

SAR EVALUATION REPORT

IEEE Std 1528-2013

For

GSM/WCDMA/LTE/5G Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPT, & NFC

FCC ID: PY7-76732V

Report Number: R14777340-S1 v3

Issue Date: 8/10/2023

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Revision History

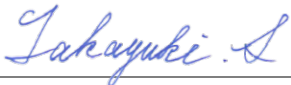
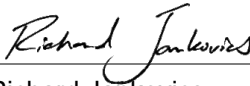
Rev.	Date	Revisions	Revised By
V1	7/21/2023	Initial Issue	--
V2	8/2/2023	Updated §1 to include NFC estimation and Extremity (10g) for Simultaneous TX. Updated §6 and 7 to include NFC exclusion. Updated §12 to include Estimated SAR for NFC and Sum of the SAR for Wi-Fi Normal State and NFC.	Richard Jankovics
V3	8/10/2023	Updated §6.1 sample note descriptions.	Lindsay Ryan

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1. Attestation of Test Results

Applicant Name	Sony Corporation					
FCC ID	PY7-76732V					
Applicable Standards	Published RF exposure KDB procedures IEEE Std 1528-2013					
Exposure Category	SAR Limits (W/Kg)					
	Peak spatial-average (1g of tissue)	Extremities (hands, wrists, ankles, etc.) (10g of tissue)				
General population / Uncontrolled exposure	1.6	4				
RF Exposure Conditions	Equipment Class - Highest Reported SAR (W/kg)					
	PCE	DTS	NII	DSS	NFC	
Head	0.118	0.362	0.276	0.305	N/A	
Body-worn*	0.266	0.169	0.068	0.088	N/A	
Hotspot/BT Tethering	0.470	0.169	0.075	0.088	N/A	
Extremity (10g)	N/A	N/A	0.420	N/A	0.501	
Simultaneous TX	Head/Body- worn/Hotspot/ BT Tethering (1g)	0.796	0.796	0.796	0.767	N/A
	Extremity (10g)	N/A	N/A	1.293	N/A	1.293
Date Tested	6/5/2023 to 7/14/2023					
Test Results	Pass					
*Note: The Body-worn minimum separation distance is 10 mm. To cover both body-worn and hotspot RF exposure conditions testing was performed at a separation distance of 10 mm. UL LLC 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. This report contains data provided by the customer which can impact the validity of results. UL LLC is only responsible for the validity of results after the integration of the data provided by the customer. 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 LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC 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 A2LA, NIST, or any agency of the U.S. Government, or any agency of the U.S. government.						
Approved & Released By:			Prepared By:			
						
Takayuki Shimada Lead Project Engineer UL Japan, Inc.			Richard Jankovics Operations Leader UL LLC			

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
- 941225 D07 UMPC Mini Tablet v01r02

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

- TCB Workshop October 2014; RF Exposure Procedures (Other LTE Considerations)
- TCB Workshop April 2015; RF Exposure Procedures (Overlapping LTE Bands)
- TCB Workshop October 2015; RF Exposure Procedures (KDB 941225 D05A)
- TCB Workshop 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 April 2019; RF Exposure Procedures (Tissue Simulating Liquids (TSL))
- TCB Workshop April 2019; RF Exposure Procedures (802.11ax SAR Testing)

3. Facilities and Accreditation

UL LLC is accredited by A2LA, cert. # 0751.06 for all testing performed within the scope of this report. Testing was performed at the locations noted below.

The test sites and measurement facilities used to collect data are located at 2800 Perimeter Park Dr, Morrisville, NC, USA.

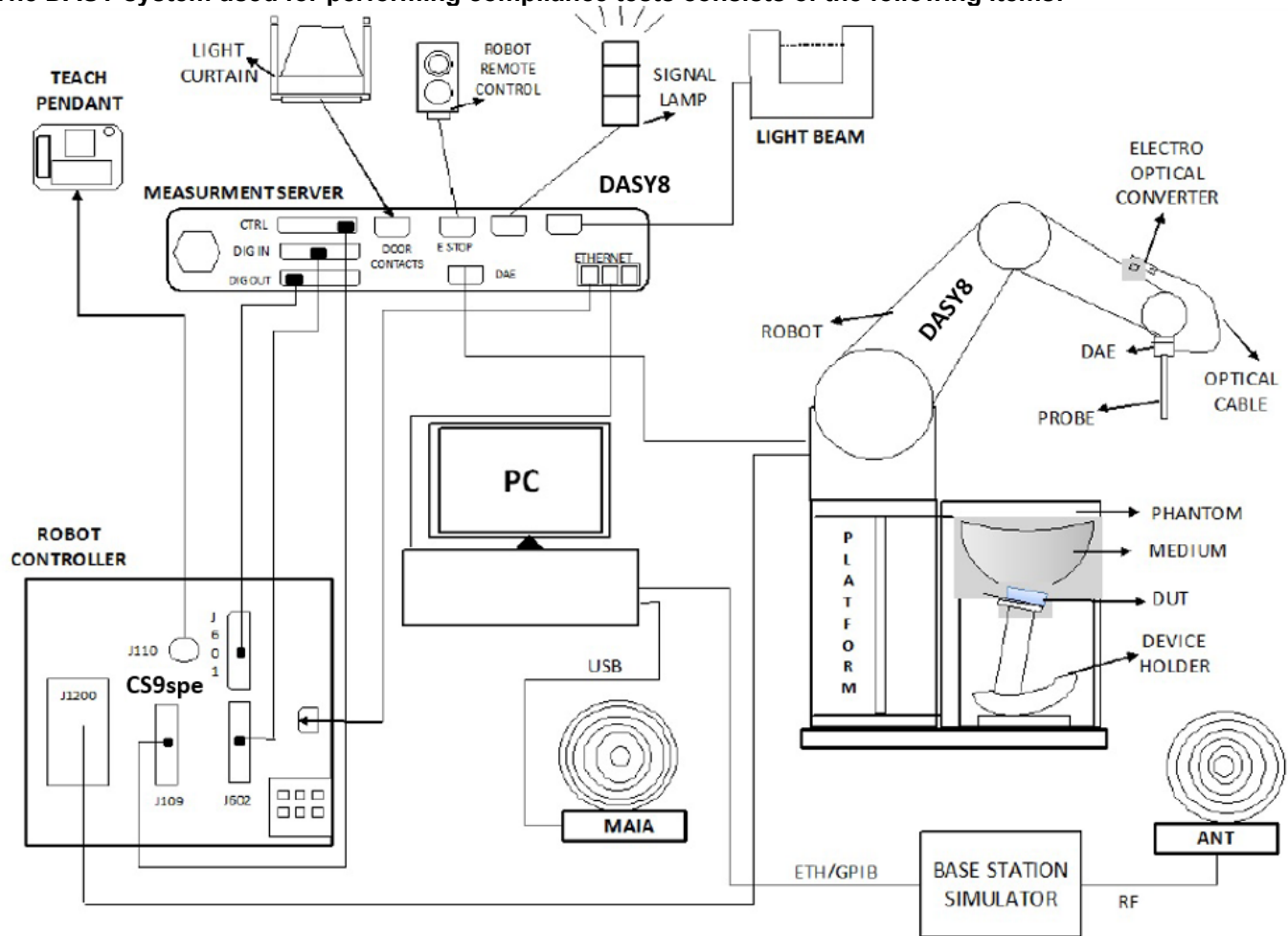
- SAR Lab 1A
- SAR Lab 2A
- SAR Lab 2B

	Address	ISED CABID	ISED Company Number	FCC Registration
☐	Building: 12 Laboratory Dr RTP, NC 27709, U.S.A	US0067	2180C	825374
☒	Building: 2800 Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A	US0067	27265	825374

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

The DASY 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 Win10 and the DASY8¹ 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.

¹ DASY8 software used: DASY16.0.2.83 and older generations.

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 IEC/IEEE 62209-1528, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

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

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

Step 3: Zoom Scan

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

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

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			≤ 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: $\Delta z_{\text{Zoom}}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
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 <u>reported</u> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

Step 4: Power drift measurement

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

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	Keysight	E5063A	MY54100681	9/30/2023
Dielectric Probe	SPEAG	DAKS-3.5	1051	10/17/2023
Shorting Block	SPEAG	DAK-3.5 Short	SM DAK 200 DA	10/17/2023
Thermometer	Fisher Scientific	15-078-181	1817705017	3/30/2024

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Signal Generator	Keysight	N5181A	MY50140788	1/31/2024
Power Meter	Keysight	N1912A	MY55116004	9/02/2024
Power Sensor ¹	Keysight	E9323A	MY55110007	6/14/2023
Power Sensor	Keysight	N1921A	MY55090047	2/02/2024
3-Path Diode Power Sensor	Rohde & Schwarz	NRP8S	112236	6/02/2024
3-Path Diode Power Sensor	Rohde & Schwarz	NRP8S	112237	6/02/2024
Amplifier	MITEQ	AMF-4D-00400600-50-30P	N/A	N/A
Directional coupler	Mini-Circuits	ZUDC10-183+	1438	N/A
DC Power Supply	Miteq	PS 15V1	1990186	N/A
RF Power Source	Speag	PowerSource1	4278	6/13/2024
RF Power Source ¹	Speag	PowerSource1	4278	6/21/2023

Note(s):

- Equipment not used for calibrated measurements past calibration due date.

Lab Equipment

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
E-Field Probe	SPEAG	EX3DV4	7709	12/12/2023
E-Field Probe	SPEAG	EX3DV4	7710	2/3/2024
E-Field Probe	SPEAG	EX3DV4	7711	3/29/2024
Data Acquisition Electronics	SPEAG	DAE4	1714	11/23/2023
Data Acquisition Electronics	SPEAG	DAE4	1715	1/23/2024
Data Acquisition Electronics	SPEAG	DAE4	1716	3/16/2024
System Validation Dipole	SPEAG	D750V3	1139	10/12/2023
System Validation Dipole	SPEAG	D1750V2	1136	10/17/2023
System Validation Dipole	SPEAG	D1900V2	5d202	10/12/2023
System Validation Dipole	SPEAG	D2450V2	963	10/18/2023
System Validation Dipole	SPEAG	D2600V2	1104	10/21/2023
System Validation Dipole	SPEAG	D5GHzV2	1213	10/11/2023
Environmental Indicator	Control Company	06-662-4	200037610	2/24/2024
Environmental Indicator	Control Company	06-662-4	200037635	2/24/2024

Other

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
3-Path Diode Power Sensor	Rohde & Schwarz	NRP8S	112236	6/2/2024
3-Path Diode Power Sensor	Rohde & Schwarz	NRP8S	112237	6/2/2024
RF Power Meter	Keysight	N1911a	MY55116001	7/07/2023
RF Power Meter	Keysight	N1911a	MY55116002	9/10/2023
RF Power Meter	Keysight	N1912a	MY55116004	9/2/2023
RF Power Sensor	Keysight	N1921a	MY55090025	9/27/2023
RF Power Sensor ¹	Keysight	N1921a	MY55090030	6/15/2023
RF Power Sensor ¹	Keysight	E9323A	MY55110006	6/15/2023
Base Station Simulator	R & S	CMW 500	170733	12/14/2023
Base Station Simulator	R & S	CMW 500	170732	12/8/2023
Base Station Simulator	R & S	CMW 500	170193	1/6/2024
Base Station Simulator ²	R & S	CMW 500	170194	6/6/2024
Base Station Simulator ²	Anritsu	MT8821C	6262116751	6/5/2024
Base Station Simulator ²	Anritsu	MT8000A	6272354129	6/9/2024

Note(s):

1. Equipment not used for calibrated measurements past calibration due date.
2. Equipment not used for calibrated measurements prior to the calibration due date.

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 $\leq 30\%$, 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	This is a Phablet Device (display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm) Refer to Appendix A																								
Back Cover	The Back Cover is not removable																								
Battery Options	The rechargeable battery is not user accessible.																								
Accessory	Headset and wireless power charger																								
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 5.2 GHz and 5.8 GHz)																								
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other Per Manufacturer, the DUT support only as a group client and not support as a group owner.																								
Bluetooth Tethering (Hotspot)	BT Tethering mode permits the device to share its cellular data connection with other devices. ☒ BT Tethering (Bluetooth 2.4 GHz)																								
Test sample information	<table> <thead> <tr> <th>S/N</th><th>Notes</th></tr> </thead> <tbody> <tr> <td>QV77002SG9</td><td>FCC 2G/3G SAR Conducted</td></tr> <tr> <td>QV770058HJ</td><td>FCC SAR 2G/3G #1</td></tr> <tr> <td>QV77007YG9</td><td>FCC 4G SAR Conducted - Low band</td></tr> <tr> <td>QV77008AG9</td><td>FCC 4G SAR Conducted - Mid/High band</td></tr> <tr> <td>QV7700AAHJ</td><td>FCC SAR 4G #5</td></tr> <tr> <td>QV7700CXG9</td><td>RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #3</td></tr> <tr> <td>QV7700F5G9</td><td>RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #2</td></tr> <tr> <td>QV7700F8G9</td><td>RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #1</td></tr> <tr> <td>QV7700JZHJ</td><td>FCC SAR 4G #3</td></tr> <tr> <td>QV7700K1HJ</td><td>FCC SAR 4G #4</td></tr> <tr> <td>QV7700LSHJ</td><td>FCC SAR 2G/3G #2</td></tr> </tbody> </table>	S/N	Notes	QV77002SG9	FCC 2G/3G SAR Conducted	QV770058HJ	FCC SAR 2G/3G #1	QV77007YG9	FCC 4G SAR Conducted - Low band	QV77008AG9	FCC 4G SAR Conducted - Mid/High band	QV7700AAHJ	FCC SAR 4G #5	QV7700CXG9	RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #3	QV7700F5G9	RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #2	QV7700F8G9	RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #1	QV7700JZHJ	FCC SAR 4G #3	QV7700K1HJ	FCC SAR 4G #4	QV7700LSHJ	FCC SAR 2G/3G #2
S/N	Notes																								
QV77002SG9	FCC 2G/3G SAR Conducted																								
QV770058HJ	FCC SAR 2G/3G #1																								
QV77007YG9	FCC 4G SAR Conducted - Low band																								
QV77008AG9	FCC 4G SAR Conducted - Mid/High band																								
QV7700AAHJ	FCC SAR 4G #5																								
QV7700CXG9	RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #3																								
QV7700F5G9	RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #2																								
QV7700F8G9	RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #1																								
QV7700JZHJ	FCC SAR 4G #3																								
QV7700K1HJ	FCC SAR 4G #4																								
QV7700LSHJ	FCC SAR 2G/3G #2																								
Hardware Version	A																								
Software Version	2G-4G Conducted: 2.108 WLAN/BT Conducted: 2.127 SAR Measurements: 2.108																								

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 (Rel. 5) HSUPA (Rel. 6)		100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 12 FDD Band 13 FDD Band 17 FDD Band 25 TDD Band 41 FDD Band 66	QPSK 16QAM 64QAM Rel. 15 Carrier Aggregation (1 Uplink and 6 Downlinks)		100% (FDD) 63.3% (TDD) ^{Power Class 3}
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20) 802.11ax (HE20)		99.9% ^(802.11b) ¹ 99.1% ^(802.11g/n 20MHz BW) ¹
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80) 802.11ac (VHT160) 802.11ax (HE20) 802.11ax (HE40) 802.11ax (HE80) 802.11ax (HE160)		99.6% ^(802.11n/ac 40MHz BW) ¹ 99.0% ^(802.11ac 80MHz BW) ¹ 99.7% ^(802.11ac 160MHz BW) ¹
	Does this device support bands 5.60 ~ 5.65 GHz? ☒ Yes ☐ No			
	Does this device support Band gap channel(s)? ☐ Yes ☒ No			
Bluetooth	2.4 GHz	BR, EDR, LE		76.8% ¹
NFC	13.56 MHz	Type A/B/F /V		N/A ²

Notes:

1. Duty cycle is referenced from the Section 9.
2. 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 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	5 MHz	3 MHz	1.4 MHz
	Low				23205/ 779.5		
	Mid			23230/ 782	23230/ 782		
	High				23255/ 784.5		
	Band 17	Frequency range: 704 - 716 MHz (BW = 12 MHz)					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz ¹	5 MHz	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/	26615/ 1882.5	26640/ 1882.5	26665/ 1882.5	26675/ 1882.5	26683/ 1882.5

		1905	1907.5	1910	1912.5	1913.5	1914.3																																																														
	Band 41 ²	Frequency range: 2496 - 2690 MHz (BW = 194 MHz)																																																																			
		Channel Bandwidth																																																																			
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																																														
	Low	39750 / 2506.0																																																																			
	Mid- Low	40185 / 2549.5																																																																			
	Mid	40620 / 2593.0																																																																			
	Mid-High	41055 / 2636.5																																																																			
	High	41490 / 2680.0																																																																			
	Band 66	Frequency range: 1710 - 1780 MHz (BW = 70 MHz)																																																																			
		Channel Bandwidth																																																																			
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																																														
	Low	132072/1720	132047/1717.5	132022/1715	131997/1712.5	131987/1711.5	131979/1710.7																																																														
	Mid	132322/1745	132322/1745	132322/1745	132322/1745	132322/1745	132322/1745																																																														
	High	132572/1770	132597/1772.5	132622/1775	132647/1777.5	132657/1778.5	132665/1779.3																																																														
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 <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr> <tr> <th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr> </thead> <tbody> <tr> <td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr> <tr> <td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr> <tr> <td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr> <tr> <td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr> <tr> <td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr> <tr> <td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr> </tbody> </table> 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							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
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																																																														
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64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2																																																														
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3																																																														
256 QAM	≥ 1						≤ 5																																																														
Power reduction	No																																																																				
Spectrum plots for RB configurations	A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																																																				

Notes:

- 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.
- LTE band 41 test channels in accordance with October 2014 TCB workshop for all channels bandwidths.
- 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	$26336 \cdot T_s$			$7680 \cdot T_s$		
5	$6592 \cdot T_s$	$(2+X) \cdot 2192 \cdot T_s$	$(2+X) \cdot 2560 \cdot T_s$	$20480 \cdot T_s$	$(2+X) \cdot 2192 \cdot T_s$	$(2+X) \cdot 2560 \cdot T_s$
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. Power Back-off Operation

The DUT supports power reduction when Simultaneous WLAN transmission is active (i.e. WLAN Chain 0 and Chain 1 transmitting simultaneously).

Power Back-off mode	Technologies Supported	Exposure Conditions Active			
		Head	Body-worn	Hotspot	Phablet SAR (Extremity 10g)
WLAN Simultaneous Tx	Wi-Fi 2.4GHz Wi-Fi 5GHz	✓	✓	✓	✓

Note(s):

Tune-Up Limits for WLAN (Simultaneous 2G_5G state) is Reduced Average Power. Please refer to §9 for all conducted power measurements.

Phablet SAR (Extremity 10g):

When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

When hotspot mode does not apply, 10-g Extremity SAR is required for all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions.

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.

