M_N = \begin{cases} -0.125N + 18.25 & ; 2 \le N \le 50 \\ -0.0333\ N + 13.67 & ; 50 < N \le 200 \end{cases}$$

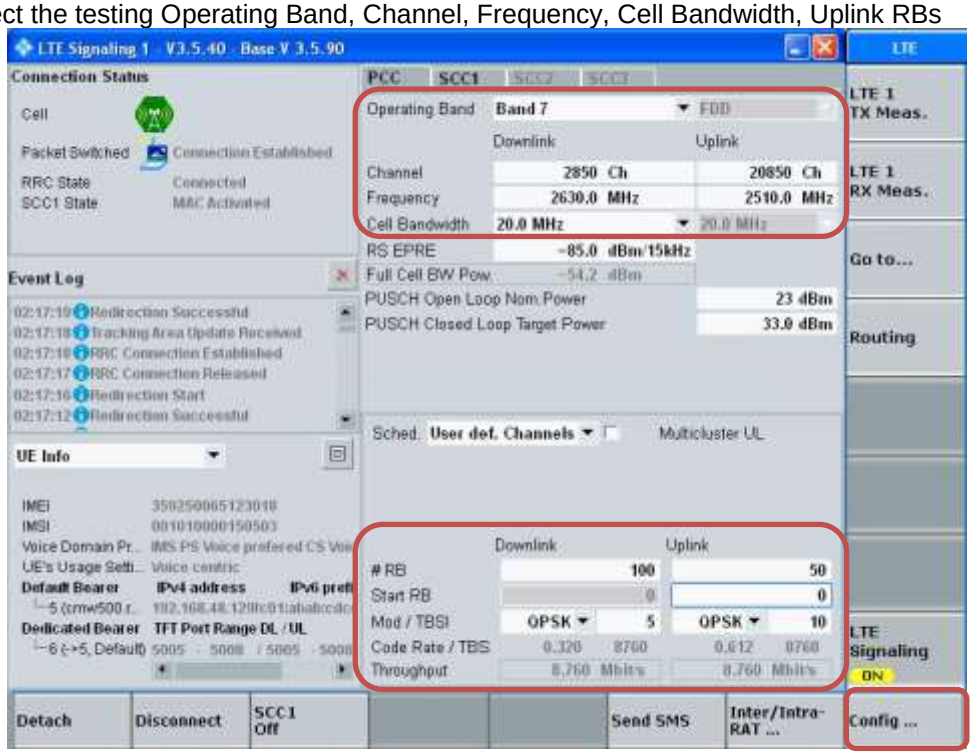
Where $N = N_{RB\_alloc}$ is the number of allocated resource blocks.

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

LTE Carrier Aggregation Test Signal Set-up Procedure

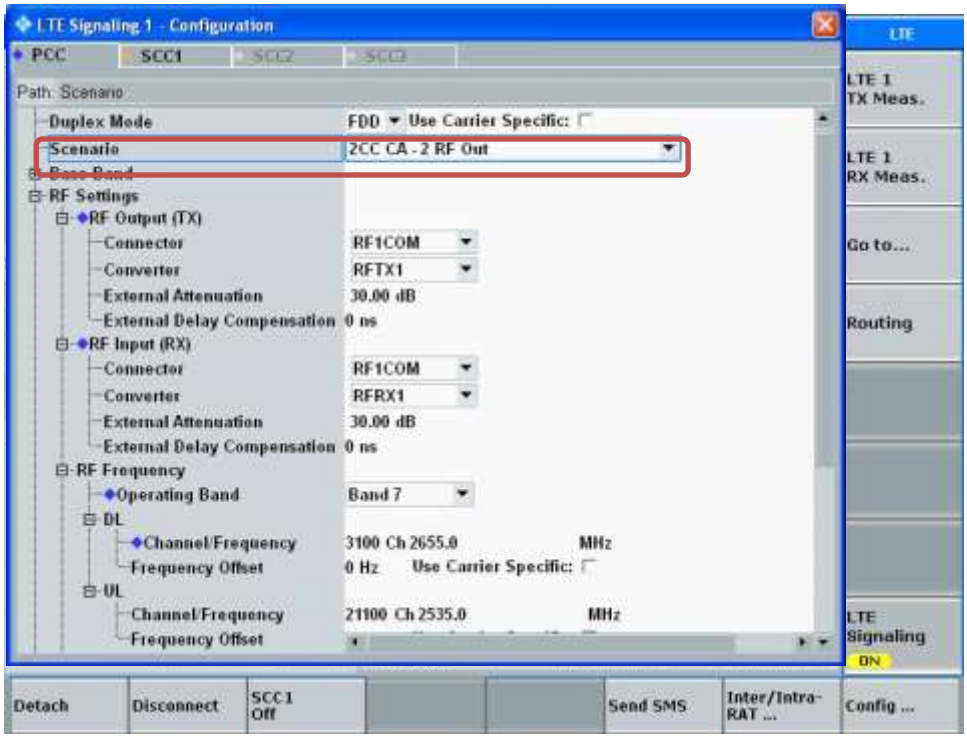
(Use normal LTE set-up procedure in addition with the following steps)

Set to CMW-500 with following parameters:

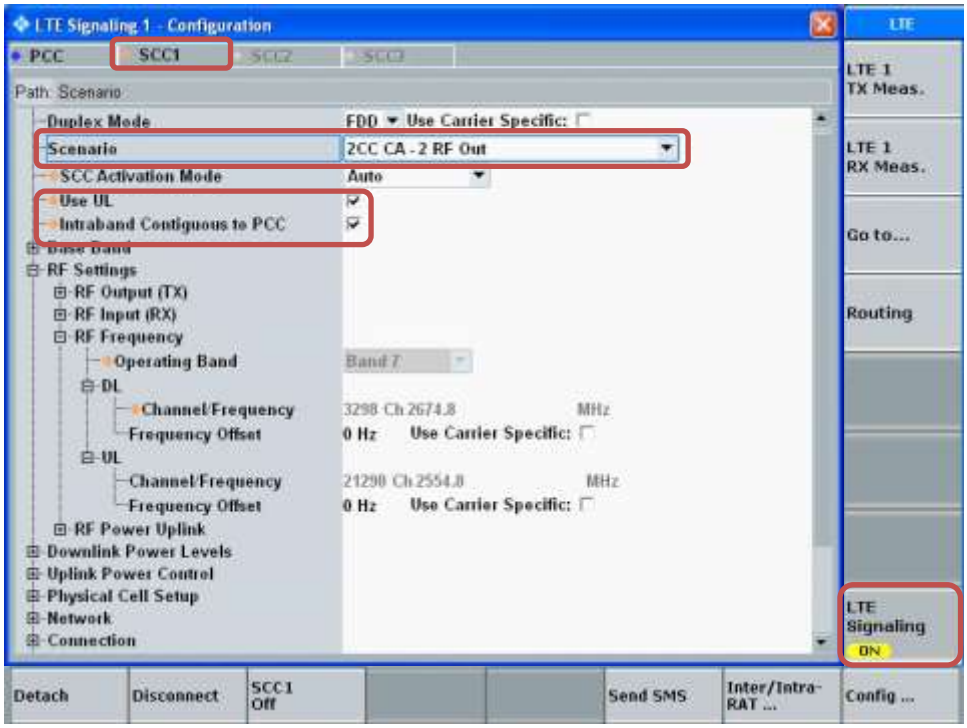
- PCC tab:
  - Select the testing Operating Band, Channel, Frequency, Cell Bandwidth, Uplink RBs
  - 

- Go to “Config….”

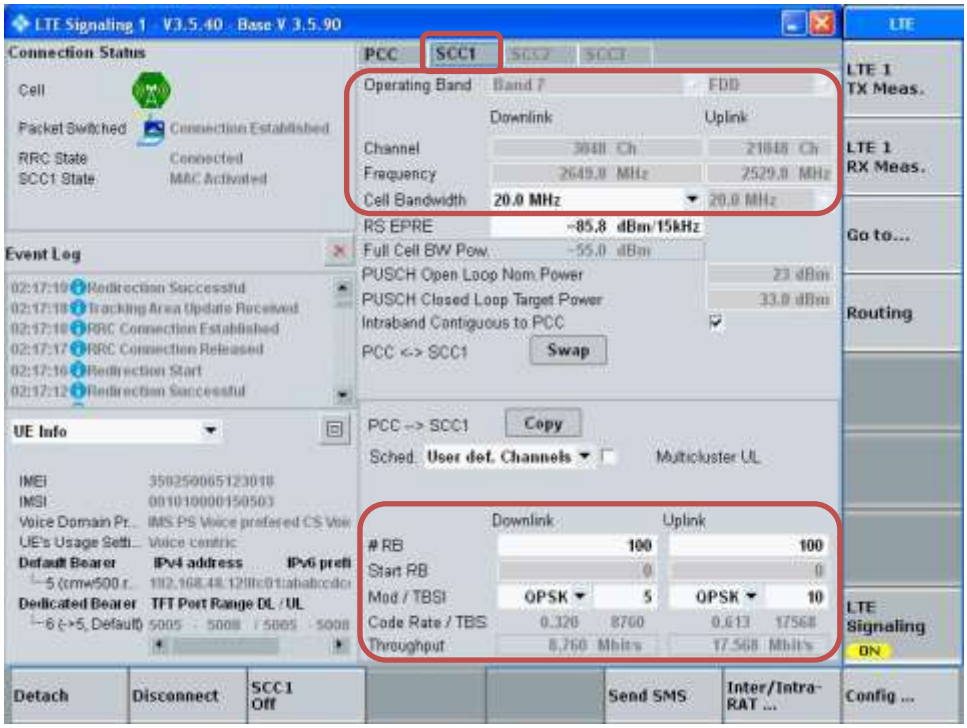
- Go to “Scenario”
- Set to “2CC CA – 2 RF Out”



- 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

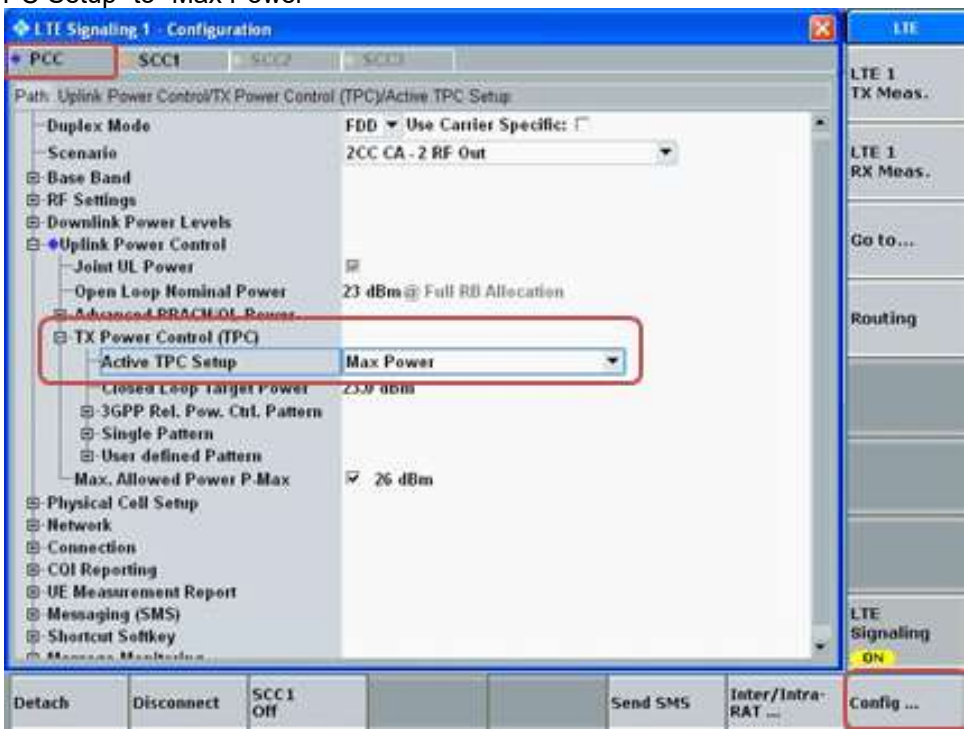


- Select “SCC1” tab
  - Select the testing Cell Bandwidth, Uplink RBs

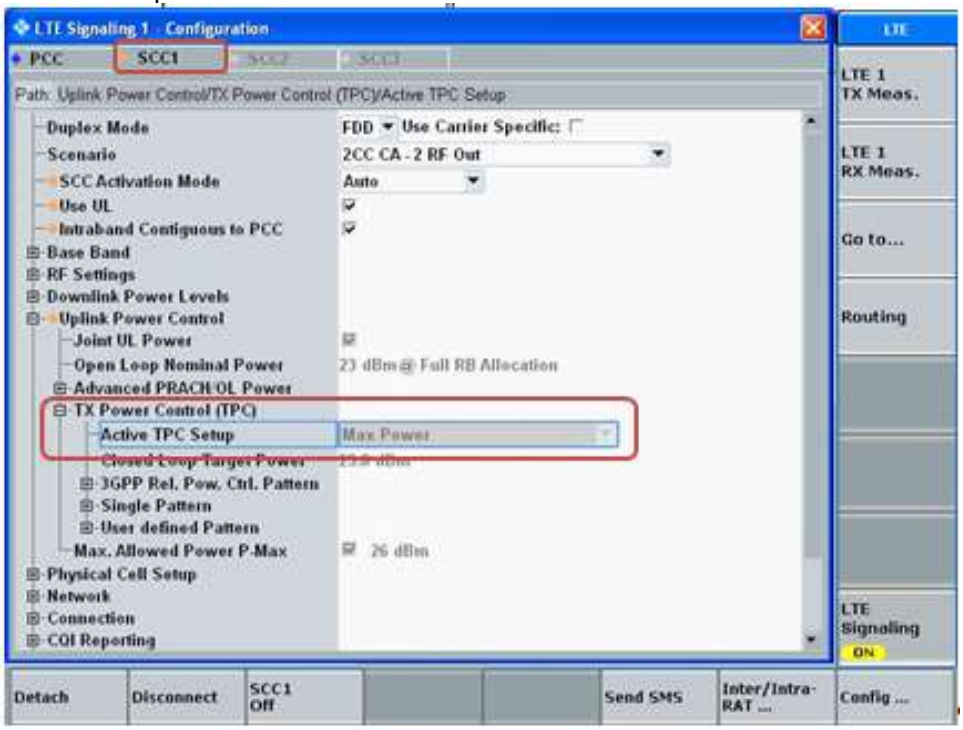


Max Power Setting

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

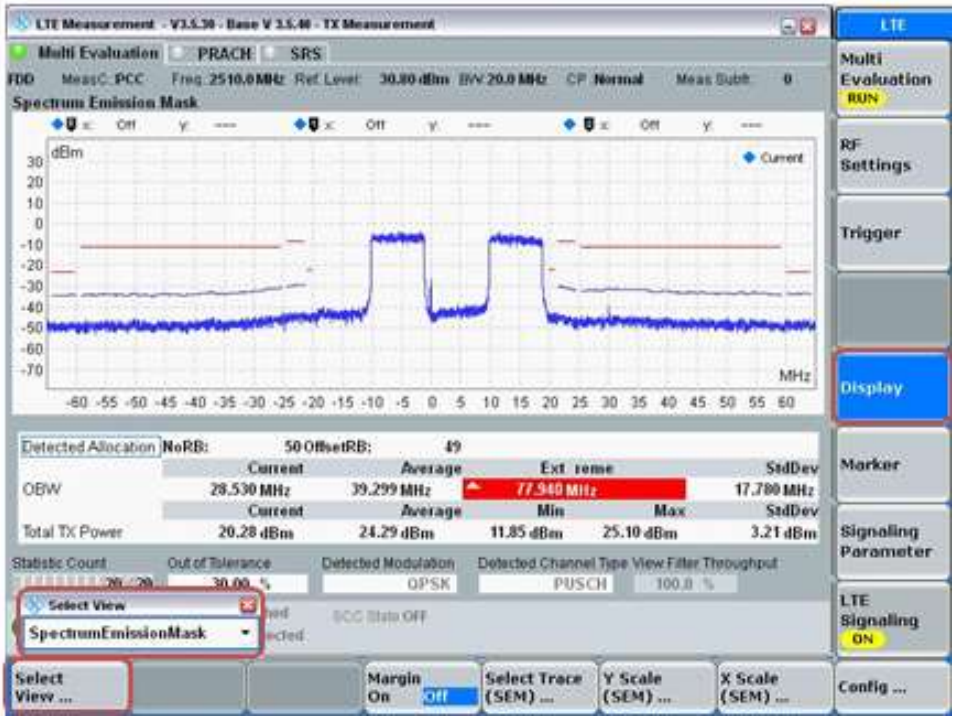


- Select SCC1 tab
- Verify that “Active TPC Setup” is set to “Max Power”



View TX Power

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



LTE Up-Link 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 the antenna with QPSK modulation based on the worst-case standalone SAR.

The UL CA mode 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).

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 table below.

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 38 (2570-2620 MHz) is covered by LTE Band 41 (2496-2690 MHz)

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.

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.

LTE CA_7C Measured Results

RF Exposure Conditions	Antenna	E-UTRA CA configuration (BCS)	Modulation	Bands		UL										
				PCC	SCC	PCC				SCC				Standalone (dBm)	PCC+SCC	
				1st	2nd	BW	RB	Offset	Freq	BW	RB	Offset	Freq		Tune-Up Limit	CA Power (Total PCC+SCC)	Delta
Head/Body-worn	ANT #1-2	CA_7C	QPSK	7C	7C	20	1	99	2510	20	1	0	2529.8	24.1	24.0	23.1	-0.9
Head/Body-worn	ANT #1-2	CA_7C	QPSK	7C	7C	20	1	99	2525.1	20	1	0	2544.9	23.9	24.0	23.0	-0.9
Head/Body-worn	ANT #1-2	CA_7C	QPSK	7C	7C	20	1	99	2540.2	20	1	0	2560	23.8	24.0	23.0	-0.8
Hotspot	ANT #1-2	CA_7C	QPSK	7C	7C	20	1	99	2510	20	1	0	2529.8	20.9	21.0	20.1	-0.8
Hotspot	ANT #1-2	CA_7C	QPSK	7C	7C	20	1	99	2525.1	20	1	0	2544.9	21.0	21.0	20.1	-0.9
Hotspot	ANT #1-2	CA_7C	QPSK	7C	7C	20	1	99	2540.2	20	1	0	2560	20.9	21.0	20.0	-0.9

Note(s):

Standalone power is reference from Sec. 9.3 - LTE B7 power.

LTE CA_38C Measured Results

RF Exposure Conditions	Antenna	E-UTRA CA configuration (BCS)	Modulation	Bands		UL										
				PCC	SCC	PCC				SCC				Standalone (dBm)	PCC+SCC	
				1st	2nd	BW	RB	Offset	Freq	BW	RB	Offset	Freq		Tune-Up Limit	CA Power (Total PCC+SCC)	Delta
Head/Body-worn	ANT #1-2	CA_38C	QPSK	38C	38C	20	1	99	2580	20	1	0	2599.8	23.9	24.0	22.9	-1.0
Head/Body-worn	ANT #1-2	CA_38C	QPSK	38C	38C	20	1	99	2585.1	20	1	0	2604.9	23.9	24.0	22.9	-1.0
Head/Body-worn	ANT #1-2	CA_38C	QPSK	38C	38C	20	1	99	2590.2	20	1	0	2610	23.9	24.0	22.8	-1.0
Hotspot	ANT #1-2	CA_38C	QPSK	38C	38C	20	1	99	2580	20	1	0	2599.8	20.9	21.0	19.9	-1.0
Hotspot	ANT #1-2	CA_38C	QPSK	38C	38C	20	1	99	2585.1	20	1	0	2604.9	20.8	21.0	19.9	-0.9
Hotspot	ANT #1-2	CA_38C	QPSK	38C	38C	20	1	99	2590.2	20	1	0	2610	20.8	21.0	19.8	-1.0

Note(s):

Standalone power is reference from Sec. 9.3 - LTE B41 power.

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 Tune-up Procedure.

