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: PY7-12907W

Report Number: R14634918-S1 v6
Issue Date: 3/15/2023

Prepared for
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ACCREDITED
CERT #0751.06

Revision History

Rev.	Date	Revisions	Revised By
V1	3/6/2023	Initial Issue	--
V2	3/8/2023	Removed IMEI and specified simultaneous transmission conditions at request of client. Updated output power tables for LTE Band 66 and 5G n41. Added NFC SAR measurements.	Richard Jankovics
V3	3/9/2023	Removed mode column from U-NII maximum output power table, changed column header to “Max Tune-Up Power Limit (dBm)”. Removed 70 MHz bandwidth from 5G n41 conducted output power. Corrected Wi-Fi normal state simultaneous Tx values, updated attestation. Added NFC to attestation. Added simultaneous Tx considerations for 10-g SAR.	Sarah Kuhaneck
V4	3/10/2023	Updated Section 6.5 supported bandwidths for 5GNR n5 and n41.	Lindsay Ryan
V5	3/13/2023	Removed unsupported bandwidths from section 6.5 n41	Sarah Kuhaneck
V6	3/15/2023	Revised Normal State output power for Wi-Fi UNII-1 Channel 42, UNII-2A Channel 50, UNII-2C Channel 114, and UNII-3 Channel 159/151 in § 9 and 10, and updated impacted SAR values in § 1 and 12	Richard Jankovics

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1. Attestation of Test Results

Applicant Name		Sony Corporation				
FCC ID		PY7-12907W				
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		0.501	0.445	0.241	0.265	N/A
Body-worn*		0.446	0.077	0.089	0.058	N/A
Hotspot/BT Tethering		0.446	0.121	0.077	0.093	N/A
Extremity (10g)		N/A	N/A	0.339	N/A	0.059
Simultaneous TX	Head/Body-worn/Hotspot/ BT Tethering (1g)	1.135	1.062	1.135	1.135	N/A
	Extremity (10g)	N/A	N/A	0.609	N/A	0.609
Date Tested		1/4/2023 to 2/27/2023				
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:
	
Devin Chang Senior Test Engineer UL Verification Services 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.

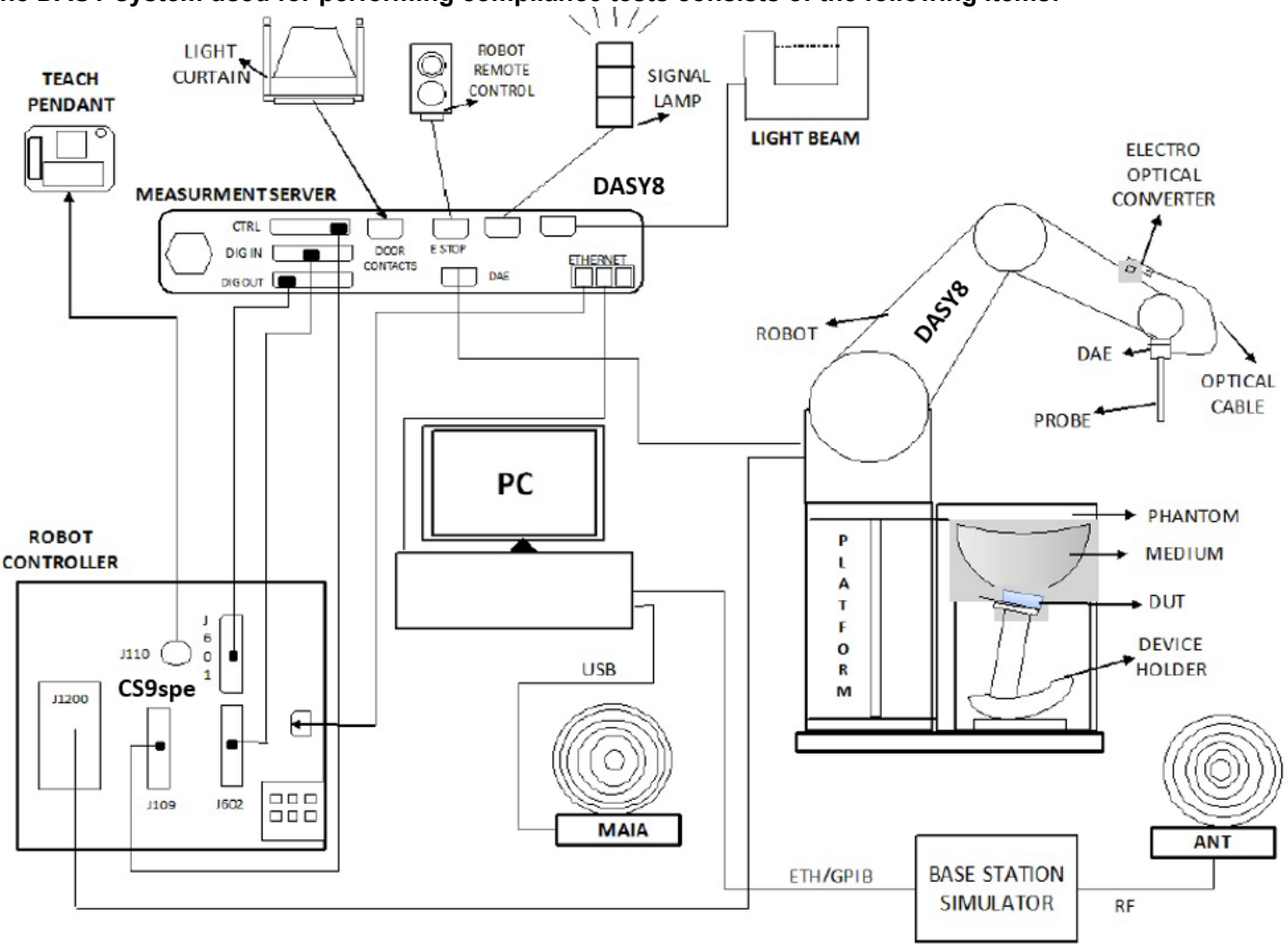
- SAR Lab 1A
- SAR Lab 2A
- SAR Lab 2B

	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 DASY8[1] 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	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 3: Zoom Scan

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

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

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

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

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

Step 4: Power drift measurement

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

4.3. Test Equipment

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

Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	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
Dielectric Probe	SPEAG	DAKS-3.5	1147	3/13/2023
Shorting Block	SPEAG	DAK-3.5 Short	SM DAK 200 DB	3/13/2023
Dielectric Probe	SPEAG	DAKS-12	1038	3/14/2023
Shorting Block	SPEAG	DAK-12 Short	2044	3/14/2023
Thermometer	Fisher Scientific	15-078-181	210204689	3/13/2023

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Signal Generator	Keysight	N5181A	MY50140788	1/12/2024
Signal Generator	Keysight	N5182B	MY51350128	5/19/2023
3-Path Diode Power Sensor	Rohde & Schwarz	NRP8S	112236	5/31/2023
3-Path Diode Power Sensor	Rohde & Schwarz	NRP8S	112237	5/31/2023
Amplifier	MITEQ	AMF-4D-00400600-50-30P	N/A	N/A
Directional coupler	Mini-Circuits	ZUDC10-183+	1438	NA
DC Power Supply	Miteq	PS 15V1	1990186	N/A
RF Power Source	Speag	PowerSource1	4278	6/21/2023

Lab Equipment

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
E-Field Probe	SPEAG	EX3DV4	7711	3/11/2023
E-Field Probe	SPEAG	EX3DV4	7709	12/12/2023
E-Field Probe	SPEAG	EX3DV4	7587	4/27/2023
Data Acquisition Electronics	SPEAG	DAE4	1716	3/8/2023
Data Acquisition Electronics	SPEAG	DAE4	1714	11/23/2023
Data Acquisition Electronics	SPEAG	DAE4	1715	1/23/2024
System Validation Dipole	SPEAG	CLA13	1017	3/9/2023
System Validation Dipole	SPEAG	D750V3	1139	10/12/2023
System Validation Dipole	SPEAG	D900V2	1d180	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
RF Power Meter	Keysight	N1911a	MY55116002	9/10/2023
RF Power Meter	Keysight	N1911a	MY55116004	9/02/2023
RF Power Sensor	Keysight	N1921a	MY55120011	7/07/2023
RF Power Sensor	Keysight	N1921a	MY55090025	9/27/2023
RF Power Sensor	Keysight	N1921a	MY55090030	6/15/2023
RF Power Sensor	Keysight	N1921a	MY55090023	3/22/2023
RF Power Sensor	ETS Lindgren	7002-006	160129	3/11/2023
RF Power Sensor	Boonton Electronics	RTP5008	11835	10/20/2023
RF Power Sensor	Boonton Electronics	RTP5008	12002	3/11/2023
Base Station Simulator	R & S	CMW 500	170733	12/14/2023
Base Station Simulator	R & S	CMW 500	170732	9/13/2023
Base Station Simulator	R & S	CMW 500	170193	4/29/2023
Base Station Simulator	Anritsu	MT8821C	6262116751	5/14/2023
DC Power Supply	Keysight	E3633A	MY58426145	N/A
DC Power Supply	Keysight	E3633A	MY62176088	N/A
DC Power Supply	Keysight	E3633A	MY62176089	N/A
DC Power Supply	Keysight	E3633A	MY61466084	N/A

5. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

Therefore, the measurement uncertainty is not required.

6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	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	**S/N** — **Notes** QV7700AZF7 — WWAN 4G/5G Conducted QV77004LFA — WWAN 4G/5G SAR QV770017FA — FCC 2G-4G SAR Conducted – Low Power QV77001RFA — FCC 2G-4G SAR Conducted – High Power QV770043FK — FCC 2G-4G SAR Conducted – High Power QV770011FA — RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #1 QV770037FA — RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #2 QV770015FA — RF/SAR WLAN/BT - 2.4GHz/5GHz (Conducted) #3 QV77004DFN — FCC SAR #1 2G/3G QV77009WFN — FCC SAR #2 2G/3G QV7700AMFN — FCC SAR #3 4G QV770094FN — FCC SAR #4 4G
Hardware Version	A
Software Version	2G-4G Conducted: 0.301 WLAN Conducted: 0.293 SAR Measurements: 0.81 NFC SAR Measurement: 0.94

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 V	UMTS Rel. 99 (Voice & Data) HSDPA (Rel. 5) HSUPA (Rel. 6)		100%
LTE	FDD Band 4 FDD Band 5 FDD Band 12 FDD Band 13 FDD Band 17 TDD Band 41 FDD Band 66	QPSK 16QAM 64QAM Rel. 15 Does not support Carrier Aggregation (CA)		100% (FDD) 63.3% (TDD) Power Class 3
5G NR (FR1)	FDD band n5 TDD band n41	DFT-S-OFDM: π/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM		100% (FDD) 63.3% (TDD)
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20) 802.11ac (VHT20) 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)		99.7% (802.11n/ac 40MHz BW) [1] 99.7% (802.11ac 80MHz BW) [1] 99.6% (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		77.2%[1]
NFC	13.56 MHz	Type A/B/F /V		N/A

Notes:

1. Duty cycle is referenced from the Section 9.

6.3. General LTE SAR Test and Reporting Considerations

Item	Description						
	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 [1]	5 MHz [1]	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 [1]	3 MHz	1.4 MHz
	Low			23780/ 709	23755/ 706.5		
	Mid			**23790/ 710**	23790/ 710		
	High			23800/ 711	23825/ 713.5		
	Band 41[2]	Frequency range: 2496 - 2690 MHz (BW = 194 MHz)					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	**39750 / 2506.0**					
	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

<table>
<tr><td>LTE transmitter and antenna implementation</td><td>Refer to Appendix A.</td></tr>
<tr><td>Maximum power reduction (MPR)</td><td>
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3
<table>
<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>
<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>
</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
</td></tr>
<tr><td>Power reduction</td><td>No</td></tr>
<tr><td>Spectrum plots for RB configurations</td><td>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.</td></tr>
</table>

Notes:

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

6.4. LTE (TDD) Considerations

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

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

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

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$(1+X) \cdot 2192 \cdot T_s$	$(1+X) \cdot 2560 \cdot T_s$	$7680 \cdot T_s$	$(1+X) \cdot 2192 \cdot T_s$	$(1+X) \cdot 2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$(2+X) \cdot 2192 \cdot T_s$	$(2+X) \cdot 2560 \cdot T_s$
5	$6592 \cdot T_s$	$(2+X) \cdot 2192 \cdot T_s$	$(2+X) \cdot 2560 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-
10	$13168 \cdot T_s$	$13152 \cdot T_s$	$12800 \cdot T_s$	-	-	-

Table 4.2-2: Uplink-downlink configurations & Calculated Duty Cycle

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.3%
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.3%
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.3%
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.7%
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.7%
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.7%
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.3%

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

Note(s):

This device supports uplink-downlink configurations 0-6. The configuration with highest duty cycle was used for SAR Testing: configuration 0 at 63.3% duty cycle.

6.5. General NR(FR1) SAR Test and Reporting Considerations

Item	Description												
	n5	Frequency range: 824 - 849 MHz (BW = 25 MHz)											
		Channel Bandwidth (MHz)											
		100	90	80	70	60	50	40	30	25	20[1]	15[1]	10[1]	5
	Low										166800 /834	166300 /831.5	165800 /829	165300 /826.5
	Mid										167300 /836.5	167300 /836.5	167300 /836.5	167300 /836.5
	High										167800 /839	168300 841.5	168800 /844	169300 /846.5
	n41	Frequency range: 2496 - 2690 MHz (BW = 194 MHz)											
		Channel Bandwidth (MHz)											
		100[1]	90[1]	80[1]	70	60	50	40	30	25	20	15	10	5
	Low	509200 /2546	508200 /2541	507200 /2536		505200 /2526	504200 /2521	503200 /2516	502200 /2511		501200 /2506			
	Mid- Low	513900 /2569.5	513400 /2567	512900 /2564.5		511900 /2559.5	511400 /2557	510900 /2554.5	510400 /2552		509900 /2549.5			
	Mid	518600 /2593	518600 /2593	518600 /2593		518600 /2593	518600 /2593	518600 /2593	518600 /2593		518600 /2593			
	Mid- High	523300 /2616.5	523800 /2619	524300 /2621.5		525300 /2626.5	525800 /2629	526300 2631.5	526800 /2634		527300 /2636.5			
	High	528000 /2640	529000 /2645	530000 /2650		532000 /2660	533000 /2665	534000 /2670	535000 /2675		536000 /2680			
SCS	15 kHz (n5) 30 kHz (n41)													
NR(FR1) transmitter and antenna implementation	Refer to Appendix A.													
A-MPR(Additional MPR) disabled for SAT testing?	Yes													

Notes:

1. Maximum bandwidth does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per FCC Guidance.
2. SAR test for NR bands and LTE anchor Bands were performed separately due to limitations in SAR probe calibration factors. And, due to test setup limitations, SAR testing for NR was performed using test mode software to establish the connection.