Antenna	Band	Head	Rear	Front	Edge 1	Edge 2	Edge 3	Edge 4	Extremity (0 mm)
					(Top Edge)	(Right Edge)	(Bottom Edge)	(Left Edge)	
Cellular Main Antenna 1	GSM 850 W-CDMA BV LTE B5/12/13	Yes	Yes	Yes	No	No	Yes	Yes	No
Cellular Main Antenna 2	GSM 1900 WCDMA BII/BV LTE B25/41/66	Yes	Yes	Yes	No	Yes	Yes	No	No
Wi-Fi Main Antenna	Wi-Fi 2.4GHz Wi-Fi 5GHz Bluetooth	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Wi-Fi Sub Antenna	Wi-Fi 2.4GHz Wi-Fi 5GHz Bluetooth	Yes	Yes	Yes	No	No	Yes	Yes	Yes

Notes:

- SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.
- The Body-worn minimum separation distance is 10 mm. To cover both body-worn and hotspot RF exposure conditions testing was performed at a separation distance of 10 mm.
- When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg. When hotspot mode does not apply, 10-g Extremity SAR is required for all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions.
- Per KDB 447498 D01 v06, the NFC extremity SAR test exclusion threshold for below 100 MHz is 593 mW. Per the manufacturer, the maximum transmit power for the NFC radio is 403 mW, and therefore meet SAR test exclusion.

8. Dielectric Property Measurements & System Check

8.1. Dielectric Property Measurements

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

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

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

The dielectric constant (ϵ_r) and conductivity (σ) of typical tissue-equivalent media recipes are expected to be within $\pm 5\%$ of the required target values; but for SAR measurement systems that have implemented the SAR error compensation algorithms documented in IEEE Std 1528-2013, to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters, the tolerance for ϵ_r and σ may be relaxed to $\pm 10\%$. This is limited to frequencies $\leq 3\text{ GHz}$.

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

Dielectric Property Measurements Results:

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity (ϵ_r)			Conductivity (σ)		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
1A	6/5/2023	2450	Head	2450	37.5	39.2	-4.31	1.7	1.8	-3.89
				2400	37.6	39.3	-4.34	1.7	1.8	-3.52
				2480	37.5	39.2	-4.30	1.8	1.8	-4.50
1A	6/8/2023	5600	Head	5600	34.9	35.5	-1.73	5.0	5.1	-1.19
				5500	35.1	35.6	-1.51	4.9	5.0	-1.47
				5725	34.7	35.4	-2.01	5.2	5.2	-0.72
1A	6/13/2002	750	Head	750	42.9	42.0	2.26	0.9	0.9	1.83
				660	43.2	42.4	1.74	0.9	0.9	-0.81
				850	42.6	41.5	2.75	0.9	0.9	3.32
1A	6/21/2023	2600	Head	2600	38.1	39.0	-2.28	2.0	2.0	0.50
				2495	38.3	39.1	-2.10	1.9	1.8	1.91
				2690	38.0	38.9	-2.44	2.0	2.1	-0.75
2A	6/12/2023	1750	Head	1750	40.0	40.1	-0.26	1.3	1.4	-1.82
				1710	40.0	40.1	-0.39	1.3	1.3	-1.89
				1780	39.9	40.0	-0.30	1.4	1.4	-1.87
2A	6/14/2023	2600	Head	2600	40.5	39.0	3.71	2.0	2.0	0.30
				2495	40.6	39.1	3.82	1.9	1.8	1.59
				2690	40.3	38.9	3.63	2.0	2.1	-0.94
2A	6/19/2023	1900	Head	1900	38.1	40.0	-4.70	1.4	1.4	1.50
				1850	38.2	40.0	-4.40	1.4	1.4	-0.71
				1970	38.0	40.0	-5.00	1.5	1.4	4.50
2A	6/22/2023	750	Head	750	40.7	42.0	-3.05	0.9	0.9	-2.01
				660	40.9	42.4	-3.54	0.8	0.9	-4.64
				850	40.4	41.5	-2.63	0.9	0.9	-0.49
2A	6/29/2023	5750	Head	5750	34.3	35.4	-3.12	5.3	5.2	1.06
				5700	34.3	35.4	-3.11	5.2	5.2	0.88
				5850	34.1	35.3	-3.34	5.4	5.3	0.75
2B	6/7/2023	1900	Head	1900	39.9	40.0	-0.27	1.5	1.4	3.86
				1850	40.0	40.0	-0.05	1.4	1.4	1.43
				1920	39.9	40.0	-0.30	1.5	1.4	4.79
2B	6/28/2023	5250	Head	5250	35.8	35.9	-0.37	4.7	4.7	-0.90
				5150	36.1	36.0	0.20	4.6	4.6	-0.50
				5350	35.7	35.8	-0.47	4.9	4.8	1.07
2B	6/28/2023	5750	Head	5750	35.0	35.4	-1.17	5.3	5.2	1.65
				5700	34.9	35.4	-1.35	5.3	5.2	2.26
				5850	34.8	35.3	-1.56	5.3	5.3	0.00
2B	7/12/2023	5250	Head	5250	34.5	35.9	-4.04	4.6	4.7	-2.32
				5150	34.6	36.1	-3.93	4.5	4.6	-2.24
				5300	34.4	35.9	-4.11	4.6	4.8	-2.47
2B	7/14/2023	5750	Head	5750	34.1	35.4	-3.51	5.1	5.2	-2.91
				5700	34.2	35.4	-3.44	5.0	5.2	-3.52
				5850	34.1	35.3	-3.48	5.3	5.3	-1.39

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 50 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 $\pm 10\%$ 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 Date	Dipole Power (dBm)	Measured Results for 1g SAR				Measured Results for 10g SAR				Plot No.
						Zoom Scan	Normalize to 1 W	Target (Ref. Value)	Delta $\pm 10\%$	Zoom Scan	Normalize to 1 W	Target (Ref. Value)	Delta $\pm 10\%$	
1A	6/5/2023	Head	D2450V2 SN: 963	10/18/2023	17.00	2.440	48.68	52.40	-7.09	1.140	22.75	24.50	-7.16	1
1A	6/8/2023	Head	D5GHzV2 SN: 1213 (5.60 GHz)	10/11/2023	17.00	3.790	75.62	82.40	-8.23	1.070	21.35	23.50	-9.15	2
1A	6/13/2023	Head	D750V3 SN: 1139	10/12/2023	17.00	0.419	8.36	8.51	-1.76	0.275	5.49	5.58	-1.67	3
1A	6/21/2023	Head	D2600V2 SN: 1104	10/21/2023	17.00	2.730	54.47	56.70	-3.93	1.230	24.54	25.30	-3.00	4
2A	6/12/2023	Head	D1750V2 SN: 1136	10/17/2023	17.00	1.750	34.92	36.10	-3.28	0.938	18.72	19.10	-2.01	5
2A	6/14/2023	Head	D2600V2 SN: 1104	10/21/2023	17.00	2.860	57.06	56.70	0.64	1.300	25.94	25.30	2.52	6
2A	6/19/2023	Head	D1900V2 SN: 5d202	10/12/2023	17.00	2.060	41.10	39.20	4.85	1.070	21.35	20.40	4.65	7
2A	6/22/2023	Head	D750V3 SN: 1139	10/12/2023	17.00	0.414	8.26	8.51	-2.93	0.274	5.47	5.58	-2.02	8
2A	6/29/2023	Head	D5GHzV2 SN: 1213 (5.75 GHz)	10/11/2023	17.00	3.660	73.03	78.80	-7.33	1.050	20.95	22.40	-6.47	9
2B	6/7/2023	Head	D1900V2 SN: 5d202	10/12/2023	17.00	1.990	39.71	39.20	1.29	1.020	20.35	20.40	-0.24	10
2B	6/28/2023	Head	D5GHzV2 SN: 1213 (5.25 GHz)	10/11/2023	17.00	3.740	74.62	79.40	-6.02	1.070	21.35	22.70	-5.95	
2B	6/28/2023	Head	D5GHzV2 SN: 1213 (5.75 GHz)	10/11/2023	17.00	3.700	73.82	78.80	-6.31	1.050	20.95	22.40	-6.47	11
2B	7/12/2023	Head	D5GHzV2 SN: 1213 (5.25 GHz)	10/11/2023	17.00	3.740	74.62	79.40	-6.02	1.060	21.15	22.70	-6.83	12
2B	7/14/2023	Head	D5GHzV2 SN: 1213 (5.75 GHz)	10/11/2023	17.00	3.760	75.02	78.80	-4.79	1.050	20.95	22.40	-6.47	

9. Conducted Output Power Measurements

Tune-Up Power Limits provided by the manufacturer are used to scale measured SAR values.

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.

Maximum Output Power (Tune-up Limit) for GSM

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

RF Air interface	Mode	GSM Burst Power Tune-up Limit (dBm)		GSM DTM CS Burst Power Tune-Up Limit (dBm)		GSM DTM PS Burst Power Tune-Up Limit (dBm)	
		CELL Main1	CELL Main2	CELL Main1	CELL Main2	CELL Main1	CELL Main2
		Normal	Normal	Normal	Normal	Normal	Normal
GSM850	Voice/GPRS (1 slot)	32.9		32.9			
	GPRS 2 slots	29.9		29.9		29.9	
	GPRS 3 slots	28.1		28.1		28.1	
	GPRS 4 slots	26.9					
	EGPRS 1 slot	28.0		32.9			
	EGPRS 2 slot	25.0		29.9		25.0	
	EGPRS 3 slot	23.2		28.1		23.2	
	EGPRS 4 slots	22.0					
GSM1900	Voice/GPRS (1 slot)		28.0		28.0		
	GPRS 2 slots		25.0		25.0		25.0
	GPRS 3 slots		23.2		23.2		23.2
	GPRS 4 slots		22.0				
	EGPRS 1 slot		27.0		28.0		
	EGPRS 2 slot		24.0		25.0		24.0
	EGPRS 3 slot		22.2		23.2		22.2
	EGPRS 4 slots		21.0				

GSM850 Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Normal Average Power (dBm)			
					Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GPRS/EDGE (GMSK)	CS1	1	128	824.2	31.6	22.6	32.9	23.9
			190	836.6	31.8	22.8		
			251	848.8	31.9	22.8		
		2	128	824.2	28.5	22.5	29.9	23.9
			190	836.6	28.6	22.5		
			251	848.8	28.6	22.6		
		3	128	824.2	26.1	21.9	28.1	23.8
			190	836.6	26.2	21.9		
			251	848.8	27.0	22.7		
		4	128	824.2	25.6	22.6	26.9	23.9
			190	836.6	25.7	22.7		
			251	848.8	25.7	22.6		
EDGE (8PSK)	MCS5	1	128	824.2	26.6	17.6	28.0	19.0
			190	836.6	26.8	17.8		
			251	848.8	26.8	17.7		
		2	128	824.2	23.8	17.7	25.0	19.0
			190	836.6	23.8	17.8		
			251	848.8	23.9	17.9		
		3	128	824.2	21.9	17.7	23.2	18.9
			190	836.6	21.9	17.7		
			251	848.8	22.0	17.7		
		4	128	824.2	20.8	17.8	22.0	19.0
			190	836.6	20.7	17.7		
			251	848.8	20.7	17.7		

GSM1900 Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Normal Average Power (dBm)			
					Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GPRS/EDGE (GMSK)	CS1	1	512	1850.2	27.1	18.1	28.0	19.0
			661	1880.0	27.1	18.1		
			810	1909.8	27.1	18.1		
		2	512	1850.2	24.1	18.1	25.0	19.0
			661	1880.0	23.8	17.8		
			810	1909.8	23.8	17.8		
		3	512	1850.2	22.0	17.7	23.2	18.9
			661	1880.0	21.7	17.5		
			810	1909.8	21.7	17.4		
		4	512	1850.2	20.8	17.8	22.0	19.0
			661	1880.0	20.8	17.8		
			810	1909.8	21.1	18.0		
EDGE (8PSK)	MCS5	1	512	1850.2	25.7	16.7	27.0	18.0
			661	1880.0	26.1	17.1		
			810	1909.8	26.0	16.9		
		2	512	1850.2	22.7	16.7	24.0	18.0
			661	1880.0	22.9	16.9		
			810	1909.8	22.9	16.9		
		3	512	1850.2	21.0	16.7	22.2	17.9
			661	1880.0	21.3	17.0		
			810	1909.8	21.3	17.0		
		4	512	1850.2	19.8	16.7	21.0	18.0
			661	1880.0	19.7	16.7		
			810	1909.8	19.8	16.8		

GSM850 DTM Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Normal Average Power (dBm)							
					Measured				Tune-up Limit			
					CS Burst Pwr	PS Burst Pwr	CS Frame Pwr	PS Frame Pwr	CS Burst Pwr	PS Burst Pwr	CS Frame Pwr	PS Frame Pwr
GSM (Voice) + GPRS/EDGE (GMSK)	CS1	1	128	824.2	31.4		22.3		32.9		23.9	
			190	836.6	31.5		22.5					
			251	848.8	31.6		22.6					
		2	128	824.2	28.5	28.6	22.5	22.6	29.9	29.9	23.9	23.9
			190	836.6	28.6	29.2	22.6	23.2				
			251	848.8	28.5	28.6	22.5	22.6				
		3	128	824.2	26.5	26.5	22.2	22.3	28.1	28.1	23.8	23.8
			190	836.6	26.8	26.8	22.6	22.5				
			251	848.8	26.7	26.8	22.4	22.6				
GSM (Voice) + EDGE (8PSK)	MCS5	1	128	824.2	31.4		22.3		32.9		23.9	
			190	836.6	31.5		22.5					
			251	848.8	31.6		22.6					
		2	128	824.2	28.5	23.7	22.5	17.7	29.9	25.0	23.9	19.0
			190	836.6	28.6	23.7	22.6	17.7				
			251	848.8	28.5	23.7	22.5	17.7				
		3	128	824.2	26.5	22.0	22.2	17.7	28.1	23.2	23.8	18.9
			190	836.6	26.8	21.8	22.6	17.6				
			251	848.8	26.7	21.8	22.4	17.6				

GSM1900 DTM Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Normal Average Power (dBm)							
					Measured				Tune-up Limit			
					CS Burst Pwr	PS Burst Pwr	CS Frame Pwr	PS Frame Pwr	CS Burst Pwr	PS Burst Pwr	CS Frame Pwr	PS Frame Pwr
GSM (Voice) + GPRS/EDGE (GMSK)	CS1	1	512	1850.2	27.0		18.0		28.0		19.0	
			661	1880.0	27.1		18.1					
			810	1909.8	27.2		18.1					
		2	512	1850.2	23.4	24.2	17.4	18.2	25.0	25.0	19.0	19.0
			661	1880.0	23.5	23.9	17.4	17.9				
			810	1909.8	23.5	23.9	17.5	17.8				
		3	512	1850.2	21.4	22.0	17.1	17.7	23.2	23.2	18.9	18.9
			661	1880.0	21.3	21.8	17.1	17.6				
			810	1909.8	21.4	21.7	17.1	17.5				
GSM (Voice) + EDGE (8PSK)	MCS5	1	512	1850.2	27.0		18.0		28.0		19.0	
			661	1880.0	27.1		18.1					
			810	1909.8	27.2		18.1					
		2	512	1850.2	23.4	22.8	17.4	16.8	25.0	24.0	19.0	18.0
			661	1880.0	23.5	23.0	17.4	17.0				
			810	1909.8	23.5	23.0	17.5	17.0				
		3	512	1850.2	21.4	21.0	17.1	16.8	23.2	22.2	18.9	17.9
			661	1880.0	21.3	21.1	17.1	16.9				
			810	1909.8	21.4	21.4	17.1	17.1				

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
	β_c/β_d	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} (Note 1, 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 $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

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 $\Delta_{NACK} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{HS} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. 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 $\beta_c = 11/15$ and $\beta_d = 15/15$.

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} (Note 1)	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	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	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 $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 5/15$ with $\beta_{HS} = 5/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPCCH 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 $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: In case of testing by UE using E-DPCCH 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-DPCCH 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 procedures in table C08.1.12 of 3GPP TS 34.121-1. A summary of subtest settings is illustrated below:

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

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

HSPA+ Setup Procedures used to establish the test signals

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

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

Sub-test	β_c (Note 3)	β_d	β_{HS} (Note 1)	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	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105
Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ 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 $\beta_d = 0$ 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.											

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

SAR measurement is not required for the HSDPA, HSUPA. When primary mode and the adjusted SAR is ≤ 1.2 W/kg and secondary mode is $\leq 1/4$ dB higher than the primary mode

RF Air interface	Mode	Tune-up PowerLimit (dBm)
		CELL Main1
		Normal
W-CDMA Band 2	R99	19.7
	HSDPA	19.0
	HSUPA	19.0
	DC-HSDPA	19.0
W-CDMA Band 4	R99	18.7
	HSDPA	18.0
	HSUPA	18.0
	DC-HSDPA	18.0
W-CDMA Band 5	R99	22.7
	HSDPA	22.0
	HSUPA	22.0
	DC-HSDPA	22.0

W-CDMA Band II Measured Results

Mode		UL Ch No.	Freq. (MHz)	Normal Average Power (dBm)		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	19.0	N/A	19.7
		9400	1880.0	18.9		
		9538	1907.6	19.0		
HSDPA	Subtest 1	9262	1852.4	18.0	0	19.0
		9400	1880.0	17.9		
		9538	1907.6	17.9		
	Subtest 2	9262	1852.4	17.9	0	19.0
		9400	1880.0	17.9		
		9538	1907.6	17.9		
	Subtest 3	9262	1852.4	17.4	0.5	18.5
		9400	1880.0	17.4		
		9538	1907.6	17.4		
	Subtest 4	9262	1852.4	17.4	0.5	18.5
		9400	1880.0	17.4		
		9538	1907.6	17.4		
HSUPA	Subtest 1	9262	1852.4	18.0	0	19.0
		9400	1880.0	18.0		
		9538	1907.6	17.9		
	Subtest 2	9262	1852.4	16.0	2	17.0
		9400	1880.0	16.1		
		9538	1907.6	15.9		
	Subtest 3	9262	1852.4	17.0	1	18.0
		9400	1880.0	17.0		
		9538	1907.6	16.9		
	Subtest 4	9262	1852.4	16.0	2	17.0
		9400	1880.0	16.0		
		9538	1907.6	15.9		
	Subtest 5	9262	1852.4	18.1	0	19.0
		9400	1880.0	18.1		
		9538	1907.6	18.0		
DC-HSDPA	Subtest 1	9262	1852.4	17.9	0	19.0
		9400	1880.0	18.0		
		9538	1907.6	17.9		
	Subtest 2	9262	1852.4	18.0	0	19.0
		9400	1880.0	18.0		
		9538	1907.6	17.9		
	Subtest 3	9262	1852.4	17.5	0.5	18.5
		9400	1880.0	17.5		
		9538	1907.6	17.4		
	Subtest 4	9262	1852.4	17.5	0.5	18.5
		9400	1880.0	17.5		
		9538	1907.6	17.4		

W-CDMA Band IV Measured Results

Mode		UL Ch No.	Freq. (MHz)	Normal Average Power (dBm)		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	1312	1712.4	17.9	N/A	18.7
		1413	1732.6	18.0		
		1513	1752.6	18.0		
HSDPA	Subtest 1	1312	1712.4	16.9	0	18.0
		1413	1732.6	17.0		
		1513	1752.6	17.0		
	Subtest 2	1312	1712.4	16.8	0	18.0
		1413	1732.6	17.0		
		1513	1752.6	17.0		
	Subtest 3	1312	1712.4	16.4	0.5	17.5
		1413	1732.6	16.5		
		1513	1752.6	16.5		
	Subtest 4	1312	1712.4	16.4	0.5	17.5
		1413	1732.6	16.6		
		1513	1752.6	16.5		
HSUPA	Subtest 1	1312	1712.4	16.9	0	18.0
		1413	1732.6	17.1		
		1513	1752.6	17.0		
	Subtest 2	1312	1712.4	14.9	2	16.0
		1413	1732.6	15.1		
		1513	1752.6	15.0		
	Subtest 3	1312	1712.4	15.9	1	17.0
		1413	1732.6	16.1		
		1513	1752.6	16.0		
	Subtest 4	1312	1712.4	14.9	2	16.0
		1413	1732.6	15.1		
		1513	1752.6	15.0		
	Subtest 5	1312	1712.4	16.9	0	18.0
		1413	1732.6	17.1		
		1513	1752.6	17.0		
DC-HSDPA	Subtest 1	1312	1712.4	16.9	0	18.0
		1413	1732.6	17.0		
		1513	1752.6	17.0		
	Subtest 2	1312	1712.4	16.9	0	18.0
		1413	1732.6	17.0		
		1513	1752.6	17.0		
	Subtest 3	1312	1712.4	16.4	0.5	17.5
		1413	1732.6	16.5		
		1513	1752.6	16.4		
	Subtest 4	1312	1712.4	16.4	0.5	17.5
		1413	1732.6	16.5		
		1513	1752.6	16.5		