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 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).

Index	2CC	Restriction	Completely Covered by Measurement Superset
Intra-Band Contiguous			
2CC # 1	CA_2C	N/A	No
2CC # 2	CA_7C	N/A	4CC #1
2CC # 3	CA_38C	N/A	No
2CC # 4	CA_41C	N/A	4CC #2
2CC # 5	CA_66B	N/A	No
2CC # 6	CA_66C	N/A	No
Intra-Band Non-Contiguous			
2CC # 7	CA_2A-2A	N/A	No
2CC # 8	CA_4A-4A	N/A	3CC #6
2CC # 9	CA_7A-7A	N/A	No
2CC # 10	CA_25A-25A	N/A	No
2CC # 11	CA_41A-41A	N/A	4CC #3
2CC # 12	CA_66A-66A	N/A	No
Inter-Band			
2CC # 13	CA_2A-4A	N/A	3CC #1
2CC # 14	CA_2A-5A	N/A	3CC #1
2CC # 15	CA_2A-7A	N/A	3CC #2
2CC # 16	CA_2A-12A	N/A	No
2CC # 17	CA_2A-13A	N/A	3CC #3
2CC # 18	CA_2A-17A	N/A	No
2CC # 19	CA_2A-66A	N/A	No
2CC # 20	CA_4A-5A	N/A	No
2CC # 21	CA_4A-7A	N/A	3CC #8
2CC # 22	CA_4A-12A	N/A	3CC #6
2CC # 23	CA_4A-13A	N/A	No
2CC # 24	CA_4A-17A	N/A	3CC #7
2CC # 25	CA_5A-7A	N/A	3CC #9
2CC # 26	CA_5A-25A	N/A	No
2CC # 27	CA_5A-41A	N/A	No
2CC # 28	CA_12A-66A	N/A	3CC #12

Index	3CC	Restriction	Completely Covered by Measurement Superset
Inter-Band			
3CC # 1	CA_2A-4A-5A	N/A	No
3CC # 2	CA_2A-4A-7A	N/A	No
3CC # 3	CA_2A-4A-13A	N/A	No
3CC # 4	CA_2A-7A-7A	N/A	No
3CC # 5	CA_2A-7C	N/A	No
3CC # 6	CA_4A-4A-12A	N/A	No
3CC # 7	CA_4A-4A-17A	N/A	No
3CC # 8	CA_4A-7C	N/A	No
3CC # 9	CA_5A-7A-7A	N/A	No
3CC # 10	CA_5A-7C	N/A	No
3CC # 11	CA_7A-66A-66A	N/A	No
3CC # 12	CA_12A-66A-66A	N/A	No
3CC # 13	CA_41A-41C	N/A	4CC #3
3CC # 14	CA_41C-41A	N/A	4CC #2
3CC # 15	CA_41D	N/A	No

Index	4CC	Restriction	Completely Covered by Measurement Superset
Inter-Band			
4CC # 1	CA_7C-66A-66A	N/A	No
4CC # 2	CA_41C-41C	N/A	No
4CC # 3	CA_41A-41D	N/A	No

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.

DL Intra-Band Contiguous Measured Results

E-UTRA CA configuration (BCS)	3GPP Rel. #	CC1 (UL)					CC2 (DL)			CC3 (DL)			CC4 (DL)			Aggregated BW	MPR	CA Inactive (dBm)	CA Active (dBm)	Delta
		Mode	BW (MHz)	Channel	Freq (MHz)	RB,Offset	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)					
CA_2C	12	QPSK	20	18801	1870.1	1,49	20	999	1969.9							40	0	24.14	24.18	0.04
CA_7C	13	QPSK	20	21001	2525.1	1,49	20	3199	2664.9							40	0	24.27	24.34	0.07
CA_38C	11	QPSK	20	37901	2585.1	1,49	20	38099	2604.9							40	0	24.27	24.20	-0.07
CA_41C	13	QPSK	20	40521	2583.1	1,49	20	40719	2602.9							40	0	23.85	23.83	-0.02
CA_66B	14	QPSK	15	132597	1772.5	1,49	5	67154	2181.8							80	0	24.28	24.23	-0.05
CA_66C	14	QPSK	20	132072	1720	1,49	20	66734	2139.8							60	0	23.89	23.83	-0.06

DL Intra-Band Non-Contiguous Measured Results

E-UTRA CA configuration	3GPP Rel. #	CC1 (UL)					CC2 (DL)			CC3 (DL)			CC4 (DL)			Aggregated BW	MPR	CA Inactive (dBm)	CA Active (dBm)	Delta
		Mode	BW (MHz)	Channel	Freq (MHz)	RB,Offset	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)					
CA_2A-2A	12	QPSK	20	18700	1860	1,49	20	1100	1980							40	0	24.36	24.37	0.01
CA_4A-4A	12	QPSK	20	20050	1720	1,49	20	2300	2145							40	0	24.24	24.24	0.00
CA_7A-7A	14	QPSK	20	20850	2510	1,49	20	3350	2680							40	0	24.14	24.15	0.01
CA_25A-25A	12	QPSK	20	26140	1860	1,49	20	8590	1985							40	0	24.45	24.40	-0.05
CA_41A-41A	12	QPSK	20	39750	2506	1,49	20	41490	2680							40	0	23.91	23.91	0.00
CA_66A-66A	13	QPSK	20	132072	1720	1,49	20	67236	2190							40	0	24.03	24.03	0.00

DL Inter-Band (2 Bands) Measured Results

E-UTRA CA configuration	3GPP Rel. #	CC1 (UL)					CC2 (DL)			CC3 (DL)			CC4 (DL)			Aggregated BW	MPR	CA Inactive (dBm)	CA Active (dBm)	Delta
		Mode	BW (MHz)	Channel	Freq (MHz)	RB,Offset	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)					
CA_2A-4A	12	QPSK	20	18900	1880	1,0	20	2300	2145							40	0	24.37	24.37	0.00
CA_2A-5A	12	QPSK	20	18900	1880	1,0	10	2600	889							30	0	24.38	24.38	0.00
CA_2A-7A	13	QPSK	20	18900	1880	1,0	20	3350	2680							40	0	24.35	24.35	0.00
CA_2A-12A	12	QPSK	20	18900	1880	1,0	10	5095	737.5							30	0	24.37	24.37	0.00
CA_2A-13A	12	QPSK	20	18900	1880	1,0	10	5230	751							30	0	24.37	24.37	0.00
CA_2A-17A	11	QPSK	20	18900	1880	1,0	10	5790	740							30	0	24.38	24.38	0.00
CA_2A-66A	14	QPSK	20	18900	1880	1,0	20	66886	2155							40	0	24.35	24.35	0.00
CA_4A-5A	12	QPSK	20	20175	1732.5	1,0	10	2525	881.5							30	0	24.35	24.37	0.02
CA_4A-7A	13	QPSK	20	20175	1732.5	1,0	20	3100	2655							40	0	24.32	24.32	0.00
CA_4A-12A	13	QPSK	20	20175	1732.5	1,0	10	5095	737.5							30	0	24.38	24.35	-0.03
CA_4A-13A	11	QPSK	20	20175	1732.5	1,0	10	5230	751							30	0	24.38	24.38	0.00
CA_4A-17A	11	QPSK	20	20175	1732.5	1,0	10	5790	740							30	0	24.38	24.38	0.00
CA_5A-7A	13	QPSK	10	20525	836.5	50,0	20	3100	2655							30	0	24.90	24.90	0.00
CA_5A-25A	12	QPSK	10	20525	836.5	50,0	20	8365	1962.5							30	0	24.90	24.92	0.02
CA_5A-41A	14	QPSK	10	20525	836.5	1,0	20	40620	2593							30	0	24.80	24.80	0.00
CA_12A-66A	14	QPSK	10	23095	707.5	50,0	20	66886	2155							30	0	24.15	24.11	-0.04

DL Inter-Band (3 Bands) Measured Results

E-UTRA CA configuration	3GPP Rel. #	CC1 (UL)					CC2 (DL)			CC3 (DL)			CC4 (DL)			Aggregated BW	MPR	CA Inactive (dBm)	CA Active (dBm)	Delta (dBm)
		Mode	BW (MHz)	Channel	Freq (MHz)	RB,Offset	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)					
CA_2A-4A-5A	12	QPSK	20	18900	1880	1,0	20	2300	2145	10	2525	881.5				50	0	24.34	24.35	0.01
CA_2A-4A-7A	13	QPSK	20	18900	1880	1,0	20	2300	2145	20	3350	2680				60	0	24.41	24.39	-0.02
CA_2A-4A-13A	12	QPSK	20	18900	1880	1,0	20	2300	2145	10	5230	751				50	0	24.19	24.22	0.03
CA_2A-7A-7A	14	QPSK	20	18900	1880	1,0	20	2850	2630	20	3350	2680				60	0	24.26	24.28	0.02
CA_2A-7C	14	QPSK	20	18900	1880	1,0	20	3001	2645.1	20	3199	2664.9				60	0	24.39	24.35	-0.04
CA_4A-4A-12A	12	QPSK	20	20050	1720	1,0	20	2300	2145	10	5095	737.5				50	0	24.38	24.41	0.03
CA_4A-4A-17A	12	QPSK	20	20050	1720	1,0	20	2300	2145	10	5790	740				50	0	24.49	24.45	-0.04
CA_4A-7C	14	QPSK	20	20050	1720	1,0	20	3001	2645.1	20	3199	2664.9				60	0	24.48	24.46	-0.02
CA_5A-7A-7A	14	QPSK	10	20525	836.5	1,0	20	2850	2630	20	3350	2680				50	0	23.19	23.18	-0.01
CA_5A-7C	14	QPSK	10	20525	836.5	1,0	20	3001	2645.1	20	3199	2664.9				50	0	24.66	24.67	0.01
CA_7A-66A-66A	15	QPSK	20	20850	2510	1,0	20	66536	2120	20	67236	2190				60	0	23.17	23.18	0.01
CA_12A-66A-66A	14	QPSK	10	23095	707.5	1,0	20	66536	2120	20	67236	2190				50	0	24.69	24.65	-0.04
CA_41A-41C	13	QPSK	20	39750	2506	1,0	20	41292	2660.2	20	41490	2680				60	0	23.95	23.95	0.00
CA_41C-41A	14	QPSK	20	39750	2506	1,0	20	39948	2525.8	20	41490	2680				60	0	24.02	24.02	0.00
CA_41D	12	QPSK	20	40422	2573.2	1,0	20	40620	2593	20	40818	2612.8				60	0	23.73	23.74	0.01

DL Inter-Band (4 Bands) Measured Results

E-UTRA CA configuration	3GPP Rel. #	CC1 (UL)					CC2 (DL)			CC3 (DL)			CC4 (DL)			Aggregated BW	MPR	CA Inactive (dBm)	CA Active (dBm)	Delta
		Mode	BW (MHz)	Channel	Freq (MHz)	RB,Offset	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)					
CA_7C-66A-66A	15	QPSK	20	21001	2525.1	1,0	20	3199	2664.9	20	66536	2120	20	67236	2190	80	0	24.27	24.23	-0.04
CA_41C-41C	13	QPSK	20	39750	2506	1,0	20	39948	2525.8	20	41292	2660.2	20	41490	2680	80	0	23.89	23.87	-0.02
CA_41A-41D	13	QPSK	20	39750	2506	1,0	20	41094	2640.4	20	41292	2660.2	20	41490	2680	80	0	23.97	23.99	0.02

9.5. Wi-Fi 2.4GHz (DTS Band)

When the proximity sensor is active in a held-to-ear user scenario, the output power level is reduced. The maximum allowed output powers in all conditions are included in the maximum power document.

Refer to Operational Description for WLAN explanation.

Wi-Fi 2.4GHz Measured Results

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/ax 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.

Band	Mode	Data Rate	Ch #	Freq. (MHz)	Wi-Fi Antenna #1 Average Power (dBm)						Wi-Fi Antenna #2 Average Power (dBm)					
					Maximum Average Power			Reduced Average Power			Maximum Average Power			Reduced Average Power		
					Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
DSSS 2.4 GHz	802.11b	1 Mbps	1	2412	18.90	19.00	Yes	15.70	16.00	Yes	19.00	19.00	Yes	15.80	16.00	Yes
			6	2437	18.80	19.00		15.80	16.00		19.00	19.00		15.90	16.00	
			11	2462	19.00	19.00		15.80	16.00		18.90	19.00		15.80	16.00	
OFDM 2.4 GHz	802.11g	6 Mbps	1	2412	Not required	15.50	No	Not required	15.50	No	Not required	15.50	No	Not required	15.50	No
			6	2437		17.00			16.00			17.00			16.00	
			11	2462		15.50			15.50			15.50			15.50	
	802.11n (HT20)	6.5 Mbps	1	2412	Not required	16.00	No	Not required	15.00	No	Not required	16.00	No	Not required	15.00	No
			6	2437		17.00			16.00			17.00			16.00	
			11	2462		15.00			15.00			15.00			15.00	
OFDMA 2.4 GHz	802.11ax (HE20)	7.3 Mbps	1	2412	Not required	15.50	No	Not required	16.00	No	Not required	15.50	No	Not required	16.00	No
			6	2437		17.00			16.00			17.00			16.00	
			11	2462		15.50			16.00			15.50			16.00	

Note(s):

1. These conducted measurements are used during the Simultaneous condition WWAN + 2.4GHz MIMO.
2. Additionally, SAR is not required for Channels 12 and 13 because the tune-up limit and the measured output power for these two channels are no greater than those for the default test channels.

RSDB (Real Simultaneous Dual Band)

Band	Mode	Data Rate	Ch #	Freq. (MHz)	Wi-Fi Antenna #1 Average Power (dBm)						Wi-Fi Antenna #2 Average Power (dBm)					
					Maximum Average Power			Reduced Average Power			Maximum Average Power			Reduced Average Power		
					Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
DSSS 2.4 GHz	802.11b	1 Mbps	1	2412	13.70	14.00	Yes	13.70	14.00	Yes	14.00	14.00	Yes	14.00	14.00	Yes
			6	2437	13.80	14.00		13.80	14.00		13.70	14.00		13.70	14.00	
			11	2462	13.60	14.00		13.60	14.00		14.00	14.00		14.00	14.00	
OFDM 2.4 GHz	802.11g	6 Mbps	1	2412	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			6	2437		14.00			14.00			14.00			14.00	
			11	2462		14.00			14.00			14.00			14.00	
	802.11n (HT20)	6.5 Mbps	1	2412	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			6	2437		14.00			14.00			14.00			14.00	
			11	2462		14.00			14.00			14.00			14.00	
OFDMA 2.4 GHz	802.11ax (HE20)	7.3 Mbps	1	2412	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			6	2437		14.00			14.00			14.00			14.00	
			11	2462		14.00			14.00			14.00			14.00	

Note(s):

1. These conducted measurements are used during the Simultaneous condition WWAN + 2.4GHz + 5GHz and WWAN + 2.4GHz MIMO + 5GHz MIMO.
2. Additionally, SAR is not required for Channels 12 and 13 because the tune-up limit and the measured output power for these two channels are no greater than those for the default test channels.

Duty Factor Measured Results

Antenna 1

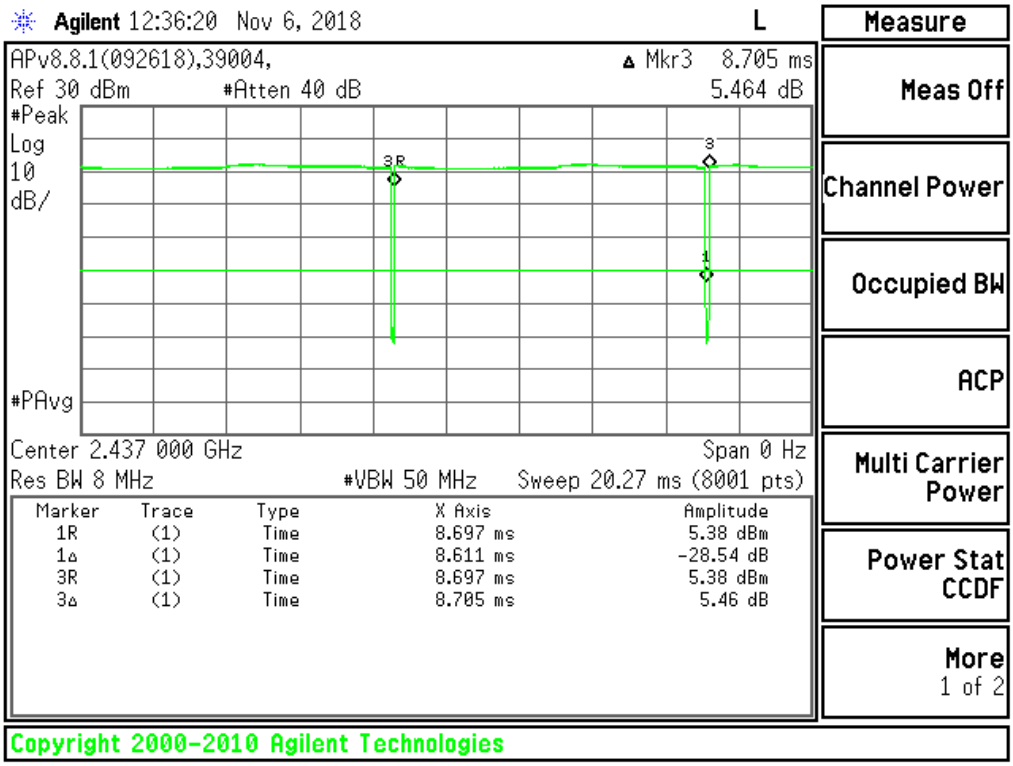
Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
802.11b	1 Mbps	8.611	8.705	98.92%	1.01

Note(s):

Duty Cycle = (T on / period) * 100%

Duty Cycle plot

802.11b



Antenna 2

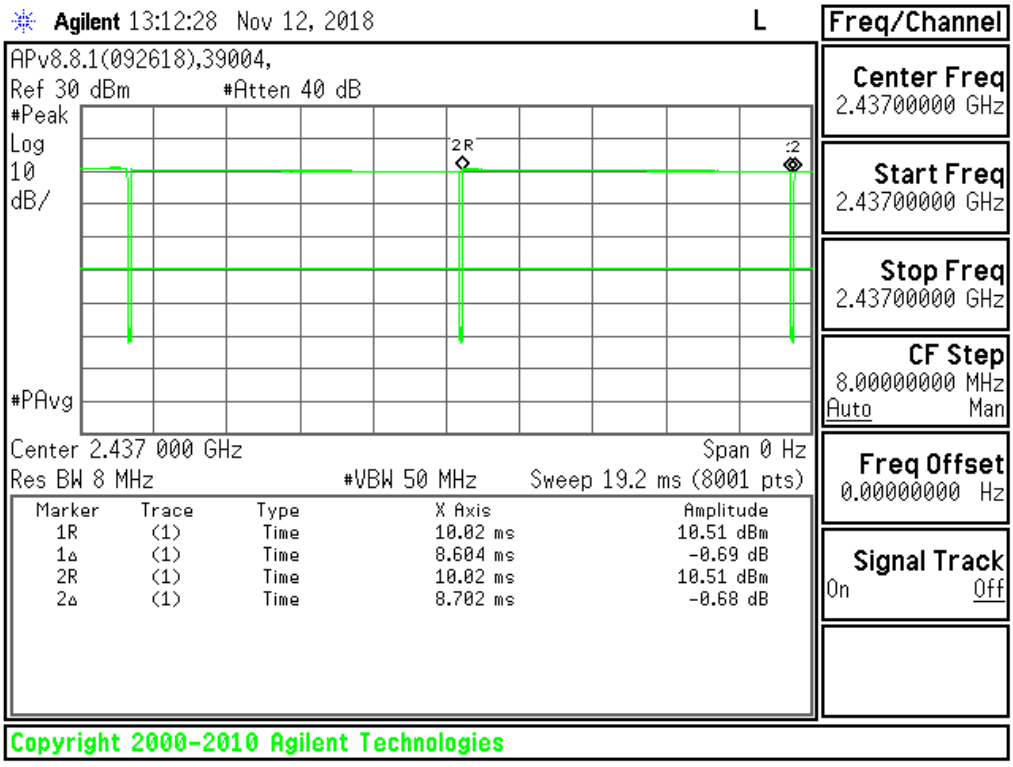
Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
802.11b	1 Mbps	8.604	8.702	98.87%	1.01

Note(s):

Duty Cycle = (T on / period) * 100%

Duty Cycle plot

802.11b



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

When the proximity sensor is active in a held-to-ear user scenario, the output power level is reduced. The maximum allowed output powers in all conditions are included in the maximum power document.