6.6. 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 (Top Edge)	Edge 2 (Right Edge)	Edge 3 (Bottom Edge)	Edge 4 (Left Edge)	Extremity (0 mm)
Cellular Main Antenna 1	GSM 850 W-CDMA BV LTE B5/12/13/17 5G NR n5	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Cellular Main Antenna 2	GSM 1900 LTE B4/41/66 5G NR n41	Yes	Yes	Yes	No	Yes	Yes	No	Yes
Cellular Sub Antenna	LTE B66	Yes	Yes	Yes	Yes	Yes	No	No	Yes
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:

1. SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.
2. 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.
3. 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.
4. Please note that Wi-Fi Main Antenna is also referred to as WLAN Chain 0/GPS/BT antenna
5. Please note that Wi-Fi Sub Antenna is also referred to as WLAN Chain 1/BT Antenna

8. Dielectric Property Measurements & System Check

8.1. Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized.
The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.
Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.
The dielectric constant (εr) and conductivity (σ) of typical tissue-equivalent media recipes are expected to be within ± 5% of the required target values; but for SAR measurement systems that have implemented the SAR error compensation algorithms documented in IEEE Std 1528-2013, to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters, the tolerance for εr and σ may be relaxed to ± 10%. This is limited to frequencies ≤ 3 GHz.

Tissue Dielectric Parameters

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

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

Dielectric Property Measurements Results:

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity (εr)			Conductivity (σ)		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
1A	1/4/2023	900	Head	900	42.04	41.50	1.30	0.96	0.97	-0.76
				820	42.21	41.60	1.46	0.94	0.90	4.17
				915	41.98	41.50	1.16	0.97	0.98	-1.03
1A	1/4/2023	1750	Head	1750	38.62	40.08	-3.65	1.36	1.37	-0.66
				1710	38.67	40.15	-3.68	1.34	1.35	-0.62
				1755	38.61	40.08	-3.66	1.36	1.37	-0.64
1A	2/6/2023	750	Head	750	40.47	41.96	-3.55	0.92	0.89	3.15
				660	40.69	42.42	-4.09	0.89	0.89	0.70
				800	40.37	41.71	-3.20	0.93	0.90	4.04
1A	2/6/2023	900	Head	900	40.11	41.50	-3.35	0.97	0.97	-0.13
				815	40.29	41.63	-3.21	0.94	0.90	4.63
				915	40.07	41.50	-3.45	0.98	0.98	-0.36
1A	2/6/2023	1750	Head	1750	38.62	40.08	-3.65	1.36	1.37	-0.66
				1710	38.67	40.15	-3.68	1.34	1.35	-0.62
				1755	38.61	40.08	-3.66	1.36	1.37	-0.64
1A	2/7/2023	13	Head	13	54.10	55.00	-1.64	0.72	0.75	-3.45
				12	54.13	55.00	-1.58	0.72	0.75	-3.45
				14	54.07	55.00	-1.69	0.72	0.75	-3.44
1A	2/10/2023	900	Head	900	39.56	41.50	-4.67	0.97	0.97	-0.34
				815	39.77	41.63	-4.46	0.94	0.90	4.23
				915	39.51	41.50	-4.80	0.98	0.98	-0.50
2A	1/10/2023	900	Head	900	42.33	41.50	2.00	0.93	0.97	-4.22
				820	42.49	41.60	2.13	0.90	0.90	0.37
				915	42.27	41.50	1.86	0.94	0.98	-4.45
2A	1/31/2023	1900	Head	1900	38.69	40.00	-3.28	1.42	1.40	1.71
				1850	38.78	40.00	-3.05	1.40	1.40	-0.21
				1970	38.60	40.00	-3.50	1.47	1.40	4.93
2A	2/3/2023	5250	Head	5250	35.47	35.93	-1.29	4.75	4.70	1.08
				5150	35.69	36.05	-0.99	4.64	4.60	0.85
				5350	35.25	35.82	-1.59	4.87	4.80	1.32
2A	2/6/2023	5250	Head	5250	35.75	35.93	-0.51	4.65	4.70	-1.11
				5150	35.94	36.05	-0.30	4.54	4.60	-1.39
				5350	35.55	35.82	-0.75	4.76	4.80	-0.88
2A	2/6/2023	5600	Head	5600	35.10	35.53	-1.22	5.05	5.06	-0.30
				5500	35.29	35.65	-1.00	4.93	4.96	-0.64
				5725	34.85	35.39	-1.53	5.20	5.19	0.15
2A	2/6/2023	5750	Head	5750	34.81	35.36	-1.56	5.23	5.21	0.27
				5700	34.91	35.42	-1.44	5.16	5.16	0.03
				5850	34.63	35.30	-1.90	5.34	5.27	1.35
2A	2/13/2006	5600	Head	5600	35.32	35.53	-0.60	5.13	5.06	1.36
				5500	35.51	35.65	-0.39	5.01	4.96	1.03
				5725	35.06	35.39	-0.94	5.29	5.19	1.87
2A	2023-03-06	5600	Head	5600	34.04	35.53	-4.20	5.01	5.06	-0.93
				5500	34.24	35.65	-3.95	4.90	4.96	-1.25
				5725	33.80	35.39	-4.50	5.17	5.19	-0.41
2A	2023-03-06	2450	Head	2450	39.67	39.20	1.20	1.83	1.80	1.67
				2400	39.74	39.30	1.13	1.79	1.75	1.96
				2480	39.64	39.16	1.22	1.85	1.83	1.01
2B	1/24/2023	2600	Head	2600	38.56	39.01	-1.16	1.99	1.96	1.27
				2495	38.73	39.14	-1.06	1.90	1.85	2.89
				2690	38.39	38.90	-1.30	2.06	2.06	-0.02
2B	2/6/2023	2600	Head	2600	37.75	39.01	-3.23	1.96	1.96	-0.21
				2495	38.09	39.14	-2.69	1.84	1.85	-0.47
				2690	37.42	38.90	-3.80	2.06	2.06	-0.22
2B	2/8/2023	2450	Head	2450	39.15	39.20	-0.13	1.87	1.80	3.94
				2400	39.33	39.30	0.08	1.81	1.75	3.50
				2480	39.06	39.16	-0.26	1.90	1.83	3.69

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 ±10% of the manufacturer calibrated dipole SAR target. Refer to Appendix B for the SAR System Check Plots.

SAR Lab	Date	Tissue Type	Dipole Type_Serial #	Dipole Cal. Due Data	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 ±10 %	Zoom Scan	Normalize to 1 W	Target (Ref. Value)	Delta ±10 %	
1A	1/4/2023	Head	D900V2 SN: 1d180	10/12/2023	17.0	0.510	10.18	10.90	-6.64	0.328	6.54	6.99	-6.37	1
1A	1/4/2023	Head	D1750V2 SN: 1136	10/17/2023	17.0	1.780	35.52	36.10	-1.62	0.942	18.80	19.10	-1.59	
1A	2/6/20236	Head	D750V3 SN: 1139	10/12/2023	17.0	0.415	8.28	56.70	-5.34	0.273	5.45	24.50	-4.57	2
1A	2/6/20236	Head	D900V2 SN: 1d180	10/12/2023	17.0	0.529	10.55	82.40	-4.10	0.342	6.82	25.30	-4.50	
1A	2/6/2023	Head	D1750V2 SN: 1136	10/17/2023	17.0	1.770	35.32	36.10	-2.17	0.939	18.74	19.10	-1.91	3
1A	2/7/2023	Head	CLA13 SN: 1017	3/9/2023	22.0	0.082	0.52	0.57	-9.23	0.051	0.32	0.35	-8.06	4
1A	2/10/2023	Head	D900V2 SN: 1d180	10/12/2023	17.0	0.546	10.89	10.90	-0.05	0.350	6.98	6.99	-0.09	
2A	1/10/2023	Head	D900V2 SN: 1d180	10/12/2023	17.0	0.515	10.28	10.90	-5.73	0.334	6.66	6.99	-4.66	5
2A	1/31/2023	Head	D1900V2 SN: 5d202	10/12/2023	17.0	2.020	40.30	39.20	2.82	1.050	20.95	20.40	2.70	6
2A	2/3/2023	Head	D5GHzV2 SN: 1213 (5.25 GHz)	10/11/2023	17.0	3.700	73.82	79.40	-7.02	1.060	21.15	22.70	-6.83	
2A	2/6/2023	Head	D5GHzV2 SN: 1213 (5.25 GHz)	10/11/2023	17.0	3.660	73.03	79.40	-8.03	1.050	20.95	22.70	-7.71	7
2A	2/6/2023	Head	D5GHzV2 SN: 1213 (5.60 GHz)	10/11/2023	17.0	3.960	79.01	82.40	-4.11	1.110	22.15	23.50	-5.76	8
2A	2/6/2023	Head	D5GHzV2 SN: 1213 (5.75 GHz)	10/11/2023	17.0	3.590	71.63	78.80	-9.10	1.020	20.35	22.40	-9.14	9
2A	2/13/2023	Head	D5GHzV2 SN: 1213 (5.60 GHz)	10/11/2023	17.0	4.030	80.41	82.40	-2.42	1.130	22.55	23.50	-4.06	
2A	3/6/2023	Head	D5GHzV2 SN: 1213 (5.60 GHz)	10/11/2023	17.0	4.050	80.8081238	82.40	-1.93	1.140	22.75	23.50	-3.21	
2A	3/6/2023	Head	D2450V2 SN: 963	10/18/2023	17.0	2.530	50.4801366	52.40	-3.66	1.180	23.54	24.50	-3.90	10
2B	1/24/2023	Head	D2600V2 SN: 1104	10/21/2023	17.0	2.870	57.26	56.70	0.99	1.280	25.54	25.30	0.95	
2B	2/6/2023	Head	D2600V2 SN: 1104	10/21/2023	17.0	2.680	53.47	56.70	-5.69	1.180	23.54	25.30	-6.94	11
2B	2/8/2023	Head	D2450V2 SN: 963	10/18/2023	17.0	2.530	50.48	52.40	-3.66	1.160	23.15	24.50	-5.53	12

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 ≤ 1/4dB higher than GPRS/EDGE (GMSK) or the adjusted SAR of the highest reported SAR of GPRS/EDGE (GMSK) is ≤ 1.2W/kg.

RF Air interface	Mode	GSM Burst Power Tune-up Limit (dBm)		GSM DTM CS + PS Burst Power Tune-Up Limit (dBm)	
		CELL Main1	CELL Main2	CELL Main1	CELL Main2
		Normal	Normal	Normal	Normal
GSM850	Voice/GPRS (1 slot)	32.9		32.9	
	GPRS 2 slots	29.9		29.9	
	GPRS 3 slots	28.1		28.1	
	GPRS 4 slots	26.9			
	EGPRS 1 slot	28.0		32.9	
	EGPRS 2 slot	25.0		29.9	
	EGPRS 3 slot	23.2		28.1	
	EGPRS 4 slots	22.0			
GSM1900	Voice/GPRS (1 slot)		28.0		28.0
	GPRS 2 slots		25.0		25.0
	GPRS 3 slots		23.2		23.2
	GPRS 4 slots		22.0		
	EGPRS 1 slot		27.0		28.0
	EGPRS 2 slot		24.0		25.0
	EGPRS 3 slot		22.2		23.2
	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	32.1	23.0	32.9	23.9
			190	836.6	32.3	23.3		
			251	848.8	32.3	23.3		
		2	128	824.2	28.9	22.9	29.9	23.9
			190	836.6	29.0	23.0		
			251	848.8	29.0	23.0		
		3	128	824.2	27.1	22.8	28.1	23.8
			190	836.6	27.4	23.2		
			251	848.8	27.3	23.1		
		4	128	824.2	26.0	23.0	26.9	23.9
			190	836.6	26.2	23.1		
			251	848.8	26.1	23.1		
EDGE (8PSK)	MCS5	1	128	824.2	26.7	17.7	28.0	19.0
			190	836.6	26.8	17.7		
			251	848.8	26.7	17.7		
		2	128	824.2	24.0	17.9	25.0	19.0
			190	836.6	24.0	18.0		
			251	848.8	24.0	17.9		
		3	128	824.2	22.1	17.9	23.2	18.9
			190	836.6	22.1	17.8		
			251	848.8	22.1	17.8		
		4	128	824.2	21.1	18.1	22.0	19.0
			190	836.6	21.0	18.0		
			251	848.8	21.0	18.0		

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	27.0	17.9	28.0	19.0
			661	1880.0	27.5	18.4		
			810	1909.8	27.6	18.6		
		2	512	1850.2	24.0	17.9	25.0	19.0
			661	1880.0	24.1	18.1		
			810	1909.8	24.3	18.3		
		3	512	1850.2	22.2	17.9	23.2	18.9
			661	1880.0	22.4	18.1		
			810	1909.8	22.6	18.3		
		4	512	1850.2	21.1	18.0	22.0	19.0
			661	1880.0	21.1	18.1		
			810	1909.8	21.4	18.4		
EDGE (8PSK)	MCS5	1	512	1850.2	26.1	17.0	27.0	18.0
			661	1880.0	26.2	17.1		
			810	1909.8	26.4	17.4		
		2	512	1850.2	22.9	16.9	24.0	18.0
			661	1880.0	23.0	17.0		
			810	1909.8	23.2	17.2		
		3	512	1850.2	21.0	16.8	22.2	17.9
			661	1880.0	21.3	17.1		
			810	1909.8	21.5	17.2		
		4	512	1850.2	19.8	16.8	21.0	18.0
			661	1880.0	19.8	16.8		
			810	1909.8	20.0	17.0		