W-CDMA Band V Measured Results

Mode		UL Ch No.	Freq. (MHz)	Normal Average Power (dBm)		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	4132	826.4	21.9	N/A	22.7
		4183	836.6	21.9		
		4233	846.6	21.8		
HSDPA	Subtest 1	4132	826.4	20.9	0	22.0
		4183	836.6	20.9		
		4233	846.6	20.8		
	Subtest 2	4132	826.4	20.9	0	22.0
		4183	836.6	20.9		
		4233	846.6	20.8		
	Subtest 3	4132	826.4	20.4	0.5	21.5
		4183	836.6	20.4		
		4233	846.6	20.3		
	Subtest 4	4132	826.4	20.4	0.5	21.5
		4183	836.6	20.4		
		4233	846.6	20.3		
HSUPA	Subtest 1	4132	826.4	21.0	0	22.0
		4183	836.6	21.0		
		4233	846.6	20.9		
	Subtest 2	4132	826.4	19.0	2	20.0
		4183	836.6	18.9		
		4233	846.6	18.9		
	Subtest 3	4132	826.4	19.9	1	21.0
		4183	836.6	19.9		
		4233	846.6	19.9		
	Subtest 4	4132	826.4	19.0	2	20.0
		4183	836.6	19.0		
		4233	846.6	18.9		
	Subtest 5	4132	826.4	21.0	0	22.0
		4183	836.6	21.0		
		4233	846.6	20.9		
DC-HSDPA	Subtest 1	4132	826.4	20.9	0	22.0
		4183	836.6	20.9		
		4233	846.6	20.8		
	Subtest 2	4132	826.4	20.9	0	22.0
		4183	836.6	20.9		
		4233	846.6	20.8		
	Subtest 3	4132	826.4	20.4	0.5	21.5
		4183	836.6	20.4		
		4233	846.6	20.3		
	Subtest 4	4132	826.4	20.4	0.5	21.5
		4183	836.6	20.4		
		4233	846.6	20.3		

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

Maximum Output Power (Tune-up Limit) for LTE

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

- a) The maximum output power, including tolerance, for the smaller band must be $\leq$ 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)

For some LTE Bands, certain channel bandwidths do not support at least three non-overlapping channels. When a device supports overlapping channel assignments 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. Please refer to section 6.3. for a detailed list of LTE test channels

- LTE Band 5 (824-849 MHz)
- LTE Band 12 (699-716 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 $\leq \frac{1}{2}$ dB higher than the QPSK or when the reported SAR for the QPSK configuration is ≤ 1.45 W/kg.

RF Air interface	Mode	Tune-up PowerLimit (dBm)	
		CELL Main1	CELL Main2
		Normal	Normal
LTE Band 2	QPSK		20.0
LTE Band 4	QPSK		19.0
LTE Band 5	QPSK	22.0	
LTE Band 12	QPSK	22.0	
LTE Band 13	QPSK	22.0	
LTE Band 17	QPSK	22.0	
LTE Band 25	QPSK		20.0
LTE Band 41	QPSK		20.0
LTE Band 66	QPSK		19.0

LTE Band 5 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				20450	20525	20600	MPR	Tune-up Limit
				829 MHz	836.5 MHz	844 MHz		
10 MHz	QPSK	1	0	20.8	20.8	20.9	0	22
		1	25	20.8	20.9	20.9	0	22
		1	49	20.8	20.9	20.8	0	22
		25	0	20.7	20.9	20.8	0	22
		25	12	20.8	20.9	20.8	0	22
		25	25	20.8	20.9	20.9	0	22
		50	0	20.8	20.8	20.8	0	22
	16QAM	1	0	21.0	21.0	21.1	0	22
		1	25	20.9	21.1	21.0	0	22
		1	49	21.0	21.1	21.0	0	22
		25	0	20.8	20.9	20.9	0	22
		25	12	20.9	20.9	20.9	0	22
		25	25	20.8	20.9	20.9	0	22
		50	0	20.8	20.9	20.9	0	22
	64QAM	1	0	21.1	21.1	21.2	0	22
		1	25	21.1	21.2	21.2	0	22
		1	49	21.2	21.1	21.1	0	22
		25	0	20.4	20.5	20.6	0	22
		25	12	20.5	20.5	20.6	0	22
		25	25	20.4	20.6	20.6	0	22
		50	0	20.4	20.5	20.6	0	22
BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				20425	20525	20625	MPR	Tune-up Limit
				826.5 MHz	836.5 MHz	846.5 MHz		
5 MHz	QPSK	1	0	20.7	20.8	20.8	0	22
		1	12	20.8	21.0	21.0	0	22
		1	24	20.7	20.9	20.8	0	22
		12	0	20.8	20.8	20.8	0	22
		12	7	20.8	20.9	20.8	0	22
		12	13	20.8	20.9	20.9	0	22
		25	0	20.8	20.9	20.8	0	22
	16QAM	1	0	20.9	21.0	21.0	0	22
		1	12	21.0	21.2	21.2	0	22
		1	24	20.9	21.1	21.1	0	22
		12	0	20.8	20.9	20.7	0	22
		12	7	20.8	21.0	20.8	0	22
		12	13	20.8	21.0	20.8	0	22
		25	0	20.8	20.9	20.8	0	22
	64QAM	1	0	20.9	21.2	21.1	0	22
		1	12	21.0	21.2	21.2	0	22
		1	24	20.9	21.2	21.2	0	22
		12	0	20.4	20.5	20.5	0	22
		12	7	20.5	20.5	20.5	0	22
		12	13	20.4	20.6	20.6	0	22
		25	0	20.4	20.5	20.4	0	22

LTE Band 5 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				20415	20525	20635	MPR	Tune-up Limit
				825.5 MHz	836.5 MHz	847.5 MHz		
3 MHz	QPSK	1	0	20.7	20.9	20.8	0	22
		1	8	20.8	21.0	20.9	0	22
		1	14	20.7	20.9	20.8	0	22
		8	0	20.8	20.9	20.9	0	22
		8	4	20.8	20.9	20.9	0	22
		8	7	20.8	21.0	20.9	0	22
		15	0	20.7	20.9	20.9	0	22
	16QAM	1	0	20.9	21.0	21.0	0	22
		1	8	21.0	21.2	21.1	0	22
		1	14	20.9	21.1	21.0	0	22
		8	0	20.8	20.9	20.9	0	22
		8	4	20.9	20.9	21.0	0	22
		8	7	20.8	21.0	21.0	0	22
		15	0	20.8	20.9	20.9	0	22
	64QAM	1	0	21.0	21.2	21.0	0	22
		1	8	21.2	21.3	21.1	0	22
		1	14	21.0	21.2	21.0	0	22
		8	0	20.4	20.5	20.5	0	22
		8	4	20.5	20.6	20.5	0	22
		8	7	20.5	20.6	20.5	0	22
		15	0	20.4	20.5	20.5	0	22
BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				20407	20525	20643	MPR	Tune-up Limit
				824.7 MHz	836.5 MHz	848.3 MHz		
1.4 MHz	QPSK	1	0	20.7	20.8	20.8	0	22
		1	3	20.7	20.9	20.8	0	22
		1	5	20.7	20.9	20.8	0	22
		3	0	20.7	20.8	20.8	0	22
		3	1	20.7	20.9	20.8	0	22
		3	3	20.7	20.9	20.8	0	22
		6	0	20.7	20.8	20.8	0	22
	16QAM	1	0	20.8	21.1	21.0	0	22
		1	3	20.8	21.1	21.0	0	22
		1	5	20.9	21.0	21.0	0	22
		3	0	20.8	21.0	20.8	0	22
		3	1	20.9	21.0	20.9	0	22
		3	3	20.9	21.0	20.9	0	22
		6	0	20.7	20.8	20.8	0	22
	64QAM	1	0	21.1	21.2	21.0	0	22
		1	3	21.1	21.2	21.0	0	22
		1	5	21.1	21.1	21.0	0	22
		3	0	20.9	21.0	21.0	0	22
		3	1	20.9	21.0	21.0	0	22
		3	3	20.9	21.0	21.0	0	22
		6	0	20.4	20.5	20.5	0	22

LTE Band 12 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				23060	23095	23130	MPR	Tune-up Limit
				704 MHz	707.5 MHz	711 MHz		
10 MHz	QPSK	1	0	21.0	20.9	21.0	0	22
		1	25	21.0	21.0	21.0	0	22
		1	49	21.0	21.0	20.9	0	22
		25	0	20.9	21.0	21.0	0	22
		25	12	21.1	21.0	21.1	0	22
		25	25	21.0	21.0	21.0	0	22
		50	0	21.0	21.0	21.0	0	22
	16QAM	1	0	21.1	21.1	21.1	0	22
		1	25	21.1	21.1	21.2	0	22
		1	49	21.2	21.1	21.0	0	22
		25	0	20.9	21.0	21.0	0	22
		25	12	21.0	21.0	21.0	0	22
		25	25	21.0	21.0	21.0	0	22
		50	0	21.0	21.0	21.0	0	22
	64QAM	1	0	21.3	21.3	21.3	0	22
		1	25	21.2	21.3	21.3	0	22
		1	49	21.3	21.3	21.3	0	22
		25	0	20.4	20.5	20.5	0	22
		25	12	20.5	20.5	20.6	0	22
		25	25	20.5	20.5	20.6	0	22
		50	0	20.5	20.5	20.6	0	22
BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				23035	23095	23155	MPR	Tune-up Limit
				701.5 MHz	707.5 MHz	713.5 MHz		
5 MHz	QPSK	1	0	20.9	20.9	20.9	0	22
		1	12	21.0	21.1	21.1	0	22
		1	24	20.9	20.9	21.0	0	22
		12	0	20.9	20.9	21.0	0	22
		12	7	21.0	21.0	21.0	0	22
		12	13	21.0	21.0	21.0	0	22
		25	0	21.0	20.9	20.9	0	22
	16QAM	1	0	21.0	21.1	21.1	0	22
		1	12	21.1	21.3	21.3	0	22
		1	24	21.0	21.2	21.2	0	22
		12	0	20.9	21.0	20.9	0	22
		12	7	21.0	21.1	21.0	0	22
		12	13	21.0	21.1	21.0	0	22
		25	0	21.0	20.9	20.9	0	22
	64QAM	1	0	21.3	21.3	21.3	0	22
		1	12	21.2	21.3	21.4	0	22
		1	24	21.2	21.2	21.3	0	22
		12	0	20.4	20.5	20.5	0	22
		12	7	20.5	20.5	20.6	0	22
		12	13	20.5	20.6	20.6	0	22
		25	0	20.5	20.4	20.5	0	22

LTE Band 12 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				23025	23095	23165	MPR	Tune-up Limit
				700.5 MHz	707.5 MHz	714.5 MHz		
3 MHz	QPSK	1	0	20.9	20.9	20.9	0	22
		1	8	20.9	21.1	21.0	0	22
		1	14	20.9	21.0	20.9	0	22
		8	0	20.9	21.0	20.9	0	22
		8	4	20.9	21.0	21.1	0	22
		8	7	21.0	21.1	21.0	0	22
		15	0	20.9	20.9	20.9	0	22
	16QAM	1	0	21.0	21.1	21.1	0	22
		1	8	21.1	21.3	21.2	0	22
		1	14	21.0	21.1	21.1	0	22
		8	0	21.0	21.0	21.0	0	22
		8	4	21.0	21.0	21.1	0	22
		8	7	21.0	21.1	21.1	0	22
		15	0	20.9	21.0	20.9	0	22
	64QAM	1	0	21.3	21.3	21.3	0	22
		1	8	21.3	21.3	21.3	0	22
		1	14	21.3	21.3	21.2	0	22
		8	0	20.5	20.5	20.5	0	22
		8	4	20.5	20.5	20.6	0	22
		8	7	20.5	20.6	20.6	0	22
		15	0	20.5	20.4	20.5	0	22
BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				23017	23095	23173	MPR	Tune-up Limit
				699.7 MHz	707.5 MHz	715.3 MHz		
1.4 MHz	QPSK	1	0	21.0	21.0	21.0	0	22
		1	3	21.0	21.1	21.0	0	22
		1	5	21.0	21.0	21.0	0	22
		3	0	21.0	21.0	20.9	0	22
		3	1	21.0	21.0	21.0	0	22
		3	3	21.0	21.0	21.0	0	22
		6	0	21.0	20.9	21.0	0	22
	16QAM	1	0	21.1	21.1	21.1	0	22
		1	3	21.2	21.2	21.2	0	22
		1	5	21.1	21.1	21.1	0	22
		3	0	21.0	21.0	21.0	0	22
		3	1	21.1	21.0	21.0	0	22
		3	3	21.1	21.1	21.0	0	22
		6	0	21.0	21.0	21.0	0	22
	64QAM	1	0	21.3	21.3	21.3	0	22
		1	3	21.4	21.4	21.3	0	22
		1	5	21.3	21.3	21.3	0	22
		3	0	21.1	21.1	21.0	0	22
		3	1	21.1	21.1	21.0	0	22
		3	3	21.1	21.2	21.0	0	22
		6	0	20.5	20.4	20.5	0	22

LTE Band 13 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
					23230 782 MHz		MPR	Tune-up Limit
10 MHz	QPSK	1	0		20.9		0	22
		1	25		20.9		0	22
		1	49		20.9		0	22
		25	0		20.9		0	22
		25	12		20.9		0	22
		25	25		20.9		0	22
		50	0		20.9		0	22
	16QAM	1	0		21.0		0	22
		1	25		21.1		0	22
		1	49		21.1		0	22
		25	0		20.9		0	22
		25	12		20.9		0	22
		25	25		21.0		0	22
		50	0		20.9		0	22
	64QAM	1	0		21.1		0	22
		1	25		21.1		0	22
		1	49		21.1		0	22
		25	0		20.4		0	22
		25	12		20.4		0	22
		25	25		20.4		0	22
		50	0		20.4		0	22
BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				23205	23230	23255	MPR	Tune-up Limit
				779.5 MHz	782 MHz	784.5 MHz		
5 MHz	QPSK	1	0	20.9	20.9	21.0	0	22
		1	12	21.1	21.0	21.1	0	22
		1	24	20.9	20.9	21.0	0	22
		12	0	20.9	20.8	20.9	0	22
		12	7	21.0	20.9	20.9	0	22
		12	13	20.9	20.9	20.9	0	22
		25	0	21.0	20.9	20.9	0	22
	16QAM	1	0	21.0	21.0	21.2	0	22
		1	12	21.1	21.1	21.1	0	22
		1	24	21.0	21.0	21.1	0	22
		12	0	20.9	20.8	20.9	0	22
		12	7	21.0	20.8	20.9	0	22
		12	13	20.9	20.9	20.9	0	22
		25	0	20.9	20.9	20.8	0	22
	64QAM	1	0	21.1	21.2	21.0	0	22
		1	12	21.1	21.2	21.1	0	22
		1	24	21.2	21.2	21.0	0	22
		12	0	20.4	20.4	20.4	0	22
		12	7	20.5	20.4	20.4	0	22
		12	13	20.5	20.5	20.5	0	22
		25	0	20.5	20.4	20.4	0	22

LTE Band 25 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				26140	26365	26590	MPR	Tune-up Limit
				1860 MHz	1882.5 MHz	1905 MHz		
20 MHz	QPSK	1	0	18.8	18.8	18.7	0	20
		1	49	18.8	18.8	18.6	0	20
		1	99	18.7	18.8	18.6	0	20
		50	0	18.8	18.9	18.7	0	20
		50	24	18.8	18.9	18.7	0	20
		50	50	18.7	18.8	18.7	0	20
		100	0	18.8	18.9	18.7	0	20
	16QAM	1	0	19.0	19.0	18.9	0	20
		1	49	19.2	19.2	19.1	0	20
		1	99	18.9	19.0	18.8	0	20
		50	0	18.8	18.8	18.7	0	20
		50	24	18.8	18.9	18.7	0	20
		50	50	18.8	18.8	18.7	0	20
		100	0	18.8	18.8	18.7	0	20
	64QAM	1	0	19.1	19.1	18.9	0	20
		1	49	19.3	19.3	19.0	0	20
		1	99	19.1	19.0	18.7	0	20
		50	0	18.8	18.8	18.7	0	20
		50	24	18.8	18.8	18.7	0	20
		50	50	18.8	18.8	18.7	0	20
		100	0	18.8	18.8	18.7	0	20
BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				26115	26365	26615	MPR	Tune-up Limit
				1857.5 MHz	1882.5 MHz	1907.5 MHz		
15 MHz	QPSK	1	0	18.8	18.8	18.8	0	20
		1	37	18.9	18.9	18.7	0	20
		1	74	18.8	18.8	18.7	0	20
		36	0	18.9	18.9	18.9	0	20
		36	20	18.9	18.9	18.8	0	20
		36	39	18.9	18.9	18.8	0	20
		75	0	18.9	18.8	18.8	0	20
	16QAM	1	0	19.1	19.1	19.0	0	20
		1	37	19.2	19.2	19.0	0	20
		1	74	19.1	19.0	18.9	0	20
		36	0	18.9	18.8	18.8	0	20
		36	20	18.9	18.8	18.8	0	20
		36	39	18.9	18.8	18.8	0	20
		75	0	18.9	18.8	18.8	0	20
	64QAM	1	0	18.8	19.2	19.0	0	20
		1	37	19.0	19.2	19.0	0	20
		1	74	18.9	19.2	18.9	0	20
		36	0	18.8	19.0	18.8	0	20
		36	20	18.8	19.0	18.8	0	20
		36	39	18.8	19.0	18.8	0	20
		75	0	18.8	18.9	18.8	0	20
BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				26090	26365	26640	MPR	Tune-up Limit
				1855 MHz	1882.5 MHz	1910 MHz		
10 MHz	QPSK	1	0	19.0	19.0	18.8	0	20
		1	25	18.9	19.0	18.8	0	20
		1	49	18.9	19.0	18.8	0	20
		25	0	19.0	19.0	18.8	0	20
		25	12	19.0	19.0	18.9	0	20
		25	25	19.0	19.0	18.8	0	20
		50	0	19.0	19.0	18.8	0	20
	16QAM	1	0	19.3	19.3	19.2	0	20
		1	25	19.2	19.3	19.1	0	20
		1	49	19.3	19.3	19.1	0	20
		25	0	19.0	19.0	18.9	0	20
		25	12	19.0	19.0	18.9	0	20
		25	25	19.0	19.0	18.9	0	20
		50	0	18.9	19.0	18.8	0	20
	64QAM	1	0	19.2	19.3	19.0	0	20
		1	25	19.2	19.3	19.0	0	20
		1	49	19.2	19.4	19.0	0	20
		25	0	19.0	19.0	18.8	0	20
		25	12	19.0	19.0	18.9	0	20
		25	25	19.0	19.1	18.8	0	20
		50	0	19.0	19.0	18.8	0	20