Refer to Operational Description for WLAN explanation.

When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/n/ac/ax modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n then ac) 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.

Wi-Fi 5 GHz Measured Results

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 802.11a/n/ac/ax 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.

Band	Mode	Data Rate	Ch #	Freq. (MHz)	Wi-Fi Antenna #1 Average Power (dBm)						Wi-Fi Antenna #2 Average Power (dBm)					
					Maximum Average Power			Reduced Average Power			Maximum Average Power			Reduced Average Power		
					Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-1 5.2 GHz	802.11a	6 Mbps	36	5180	16.60	17.00	Yes	Not required	14.00	No	16.70	17.00	Yes	Not required	14.00	No
			40	5200	16.90	17.00			14.00		16.60	17.00			14.00	
			44	5220	16.60	17.00			14.00		16.60	17.00			14.00	
			48	5240	16.90	17.00			14.00		16.60	17.00			14.00	
	802.11n (HT20)	6.5 Mbps	36	5180	Not required	17.00	No	Not required	14.00	No	Not required	17.00	No	Not required	14.00	No
			40	5200		17.00			14.00			17.00			14.00	
			44	5220		17.00			14.00			17.00			14.00	
			48	5240		17.00			14.00			17.00			14.00	
	802.11ac (VHT20)	6.5 Mbps	36	5180	Not required	17.00	No	Not required	14.00	No	Not required	17.00	No	Not required	14.00	No
			40	5200		17.00			14.00			17.00			14.00	
			44	5220		17.00			14.00			17.00			14.00	
			48	5240		17.00			14.00			17.00			14.00	
	802.11ax (HE20)	7.3 Mbps	36	5180	Not required	17.00	No	Not required	14.00	No	Not required	17.00	No	Not required	14.00	No
			40	5200		17.00			14.00			17.00			14.00	
			44	5220		17.00			14.00			17.00			14.00	
			48	5240		17.00			14.00			17.00			14.00	
	802.11n (HT40)	13.5 Mbps	38	5190	Not required	16.00	No	Not required	14.00	No	Not required	16.00	No	Not required	14.00	No
			46	5230		16.00			14.00			16.00			14.00	
	802.11ac (VHT40)	13.5 Mbps	38	5190	Not required	16.00	No	Not required	14.00	No	Not required	16.00	No	Not required	14.00	No
			46	5230		16.00			14.00			16.00			14.00	
	802.11ax (HE40)	14.6 Mbps	38	5190	Not required	16.00	No	Not required	14.00	No	Not required	16.00	No	Not required	14.00	No
			46	5230		16.00			14.00			16.00			14.00	
	802.11ac (VHT80)	29.3 Mbps	42	5210	Not required	15.00	No	13.70	14.00	No	Not required	15.00	No	13.60	14.00	No
	802.11ax (HE80)	30.6 Mbps	42	5210	Not required	15.00	No	13.50	14.00	No	Not required	15.00	No	13.80	14.00	No

Band	Mode	Data Rate	Ch #	Freq. (MHz)	Wi-Fi Antenna #1 Average Power (dBm)						Wi-Fi Antenna #2 Average Power (dBm)					
					Maximum Average Power			Reduced Average Power			Maximum Average Power			Reduced Average Power		
					Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-2A 5.3 GHz	802.11a	6 Mbps	52	5260	16.70	17.00	Yes	Not required	14.00	No	17.00	17.00	Yes	Not required	14.00	No
			56	5280	16.70	17.00			14.00		17.00	17.00			14.00	
			60	5300	16.60	17.00			14.00		17.00	17.00			14.00	
			64	5320	16.60	17.00			14.00		17.00	17.00			14.00	
	802.11n (HT20)	6.5 Mbps	52	5260	Not required	17.00	No	Not required	14.00	No	Not required	17.00	No	Not required	14.00	No
			56	5280		17.00			14.00			17.00			14.00	
			60	5300		17.00			14.00			17.00			14.00	
			64	5320		17.00			14.00			17.00			14.00	
	802.11ac (VHT20)	6.5 Mbps	52	5260	Not required	17.00	No	Not required	14.00	No	Not required	17.00	No	Not required	14.00	No
			56	5280		17.00			14.00			17.00			14.00	
			60	5300		17.00			14.00			17.00			14.00	
			64	5320		17.00			14.00			17.00			14.00	
	802.11ax (HE20)	7.3 Mbps	52	5260	Not required	17.00	No	Not required	14.00	No	Not required	17.00	No	Not required	14.00	No
			56	5280		17.00			14.00			17.00			14.00	
			60	5300		17.00			14.00			17.00			14.00	
			64	5320		17.00			14.00			17.00			14.00	
	802.11n (HT40)	13.5 Mbps	54	5270	Not required	16.00	No	Not required	14.00	No	Not required	16.00	No	Not required	14.00	No
			62	5310		16.00			14.00			16.00			14.00	
	802.11ac (VHT40)	13.5 Mbps	54	5270	Not required	16.00	No	Not required	14.00	No	Not required	16.00	No	Not required	14.00	No
			62	5310		16.00			14.00			16.00			14.00	
	802.11ax (HE40)	14.6 Mbps	54	5270	Not required	16.00	No	Not required	14.00	No	Not required	16.00	No	Not required	14.00	No
			62	5310		16.00			14.00			16.00			14.00	
	802.11ac (VHT80)	29.3 Mbps	58	5290	Not required	15.00	No	13.90	14.00	Yes	Not required	15.00	No	14.00	14.00	Yes
	802.11ax (HE80)	30.6 Mbps	58	5290	Not required	15.00	No	13.90	14.00	No	Not required	15.00	No	13.60	14.00	No

Band	Mode	Data Rate	Ch #	Freq. (MHz)	Wi-Fi Antenna #1 Average Power (dBm)						Wi-Fi Antenna #2 Average Power (dBm)					
					Maximum Average Power			Reduced Average Power			Maximum Average Power			Reduced Average Power		
					Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-2C 5.5 GHz	802.11a	6 Mbps	100	5500	17.00	17.00	Yes	Not required	14.00	No	16.80	17.00	Yes	Not required	14.00	No
			116	5580	16.70	17.00			14.00		17.00	17.00			14.00	
			124	5620	17.00	17.00			14.00		16.90	17.00			14.00	
			140	5700	17.00	17.00			14.00		17.00	17.00			14.00	
			144	5720	16.90	17.00			14.00		16.90	17.00			14.00	
	802.11n (HT20)	6.5 Mbps	100	5500	Not required	17.00	No	Not required	14.00	No	Not required	17.00	No	Not required	14.00	No
			116	5580		17.00			14.00			17.00			14.00	
			124	5620		17.00			14.00			17.00			14.00	
			140	5700		17.00			14.00			17.00			14.00	
			144	5720		17.00			14.00			17.00			14.00	
	802.11ac (VHT20)	6.5 Mbps	100	5500	Not required	17.00	No	Not required	14.00	No	Not required	17.00	No	Not required	14.00	No
			116	5580		17.00			14.00			17.00			14.00	
			124	5620		17.00			14.00			17.00			14.00	
			140	5700		17.00			14.00			17.00			14.00	
			144	5720		17.00			14.00			17.00			14.00	
	802.11ax (HE20)	7.3 Mbps	100	5500	Not required	17.00	No	Not required	14.00	No	Not required	17.00	No	Not required	14.00	No
			116	5580		17.00			14.00			17.00			14.00	
			124	5620		17.00			14.00			17.00			14.00	
			140	5700		17.00			14.00			17.00			14.00	
			144	5720		17.00			14.00			17.00			14.00	
	802.11n (HT40)	13.5 Mbps	102	5510	Not required	16.00	No	Not required	14.00	No	Not required	16.00	No	Not required	14.00	No
			118	5590		16.00			14.00			16.00			14.00	
			126	5630		16.00			14.00			16.00			14.00	
			134	5670		16.00			14.00			16.00			14.00	
			142	5710		16.00			14.00			16.00			14.00	
	802.11ac (VHT40)	13.5 Mbps	102	5510	Not required	16.00	No	Not required	14.00	No	Not required	16.00	No	Not required	14.00	No
			118	5590		16.00			14.00			16.00			14.00	
			126	5630		16.00			14.00			16.00			14.00	
			134	5670		16.00			14.00			16.00			14.00	
			142	5710		16.00			14.00			16.00			14.00	
	802.11ax (HE40)	14.6 Mbps	102	5510	Not required	16.00	No	Not required	14.00	No	Not required	16.00	No	Not required	14.00	No
			118	5590		16.00			14.00			16.00			14.00	
			126	5630		16.00			14.00			16.00			14.00	
			134	5670		16.00			14.00			16.00			14.00	
			142	5710		16.00			14.00			16.00			14.00	
	802.11ac (VHT80)	29.3 Mbps	106	5530	Not required	15.00	No	13.80	14.00	Yes	Not required	15.00	No	13.70	14.00	Yes
			122	5610		15.00		13.70	14.00			15.00		13.60	14.00	
			138	5690		15.00		13.80	14.00			15.00		13.70	14.00	
	802.11ax (HE80)	30.6 Mbps	106	5530	Not required	15.00	No	13.80	14.00	No	Not required	15.00	No	14.00	14.00	No
			122	5610		15.00		13.60	14.00			15.00		14.00	14.00	
			138	5690		15.00		13.80	14.00			15.00		13.70	14.00	

Band	Mode	Data Rate	Ch #	Freq. (MHz)	Wi-Fi Antenna #1 Average Power (dBm)						Wi-Fi Antenna #2 Average Power (dBm)					
					Maximum Average Power			Reduced Average Power			Maximum Average Power			Reduced Average Power		
					Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-3 5.8 GHz	802.11a	6 Mbps	149	5745	16.80	17.00	Yes	Not required	14.00	No	17.00	17.00	Yes	Not required	14.00	No
			157	5785	17.00	17.00			14.00		17.00	17.00			14.00	
			165	5825	17.00	17.00			14.00		16.90	17.00			14.00	
	802.11n (HT20)	6.5 Mbps	149	5745	Not required	17.00	No	Not required	14.00	No	Not required	17.00	No	Not required	14.00	No
			157	5785		17.00			14.00			17.00			14.00	
			165	5825		17.00			14.00			17.00			14.00	
	802.11ac (VHT20)	6.5 Mbps	149	5745	Not required	17.00	No	Not required	14.00	No	Not required	17.00	No	Not required	14.00	No
			157	5785		17.00			14.00			17.00			14.00	
			165	5825		17.00			14.00			17.00			14.00	
	802.11ax (HE20)	7.3 Mbps	149	5745	Not required	17.00	No	Not required	14.00	No	Not required	17.00	No	Not required	14.00	No
			157	5785		17.00			14.00			17.00			14.00	
			165	5825		17.00			14.00			17.00			14.00	
	802.11n (HT40)	13.5 Mbps	151	5755	Not required	16.00	No	Not required	14.00	No	Not required	16.00	No	Not required	14.00	No
			159	5795		16.00			14.00			16.00			14.00	
	802.11ac (VHT40)	13.5 Mbps	151	5755	Not required	16.00	No	Not required	14.00	No	Not required	16.00	No	Not required	14.00	No
			159	5795		16.00			14.00			16.00			14.00	
	802.11ax (HE40)	14.6 Mbps	151	5755	Not required	16.00	No	Not required	14.00	No	Not required	16.00	No	Not required	14.00	No
			159	5795		16.00			14.00			16.00			14.00	
	802.11ac (VHT80)	29.3 Mbps	155	5775	Not required	15.00	No	13.90	14.00	Yes	Not required	15.00	No	13.91	14.00	Yes
	802.11ax (HE80)	30.6 Mbps	155	5775	Not required	15.00	No	13.80	14.00	No	Not required	15.00	No	13.70	14.00	No

RSDB (Real Simultaneous Dual Band) Conducted Power

Band	Mode	Data Rate	Ch #	Freq. (MHz)	Wi-Fi Antenna #1 Average Power (dBm)						Wi-Fi Antenna #2 Average Power (dBm)					
					Maximum Average Power			Reduced Average Power			Maximum Average Power			Reduced Average Power		
					Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-1 5.2 GHz	802.11a	6 Mbps	36	5180	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			40	5200		14.00			14.00			14.00			14.00	
			44	5220		14.00			14.00			14.00			14.00	
			48	5240		14.00			14.00			14.00			14.00	
	802.11n (HT20)	6.5 Mbps	36	5180	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			40	5200		14.00			14.00			14.00			14.00	
			44	5220		14.00			14.00			14.00			14.00	
			48	5240		14.00			14.00			14.00			14.00	
	802.11ac (VHT20)	6.5 Mbps	36	5180	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			40	5200		14.00			14.00			14.00			14.00	
			44	5220		14.00			14.00			14.00			14.00	
			48	5240		14.00			14.00			14.00			14.00	
	802.11ax (HE20)	7.3 Mbps	36	5180	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			40	5200		14.00			14.00			14.00			14.00	
			44	5220		14.00			14.00			14.00			14.00	
			48	5240		14.00			14.00			14.00			14.00	
	802.11n (HT40)	13.5 Mbps	38	5190	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			46	5230		14.00			14.00			14.00			14.00	
	802.11ac (VHT40)	13.5 Mbps	38	5190	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			46	5230		14.00			14.00			14.00			14.00	
	802.11ax (HE40)	14.6 Mbps	38	5190	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			46	5230		14.00			14.00			14.00			14.00	
	802.11ac (VHT80)	29.3 Mbps	42	5210	13.70	14.00	No	13.70	14.00	**Yes**	13.60	14.00	No	13.60	14.00	**Yes**
	802.11ax (HE80)	30.6 Mbps	42	5210	13.50	14.00	No	13.50	14.00	No	13.80	14.00	No	13.80	14.00	No

Band	Mode	Data Rate	Ch #	Freq. (MHz)	Wi-Fi Antenna #1 Average Power (dBm)						Wi-Fi Antenna #2 Average Power (dBm)					
					Maximum Average Power			Reduced Average Power			Maximum Average Power			Reduced Average Power		
					Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-2A 5.3 GHz	802.11a	6 Mbps	52	5260	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			56	5280		14.00			14.00			14.00			14.00	
			60	5300		14.00			14.00			14.00			14.00	
			64	5320		14.00			14.00			14.00			14.00	
	802.11n (HT20)	6.5 Mbps	52	5260	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			56	5280		14.00			14.00			14.00			14.00	
			60	5300		14.00			14.00			14.00			14.00	
			64	5320		14.00			14.00			14.00			14.00	
	802.11ac (VHT20)	6.5 Mbps	52	5260	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			56	5280		14.00			14.00			14.00			14.00	
			60	5300		14.00			14.00			14.00			14.00	
			64	5320		14.00			14.00			14.00			14.00	
	802.11ax (HE20)	7.3 Mbps	52	5260	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			56	5280		14.00			14.00			14.00			14.00	
			60	5300		14.00			14.00			14.00			14.00	
			64	5320		14.00			14.00			14.00			14.00	
	802.11n (HT40)	13.5 Mbps	54	5270	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			62	5310		14.00			14.00			14.00			14.00	
	802.11ac (VHT40)	13.5 Mbps	54	5270	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			62	5310		14.00			14.00			14.00			14.00	
	802.11ax (HE40)	14.6 Mbps	54	5270	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			62	5310		14.00			14.00			14.00			14.00	
	802.11ac (VHT80)	29.3 Mbps	58	5290	13.90	14.00	**Yes**	13.90	14.00	**Yes**	14.00	14.00	**Yes**	14.00	14.00	**Yes**
	802.11ax (HE80)	30.6 Mbps	58	5290	13.90	14.00	No	13.90	14.00	No	13.60	14.00	No	13.60	14.00	No

RSDB (Real Simultaneous Dual Band) Conducted Power Continued

Band	Mode	Data Rate	Ch #	Freq. (MHz)	Wi-Fi Antenna #1 Average Power (dBm)						Wi-Fi Antenna #2 Average Power (dBm)					
					Maximum Average Power			Reduced Average Power			Maximum Average Power			Reduced Average Power		
					Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-2C 5.5 GHz	802.11a	6 Mbps	100	5500	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			116	5580		14.00			14.00			14.00			14.00	
			124	5620		14.00			14.00			14.00			14.00	
			140	5700		14.00			14.00			14.00			14.00	
			144	5720		14.00			14.00			14.00			14.00	
	802.11n (HT20)	6.5 Mbps	100	5500	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			116	5580		14.00			14.00			14.00			14.00	
			124	5620		14.00			14.00			14.00			14.00	
			140	5700		14.00			14.00			14.00			14.00	
			144	5720		14.00			14.00			14.00			14.00	
	802.11ac (VHT20)	6.5 Mbps	100	5500	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			116	5580		14.00			14.00			14.00			14.00	
			124	5620		14.00			14.00			14.00			14.00	
			140	5700		14.00			14.00			14.00			14.00	
			144	5720		14.00			14.00			14.00			14.00	
	802.11ax (HE20)	7.3 Mbps	100	5500	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			116	5580		14.00			14.00			14.00			14.00	
			124	5620		14.00			14.00			14.00			14.00	
			140	5700		14.00			14.00			14.00			14.00	
			144	5720		14.00			14.00			14.00			14.00	
	802.11n (HT40)	13.5 Mbps	102	5510	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			118	5590		14.00			14.00			14.00			14.00	
			126	5630		14.00			14.00			14.00			14.00	
			134	5670		14.00			14.00			14.00			14.00	
			142	5710		14.00			14.00			14.00			14.00	
	802.11ac (VHT40)	13.5 Mbps	102	5510	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			118	5590		14.00			14.00			14.00			14.00	
			126	5630		14.00			14.00			14.00			14.00	
			134	5670		14.00			14.00			14.00			14.00	
			142	5710		14.00			14.00			14.00			14.00	
	802.11ax (HE40)	14.6 Mbps	102	5510	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			118	5590		14.00			14.00			14.00			14.00	
			126	5630		14.00			14.00			14.00			14.00	
			134	5670		14.00			14.00			14.00			14.00	
			142	5710		14.00			14.00			14.00			14.00	
	802.11ac (VHT80)	29.3 Mbps	106	5530	13.80	14.00	Yes	13.80	14.00	Yes	13.70	14.00	Yes	13.70	14.00	Yes
			122	5610	13.70	14.00		13.70	14.00		13.60	14.00		13.60	14.00	
			138	5690	13.80	14.00		13.80	14.00		13.70	14.00		13.70	14.00	
	802.11ax (HE80)	30.6 Mbps	106	5530	13.80	14.00	No	13.80	14.00	No	14.00	14.00	No	14.00	14.00	No
			122	5610	13.60	14.00		13.60	14.00		14.00	14.00		14.00	14.00	
			138	5690	13.80	14.00		13.80	14.00		13.70	14.00		13.70	14.00	

Band	Mode	Data Rate	Ch #	Freq. (MHz)	Wi-Fi Antenna #1 Average Power (dBm)						Wi-Fi Antenna #2 Average Power (dBm)					
					Maximum Average Power			Reduced Average Power			Maximum Average Power			Reduced Average Power		
					Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-3 5.8 GHz	802.11a	6 Mbps	149	5745	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			157	5785		14.00			14.00			14.00			14.00	
			165	5825		14.00			14.00			14.00			14.00	
	802.11n (HT20)	6.5 Mbps	149	5745	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			157	5785		14.00			14.00			14.00			14.00	
			165	5825		14.00			14.00			14.00			14.00	
	802.11ac (VHT20)	6.5 Mbps	149	5745	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			157	5785		14.00			14.00			14.00			14.00	
			165	5825		14.00			14.00			14.00			14.00	
	802.11ax (HE20)	7.3 Mbps	149	5745	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			157	5785		14.00			14.00			14.00			14.00	
			165	5825		14.00			14.00			14.00			14.00	
	802.11n (HT40)	13.5 Mbps	151	5755	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			159	5795		14.00			14.00			14.00			14.00	
	802.11ac (VHT40)	13.5 Mbps	151	5755	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			159	5795		14.00			14.00			14.00			14.00	
	802.11ax (HE40)	14.6 Mbps	151	5755	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No	Not required	14.00	No
			159	5795		14.00			14.00			14.00			14.00	
	802.11ac (VHT80)	29.3 Mbps	155	5775	13.90	14.00	Yes	13.90	14.00	Yes	13.91	14.00	Yes	13.91	14.00	Yes
	802.11ax (HE80)	30.6 Mbps	155	5775	13.80	14.00	No	13.80	14.00	No	13.70	14.00	No	13.70	14.00	No

Duty Factor Measured Results

Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
802.11a	6 Mbps	1.428	1.528	93.46%	1.07

Note(s):

Duty Cycle = (T on / period) * 100%

Duty Cycle plot

802.11a

Duty Factor Measured Results

Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
802.11n	HT40	0.664	0.762	87.14%	1.15

Note(s):

Duty Cycle = (T on / period) * 100%

Duty Cycle plot

802.11n

Duty Factor Measured Results

Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
802.11ac	VHT80	0.192	0.301	63.79%	1.57

Note(s):

Duty Cycle = (T on / period) * 100%

Duty Cycle plot

802.11ac

9.7. Bluetooth

Bluetooth Measured Results

SAR measurement is not required for the QPSK, 8PSK, and BLE. When the secondary mode is ≤ ¼ dB higher than the primary mode.