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	32.2		23.2		32.9		23.9	
			190	836.6	32.3		23.3					
			251	848.8	32.4		23.4					
		2	128	824.2	28.9	29.1	22.9	23.0	29.9	29.9	23.9	23.9
			190	836.6	29.1	29.2	23.0	23.1				
			251	848.8	29.1	29.2	23.1	23.2				
		3	128	824.2	27.0	27.0	22.8	22.8	28.1	28.1	23.8	23.8
			190	836.6	27.2	27.2	23.0	22.9				
			251	848.8	27.2	27.1	22.9	22.9				
GSM (Voice) + EDGE (8PSK)	MCS5	1	128	824.2	32.2		23.2		32.9		23.9	
			190	836.6	32.3		23.2					
			251	848.8	32.4		23.4					
		2	128	824.2	29.0	23.8	23.0	17.7	29.9	25.0	23.9	19.0
			190	836.6	29.1	23.8	23.1	17.8				
			251	848.8	29.2	23.9	23.2	17.9				
		3	128	824.2	27.2	21.8	22.9	17.5	28.1	23.2	23.8	18.9
			190	836.6	27.2	21.9	23.0	17.6				
			251	848.8	27.1	21.8	22.9	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	27.2		18.2		28.0		19.0	
			661	1880.0	27.5		18.4					
			810	1909.8	27.5		18.5					
		2	512	1850.2	23.6	23.8	17.6	17.8	25.0	25.0	19.0	19.0
			661	1880.0	23.6	23.7	17.6	17.7				
			810	1909.8	23.7	23.7	17.7	17.7				
		3	512	1850.2	21.8	21.9	17.6	17.6	23.2	23.2	18.9	18.9
			661	1880.0	22.2	22.2	18.0	17.9				
			810	1909.8	22.5	22.5	18.3	18.3				
GSM (Voice) + EDGE (8PSK)	MCS5	1	512	1850.2	27.2		18.2		28.0		19.0	
			661	1880.0	27.5		18.4					
			810	1909.8	27.5		18.5					
		2	512	1850.2	23.8	23.2	17.8	17.1	25.0	24.0	19.0	18.0
			661	1880.0	23.8	23.1	17.7	17.1				
			810	1909.8	23.9	23.1	17.9	17.1				
		3	512	1850.2	21.9	20.8	17.7	16.6	23.2	22.2	18.9	17.9
			661	1880.0	22.1	21.0	17.8	16.7				
			810	1909.8	21.3	21.1	17.0	16.9				

9.2. W-CDMA

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

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

Release 99 Setup Procedures used to establish the test signals

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1. A summary of these settings is illustrated below:

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

HSDPA Setup Procedures used to establish the test signals

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

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

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

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

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

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

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

HSUPA Setup Procedures used to establish the test signals

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

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

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

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

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

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

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

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

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

DC-HSDPA Setup Procedures used to establish the test signals

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

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

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

HSPA+ Setup Procedures used to establish the test signals

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

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

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

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

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 ≤ ¼ dB higher than the primary mode

RF Air interface	Mode	Tune-up Pow erLimit (dBm)
		CELL Main1
		Normal
W-CDMA Band 5	R99	22.7
	HSDPA	22.0
	HSUPA	22.0

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	22.3	N/A	22.7
		4183	836.6	22.2		
		4233	846.6	21.6		
HSDPA	Subtest 1	4132	826.4	21.2	0	22.0
		4183	836.6	21.2		
		4233	846.6	20.6		
	Subtest 2	4132	826.4	21.2	0	22.0
		4183	836.6	21.0		
		4233	846.6	20.6		
	Subtest 3	4132	826.4	20.5	0.5	21.5
		4183	836.6	20.5		
		4233	846.6	20.1		
	Subtest 4	4132	826.4	20.6	0.5	21.5
		4183	836.6	20.5		
		4233	846.6	20.1		
HSUPA	Subtest 1	4132	826.4	21.3	0	22.0
		4183	836.6	21.3		
		4233	846.6	20.5		
	Subtest 2	4132	826.4	19.3	2	20.0
		4183	836.6	19.2		
		4233	846.6	18.6		
	Subtest 3	4132	826.4	20.3	1	21.0
		4183	836.6	20.3		
		4233	846.6	19.6		
	Subtest 4	4132	826.4	19.3	2	20.0
		4183	836.6	19.3		
		4233	846.6	18.6		
	Subtest 5	4132	826.4	21.2	0	22.0
		4183	836.6	21.3		
		4233	846.6	20.5		

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 ≤ 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 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 QPSK configuration has the highest maximum average output power per 3GPP standard.

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

RF Air interface	Mode	Tune-up Pow erLimit (dBm)		
		CELL Main1	CELL Main2	CELL Sub
		Normal	Normal	Normal
LTE Band 5	QPSK	22.0		
LTE Band 12	QPSK	22.0		
LTE Band 13	QPSK	22.0		
LTE Band 41	QPSK		20.0	
LTE Band 66	QPSK		19.0	17.0

LTE Band 5 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				20450	20525	20600		
				829 MHz	836.5 MHz	844 MHz		
10 MHz	QPSK	1	0	21.3	21.2	21.3	0	22
		1	25	21.2	21.2	21.3	0	22
		1	49	21.3	21.2	21.2	0	22
		25	0	21.2	21.2	21.2	0	22
		25	12	21.3	21.3	21.2	0	22
		25	25	21.3	21.2	21.3	0	22
		50	0	21.3	21.2	21.2	0	22
	16QAM	1	0	21.6	21.6	21.6	0	22
		1	25	21.6	21.5	21.5	0	22
		1	49	21.6	21.6	21.5	0	22
		25	0	21.3	21.2	21.3	0	22
		25	12	21.3	21.3	21.3	0	22
		25	25	21.3	21.3	21.3	0	22
		50	0	21.3	21.2	21.2	0	22
	64QAM	1	0	21.6	21.4	21.6	0	22
		1	25	21.6	21.4	21.6	0	22
		1	49	21.6	21.4	21.5	0	22
		25	0	21.3	21.2	21.2	0	22
		25	12	21.3	21.3	21.3	0	22
		25	25	21.3	21.2	21.3	0	22
		50	0	21.3	21.3	21.3	0	22

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				20425	20525	20625		
				826.5 MHz	836.5 MHz	846.5 MHz		
5 MHz	QPSK	1	0	21.2	21.1	21.1	0	22
		1	12	21.3	21.3	21.3	0	22
		1	24	21.1	21.1	21.1	0	22
		12	0	21.2	21.1	21.1	0	22
		12	7	21.3	21.2	21.1	0	22
		12	13	21.2	21.2	21.2	0	22
		25	0	21.2	21.2	21.1	0	22
	16QAM	1	0	21.5	21.5	21.5	0	22
		1	12	21.7	21.7	21.6	0	22
		1	24	21.5	21.5	21.5	0	22
		12	0	21.3	21.2	21.2	0	22
		12	7	21.4	21.2	21.3	0	22
		12	13	21.3	21.3	21.3	0	22
		25	0	21.2	21.2	21.1	0	22
	64QAM	1	0	21.4	21.4	21.3	0	22
		1	12	21.5	21.5	21.5	0	22
		1	24	21.5	21.4	21.3	0	22
		12	0	21.3	21.1	21.2	0	22
		12	7	21.3	21.2	21.2	0	22
		12	13	21.3	21.2	21.3	0	22
		25	0	21.2	21.2	21.1	0	22

LTE Band 5 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				20415	20525	20635		
				825.5 MHz	836.5 MHz	847.5 MHz		
3 MHz	QPSK	1	0	21.1	21.1	21.2	0	22
		1	8	21.2	21.2	21.2	0	22
		1	14	21.1	21.1	21.1	0	22
		8	0	21.2	21.1	21.2	0	22
		8	4	21.2	21.2	21.2	0	22
		8	7	21.2	21.2	21.2	0	22
		15	0	21.2	21.2	21.2	0	22
	16QAM	1	0	21.5	21.5	21.4	0	22
		1	8	21.6	21.6	21.5	0	22
		1	14	21.5	21.4	21.3	0	22
		8	0	21.2	21.2	21.2	0	22
		8	4	21.3	21.2	21.2	0	22
		8	7	21.3	21.3	21.2	0	22
		15	0	21.2	21.2	21.2	0	22
	64QAM	1	0	21.4	21.4	21.3	0	22
		1	8	21.6	21.5	21.4	0	22
		1	14	21.4	21.4	21.3	0	22
		8	0	21.3	21.2	21.2	0	22
		8	4	21.3	21.2	21.3	0	22
		8	7	21.3	21.3	21.2	0	22
		15	0	21.3	21.2	21.2	0	22

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				20407	20525	20643		
				824.7 MHz	836.5 MHz	848.3 MHz		
1.4 MHz	QPSK	1	0	21.2	21.1	21.1	0	22
		1	3	21.2	21.1	21.1	0	22
		1	5	21.2	21.1	21.1	0	22
		3	0	21.2	21.1	21.1	0	22
		3	1	21.2	21.2	21.1	0	22
		3	3	21.2	21.1	21.1	0	22
		6	0	21.2	21.1	21.1	0	22
	16QAM	1	0	21.5	21.5	21.5	0	22
		1	3	21.6	21.5	21.5	0	22
		1	5	21.5	21.5	21.5	0	22
		3	0	21.4	21.3	21.3	0	22
		3	1	21.4	21.3	21.3	0	22
		3	3	21.4	21.3	21.3	0	22
		6	0	21.3	21.2	21.2	0	22
	64QAM	1	0	21.4	21.4	21.4	0	22
		1	3	21.5	21.4	21.4	0	22
		1	5	21.4	21.4	21.4	0	22
		3	0	21.3	21.2	21.3	0	22
		3	1	21.3	21.3	21.3	0	22
		3	3	21.3	21.3	21.3	0	22
		6	0	21.1	21.3	21.1	0	22

LTE Band 12 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				23060	23095	23130		
				704 MHz	707.5 MHz	711 MHz		
10 MHz	QPSK	1	0	21.4	21.4	21.2	0	22
		1	25	21.3	21.4	21.3	0	22
		1	49	21.3	21.4	21.1	0	22
		25	0	21.1	21.3	21.2	0	22
		25	12	21.2	21.4	21.2	0	22
		25	25	21.2	21.4	21.2	0	22
		50	0	21.1	21.3	21.2	0	22
	16QAM	1	0	21.7	21.7	21.5	0	22
		1	25	21.7	21.7	21.4	0	22
		1	49	21.5	21.7	21.6	0	22
		25	0	21.1	21.4	21.1	0	22
		25	12	21.1	21.4	21.2	0	22
		25	25	21.2	21.5	21.3	0	22
		50	0	21.0	21.3	21.2	0	22
	64QAM	1	0	21.3	21.6	21.4	0	22
		1	25	21.5	21.6	21.4	0	22
		1	49	21.5	21.6	21.5	0	22
		25	0	21.2	20.9	21.1	0	22
		25	12	21.2	20.9	21.2	0	22
		25	25	21.3	20.9	21.3	0	22
		50	0	21.3	20.9	21.2	0	22

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				23035	23095	23155		
				701.5 MHz	707.5 MHz	713.5 MHz		
5 MHz	QPSK	1	0	21.3	21.3	21.3	0	22
		1	12	21.4	21.5	21.5	0	22
		1	24	21.3	21.3	21.4	0	22
		12	0	21.4	21.3	21.3	0	22
		12	7	21.4	21.3	21.4	0	22
		12	13	21.4	21.4	21.4	0	22
		25	0	21.4	21.3	21.4	0	22
	16QAM	1	0	21.7	21.7	21.8	0	22
		1	12	21.8	21.8	21.9	0	22
		1	24	21.7	21.7	21.8	0	22
		12	0	21.5	21.4	21.4	0	22
		12	7	21.5	21.5	21.4	0	22
		12	13	21.5	21.5	21.5	0	22
		25	0	21.4	21.3	21.4	0	22
	64QAM	1	0	21.7	21.6	21.7	0	22
		1	12	21.8	21.7	21.7	0	22
		1	24	21.7	21.6	21.7	0	22
		12	0	21.0	20.8	20.9	0	22
		12	7	21.0	20.8	21.0	0	22
		12	13	21.0	20.9	21.0	0	22
		25	0	20.9	20.8	20.9	0	22

LTE Band 12 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				23025	23095	23165		
				700.5 MHz	707.5 MHz	714.5 MHz		
3 MHz	QPSK	1	0	21.4	21.3	21.3	0	22
		1	8	21.4	21.4	21.5	0	22
		1	14	21.3	21.3	21.3	0	22
		8	0	21.4	21.4	21.3	0	22
		8	4	21.4	21.4	21.4	0	22
		8	7	21.4	21.4	21.4	0	22
		15	0	21.4	21.3	21.3	0	22
	16QAM	1	0	21.7	21.7	21.7	0	22
		1	8	21.8	21.9	21.8	0	22
		1	14	21.6	21.7	21.7	0	22
		8	0	21.5	21.4	21.5	0	22
		8	4	21.5	21.5	21.5	0	22
		8	7	21.5	21.5	21.6	0	22
		15	0	21.5	21.4	21.4	0	22
	64QAM	1	0	21.5	21.6	21.7	0	22
		1	8	21.6	21.7	21.7	0	22
		1	14	21.5	21.5	21.6	0	22
		8	0	21.0	20.9	20.9	0	22
		8	4	21.0	20.9	20.9	0	22
		8	7	21.0	21.0	21.0	0	22
		15	0	20.9	20.9	20.9	0	22

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				23017	23095	23173		
				699.7 MHz	707.5 MHz	715.3 MHz		
1.4 MHz	QPSK	1	0	21.3	21.4	21.4	0	22
		1	3	21.4	21.4	21.4	0	22
		1	5	21.3	21.4	21.4	0	22
		3	0	21.3	21.4	21.4	0	22
		3	1	21.4	21.4	21.4	0	22
		3	3	21.4	21.4	21.4	0	22
		6	0	21.3	21.4	21.4	0	22
	16QAM	1	0	21.5	21.7	21.7	0	22
		1	3	21.6	21.7	21.8	0	22
		1	5	21.6	21.7	21.7	0	22
		3	0	21.5	21.5	21.6	0	22
		3	1	21.6	21.5	21.6	0	22
		3	3	21.5	21.6	21.6	0	22
		6	0	21.4	21.4	21.5	0	22
	64QAM	1	0	21.6	21.5	21.6	0	22
		1	3	21.7	21.6	21.7	0	22
		1	5	21.6	21.6	21.6	0	22
		3	0	21.4	21.5	21.5	0	22
		3	1	21.4	21.5	21.5	0	22
		3	3	21.5	21.5	21.5	0	22
		6	0	21.0	21.0	20.8	0	22

LTE Band 13 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	23230	[redacted]		
					782 MHz			
10 MHz	QPSK	1	0		21.4		0	22
		1	25		21.4		0	22
		1	49		21.3		0	22
		25	0		21.3		0	22
		25	12		21.3		0	22
		25	25		21.4		0	22
		50	0		21.3		0	22
	16QAM	1	0		21.7		0	22
		1	25		21.7		0	22
		1	49		21.7		0	22
		25	0		21.4		0	22
		25	12		21.4		0	22
		25	25		21.4		0	22
		50	0		21.4		0	22
	64QAM	1	0		21.7		0	22
		1	25		21.6		0	22
		1	49		21.6		0	22
		25	0		21.0		0	22
		25	12		21.0		0	22
		25	25		21.0		0	22
		50	0		21.0		0	22