LTE Band 25 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				26065	26365	26665	MPR	Tune-up Limit
				1852.5 MHz	1882.5 MHz	1912.5 MHz		
5 MHz	QPSK	1	0	18.9	19.0	18.7	0	20
		1	12	19.1	19.1	18.8	0	20
		1	24	19.0	19.0	18.8	0	20
		12	0	18.9	19.0	18.8	0	20
		12	7	19.0	19.0	18.8	0	20
		12	13	19.0	19.1	18.8	0	20
		25	0	18.9	19.0	18.8	0	20
	16QAM	1	0	19.3	19.3	19.1	0	20
		1	12	19.5	19.5	19.2	0	20
		1	24	19.3	19.4	19.1	0	20
		12	0	19.0	19.0	18.9	0	20
		12	7	19.1	19.0	18.9	0	20
		12	13	19.1	19.1	18.9	0	20
		25	0	19.0	19.0	18.8	0	20
	64QAM	1	0	19.2	19.3	19.0	0	20
		1	12	19.4	19.4	19.1	0	20
		1	24	19.3	19.3	19.0	0	20
		12	0	19.0	19.0	19.0	0	20
		12	7	19.0	19.1	19.0	0	20
		12	13	19.1	19.1	19.0	0	20
		25	0	19.0	18.9	18.8	0	20
BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				26055	26365	26675	MPR	Tune-up Limit
				1851.5 MHz	1882.5 MHz	1913.5 MHz		
3 MHz	QPSK	1	0	18.9	18.9	18.7	0	20
		1	8	18.9	19.1	18.8	0	20
		1	14	18.8	18.9	18.7	0	20
		8	0	18.9	18.9	18.8	0	20
		8	4	19.0	19.1	18.8	0	20
		8	7	19.0	19.0	18.8	0	20
		15	0	18.9	18.9	18.8	0	20
	16QAM	1	0	19.2	19.2	19.0	0	20
		1	8	19.3	19.4	19.1	0	20
		1	14	19.2	19.2	19.0	0	20
		8	0	19.0	19.0	18.8	0	20
		8	4	19.0	19.1	18.8	0	20
		8	7	19.0	19.1	18.8	0	20
		15	0	19.0	18.9	18.8	0	20
	64QAM	1	0	19.1	19.3	19.1	0	20
		1	8	19.2	19.4	19.1	0	20
		1	14	19.2	19.2	19.0	0	20
		8	0	19.0	19.0	18.8	0	20
		8	4	19.0	19.1	18.8	0	20
		8	7	19.0	19.1	18.8	0	20
		15	0	19.0	19.0	18.8	0	20
BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				26047	26365	26683	MPR	Tune-up Limit
				1850.7 MHz	1882.5 MHz	1914.3 MHz		
1.4 MHz	QPSK	1	0	18.8	18.9	18.6	0	20
		1	3	18.8	18.9	18.7	0	20
		1	5	18.8	18.8	18.6	0	20
		3	0	18.8	18.8	18.6	0	20
		3	1	18.8	18.9	18.6	0	20
		3	3	18.8	18.9	18.6	0	20
		6	0	18.8	18.9	18.6	0	20
	16QAM	1	0	18.9	19.2	18.9	0	20
		1	3	19.0	19.2	18.9	0	20
		1	5	19.0	19.3	19.0	0	20
		3	0	19.0	19.1	18.8	0	20
		3	1	19.0	19.0	18.8	0	20
		3	3	19.0	19.0	18.8	0	20
		6	0	18.8	19.0	18.7	0	20
	64QAM	1	0	19.2	19.2	18.9	0	20
		1	3	19.2	19.2	18.9	0	20
		1	5	19.1	19.2	18.9	0	20
		3	0	18.9	18.9	18.7	0	20
		3	1	18.9	19.0	18.7	0	20
		3	3	19.0	18.9	18.7	0	20
		6	0	18.8	18.9	18.8	0	20

LTE Band 41 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)						
				39750	40185	40620	41055	41490	MPR	Tune-up Limit
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
20 MHz	QPSK	1	0	19.1	19.0	19.0	18.9	19.1	0	20
		1	49	19.2	19.0	19.0	18.9	19.0	0	20
		1	99	19.1	18.9	19.1	19.0	19.1	0	20
		50	0	19.1	19.0	19.1	18.8	19.0	0	20
		50	24	19.2	19.1	19.2	19.0	19.2	0	20
		50	50	19.2	19.0	19.1	19.0	19.1	0	20
		100	0	19.2	19.1	19.1	18.9	19.0	0	20
	16QAM	1	0	19.1	19.0	19.1	19.0	19.1	0	20
		1	49	19.4	19.1	19.1	19.0	19.3	0	20
		1	99	19.1	19.0	19.2	19.2	19.2	0	20
		50	0	19.2	19.0	19.0	18.9	19.1	0	20
		50	24	19.2	19.1	19.1	19.0	19.2	0	20
		50	50	19.2	19.1	19.1	19.0	19.1	0	20
		100	0	19.2	19.1	19.1	19.0	19.1	0	20
	64QAM	1	0	19.1	19.1	19.0	18.9	19.1	0	20
		1	49	19.2	19.1	19.1	18.9	19.1	0	20
		1	99	19.1	19.0	19.1	19.0	19.0	0	20
		50	0	19.1	19.1	19.0	18.8	19.0	0	20
		50	24	19.2	19.1	19.1	18.9	19.1	0	20
		50	50	19.2	19.1	19.1	19.0	19.1	0	20
		100	0	19.2	19.1	19.1	19.0	19.0	0	20
BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)						
				39750	40185	40620	41055	41490	MPR	Tune-up Limit
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
15 MHz	QPSK	1	0	19.1	19.1	19.0	18.9	19.0	0	20
		1	37	19.2	19.1	19.0	18.9	19.0	0	20
		1	74	19.1	19.1	19.1	19.0	19.1	0	20
		36	0	19.2	19.0	19.0	18.9	19.0	0	20
		36	20	19.2	19.1	19.1	18.9	19.0	0	20
		36	39	19.2	19.1	19.1	18.9	19.1	0	20
		75	0	19.2	19.1	19.1	18.9	19.1	0	20
	16QAM	1	0	19.1	19.0	18.9	18.9	19.0	0	20
		1	37	19.2	19.1	18.9	18.9	19.1	0	20
		1	74	19.2	19.1	19.0	18.9	19.0	0	20
		36	0	19.2	19.1	19.0	18.8	19.0	0	20
		36	20	19.3	19.1	19.0	18.9	19.0	0	20
		36	39	19.2	19.1	19.1	18.9	19.1	0	20
		75	0	19.2	19.1	19.1	18.9	19.1	0	20
	64QAM	1	0	19.2	19.1	19.0	18.9	19.1	0	20
		1	37	19.2	19.1	19.0	18.9	19.1	0	20
		1	74	19.2	19.1	19.1	19.0	19.2	0	20
		36	0	19.2	19.1	19.0	18.8	19.0	0	20
		36	20	19.3	19.1	19.1	18.9	19.0	0	20
		36	39	19.2	19.1	19.1	18.9	19.1	0	20
		75	0	19.2	19.1	19.1	18.9	19.1	0	20

LTE Band 41 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)						
				39750	40185	40620	41055	41490	MPR	Tune-up Limit
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
10 MHz	QPSK	1	0	19.3	19.2	19.1	18.9	19.1	0	20
		1	25	19.3	19.2	19.1	19.0	19.2	0	20
		1	49	19.3	19.2	19.1	19.0	19.1	0	20
		25	0	19.4	19.2	19.1	18.9	19.2	0	20
		25	12	19.4	19.3	19.2	19.1	19.3	0	20
		25	25	19.4	19.3	19.2	19.0	19.2	0	20
		50	0	19.4	19.3	19.2	19.1	19.3	0	20
	16QAM	1	0	19.3	19.3	19.1	19.1	19.1	0	20
		1	25	19.3	19.3	19.0	19.1	19.2	0	20
		1	49	19.4	19.3	19.1	19.1	19.1	0	20
		25	0	19.4	19.1	19.1	19.0	19.2	0	20
		25	12	19.4	19.3	19.2	19.1	19.2	0	20
		25	25	19.4	19.3	19.2	19.1	19.2	0	20
		50	0	19.4	19.2	19.2	19.1	19.2	0	20
	64QAM	1	0	19.3	19.2	19.1	19.0	19.1	0	20
		1	25	19.4	19.2	19.2	19.1	19.3	0	20
		1	49	19.3	19.3	19.2	19.0	19.2	0	20
		25	0	19.4	19.2	19.1	19.0	19.1	0	20
		25	12	19.4	19.3	19.2	19.1	19.2	0	20
		25	25	19.4	19.3	19.2	19.1	19.2	0	20
		50	0	19.4	19.2	19.2	19.1	19.2	0	20
BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)						
				39750	40185	40620	41055	41490	MPR	Tune-up Limit
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
5 MHz	QPSK	1	0	19.3	19.1	19.1	18.9	19.2	0	20
		1	12	19.5	19.2	19.2	19.0	19.3	0	20
		1	24	19.3	19.1	19.1	19.0	19.2	0	20
		12	0	19.4	19.2	19.1	18.9	19.2	0	20
		12	7	19.4	19.3	19.2	19.1	19.3	0	20
		12	13	19.4	19.2	19.2	19.1	19.2	0	20
		25	0	19.4	19.3	19.2	19.0	19.2	0	20
	16QAM	1	0	19.3	19.2	19.2	19.0	19.2	0	20
		1	12	19.5	19.3	19.4	19.2	19.4	0	20
		1	24	19.3	19.2	19.2	19.1	19.2	0	20
		12	0	19.4	19.1	19.1	18.9	19.2	0	20
		12	7	19.4	19.2	19.2	19.1	19.2	0	20
		12	13	19.3	19.1	19.2	19.1	19.2	0	20
		25	0	19.3	19.2	19.1	19.0	19.2	0	20
	64QAM	1	0	19.3	19.2	19.1	19.0	19.2	0	20
		1	12	19.4	19.3	19.2	19.1	19.2	0	20
		1	24	19.3	19.2	19.1	19.0	19.1	0	20
		12	0	19.3	19.2	19.2	19.0	19.2	0	20
		12	7	19.4	19.2	19.3	19.1	19.3	0	20
		12	13	19.3	19.2	19.3	19.1	19.2	0	20
		25	0	19.3	19.1	19.2	19.0	19.2	0	20

LTE Band 66 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				132072	132322	132572	MPR	Tune-up Limit
				1720 MHz	1745 MHz	1770 MHz		
20 MHz	QPSK	1	0	18.1	18.1	18.0	0	19
		1	49	18.1	18.0	17.9	0	19
		1	99	18.1	18.0	17.8	0	19
		50	0	18.0	18.0	17.9	0	19
		50	24	18.1	18.1	17.9	0	19
		50	50	18.1	18.1	18.0	0	19
		100	0	18.1	18.0	17.9	0	19
	16QAM	1	0	18.3	18.3	18.2	0	19
		1	49	18.5	18.4	18.3	0	19
		1	99	18.3	18.3	18.1	0	19
		50	0	18.0	18.0	17.9	0	19
		50	24	18.1	18.0	17.9	0	19
		50	50	18.1	18.1	18.0	0	19
		100	0	18.0	18.0	17.9	0	19
	64QAM	1	0	18.2	18.2	18.1	0	19
		1	49	18.3	18.3	18.1	0	19
		1	99	18.2	18.2	18.1	0	19
		50	0	18.0	18.0	17.9	0	19
		50	24	18.1	18.0	17.9	0	19
		50	50	18.0	18.1	17.9	0	19
		100	0	18.0	18.0	17.9	0	19
15 MHz	QPSK	1	0	18.0	18.0	17.9	0	19
		1	37	18.1	18.0	17.9	0	19
		1	74	18.1	18.0	17.8	0	19
		36	0	18.1	18.0	17.9	0	19
		36	20	18.0	18.0	17.9	0	19
		36	39	18.1	18.0	17.9	0	19
		75	0	18.0	18.0	17.9	0	19
	16QAM	1	0	18.4	18.2	18.1	0	19
		1	37	18.3	18.2	18.1	0	19
		1	74	18.4	18.2	18.0	0	19
		36	0	18.0	18.0	17.9	0	19
		36	20	18.0	18.0	17.9	0	19
		36	39	18.1	18.0	17.9	0	19
		75	0	18.0	18.0	17.9	0	19
	64QAM	1	0	18.3	18.3	18.1	0	19
		1	37	18.3	18.3	18.2	0	19
		1	74	18.4	18.3	18.1	0	19
		36	0	18.0	18.0	17.9	0	19
		36	20	18.0	18.0	17.9	0	19
		36	39	18.1	18.0	17.9	0	19
		75	0	18.0	18.0	17.9	0	19
10 MHz	QPSK	1	0	18.1	18.1	18.0	0	19
		1	25	18.1	18.2	18.0	0	19
		1	49	18.1	18.1	17.9	0	19
		25	0	18.2	18.1	17.9	0	19
		25	12	18.2	18.1	18.0	0	19
		25	25	18.2	18.2	18.0	0	19
		50	0	18.2	18.1	17.9	0	19
	16QAM	1	0	18.6	18.5	18.3	0	19
		1	25	18.5	18.5	18.3	0	19
		1	49	18.6	18.4	18.3	0	19
		25	0	18.2	18.1	17.9	0	19
		25	12	18.2	18.1	18.0	0	19
		25	25	18.2	18.2	18.0	0	19
		50	0	18.1	18.1	17.9	0	19
	64QAM	1	0	18.4	18.4	18.3	0	19
		1	25	18.4	18.4	18.3	0	19
		1	49	18.4	18.4	18.2	0	19
		25	0	18.1	18.1	17.9	0	19
		25	12	18.2	18.1	18.0	0	19
		25	25	18.1	18.2	18.0	0	19
		50	0	18.1	18.1	17.9	0	19

LTE Band 66 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				131997	132322	132647	MPR	Tune-up Limit
				1712.5 MHz	1745 MHz	1777.5 MHz		
5 MHz	QPSK	1	0	18.0	18.0	17.9	0	19
		1	12	18.2	18.2	18.0	0	19
		1	24	18.0	18.1	17.9	0	19
		12	0	18.1	18.1	18.0	0	19
		12	7	18.1	18.1	18.0	0	19
		12	13	18.1	18.1	18.0	0	19
		25	0	18.1	18.0	17.9	0	19
	16QAM	1	0	18.3	18.4	18.2	0	19
		1	12	18.5	18.5	18.3	0	19
		1	24	18.3	18.5	18.3	0	19
		12	0	18.1	18.1	18.0	0	19
		12	7	18.1	18.1	18.0	0	19
		12	13	18.1	18.1	18.0	0	19
	64QAM	25	0	18.1	18.1	18.0	0	19
		1	0	18.3	18.4	18.3	0	19
		1	12	18.4	18.5	18.4	0	19
		1	24	18.3	18.4	18.3	0	19
		12	0	18.1	18.1	17.9	0	19
		12	7	18.1	18.1	18.0	0	19
		12	13	18.1	18.2	17.9	0	19
		25	0	18.1	18.1	18.0	0	19
BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				131987	132322	132657	MPR	Tune-up Limit
				1711.5 MHz	1745 MHz	1778.5 MHz		
3 MHz	QPSK	1	0	18.0	18.1	17.9	0	19
		1	8	18.1	18.2	18.0	0	19
		1	14	18.0	18.1	17.9	0	19
		8	0	18.1	18.1	18.0	0	19
		8	4	18.1	18.1	18.0	0	19
		8	7	18.1	18.2	18.0	0	19
		15	0	18.1	18.1	18.0	0	19
	16QAM	1	0	18.4	18.4	18.3	0	19
		1	8	18.5	18.5	18.3	0	19
		1	14	18.3	18.4	18.3	0	19
		8	0	18.1	18.2	18.0	0	19
		8	4	18.2	18.2	18.1	0	19
		8	7	18.2	18.3	18.1	0	19
	64QAM	15	0	18.1	18.1	18.0	0	19
		1	0	18.3	18.3	18.2	0	19
		1	8	18.4	18.3	18.3	0	19
		1	14	18.3	18.3	18.2	0	19
		8	0	18.3	18.1	18.1	0	19
		8	4	18.3	18.2	18.1	0	19
		8	7	18.3	18.3	18.1	0	19
		15	0	18.2	18.1	18.0	0	19
BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)				
				131979	132322	132665	MPR	Tune-up Limit
				1710.7 MHz	1745 MHz	1779.3 MHz		
1.4 MHz	QPSK	1	0	18.2	18.2	18.0	0	19
		1	3	18.2	18.2	18.0	0	19
		1	5	18.2	18.2	18.0	0	19
		3	0	18.1	18.1	18.0	0	19
		3	1	18.1	18.2	18.0	0	19
		3	3	18.1	18.2	18.0	0	19
		6	0	18.2	18.2	18.0	0	19
	16QAM	1	0	18.5	18.6	18.3	0	19
		1	3	18.5	18.6	18.4	0	19
		1	5	18.5	18.5	18.3	0	19
		3	0	18.3	18.4	18.1	0	19
		3	1	18.3	18.3	18.2	0	19
		3	3	18.4	18.4	18.2	0	19
	64QAM	6	0	18.2	18.2	18.1	0	19
		1	0	18.4	18.3	18.2	0	19
		1	3	18.5	18.5	18.2	0	19
		1	5	18.4	18.4	18.2	0	19
		3	0	18.3	18.3	18.1	0	19
		3	1	18.2	18.3	18.1	0	19
		3	3	18.3	18.3	18.0	0	19
		6	0	18.1	18.3	18.1	0	19

9.4. 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 on ANT1 antenna.