Band	Mode	Ch #	Freq. (MHz)	Chain 0 Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)
2.4	GFSK	0	2402	15.87	17.00	Yes
		39	2441	16.57	17.00	
		78	2480	15.62	17.00	

Duty Factor Measured Results

Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
GFSK	DH5	2.883	3.752	76.84%	1.30

Note(s):

Duty Cycle = (T on / period) * 100%

Duty Cycle plot

GFSK

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 = 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 941225 D01 SAR test for 3G devices:

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

KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

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

KDB 248227 D01 SAR meas for 802.11:

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.

10.1. GSM850

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	GSM Voice	OFF	0	Left Touch	190	836.6	34.00	33.62	0.152	0.166	
				Left Tilt	190	836.6	34.00	33.62	0.078	0.085	
				Right Touch	190	836.6	34.00	33.62	0.199	**0.217**	1
				Right Tilt	190	836.6	34.00	33.62	0.084	0.092	
Body-worn	GSM Voice	OFF	15	Rear	190	836.6	34.00	33.62	0.248	**0.271**	2
				Front	190	836.6	34.00	33.62	0.234	0.255	
Hotspot	GPRS 3 Slots	OFF	10	Rear	190	836.6	30.50	29.80	0.424	**0.498**	3
				Front	190	836.6	30.50	29.80	0.306	0.360	
				Edge 2	190	836.6	30.50	29.80	0.154	0.181	
				Edge 3	190	836.6	30.50	29.80	0.286	0.336	
				Edge 4	190	836.6	30.50	29.80	0.071	0.083	

10.2. GSM1900

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	GSM Voice	OFF	0	Left Touch	661	1880.0	31.00	30.40	0.081	**0.093**	4
				Left Tilt	661	1880.0	31.00	30.40	0.035	0.041	
				Right Touch	661	1880.0	31.00	30.40	0.052	0.060	
				Right Tilt	661	1880.0	31.00	30.40	0.030	0.034	
Body-worn	GSM Voice	OFF	15	Rear	661	1880.0	31.00	30.40	0.251	**0.288**	5
				Front	661	1880.0	31.00	30.40	0.152	0.175	
Hotspot	GPRS 1 Slot	OFF	10	Rear	661	1880.0	31.00	30.40	0.468	0.537	
				Front	661	1880.0	31.00	30.40	0.319	0.366	
				Edge 2	661	1880.0	31.00	30.40	0.059	0.068	
				Edge 3	512	1850.2	31.00	30.38	0.683	0.788	
					661	1880.0	31.00	30.40	0.755	0.867	
					810	1909.8	31.00	30.45	0.813	**0.923**	6
				Edge 4	661	1880.0	31.00	30.40	0.133	0.153	

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	OFF	0	Left Touch	9400	1880.0	25.00	24.32	0.219	**0.256**	7
				Left Tilt	9400	1880.0	25.00	24.32	0.066	0.077	
				Right Touch	9400	1880.0	25.00	24.32	0.125	0.146	
				Rightt Tilt	9400	1880.0	25.00	24.32	0.071	0.083	
Body-worn	Rel 99 RMC 12.2 kbps	OFF	15	Rear	9400	1880.0	25.00	24.32	0.587	**0.686**	8
				Front	9400	1880.0	25.00	24.32	0.379	0.443	
Hotspot	Rel 99 RMC 12.2 kbps	ON	10	Rear	9400	1880.0	22.00	21.34	0.563	0.655	
				Front	9400	1880.0	22.00	21.34	0.385	0.448	
				Edge 2	9400	1880.0	22.00	21.34	0.080	0.093	
				Edge 3	9262	1852.1	22.00	21.50	0.805	0.903	
					9400	1880.0	22.00	21.34	0.934	**1.087**	9
					9538	1907.6	22.00	21.66	0.961	1.039	
				Edge 4	9400	1880.0	22.00	21.34	0.178	0.207	

10.4. W-CDMA Band IV

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	OFF	0	Left Touch	1413	1732.6	25.00	24.27	0.287	**0.340**	10
				Left Tilt	1413	1732.6	25.00	24.27	0.075	0.089	
				Right Touch	1413	1732.6	25.00	24.27	0.127	0.150	
				Rightt Tilt	1413	1732.6	25.00	24.27	0.054	0.064	
Body-worn	Rel 99 RMC 12.2 kbps	OFF	15	Rear	1413	1732.6	25.00	24.27	0.549	**0.649**	11
				Front	1413	1732.6	25.00	24.27	0.402	0.476	
Hotspot	Rel 99 RMC 12.2 kbps	ON	10	Rear	1413	1732.6	22.00	21.40	0.455	0.522	
				Front	1413	1732.6	22.00	21.40	0.323	0.371	
				Edge 2	1413	1732.6	22.00	21.40	0.038	0.043	
				Edge 3	1312	1712.4	22.00	21.12	0.706	0.865	
					1413	1732.6	22.00	21.40	0.840	**0.964**	12
					1513	1752.6	22.00	21.40	0.747	0.858	
				Edge 4	1413	1732.6	22.00	21.40	0.120	0.138	

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	OFF	0	Left Touch	4183	836.6	25.00	24.78	0.196	0.206	
				Left Tilt	4183	836.6	25.00	24.78	0.100	0.105	
				Right Touch	4183	836.6	25.00	24.78	0.220	**0.231**	13
				Rightt Tilt	4183	836.6	25.00	24.78	0.115	0.121	
Body-worn	Rel 99 RMC 12.2 kbps	OFF	15	Rear	4183	836.6	25.00	24.78	0.264	**0.278**	14
				Front	4183	836.6	25.00	24.78	0.246	0.259	
Hotspot	Rel 99 RMC 12.2 kbps	OFF	10	Rear	4183	836.6	25.00	24.78	0.479	**0.504**	15
				Front	4183	836.6	25.00	24.78	0.382	0.402	
				Edge 2	4183	836.6	25.00	24.78	0.171	0.180	
				Edge 3	4183	836.6	25.00	24.78	0.304	0.320	
				Edge 4	4183	836.6	25.00	24.78	0.100	0.105	

10.6. LTE Band 5 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Power back-off	DAT State	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	OFF	Default	0	Left Touch	20525	836.5	1	0	25.0	24.7	0.215	0.229	
								25	0	24.0	22.2	0.121	0.185	
					Left Tilt	20525	836.5	1	0	25.0	24.7	0.141	0.150	
								25	0	24.0	22.2	0.080	0.122	
					Right Touch	20525	836.5	1	0	25.0	24.7	0.238	**0.254**	16
								25	0	24.0	22.2	0.136	0.208	
					Right Tilt	20525	836.5	1	0	25.0	24.7	0.143	0.153	
								25	0	24.0	22.2	0.082	0.126	
Body-worn	QPSK	OFF	Default	15	Rear	20525	836.5	1	0	25.0	24.7	0.327	**0.349**	17
								25	0	24.0	22.2	0.184	0.282	
					Front	20525	836.5	1	0	25.0	24.7	0.299	0.319	
								25	0	24.0	22.2	0.169	0.259	
Hotspot	QPSK	OFF	Default	10	Rear	20525	836.5	1	0	25.0	24.7	0.457	**0.487**	18
								25	0	24.0	22.2	0.267	0.409	
					Front	20525	836.5	1	0	25.0	24.7	0.370	0.395	
								25	0	24.0	22.2	0.209	0.320	
					Edge 2	20525	836.5	1	0	25.0	24.7	0.375	0.400	
								25	0	24.0	22.2	0.229	0.351	
					Edge 3	20525	836.5	1	0	25.0	24.7	0.332	0.354	
								25	0	24.0	22.2	0.190	0.291	
					Edge 4	20525	836.5	1	0	25.0	24.7	0.191	0.204	
								25	0	24.0	22.2	0.102	0.156	

Note(s):

Default Tuner State, using Index 2, was used for all SAR RF Exposure Conditions, based off the results obtained using the single point measurements in §6.5.

10.7. LTE Band 7 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Power back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	OFF	0	Left Touch	21100	2535.0	1	0	25.0	24.49	0.110	0.124	
							50	0	24.0	22.41	0.068	0.098	
				Left Tilt	21100	2535.0	1	0	25.0	24.49	0.047	0.053	
							50	0	24.0	22.41	0.029	0.042	
				Right Touch	21100	2535.0	1	0	25.0	24.49	0.185	**0.208**	19
							50	0	24.0	22.41	0.115	0.166	
				Right Tilt	21100	2535.0	1	0	25.0	24.49	0.111	0.125	
							50	0	24.0	22.41	0.067	0.097	
Body-worn	QPSK	OFF	15	Rear	21100	2535.0	1	0	25.0	24.49	0.617	**0.694**	20
							50	0	24.0	22.41	0.422	0.609	
				Front	21100	2535.0	1	0	25.0	24.49	0.509	0.573	
							50	0	24.0	22.41	0.287	0.414	
Hotspot	QPSK	ON	10	Rear	20850	2510.0	50	0	22.0	20.60	0.470	0.649	
					21100	2535.0	1	0	22.0	21.60	0.598	0.656	
							50	0	22.0	20.55	0.621	0.867	
					21350	2560.0	50	0	22.0	20.44	0.632	0.905	
				Front	21100	2535.0	1	0	22.0	21.60	0.384	0.421	
							50	0	22.0	20.55	0.387	0.540	
				Edge 3	20850	2510.0	1	0	22.0	21.70	0.830	0.889	
							50	0	22.0	20.60	0.851	1.175	
					21100	2535.0	1	0	22.0	21.60	0.883	0.968	
							50	0	22.0	20.55	0.883	1.233	
							100	0	22.0	20.48	0.889	1.262	
					21350	2560.0	1	0	22.0	21.53	0.895	0.997	
							50	0	22.0	20.44	0.893	**1.279**	21
				Edge 4	21100	2535.0	1	0	22.0	21.60	0.294	0.322	
							50	0	22.0	20.55	0.181	0.253	

Note(s):

Default Tuner State, using Index 2, was used for all SAR RF Exposure Conditions, based off the results obtained using the single point measurements in §6.5.

10.8. 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	OFF	0	Left Touch	23095	707.5	1	0	25.0	24.10	0.106	0.130	
							25	0	24.0	22.07	0.065	0.101	
				Left Tilt	23095	707.5	1	0	25.0	24.10	0.077	0.095	
							25	0	24.0	22.07	0.049	0.076	
				Right Touch	23095	707.5	1	0	25.0	24.10	0.127	**0.156**	22
							25	0	24.0	22.07	0.081	0.126	
				Right Tilt	23095	707.5	1	0	25.0	24.10	0.078	0.096	
							25	0	24.0	22.07	0.050	0.078	
Body-worn	QPSK	OFF	15	Rear	23095	707.5	1	0	25.0	24.10	0.229	**0.282**	23
							25	0	24.0	22.07	0.146	0.228	
				Front	23095	707.5	1	0	25.0	24.10	0.185	0.228	
							25	0	24.0	22.07	0.120	0.187	
Hotspot	QPSK	OFF	10	Rear	23095	707.5	1	0	25.0	24.10	0.283	**0.348**	24
							25	0	24.0	22.07	0.181	0.282	
				Front	23095	707.5	1	0	25.0	24.10	0.225	0.277	
							25	0	24.0	22.07	0.143	0.223	
				Edge 2	23095	707.5	1	0	25.0	24.10	0.200	0.246	
							25	0	24.0	22.07	0.130	0.203	
				Edge 3	23095	707.5	1	0	25.0	24.10	0.105	0.129	
							25	0	24.0	22.07	0.068	0.106	
				Edge 4	23095	707.5	1	0	25.0	24.10	0.178	0.219	
							25	0	24.0	22.07	0.114	0.178	

10.9. 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	OFF	0	Left Touch	23230	782.0	1	0	25.0	24.74	0.107	0.114	
							25	0	24.0	22.24	0.064	0.096	
				Left Tilt	23230	782.0	1	0	25.0	24.74	0.077	0.082	
							25	0	24.0	22.24	0.041	0.061	
				Right Touch	23230	782.0	1	0	25.0	24.74	0.136	**0.145**	25
							25	0	24.0	22.24	0.080	0.120	
				Right Tilt	23230	782.0	1	0	25.0	24.74	0.081	0.086	
							25	0	24.0	22.24	0.044	0.066	
Body-worn	QPSK	OFF	15	Rear	23230	782.0	1	0	25.0	24.74	0.189	**0.201**	26
							25	0	24.0	22.24	0.111	0.166	
				Front	23230	782.0	1	0	25.0	24.74	0.174	0.185	
							25	0	24.0	22.24	0.100	0.150	
Hotspot	QPSK	OFF	10	Rear	23230	782.0	1	0	25.0	24.74	0.304	**0.323**	27
							25	0	24.0	22.24	0.179	0.268	
				Front	23230	782.0	1	0	25.0	24.74	0.222	0.236	
							25	0	24.0	22.24	0.129	0.193	
				Edge 2	23230	782.0	1	0	25.0	24.74	0.173	0.184	
							25	0	24.0	22.24	0.095	0.142	
				Edge 3	23230	782.0	1	0	25.0	24.74	0.130	0.138	
							25	0	24.0	22.24	0.080	0.120	
				Edge 4	23230	782.0	1	0	25.0	24.74	0.142	0.151	
							25	0	24.0	22.24	0.080	0.120	

10.10. 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	OFF	0	Left Touch	26365	1882.5	1	0	25.00	24.32	0.226	**0.264**	28
							50	0	24.00	22.25	0.137	0.205	
				Left Tilt	26365	1882.5	1	0	25.00	24.32	0.069	0.081	
							50	0	24.00	22.25	0.042	0.063	
				Right Touch	26365	1882.5	1	0	25.00	24.32	0.126	0.147	
							50	0	24.00	22.25	0.078	0.117	
				Right Tilt	26365	1882.5	1	0	25.00	24.32	0.067	0.078	
							50	0	24.00	22.25	0.040	0.060	
Body-worn	QPSK	OFF	15	Rear	26365	1882.5	1	0	25.00	24.32	0.601	**0.703**	29
							50	0	24.00	22.25	0.376	0.563	
				Front	26365	1882.5	1	0	25.00	24.32	0.378	0.442	
							50	0	24.00	22.25	0.247	0.370	
Hotspot	QPSK	ON	10	Rear	26140	1860.0	1	0	22.00	21.31	0.492	0.577	
					26365	1882.5	1	0	22.00	21.20	0.573	0.689	
							50	0	22.00	21.10	0.571	0.702	
					26590	1905.0	1	0	22.00	21.41	0.551	0.631	
				Front	26365	1882.5	1	0	22.00	21.20	0.355	0.427	
							50	0	22.00	21.10	0.352	0.433	
				Edge 2	26365	1882.5	1	0	22.00	21.20	0.057	0.069	
							50	0	22.00	21.10	0.058	0.071	
				Edge 3	26140	1860.0	1	0	22.00	21.31	0.731	0.857	
							50	0	22.00	21.24	0.717	0.854	
					26365	1882.5	1	0	22.00	21.20	0.827	0.994	
							50	0	22.00	21.10	0.804	0.989	
					26590	1905.0	1	0	22.00	21.41	0.876	1.003	
							50	0	22.00	21.34	0.953	**1.109**	30
							100	0	22.00	21.29	0.906	1.067	
				Edge 4	26365	1882.5	1	0	22.00	21.20	0.148	0.178	
							50	0	22.00	21.10	0.143	0.176	

10.11. 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	OFF	0	Left Touch	26865	831.5	1	37	25.0	24.51	0.159	0.178	
							36	0	24.0	22.35	0.104	0.152	
				Left Tilt	26865	831.5	1	37	25.0	24.51	0.104	0.116	
							36	0	24.0	22.35	0.068	0.099	
				Right Touch	26865	831.5	1	37	25.0	24.51	0.186	**0.208**	31
							36	0	24.0	22.35	0.124	0.181	
				Right Tilt	26865	831.5	1	37	25.0	24.51	0.091	0.102	
							36	0	24.0	22.35	0.061	0.089	
Body-worn	QPSK	OFF	15	Rear	26865	831.5	1	37	25.0	24.51	0.245	**0.274**	32
							36	0	24.0	22.35	0.148	0.216	
				Front	26865	831.5	1	37	25.0	24.51	0.207	0.232	
							36	0	24.0	22.35	0.141	0.206	
Hotspot	QPSK	OFF	10	Rear	26865	831.5	1	37	25.0	24.51	0.385	**0.431**	33
							36	0	24.0	22.35	0.227	0.332	
				Front	26865	831.5	1	37	25.0	24.51	0.284	0.318	
							36	0	24.0	22.35	0.194	0.284	
				Edge 2	26865	831.5	1	37	25.0	24.51	0.249	0.279	
							36	0	24.0	22.35	0.168	0.246	
				Edge 3	26865	831.5	1	37	25.0	24.51	0.247	0.277	
							36	0	24.0	22.35	0.141	0.206	
				Edge 4	26865	831.5	1	37	25.0	24.51	0.099	0.111	
							36	0	24.0	22.35	0.070	0.103	

10.12. LTE Band 41 (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	OFF	0	Left Touch	40620	2593.0	1	0	24.00	23.74	0.078	**0.083**	34
							50	0	23.00	21.61	0.050	0.068	
				Left Tilt	40620	2593.0	1	0	24.00	23.74	0.026	0.028	
							50	0	23.00	21.61	0.017	0.023	
				Right Touch	40620	2593.0	1	0	24.00	23.74	0.052	0.055	
							50	0	23.00	21.61	0.034	0.047	
				Right Tilt	40620	2593.0	1	0	24.00	23.74	0.047	0.050	
							50	0	23.00	21.61	0.032	0.044	
Body-worn	QPSK	OFF	15	Rear	40620	2593.0	1	0	24.00	23.74	0.341	**0.362**	35
							50	0	23.00	21.61	0.242	0.333	
				Front	40620	2593.0	1	0	24.00	23.74	0.234	0.248	
							50	0	23.00	21.61	0.154	0.212	
Hotspot	QPSK	OFF	10	Rear	40620	2593.0	1	0	21.50	20.45	0.196	0.250	
							50	0	21.50	20.94	0.216	0.246	
				Front	40620	2593.0	1	0	21.50	20.45	0.199	0.253	
							50	0	21.50	20.94	0.211	0.240	
				Edge 3	40620	2593.0	1	0	21.50	20.45	0.312	**0.397**	36
							50	0	21.50	20.94	0.331	0.377	
				Edge 4	40620	2593.0	1	0	21.50	20.45	0.072	0.092	
							50	0	21.50	20.94	0.078	0.089	

10.13. 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	OFF	0	Left Touch	132322	1745.0	1	0	25.00	24.14	0.267	**0.325**	37
							50	0	24.00	22.08	0.166	0.258	
				Left Tilt	132322	1745.0	1	0	25.00	24.14	0.070	0.085	
							50	0	24.00	22.08	0.047	0.073	
				Right Touch	132322	1745.0	1	0	25.00	24.14	0.142	0.173	
							50	0	24.00	22.08	0.087	0.135	
				Right Tilt	132322	1745.0	1	0	25.00	24.14	0.057	0.069	
							50	0	24.00	22.08	0.037	0.058	
Body-worn	QPSK	OFF	15	Rear	132322	1745.0	1	0	25.00	24.14	0.576	**0.702**	38
							50	0	24.00	22.08	0.367	0.571	
				Front	132322	1745.0	1	0	25.00	24.14	0.429	0.523	
							50	0	24.00	22.08	0.274	0.426	
Hotspot	QPSK	ON	10	Rear	132322	1745.0	1	0	22.00	21.16	0.511	0.620	
							50	0	22.00	21.08	0.513	0.634	
				Front	132322	1745.0	1	0	22.00	21.16	0.390	0.473	
							50	0	22.00	21.08	0.395	0.488	
				Edge 2	132322	1745.0	1	0	22.00	21.16	0.043	0.052	
							50	0	22.00	21.08	0.043	0.053	
				Edge 3	132072	1720.0	1	0	22.00	21.05	0.767	0.955	
							50	0	22.00	20.94	0.771	0.984	
					132322	1745.0	1	0	22.00	21.16	0.888	1.077	
							50	0	22.00	21.08	0.888	1.098	
					132572	1770.0	1	0	22.00	21.18	0.989	1.195	
							50	0	22.00	21.15	0.970	1.180	
							100	0	22.00	21.09	0.970	**1.196**	39
				Edge 4	132322	1745.0	1	0	22.00	21.16	0.145	0.176	
							50	0	22.00	21.08	0.146	0.180	

10.14. Wi-Fi (DTS Band)

When the proximity sensor is active in a held-to-ear user scenario, the output power level is reduced. The maximum allowed output powers in all conditions are included in the maximum power document.