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				23205	23230	23255		
				779.5 MHz	782 MHz	784.5 MHz		
5 MHz	QPSK	1	0	21.1	21.3	21.0	0	22
		1	12	21.1	21.5	21.1	0	22
		1	24	21.0	21.3	20.9	0	22
		12	0	21.1	21.3	20.9	0	22
		12	7	21.1	21.3	21.0	0	22
		12	13	21.0	21.4	21.0	0	22
		25	0	21.1	21.3	20.9	0	22
	16QAM	1	0	21.4	21.7	21.4	0	22
		1	12	21.5	21.8	21.4	0	22
		1	24	21.3	21.7	21.4	0	22
		12	0	21.2	21.4	21.0	0	22
		12	7	21.2	21.4	21.0	0	22
		12	13	21.1	21.4	21.1	0	22
		25	0	21.0	21.3	21.0	0	22
	64QAM	1	0	21.3	21.6	21.2	0	22
		1	12	21.3	21.6	21.2	0	22
		1	24	21.2	21.6	21.2	0	22
		12	0	21.1	20.9	20.9	0	22
		12	7	21.2	20.9	21.0	0	22
		12	13	21.1	21.0	21.0	0	22
		25	0	21.1	20.9	20.9	0	22

LTE Band 41 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
20 MHz	QPSK	1	0	19.3	19.2	19.3	19.3	19.3	0	20
		1	49	19.3	19.2	19.3	19.3	19.2	0	20
		1	99	19.2	19.2	19.4	19.4	19.2	0	20
		50	0	19.3	19.2	19.2	19.4	19.3	0	20
		50	24	19.4	19.3	19.3	19.4	19.3	0	20
		50	50	19.4	19.3	19.4	19.4	19.3	0	20
		100	0	19.4	19.3	19.3	19.4	19.2	0	20
	16QAM	1	0	19.4	19.4	19.3	19.4	19.4	0	20
		1	49	19.7	19.5	19.7	19.5	19.5	0	20
		1	99	19.4	19.3	19.4	19.5	19.3	0	20
		50	0	19.3	19.2	19.2	19.4	19.3	0	20
		50	24	19.4	19.3	19.3	19.4	19.3	0	20
		50	50	19.4	19.2	19.3	19.4	19.3	0	20
		100	0	19.4	19.3	19.3	19.4	19.2	0	20
	64QAM	1	0	19.2	19.2	19.3	19.4	19.2	0	20
		1	49	19.3	19.3	19.4	19.5	19.3	0	20
		1	99	19.1	19.1	19.5	19.5	19.3	0	20
		50	0	19.3	19.2	19.2	19.4	19.2	0	20
		50	24	19.4	19.3	19.4	19.4	19.2	0	20
		50	50	19.4	19.2	19.3	19.4	19.3	0	20
		100	0	19.4	19.3	19.3	19.4	19.2	0	20

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

LTE Band 41 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
10 MHz	QPSK	1	0	19.4	19.4	19.4	19.4	19.4	0	20
		1	25	19.5	19.4	19.4	19.5	19.5	0	20
		1	49	19.4	19.3	19.4	19.5	19.4	0	20
		25	0	19.5	19.4	19.4	19.5	19.5	0	20
		25	12	19.6	19.5	19.5	19.6	19.6	0	20
		25	25	19.5	19.4	19.5	19.6	19.5	0	20
		50	0	19.5	19.5	19.5	19.6	19.5	0	20
	16QAM	1	0	19.6	19.2	19.3	19.5	19.6	0	20
		1	25	19.6	19.3	19.4	19.6	19.6	0	20
		1	49	19.6	19.2	19.3	19.5	19.6	0	20
		25	0	19.6	19.4	19.4	19.5	19.6	0	20
		25	12	19.6	19.5	19.5	19.6	19.6	0	20
		25	25	19.6	19.4	19.4	19.5	19.6	0	20
		50	0	19.5	19.4	19.5	19.5	19.5	0	20
	64QAM	1	0	19.5	19.4	19.3	19.4	19.4	0	20
		1	25	19.5	19.4	19.5	19.5	19.5	0	20
		1	49	19.5	19.3	19.4	19.4	19.4	0	20
		25	0	19.6	19.4	19.4	19.5	19.4	0	20
		25	12	19.6	19.4	19.5	19.6	19.4	0	20
		25	25	19.6	19.4	19.5	19.6	19.5	0	20
		50	0	19.5	19.4	19.5	19.5	19.4	0	20

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
5 MHz	QPSK	1	0	19.4	19.3	19.4	19.4	19.4	0	20
		1	12	19.6	19.5	19.5	19.6	19.5	0	20
		1	24	19.5	19.4	19.4	19.5	19.4	0	20
		12	0	19.5	19.4	19.4	19.5	19.4	0	20
		12	7	19.5	19.4	19.5	19.5	19.4	0	20
		12	13	19.6	19.4	19.4	19.5	19.5	0	20
		25	0	19.5	19.4	19.4	19.5	19.4	0	20
	16QAM	1	0	19.4	19.5	19.5	19.4	19.4	0	20
		1	12	19.5	19.6	19.6	19.5	19.6	0	20
		1	24	19.5	19.5	19.6	19.4	19.4	0	20
		12	0	19.5	19.4	19.4	19.5	19.3	0	20
		12	7	19.5	19.5	19.5	19.5	19.4	0	20
		12	13	19.5	19.4	19.5	19.5	19.4	0	20
		25	0	19.5	19.4	19.4	19.5	19.3	0	20
	64QAM	1	0	19.5	19.3	19.4	19.5	19.3	0	20
		1	12	19.5	19.4	19.5	19.7	19.5	0	20
		1	24	19.5	19.3	19.4	19.6	19.5	0	20
		12	0	19.4	19.2	19.3	19.4	19.4	0	20
		12	7	19.5	19.3	19.4	19.4	19.5	0	20
		12	13	19.4	19.2	19.4	19.4	19.5	0	20
		25	0	19.5	19.4	19.4	19.5	19.4	0	20

LTE Band 66 Measured Results

BW (MHz)	Mode	RB Allocation	RB Offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				132072	132322	132572		
				1720 MHz	1745 MHz	1770 MHz		
20	QPSK	1	0	18.0	18.0	17.8	0	19.0
		1	49	18.0	18.0	17.9	0	19.0
		1	99	18.0	18.0	17.9	0	19.0
		50	0	18.0	18.0	17.9	0	19.0
		50	24	18.0	18.0	17.9	0	19.0
		50	50	18.0	18.0	17.9	0	19.0
		100	0	18.0	18.0	17.8	0	19.0
	16QAM	1	0	18.0	18.0	17.8	0	19.0
		1	49	18.0	18.0	17.8	0	19.0
		1	99	18.0	18.0	17.9	0	19.0
		50	0	18.0	18.0	17.9	0	19.0
		50	24	18.0	18.0	17.9	0	19.0
		50	50	18.0	18.0	17.9	0	19.0
		100	0	18.0	18.0	17.9	0	19.0
	64QAM	1	0	18.0	18.0	17.8	0	19.0
		1	49	18.0	18.0	17.8	0	19.0
		1	99	18.0	18.0	17.7	0	19.0
		50	0	18.0	18.0	17.7	0	19.0
		50	24	18.0	18.0	17.7	0	19.0
		50	50	18.0	18.0	17.7	0	19.0
		100	0	18.0	18.0	17.7	0	19.0

BW (MHz)	Mode	RB Allocation	RB Offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				132047	132322	132597		
				1717.5 MHz	1745 MHz	1772.5 MHz		
15	QPSK	1	0	17.9	18.0	17.9	0	19.0
		1	37	18.0	18.0	17.9	0	19.0
		1	74	17.9	18.0	17.9	0	19.0
		36	0	18.0	18.0	17.9	0	19.0
		36	20	18.0	18.0	17.9	0	19.0
		36	39	17.9	18.0	17.9	0	19.0
		75	0	17.9	18.0	17.9	0	19.0
	16QAM	1	0	18.0	18.0	17.9	0	19.0
		1	37	18.0	18.0	17.9	0	19.0
		1	74	17.9	18.0	17.9	0	19.0
		36	0	18.0	18.0	17.9	0	19.0
		36	20	18.0	18.0	17.9	0	19.0
		36	39	18.0	18.0	17.9	0	19.0
		75	0	17.9	17.9	17.9	0	19.0
	64QAM	1	0	18.0	18.0	17.9	0	19.0
		1	37	18.0	18.0	17.9	0	19.0
		1	74	18.0	18.0	17.9	0	19.0
		36	0	18.0	18.0	17.9	0	19.0
		36	20	17.9	18.0	17.9	0	19.0
		36	39	17.9	18.0	17.9	0	19.0
		75	0	17.9	18.0	17.9	0	19.0

LTE Band 66 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB Offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				132022	132322	132622		
				1715 MHz	1745 MHz	1775 MHz		
10	QPSK	1	0	18.1	18.1	18.0	0	19.0
		1	25	18.0	18.1	18.0	0	19.0
		1	49	18.0	18.1	18.0	0	19.0
		25	0	18.0	18.1	18.0	0	19.0
		25	12	18.1	18.0	18.0	0	19.0
		25	25	18.0	18.1	18.0	0	19.0
		50	0	18.1	18.1	18.0	0	19.0
	16QAM	1	0	18.0	18.0	18.0	0	19.0
		1	25	18.0	18.0	18.0	0	19.0
		1	49	18.1	18.1	18.0	0	19.0
		25	0	18.1	18.0	18.0	0	19.0
		25	12	18.1	18.0	18.0	0	19.0
		25	25	18.0	18.1	18.0	0	19.0
		50	0	18.1	18.1	18.0	0	19.0
	64QAM	1	0	18.1	18.0	18.0	0	19.0
		1	25	18.1	18.0	18.0	0	19.0
		1	49	18.1	18.1	18.0	0	19.0
		25	0	18.1	18.0	18.0	0	19.0
		25	12	18.1	18.1	18.0	0	19.0
		25	25	18.1	18.1	18.0	0	19.0
		50	0	18.1	18.1	18.0	0	19.0

BW (MHz)	Mode	RB Allocation	RB Offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				131997	132322	132647		
				1712.5 MHz	1745 MHz	1777.5 MHz		
5	QPSK	1	0	17.9	18.0	18.0	0	19.0
		1	12	18.1	18.1	18.1	0	19.0
		1	24	17.9	18.0	18.0	0	19.0
		12	0	18.0	18.0	18.0	0	19.0
		12	7	18.0	18.0	18.1	0	19.0
		12	13	18.0	18.1	18.1	0	19.0
		25	0	18.0	18.0	18.0	0	19.0
	16QAM	1	0	18.3	18.3	18.4	0	19.0
		1	12	18.4	18.5	18.5	0	19.0
		1	24	18.2	18.4	18.4	0	19.0
		12	0	18.1	18.1	18.0	0	19.0
		12	7	18.1	18.2	18.0	0	19.0
		12	13	18.1	18.2	18.0	0	19.0
		25	0	18.0	18.1	18.1	0	19.0
	64QAM	1	0	18.2	18.2	18.1	0	19.0
		1	12	18.3	18.4	18.1	0	19.0
		1	24	18.2	18.4	18.1	0	19.0
		12	0	18.0	18.1	18.2	0	19.0
		12	7	18.0	18.2	18.2	0	19.0
		12	13	18.0	18.2	18.1	0	19.0
		25	0	18.0	18.1	18.1	0	19.0

LTE Band 66 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB Offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				131987	132322	132657		
				1711.5 MHz	1745 MHz	1778.5 MHz		
3	QPSK	1	0	17.9	18.0	18.0	0	19.0
		1	8	18.0	18.1	18.1	0	19.0
		1	14	17.9	18.0	18.0	0	19.0
		8	0	18.0	18.0	18.1	0	19.0
		8	4	18.0	18.1	18.1	0	19.0
		8	7	18.0	18.1	18.1	0	19.0
		15	0	18.0	18.0	18.0	0	19.0
	16QAM	1	0	18.2	18.3	18.3	0	19.0
		1	8	18.3	18.4	18.3	0	19.0
		1	14	18.2	18.3	18.3	0	19.0
		8	0	18.0	18.1	18.1	0	19.0
		8	4	18.0	18.2	18.2	0	19.0
		8	7	18.0	18.2	18.1	0	19.0
		15	0	18.0	18.0	18.1	0	19.0
	64QAM	1	0	18.2	18.4	18.3	0	19.0
		1	8	18.3	18.4	18.4	0	19.0
		1	14	18.2	18.3	18.3	0	19.0
		8	0	18.0	18.1	18.1	0	19.0
		8	4	18.1	18.1	18.1	0	19.0
		8	7	18.0	18.2	18.1	0	19.0
		15	0	18.0	18.0	18.0	0	19.0

BW (MHz)	Mode	RB Allocation	RB Offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				131979	132322	132665		
				1710.7 MHz	1745 MHz	1779.3 MHz		
1.4	QPSK	1	0	17.9	18.1	18.0	0	19.0
		1	3	17.9	18.1	18.0	0	19.0
		1	5	17.9	18.0	18.0	0	19.0
		3	0	17.9	18.1	18.0	0	19.0
		3	1	17.9	18.1	17.9	0	19.0
		3	3	17.8	18.1	18.0	0	19.0
		6	0	17.9	18.0	18.0	0	19.0
	16QAM	1	0	18.3	18.4	18.3	0	19.0
		1	3	18.3	18.4	18.4	0	19.0
		1	5	18.3	18.4	18.3	0	19.0
		3	0	18.1	18.2	18.2	0	19.0
		3	1	18.1	18.2	18.2	0	19.0
		3	3	18.1	18.2	18.2	0	19.0
		6	0	18.0	18.1	18.1	0	19.0
	64QAM	1	0	18.2	18.3	18.2	0	19.0
		1	3	18.3	18.3	18.3	0	19.0
		1	5	18.3	18.3	18.2	0	19.0
		3	0	18.0	18.1	18.1	0	19.0
		3	1	18.0	18.2	18.1	0	19.0
		3	3	18.0	18.1	18.1	0	19.0
		6	0	17.9	18.0	18.0	0	19.0

LTE Band 66 Sub Antenna Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				132072	132322	132572		
				1720 MHz	1745 MHz	1770 MHz		
20 MHz	QPSK	1	0	15.4	15.6	15.6	0	17
		1	49	15.5	16.1	16.1	0	17
		1	99	15.2	15.9	16.0	0	17
		50	0	15.4	15.9	15.8	0	17
		50	24	15.6	16.2	16.1	0	17
		50	50	15.5	16.3	15.8	0	17
		100	0	15.5	16.1	16.1	0	17
	16QAM	1	0	15.6	15.9	16.0	0	17
		1	49	16.3	16.8	16.5	0	17
		1	99	15.4	16.1	16.2	0	17
		50	0	15.4	15.9	15.8	0	17
		50	24	15.6	16.2	16.1	0	17
		50	50	15.5	16.3	16.3	0	17
		100	0	15.5	16.1	16.1	0	17
	64QAM	1	0	15.5	15.8	15.7	0	17
		1	49	15.9	16.4	16.3	0	17
		1	99	15.3	16.2	16.2	0	17
		50	0	15.4	15.9	15.8	0	17
		50	24	15.6	16.2	16.1	0	17
		50	50	15.5	16.3	16.3	0	17
		100	0	15.5	16.1	16.1	0	17