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

Index	2CC	Restriction	Completely Covered by Measurement Superset	Index	3CC	Restriction	Completely Covered by Measurement Superset	Index	4CC	Restriction	Completely Covered by Measurement Superset	Index	5CC	Restriction	Completely Covered by Measurement Superset	Index	6CC	Restriction	Completely Covered by Measurement Superset
2CC # 1	CA_2A-12A		3CC #1	3CC # 1	CA_2A-12A-66A		4CC #	4CC # 1	CA_2A-12A-66A-66A			5CC # 1	CA_2A-13A-46D	B46 SCC only	No	6CC # 1	CA_2A-46E-66A	B46 SCC only	No
2CC # 2	CA_2A-13A		3CC #2	3CC # 2	CA_2A-13A-66A	B46 SCC only	No	4CC # 2	CA_2A-12A-66C		No	5CC # 2	CA_2A-2A-12A-66A-66A		No				
2CC # 3	CA_2A-2A		3CC #4	3CC # 3	CA_2A-13A-66A		4CC #	4CC # 3	CA_2A-13A-66C	B46 SCC only	No	5CC # 3	CA_2A-2A-13A-66A-66A		No				
2CC # 4	CA_2A-66A	B46 SCC only	3CC #6	3CC # 4	CA_2A-2A-12A		4CC #	4CC # 4	CA_2A-13A-66A-66A			5CC # 4	CA_2A-2A-46D	B46 SCC only	No				
2CC # 5	CA_2A-4A		3CC #7	3CC # 5	CA_2A-2A-13A		4CC #	4CC # 5	CA_2A-13A-66B		No	5CC # 5	CA_2A-2A-5A-66A-66A		No				
2CC # 6	CA_2A-5A		3CC #8	3CC # 6	CA_2A-2A-66A	B46 SCC only	No	4CC # 6	CA_2A-13A-66C		No	5CC # 6	CA_2A-2A-5A-66B		No				
2CC # 7	CA_2A-66A		3CC #20	3CC # 7	CA_2A-2A-4A		4CC #	4CC # 7	CA_2A-2A-12A-66A			5CC # 7	CA_2A-2A-5A-66C		No				
2CC # 8	CA_2C		3CC #23	3CC # 8	CA_2A-2A-5A		4CC #	4CC # 8	CA_2A-2A-13A-66A			5CC # 8	CA_2A-46A-66C-66A	B46 SCC only	No				
2CC # 9	CA_12A-66A		3CC #25	3CC # 9	CA_2A-2A-66A		4CC #	4CC # 9	CA_2A-2A-46C	B46 SCC only	No	5CC # 9	CA_2A-46A-46D	B46 SCC only	No				
2CC # 10	CA_12B		3CC #27	3CC # 10	CA_2A-66A-66A	B46 SCC only	4CC #	4CC # 10	CA_2A-2A-4A-4A		No	5CC # 10	CA_2A-46D-66A	B46 SCC only	No				
2CC # 11	CA_13A-66A	B46 SCC only	3CC #28	3CC # 11	CA_2A-66A-66A	B46 SCC only	No	4CC # 11	CA_2A-2A-4A-5A		No	5CC # 11	CA_2A-46E	B46 SCC only	No				
2CC # 12	CA_13A-66A		3CC #30	3CC # 12	CA_2A-46C	B46 SCC only	4CC #	4CC # 12	CA_2A-2A-5A-66A			5CC # 12	CA_2A-5A-46D		No				
2CC # 13	CA_41A-66A		No	3CC # 13	CA_2A-4A-12A		No	4CC # 13	CA_2A-2A-66A-66A		No	5CC # 13	CA_2A-5B-66A-66A		No				
2CC # 14	CA_41C		No	3CC # 14	CA_2A-4A-13A		No	4CC # 14	CA_2A-2A-66B		No	5CC # 14	CA_2A-5B-66B		No				
2CC # 15	CA_46A-66A	B46 SCC only	3CC #36	3CC # 15	CA_2A-4A-4A		4CC #	4CC # 15	CA_2A-2A-66C		No	5CC # 15	CA_2A-5B-66C		No				
2CC # 16	CA_4A-12A		3CC #41	3CC # 16	CA_2A-4A-5A		4CC #	4CC # 16	CA_2A-66A-66A-66A	B46 SCC only	No	5CC # 16	CA_13A-46D-66A	B46 SCC only	No				
2CC # 17	CA_4A-13A		3CC #42	3CC # 17	CA_2A-4A-66A	B46 SCC only	No	4CC # 17	CA_2A-4A-46C	B46 SCC only	No	5CC # 17	CA_13A-46E	B46 SCC only	No				
2CC # 18	CA_4A-25A		No	3CC # 18	CA_2A-5A-66A		4CC #	4CC # 18	CA_2A-46C-66A	B46 SCC only	No	5CC # 18	CA_41A-46E	B46 SCC only	No				
2CC # 19	CA_4A-46A	B46 SCC only	3CC #39	3CC # 19	CA_2A-5B		4CC #	4CC # 19	CA_2A-46D		B46 SCC only	5CC # 19	CA_46A-46D-66A	B46 SCC only	No				
2CC # 20	CA_4A-4A		3CC #41	3CC # 20	CA_2A-66A-66A		4CC #	4CC # 20	CA_2A-4A-4A-5A		No	5CC # 20	CA_46D-66A-66A	B46 SCC only	No				
2CC # 21	CA_4A-5A		3CC #43	3CC # 21	CA_2A-66B		4CC #	4CC # 21	CA_2A-4A-66B		No	5CC # 21	CA_46E-66A	B46 SCC only	No				
2CC # 22	CA_4A-66A	B46 SCC only	3CC #45	3CC # 22	CA_2A-66C		4CC #	4CC # 22	CA_2A-5A-46C	B46 SCC only	No	5CC # 22	CA_4A-46A-46D	B46 SCC only	No				
2CC # 23	CA_5A-5A		3CC #47	3CC # 23	CA_2C-66A		4CC #	4CC # 23	CA_2A-5A-66A-66A			5CC # 23	CA_5A-46D-66A	B46 SCC only	No				
2CC # 24	CA_5A-66A		3CC #48	3CC # 24	CA_66A-66C	B46 SCC only	No	4CC # 24	CA_2A-5A-66B			5CC # 24	CA_5A-46E	B46 SCC only	No				
2CC # 25	CA_5B		3CC #51	3CC # 25	CA_12A-66A-66A		4CC #	4CC # 25	CA_2A-5A-66C			5CC # 25	CA_5B-46D	B46 SCC only	No				
2CC # 26	CA_66A-66A		3CC #53	3CC # 26	CA_12B-66C		4CC #	4CC # 26	CA_2A-5B-66A										
2CC # 27	CA_66B		3CC #21	3CC # 27	CA_12B-66A		No	4CC # 27	CA_2A-66A-66A-66A		No								
2CC # 28	CA_66C		3CC #22	3CC # 28	CA_13A-46A-66A		No	4CC # 28	CA_2C-66A-66A		No								
				3CC # 29	CA_13A-46C	B46 SCC only	4CC #	4CC # 29	CA_13A-46C-66A	B46 SCC only	No								
				3CC # 30	CA_13A-66A-66A		4CC #	4CC # 30	CA_13A-46D	B46 SCC only	No								
				3CC # 31	CA_13A-66B		4CC #	4CC # 31	CA_41A-46D	B46 SCC only	No								
				3CC # 32	CA_13A-66C		4CC #	4CC # 32	CA_46A-46C-66A	B46 SCC only	No								
				3CC # 33	CA_41A-46C		No	4CC # 33	CA_46C-66A-66A	B46 SCC only	No								
				3CC # 34	CA_41D		No	4CC # 34	CA_46D-66A	B46 SCC only	No								
				3CC # 35	CA_46A-46A-66A	B46 SCC only	4CC #	4CC # 35	CA_4A-46A-46C	B46 SCC only	No								
				3CC # 36	CA_46A-66A-66A	B46 SCC only	No	4CC # 36	CA_4A-46D	B46 SCC only	No								
				3CC # 37	CA_46C-66A	B46 SCC only	4CC #	4CC # 37	CA_4A-4A-5B		No								
				3CC # 38	CA_4A-12B		No	4CC # 38	CA_5A-46C-66A	B46 SCC only	No								
				3CC # 39	CA_4A-46A-66A	B46 SCC only	No	4CC # 39	CA_5A-46D	B46 SCC only	No								
				3CC # 40	CA_4A-46C	B46 SCC only	No	4CC # 40	CA_5A-5A-66A-66A		No								
				3CC # 41	CA_4A-4A-12A		No	4CC # 41	CA_5A-5A-66B		No								
				3CC # 42	CA_4A-4A-13A		No	4CC # 42	CA_5A-5A-66C		No								
				3CC # 43	CA_4A-4A-5A		4CC #	4CC # 43	CA_5B-46C	B46 SCC only	No								
				3CC # 44	CA_4A-5B		4CC #	4CC # 44	CA_5B-66A-66A										
				3CC # 45	CA_5A-46A-66A	B46 SCC only	No	4CC # 45	CA_5B-66B										
				3CC # 46	CA_5A-46C	B46 SCC only	4CC #	4CC # 46	CA_5B-66C										
				3CC # 47	CA_5A-5A-66A		4CC #												
				3CC # 48	CA_5A-66A-66A		4CC #												
				3CC # 49	CA_5A-66B		4CC #												
				3CC # 50	CA_5A-66C		4CC #												
				3CC # 51	CA_5B-66A		No												
				3CC # 52	CA_5B-66B		4CC #												
				3CC # 53	CA_66A-66A-66A		4CC #												
				3CC # 54	CA_66A-66B		No												
				3CC # 55	CA_66A-66C		No												
				3CC # 56	CA_66D		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.

2CC DL CA Measured Results

E-UTRA CA configuration	CC1 (UL)					CC1 (DL)			CC2 (DL)			Aggregated BW	CA Inactive (dBm)	CA Active (dBm)	Delta	2CC
	Mode	BW (MHz)	Channel	Freq (MHz)	RB Offset	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)					
CA_41A-46A	QPSK	20	39750	2506	50.24	20	39750	2506	20	50690	5540	40	17.61	17.60	-0.01	13
CA_41C	QPSK	20	39750	2506	50.24	20	39750	2506	20	39948	2525.8	40	17.62	17.60	-0.02	14
CA_4A-28A	QPSK	20	20175	1732.5	1.0	20	2175	2132.5	20	9410	778	40	15.66	15.66	0.00	18

3CC DL CA Measured Results

E-UTRA CA configuration	CC1 (UL)					CC1 (DL)					CC2 (DL)			CC3 (DL)			Aggregated BW	CA Inactive (dBm)	CA Active (dBm)	Delta	3CC
	Mode	BW (MHz)	Channel	Freq (MHz)	RB Offset	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)							
CA_2A-13A-46A	QPSK	20	18900	1880	50.0	20	900	1960	10	5230	751	20	50690	5540	50	19.30	19.31	0.01	2		
CA_2A-2A-46A	QPSK	20	18900	1880	50.0	20	900	1960	20	1100	1980	20	50690	5540	60	19.28	19.27	-0.01			
CA_2A-46A-66A	QPSK	20	18900	1880	50.0	20	900	1960	20	50690	5540	20	66886	2155	60	19.27	19.29	0.02	11		
CA_2A-4A-12A	QPSK	20	18900	1880	50.0	20	900	1960	20	2175	2132.5	10	5060	734	50	19.29	19.33	0.04	13		
CA_2A-4A-13A	QPSK	20	18900	1880	50.0	20	900	1960	20	2175	2132.5	10	5230	751	50	19.32	19.33	0.01	14		
CA_2A-5A-46A	QPSK	20	18900	1880	50.0	20	900	1960	10	2450	874	20	50690	5540	50	19.31	19.37	0.06	17		
CA_46A-66C	QPSK	20	132323	1745.1	1.0	20	66787	2145.1	20	66985	2164.9	20	50690	5540	60	16.90	16.95	0.05	24		
CA_12B-66A	QPSK	5	23048	702.8	1.25	5	5048	732.8	10	5120	740	20	66886	2155	35	22.82	22.85	0.03	27		
CA_13A-46A-66A	QPSK	10	23230	782	1.0	10	5230	751	20	50690	5540	20	66886	2155	50	22.05	22.12	0.07	28		
CA_41A-46C	QPSK	20	39750	2506	50.24	20	39750	2506	20	54142	5885.2	20	54340	5905	60	19.95	19.94	-0.01	33		
CA_41D	QPSK	20	39750	2506	50.24	20	39750	2506	20	39948	2525.8	20	40146	2545.6	60	19.97	19.95	-0.02	34		
CA_46A-66A-66A	QPSK	20	132322	1745	1.0	20	66786	2145	20	67086	2175	20	50690	5540	60	17.20	17.16	-0.04	36		
CA_4A-12B	QPSK	20	20175	1732.5	1.0	20	2175	2132.5	5	5048	732.8	10	5120	740	35	16.36	16.39	0.03	38		
CA_4A-46A-46A	QPSK	20	20175	1732.5	1.0	20	2175	2132.5	20	50690	5540	20	53940	5865	60	16.71	16.72	0.01	39		
CA_4A-46C	QPSK	20	20175	1732.5	1.0	20	2175	2132.5	20	50692	5540.2	20	50890	5560	60	16.70	16.75	0.05	40		
CA_4A-4A-12A	QPSK	20	20050	1720	1.0	20	2050	2120	20	2300	2145	10	5060	734	50	17.27	17.29	0.02	41		
CA_4A-4A-13A	QPSK	20	20175	1720	1.0	20	2050	2120	20	2300	2145	10	5230	751	50	17.28	17.27	-0.01	42		
CA_5A-46A-66A	QPSK	10	20525	836.5	1.25	10	2525	881.5	20	50690	5540	20	66886	2155	50	20.86	20.88	0.02	45		
CA_5B-46A	QPSK	10	20476	831.6	1.25	10	2476	876.6	10	2575	886.5	20	50690	5540	40	18.94	18.97	0.03	51		
CA_66A-66B	QPSK	20	132072	1720	1.0	20	66536	2120	10	67187	2185.1	10	67286	2195	40	17.42	17.37	-0.05	54		
CA_66A-66C	QPSK	20	132072	1720	1.0	20	66536	2120	20	67038	2170.2	20	67236	2190	60	17.46	17.43	-0.03	55		
CA_66D	QPSK	20	132224	1735.2	1.0	20	66688	2135.2	20	66886	2155	20	67084	2174.8	60	16.82	16.79	-0.03	56		

4CC DL CA Measured Results

E-UTRA CA configuration	Mode	CC1 (UL)				CC1 (DL)				CC2 (DL)				CC3 (DL)				CC4 (DL)				Aggregated BW	CA Inactive (dBm)	CA Active (dBm)	Delta	4CC
		BW (MHz)	Channel	Freq (MHz)	RB Offset	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)									
CA_2A-12A-66C	QPSK	20	18900	1880	50.0	20	900	1960	10	5060	734	20	66985	2164.9	20	67236	2190	70	19.07	19.04	-0.03	2				
CA_2A-13A-46C	QPSK	20	18900	1880	50.0	20	900	1960	10	5230	751	20	50692	5540.2	20	50890	5560	70	19.05	19.07	0.02	3				
CA_2A-13A-66B	QPSK	20	18900	1880	50.0	20	900	1960	10	5230	751	10	66837	2150.1	10	66936	2160	50	19.11	19.08	-0.03	5				
CA_2A-13A-66C	QPSK	20	18900	1880	50.0	20	900	1960	10	5230	751	20	66787	2145.1	20	66985	2164.9	70	19.12	19.10	-0.02	6				
CA_2A-2A-46C	QPSK	20	18900	1880	50.0	20	900	1960	20	1100	1980	20	54142	5885.2	20	54340	5905	80	19.16	19.18	0.02	9				
CA_2A-2A-4A-4A	QPSK	20	18900	1880	50.0	20	900	1960	20	1100	1980	20	2050	2120	20	2300	2145	80	19.18	19.21	0.03	10				
CA_2A-2A-4A-5A	QPSK	20	18900	1880	50.0	20	900	1960	20	1100	1980	20	2175	2132.5	10	2575	886.5	70	19.19	19.22	0.03	11				
CA_2A-2A-66A-66A	QPSK	20	18900	1880	50.0	20	900	1960	20	1100	1980	20	66786	2145	20	67086	2175	80	19.20	19.19	-0.01	13				
CA_2A-2A-66B	QPSK	20	18900	1880	50.0	20	900	1960	20	1100	1980	10	66837	2150.1	10	66936	2160	60	19.19	19.22	0.03	14				
CA_2A-2A-66C	QPSK	20	18900	1880	50.0	20	900	1960	20	1100	1980	20	66787	2145.1	20	66985	2164.9	80	19.18	19.21	0.03	15				
CA_2A-46A-46A-66A	QPSK	20	18900	1880	50.0	20	900	1960	20	50690	5540	20	53940	5865	20	66886	2155	80	19.20	19.21	0.01	16				
CA_2A-46C-66A	QPSK	20	18900	1880	50.0	20	900	1960	20	50467	5517.7	20	50665	5537.5	20	66536	2120	80	19.20	19.23	0.03	18				
CA_2A-4A-4A-5A	QPSK	20	18900	1880	50.0	20	900	1960	20	2050	2120	20	2300	2145	10	2525	881.5	70	19.22	19.24	0.02	20				
CA_2A-4A-5B	QPSK	20	18900	1880	50.0	20	900	1960	20	2175	2132.5	10	2476	876.6	10	2575	886.5	60	19.23	19.22	-0.01	21				
CA_2A-5A-46C	QPSK	20	18900	1880	50.0	20	900	1960	10	2525	881.5	20	50467	5517.7	20	50665	5537.5	70	19.22	19.24	0.02	22				
CA_2A-66A-66A-66A	QPSK	20	18900	1880	50.0	20	900	1960	20	66536	2120	20	66886	2155	20	67236	2190	80	19.17	19.21	0.04	27				
CA_2C-66A-66A	QPSK	20	18801	1870.1	50.0	20	801	1950.1	20	999	1969.9	20	66536	2120	20	67236	2190	80	19.13	19.15	0.02	28				
CA_13A-46C-66A	QPSK	10	23230	782	1.0	10	5230	751	20	50467	5517.7	20	50665	5537.5	20	66536	2120	70	20.28	20.29	0.01	29				
CA_41A-46D	QPSK	20	39750	2506	50.24	20	39750	2506	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	80	20.91	20.89	-0.02	31				
CA_46C-66A-66A	QPSK	20	132322	1745	1.0	20	66786	2145	20	67086	2175	20	50692	5540.2	20	50890	5560	80	18.76	18.78	0.02	33				
CA_4A-46A-46C	QPSK	20	20175	1732.5	1.0	20	2175	2132.5	20	54340	5905	20	46890	5160	20	47088	5179.8	80	18.65	18.68	0.03	35				
CA_4A-46D	QPSK	20	20175	1732.5	1.0	20	2175	2132.5	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	80	18.66	18.68	0.02	36				
CA_4A-4A-5B	QPSK	20	20050	1720	1.0	20	2050	2120	20	2300	2145	10	2476	876.6	10	2575	886.5	60	16.45	16.43	-0.02	37				
CA_5A-46C-66A	QPSK	10	20525	836.5	1.25	10	2525	881.5	20	50467	5517.7	20	50665	5537.5	20	66536	2120	70	20.98	21.01	0.03	38				
CA_5A-5A-66A-66A	QPSK	10	20450	829	1.25	10	2450	874	10	2600	889	20	66536	2120	20	67236	2190	60	20.28	20.32	0.04	40				
CA_5A-5A-66B	QPSK	10	20450	829	1.25	10	2450	874	10	2600	889	10	66837	2150.1	10	66936	2160	40	20.28	20.29	0.01	41				
CA_5A-5A-66C	QPSK	10	20450	829	1.25	10	2450	874	10	2600	889	20	66787	2145.1	20	66985	2164.9	60	20.31	20.32	0.01	42				
CA_5B-46C	QPSK	10	20476	831.6	1.25	10	2476	876.6	10	2575	886.5	20	50692	5540.2	20	50890	5560	60	20.25	20.24	-0.01	43				