Refer to Operational Description for WLAN explanation.

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

Antenna	Mode	RF Exposure Conditions	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	
Wi-Fi Antenna #1	802.11b 1 Mbps	Head	ON	0	Left Touch	11	2462	98.92%	0.144	16.0	15.80			
					Left Tilt	11	2462	98.92%	0.173	16.0	15.80			
					Right Touch	11	2462	98.92%	0.652	16.0	15.80	0.422	**0.447**	40
					Right Tilt	11	2462	98.92%	**0.731**	16.0	15.80	0.418	0.442	
		Body-worn	OFF	15	Rear	11	2462	98.92%	**0.142**	19.0	19.00	0.092	**0.093**	41
					Front	11	2462	98.92%	0.108	19.0	19.00			
		Hotspot	OFF	10	Rear	11	2462	98.92%	**0.355**	19.0	19.00	0.212	**0.214**	42
					Front	11	2462	98.92%	0.175	19.0	19.00			
					Edge 1	11	2462	98.92%	0.224	19.0	19.00			
					Edge 4	11	2462	98.92%	0.242	19.0	19.00			
Wi-Fi Antenna #2	802.11b 1 Mbps	Head	ON	0	Left Touch	6	2437	98.87%	0.077	16.0	15.90			
					Left Tilt	6	2437	98.87%	0.132	16.0	15.90			
					Right Touch	6	2437	98.87%	0.167	16.0	15.90			
					Right Tilt	6	2437	98.87%	**0.221**	16.0	15.90	0.119	**0.123**	43
		Body-worn	OFF	15	Rear	6	2437	98.87%	**0.072**	19.0	19.00	0.052	**0.052**	44
					Front	6	2437	98.87%	0.035	19.0	19.00			
		Hotspot	OFF	10	Rear	6	2437	98.87%	**0.167**	19.0	19.00	0.102	**0.103**	45
					Front	6	2437	98.87%	0.067	19.0	19.00			
					Edge 1	6	2437	98.87%	0.155	19.0	19.00			
					Edge 4	6	2437	98.87%	0.029	19.0	19.00			

10.15. Wi-Fi (DTS Band) RSDB (Real Simultaneous Dual Band)

Antenna	Mode	RF Exposure Conditions	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	
Wi-Fi Antenna #1	802.11b 1 Mbps	Head	0	Right Tilt	6	2437	98.92%		14.0	13.80	0.298	**0.315**	46
		Body-worn	15	Rear	6	2437	98.92%		14.0	13.80	0.038	**0.040**	47
		Hotspot	10	Rear	6	2437	98.92%		14.0	13.80	0.080	**0.085**	48
Wi-Fi Antenna #2	802.11b 1 Mbps	Head	0	Right Tilt	11	2462	98.87%		14.0	14.00	0.148	**0.150**	49
		Body-worn	15	Rear	11	2462	98.87%		14.0	14.00	0.025	**0.026**	50
		Hotspot	10	Rear	11	2462	98.87%		14.0	14.00	0.057	**0.057**	51

10.16. Wi-Fi (U-NII Bands)

When the proximity sensor is active in a held-to-ear user scenario, the output power level is reduced. The maximum allowed output powers in all conditions are included in the maximum power document.

Refer to Operational Description for WLAN explanation.

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.

Antenna	Mode	RF Exposure Conditions	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	
Wi-Fi Antenna #1	802.11ac VHT80	Head	ON	0	Left Touch	58	5290	63.79%	0.312	14.0	13.90			
					Left Tilt	58	5290	63.79%	0.357	14.0	13.90			
					Right Touch	58	5290	63.79%	**0.932**	14.0	13.90	0.347	**0.557**	52
					Right Tilt	58	5290	63.79%	0.880	14.0	13.90	0.335	0.537	
Wi-Fi Antenna #1	802.11a 6 Mbps	Body-worn	OFF	15	Rear	56	5280	93.46%	**0.762**	17.0	16.70	0.365	**0.418**	53
					Front	56	5280	93.46%	0.197	17.0	16.70	0.088	0.101	
Wi-Fi Antenna #2	802.11ac VHT80	Head	ON	0	Left Touch	58	5290	63.79%	0.046	14.0	14.00			
					Left Tilt	58	5290	63.79%	0.041	14.0	14.00			
					Right Touch	58	5290	63.79%	**0.073**	14.0	14.00	0.022	**0.034**	54
					Right Tilt	58	5290	63.79%	0.062	14.0	14.00			
Wi-Fi Antenna #2	802.11a 6 Mbps	Body-worn	OFF	15	Rear	64	5320	93.46%	**0.389**	17.0	17.00	0.168	**0.180**	55
					Front	64	5320	93.46%	0.026	17.0	17.00			

Note(s):
Highest Reported 1-g SAR for U-NII 2A mode is < 1.2 W/kg, therefore SAR testing is not required for U-NII 1 mode.

UNII-2C

Antenna	Mode	RF Exposure Conditions	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	
Wi-Fi Antenna #1	802.11ac VHT80	Head	ON	0	Left Touch	138	5690	63.79%	0.162	14.0	13.80			
					Left Tilt	138	5690	63.79%	0.220	14.0	13.80			
					Right Touch	138	5690	63.79%	**0.639**	14.0	13.80	0.269	**0.442**	56
					Right Tilt	138	5690	63.79%	0.442	14.0	13.80	0.195	0.320	
Wi-Fi Antenna #1	802.11a 6 Mbps	Body-worn	OFF	15	Rear	140	5700	93.46%	**0.556**	17.0	17.00	0.233	**0.249**	57
					Front	140	5700	93.46%	0.083	17.0	17.00			
Wi-Fi Antenna #2	802.11ac VHT80	Head	ON	0	Left Touch	138	5690	63.79%	0.029	14.0	13.70			
					Left Tilt	138	5690	63.79%	0.025	14.0	13.70			
					Right Touch	138	5690	63.79%	0.034	14.0	13.70			
					Right Tilt	138	5690	63.79%	**0.061**	14.0	13.70	0.015	**0.025**	58
Wi-Fi Antenna #2	802.11a 6 Mbps	Body-worn	OFF	15	Rear	140	5700	93.46%	**0.387**	17.0	17.00	0.166	**0.178**	59
					Front	140	5700	93.46%	0.022	17.0	17.00			

UNII-3

Antenna	Mode	RF Exposure Conditions	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	
Wi-Fi Antenna #1	802.11ac VHT80	Head	ON	0	Left Touch	155	5775	63.79%	0.118	14.0	13.90			
					Left Tilt	155	5775	63.79%	0.160	14.0	13.90			
					Right Touch	155	5775	63.79%	**0.387**	14.0	13.90	0.162	**0.260**	60
					Right Tilt	155	5775	63.79%	0.362	14.0	13.90			
Wi-Fi Antenna #1	802.11a 6 Mbps	Body-worn	OFF	15	Rear	165	5825	93.46%	**0.350**	17.0	17.00	0.156	**0.167**	61
					Front	165	5825	93.46%	0.126	17.0	17.00			
wi-Fi Antenna #1	802.11a 6 Mbps	Hotspot	OFF	10	Rear	165	5825	93.46%	**0.693**	17.0	17.00	0.284	**0.304**	62
					Front	165	5825	93.46%	0.136	17.0	17.00			
					Edge 1	165	5825	93.46%	0.256	17.0	17.00			
					Edge 4	165	5825	93.46%	0.272	17.0	17.00			
Wi-Fi Antenna #2	802.11ac VHT80	Head	ON	0	Left Touch	155	5775	63.79%	0.035	14.0	13.91			
					Left Tilt	155	5775	63.79%	0.024	14.0	13.91			
					Right Touch	155	5775	63.79%	0.040	14.0	13.91			
					Right Tilt	155	5775	63.79%	**0.062**	14.0	13.91	0.013	**0.021**	63
Wi-Fi Antenna #2	802.11a 6 Mbps	Body-worn	OFF	15	Rear	149	5745	93.46%	**0.589**	17.0	17.00	0.282	**0.302**	64
					Front	149	5745	93.46%	0.033	17.0	17.00			
Wi-Fi Antenna #2	802.11a 6 Mbps	Hotspot	OFF	10	Rear	149	5745	93.46%	**1.110**	17.0	17.00	0.505	**0.540**	65
					Front	149	5745	93.46%	0.035	17.0	17.00			
					Edge 1	149	5745	93.46%	0.135	17.0	17.00			
					Edge 4	149	5745	93.46%	0.201	17.0	17.00	0.094	0.101	

10.17. Wi-Fi (U-NII Bands) RSDB (Real Simultaneous Dual Band)

When the proximity sensor is active in a held-to-ear user scenario, the output power level is reduced. The maximum allowed output powers in all conditions are included in the maximum power document.

Refer to Operational Description for WLAN explanation.

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.

Antenna	Mode	RF Exposure Conditions	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	
Wi-Fi Antenna #1	802.11ac VHT80	Head	0	Left Touch	58	5290	63.79%	0.312	14.0	13.90			
				Left Tilt	58	5290	63.79%	0.357	14.0	13.90			
				Right Touch	58	5290	63.79%	**0.932**	14.0	13.90	0.347	**0.557**	66
				Right Tilt	58	5290	63.79%	0.880	14.0	13.90	0.335	0.537	
		Body worn	15	Rear	58	5290	63.79%	**0.315**	14.0	13.90	0.137	**0.220**	67
				Front	58	5290	63.79%	0.055	14.0	13.90			
Wi-Fi Antenna #2	802.11ac VHT80	Head	0	Left Touch	58	5290	63.79%	0.046	14.0	14.00			
				Left Tilt	58	5290	63.79%	0.041	14.0	14.00			
				Right Touch	58	5290	63.79%	**0.073**	14.0	14.00	0.022	**0.034**	68
				Right Tilt	58	5290	63.79%	0.062	14.0	14.00			
		Body worn	15	Rear	58	5290	63.79%	**0.199**	14.0	14.00	0.093	**0.146**	69
				Front	58	5290	63.79%	0.029	14.0	14.00			

Note(s):

Highest Reported 1-g SAR for U-NII 2A mode is < 1.2 W/kg, therefore SAR testing is not required for U-NII 1 mode.

UNII-2C

Antenna	Mode	RF Exposure Conditions	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	
Wi-Fi Antenna #1	802.11ac VHT80	Head	0	Left Touch	138	5690	63.79%	0.162	14.0	13.80			
				Left Tilt	138	5690	63.79%	0.220	14.0	13.80			
				Right Touch	138	5690	63.79%	**0.639**	14.0	13.80	0.269	**0.442**	70
				Right Tilt	138	5690	63.79%	0.442	14.0	13.80	0.195	0.320	
		Body worn	15	Rear	138	5690	63.79%	**0.224**	14.0	13.80	0.100	**0.164**	71
				Front	138	5690	63.79%	0.048	14.0	13.80			
Wi-Fi Antenna #2	802.11ac VHT80	Head	0	Left Touch	138	5690	63.79%	0.029	14.0	13.70			
				Left Tilt	138	5690	63.79%	0.025	14.0	13.70			
				Right Touch	138	5690	63.79%	0.034	14.0	13.70			
				Right Tilt	138	5690	63.79%	**0.061**	14.0	13.70	0.015	**0.025**	72
		Body worn	15	Rear	138	5690	63.79%	**0.195**	14.0	13.70	0.081	**0.136**	73
				Front	138	5690	63.79%	0.024	14.0	13.70			

UNII-3

Antenna	Mode	RF Exposure Conditions	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	
Wi-Fi Antenna #1	802.11ac VHT80	Head	0	Left Touch	155	5775	63.79%	0.118	14.0	13.90			
				Left Tilt	155	5775	63.79%	0.160	14.0	13.90			
				Right Touch	155	5775	63.79%	**0.387**	14.0	13.90	0.162	**0.260**	74
				Right Tilt	155	5775	63.79%	0.362	14.0	13.90			
		Body-worn	15	Rear	155	5775	63.79%	**0.242**	14.0	13.90	0.091	**0.146**	75
				Front	155	5775	63.79%	0.052	14.0	13.90			
		Hotspot	10	Rear	155	5775	63.79%	**0.366**	14.0	13.90	0.184	**0.295**	76
				Front	155	5775	63.79%	0.073	14.0	13.90			
				Edge 1	155	5775	63.79%	0.132	14.0	13.90			
				Edge 4	155	5775	63.79%	0.181	14.0	13.90			
Wi-Fi Antenna #2	802.11ac VHT80	Head	0	Left Touch	155	5775	63.79%	0.035	14.0	13.91			
				Left Tilt	155	5775	63.79%	0.024	14.0	13.91			
				Right Touch	155	5775	63.79%	0.040	14.0	13.91			
				Right Tilt	155	5775	63.79%	**0.062**	14.0	13.91	0.013	**0.021**	77
		Body-worn	15	Rear	155	5775	63.79%	0.361	14.0	13.91	0.145	**0.232**	78
				Front	155	5775	63.79%	0.038	14.0	13.91			
		Hotspot	10	Rear	155	5775	63.79%	**0.809**	14.0	13.91	0.288	**0.461**	79
				Front	155	5775	63.79%	0.053	14.0	13.91			
				Edge 1	155	5775	63.79%	0.107	14.0	13.91			
				Edge 4	155	5775	63.79%	0.175	14.0	13.91	0.049	0.078	

10.18. Bluetooth

Antenna	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	
Antenna #1	GFSK	Head	0	Left Touch	39	2441	17.0	16.57	0.119	0.131	
				Left Tilt	39	2441	17.0	16.57	0.143	0.158	
				Right Touch	39	2441	17.0	16.57	0.455	**0.502**	80
				Right Tilt	39	2441	17.0	16.57	0.408	0.450	
		Body-worn	15	Rear	39	2441	17.0	16.57	0.047	**0.051**	81
				Front	39	2441	17.0	16.57	0.032	0.035	
		BT Tethering	10	Rear	39	2441	17.0	16.57	0.097	**0.107**	82
				Front	39	2441	17.0	16.57	0.063	0.070	
				Edge 1	39	2441	17.0	16.57	0.079	0.087	
				Edge 4	39	2441	17.0	16.57	0.071	0.078	

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.

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	First Repeated	
						Measured SAR (W/kg)	Largest to Smallest SAR Ratio
700	LTE Band 12	Hotspot	Rear	No	0.283	N/A	N/A
	LTE Band 13	Hotspot	Rear	No	0.304	N/A	N/A
850	GSM 850	Hotspot	Rear	No	0.424	N/A	N/A
	WCDMA Band V	Hotspot	Rear	No	0.479	N/A	N/A
	LTE Band 5	Hotspot	Rear	No	0.457	N/A	N/A
	LTE Band 26	Hotspot	Rear	No	0.385	N/A	N/A
1700	WCDMA Band IV	Hotspot	Edge 3	No	0.840	N/A	N/A
	LTE Band 66	Hotspot	Edge 3	Yes	0.989	0.972	1.02
1900	GSM 1900	Hotspot	Edge 3	No	0.813	N/A	N/A
	WCDMA Band II	Hotspot	Edge 3	Yes	0.961	0.961	1.00
	LTE Band 25	Hotspot	Edge 3	No	0.953	N/A	N/A
2400	Wi-Fi 802.11b/g/n	Head	Right Touch	No	0.422	N/A	N/A
	BT	Head	Right Touch	No	0.455	N/A	N/A
2500	LTE Band 7	Hotspot	Edge 3	Yes	0.895	0.884	1.01
2600	LTE Band 41	Body	Rear	No	0.341	N/A	N/A
5300	Wi-Fi 802.11a/n/ac/ax	Body	Rear	No	0.365	N/A	N/A
5500	Wi-Fi 802.11a/n/ac/ax	Head	Right Touch	No	0.269	N/A	N/A
5800	Wi-Fi 802.11a/n/ac/ax	Hotspot	Rear	No	0.505	N/A	N/A

Note(s):