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				132047	132322	132597		
				1717.5 MHz	1745 MHz	1772.5 MHz		
15 MHz	QPSK	1	0	15.3	15.5	15.7	0	17
		1	37	15.6	15.8	16.2	0	17
		1	74	15.5	15.9	16.0	0	17
		36	0	15.5	15.6	15.8	0	17
		36	20	15.5	15.8	16.2	0	17
		36	39	15.7	16.1	16.3	0	17
		75	0	15.5	16.0	16.2	0	17
	16QAM	1	0	15.7	15.8	16.1	0	17
		1	37	15.7	15.6	16.6	0	17
		1	74	15.6	16.2	16.3	0	17
		36	0	15.4	15.6	15.8	0	17
		36	20	15.6	15.8	16.3	0	17
		36	39	15.7	16.0	16.4	0	17
		75	0	15.5	15.8	16.2	0	17
	64QAM	1	0	15.4	15.8	15.7	0	17
		1	37	15.7	15.9	15.7	0	17
		1	74	15.7	16.1	16.1	0	17
		36	0	15.5	15.7	15.9	0	17
		36	20	15.6	15.7	16.3	0	17
		36	39	15.6	16.0	16.3	0	17
		75	0	15.5	15.8	15.9	0	17

LTE Band 66 Sub Antenna Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				132022	132322	132622		
				1715 MHz	1745 MHz	1775 MHz		
10 MHz	QPSK	1	0	15.5	15.8	16.3	0	17
		1	25	15.7	16.1	16.4	0	17
		1	49	15.8	16.4	16.1	0	17
		25	0	15.5	16.0	16.4	0	17
		25	12	15.7	16.1	16.5	0	17
		25	25	15.8	16.2	16.4	0	17
		50	0	15.7	16.1	16.4	0	17
	16QAM	1	0	16.1	16.3	16.6	0	17
		1	25	16.0	16.4	16.8	0	17
		1	49	16.2	16.6	16.2	0	17
		25	0	15.6	16.0	16.4	0	17
		25	12	15.7	16.1	16.5	0	17
		25	25	15.8	16.3	16.4	0	17
		50	0	15.7	16.1	16.3	0	17
	64QAM	1	0	15.7	16.0	16.3	0	17
		1	25	15.9	16.2	16.5	0	17
		1	49	16.1	16.5	15.9	0	17
		25	0	15.6	16.0	16.4	0	17
		25	12	15.7	16.1	16.5	0	17
		25	25	15.8	16.3	16.3	0	17
		50	0	15.7	16.1	16.2	0	17

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				131997	132322	132647		
				1712.5 MHz	1745 MHz	1777.5 MHz		
5 MHz	QPSK	1	0	15.6	15.9	16.5	0	17
		1	12	15.6	16.2	16.5	0	17
		1	24	15.6	16.1	16.1	0	17
		12	0	15.6	16.0	16.5	0	17
		12	7	15.0	16.1	16.3	0	17
		12	13	15.7	16.2	16.3	0	17
		25	0	15.6	16.1	16.3	0	17
	16QAM	1	0	15.9	16.3	16.8	0	17
		1	12	16.0	16.5	16.7	0	17
		1	24	15.8	16.5	16.6	0	17
		12	0	15.7	16.0	16.5	0	17
		12	7	15.7	16.1	16.3	0	17
		12	13	15.7	16.1	16.2	0	17
		25	0	15.6	16.1	15.6	0	17
	64QAM	1	0	15.8	16.0	16.6	0	17
		1	12	15.8	15.7	16.7	0	17
		1	24	15.9	16.2	16.3	0	17
		12	0	15.7	15.9	16.4	0	17
		12	7	15.7	15.6	16.4	0	17
		12	13	15.7	16.0	16.2	0	17
		25	0	15.7	15.9	16.3	0	17

LTE Band 66 Sub Antenna Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				131987	132322	132657		
				1711.5 MHz	1745 MHz	1778.5 MHz		
3 MHz	QPSK	1	0	15.6	15.8	16.3	0	17
		1	8	15.6	16.0	16.3	0	17
		1	14	15.5	16.0	16.1	0	17
		8	0	15.7	16.0	16.3	0	17
		8	4	15.6	16.1	16.3	0	17
		8	7	15.6	16.1	16.2	0	17
		15	0	15.6	16.0	16.3	0	17
	16QAM	1	0	15.8	16.3	16.7	0	17
		1	8	16.0	16.4	16.7	0	17
		1	14	15.8	16.4	16.4	0	17
		8	0	15.7	16.1	16.4	0	17
		8	4	15.7	16.2	16.4	0	17
		8	7	15.7	16.2	16.3	0	17
		15	0	15.7	16.1	16.3	0	17
	64QAM	1	0	15.8	16.1	16.5	0	17
		1	8	16.1	16.3	16.4	0	17
		1	14	15.7	16.4	16.4	0	17
		8	0	15.7	16.1	16.4	0	17
		8	4	15.7	16.2	16.4	0	17
		8	7	15.6	16.1	16.3	0	17
		15	0	15.7	16.1	16.3	0	17

BW (MHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
				131979	132322	132665		
				1710.7 MHz	1745 MHz	1779.3 MHz		
1.4 MHz	QPSK	1	0	15.8	16.0	16.2	0	17
		1	3	15.7	16.1	16.2	0	17
		1	5	15.6	16.1	16.1	0	17
		3	0	15.7	16.0	16.1	0	17
		3	1	16.0	16.1	16.2	0	17
		3	3	15.9	16.1	16.2	0	17
		6	0	15.6	16.0	16.1	0	17
	16QAM	1	0	15.7	16.4	16.6	0	17
		1	3	15.5	16.4	16.5	0	17
		1	5	15.5	16.4	16.5	0	17
		3	0	15.6	16.2	16.4	0	17
		3	1	15.5	16.2	16.3	0	17
		3	3	15.4	16.2	16.3	0	17
		6	0	15.5	16.1	16.3	0	17
	64QAM	1	0	15.3	16.2	16.4	0	17
		1	3	15.6	16.3	16.4	0	17
		1	5	15.5	16.3	16.3	0	17
		3	0	15.4	16.2	16.3	0	17
		3	1	15.6	16.1	16.4	0	17
		3	3	15.3	16.3	16.3	0	17
		6	0	15.3	16.1	16.2	0	17

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BW (MHz)	OFDM Modulation Scheme	SCS (kHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
						166800	167300	167800		
						834 MHz	836.5 MHz	839 MHz		
20	DFT-s	15	π/2 BPSK	1	1	21.9	21.9	22.0	0	22
				1	52	21.9	21.9	21.9	0	22
				1	104	21.8	21.8	21.9	0	22
				50	25	21.9	22.0	22.0	0	22
			QPSK	1	1	21.9	21.9	22.0	0	22
				1	52	21.9	22.0	22.0	0	22
				1	104	21.8	21.9	21.9	0	22
				50	25	21.9	21.9	21.9	0	22
BW (MHz)	OFDM Modulation Scheme	SCS (kHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
						166300	167300	168300		
						831.5 MHz	836.5 MHz	841.5 MHz		
15	DFT-s	15	π/2 BPSK	1	1	21.9	21.9	22.0	0	22
				1	39	22.0	22.0	21.9	0	22
				1	77	21.9	21.9	21.9	0	22
				36	18	21.9	21.9	21.8	0	22
			QPSK	1	1	21.9	21.9	21.9	0	22
				1	39	21.9	22.0	21.8	0	22
				1	77	21.9	21.8	21.8	0	22
				36	18	21.8	21.9	21.8	0	22
BW (MHz)	OFDM Modulation Scheme	SCS (kHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
						165800	167300	168800		
						829 MHz	836.5 MHz	844 MHz		
10	DFT-s	15	π/2 BPSK	1	1	21.7	21.8	21.8	0	22
				1	25	21.8	21.9	21.9	0	22
				1	50	21.8	21.9	21.8	0	22
				25	12	21.7	21.8	21.9	0	22
			QPSK	1	1	21.7	21.7	21.8	0	22
				1	25	21.8	21.8	21.8	0	22
				1	50	21.8	21.8	21.8	0	22
				25	12	21.7	21.7	21.8	0	22
BW (MHz)	OFDM Modulation Scheme	SCS (kHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)			MPR	Tune-up Limit
						165300	167300	169300		
						826.5 MHz	836.5 MHz	846.5 MHz		
5	DFT-s	15	π/2 BPSK	1	1	21.8	21.9	21.9	0	22
				1	12	21.8	21.9	21.8	0	22
				1	23	21.9	21.9	21.8	0	22
				12	6	21.8	21.8	21.8	0	22
			QPSK	1	1	21.7	21.8	21.8	0	22
				1	12	21.8	21.8	21.8	0	22
				1	23	21.8	21.8	21.8	0	22
				12	6	21.7	21.8	21.7	0	22

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BW (MHz)	OFDM Modulation Scheme	SCS (kHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)					MPR	Tune-up Limit
						509196	513900	518598	523296	527994		
						2545.98 MHz	2569.5 MHz	2592.99 MHz	2616.48 MHz	2639.97 MHz		
100	DFT-s	30	π/2 BPSK	1	1	19.6	19.9	19.8	19.6	19.6	0	20
				1	136	19.4	19.7	19.7	19.7	19.6	0	20
				1	271	19.2	19.7	19.6	19.8	19.6	0	20
				135	67	19.5	19.6	19.6	19.7	19.6	0	20
			QPSK	1	1	19.5	19.8	19.7	19.5	19.7	0	20
				1	136	19.4	19.6	19.7	19.5	19.6	0	20
				1	271	19.2	19.6	19.8	19.6	19.7	0	20
				135	67	19.4	19.5	19.6	19.5	19.6	0	20
BW (MHz)	OFDM Modulation Scheme	SCS (kHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)					MPR	Tune-up Limit
						508200	513396	518598	523800	528996		
						2541 MHz	2566.98 MHz	2592.99 MHz	2619 MHz	2644.98 MHz		
90	DFT-s	30	π/2 BPSK	1	1	19.6	19.8	19.7	19.5	19.7	0	20
				1	122	19.4	19.7	19.7	19.5	19.5	0	20
				1	243	19.3	19.7	19.5	19.7	19.6	0	20
				120	60	19.5	19.6	19.6	19.5	19.5	0	20
			QPSK	1	1	19.6	19.8	19.7	19.5	19.7	0	20
				1	122	19.4	19.5	19.6	19.5	19.7	0	20
				1	243	19.3	19.6	19.5	19.6	19.7	0	20
				120	60	19.4	19.6	19.4	19.6	19.6	0	20
BW (MHz)	OFDM Modulation Scheme	SCS (kHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)					MPR	Tune-up Limit
						507198	512898	518598	524298	529998		
						2535.99 MHz	2564.49 MHz	2592.99 MHz	2621.49 MHz	2649.99 MHz		
80	DFT-s	30	π/2 BPSK	1	1	19.7	19.8	19.6	19.6	19.7	0	20
				1	108	19.6	19.6	19.7	19.7	19.7	0	20
				1	215	19.4	19.8	19.5	19.8	19.6	0	20
				108	54	19.5	19.7	19.7	19.7	19.6	0	20
			QPSK	1	1	19.5	19.8	19.6	19.5	19.6	0	20
				1	108	19.4	19.7	19.5	19.6	19.6	0	20
				1	215	19.2	19.7	19.6	19.7	19.6	0	20
				108	54	19.5	19.6	19.6	19.6	19.6	0	20
BW (MHz)	OFDM Modulation Scheme	SCS (kHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)					MPR	Tune-up Limit
						505200	511896	518598	525300	531996		
						2526 MHz	2559.48 MHz	2592.99 MHz	2626.5 MHz	2659.98 MHz		
60	DFT-s	30	π/2 BPSK	1	1	19.9	19.7	20.0	19.8	19.8	0	20
				1	80	19.7	19.6	20.0	19.8	19.8	0	20
				1	160	19.5	19.4	19.9	19.8	19.9	0	20
				81	40	19.7	19.5	19.8	19.7	19.8	0	20
			QPSK	1	1	19.9	19.7	19.8	19.9	19.8	0	20
				1	80	19.7	19.6	19.8	20.0	19.8	0	20
				1	160	19.6	19.4	19.8	20.0	19.9	0	20
				81	40	19.7	19.5	19.8	19.8	19.7	0	20
BW (MHz)	OFDM Modulation Scheme	SCS (kHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)					MPR	Tune-up Limit
						504198	511398	518598	525798	532998		
						2520.99 MHz	2556.99 MHz	2592.99 MHz	2628.99 MHz	2664.99 MHz		
50	DFT-s	30	π/2 BPSK	1	1	19.9	19.8	19.9	19.9	19.7	0	20
				1	66	19.7	19.6	19.9	19.9	19.8	0	20
				1	131	19.7	19.6	19.9	19.8	19.9	0	20
				64	32	19.7	19.5	19.8	19.8	19.8	0	20
			QPSK	1	1	19.9	19.8	19.8	19.9	19.8	0	20
				1	66	19.7	19.7	19.8	19.8	19.9	0	20
				1	131	19.7	19.6	19.9	19.8	19.9	0	20
				64	32	19.8	19.6	19.8	19.8	19.8	0	20
BW (MHz)	OFDM Modulation Scheme	Mode	Mode	RB Allocation	RB offset	Normal Average Power (dBm)					MPR	Tune-up Limit
						503196	510900	518598	526296	533994		
						2515.98 MHz	2554.5 MHz	2592.99 MHz	2631.48 MHz	2669.97 MHz		
40	DFT-s	30	π/2 BPSK	1	1	20.0	19.8	19.9	20.0	19.6	0	20
				1	52	19.8	19.6	19.9	19.8	20.0	0	20
				1	104	19.9	19.7	19.7	19.5	19.6	0	20
				50	25	19.7	19.6	20.0	19.8	19.9	0	20
			QPSK	1	1	20.0	19.8	19.9	19.9	20.0	0	20
				1	52	19.8	19.6	19.9	19.8	19.9	0	20
				1	104	19.9	19.7	20.0	20.0	20.0	0	20
				50	25	19.8	19.6	19.9	19.8	19.9	0	20

n41 Main Ant (continued)