5CC DL CA Measured Results

E-UTRA CA configuration	CC1 (UL)					CC1 (DL)					CC2 (DL)					CC3 (DL)					CC4 (DL)					CC5 (DL)					Aggregated BW	CA Inactive (dBm)	CA Active (dBm)	Delta	5CC#
	Mode	BW (MHz)	Channel	Freq (MHz)	RB Offset	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)									
CA_2A-13A-46D	QPSK	20	18900	1880	50.0	20	900	1960	10	5230	751	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	90	19.24	19.26	0.02	1										
CA_2A-2A-12A-66A-66A	QPSK	20	18900	1880	50.0	20	900	1960	20	1100	1980	10	5095	737.5	20	66536	2120	20	67036	2170	90	19.18	19.20	0.02	2										
CA_2A-2A-13A-66A-66A	QPSK	20	18900	1880	50.0	20	900	1960	20	1100	1980	10	5230	751	20	66536	2120	20	67036	2170	90	19.18	19.19	0.01	3										
CA_2A-2A-46D	QPSK	20	18900	1880	50.0	20	900	1960	20	1100	1980	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	100	19.27	19.29	0.02	4										
CA_2A-2A-5A-66A-66A	QPSK	20	18900	1880	50.0	20	900	1960	20	1100	1980	10	2525	881.5	20	66536	2120	20	67236	2190	90	19.18	19.20	0.02	5										
CA_2A-2A-5A-66B	QPSK	20	18900	1880	50.0	20	900	1960	20	1100	1980	10	2525	881.5	10	66837	2150.1	10	66936	2160	70	19.19	19.20	0.01	6										
CA_2A-2A-5A-66C	QPSK	20	18900	1880	50.0	20	900	1960	20	1100	1980	10	2525	881.5	20	66787	2145.1	20	66985	2164.9	90	19.19	19.20	0.01	7										
CA_2A-46A-46C-66A	QPSK	20	18900	1880	50.0	20	900	1960	20	54340	5905	20	46890	5160	20	47088	5179.8	20	66536	2120	100	19.30	19.31	0.01	8										
CA_2A-46A-46D	QPSK	20	18900	1880	50.0	20	900	1960	20	54340	5905	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	100	19.28	19.31	0.03	9										
CA_2A-46D-66A	QPSK	20	18900	1880	50.0	20	900	1960	20	50665	5537.5	20	50863	5557.3	20	51061	5577.1	20	66536	2120	100	19.31	19.29	-0.02	10										
CA_2A-5A-46D	QPSK	20	18900	1880	50.0	20	900	1960	10	2525	881.5	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	90	19.17	19.18	0.01	12										
CA_2A-5B-66A-66A	QPSK	20	18900	1880	50.0	20	900	1960	10	2476	876.6	10	2575	886.5	20	66536	2120	20	67236	2190	80	19.20	19.21	0.01	13										
CA_2A-5B-66B	QPSK	20	18900	1880	50.0	20	900	1960	10	2476	876.6	10	2575	886.5	10	66787	2145.1	10	66985	2164.9	60	19.21	19.20	-0.01	14										
CA_2A-5B-66C	QPSK	20	18900	1880	50.0	20	900	1960	10	2476	876.6	10	2575	886.5	20	66787	2145.1	20	66985	2164.9	80	19.22	19.24	0.02	15										
CA_13A-46D-66A	QPSK	10	23230	782	1.0	10	5230	751	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	20	66536	2120	90	20.19	20.12	-0.07	16										
CA_13A-46E	QPSK	10	23230	782	1.0	10	5230	751	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	20	51061	5577.1	90	20.15	20.09	-0.06	17										
CA_41A-46E	QPSK	20	39750	2506	50.24	20	39750	2506	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	20	51061	5577.1	100	19.90	19.87	-0.03	18										
CA_46A-46D-66A	QPSK	20	132322	1745	1.0	20	66786	2145	20	54142	5885.2	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	100	16.92	16.91	-0.01	19										
CA_46D-66A-66A	QPSK	20	132322	1745	1.0	20	66786	2145	20	67086	2175	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	100	16.90	16.89	-0.01	20										
CA_4A-46A-46D	QPSK	20	20175	1732.5	1.0	20	2175	2132.5	20	54340	5905	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	100	16.87	16.91	0.04	22										
CA_5A-46D-66A	QPSK	10	20525	836.5	1.25	10	2525	881.5	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	20	66536	2120	90	20.74	20.76	0.02	23										
CA_5A-46E	QPSK	10	20525	836.5	1.25	10	2525	881.5	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	20	51061	5577.1	90	20.75	20.80	0.05	24										
CA_5B-46D	QPSK	10	20476	831.6	1.25	10	2476	876.6	10	2575	886.5	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	80	20.07	20.12	0.05	25										

6CC DL CA Measured Results

E-UTRA CA configuration	CC1 (UL)					CC1 (DL)					CC2 (DL)					CC3 (DL)					CC4 (DL)					CC5 (DL)					CC6 (DL)					Aggregated BW	CA Inactive (dBm)	CA Active (dBm)	Delta	6CC #
	Mode	BW (MHz)	Channel	Freq (MHz)	RB Offset	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)	Channel	Freq (MHz)	BW (MHz)													
CA_2A-46E-66A	QPSK	20	18900	1880	50.0	20	900	1960	20	50467	5517.7	20	50665	5537.5	20	50863	5557.3	20	51061	5577.1	20	66536	2120	120	19.26	19.29	0.03	1												

9.5. Wi-Fi 2.4GHz (DTS Band)

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

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

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

SAR testing is not required for OFDM mode(s) when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

Band	Normal Tune-Up Power Limit (dBm)			
	WiFi Main		WiFi Sub	
	Normal	Simultaneous 2G_5G	Normal	Simultaneous 2G_5G
DSSS 2.4 GHz	14	11	12.5	11
OFDM 2.4 GHz	14	11	14	11

Wi-Fi 2.4GHz Normal State Measured Results

Band	Mode	Ch #	Freq. (MHz)	WiFi Main Average Power (dBm)			WiFi Sub Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
DSSS 2.4 GHz	802.11b	1	2412	13.8	14.0	Yes	12.1	12.5	Yes
		6	2437	13.1	14.0		12.0	12.5	
		11	2462	13.4	14.0		11.7	12.5	
OFDM 2.4 GHz	802.11g	1	2412	12.6	14.0	No	13.3	14.0	Yes
		6	2437	13.2	14.0		14.0	14.0	
		11	2462	13.4	14.0		13.8	14.0	
	802.11n (HT20)	1	2412	13.3	14.0	No	13.8	14.0	No
		6	2437	13.0	14.0		14.0	14.0	
		11	2462	13.0	14.0		13.9	14.0	
OFDMA 2.4 GHz	802.11ax (HE20, SU)	1	2412	13.4	14.0	No	13.4	14.0	No
		6	2437	13.1	14.0		13.8	14.0	
		11	2462	13.2	14.0		13.5	14.0	

Wi-Fi 2.4GHz Simultaneous State Measured Results

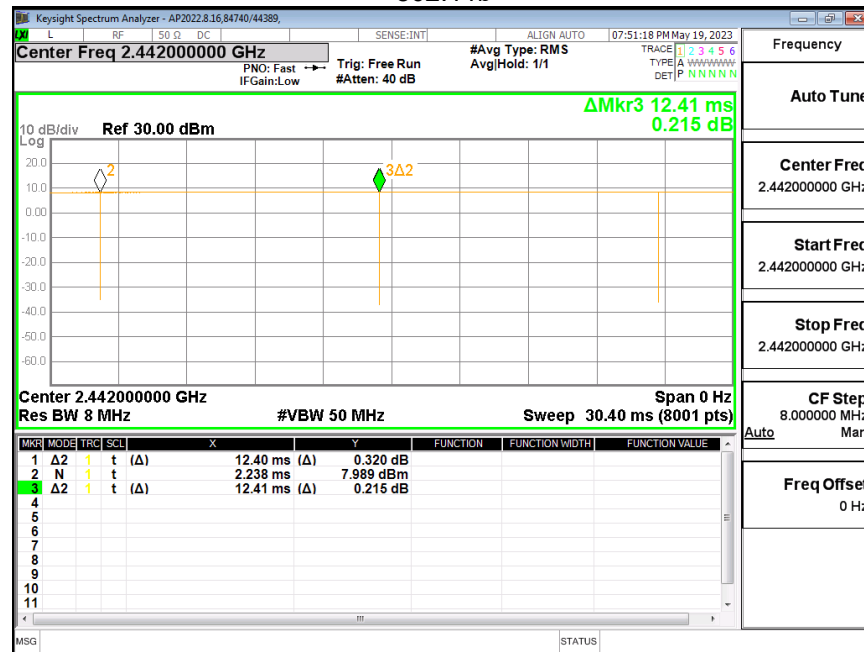
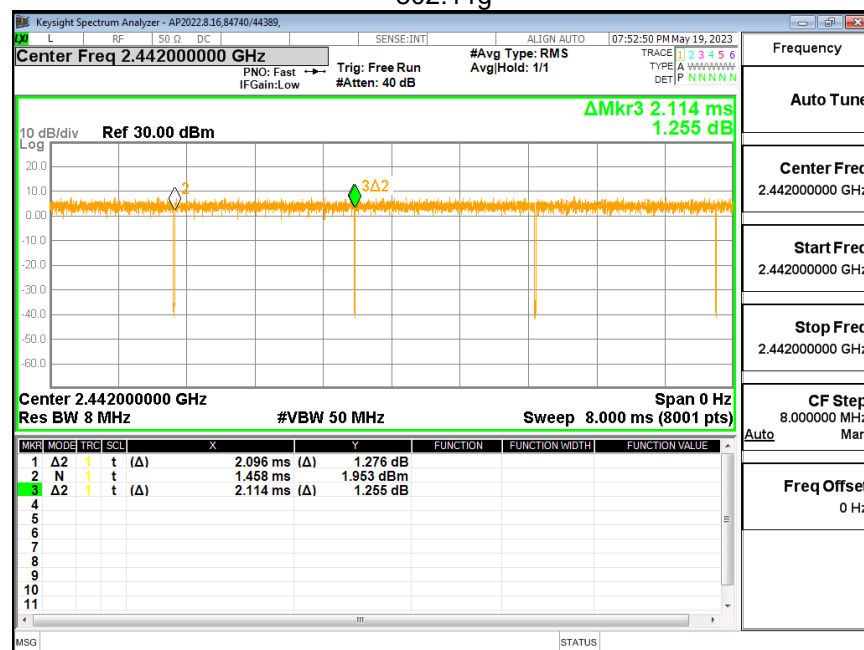
Band	Mode	Ch #	Freq. (MHz)	WiFi Main Average Power (dBm)			WiFi Sub Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
DSSS 2.4 GHz	802.11b	1	2412	10.5	11.0	Yes	10.6	11.0	Yes
		6	2437	10.8	11.0		10.8	11.0	
		11	2462	11.0	11.0		11.0	11.0	

Duty Factor Measured Results

Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
802.11b	1 Mbps	12.40	12.41	99.9%	1.00
802.11g	6 Mbps	2.096	2.114	99.1%	1.01

Note(s):

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

WLAN 2.4GHz Duty Cycle**802.11b****802.11g**

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

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

When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac/ax modes, the channel in the lower order/sequence 802.11 transmission mode is selected.

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

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/g/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	Max Tune-Up Power Limit (dBm)			
	WiFi Main		WiFi Sub	
	Normal	Simultaneous 2G_5G	Normal	Simultaneous 2G_5G
UNII-1 5.2 GHz	11.5	9.5	11.5	9.5
UNII-1 & 2A	11.5	9.5	11.5	9.5
UNII-2C 5.5 GHz	11.5	9.5	11.5	9.5
UNII-3 5.8 GHz	11.5	9.5	11.5	9.5

Wi-Fi 5 GHz Normal State Measured Results

Band	Mode	Ch #	Freq. (MHz)	WiFi Main Average Power (dBm)			WiFi Sub Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-1 5.2GHz	802.11ac (VHT80)	42	5210	10.6	11.5	Yes	10.9	11.5	Yes
Band	Mode	Ch #	Freq. (MHz)	WiFi Main Average Power (dBm)			WiFi Sub Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-1 & 2A	802.11ac (VHT160)	50	5250	10.7	11.5	Yes	10.9	11.5	Yes
Band	Mode	Ch #	Freq. (MHz)	WiFi Main Average Power (dBm)			WiFi Sub Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-2C 5.5 GHz	802.11ac (VHT160)	114	5570	10.6	11.5	Yes	10.8	11.5	Yes
Band	Mode	Ch #	Freq. (MHz)	WiFi Main Average Power (dBm)			WiFi Sub Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-3 5.8GHz	802.11n (HT40)	151	5755	10.6	11.5	Yes	11.0	11.5	Yes
		159	5795	10.6	11.5		10.5	11.5	
	802.11ax (HE40, SU)	151	5755	10.6	11.5	Yes	11.0	11.5	Yes
		159	5795	10.6	11.5		10.5	11.5	

Wi-Fi 5 GHz Simultaneous State Measured Results

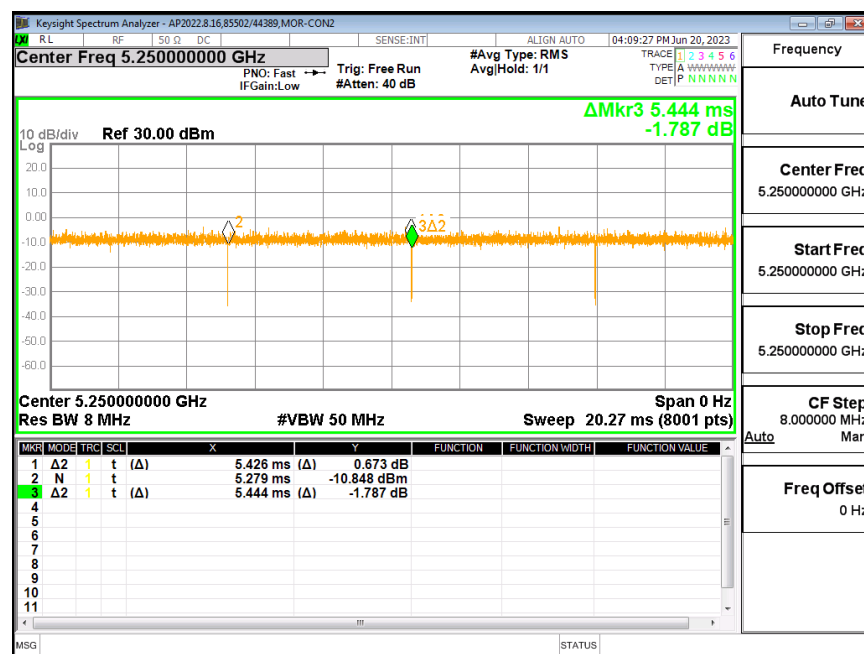
Band	Mode	Ch #	Freq. (MHz)	WiFi Main Average Power (dBm)			WiFi Sub Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-1 5.2GHz	802.11ac (VHT80)	42	5210	8.9	9.5	Yes	9.5	9.5	Yes
Band	Mode	Ch #	Freq. (MHz)	WiFi Main Average Power (dBm)			WiFi Sub Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-1 & 2A	802.11ac (VHT160)	50	5250	9.4	9.5	Yes	9.4	9.5	Yes
Band	Mode	Ch #	Freq. (MHz)	WiFi Main Average Power (dBm)			WiFi Sub Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-2C 5.5 GHz	802.11ac (VHT160)	114	5570	9.2	9.5	Yes	9.4	9.5	Yes
Band	Mode	Ch #	Freq. (MHz)	WiFi Main Average Power (dBm)			WiFi Sub Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
UNII-3 5.8GHz	802.11ac (VHT80)	155	5775	9.4	9.5	Yes	9.1	9.5	Yes

Duty Factor Measured Results

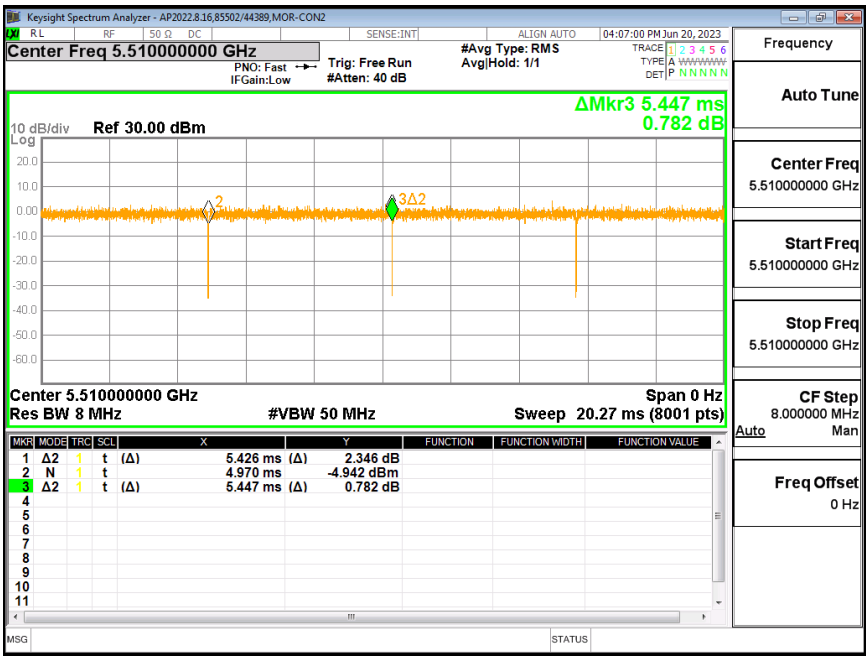
Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
802.11ac VHT80	MCS0	5.39	5.445	99.0%	1.01
802.11ac VHT160	MCS0	5.426	5.444	99.7%	1.00
802.11n HT40	MCS0	5.426	5.447	99.6%	1.00

Note(s):

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

WLAN 5GHz Duty Cycle**802.11ac VHT80****802.11ac VHT160**

802.11n HT40



9.7. Bluetooth

Maximum Output Power (Tune-up Limit) for Bluetooth

From October 2016 TCB workshop, Power and SAR were measured with the device connected to a call box with hopping disabled using DH5 modulation. The duty cycle value from the device is taken from the Duty Cycle plot below.

SAR measurement is not required for the EDR and LE. When the secondary mode is $\leq 1/4$ dB higher than the primary mode.

Band	Mode	Tune-Up Power Limit (dBm)	
		WiFi Main	WiFi Sub
		Normal	Normal
2.4	BR	14.0	14.0
	EDR	14.0	14.0
	BLE	10.0	10.02

Bluetooth Measured Results

Band	Mode	Ch #	Freq. (MHz)	WiFi Main Average Power (dBm)			WiFi Sub Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)	Meas Pwr	Tune-up	SAR Test (Yes/No)
2.4	BR GFSK	0	2402	12.9	14.0	Yes	13.3	14.0	Yes
		39	2441	12.8	14.0		13.3	14.0	
		78	2480	13.5	14.0		13.1	14.0	
	EDR, $\pi/4$ DQPSK	0	2402	12.8	14.0	No	13.1	14.0	No
		39	2441	12.6	14.0		13.1	14.0	
		78	2480	13.3	14.0		13.1	14.0	
	EDR, 8-DPSK	0	2402	12.5	14.0	No	13.0	14.0	No
		39	2441	12.7	14.0		13.1	14.0	
		78	2480	13.2	14.0		13.1	14.0	
	LE, GFSK	0	2402	9.8	10.0	No	10.0	10.02	No
		19	2440	9.7	10.0		10.0	10.02	
		39	2480	9.9	10.0		9.7	10.02	

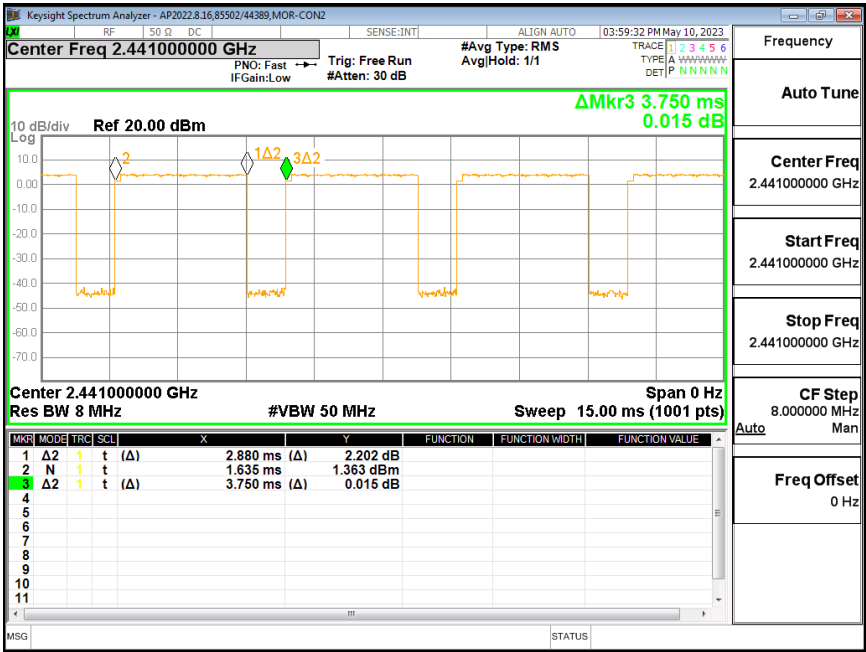
Duty Factor Measured Results

Mode	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
BR GFSK	2.88	3.750	76.80%	1.30

Note(s):

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

WLAN 5GHz Duty Cycle
BT BR 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 648474 D04 Handset SAR (Phablet Only):

For smart phones, with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm.