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

12. Simultaneous Transmission Conditions

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Notes
1	GSM voice + 2.4 GHz Wi-Fi	Yes	Yes	N/A	
2	GSM voice + 5 GHz Wi-Fi	Yes	Yes	N/A	
3	GSM voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	^Bluetooth Tethering is considered
4	GSM voice + 2.4 GHz Wi-Fi MIMO	Yes	Yes	N/A	
5	GSM voice + 5 GHz Wi-Fi MIMO	Yes	Yes	N/A	
6	GSM voice + 5 GHz Wi-Fi + 2.4 GHz Bluetooth	Yes^	Yes	N/A	^Bluetooth Tethering is considered
7	GSM voice + 5 GHz Wi-Fi MIMO + 2.4 GHz Bluetooth	Yes^	Yes	N/A	^Bluetooth Tethering is considered
8	GSM voice + 2.4 GHz Wi-Fi + 5 GHz Wi-Fi	Yes	Yes	N/A	Wi-Fi RSDB Combination
9	GSM voice + 2.4 GHz Wi-Fi MIMO + 5 GHz Wi-Fi MIMO	Yes	Yes	N/A	Wi-Fi RSDB Combination
10	UMTS + 2.4 GHz Wi-Fi	Yes	Yes	Yes	
11	UMTS + 5 GHz Wi-Fi	Yes	Yes	Yes	
12	UMTS + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	^Bluetooth Tethering is considered
13	UMTS + 2.4 GHz Wi-Fi MIMO	Yes	Yes	Yes	
14	UMTS + 5 GHz Wi-Fi MIMO	Yes	Yes	Yes	
15	UMTS + 5 GHz Wi-Fi + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	^Bluetooth Tethering is considered
16	UMTS + 5 GHz Wi-Fi MIMO + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	^Bluetooth Tethering is considered
17	UMTS + 2.4 GHz Wi-Fi + 5 GHz Wi-Fi	Yes	Yes	Yes	Wi-Fi RSDB Combination
18	UMTS + 2.4 GHz Wi-Fi MIMO + 5 GHz Wi-Fi MIMO	Yes	Yes	Yes	Wi-Fi RSDB Combination
19	LTE + 2.4 GHz Wi-Fi	Yes	Yes	Yes	
20	LTE + 5 GHz Wi-Fi	Yes	Yes	Yes	
21	LTE + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	^Bluetooth Tethering is considered
22	LTE + 2.4 GHz Wi-Fi MIMO	Yes	Yes	Yes	
23	LTE + 5 GHz Wi-Fi MIMO	Yes	Yes	Yes	
24	LTE + 5 GHz Wi-Fi + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	^Bluetooth Tethering is considered
25	LTE + 5 GHz Wi-Fi MIMO + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	^Bluetooth Tethering is considered
26	LTE + 2.4 GHz Wi-Fi + 5 GHz Wi-Fi	Yes	Yes	Yes	Wi-Fi RSDB Combination
27	LTE + 2.4 GHz Wi-Fi MIMO + 5 GHz Wi-Fi MIMO	Yes	Yes	Yes	Wi-Fi RSDB Combination
28	GPRS/EDGE + 2.4 GHz Wi-Fi	N/A	N/A	Yes	
29	GPRS/EDGE + 5 GHz Wi-Fi	N/A	N/A	Yes	
30	GPRS/EDGE + 2.4 GHz Bluetooth	N/A	N/A	Yes^	^Bluetooth Tethering is considered
31	GPRS/EDGE + 2.4 GHz Wi-Fi MIMO	N/A	N/A	Yes	
32	GPRS/EDGE + 5 GHz Wi-Fi MIMO	N/A	N/A	Yes	
33	GPRS/EDGE + 5 GHz Wi-Fi + 2.4 GHz Bluetooth	N/A	N/A	Yes^	^Bluetooth Tethering is considered
34	GPRS/EDGE + 5 GHz Wi-Fi MIMO + 2.4 GHz Bluetooth	N/A	N/A	Yes^	^Bluetooth Tethering is considered
35	GPRS/EDGE + 2.4 GHz Wi-Fi + 5 GHz Wi-Fi	N/A	N/A	Yes	Wi-Fi RSDB Combination
36	GPRS/EDGE + 2.4 GHz Wi-Fi MIMO + 5 GHz Wi-Fi MIMO	N/A	N/A	Yes	Wi-Fi RSDB Combination

Note(s):

1. DTS Radio cannot transmit simultaneously with Bluetooth Radio.

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 *reported* 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

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 GSM850 & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						∑ 1-g SAR (W/kg)				
		WWAN	DTS		U-NII		BT	WWAN + BT	WWAN + DTS	WWAN + U-NII	WWAN + U-NII + BT	WWAN + U-NII + BT
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥	① + ⑥	① + ② + ③	① + ④ + ⑤	① + ⑤ + ⑥	① + ④ + ⑤ + ⑥
Head	Left Touch	0.166	0.418	0.123	0.537	0.025	0.131	0.297	0.707	0.728	0.322	0.859
	Left Tilt	0.085	0.418	0.123	0.537	0.025	0.158	0.243	0.626	0.647	0.268	0.805
	Right Touch	0.217	0.422	0.123	0.557	0.034	0.502	0.719	0.762	0.808	0.753	1.310
	Right Tilt	0.092	0.418	0.123	0.537	0.025	0.450	0.542	0.633	0.654	0.567	1.104
Body-worn	Rear	0.271	0.093	0.052	0.418	0.302	0.051	0.322	0.416	0.991	0.624	1.042
	Front	0.255	0.093	0.052	0.101	0.302	0.035	0.290	0.400	0.658	0.592	0.693
Hotspot	Rear	0.498	0.212	0.103	0.304	0.540	0.107	0.605	0.813	1.342	1.145	1.449
	Front	0.360	0.212	0.103	0.304	0.101	0.070	0.430	0.675	0.765	0.531	0.835
	Edge 1		0.212	0.103	0.304	0.101	0.087		0.315	0.405	0.188	0.492
	Edge 2	0.181										
	Edge 3	0.336										
	Edge 4	0.083	0.212	0.103	0.304	0.101	0.078	0.161	0.398	0.488	0.262	0.566

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

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

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						∑ 1-g SAR (W/kg)				
		WWAN	DTS		U-NII		BT	WWAN + BT	WWAN + DTS	WWAN + U-NII	WWAN + U-NII + BT	WWAN + U-NII + BT
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥	① + ⑥	① + ② + ③	① + ④ + ⑤	① + ⑤ + ⑥	① + ④ + ⑤ + ⑥
Head	Left Touch	0.093	0.418	0.123	0.537	0.025	0.131	0.224	0.634	0.655	0.249	0.786
	Left Tilt	0.041	0.418	0.123	0.537	0.025	0.158	0.199	0.582	0.603	0.224	0.761
	Right Touch	0.060	0.422	0.123	0.557	0.034	0.502	0.562	0.605	0.651	0.596	1.153
	Right Tilt	0.034	0.418	0.123	0.537	0.025	0.450	0.484	0.575	0.596	0.509	1.046
Body-worn	Rear	0.288	0.093	0.052	0.418	0.302	0.051	0.339	0.433	1.008	0.641	1.059
	Front	0.175	0.093	0.052	0.101	0.302	0.035	0.210	0.320	0.578	0.512	0.613
Hotspot	Rear	0.537	0.212	0.103	0.304	0.540	0.107	0.644	0.852	1.381	1.184	1.488
	Front	0.366	0.212	0.103	0.304	0.101	0.070	0.436	0.681	0.771	0.537	0.841
	Edge 1		0.212	0.103	0.304	0.101	0.087		0.315	0.405	0.188	0.492
	Edge 2	0.068										
	Edge 3	0.923										
	Edge 4	0.153	0.212	0.103	0.304	0.101	0.078	0.231	0.468	0.558	0.332	0.636

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

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

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						∑ 1-g SAR (W/kg)				
		WWAN	DTS		U-NII		BT	WWAN + BT	WWAN + DTS	WWAN + U-NII	WWAN + U-NII + BT	WWAN + U-NII + BT
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥	① + ⑥	① + ② + ③	① + ④ + ⑤	① + ⑤ + ⑥	① + ④ + ⑤ + ⑥
Head	Left Touch	0.256	0.418	0.123	0.537	0.025	0.131	0.387	0.797	0.818	0.412	0.949
	Left Tilt	0.077	0.418	0.123	0.537	0.025	0.158	0.235	0.618	0.639	0.260	0.797
	Right Touch	0.146	0.422	0.123	0.557	0.034	0.502	0.648	0.691	0.737	0.682	1.239
	Right Tilt	0.083	0.418	0.123	0.537	0.025	0.450	0.533	0.624	0.645	0.558	1.095
Body-worn	Rear	0.686	0.093	0.052	0.418	0.302	0.051	0.737	0.831	1.406	1.039	1.457
	Front	0.443	0.093	0.052	0.101	0.302	0.035	0.478	0.588	0.846	0.780	0.881
Hotspot	Rear	0.655	0.212	0.103	0.304	0.540	0.107	0.762	0.970	1.499	1.302	1.606
	Front	0.448	0.212	0.103	0.304	0.101	0.070	0.518	0.763	0.853	0.619	0.923
	Edge 1		0.212	0.103	0.304	0.101	0.087		0.315	0.405	0.188	0.492
	Edge 2	0.093										
	Edge 3	1.087										
	Edge 4	0.207	0.212	0.103	0.304	0.101	0.078	0.285	0.522	0.612	0.386	0.690

Conclusion:

SPLSR analysis is required because the Sum of the SAR is > 1.6 W/kg.

SAR to Peak Location Separation Ratio (SPLSR)

RF Exposure Conditions	Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Refer to Section
		WWAN	U-NII		BT						
		①	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥						
Hotspot	Rear	0.655	0.304	0.540	0.107	① + ④ + ⑤ + ⑥	1.606				
		0.655	0.304			① + ④	0.959	138.6	0.01	No	
		0.655		0.540		① + ⑤	1.195	130.0	0.01	No	
		0.655			0.107	① + ⑥	0.762	142.8	0.00	No	
			0.304	0.540		④ + ⑤	0.844	8.9	0.09	Yes	12.28
				0.540	0.107	⑤ + ⑥	0.647	13.9	0.04	No	

RF Exposure Conditions	Test Position	Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
				W/kg	m	m	m		
Hotspot	Rear	UMTS Band II	①	0.809	-0.001	-0.071	-0.180	① + ④	138.6
		Ant #1 U-NII	④	0.696	0.028	0.065	-0.174		
		UMTS Band II	①	0.809	-0.001	-0.071	-0.180	① + ⑤	130.0
		Ant #2 U-NII	⑤	1.330	0.024	0.057	-0.174		
		UMTS Band II	①	0.809	-0.001	-0.071	-0.180	① + ⑥	142.8
		Ant #1 BT	⑥	0.153	0.026	0.070	-0.179		
		Ant #1 U-NII	④	0.696	0.028	0.065	-0.174	④ + ⑤	8.9
		Ant #2 U-NII	⑤	1.330	0.024	0.057	-0.174		
		Ant #2 U-NII	⑤	1.330	0.024	0.057	-0.174	⑤ + ⑥	13.9
		Ant #1 BT	⑥	0.153	0.026	0.070	-0.179		

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

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is required because the SPLSR is > 0.04

12.5. Sum of the SAR for WCDMA Band IV & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						∑ 1-g SAR (W/kg)				
		WWAN	DTS		U-NII		BT	WWAN + BT	WWAN + DTS	WWAN + U-NII	WWAN + U-NII + BT	WWAN + U-NII + BT
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥	① + ⑥	① + ② + ③	① + ④ + ⑤	① + ⑤ + ⑥	① + ④ + ⑤ + ⑥
Head	Left Touch	0.340	0.418	0.123	0.537	0.025	0.131	0.471	0.881	0.902	0.496	1.033
	Left Tilt	0.089	0.418	0.123	0.537	0.025	0.158	0.247	0.630	0.651	0.272	0.809
	Right Touch	0.150	0.422	0.123	0.557	0.034	0.502	0.652	0.695	0.741	0.686	1.243
	Right Tilt	0.064	0.418	0.123	0.537	0.025	0.450	0.514	0.605	0.626	0.539	1.076
Body-worn	Rear	0.649	0.093	0.052	0.418	0.302	0.051	0.700	0.794	1.369	1.002	1.420
	Front	0.476	0.093	0.052	0.101	0.302	0.035	0.511	0.621	0.879	0.813	0.914
Hotspot	Rear	0.522	0.212	0.103	0.304	0.540	0.107	0.629	0.837	1.366	1.169	1.473
	Front	0.371	0.212	0.103	0.304	0.101	0.070	0.441	0.686	0.776	0.542	0.846
	Edge 1		0.212	0.103	0.304	0.101	0.087		0.315	0.405	0.188	0.492
	Edge 2	0.043										
	Edge 3	0.964										
	Edge 4	0.138	0.212	0.103	0.304	0.101	0.078	0.216	0.453	0.543	0.317	0.621

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

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

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						∑ 1-g SAR (W/kg)				
		WWAN	DTS		U-NII		BT	WWAN + BT	WWAN + DTS	WWAN + U-NII	WWAN + U-NII + BT	WWAN + U-NII + BT
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥	① + ⑥	① + ② + ③	① + ④ + ⑤	① + ⑤ + ⑥	① + ④ + ⑤ + ⑥
Head	Left Touch	0.206	0.418	0.123	0.537	0.025	0.131	0.337	0.747	0.768	0.362	0.899
	Left Tilt	0.105	0.418	0.123	0.537	0.025	0.158	0.263	0.646	0.667	0.288	0.825
	Right Touch	0.231	0.422	0.123	0.557	0.034	0.502	0.733	0.776	0.822	0.767	1.324
	Right Tilt	0.121	0.418	0.123	0.537	0.025	0.450	0.571	0.662	0.683	0.596	1.133
Body-worn	Rear	0.278	0.093	0.052	0.418	0.302	0.051	0.329	0.423	0.998	0.631	1.049
	Front	0.259	0.093	0.052	0.101	0.302	0.035	0.294	0.404	0.662	0.596	0.697
Hotspot	Rear	0.504	0.212	0.103	0.304	0.540	0.107	0.611	0.819	1.348	1.151	1.455
	Front	0.402	0.212	0.103	0.304	0.101	0.070	0.472	0.717	0.807	0.573	0.877
	Edge 1		0.212	0.103	0.304	0.101	0.087		0.315	0.405	0.188	0.492
	Edge 2	0.180										
	Edge 3	0.320										
	Edge 4	0.105	0.212	0.103	0.304	0.101	0.078	0.183	0.420	0.510	0.284	0.588

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

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

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						∑ 1-g SAR (W/kg)				
		WWAN	DTS		U-NII		BT	WWAN + BT	WWAN + DTS	WWAN + U-NII	WWAN + U-NII + BT	WWAN + U-NII + BT
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥	① + ⑥	① + ② + ③	① + ④ + ⑤	① + ⑤ + ⑥	① + ④ + ⑤ + ⑥
Head	Left Touch	0.229	0.418	0.123	0.537	0.025	0.131	0.360	0.770	0.791	0.385	0.922
	Left Tilt	0.150	0.418	0.123	0.537	0.025	0.158	0.308	0.691	0.712	0.333	0.870
	Right Touch	0.254	0.422	0.123	0.557	0.034	0.502	0.756	0.799	0.845	0.790	**1.347**
	Right Tilt	0.153	0.418	0.123	0.537	0.025	0.450	0.603	0.694	0.715	0.628	1.165
Body-worn	Rear	0.349	0.093	0.052	0.418	0.302	0.051	0.400	0.494	1.069	0.702	1.120
	Front	0.319	0.093	0.052	0.101	0.302	0.035	0.354	0.464	0.722	0.656	0.757
Hotspot	Rear	0.487	0.212	0.103	0.304	0.540	0.107	0.594	0.802	1.331	1.134	1.438
	Front	0.395	0.212	0.103	0.304	0.101	0.070	0.465	0.710	0.800	0.566	0.870
	Edge 1		0.212	0.103	0.304	0.101	0.087		0.315	0.405	0.188	0.492
	Edge 2	0.400										
	Edge 3	0.354										
	Edge 4	0.204	0.212	0.103	0.304	0.101	0.078	0.282	0.519	0.609	0.383	0.687

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.8. Sum of the SAR for LTE Band 7 & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						∑ 1-g SAR (W/kg)				
		WWAN	DTS		U-NII		BT	WWAN + BT	WWAN + DTS	WWAN + U-NII	WWAN + U-NII + BT	WWAN + U-NII + BT
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥	① + ⑥	① + ② + ③	① + ④ + ⑤	① + ⑤ + ⑥	① + ④ + ⑤ + ⑥
Head	Left Touch	0.124	0.418	0.123	0.537	0.025	0.131	0.255	0.665	0.686	0.280	0.817
	Left Tilt	0.053	0.418	0.123	0.537	0.025	0.158	0.211	0.594	0.615	0.236	0.773
	Right Touch	0.208	0.422	0.123	0.557	0.034	0.502	0.710	0.753	0.799	0.744	1.301
	Right Tilt	0.125	0.418	0.123	0.537	0.025	0.450	0.575	0.666	0.687	0.600	1.137
Body-worn	Rear	0.694	0.093	0.052	0.418	0.302	0.051	0.745	0.839	1.414	1.047	1.465
	Front	0.573	0.093	0.052	0.101	0.302	0.035	0.608	0.718	0.976	0.910	1.011
Hotspot	Rear	0.905	0.212	0.103	0.304	0.540	0.107	1.012	1.220	1.749	1.552	1.856
	Front	0.540	0.212	0.103	0.304	0.101	0.070	0.610	0.855	0.945	0.711	1.015
	Edge 1		0.212	0.103	0.304	0.101	0.087		0.315	0.405	0.188	0.492
	Edge 3	1.279										
	Edge 4	0.322	0.212	0.103	0.304	0.101	0.078	0.400	0.637	0.727	0.501	0.805

Conclusion:

SPLSR analysis is required because the Sum of the SAR is > 1.6 W/kg.

SAR to Peak Location Separation Ratio (SPLSR)

RF Exposure Conditions	Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Refer to Section
		WWAN	U-NII		BT						
		①	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥						
Hotspot	Rear	0.905	0.304	0.540	0.107	① + ④ + ⑤ + ⑥	1.856				
		0.905	0.304			① + ④	1.209	136.6	0.01	No	
		0.905		0.540		① + ⑤	1.445	127.9	0.01	No	
		0.905			0.107	① + ⑥	1.012	140.8	0.01	No	
			0.304	0.540		④ + ⑤	0.844	8.9	0.09	Yes	12.28
				0.540	0.107	⑤ + ⑥	0.647	13.9	0.04	No	

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	1.020	-0.006	-0.067	-0.177	① + ④	136.6
		Ant #1 U-NII	④	0.696	0.028	0.065	-0.174		
		LTE Band 7	①	1.020	-0.006	-0.067	-0.177	① + ⑤	127.9
		Ant #2 U-NII	⑤	1.330	0.024	0.057	-0.174		
		LTE Band 7	①	1.020	-0.006	-0.067	-0.177	① + ⑥	140.8
		Ant #1 BT	⑥	0.153	0.026	0.070	-0.179		
		Ant #1 U-NII	④	0.696	0.028	0.065	-0.174	④ + ⑤	8.9
		Ant #2 U-NII	⑤	1.330	0.024	0.057	-0.174		
		Ant #2 U-NII	⑤	1.330	0.024	0.057	-0.174	⑤ + ⑥	13.9
		Ant #1 BT	⑥	0.153	0.026	0.070	-0.179		

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

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is required because the SPLSR is > 0.04

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

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						∑ 1-g SAR (W/kg)				
		WWAN	DTS		U-NII		BT	WWAN + BT	WWAN + DTS	WWAN + U-NII	WWAN + U-NII + BT	WWAN + U-NII + BT
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥	① + ⑥	① + ② + ③	① + ④ + ⑤	① + ⑤ + ⑥	① + ④ + ⑤ + ⑥
Head	Left Touch	0.130	0.418	0.123	0.537	0.025	0.131	0.261	0.671	0.692	0.286	0.823
	Left Tilt	0.095	0.418	0.123	0.537	0.025	0.158	0.253	0.636	0.657	0.278	0.815
	Right Touch	0.156	0.422	0.123	0.557	0.034	0.502	0.658	0.701	0.747	0.692	1.249
	Right Tilt	0.096	0.418	0.123	0.537	0.025	0.450	0.546	0.637	0.658	0.571	1.108
Body-worn	Rear	0.282	0.093	0.052	0.418	0.302	0.051	0.333	0.427	1.002	0.635	1.053
	Front	0.228	0.093	0.052	0.101	0.302	0.035	0.263	0.373	0.631	0.565	0.666
Hotspot	Rear	0.348	0.212	0.103	0.304	0.540	0.107	0.455	0.663	1.192	0.995	1.299
	Front	0.277	0.212	0.103	0.304	0.101	0.070	0.347	0.592	0.682	0.448	0.752
	Edge 1		0.212	0.103	0.304	0.101	0.087		0.315	0.405	0.188	0.492
	Edge 2	0.246										
	Edge 3	0.129										
	Edge 4	0.219	0.212	0.103	0.304	0.101	0.078	0.297	0.534	0.624	0.398	0.702

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.10. Sum of the SAR for LTE Band 13 & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						∑ 1-g SAR (W/kg)				
		WWAN	DTS		U-NII		BT	WWAN + BT	WWAN + DTS	WWAN + U-NII	WWAN + U-NII + BT	WWAN + U-NII + BT
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥	① + ⑥	① + ② + ③	① + ④ + ⑤	① + ⑤ + ⑥	① + ④ + ⑤ + ⑥
Head	Left Touch	0.114	0.418	0.123	0.537	0.025	0.131	0.245	0.655	0.676	0.270	0.807
	Left Tilt	0.082	0.418	0.123	0.537	0.025	0.158	0.240	0.623	0.644	0.265	0.802
	Right Touch	0.145	0.422	0.123	0.557	0.034	0.502	0.647	0.690	0.736	0.681	1.238
	Right Tilt	0.086	0.418	0.123	0.537	0.025	0.450	0.536	0.627	0.648	0.561	1.098
Body-worn	Rear	0.201	0.093	0.052	0.418	0.302	0.051	0.252	0.346	0.921	0.554	0.972
	Front	0.185	0.093	0.052	0.101	0.302	0.035	0.220	0.330	0.588	0.522	0.623
Hotspot	Rear	0.323	0.212	0.103	0.304	0.540	0.107	0.430	0.638	1.167	0.970	1.274
	Front	0.236	0.212	0.103	0.304	0.101	0.070	0.306	0.551	0.641	0.407	0.711
	Edge 1		0.212	0.103	0.304	0.101	0.087		0.315	0.405	0.188	0.492
	Edge 2	0.184										
	Edge 3	0.138										
	Edge 4	0.151	0.212	0.103	0.304	0.101	0.078	0.229	0.466	0.556	0.330	0.634

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.11. Sum of the SAR for LTE Band 25 & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						∑ 1-g SAR (W/kg)				
		WWAN	DTS		U-NII		BT	WWAN + BT	WWAN + DTS	WWAN + U-NII	WWAN + U-NII + BT	WWAN + U-NII + BT
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥	① + ⑥	① + ② + ③	① + ④ + ⑤	① + ⑤ + ⑥	① + ④ + ⑤ + ⑥
Head	Left Touch	0.264	0.418	0.123	0.537	0.025	0.131	0.395	0.805	0.826	0.420	0.957
	Left Tilt	0.081	0.418	0.123	0.537	0.025	0.158	0.239	0.622	0.643	0.264	0.801
	Right Touch	0.147	0.422	0.123	0.557	0.034	0.502	0.649	0.692	0.738	0.683	1.240
	Right Tilt	0.078	0.418	0.123	0.537	0.025	0.450	0.528	0.619	0.640	0.553	1.090
Body-worn	Rear	0.703	0.093	0.052	0.418	0.302	0.051	0.754	0.848	1.423	1.056	**1.474**
	Front	0.442	0.093	0.052	0.101	0.302	0.035	0.477	0.587	0.845	0.779	0.880
Hotspot	Rear	0.702	0.212	0.103	0.304	0.540	0.107	0.809	1.017	1.546	1.349	1.653
	Front	0.433	0.212	0.103	0.304	0.101	0.070	0.503	0.748	0.838	0.604	0.908
	Edge 1		0.212	0.103	0.304	0.101	0.087		0.315	0.405	0.188	0.492
	Edge 2	0.071										
	Edge 3	1.109										
	Edge 4	0.178	0.212	0.103	0.304	0.101	0.078	0.256	0.493	0.583	0.357	0.661

Conclusion:

SPLSR analysis is required because the Sum of the SAR is > 1.6 W/kg.