BW (MHz)	OFDM Modulation Scheme	SCS (kHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)					MPR	Tune-up Limit
						502200	510396	518598	526800	534996		
						2511 MHz	2551.98 MHz	2592.99 MHz	2634 MHz	2674.98 MHz		
30	DFT-s	30	π/2 BPSK	1	1	19.9	19.7	19.9	19.9	19.9	0	20
				1	38	19.8	19.6	20.0	19.9	19.9	0	20
				1	76	19.9	19.7	20.0	20.0	19.3	0	20
				36	18	19.9	19.6	19.9	19.9	19.1	0	20
			QPSK	1	1	20.0	19.7	19.9	19.9	19.9	0	20
				1	38	19.9	19.6	19.9	19.9	19.9	0	20
				1	76	19.9	19.7	19.9	20.0	20.0	0	20
				36	18	19.9	19.6	19.9	19.8	20.0	0	20
BW (MHz)	OFDM Modulation Scheme	SCS (kHz)	Mode	RB Allocation	RB offset	Normal Average Power (dBm)					MPR	Tune-up Limit
						501198	509898	518598	527298	535998		
						2505.99 MHz	2549.49 MHz	2592.99 MHz	2636.49 MHz	2679.99 MHz		
20	DFT-s	30	π/2 BPSK	1	1	20.0	19.7	20.0	19.8	19.4	0	20
				1	25	19.9	19.7	19.9	19.8	19.9	0	20
				1	49	19.8	19.7	19.9	19.9	19.3	0	20
				25	12	20.0	19.6	19.9	19.8	20.0	0	20
			QPSK	1	1	20.0	19.8	19.9	19.8	20.0	0	20
				1	25	20.0	19.7	19.9	19.7	20.0	0	20
				1	49	20.0	19.8	19.8	19.9	19.8	0	20
				25	12	20.0	19.6	19.7	19.8	19.9	0	20

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	Max 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
	14	11	14	11
	14	11	14	11
	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	13.4	14.0	Yes	12.2	12.5	Yes
		6	2437	13.3	14.0		12.4	12.5	
		11	2462	13.1	14.0		12.4	12.5	

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	10.7	11.0	Yes	10.0	11.0	Yes
		6	2437	10.4	11.0		10.4	11.0	
		11	2462	10.2	11.0		10.3	11.0	

Note(s):

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

Duty Factor Measured Results

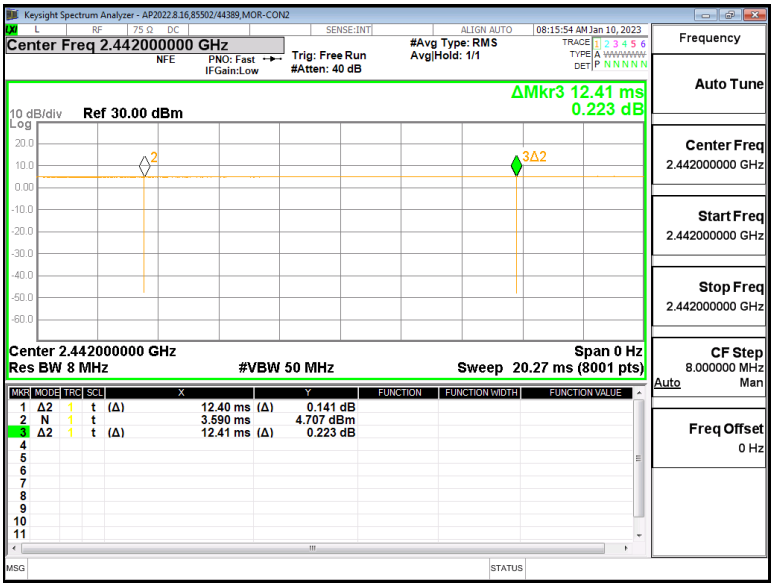
Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
802.11b	1 Mbps	12.40	12.41	99.9%	1.00
802.11g	6 Mbps	2.096	2.114	99.1%	1.01

Note(s):

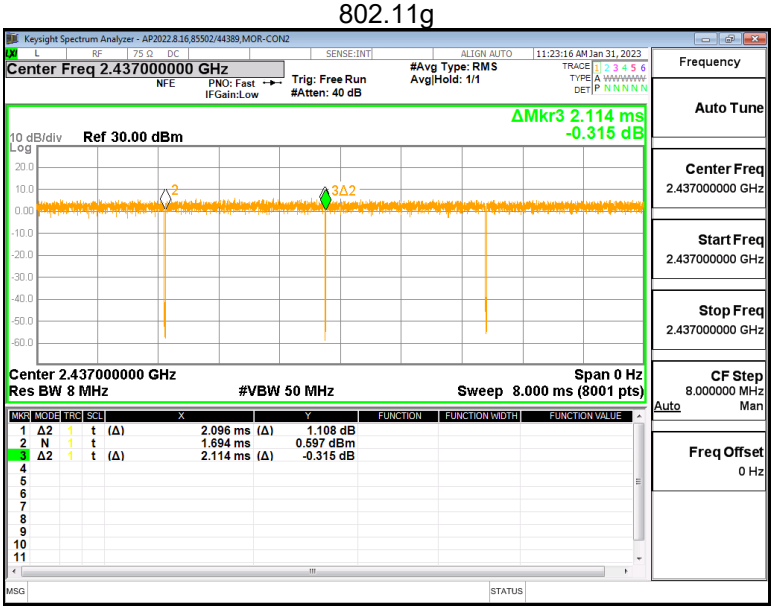
Duty Cycle = (T on / period) * 100%

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 5.2 GHz	802.11ac (VHT80)	42	5210	10.5	11.5	Yes	10.4	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	10.6	11.5	Yes	10.2	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	10.4	11.5	Yes	10.2	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 5.8 GHz	802.11n (HT40)	151	5755	10.6	11.5	Yes	11.0	11.5	Yes
		159	5795	10.6	11.5		11.0	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 5.2 GHz	802.11ac (VHT80)	42	5210	7.6	9.5	Yes	8.3	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	8.7	9.5	Yes	8.2	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	7.7	9.5	Yes	8.1	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 5.8 GHz	802.11ac (VHT80)	155	5775	8.5	9.5	Yes	8.6	9.5	Yes

Duty Factor Measured Results

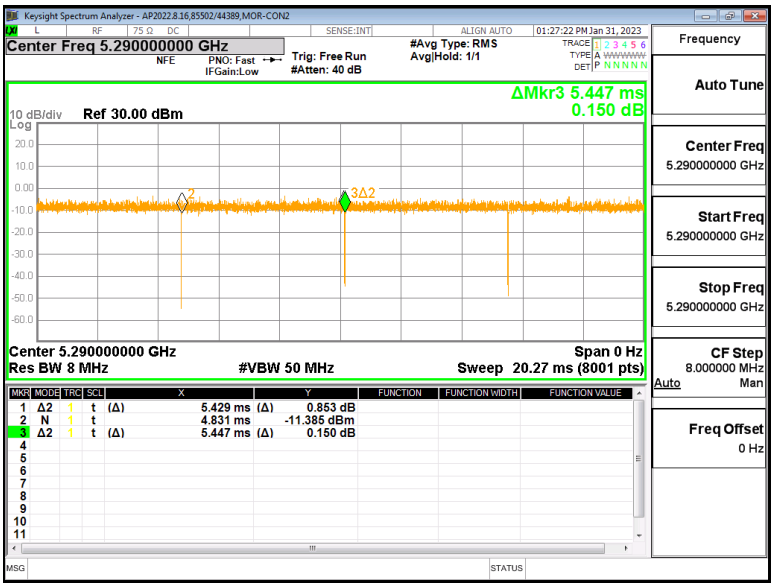
Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
802.11ac VHT80	MCS0	5.429	5.447	99.7%	1.00
802.11ac VHT160	MCS0	5.426	5.447	99.6%	1.00
802.11n HT40	MCS0	5.429	5.447	99.7%	1.00

Note(s):

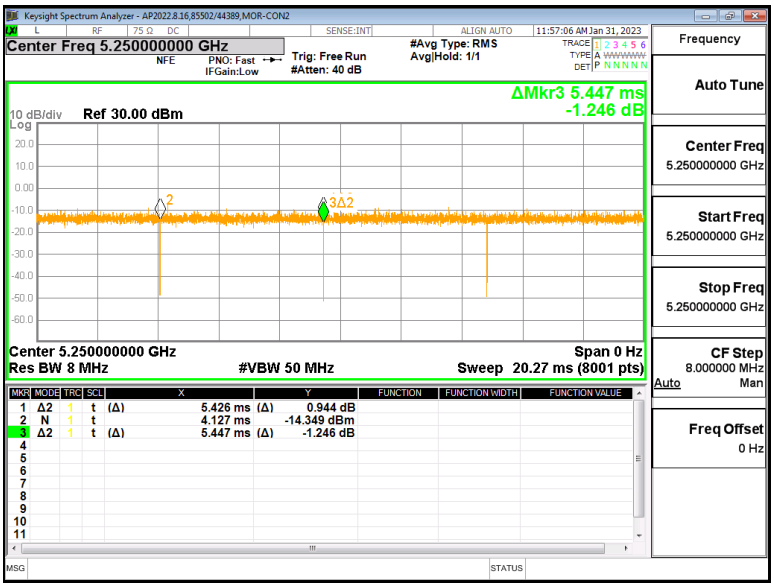
Duty Cycle = (T on / period) * 100%

WLAN 5GHz Duty Cycle

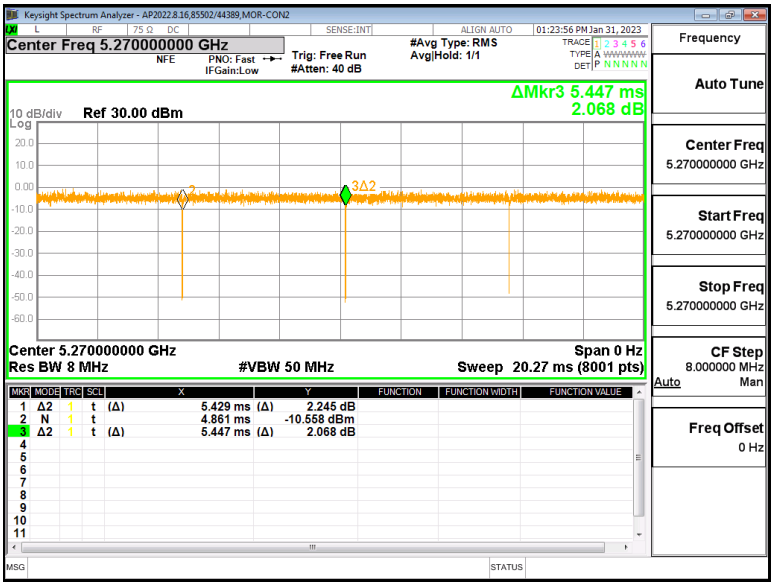
802.11ac VHT80



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 ≤ ¼ dB higher than the primary mode.

Band	Mode	Tune-Up Power Limit (dBm)	
		WiFi Main	WiFi Sub
		Normal	Normal
2.4	BR	14	14
	EDR	14	14
	BLE	10.2	10.79

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	12.6	14.0	Yes
		39	2441	13.6	14.0		13.2	14.0	
		78	2480	14.0	14.0		13.6	14.0	

Duty Factor Measured Results

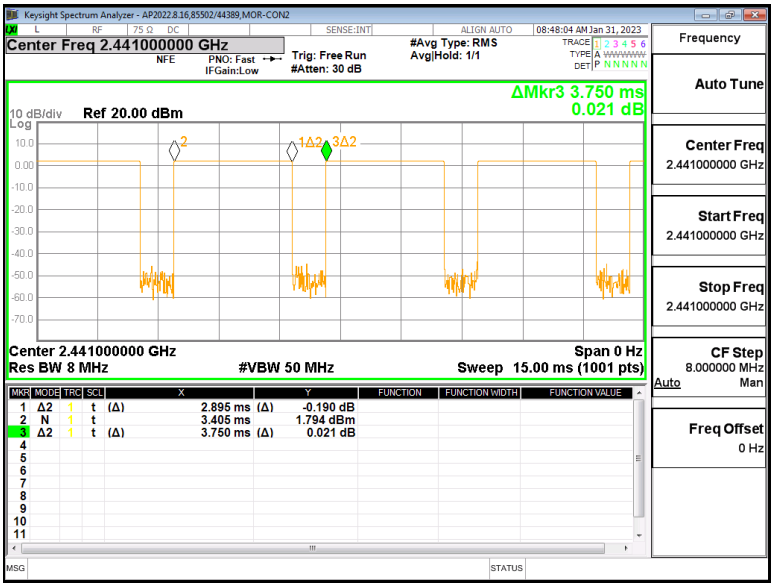
Mode	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
BR GFSK	2.895	3.750	77.20%	1.30

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

KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

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

KDB 248227 D01 SAR meas for 802.11:

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

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the *initial test position(s)* by applying the DSSS or OFDM SAR measurement procedures in the required wireless mode test configuration(s). The *initial test position(s)* is measured using the highest measured maximum output power channel in the required wireless mode test configuration(s). 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 Main 1	0	Left Cheek	190	836.6	26.9	26.2	0.088	0.104	
				Left Tilt	190	836.6	26.9	26.2	0.040	0.047	
				Right Cheek	190	836.6	26.9	26.2	0.111	0.132	1
				Right Tilt	190	836.6	26.9	26.2	0.043	0.051	
Body-Worn / Hotspot	GPRS 4 Slots	CELL Main 1	10	Back	190	836.6	26.9	26.2	0.376	**0.446**	2
				Front	190	836.6	26.9	26.2	0.284	0.337	
Hotspot	GPRS 4 Slots	CELL Main 1	10	Edge Bottom	190	836.6	26.9	26.2	0.152	0.180	
				Edge Left	190	836.6	26.9	26.2	0.134	0.159	
Body-Worn / Hotspot	DTM GPRS 2 Slots	CELL Main 1	10	Back	190	836.6	29.9	29.1	0.348	0.418	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 Main 2	0	Left Cheek	810	1909.8	22.0	21.4	0.025	0.029	
				Left Tilt	810	1909.8	22.0	21.4	0.022	0.025	
				Right Cheek	810	1909.8	22.0	21.4	0.037	0.042	4
				Right Tilt	810	1909.8	22.0	21.4	0.015	0.017	
Body-Worn / Hotspot	GPRS 4 Slots	CELL Main 2	10	Back	810	1909.8	22.0	21.4	0.143	0.164	5
				Front	810	1909.8	22.0	21.4	0.125	0.144	
Hotspot	GPRS 4 Slots	CELL Main 2	10	Edge Right	810	1909.8	22.0	21.4	0.059	0.068	
				Edge Bottom	810	1909.8	22.0	21.4	0.211	0.242	6
Hotspot	DTM GPRS 2 Slots	CELL Main 2	10	Edge Bottom	810	1909.8	25.0	23.7	0.217	0.293	7