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

KDB 941225 D01 SAR test for 3G devices:

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

KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

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

KDB 248227 D01 SAR meas for 802.11:

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

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

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

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

10.1. GSM850

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
Head	GPRS 4 Slots	CELL Main1	0	Left Cheek	190	836.6	26.9	25.7	0.066	0.087	1
				Left Tilt	190	836.6	26.9	25.7	0.035	0.046	
				Right Cheek	190	836.6	26.9	25.7	0.082	0.108	
				Right Tilt	190	836.6	26.9	25.7	0.030	0.040	
Body-Worn and Hotspot	GPRS 4 Slots	CELL Main1	10	Rear	190	836.6	26.9	25.7	0.183	0.241	2
				Front	190	836.6	26.9	25.7	0.112	0.148	
Hotspot	GPRS 4 Slots	CELL Main1	10	Edge Left	190	836.6	26.9	25.7	0.044	0.058	
				Edge Bottom	190	836.6	26.9	25.7	0.064	0.084	
Body-Worn and Hotspot	DTM GPRS 2 Slots	CELL Main1	10	Rear	190	836.6	29.9	29.2	0.226	0.266	3

10.2. GSM1900

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
Head	GPRS 4 Slots	CELL Main2	0	Left Cheek	810	1909.8	22.0	21.1	0.021	0.026	4
				Left Tilt	810	1909.8	22.0	21.1	0.013	0.016	
				Right Cheek	810	1909.8	22.0	21.1	0.034	0.042	
				Right Tilt	810	1909.8	22.0	21.1	0.010	0.012	
Body-Worn and Hotspot	GPRS 4 Slots	CELL Main2	10	Rear	810	1909.8	22.0	21.1	0.120	0.148	5
				Front	810	1909.8	22.0	21.1	0.107	0.132	
Hotspot	GPRS 4 Slots	CELL Main2	10	Edge Right	810	1909.8	22.0	21.1	0.111	0.137	6
				Edge Bottom	810	1909.8	22.0	21.1	0.162	0.199	
Body-Worn and Hotspot	DTM GPRS 2 Slots	CELL Main2	10	Edge Bottom	512	1850.2	25	24.2	0.102	0.123	7

10.3. W-CDMA Band II

RF Exposure Conditions	Mode	Antenna	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	CELL Main2	0	Left Cheek	9538	1907.6	19.7	19.0	0.032	0.038	8
				Left Tilt	9538	1907.6	19.7	19.0	0.019	0.022	
				Right Cheek	9538	1907.6	19.7	19.0	0.041	0.048	
				Right Tilt	9538	1907.6	19.7	19.0	0.011	0.013	
Body-Worn and Hotspot	Rel. 99 RMC 12.2 kbps	CELL Main2	10	Rear	9538	1907.6	19.7	19.0	0.207	0.243	9
				Front	9538	1907.6	19.7	19.0	0.191	0.224	
Hotspot	Rel. 99 RMC 12.2 kbps	CELL Main2	10	Edge Right	9538	1907.6	19.7	19.0	0.143	0.168	10
				Edge Bottom	9538	1907.6	19.7	19.0	0.400	0.470	

10.4.W-CDMA Band IV

RF Exposure Conditions	Mode	Antenna	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	CELL Main2	0	Left Cheek	1413	1732.6	18.7	18.0	0.030	0.035	11
				Left Tilt	1413	1732.6	18.7	18.0	0.019	0.022	
				Right Cheek	1413	1732.6	18.7	18.0	0.053	0.062	
				Right Tilt	1413	1732.6	18.7	18.0	0.020	0.023	
Body-Worn and Hotspot	Rel. 99 RMC 12.2 kbps	CELL Main2	10	Rear	1413	1732.6	18.7	18.0	0.137	0.161	12
				Front	1413	1732.6	18.7	18.0	0.105	0.123	
Hotspot	Rel. 99 RMC 12.2 kbps	CELL Main2	10	Edge Right	1413	1732.6	18.7	18.0	0.115	0.135	13
				Edge Bottom	1413	1732.6	18.7	18.0	0.149	0.175	

10.5.W-CDMA Band V

RF Exposure Conditions	Mode	Antenna	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	CELL Main1	0	Left Cheek	4183	836.6	22.7	21.9	0.086	0.103	14
				Left Tilt	4183	836.6	22.7	21.9	0.051	0.061	
				Right Cheek	4183	836.6	22.7	21.9	0.098	0.118	
				Right Tilt	4183	836.6	22.7	21.9	0.052	0.063	
Body-Worn and Hotspot	Rel. 99 RMC 12.2 kbps	CELL Main1	10	Rear	4183	836.6	22.7	21.9	0.177	0.213	15
				Front	4183	836.6	22.7	21.9	0.118	0.142	
Hotspot	Rel. 99 RMC 12.2 kbps	CELL Main1	10	Edge Left	4183	836.6	22.7	21.9	0.075	0.090	
				Edge Bottom	4183	836.6	22.7	21.9	0.060	0.072	

10.6.LTE Band 5 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Antenna	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	CELL Main1	0	Left Cheek	20525	836.5	1	25	22.0	20.9	0.059	0.076	16
							25	0	22.0	20.9	0.059	0.076	
				Left Tilt	20525	836.5	1	25	22.0	20.9	0.032	0.041	
							25	0	22.0	20.9	0.034	0.044	
				Right Cheek	20525	836.5	1	25	22.0	20.9	0.066	0.085	
							25	0	22.0	20.9	0.066	0.085	
				Right Tilt	20525	836.5	1	25	22.0	20.9	0.030	0.039	
							25	0	22.0	20.9	0.030	0.039	
Body-Worn and Hotspot	QPSK	CELL Main1	10	Rear	20525	836.5	1	25	22.0	20.9	0.150	0.193	17
							25	0	22.0	20.9	0.148	0.191	
				Front	20525	836.5	1	25	22.0	20.9	0.093	0.120	
							25	0	22.0	20.9	0.091	0.117	
Hotspot	QPSK	CELL Main1	10	Edge Left	20525	836.5	1	25	22.0	20.9	0.046	0.059	
							25	0	22.0	20.9	0.045	0.058	
				Edge Bottom	20525	836.5	1	25	22.0	20.9	0.048	0.062	
							25	0	22.0	20.9	0.047	0.061	

10.7.LTE Band 12 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Antenna	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	CELL Main1	0	Left Cheek	23095	707.5	1	25	22.0	21.0	0.051	0.064	
							25	0	22.0	21.0	0.053	0.067	
				Left Tilt	23095	707.5	1	25	22.0	21.0	0.019	0.024	
							25	0	22.0	21.0	0.019	0.024	
				Right Cheek	23095	707.5	1	25	22.0	21.0	0.054	0.068	
							25	0	22.0	21.0	0.055	0.069	18
Body-Worn and Hotspot	QPSK	CELL Main1	10	Rear	23095	707.5	1	25	22.0	21.0	0.090	0.113	19
							25	0	22.0	21.0	0.090	0.113	
				Front	23095	707.5	1	25	22.0	21.0	0.068	0.086	
							25	0	22.0	21.0	0.070	0.088	
Hotspot	QPSK	CELL Main1	10	Edge Left	23095	707.5	1	25	22.0	21.0	0.093	0.117	
							25	0	22.0	21.0	0.098	0.123	20
				Edge Bottom	23095	707.5	1	25	22.0	21.0	0.026	0.033	
							25	0	22.0	21.0	0.026	0.033	

10.8.LTE Band 13 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Antenna	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	CELL Main1	0	Left Cheek	23230	782.0	1	0	22.0	20.9	0.081	0.104	
							25	0	22.0	20.9	0.071	0.091	
				Left Tilt	23230	782.0	1	0	22.0	20.9	0.054	0.070	
							25	0	22.0	20.9	0.047	0.061	
				Right Cheek	23230	782.0	1	0	22.0	20.9	0.084	0.108	21
							25	0	22.0	20.9	0.072	0.093	
Body-Worn and Hotspot	QPSK	CELL Main1	10	Right Tilt	23230	782.0	1	0	22.0	20.9	0.048	0.062	
							25	0	22.0	20.9	0.041	0.053	
				Rear	23230	782.0	1	0	22.0	20.9	0.167	0.215	22
							25	0	22.0	20.9	0.142	0.183	
				Front	23230	782.0	1	0	22.0	20.9	0.131	0.169	
							25	0	22.0	20.9	0.111	0.143	
Hotspot	QPSK	CELL Main1	10	Edge Left	23230	782.0	1	0	22.0	20.9	0.126	0.162	
							25	0	22.0	20.9	0.118	0.152	
				Edge Bottom	23230	782.0	1	0	22.0	20.9	0.037	0.048	
							25	0	22.0	20.9	0.030	0.039	

10.9. LTE Band 25 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Antenna	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	CELL Main2	0	Left Cheek	26365	1882.5	1	0	20.0	18.8	0.033	0.044	23
							50	0	20.0	18.9	0.035	0.045	
				Left Tilt	26365	1882.5	1	0	20.0	18.8	0.018	0.024	
							50	0	20.0	18.9	0.017	0.022	
				Right Cheek	26365	1882.5	1	0	20.0	18.8	0.062	0.082	
							50	0	20.0	18.9	0.062	0.080	
Body-Worn and Hotspot	QPSK	CELL Main2	10	Rear	26365	1882.5	1	0	20.0	18.8	0.190	0.250	24
							50	0	20.0	18.9	0.196	0.252	
				Front	26365	1882.5	1	0	20.0	18.8	0.135	0.178	
							50	0	20.0	18.9	0.140	0.180	
Hotspot	QPSK	CELL Main2	10	Edge Right	26365	1882.5	1	0	20.0	18.8	0.154	0.203	25
							50	0	20.0	18.9	0.160	0.206	
				Edge Bottom	26365	1882.5	1	0	20.0	18.8	0.209	0.276	
							50	0	20.0	18.9	0.220	0.283	

10.10. LTE Band 41 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Antenna	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	CELL Main2	0	Left Cheek	39750	2506.0	1	49	20.0	19.2	0.014	0.017	26
							50	24	20.0	19.2	0.013	0.016	
				Left Tilt	39750	2506.0	1	49	20.0	19.2	0.012	0.014	
							50	24	20.0	19.2	0.011	0.013	
				Right Cheek	39750	2506.0	1	49	20.0	19.2	0.025	0.030	
							50	24	20.0	19.2	0.025	0.030	
Body-Worn and Hotspot	QPSK	CELL Main2	10	Right Tilt	39750	2506.0	1	49	20	19.2	0.002	0.002	27
							50	24	20	19.2	0.005	0.006	
				Rear	39750	2506.0	1	49	20.0	19.2	0.104	0.125	
							50	24	20.0	19.2	0.112	0.135	
				Front	39750	2506.0	1	49	20.0	19.2	0.099	0.119	
							50	24	20.0	19.2	0.100	0.120	
Hotspot	QPSK	CELL Main2	10	Edge Right	39750	2506.0	1	49	20.0	19.2	0.034	0.041	28
							50	24	20.0	19.2	0.035	0.042	
				Edge Bottom	39750	2506.0	1	49	20.0	19.2	0.154	0.185	
							50	24	20.0	19.2	0.157	0.189	

10.11. LTE Band 66 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Antenna	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	CELL Main2	0	Left Cheek	132322	1720.0	1	0	19.0	18.1	0.029	0.036	
							50	24	19.0	18.1	0.030	0.037	
				Left Tilt	132322	1720.0	1	0	19.0	18.1	0.015	0.018	
							50	24	19.0	18.1	0.015	0.018	
				Right Cheek	132322	1720.0	1	0	19.0	18.1	0.049	0.060	
							50	24	19.0	18.1	0.050	0.062	29
				Right Tilt	132322	1720.0	1	0	19.0	18.1	0.015	0.018	
							50	24	19.0	18.1	0.014	0.017	
Body-Worn and Hotspot	QPSK	CELL Main2	10	Rear	132322	1720.0	1	0	19.0	18.1	0.120	0.148	
							50	24	19.0	18.1	0.121	0.149	30
				Front	132322	1720.0	1	0	19.0	18.1	0.113	0.139	
							50	24	19.0	18.1	0.113	0.139	
Hotspot	QPSK	CELL Main2	10	Edge Right	132322	1720.0	1	0	19.0	18.1	0.135	0.166	31
							50	24	19.0	18.1	0.134	0.165	
				Edge Bottom	132322	1720.0	1	0	19.0	18.1	0.102	0.125	
							50	24	19.0	18.1	0.106	0.130	

10.12. Wi-Fi (DTS Band)

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

SAR testing is not required for OFDM mode(s) when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11b	WiFi Main	Normal	0	Left Cheek	1	2412	0.057	99.9%	14.0	13.8			
					Left Tilt	1	2412	0.023	99.9%	14.0	13.8			
					Right Cheek	1	2412	0.340	99.9%	14.0	13.8	0.345	0.362	32
					Right Tilt	1	2412	0.086	99.9%	14.0	13.8			
Body-Worn and Hotspot	802.11b	WiFi Main	Normal	10	Rear	1	2412	0.037	99.9%	14.0	13.8	0.041	0.043	33
					Front	1	2412	0.032	99.9%	14.0	13.8			
Hotspot	802.11b	WiFi Main	Normal	10	Edge Left	1	2412	0.067	99.9%	14.0	13.8	0.070	0.073	34
					Edge Top	1	2412	0.003	99.9%	14.0	13.8			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11b	WiFi Main	Simultaneous 2G_5G/6G	0	Left Cheek	11	2462	0.060	99.9%	11.0	11.0			
					Left Tilt	11	2462	0.016	99.9%	11.0	11.0			
					Right Cheek	11	2462	0.324	99.9%	11.0	11.0	0.337	0.337	35
					Right Tilt	11	2462	0.080	99.9%	11.0	11.0			
Body-Worn and Hotspot	802.11b	WiFi Main	Simultaneous 2G_5G/6G	10	Rear	11	2462	0.041	99.9%	11.0	11.0	0.042	0.042	36
					Front	11	2462	0.027	99.9%	11.0	11.0			
Hotspot	802.11b	WiFi Main	Simultaneous 2G_5G/6G	10	Edge Left	11	2462	0.074	99.9%	11.0	11.0	0.077	0.077	37
					Edge Top	11	2462	0.002	99.9%	11.0	11.0			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11g	WiFi Sub	Normal	0	Left Cheek	6	2437	<.001	99.1%	14.0	14.0			
					Left Tilt	6	2437	0.001	99.1%	14.0	14.0			-
					Right Cheek	6	2437	<.001	99.1%	14.0	14.0			
					Right Tilt	6	2437	<.001	99.1%	14.0	14.0			
Body-Worn and Hotspot	802.11g	WiFi Sub	Normal	10	Rear	6	2437	0.150	99.1%	14.0	14.0	0.167	0.169	38
					Front	6	2437	<.001	99.1%	14.0	14.0			
Hotspot	802.11g	WiFi Sub	Normal	10	Edge Left	6	2437	0.003	99.1%	14.0	14.0			
					Edge Bottom	6	2437	0.012	99.1%	14.0	14.0			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11b	WiFi Sub	Simultaneous 2G_5G/6G	0	Left Cheek	11	2462	0.002	99.9%	11.0	11.0	<.001	<.001	-
					Left Tilt	11	2462	<.001	99.9%	11.0	11.0			
					Right Cheek	11	2462	<.001	99.9%	11.0	11.0			
					Right Tilt	11	2462	<.001	99.9%	11.0	11.0			
Body-Worn and Hotspot	802.11b	WiFi Sub	Simultaneous 2G_5G/6G	10	Rear	11	2462	0.101	99.9%	11.0	11.0	0.106	0.106	39
					Front	11	2462	0.002	99.9%	11.0	11.0			
Hotspot	802.11b	WiFi Sub	Simultaneous 2G_5G/6G	10	Edge Left	11	2462	0.002	99.9%	11.0	11.0			
					Edge Bottom	11	2462	0.005	99.9%	11.0	11.0			

Notes:

- 10-g extremity SAR is not required since hotspot mode 1-g report SAR < 1.2 W/kg

Antenna	802.11b SAR (W/kg)	802.11b pwr (dBm)	802.11g/n pwr (dBm)	Adjusted SAR (W/kg)	Additional SAR Test
WiFi Main	0.362	14	14	0.362	Not Test

10.13. Wi-Fi (U-NII Band)

UNII-1 & 2A

When the specified maximum output power is the same for both UNII band I and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is

- ≤ 1.2 W/kg, SAR is not required for UNII band I
- > 1.2 W/kg, both bands should be tested independently for SAR.