SAR to Peak Location Separation Ratio (SPLSR)

RF Exposure Conditions	Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Refer to Section
		WWAN	U-NII		BT						
		①	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥						
Hotspot	Rear	0.702	0.304	0.540	0.107	① + ④ + ⑤ + ⑥	1.653				
		0.702	0.304			① + ④	1.006	150.6	0.01	No	
		0.702		0.540		① + ⑤	1.242	142.3	0.01	No	
		0.702			0.107	① + ⑥	0.809	155.1	0.00	No	
			0.304	0.540		④ + ⑤	0.844	8.9	0.09	Yes	12.28
				0.540	0.107	⑤ + ⑥	0.647	13.9	0.04	No	

RF Exposure Conditions	Test Position	Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
				W/kg	m	m	m		
Hotspot	Rear	LTE Band 25	①	0.147	0.016	-0.085	-0.179	① + ④	150.6
		Ant #1 U-NII	④	0.696	0.028	0.065	-0.174		
		LTE Band 25	①	0.147	0.016	-0.085	-0.179	① + ⑤	142.3
		Ant #2 U-NII	⑤	1.330	0.024	0.057	-0.174		
		LTE Band 25	①	0.147	0.016	-0.085	-0.179	① + ⑥	155.1
		Ant #1 BT	⑥	0.153	0.026	0.070	-0.179		
		Ant #1 U-NII	④	0.696	0.028	0.065	-0.174	④ + ⑤	8.9
		Ant #2 U-NII	⑤	1.330	0.024	0.057	-0.174		
		Ant #2 U-NII	⑤	1.330	0.024	0.057	-0.174	⑤ + ⑥	13.9
		Ant #1 BT	⑥	0.153	0.026	0.070	-0.179		

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

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is required because the SPLSR is > 0.04

12.12. Sum of the SAR for LTE Band 26 & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						∑ 1-g SAR (W/kg)				
		WWAN	DTS		U-NII		BT	WWAN + BT	WWAN + DTS	WWAN + U-NII	WWAN + U-NII + BT	WWAN + U-NII + BT
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥	① + ⑥	① + ② + ③	① + ④ + ⑤	① + ⑤ + ⑥	① + ④ + ⑤ + ⑥
Head	Left Touch	0.178	0.418	0.123	0.537	0.025	0.131	0.309	0.719	0.740	0.334	0.871
	Left Tilt	0.116	0.418	0.123	0.537	0.025	0.158	0.274	0.657	0.678	0.299	0.836
	Right Touch	0.208	0.422	0.123	0.557	0.034	0.502	0.710	0.753	0.799	0.744	1.301
	Right Tilt	0.102	0.418	0.123	0.537	0.025	0.450	0.552	0.643	0.664	0.577	1.114
Body-worn	Rear	0.274	0.093	0.052	0.418	0.302	0.051	0.325	0.419	0.994	0.627	1.045
	Front	0.232	0.093	0.052	0.101	0.302	0.035	0.267	0.377	0.635	0.569	0.670
Hotspot	Rear	0.431	0.212	0.103	0.304	0.540	0.107	0.538	0.746	1.275	1.078	1.382
	Front	0.318	0.212	0.103	0.304	0.101	0.070	0.388	0.633	0.723	0.489	0.793
	Edge 1		0.212	0.103	0.304	0.101	0.087		0.315	0.405	0.188	0.492
	Edge 2	0.279										
	Edge 3	0.277										
	Edge 4	0.111	0.212	0.103	0.304	0.101	0.078	0.189	0.426	0.516	0.290	0.594

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.13. Sum of the SAR for LTE Band 41 & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						∑ 1-g SAR (W/kg)				
		WWAN	DTS		U-NII		BT	WWAN + BT	WWAN + DTS	WWAN + U-NII	WWAN + U-NII + BT	WWAN + U-NII + BT
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥	① + ⑥	① + ② + ③	① + ④ + ⑤	① + ⑤ + ⑥	① + ④ + ⑤ + ⑥
Head	Left Touch	0.083	0.418	0.123	0.537	0.025	0.131	0.214	0.624	0.645	0.239	0.776
	Left Tilt	0.028	0.418	0.123	0.537	0.025	0.158	0.186	0.569	0.590	0.211	0.748
	Right Touch	0.055	0.422	0.123	0.557	0.034	0.502	0.557	0.600	0.646	0.591	1.148
	Right Tilt	0.050	0.418	0.123	0.537	0.025	0.450	0.500	0.591	0.612	0.525	1.062
Body-worn	Rear	0.362	0.093	0.052	0.418	0.302	0.051	0.413	0.507	1.082	0.715	1.133
	Front	0.248	0.093	0.052	0.101	0.302	0.035	0.283	0.393	0.651	0.585	0.686
Hotspot	Rear	0.250	0.212	0.103	0.304	0.540	0.107	0.357	0.565	1.094	0.897	1.201
	Front	0.253	0.212	0.103	0.304	0.101	0.070	0.323	0.568	0.658	0.424	0.728
	Edge 1		0.212	0.103	0.304	0.101	0.087		0.315	0.405	0.188	0.492
	Edge 3	0.397										
	Edge 4	0.092	0.212	0.103	0.304	0.101	0.078	0.170	0.407	0.497	0.271	0.575

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.14. Sum of the SAR for LTE Band 66 & Wi-Fi & BT

RF Exposure conditions	Test Position	Standalone SAR (W/kg)						∑ 1-g SAR (W/kg)				
		WWAN	DTS		U-NII		BT	WWAN + BT	WWAN + DTS	WWAN + U-NII	WWAN + U-NII + BT	WWAN + U-NII + BT
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	Ant #1 ⑥	① + ⑥	① + ② + ③	① + ④ + ⑤	① + ⑤ + ⑥	① + ④ + ⑤ + ⑥
Head	Left Touch	0.325	0.418	0.123	0.537	0.025	0.131	0.456	0.866	0.887	0.481	1.018
	Left Tilt	0.085	0.418	0.123	0.537	0.025	0.158	0.243	0.626	0.647	0.268	0.805
	Right Touch	0.173	0.422	0.123	0.557	0.034	0.502	0.675	0.718	0.764	0.709	1.266
	Right Tilt	0.069	0.418	0.123	0.537	0.025	0.450	0.519	0.610	0.631	0.544	1.081
Body-worn	Rear	0.702	0.093	0.052	0.418	0.302	0.051	0.753	0.847	1.422	1.055	1.473
	Front	0.523	0.093	0.052	0.101	0.302	0.035	0.558	0.668	0.926	0.860	0.961
Hotspot	Rear	0.634	0.212	0.103	0.304	0.540	0.107	0.741	0.949	1.478	1.281	1.585
	Front	0.488	0.212	0.103	0.304	0.101	0.070	0.558	0.803	0.893	0.659	0.963
	Edge 1		0.212	0.103	0.304	0.101	0.087		0.315	0.405	0.188	0.492
	Edge 2	0.053										
	Edge 3	1.196										
	Edge 4	0.180	0.212	0.103	0.304	0.101	0.078	0.258	0.495	0.585	0.359	0.663

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.15. Sum of the SAR for GSM850 & Wi-Fi (RSDB)

RF Exposure conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)								
		WWAN	DTS		U-NII		WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	①+③+④	①+②+⑤	①+②+④	①+③+⑤	①+③+④+⑤	①+②+④+⑤	①+②+③+④	①+②+③+⑤	①+②+③+④+⑤
Head	Left Touch	0.166	0.315	0.150	0.537	0.025	0.853	0.506	1.018	0.341	0.878	1.043	1.168	0.656	1.193
	Left Tilt	0.085	0.315	0.150	0.537	0.025	0.772	0.425	0.937	0.260	0.797	0.962	1.087	0.575	1.112
	Right Touch	0.217	0.315	0.150	0.557	0.034	0.924	0.566	1.089	0.401	0.958	1.123	1.239	0.716	1.273
	Right Tilt	0.092	0.315	0.150	0.537	0.025	0.779	0.432	0.944	0.267	0.804	0.969	1.094	0.582	1.119
Body-worn	Rear	0.271	0.040	0.026	0.220	0.232	0.517	0.543	0.531	0.529	0.749	0.763	0.557	0.569	0.789
	Front	0.255	0.040	0.026	0.220	0.232	0.501	0.527	0.515	0.513	0.733	0.747	0.541	0.553	0.773
Hotspot	Rear	0.498	0.085	0.057	0.295	0.461	0.850	1.044	0.878	1.016	1.311	1.339	0.935	1.101	1.396
	Front	0.360	0.085	0.057	0.295	0.461	0.712	0.906	0.740	0.878	1.173	1.201	0.797	0.963	1.258
	Edge 1		0.085	0.057	0.295	0.461	0.352	0.546	0.380	0.518	0.380	0.841	0.437	0.603	0.898
	Edge 2	0.181													
	Edge 3	0.336													
	Edge 4	0.083	0.085	0.057	0.295	0.078	0.435	0.246	0.463	0.218	0.513	0.541	0.520	0.303	0.598

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.16. Sum of the SAR for GSM1900 & Wi-Fi (RSDB)

RF Exposure conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)								
		WWAN	DTS		U-NII		WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	①+③+④	①+②+⑤	①+②+④	①+③+⑤	①+③+④+⑤	①+②+④+⑤	①+②+③+④	①+②+③+⑤	①+②+③+④+⑤
Head	Left Touch	0.093	0.315	0.150	0.537	0.025	0.780	0.433	0.945	0.268	0.805	0.970	1.095	0.583	1.120
	Left Tilt	0.041	0.315	0.150	0.537	0.025	0.728	0.381	0.893	0.216	0.753	0.918	1.043	0.531	1.068
	Right Touch	0.060	0.315	0.150	0.557	0.034	0.767	0.409	0.932	0.244	0.801	0.966	1.082	0.559	1.116
	Right Tilt	0.034	0.315	0.150	0.537	0.025	0.721	0.374	0.886	0.209	0.746	0.911	1.036	0.524	1.061
Body-worn	Rear	0.288	0.040	0.026	0.220	0.232	0.534	0.560	0.548	0.546	0.766	0.780	0.574	0.586	0.806
	Front	0.175	0.040	0.026	0.220	0.232	0.421	0.447	0.435	0.433	0.653	0.667	0.461	0.473	0.693
Hotspot	Rear	0.537	0.085	0.057	0.295	0.461	0.889	1.083	0.917	1.055	1.350	1.378	0.974	1.140	1.435
	Front	0.366	0.085	0.057	0.295	0.461	0.718	0.912	0.746	0.884	1.179	1.207	0.803	0.969	1.264
	Edge 1		0.085	0.057	0.295	0.461	0.352	0.546	0.380	0.518	0.380	0.841	0.437	0.603	0.898
	Edge 2	0.068													
	Edge 3	0.923													
	Edge 4	0.153	0.085	0.057	0.295	0.078	0.505	0.316	0.533	0.288	0.583	0.611	0.590	0.373	0.668

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.17. Sum of the SAR for W-CDMA Band II & Wi-Fi (RSDB)

RF Exposure conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)								
		WWAN	DTS		U-NII		WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	①+③+④	①+②+⑤	①+②+④	①+③+⑤	①+③+④+⑤	①+②+④+⑤	①+②+③+④	①+②+③+⑤	①+②+③+④+⑤
Head	Left Touch	0.256	0.315	0.150	0.537	0.025	0.943	0.596	1.108	0.431	0.968	1.133	1.258	0.746	1.283
	Left Tilt	0.077	0.315	0.150	0.537	0.025	0.764	0.417	0.929	0.252	0.789	0.954	1.079	0.567	1.104
	Right Touch	0.146	0.315	0.150	0.557	0.034	0.853	0.495	1.018	0.330	0.887	1.052	1.168	0.645	1.202
	Right Tilt	0.083	0.315	0.150	0.537	0.025	0.770	0.423	0.935	0.258	0.795	0.960	1.085	0.573	1.110
Body-worn	Rear	0.686	0.040	0.026	0.220	0.232	0.932	0.958	0.946	0.944	1.164	1.178	0.972	0.984	1.204
	Front	0.443	0.040	0.026	0.220	0.232	0.689	0.715	0.703	0.701	0.921	0.935	0.729	0.741	0.961
Hotspot	Rear	0.655	0.085	0.057	0.295	0.461	1.007	1.201	1.035	1.173	1.468	1.496	1.092	1.258	1.553
	Front	0.448	0.085	0.057	0.295	0.461	0.800	0.994	0.828	0.966	1.261	1.289	0.885	1.051	1.346
	Edge 1		0.085	0.057	0.295	0.461	0.352	0.546	0.380	0.518	0.380	0.841	0.437	0.603	0.898
	Edge 2	0.093													
	Edge 3	1.087													
	Edge 4	0.207	0.085	0.057	0.295	0.078	0.559	0.370	0.587	0.342	0.637	0.665	0.644	0.427	0.722

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.18. Sum of the SAR for W-CDMA Band IV & Wi-Fi (RSDB)

RF Exposure conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)								
		WWAN	DTS		U-NII		WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	①+③+④	①+②+⑤	①+②+④	①+③+⑤	①+③+④+⑤	①+②+④+⑤	①+②+③+④	①+②+③+⑤	①+②+③+④+⑤
Head	Left Touch	0.340	0.315	0.150	0.537	0.025	1.027	0.680	1.192	0.515	1.052	1.217	1.342	0.830	1.367
	Left Tilt	0.089	0.315	0.150	0.537	0.025	0.776	0.429	0.941	0.264	0.801	0.966	1.091	0.579	1.116
	Right Touch	0.150	0.315	0.150	0.557	0.034	0.857	0.499	1.022	0.334	0.891	1.056	1.172	0.649	1.206
	Right Tilt	0.064	0.315	0.150	0.537	0.025	0.751	0.404	0.916	0.239	0.776	0.941	1.066	0.554	1.091
Body-worn	Rear	0.649	0.040	0.026	0.220	0.232	0.895	0.921	0.909	0.907	1.127	1.141	0.935	0.947	1.167
	Front	0.476	0.040	0.026	0.220	0.232	0.722	0.748	0.736	0.734	0.954	0.968	0.762	0.774	0.994
Hotspot	Rear	0.522	0.085	0.057	0.295	0.461	0.874	1.068	0.902	1.040	1.335	1.363	0.959	1.125	1.420
	Front	0.371	0.085	0.057	0.295	0.461	0.723	0.917	0.751	0.889	1.184	1.212	0.808	0.974	1.269
	Edge 1		0.085	0.057	0.295	0.461	0.352	0.546	0.380	0.518	0.380	0.841	0.437	0.603	0.898
	Edge 2	0.043													
	Edge 3	0.964													
	Edge 4	0.138	0.085	0.057	0.295	0.078	0.490	0.301	0.518	0.273	0.568	0.596	0.575	0.358	0.653

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.19. Sum of the SAR for W-CDMA Band V & Wi-Fi (RSDB)

RF Exposure conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)								
		WWAN	DTS		U-NII		WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	①+③+④	①+②+⑤	①+②+④	①+③+⑤	①+③+④+⑤	①+②+④+⑤	①+②+③+④	①+②+③+⑤	①+②+③+④+⑤
Head	Left Touch	0.206	0.315	0.150	0.537	0.025	0.893	0.546	1.058	0.381	0.918	1.083	1.208	0.696	1.233
	Left Tilt	0.105	0.315	0.150	0.537	0.025	0.792	0.445	0.957	0.280	0.817	0.982	1.107	0.595	1.132
	Right Touch	0.231	0.315	0.150	0.557	0.034	0.938	0.580	1.103	0.415	0.972	1.137	1.253	0.730	1.287
	Right Tilt	0.121	0.315	0.150	0.537	0.025	0.808	0.461	0.973	0.296	0.833	0.998	1.123	0.611	1.148
Body-worn	Rear	0.278	0.040	0.026	0.220	0.232	0.524	0.550	0.538	0.536	0.756	0.770	0.564	0.576	0.796
	Front	0.259	0.040	0.026	0.220	0.232	0.505	0.531	0.519	0.517	0.737	0.751	0.545	0.557	0.777
Hotspot	Rear	0.504	0.085	0.057	0.295	0.461	0.856	1.050	0.884	1.022	1.317	1.345	0.941	1.107	1.402
	Front	0.402	0.085	0.057	0.295	0.461	0.754	0.948	0.782	0.920	1.215	1.243	0.839	1.005	1.300
	Edge 1		0.085	0.057	0.295	0.461	0.352	0.546	0.380	0.518	0.380	0.841	0.437	0.603	0.898
	Edge 2	0.180													
	Edge 3	0.320													
	Edge 4	0.105	0.085	0.057	0.295	0.078	0.457	0.268	0.485	0.240	0.535	0.563	0.542	0.325	0.620

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.20. Sum of the SAR for LTE Band 5 & Wi-Fi (RSDB)