10.3. 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 Main 1	0	Left Cheek	4183	836.6	22.7	22.2	0.093	0.104	
				Left Tilt	4183	836.6	22.7	22.2	0.052	0.058	
				Right Cheek	4183	836.6	22.7	22.2	0.106	0.119	8
				Right Tilt	4183	836.6	22.7	22.2	0.050	0.056	
Body-Worn / Hotspot	Rel. 99 RMC 12.2 kbps	CELL Main 1	10	Back	4183	836.6	22.7	22.2	0.335	0.376	9
				Front	4183	836.6	22.7	22.2	0.288	0.323	
Hotspot	Rel. 99 RMC 12.2 kbps	CELL Main 1	10	Edge Bottom	4183	836.6	22.7	22.2	0.148	0.166	
				Edge Left	4183	836.6	22.7	22.2	0.128	0.144	

10.4. LTE Band 5 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No,
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	CELL Main 1	0	Left Cheek	20525	836.5	1	0	22.0	21.2	0.069	0.083	
							25	12	22.0	21.3	0.047	0.055	
				Left Tilt	20525	836.5	1	0	22.0	21.2	0.035	0.042	
							25	12	22.0	21.3	0.028	0.033	
				Right Cheek	20525	836.5	1	0	22.0	21.2	0.088	0.106	10
							25	12	22.0	21.3	0.069	0.081	
				Right Tilt	20525	836.5	1	0	22.0	21.2	0.032	0.038	
							25	12	22.0	21.3	0.024	0.028	
Body-worn / Hotspot	QPSK	CELL Main 1	10	Back	20525	836.5	1	0	22.0	21.2	0.255	0.307	11
							25	12	22.0	21.3	0.204	0.240	
				Front	20525	836.5	1	0	22.0	21.2	0.216	0.260	
							25	12	22.0	21.3	0.171	0.201	
Hotspot	QPSK	CELL Main 1	10	Edge Bottom	20525	836.5	1	0	22.0	21.2	0.126	0.151	
							25	12	22.0	21.3	0.100	0.117	
				Edge Left	20525	836.5	1	0	22.0	21.2	0.095	0.114	
							25	12	22.0	21.3	0.075	0.088	

10.5. LTE Band 12 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No,
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	CELL Main 1	0	Left Cheek	23095	707.5	1	0	22.0	21.4	0.045	0.052	
							25	12	22.0	21.4	0.035	0.040	
				Left Tilt	23095	707.5	1	0	22.0	21.4	0.018	0.021	
							25	12	22.0	21.4	0.013	0.015	
				Right Cheek	23095	707.5	1	0	22.0	21.4	0.050	0.057	12
							25	12	22.0	21.4	0.040	0.046	
				Right Tilt	23095	707.5	1	0	22.0	21.4	0.016	0.018	
							25	12	22.0	21.4	0.012	0.014	
Body-worn / Hotspot	QPSK	CELL Main 1	10	Back	23095	707.5	1	0	22.0	21.4	0.115	0.132	13
							25	12	22.0	21.4	0.096	0.110	
				Front	23095	707.5	1	0	22.0	21.4	0.103	0.118	
							25	12	22.0	21.4	0.085	0.098	
Hotspot	QPSK	CELL Main 1	10	Edge Bottom	23095	707.5	1	0	22.0	21.4	0.066	0.076	
							25	12	22.0	21.4	0.054	0.062	
				Edge Left	23095	707.5	1	0	22.0	21.4	0.049	0.056	
							25	12	22.0	21.4	0.041	0.047	

10.6. LTE Band 13 (10MHz Bandwidth)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No,
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	CELL Main1	0	Left Cheek	23230	782.0	1	0	22.0	21.4	0.057	0.065	
							25	25	22.0	21.4	0.047	0.054	
				Left Tilt	23230	782.0	1	0	22.0	21.4	0.026	0.030	
							25	25	22.0	21.4	0.023	0.026	
				Right Cheek	23230	782.0	1	0	22.0	21.4	0.062	0.071	14
							25	25	22.0	21.4	0.053	0.061	
				Right Tilt	23230	782.0	1	0	22.0	21.4	0.029	0.033	
							25	25	22.0	21.4	0.025	0.029	
Body-worn / Hotspot	QPSK	CELL Main1	10	Back	23230	782.0	1	0	22.0	21.4	0.217	0.249	15
							25	25	22.0	21.4	0.180	0.207	
				Front	23230	782.0	1	0	22.0	21.4	0.185	0.212	
							25	25	22.0	21.4	0.158	0.181	
Hotspot	QPSK	CELL Main1	10	Edge Bottom	23230	782.0	1	0	22.0	21.4	0.110	0.126	
							25	25	22.0	21.4	0.091	0.104	
				Edge Left	23230	782.0	1	0	22.0	21.4	0.067	0.077	
							25	25	22.0	21.4	0.057	0.065	

10.7. LTE Band 41 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No,
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	CELL Main 2	0	Left Cheek	40620	2593.0	1	99	20.0	19.4	0.005	0.006	
							50	50	20.0	19.4	0.002	0.002	
				Left Tilt	40620	2593.0	1	99	20.0	19.4	<0.001	<0.001	
							50	50	20.0	19.4	0.004	0.005	
				Right Cheek	40620	2593.0	1	99	20.0	19.4	0.011	0.013	16
							50	50	20.0	19.4	0.008	0.009	
				Right Tilt	40620	2593.0	1	99	20.0	19.4	<0.001	<0.001	
							50	50	20.0	19.4	<0.001	<0.001	
Body-worn / Hotspot	QPSK	CELL Main 2	10	Back	40620	2593.0	1	99	20.0	19.4	0.040	0.046	
							50	50	20.0	19.4	0.031	0.036	
				Front	40620	2593.0	1	99	20.0	19.4	0.090	0.103	17
							50	50	20.0	19.4	0.070	0.080	
Hotspot	QPSK	CELL Main 2	10	Edge Right	40620	2593.0	1	99	20.0	19.4	0.017	0.020	
							50	50	20.0	19.4	0.016	0.018	
				Edge Bottom	40620	2593.0	1	99	20.0	19.4	0.047	0.054	
							50	50	20.0	19.4	0.045	0.052	

10.8. LTE Band 66 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No,
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	CELL Main 2	0	Left Cheek	132322	1745.0	1	49	19.0	18.0	0.023	0.029	
							50	24	19.0	18.0	0.023	0.029	
				Left Tilt	132322	1745.0	1	49	19.0	18.0	0.017	0.021	
							50	24	19.0	18.0	0.017	0.021	
				Right Cheek	132322	1745.0	1	49	19.0	18.0	0.035	0.044	
							50	24	19.0	18.0	0.036	0.045	18
				Right Tilt	132322	1745.0	1	49	19.0	18.0	0.018	0.023	
							50	24	19.0	18.0	0.018	0.023	
Body-Worn / Hotspot	QPSK	CELL Main 2	10	Back	132322	1745.0	1	49	19.0	18.0	0.155	0.195	
							50	24	19.0	18.0	0.160	0.201	19
				Front	132322	1745.0	1	49	19.0	18.0	0.140	0.176	
							50	24	19.0	18.0	0.143	0.180	
Hotspot	QPSK	CELL Main 2	10	Edge Right	132322	1745.0	1	49	19.0	18.0	0.090	0.113	
							50	24	19.0	18.0	0.092	0.116	
				Edge Bottom	132322	1745.0	1	49	19.0	18.0	0.191	0.240	
							50	24	19.0	18.0	0.197	0.248	20

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No,
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	QPSK	CELL Sub	0	Left Cheek	132322	1745.0	1	49	17.0	16.1	0.338	0.416	
							50	50	17.0	16.3	0.333	0.391	
				Left Tilt	132322	1745.0	1	49	17.0	16.1	0.407	**0.501**	21
							50	50	17.0	16.3	0.397	0.466	
				Right Cheek	132322	1745.0	1	49	17.0	16.1	0.225	0.277	
							50	50	17.0	16.3	0.214	0.251	
				Right Tilt	132322	1745.0	1	49	17.0	16.1	0.255	0.314	
							50	50	17.0	16.3	0.247	0.290	
Body-Worn / Hotspot	QPSK	CELL Sub	10	Back	132322	1745.0	1	49	17.0	16.1	0.096	0.118	22
							50	50	17.0	16.3	0.093	0.109	
				Front	132322	1745.0	1	49	17.0	16.1	0.082	0.101	
							50	50	17.0	16.3	0.078	0.092	
Hotspot	QPSK	CELL Sub	10	Edge Top	132322	1745.0	1	49	17.0	16.1	0.160	0.197	23
							50	50	17.0	16.3	0.154	0.181	
				Edge Right	132322	1745.0	1	49	17.0	16.1	0.005	0.006	
							50	50	17.0	16.3	0.004	0.005	

10.9. NR Band 5 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	DFTs-OFDM QPSK	CELL Main 1	0	Left Cheek	167300	836.5	1	52	22.0	22.0	0.065	0.065	
							50	25	22.0	21.9	0.065	0.067	
				Left Tilt	167300	836.5	1	52	22.0	22.0	0.030	0.030	
							50	25	22.0	21.9	0.033	0.034	
				Right Cheek	167300	836.5	1	52	22.0	22.0	0.093	0.093	24
							50	25	22.0	21.9	0.082	0.084	
				Right Tilt	167300	836.5	1	52	22.0	22.0	0.026	0.026	
							50	25	22.0	21.9	0.031	0.032	
Body-Worn / Hotspot	DFTs-OFDM QPSK	CELL Main 1	10	Back	167300	836.5	1	52	22.0	22.0	0.279	0.279	25
							50	25	22.0	21.9	0.271	0.277	
				Front	167300	836.5	1	52	22.0	22.0	0.227	0.227	
							50	25	22.0	21.9	0.217	0.222	
Hotspot	DFTs-OFDM QPSK	CELL Main 1	10	Edge Bottom	167300	836.5	1	52	22.0	22.0	0.161	0.161	
							50	25	22.0	21.9	0.164	0.168	
				Edge Left	167300	836.5	1	52	22.0	22.0	0.085	0.085	
							50	25	22.0	21.9	0.079	0.081	

10.10. NR Band 41 (20MHz Bandwidth)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
Head	DFTs-OFDM QPSK	CELL Main 2	0	Left Cheek	518598	2592.99	1	271	20.0	19.8	0.018	0.019	
							135	67	20.0	19.6	0.017	0.019	
				Left Tilt	518598	2592.99	1	271	20.0	19.8	0.018	0.019	
							135	67	20.0	19.6	0.024	0.026	
				Right Cheek	518598	2592.99	1	271	20.0	19.8	0.023	0.024	
							135	67	20.0	19.6	0.036	0.039	26
				Right Tilt	518598	2592.99	1	271	20.0	19.8	0.004	0.004	
							135	67	20.0	19.6	0.005	0.005	
Body-Worn / Hotspot	DFTs-OFDM QPSK	CELL Main 2	10	Back	518598	2592.99	1	271	20.0	19.8	0.116	0.121	
							135	67	20.0	19.6	0.141	0.155	
				Front	518598	2592.99	1	271	20.0	19.8	0.156	0.163	
							135	67	20.0	19.6	0.179	0.196	27
Hotspot	DFTs-OFDM QPSK	CELL Main 2	10	Edge Right	518598	2592.99	1	271	20.0	19.8	0.059	0.062	
							135	67	20.0	19.6	0.085	0.093	
				Edge Bottom	518598	2592.99	1	271	20.0	19.8	0.207	0.217	28
							135	67	20.0	19.6	0.205	0.225	

10.11. 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.

Wi-Fi DTS Normal State

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	0.081	99.9%	14.0	13.4	0.085	0.098	
					Left Tilt	1	2412	0.025	99.9%	14.0	13.4			
					Right Cheek	1	2412	0.367	99.9%	14.0	13.4	0.387	**0.445**	29
					Right Tilt	1	2412	0.073	99.9%	14.0	13.4			
Body-worn / Hotspot	802.11b	WiFi Main	Normal	10	Back	1	2412	0.063	99.9%	14.0	13.4	0.064	0.074	30
					Front	1	2412	0.051	99.9%	14.0	13.4			
Hotspot	802.11b	WiFi Main	Normal	10	Edge Top	1	2412	0.008	99.9%	14.0	13.4			
					Edge Left	1	2412	0.103	99.9%	14.0	13.4	0.105	**0.121**	31
Head	802.11b	WiFi Sub	Normal	0	Left Cheek	6	2437	<0.001	99.1%	12.5	12.4	<0.001	<0.001	-
					Left Tilt	6	2437	<0.001	99.1%	12.5	12.4			
					Right Cheek	6	2437	<0.001	99.1%	12.5	12.4			
					Right Tilt	6	2437	<0.001	99.1%	12.5	12.4			
Body-worn / Hotspot	802.11b	WiFi Sub	Normal	10	Back	6	2437	0.075	99.1%	12.5	12.4	0.075	**0.077**	32
					Front	6	2437	0.006	99.1%	12.5	12.4			
Hotspot	802.11b	WiFi Sub	Normal	10	Edge Bottom	6	2437	0.006	99.1%	12.5	12.4			
					Edge Left	6	2437	0.005	99.1%	12.5	12.4			

Antenna	802.11b SAR (W/kg)	802.11b pwr (dBm)	802.11g/n pwr (dBm)	Adjected SAR (W/kg)	Additional SAR Test
WiFi Main	0.445	14	14	0.445	Not Test
WiFi Sub	0.077	12.5	14	0.109	Not Test

Wi-Fi DTS Simultaneous 2G_5G State

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	1	2412	0.040	99.9%	11.0	10.7			
					Left Tilt	1	2412	0.010	99.9%	11.0	10.7			
					Right Cheek	1	2412	0.128	99.9%	11.0	10.7	0.135	0.145	33
					Right Tilt	1	2412	0.035	99.9%	11.0	10.7			
Body-worn / Hotspot	802.11b	WiFi Main	Simultaneous 2G_5G/6G	10	Back	1	2412	0.032	99.9%	11.0	10.7	0.029	0.031	34
					Front	1	2412	0.021	99.9%	11.0	10.7			
Hotspot	802.11b	WiFi Main	Simultaneous 2G_5G/6G	10	Edge Top	1	2412	0.002	99.9%	11.0	10.7			
					Edge Left	1	2412	0.053	99.9%	11.0	10.7	0.052	0.056	35
Head	802.11b	WiFi Sub	Simultaneous 2G_5G/6G	0	Left Cheek	6	2437	0.002	99.9%	11.0	10.4			
					Left Tilt	6	2437	<0.001	99.9%	11.0	10.4			
					Right Cheek	6	2437	<0.001	99.9%	11.0	10.4			
					Right Tilt	6	2437	0.003	99.9%	11.0	10.4	<0.001	<0.001	36
Body-worn / Hotspot	802.11b	WiFi Sub	Simultaneous 2G_5G/6G	10	Back	6	2437	0.033	99.9%	11.0	10.4	0.030	0.036	37
					Front	6	2437	0.003	99.9%	11.0	10.4			
Hotspot	802.11b	WiFi Sub	Simultaneous 2G_5G/6G	10	Edge Bottom	6	2437	0.001	99.9%	11.0	10.4			
					Edge Left	6	2437	0.002	99.9%	11.0	10.4			

Notes:

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

10.12. 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.