UNII-1

RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Hotspot	802.11ac (VHT80)	WiFi Main	Normal	0	Rear	42	5210	0.034	99.0%	11.5	10.6	0.028	0.035	40
					Front	42	5210	0.014	99.0%					
					Edge Left	42	5210	0.033	99.0%					
					Edge Top	42	5210	0.002	99.0%					
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Hotspot	802.11ac (VHT80)	WiFi Main	Simultaneous 2G_5G/6G	0	Rear	42	5210	0.022	99.0%	9.5	8.9	0.013	0.015	41
					Front	42	5210	0.009	99.0%					
					Edge Left	42	5210	0.018	99.0%					
					Edge Top	42	5210	0.005	99.0%					
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Hotspot	802.11ac (VHT80)	WiFi Sub	Normal	0	Rear	42	5210	0.032	99.0%	11.5	10.9	0.024	0.028	42
					Front	42	5210	0.006	99.0%					
					Edge Left	42	5210	0.006	99.0%					
					Edge Bottom	42	5210	<0.001	99.0%					
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Hotspot	802.11ac (VHT80)	WiFi Sub	Simultaneous 2G_5G/6G	0	Rear	42	5210	0.022	99.0%	9.5	9.5	0.016	0.016	43
					Front	42	5210	0.006	99.0%					
					Edge Left	42	5210	0.005	99.0%					
					Edge Bottom	42	5210	0.004	99.0%					

UNII-2A

RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11ac (VHT160)	WiFi Main	Normal	0	Left Cheek	50	5250	0.023	99.7%	11.5	10.7			
					Left Tilt	50	5250	0.012	99.7%	11.5	10.7			
					Right Cheek	50	5250	0.106	99.7%	11.5	10.7	0.151	0.182	44
					Right Tilt	50	5250	0.035	99.7%	11.5	10.7			
Body-Worn	802.11ac (VHT160)	WiFi Main	Normal	10	Rear	50	5250	0.030	99.7%	11.5	10.7	0.023	0.028	45
					Front	50	5250	0.016	99.7%	11.5	10.7			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		10-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	802.11ac (VHT160)	WiFi Main	Normal	0	Rear	50	5250	0.109	99.7%	11.5	10.7	0.105	0.127	46
					Front	50	5250	0.097	99.7%	11.5	10.7			
					Edge Left	50	5250	0.290	99.7%	11.5	10.7	0.282	0.340	47
					Edge Top	50	5250	0.011	99.7%	11.5	10.7			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11ac (VHT160)	WiFi Main	Simultaneous 2G_5G/6G	0	Left Cheek	50	5250	0.014	99.7%	9.5	9.4			
					Left Tilt	50	5250	0.013	99.7%	9.5	9.4			
					Right Cheek	50	5250	0.128	99.7%	9.5	9.4	0.179	0.184	48
					Right Tilt	50	5250	0.037	99.7%	9.5	9.4			
Body-Worn	802.11ac (VHT160)	WiFi Main	Simultaneous 2G_5G/6G	10	Rear	50	5250	0.032	99.7%	9.5	9.4	0.024	0.025	49
					Front	50	5250	0.013	99.7%	9.5	9.4			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11ac (VHT160)	WiFi Sub	Normal	0	Left Cheek	50	5250	0.004	99.7%	11.5	10.9	<0.001	<0.001	-
					Left Tilt	50	5250	<0.001	99.7%	11.5	10.9			
					Right Cheek	50	5250	<0.001	99.7%	11.5	10.9			
					Right Tilt	50	5250	<0.001	99.7%	11.5	10.9			
Body-Worn	802.11ac (VHT160)	WiFi Sub	Normal	10	Rear	50	5250	0.017	99.7%	11.5	10.9	0.018	0.021	50
					Front	50	5250	<0.001	99.7%	11.5	10.9			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		10-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	802.11ac (VHT160)	WiFi Sub	Normal	0	Rear	50	5250	0.138	99.7%	11.5	10.9	0.157	0.181	51
					Front	50	5250	0.003	99.7%	11.5	10.9			
					Edge Left	50	5250	0.005	99.7%	11.5	10.9	0.001	0.001	52
					Edge Top	50	5250	0.004	99.7%	11.5	10.9			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11ac (VHT160)	WiFi Main	Simultaneous 2G_5G/6G	0	Left Cheek	50	5250	<0.001	99.7%	9.5	9.4	<0.001	<0.001	-
					Left Tilt	50	5250	<0.001	99.7%	9.5	9.4			
					Right Cheek	50	5250	<0.001	99.7%	9.5	9.4			
					Right Tilt	50	5250	<0.001	99.7%	9.5	9.4			
Body-Worn	802.11ac (VHT160)	WiFi Main	Simultaneous 2G_5G/6G	10	Rear	50	5250	0.018	99.7%	9.5	9.4	0.011	0.011	53
					Front	50	5250	<0.001	99.7%	9.5	9.4			

Note(s):

- For results listed with "-", the SAR result is less than 0.01 W/kg.

Wi-Fi UNII-2C

RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11ac (VHT160)	WiFi Main	Normal	0	Left Cheek	114	5570	0.015	99.7%	11.5	10.6			
					Left Tilt	114	5570	0.013	99.7%	11.5	10.6			
					Right Cheek	114	5570	0.178	99.7%	11.5	10.6	0.224	0.276	54
					Right Tilt	114	5570	0.032	99.7%	11.5	10.6			
Body-Worn	802.11ac (VHT160)	WiFi Main	Normal	10	Rear	114	5570	0.035	99.7%	11.5	10.6	0.030	0.037	55
					Front	114	5570	0.013	99.7%	11.5	10.6			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		10-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	802.11ac (VHT160)	WiFi Main	Normal	0	Rear	114	5570	0.075	99.7%	11.5	10.6			
					Front	114	5570	0.060	99.7%	11.5	10.6			
					Edge Left	114	5570	0.313	99.7%	11.5	10.6	0.310	0.383	56
					Edge Top	114	5570	0.018	99.7%	11.5	10.6			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11ac (VHT160)	WiFi Main	Simultaneous 2G_5G/6G	0	Left Cheek	114	5570	0.007	99.7%	9.5	9.2			
					Left Tilt	114	5570	<.001	99.7%	9.5	9.2			
					Right Cheek	114	5570	0.098	99.7%	9.5	9.2	0.122	0.131	57
					Right Tilt	114	5570	0.005	99.7%	9.5	9.2			
Body-Worn	802.11ac (VHT160)	WiFi Main	Simultaneous 2G_5G/6G	10	Rear	114	5570	0.026	99.7%	9.5	9.2	0.019	0.020	58
					Front	114	5570	0.002	99.7%	9.5	9.2			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11ac (VHT160)	WiFi Sub	Normal	0	Left Cheek	114	5570	<0.001	99.7%	11.5	10.8			
					Left Tilt	114	5570	<0.001	99.7%	11.5	10.8			
					Right Cheek	114	5570	<0.001	99.7%	11.5	10.8	<0.001	<0.001	-
					Right Tilt	114	5570	<0.001	99.7%	11.5	10.8			
Body-Worn	802.11ac (VHT160)	WiFi Sub	Normal	10	Rear	114	5570	0.028	99.70%	11.5	10.8	0.028	0.033	59
					Front	114	5570	<.001	99.7%	11.5	10.8			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		10-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	802.11ac (VHT160)	WiFi Sub	Normal	0	Rear	114	5570	0.243	99.7%	11.5	10.8	0.316	0.372	60
					Front	114	5570	0.011	99.7%	11.5	10.8			
					Edge Left	114	5570	0.035	99.7%	11.5	10.8			
					Edge Bottom	114	5570	0.025	99.7%	11.5	10.8			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11ac (VHT160)	WiFi Sub	Simultaneous 2G_5G/6G	0	Left Cheek	114	5570	<0.001	99.7%	9.5	9.4			-
					Left Tilt	114	5570	<0.001	99.7%	9.5	9.4			
					Right Cheek	114	5570	<0.001	99.7%	9.5	9.4			
					Right Tilt	114	5570	<0.001	99.7%	9.5	9.4			
Body-Worn	802.11ac (VHT160)	WiFi Sub	Simultaneous 2G_5G/6G	10	Rear	114	5570	0.030	99.7%	9.5	9.4	0.029	0.030	61
					Front	114	5570	0.004	99.7%	9.5	9.4			

Note(s):

- For results listed with "-", the SAR result is less than 0.01 W/kg.

Wi-Fi UNII-3

RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11n (HT40)	WiFi Main	Normal	0	Left Cheek	159	5795	0.016	99.6%	11.5	10.6			
					Left Tilt	159	5795	0.003	99.6%	11.5	10.6			
					Right Cheek	159	5795	0.098	99.6%	11.5	10.6	0.211	0.261	62
					Right Tilt	159	5795	0.028	99.6%	11.5	10.6			
Body-Worn / Hotspot	802.11n (HT40)	WiFi Main	Normal	10	Rear	159	5795	0.045	99.6%	11.5	10.6	0.038	0.047	63
					Front	159	5795	0.008	99.6%	11.5	10.6			
Hotspot	802.11n (HT40)	WiFi Main	Normal	10	Edge Left	159	5795	0.061	99.6%	11.5	10.6	0.061	0.075	64
					Edge Top	159	5795	0.012	99.6%	11.5	10.6			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		10-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	802.11n (HT40)	WiFi Main	Normal	0	Rear	159	5795	0.086	99.6%	11.5	10.6			
					Front	159	5795	0.080	99.6%	11.5	10.6			
					Edge Left	159	5795	0.337	99.6%	11.5	10.6	0.340	0.420	65
					Edge Top	159	5795	0.022	99.6%	11.5	10.6			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11ac (VHT80)	WiFi Main	Simultaneous 2G_5G/6G	0	Left Cheek	155	5775	0.008	99.0%	9.5	9.4			
					Left Tilt	155	5775	<0.001	99.0%	9.5	9.4			
					Right Cheek	155	5775	0.073	99.0%	9.5	9.4	0.105	0.109	66
					Right Tilt	155	5775	0.033	99.0%	9.5	9.4			
Body-Worn / Hotspot	802.11ac (VHT80)	WiFi Main	Simultaneous 2G_5G/6G	10	Rear	155	5775	0.03	99.0%	9.5	9.4	0.019	0.020	67
					Front	155	5775	0.003	99.0%	9.5	9.4			
Hotspot	802.11ac (VHT80)	WiFi Main	Simultaneous 2G_5G/6G	10	Edge Left	155	5775	0.046	99.0%	9.5	9.4	0.043	0.044	68
					Edge Top	155	5775	0.017	99.0%	9.5	9.4			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11n (HT40)	WiFi Sub	Normal	0	Left Cheek	151	5755	0.008	99.6%	11.5	11			
					Left Tilt	151	5755	0.01	99.6%	11.5	11			
					Right Cheek	151	5755	0.005	99.6%	11.5	11			
					Right Tilt	151	5755	0.015	99.6%	11.5	11	<0.001	<0.001	-
Body-Worn / Hotspot	802.11n (HT40)	WiFi Sub	Normal	10	Rear	151	5755	0.06	99.6%	11.5	11	0.060	0.068	69
					Front	151	5755	0.008	99.6%	11.5	11			
Hotspot	802.11n (HT40)	WiFi Sub	Normal	10	Edge Left	151	5755	0.013	99.6%	11.5	11	0.008	0.009	
					Edge Bottom	151	5755	0.001	99.6%	11.5	11			
RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		10-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	802.11n (HT40)	WiFi Main	Normal	0	Rear	151	5755	0.231	99.6%	11.5	11.0	0.349	0.393	70
					Front	151	5755	0.009	99.6%	11.5	11.0			
					Edge Left	151	5755	0.013	99.6%	11.5	11.0	0.007	0.008	
					Edge Bottom	151	5755	0.005	99.6%	11.5	11.0			

RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Head	802.11ac (VHT80)	WiFi Sub	Simultaneous 2G_5G/6G	0	Left Cheek	155	5775	0.003	99.0%	9.5	9.1			
					Left Tilt	155	5775	0.006	99.0%	9.5	9.1	<0.001	<0.001	-
					Right Cheek	155	5775	0.004	99.0%	9.5	9.1			
					Right Tilt	155	5775	0.004	99.0%	9.5	9.1			
Body-Worn / Hotspot	802.11ac (VHT80)	WiFi Sub	Simultaneous 2G_5G/6G	10	Rear	155	5775	0.044	99.0%	9.5	9.1	0.046	0.051	71
					Front	155	5775	<0.001	99.0%	9.5	9.1			
Hotspot	802.11ac (VHT80)	WiFi Sub	Simultaneous 2G_5G/6G	10	Edge Left	155	5775	0.011	99.0%	9.5	9.1			
					Edge Bottom	155	5775	0.001	99.0%	9.5	9.1			

Note(s):

- For results listed with "-", the SAR result is less than 0.001 W/kg.

10.14. Bluetooth

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up Limit	Meas.	Meas.	Scaled	
Head	GFSK	WiFi Main	0	Left Cheek	78	2480	100.0%	14.0	13.5	0.058	0.065	
				Left Tilt	78	2480	100.0%	14.0	13.5	0.020	0.022	
				Right Cheek	78	2480	100.0%	14.0	13.5	0.272	0.305	72
				Right Tilt	78	2480	100.0%	14.0	13.5	0.071	0.080	
Body-Worn and Hotspot	GFSK	WiFi Main	10	Rear	78	2480	100.0%	14.0	13.5	0.046	0.052	73
				Front	78	2480	100.0%	14.0	13.5	0.032	0.036	
Hotspot	GFSK	WiFi Main	10	Edge Left	78	2480	100.0%	14.0	13.5	0.074	0.083	74
				Edge Top	78	2480	100.0%	14.0	13.5	0.003	0.003	
RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up Limit	Meas.	Meas.	Scaled	
Head	GFSK	WiFi Sub	0	Left Cheek	39	2441	100.0%	14.0	13.3	<.001	<.001	-
				Left Tilt	39	2441	100.0%	14.0	13.3	<.001	<.001	
				Right Cheek	39	2441	100.0%	14.0	13.3	<.001	<.001	
				Right Tilt	39	2441	100.0%	14.0	13.3	<.001	<.001	
Body-Worn and Hotspot	GFSK	WiFi Sub	10	Rear	39	2441	100.0%	14.0	13.3	0.075	0.088	75
				Front	39	2441	100.0%	14.0	13.3	<.001	<.001	
Hotspot	GFSK	WiFi Sub	10	Edge Left	39	2441	100.0%	14.0	13.3	0.001	0.001	
				Edge Bottom	39	2441	100.0%	14.0	13.3	0.007	0.008	

Note(s):

- For results listed with "-", the SAR result is less than 0.001 W/kg.
- TCB Workshop October 2016 was referenced to support utilizing a 100% Duty Cycle for Bluetooth.

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

Note(s):

Repeated measurement is not required since the original highest measured SAR is $< 0.8 \text{ W/kg}$ (1-g) or 2 W/kg (10-g) .

12. Simultaneous Transmission Conditions

RF Exposure Condition	Tx Mode	WWAN		WiFi Main			Wi-Fi Sub			NFC
		CELL Main1	CELL Main2	2.4 GHz Wi-Fi	5 GHz Wi-Fi	Bluetooth	2.4 GHz Wi-Fi	5 GHz Wi-Fi	Bluetooth	
Head, Body-worn, & Hotspot	1	✓		✓			✓			
	2	✓			✓			✓		
	3	✓				✓				
	4	✓							✓	
	5	✓			✓	✓		✓		
	6	✓			✓			✓	✓	
	7	✓		✓	✓		✓	✓		
	8		✓	✓			✓			
	9		✓		✓			✓		
	10		✓			✓				
	11		✓						✓	
	12		✓		✓	✓		✓		
	13		✓		✓			✓	✓	
	14		✓	✓	✓			✓		
Extremity	15				✓			✓		✓

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)

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.

12.2. Estimated SAR for Simultaneous Transmission SAR Analysis

Considerations for SAR estimation

- When standalone SAR test exclusion applies, standalone SAR must also be estimated to determine simultaneous transmission SAR test exclusion.
- Dedicated Host Approach criteria for SAR test exclusion is likewise applied to SAR estimation, with certain distinctions between test exclusion and SAR estimation:
 - When the separation distance from the antenna to an adjacent edge is ≤ 5 mm, a distance of 5 mm is applied for SAR estimation; this is the same between test exclusion and SAR estimation calculations.
 - When the separation distance from the antenna to an adjacent edge is > 5 mm but ≤ 50 mm, the actual antenna-to-edge separation distance is applied for SAR estimation.
 - When the minimum test separation distance is > 50 mm, the estimated SAR value is 0.4 W/kg
- Please refer to [Estimated SAR Tables](#) to see which test positions are inherently compliant as they consist of only estimated SAR values for all applicable transmitters and consequently will always have sum of SAR values < 1.2 W/kg. Simultaneous transmission SAR analysis was therefore not performed for these test positions.

Estimated SAR for NFC

Antenna	Tx Interface	Frequency (MHz)	Output Power	Separation Distances (mm)		Estimated 10-g SAR Value (W/kg)
			mW	Back		Back
NFC	NFC	13.56	403	0		0.501

12.3. Sum of the SAR for WWAN CELL Main1 & Wi-Fi Normal State & BT

RF Exposure Conditions	Standalone SAR (W/kg)							Σ 1-g SAR (W/kg)					
	WWAN	WLAN 2.4 GHz		WLAN 5 GHz		BT		WWAN + WLAN 2.4 GHz	WWAN + WLAN 5 GHz	WWAN + WLAN 5 GHz + BT	WWAN + WLAN 5 GHz + BT	WWAN + BT	WWAN + BT
	CELL Main1 ①	WiFi Main ②	WiFi Sub ③	WiFi Main ④	WiFi Sub ⑤	WiFi Main ⑥	WiFi Sub ⑦	① + ② + ③	① + ④ + ⑤	① + ④ + ⑤ + ⑥	① + ④ + ⑤ + ⑦	① + ⑥	① + ⑦
Head	0.118	0.362	0.169	0.276	0.068	0.305	0.088	0.649	0.462	0.767	0.550	0.423	0.206
Body	0.266	0.043	0.169	0.047	0.068	0.052	0.088	0.478	0.381	0.433	0.469	0.318	0.354
Hotspot	0.266	0.073	0.169	0.075	0.068	0.083	0.088	0.508	0.409	0.492	0.497	0.349	0.354

Conclusion:

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

12.4. Sum of the SAR for WWAN CELL Main1 & Wi-Fi Simultaneous 2G_5G State

RF Exposure Conditions	Standalone SAR (W/kg)					Σ 1-g SAR (W/kg)
	WWAN	WLAN 2.4 GHz		WLAN 5 GHz		WWAN + WLAN 2.4 GHz + WLAN 5 GHz
	CELL Main1 ①	WiFi Main ②	WiFi Sub ③	WiFi Main ④	WiFi Sub ⑤	① + ② + ③ + ④ + ⑤
Head	0.118	0.337	0.106	0.184	0.051	0.796
Body	0.266	0.042	0.106	0.025	0.051	0.490
Hotspot	0.266	0.077	0.106	0.044	0.051	0.544

Conclusion:

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

12.5. Sum of the SAR for WWAN CELL Main2 & Wi-Fi Normal State & BT

RF Exposure Conditions	Standalone SAR (W/kg)							Σ 1-g SAR (W/kg)					
	WWAN	WLAN 2.4 GHz		WLAN 5 GHz		BT		WWAN + WLAN 2.4 GHz	WWAN + WLAN 5 GHz	WWAN + WLAN 5 GHz + BT	WWAN + WLAN 5 GHz + BT	WWAN + BT	WWAN + BT
	CELL Main2 ①	WiFi Main ②	WiFi Sub ③	WiFi Main ④	WiFi Sub ⑤	WiFi Main ⑥	WiFi Sub ⑦	① + ② + ③	① + ④ + ⑤	① + ④ + ⑤ + ⑥	① + ④ + ⑤ + ⑦	① + ⑥	① + ⑦
Head	0.082	0.362	0.169	0.276	0.068	0.305	0.088	0.613	0.426	0.731	0.514	0.387	0.170
Body	0.252	0.043	0.169	0.047	0.068	0.052	0.088	0.464	0.367	0.419	0.455	0.304	0.340
Hotspot	0.470	0.073	0.169	0.075	0.068	0.083	0.088	0.712	0.613	0.696	0.701	0.553	0.558

Conclusion:

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

12.6. Sum of the SAR for WWAN CELL Main2 & Wi-Fi Simultaneous 2G_5G State

RF Exposure Conditions	Standalone SAR (W/kg)					Σ 1-g SAR (W/kg)
	WWAN	WLAN 2.4 GHz		WLAN 5 GHz		WWAN + WLAN 2.4 GHz + WLAN 5 GHz
	CELL Main2 ①	WiFi Main ②	WiFi Sub ③	WiFi Main ④	WiFi Sub ⑤	
Head	0.082	0.337	0.106	0.184	0.051	① + ② + ③ + ④ + ⑤
Body	0.252	0.042	0.106	0.025	0.051	
Hotspot	0.470	0.077	0.106	0.044	0.051	

Conclusion:

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

12.7. Sum of the SAR for Wi-Fi Normal State & NFC

RF Exposure Conditions	Standalone SAR (W/kg)			Σ 10-g SAR (W/kg)
	WLAN 5 GHz		NFC	
	WiFi Main ①	WiFi Sub ②	NFC ③	① + ② + ③
Extremity	0.420	0.372	0.501	1.293

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because either the sum of the 10-g SAR is < 4 W/kg or the SPLSR is < 0.1 for all circumstances that require SPLSR calculation.

Appendixes

Refer to separated files for the following appendixes.

Appendix A: SAR Setup Photos

Appendix B: SAR System Check Plots

Appendix C: SAR Highest Test Plots

Appendix D: SAR Tissue Ingredients

Appendix E: SAR Probe Certificates

Appendix F: SAR Dipole Certificates

END OF REPORT