RF Exposure conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)								
		WWAN	DTS		U-NII		WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	①+③+④	①+②+⑤	①+②+④	①+③+⑤	①+③+④+⑤	①+②+④+⑤	①+②+③+④	①+②+③+⑤	①+②+③+④+⑤
Head	Left Touch	0.229	0.315	0.150	0.537	0.025	0.916	0.569	1.081	0.404	0.941	1.106	1.231	0.719	1.256
	Left Tilt	0.150	0.315	0.150	0.537	0.025	0.837	0.490	1.002	0.325	0.862	1.027	1.152	0.640	1.177
	Right Touch	0.254	0.315	0.150	0.557	0.034	0.961	0.603	1.126	0.438	0.995	1.160	1.276	0.753	1.310
	Right Tilt	0.153	0.315	0.150	0.537	0.025	0.840	0.493	1.005	0.328	0.865	1.030	1.155	0.643	1.180
Body-worn	Rear	0.349	0.040	0.026	0.220	0.232	0.595	0.621	0.609	0.607	0.827	0.841	0.635	0.647	0.867
	Front	0.319	0.040	0.026	0.220	0.232	0.565	0.591	0.579	0.577	0.797	0.811	0.605	0.617	0.837
Hotspot	Rear	0.487	0.085	0.057	0.295	0.461	0.839	1.033	0.867	1.005	1.300	1.328	0.924	1.090	1.385
	Front	0.395	0.085	0.057	0.295	0.461	0.747	0.941	0.775	0.913	1.208	1.236	0.832	0.998	1.293
	Edge 1		0.085	0.057	0.295	0.461	0.352	0.546	0.380	0.518	0.380	0.841	0.437	0.603	0.898
	Edge 2	0.400													
	Edge 3	0.354													
	Edge 4	0.204	0.085	0.057	0.295	0.078	0.556	0.367	0.584	0.339	0.634	0.662	0.641	0.424	0.719

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.21. Sum of the SAR for LTE Band 7 & Wi-Fi (RSDB)

RF Exposure conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)								
		WWAN	DTS		U-NII		WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	①+③+④	①+②+⑤	①+②+④	①+③+⑤	①+③+④+⑤	①+②+④+⑤	①+②+③+④	①+②+③+⑤	①+②+③+④+⑤
Head	Left Touch	0.124	0.315	0.150	0.537	0.025	0.811	0.464	0.976	0.299	0.836	1.001	1.126	0.614	1.151
	Left Tilt	0.053	0.315	0.150	0.537	0.025	0.740	0.393	0.905	0.228	0.765	0.930	1.055	0.543	1.080
	Right Touch	0.208	0.315	0.150	0.557	0.034	0.915	0.557	1.080	0.392	0.949	1.114	1.230	0.707	1.264
	Right Tilt	0.125	0.315	0.150	0.537	0.025	0.812	0.465	0.977	0.300	0.837	1.002	1.127	0.615	1.152
Body-worn	Rear	0.694	0.040	0.026	0.220	0.232	0.940	0.966	0.954	0.952	1.172	1.186	0.980	0.992	1.212
	Front	0.573	0.040	0.026	0.220	0.232	0.819	0.845	0.833	0.831	1.051	1.065	0.859	0.871	1.091
Hotspot	Rear	0.905	0.085	0.057	0.295	0.461	1.257	1.451	1.285	1.423	1.718	1.746	1.342	1.508	1.803
	Front	0.540	0.085	0.057	0.295	0.461	0.892	1.086	0.920	1.058	1.353	1.381	0.977	1.143	1.438
	Edge 1		0.085	0.057	0.295	0.461	0.352	0.546	0.380	0.518	0.380	0.841	0.437	0.603	0.898
	Edge 3	1.279													
	Edge 4	0.322	0.085	0.057	0.295	0.078	0.674	0.485	0.702	0.457	0.752	0.780	0.759	0.542	0.837

Conclusion:

SPLSR analysis is required because the Sum of the SAR is > 1.6 W/kg.

SAR to Peak Location Separation Ratio (SPLSR)

RF Exposure Conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)
		WWAN	DTS		U-NII						
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤					
Hotspot	Rear	0.905	0.085	0.057	0.295	0.461	① + ② + ③ + ④ + ⑤	1.803			
		0.905	0.085				① + ②	0.990	138.0	0.01	No
		0.905		0.057			① + ③	0.962	132.0	0.01	No
		0.905			0.295		① + ④	1.200	136.6	0.01	No
		0.905				0.461	① + ⑤	1.366	125.8	0.01	No
			0.085			0.461	② + ⑤	0.546	13.8	0.03	No
				0.057	0.295		③ + ④	0.352	35.5	0.01	No
				0.057		0.461	③ + ⑤	0.518	28.1	0.01	No

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	1.020	-0.006	-0.067	-0.177	① + ②	138.0
		Ant #1 DTS	②	0.134	0.024	0.067	-0.180		
		LTE Band 7	①	1.020	-0.006	-0.067	-0.177	① + ③	132.0
		Ant #2 DTS	③	0.091	-0.007	0.065	-0.180		
		LTE Band 7	①	1.020	-0.006	-0.067	-0.177	① + ④	136.6
		Ant #1 U-NII	④	0.458	0.028	0.065	-0.174		
		LTE Band 7	①	1.020	-0.006	-0.067	-0.177	① + ⑤	125.8
		Ant #2 U-NII	⑤	0.789	0.019	0.056	-0.174		
		Ant #1 DTS	②	0.134	0.024	0.067	-0.180	② + ⑤	13.8
		Ant #2 U-NII	⑤	0.789	0.019	0.056	-0.174		
		Ant #2 DTS	③	0.091	-0.007	0.065	-0.180	③ + ④	35.5
		Ant #1 U-NII	④	0.458	0.028	0.065	-0.174		
		Ant #2 DTS	③	0.091	-0.007	0.065	-0.180	③ + ⑤	28.1
		Ant #2 U-NII	⑤	0.789	0.019	0.056	-0.174		

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

Conclusion:

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

12.22. Sum of the SAR for LTE Band 12 & Wi-Fi (RSDB)

RF Exposure conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)								
		WWAN	DTS		U-NII		WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	①+③+④	①+②+⑤	①+②+④	①+③+⑤	①+③+④+⑤	①+②+④+⑤	①+②+③+④	①+②+③+⑤	①+②+③+④+⑤
Head	Left Touch	0.130	0.315	0.150	0.537	0.025	0.817	0.470	0.982	0.305	0.842	1.007	1.132	0.620	1.157
	Left Tilt	0.095	0.315	0.150	0.537	0.025	0.782	0.435	0.947	0.270	0.807	0.972	1.097	0.585	1.122
	Right Touch	0.156	0.315	0.150	0.557	0.034	0.863	0.505	1.028	0.340	0.897	1.062	1.178	0.655	1.212
	Right Tilt	0.096	0.315	0.150	0.537	0.025	0.783	0.436	0.948	0.271	0.808	0.973	1.098	0.586	1.123
Body-worn	Rear	0.282	0.040	0.026	0.220	0.232	0.528	0.554	0.542	0.540	0.760	0.774	0.568	0.580	0.800
	Front	0.228	0.040	0.026	0.220	0.232	0.474	0.500	0.488	0.486	0.706	0.720	0.514	0.526	0.746
Hotspot	Rear	0.348	0.085	0.057	0.295	0.461	0.700	0.894	0.728	0.866	1.161	1.189	0.785	0.951	1.246
	Front	0.277	0.085	0.057	0.295	0.461	0.629	0.823	0.657	0.795	1.090	1.118	0.714	0.880	1.175
	Edge 1		0.085	0.057	0.295	0.461	0.352	0.546	0.380	0.518	0.380	0.841	0.437	0.603	0.898
	Edge 2	0.246													
	Edge 3	0.129													
	Edge 4	0.219	0.085	0.057	0.295	0.078	0.571	0.382	0.599	0.354	0.649	0.677	0.656	0.439	0.734

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.23. Sum of the SAR for LTE Band 13 & Wi-Fi (RSDB)

RF Exposure conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)								
		WWAN	DTS		U-NII		WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	①+③+④	①+②+⑤	①+②+④	①+③+⑤	①+③+④+⑤	①+②+④+⑤	①+②+③+④	①+②+③+⑤	①+②+③+④+⑤
Head	Left Touch	0.114	0.315	0.150	0.537	0.025	0.801	0.454	0.966	0.289	0.826	0.991	1.116	0.604	1.141
	Left Tilt	0.082	0.315	0.150	0.537	0.025	0.769	0.422	0.934	0.257	0.794	0.959	1.084	0.572	1.109
	Right Touch	0.145	0.315	0.150	0.557	0.034	0.852	0.494	1.017	0.329	0.886	1.051	1.167	0.644	1.201
	Right Tilt	0.086	0.315	0.150	0.537	0.025	0.773	0.426	0.938	0.261	0.798	0.963	1.088	0.576	1.113
Body-worn	Rear	0.201	0.040	0.026	0.220	0.232	0.447	0.473	0.461	0.459	0.679	0.693	0.487	0.499	0.719
	Front	0.185	0.040	0.026	0.220	0.232	0.431	0.457	0.445	0.443	0.663	0.677	0.471	0.483	0.703
Hotspot	Rear	0.323	0.085	0.057	0.295	0.461	0.675	0.869	0.703	0.841	1.136	1.164	0.760	0.926	1.221
	Front	0.236	0.085	0.057	0.295	0.461	0.588	0.782	0.616	0.754	1.049	1.077	0.673	0.839	1.134
	Edge 1		0.085	0.057	0.295	0.461	0.352	0.546	0.380	0.518	0.380	0.841	0.437	0.603	0.898
	Edge 2	0.184													
	Edge 3	0.138													
	Edge 4	0.151	0.085	0.057	0.295	0.078	0.503	0.314	0.531	0.286	0.581	0.609	0.588	0.371	0.666

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.24. Sum of the SAR for LTE Band 25 & Wi-Fi (RSDB)

RF Exposure conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)								
		WWAN	DTS		U-NII		WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	①+③+④	①+②+⑤	①+②+④	①+③+⑤	①+③+④+⑤	①+②+④+⑤	①+②+③+④	①+②+③+⑤	①+②+③+④+⑤
Head	Left Touch	0.264	0.315	0.150	0.537	0.025	0.951	0.604	1.116	0.439	0.976	1.141	1.266	0.754	1.291
	Left Tilt	0.081	0.315	0.150	0.537	0.025	0.768	0.421	0.933	0.256	0.793	0.958	1.083	0.571	1.108
	Right Touch	0.147	0.315	0.150	0.557	0.034	0.854	0.496	1.019	0.331	0.888	1.053	1.169	0.646	1.203
	Right Tilt	0.078	0.315	0.150	0.537	0.025	0.765	0.418	0.930	0.253	0.790	0.955	1.080	0.568	1.105
Body-worn	Rear	0.703	0.040	0.026	0.220	0.232	0.949	0.975	0.963	0.961	1.181	1.195	0.989	1.001	1.221
	Front	0.442	0.040	0.026	0.220	0.232	0.688	0.714	0.702	0.700	0.920	0.934	0.728	0.740	0.960
Hotspot	Rear	0.702	0.085	0.057	0.295	0.461	1.054	1.248	1.082	1.220	1.515	1.543	1.139	1.305	1.600
	Front	0.433	0.085	0.057	0.295	0.461	0.785	0.979	0.813	0.951	1.246	1.274	0.870	1.036	1.331
	Edge 1		0.085	0.057	0.295	0.461	0.352	0.546	0.380	0.518	0.380	0.841	0.437	0.603	0.898
	Edge 2	0.071													
	Edge 3	1.109													
	Edge 4	0.178	0.085	0.057	0.295	0.078	0.530	0.341	0.558	0.313	0.608	0.636	0.615	0.398	0.693

Conclusion:

SPLSR analysis is required because the Sum of the SAR is > 1.6 W/kg.

SAR to Peak Location Separation Ratio (SPLSR)

RF Exposure Conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)
		WWAN	DTS		U-NII						
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤					
Hotspot	Rear	0.702	0.085	0.057	0.295	0.461	①+②+③+④+⑤	1.6			
		0.702	0.085				①+②	0.787	138.5	0.01	No
		0.702		0.057			①+③	0.759	134.0	0.00	No
		0.702			0.295		①+④	0.997	137.0	0.01	No
		0.702				0.461	①+⑤	1.163	126.5	0.01	No
			0.085			0.461	②+⑤	0.546	13.8	0.03	No
				0.057	0.295		③+④	0.352	35.5	0.01	No
				0.057		0.461	③+⑤	0.518	28.1	0.01	No

RF Exposure Conditions	Test Position	Mode		Peak SAR	X	Y	Z	d: Calculated distance (mm)	
				W/kg	m	m	m		
Hotspot	Rear	LTE Band 25	①	0.819	0.000	-0.069	-0.179	①+②	138.5
		Ant #1 DTS	②	0.134	0.024	0.067	-0.180		
		LTE Band 25	①	0.819	0.000	-0.069	-0.179	①+③	134.0
		Ant #2 DTS	③	0.091	-0.007	0.065	-0.180		
		LTE Band 25	①	0.819	0.000	-0.069	-0.179	①+④	137.0
		Ant #1 U-NII	④	0.458	0.028	0.065	-0.174		
		LTE Band 25	①	0.819	0.000	-0.069	-0.179	①+⑤	126.5
		Ant #2 U-NII	⑤	0.789	0.019	0.056	-0.174		
		Ant #1 DTS	②	0.134	0.024	0.067	-0.180	②+⑤	13.8
		Ant #2 U-NII	⑤	0.789	0.019	0.056	-0.174		
		Ant #2 DTS	③	0.091	-0.007	0.065	-0.180	③+④	35.5
		Ant #1 U-NII	④	0.458	0.028	0.065	-0.174		
		Ant #2 DTS	③	0.091	-0.007	0.065	-0.180	③+⑤	28.1
		Ant #2 U-NII	⑤	0.789	0.019	0.056	-0.174		

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

Conclusion:

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

12.25. Sum of the SAR for LTE Band 26 & Wi-Fi (RSDB)

RF Exposure conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)								
		WWAN	DTS		U-NII		WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	①+③+④	①+②+⑤	①+②+④	①+③+⑤	①+③+④+⑤	①+②+④+⑤	①+②+③+④	①+②+③+⑤	①+②+③+④+⑤
Head	Left Touch	0.178	0.315	0.150	0.537	0.025	0.865	0.518	1.030	0.353	0.890	1.055	1.180	0.668	1.205
	Left Tilt	0.116	0.315	0.150	0.537	0.025	0.803	0.456	0.968	0.291	0.828	0.993	1.118	0.606	1.143
	Right Touch	0.208	0.315	0.150	0.557	0.034	0.915	0.557	1.080	0.392	0.949	1.114	1.230	0.707	1.264
	Right Tilt	0.102	0.315	0.150	0.537	0.025	0.789	0.442	0.954	0.277	0.814	0.979	1.104	0.592	1.129
Body-worn	Rear	0.274	0.040	0.026	0.220	0.232	0.520	0.546	0.534	0.532	0.752	0.766	0.560	0.572	0.792
	Front	0.232	0.040	0.026	0.220	0.232	0.478	0.504	0.492	0.490	0.710	0.724	0.518	0.530	0.750
Hotspot	Rear	0.431	0.085	0.057	0.295	0.461	0.783	0.977	0.811	0.949	1.244	1.272	0.868	1.034	1.329
	Front	0.318	0.085	0.057	0.295	0.461	0.670	0.864	0.698	0.836	1.131	1.159	0.755	0.921	1.216
	Edge 1		0.085	0.057	0.295	0.461	0.352	0.546	0.380	0.518	0.380	0.841	0.437	0.603	0.898
	Edge 2	0.279													
	Edge 3	0.277													
	Edge 4	0.111	0.085	0.057	0.295	0.078	0.463	0.274	0.491	0.246	0.541	0.569	0.548	0.331	0.626

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.26. Sum of the SAR for LTE Band 41 & Wi-Fi (RSDB)

RF Exposure conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)								
		WWAN	DTS		U-NII		WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	①+③+④	①+②+⑤	①+②+④	①+③+⑤	①+③+④+⑤	①+②+④+⑤	①+②+③+④	①+②+③+⑤	①+②+③+④+⑤
Head	Left Touch	0.083	0.315	0.150	0.537	0.025	0.770	0.423	0.935	0.258	0.795	0.960	1.085	0.573	1.110
	Left Tilt	0.028	0.315	0.150	0.537	0.025	0.715	0.368	0.880	0.203	0.740	0.905	1.030	0.518	1.055
	Right Touch	0.055	0.315	0.150	0.557	0.034	0.762	0.404	0.927	0.239	0.796	0.961	1.077	0.554	1.111
	Right Tilt	0.050	0.315	0.150	0.537	0.025	0.737	0.390	0.902	0.225	0.762	0.927	1.052	0.540	1.077
Body-worn	Rear	0.362	0.040	0.026	0.220	0.232	0.608	0.634	0.622	0.620	0.840	0.854	0.648	0.660	0.880
	Front	0.248	0.040	0.026	0.220	0.232	0.494	0.520	0.508	0.506	0.726	0.740	0.534	0.546	0.766
Hotspot	Rear	0.250	0.085	0.057	0.295	0.461	0.602	0.796	0.630	0.768	1.063	1.091	0.687	0.853	1.148
	Front	0.253	0.085	0.057	0.295	0.461	0.605	0.799	0.633	0.771	1.066	1.094	0.690	0.856	1.151
	Edge 1		0.085	0.057	0.295	0.461	0.352	0.546	0.380	0.518	0.380	0.841	0.437	0.603	0.898
	Edge 3	0.397													
	Edge 4	0.092	0.085	0.057	0.295	0.078	0.444	0.255	0.472	0.227	0.522	0.550	0.529	0.312	0.607

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.27. Sum of the SAR for LTE Band 66 & Wi-Fi (RSDB)

RF Exposure conditions	Test Position	Standalone SAR (W/kg)					∑ 1-g SAR (W/kg)								
		WWAN	DTS		U-NII		WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII	WWAN+DTS+U-NII
		①	Ant #1 ②	Ant #2 ③	Ant #1 ④	Ant #2 ⑤	①+③+④	①+②+⑤	①+②+④	①+③+⑤	①+③+④+⑤	①+②+④+⑤	①+②+③+④	①+②+③+⑤	①+②+③+④+⑤
Head	Left Touch	0.325	0.315	0.150	0.537	0.025	1.012	0.665	1.177	0.500	1.037	1.202	1.327	0.815	1.352
	Left Tilt	0.085	0.315	0.150	0.537	0.025	0.772	0.425	0.937	0.260	0.797	0.962	1.087	0.575	1.112
	Right Touch	0.173	0.315	0.150	0.557	0.034	0.880	0.522	1.045	0.357	0.914	1.079	1.195	0.672	1.229
	Right Tilt	0.069	0.315	0.150	0.537	0.025	0.756	0.409	0.921	0.244	0.781	0.946	1.071	0.559	1.096
Body-worn	Rear	0.702	0.040	0.026	0.220	0.232	0.948	0.974	0.962	0.960	1.180	1.194	0.988	1.000	1.220
	Front	0.523	0.040	0.026	0.220	0.232	0.769	0.795	0.783	0.781	1.001	1.015	0.809	0.821	1.041
Hotspot	Rear	0.634	0.085	0.057	0.295	0.461	0.986	1.180	1.014	1.152	1.447	1.475	1.071	1.237	1.532
	Front	0.488	0.085	0.057	0.295	0.461	0.840	1.034	0.868	1.006	1.301	1.329	0.925	1.091	1.386
	Edge 1		0.085	0.057	0.295	0.461	0.352	0.546	0.380	0.518	0.380	0.841	0.437	0.603	0.898
	Edge 2	0.053													
	Edge 3	1.196													
	Edge 4	0.180	0.085	0.057	0.295	0.078	0.532	0.343	0.560	0.315	0.610	0.638	0.617	0.400	0.695

Conclusion:

SPLSR analysis is not required because the Sum of the SAR is < 1.6 W/kg.

12.28. Volume Scan

Test Position	Mode	Antenna	Dist. (mm)	Ch #.	Freq. (MHz)	Volume Scan 1-g SAR (W/kg)		Plot No.
						Measured	Combined Multi-Band	
Rear	802.11a	1	10	48	5240.0	0.238	0.597	Appendix G page 1-3
	802.11a	2	10	149	5745.0	0.426		

Conclusion:

The combined 1g SAR is < 1.6 W/kg and is therefore compliant. Refer to Appendix G for the Test plots.

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

Appendix G: SAR Volume Scan Plots

END OF REPORT