Wi-Fi UNII-1 Normal State

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	10	Back	42	5210	0.022	99.7%	11.5	10.5			
					Front	42	5210	0.037	99.7%	11.5	10.5			
					Edge Top	42	5210	0.009	99.7%	11.5	10.5			
					Edge Left	42	5210	0.059	99.7%	11.5	10.5	0.061	**0.077**	38
Hotspot	802.11ac (VHT80)	WiFi Sub	Normal	10	Back	42	5210	0.056	99.7%	11.5	10.4	0.054	0.070	39
					Front	42	5210	0.000	99.7%	11.5	10.4			
					Edge Bottom	42	5210	0.008	99.7%	11.5	10.4			
					Edge Left	42	5210	0.011	99.7%	11.5	10.4			

Wi-Fi UNII-1 Simultaneous 2G_5G State

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	10	Back	42	5210	0.015	99.7%	9.5	7.6			
					Front	42	5210	0.016	99.7%	9.5	7.6			
					Edge Top	42	5210	0.002	99.7%	9.5	7.6			
					Edge Left	42	5210	0.030	99.7%	9.5	7.6	0.028	0.043	40
Hotspot	802.11ac (VHT80)	WiFi Sub	Simultaneous 2G_5G/6G	10	Back	42	5210	0.028	99.7%	9.5	8.3	0.031	0.041	41
					Front	42	5210	0.000	99.7%	9.5	8.3			
					Edge Bottom	42	5210	0.003	99.7%	9.5	8.3			
					Edge Left	42	5210	0.005	99.7%	9.5	8.3			

Wi-Fi UNII-2A Normal State

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	0.032	99.6%	11.5	10.6			
					Left Tilt	50	5250	0.028	99.6%	11.5	10.6			
					Right Cheek	50	5250	0.138	99.6%	11.5	10.6	0.186	0.230	42
					Right Tilt	50	5250	0.051	99.6%	11.5	10.6			
Body-worn	802.11ac (VHT160)	WiFi Main	Normal	10	Back	50	5250	0.033	99.6%	11.5	10.6	0.033	0.041	43
					Front	50	5250	0.021	99.6%	11.5	10.6			
Head	802.11ac (VHT160)	WiFi Sub	Normal	0	Left Cheek	50	5250	0.000	99.6%	11.5	10.2			
					Left Tilt	50	5250	0.000	99.6%	11.5	10.2	0.000	0.000	-
					Right Cheek	50	5250	0.000	99.6%	11.5	10.2			
					Right Tilt	50	5250	0.000	99.6%	11.5	10.2			
Body-worn	802.11ac (VHT160)	WiFi Sub	Normal	10	Back	50	5250	0.063	99.6%	11.5	10.2	0.066	**0.089**	44
					Front	50	5250	0.000	99.6%	11.5	10.2			

RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle	Power (dBm)		10-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	802.11ac (VHT160)	WiFi Main	Normal	0	Back	50	5250	0.282	99.6%	11.5	10.6			
					Front	50	5250	0.191	99.6%	11.5	10.6			
					Edge Top	50	5250	0.015	99.6%	11.5	10.6			
					Edge Left	50	5250	0.753	99.6%	11.5	10.6	0.202	0.250	45
Extremity	802.11ac (VHT160)	WiFi Sub	Normal	0	Back	50	5250	0.374	99.6%	11.5	10.2	0.156	0.211	46
					Front	50	5250	0.034	99.6%	11.5	10.2			
					Edge Bottom	50	5250	0.053	99.6%	11.5	10.2			
					Edge Left	50	5250	0.058	99.6%	11.5	10.2			

Wi-Fi UNII-2A Simultaneous 2G_5G State

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	0.031	99.6%	9.5	8.7			
					Left Tilt	50	5250	0.031	99.6%	9.5	8.7			
					Right Cheek	50	5250	0.107	99.6%	9.5	8.7	0.136	0.164	47
					Right Tilt	50	5250	0.057	99.6%	9.5	8.7			
Body-worn	802.11ac (VHT160)	WiFi Main	Simultaneous 2G_5G/6G	10	Back	50	5250	0.029	99.6%	9.5	8.7	0.028	0.034	48
					Front	50	5250	0.018	99.6%	9.5	8.7			
Head	802.11ac (VHT160)	WiFi Sub	Simultaneous 2G_5G/6G	0	Left Cheek	50	5250	0.000	99.6%	9.5	8.2			
					Left Tilt	50	5250	0.000	99.6%	9.5	8.2			
					Right Cheek	50	5250	0.000	99.6%	9.5	8.2	0.000	0.000	-
					Right Tilt	50	5250	0.000	99.6%	9.5	8.2			
Body-worn	802.11ac (VHT160)	WiFi Sub	Simultaneous 2G_5G/6G	10	Back	50	5250	0.036	99.6%	9.5	8.2	0.037	0.050	49
					Front	50	5250	0.000	99.6%	9.5	8.2			

Wi-Fi UNII-2C Normal State

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	0.041	99.6%	11.5	10.4			
					Left Tilt	114	5570	0.015	99.6%	11.5	10.4			
					Right Cheek	114	5570	0.190	99.6%	11.5	10.4	0.186	**0.241**	50
					Right Tilt	114	5570	0.025	99.6%	11.5	10.4			
Body-worn	802.11ac (VHT160)	WiFi Main	Normal	10	Back	114	5570	0.035	99.6%	11.5	10.4	0.028	0.036	51
					Front	114	5570	0.021	99.6%	11.5	10.4			
Head	802.11ac (VHT160)	WiFi Sub	Normal	0	Left Cheek	114	5570	0.000	99.6%	11.5	10.2	0.000	0.000	-
					Left Tilt	114	5570	0.000	99.6%	11.5	10.2			
					Right Cheek	114	5570	0.000	99.6%	11.5	10.2			
					Right Tilt	114	5570	0.000	99.6%	11.5	10.2			
Body-worn	802.11ac (VHT160)	WiFi Sub	Normal	10	Back	114	5570	0.022	99.6%	11.5	10.2	0.021	0.028	52
					Front	114	5570	0.000	99.6%	11.5	10.2			

RF Exposure Conditions	Mode	Antenna	Power State	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle	Power (dBm)		10-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Extremity	802.11ac (VHT160)	WiFi Main	Normal	0	Back	114	5570	0.419	99.6%	11.5	10.4	0.113	0.146	
					Front	114	5570	0.268	99.6%	11.5	10.4			
					Edge Top	114	5570	0.079	99.6%	11.5	10.4			
					Edge Left	114	5570	1.110	99.6%	11.5	10.4	0.262	**0.339**	53
Extremity	802.11ac (VHT160)	WiFi Sub	Normal	0	Back	114	5570	0.240	99.6%	11.5	10.2	0.073	0.099	54
					Front	114	5570	0.019	99.6%	11.5	10.2			
					Edge Bottom	114	5570	0.033	99.6%	11.5	10.2			
					Edge Left	114	5570	0.016	99.6%	11.5	10.2			

Wi-Fi UNII-2C Simultaneous 2G_5G State

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	0.019	99.6%	9.5	7.7			
					Left Tilt	114	5570	0.002	99.6%	9.5	7.7			
					Right Cheek	114	5570	0.056	99.6%	9.5	7.7	0.052	0.079	55
					Right Tilt	114	5570	0.009	99.6%	9.5	7.7			
Body-worn	802.11ac (VHT160)	WiFi Main	Simultaneous 2G_5G/6G	10	Back	114	5570	0.021	99.6%	9.5	7.7	0.015	0.023	56
					Front	114	5570	0.007	99.6%	9.5	7.7			
Head	802.11ac (VHT160)	WiFi Sub	Simultaneous 2G_5G/6G	0	Left Cheek	114	5570	0.000	99.6%	9.5	8.1			
					Left Tilt	114	5570	0.000	99.6%	9.5	8.1			
					Right Cheek	114	5570	0.000	99.6%	9.5	8.1			
					Right Tilt	114	5570	0.000	99.6%	9.5	8.1			
Body-worn	802.11ac (VHT160)	WiFi Sub	Simultaneous 2G_5G/6G	10	Back	114	5570	0.012	99.6%	9.5	8.1	<0.1	<0.1	-
					Front	114	5570	0.000	99.6%	9.5	8.1			

Note(s):

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

Wi-Fi UNII-3 Normal State

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	0.022	99.7%	11.5	10.6			
					Left Tilt	159	5795	0.007	99.7%	11.5	10.6			
					Right Cheek	159	5795	0.102	99.7%	11.5	10.6	0.099	0.122	57
					Right Tilt	159	5795	0.020	99.7%	11.5	10.6			
Body-Worn / Hotspot	802.11n (HT40)	WiFi Main	Normal	10	Back	159	5795	0.035	99.7%	11.5	10.6	0.030	0.037	58
					Front	159	5795	0.002	99.7%	11.5	10.6			
Hotspot	802.11n (HT40)	WiFi Main	Normal	10	Edge Top	159	5795	0.009	99.7%	11.5	10.6			
					Edge Left	159	5795	0.042	99.7%	11.5	10.6	0.043	0.053	59
Head	802.11n (HT40)	WiFi Sub	Normal	0	Left Cheek	151	5755	0.000	99.7%	11.5	11.0			
					Left Tilt	151	5755	0.000	99.7%	11.5	11.0	< 0.001	< 0.001	-
					Right Cheek	151	5755	0.000	99.7%	11.5	11.0			
					Right Tilt	151	5755	0.000	99.7%	11.5	11.0			
Body-worn / Hotspot	802.11n (HT40)	WiFi Sub	Normal	10	Back	151	5755	0.018	99.7%	11.5	11.0	0.016	0.018	60
					Front	151	5755	0.000	99.7%	11.5	11.0			
Hotspot	802.11n (HT40)	WiFi Sub	Normal	10	Edge Bottom	151	5755	0.002	99.7%	11.5	11.0			
					Edge Left	151	5755	0.004	99.7%	11.5	11.0	0.002	0.002	61

Note(s):

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

Wi-Fi UNII-3 Simultaneous 2G_5G State

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	0.015	99.7%	9.5	8.5			
					Left Tilt	155	5775	0.000	99.7%	9.5	8.5			
					Right Cheek	155	5775	0.027	99.7%	9.5	8.5	0.032	0.040	62
					Right Tilt	155	5775	0.011	99.7%	9.5	8.5			
Body-worn / Hotspot	802.11ac (VHT80)	WiFi Main	Simultaneous 2G_5G/6G	10	Back	155	5775	0.031	99.7%	9.5	8.5	0.025	0.032	63
					Front	155	5775	0.003	99.7%	9.5	8.5			
Hotspot	802.11ac (VHT80)	WiFi Main	Simultaneous 2G_5G/6G	10	Edge Top	155	5775	0.006	99.7%	9.5	8.5			
					Edge Left	155	5775	0.046	99.7%	9.5	8.5	0.046	0.058	64
Head	802.11ac (VHT80)	WiFi Sub	Simultaneous 2G_5G/6G	0	Left Cheek	155	5775	0.000	99.7%	9.5	8.6			
					Left Tilt	155	5775	0.000	99.7%	9.5	8.6			
					Right Cheek	155	5775	0.000	99.7%	9.5	8.6	< 0.001	< 0.001	-
					Right Tilt	155	5775	0.000	99.7%	9.5	8.6			
Body-worn / Hotspot	802.11ac (VHT80)	WiFi Sub	Simultaneous 2G_5G/6G	10	Back	155	5775	0.006	99.7%	9.5	8.6	0.007	0.009	65
					Front	155	5775	0.000	99.7%	9.5	8.6			
Hotspot	802.11ac (VHT80)	WiFi Sub	Simultaneous 2G_5G/6G	10	Edge Bottom	155	5775	0.000	99.7%	9.5	8.6			
					Edge Left	155	5775	0.000	99.7%	9.5	8.6			

Note(s):

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

10.13. Bluetooth

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	GFSK	WiFi Main	0	Left Cheek	78	2480	14.0	14.0	0.041	0.041	
				Left Tilt	78	2480	14.0	14.0	0.011	0.011	
				Right Cheek	78	2480	14.0	14.0	0.265	**0.265**	66
				Right Tilt	78	2480	14.0	14.0	0.057	0.057	
Body-Worn / Hotspot	GFSK	WiFi Main	10	Back	78	2480	14.0	14.0	0.036	0.036	67
				Front	78	2480	14.0	14.0	0.033	0.033	
Hotspot	GFSK	WiFi Main	10	Edge Top	78	2480	14.0	14.0	0.003	0.003	
				Edge Left	78	2480	14.0	14.0	0.093	**0.093**	68
Head	GFSK	WiFi Sub	0	Left Cheek	78	2480	14.0	13.6	<0.001	<0.001	69
				Left Tilt	78	2480	14.0	13.6	<0.001	<0.001	
				Right Cheek	78	2480	14.0	13.6	<0.001	<0.001	
				Right Tilt	78	2480	14.0	13.6	<0.001	<0.001	
Body-Worn / Hotspot	GFSK	WiFi Sub	10	Back	78	2480	14.0	13.6	0.053	**0.058**	70
				Front	78	2480	14.0	13.6	0.002	0.002	
Hotspot	GFSK	WiFi Sub	10	Edge Bottom	78	2480	14.0	13.6	0.002	0.002	71
				Edge Left	78	2480	14.0	13.6	<0.001	<0.001	

Note(s):

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

10.14. NFC

RF Exposure Conditions	Mode	Dist. (mm)	Freq. (MHz)	Tolerance Scaling[1] (dB)	Test Position	10-g SAR (W/kg)		Plot No.
						Meas.	Scaled	
Extremity	Type A PRBS9 106k	0	13.56	2	Rear	0.037	0.059	72
				2	Front	0.000	0.000	
				2	Left	0.000	0.000	

Note(s):

1. The SAR values for the NFC are not scaled for maximum production power because measurements of actual output power are not practical. The values were measured with the device operated within expected tolerances of the transmitter specifications and after accounting for production tolerances the contribution to the RF exposure budget from the NFC transmitter would remain negligible.

11. SAR Measurement Variability

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

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

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	First Repeated		Second Repeated		Third Repeated
						Measured SAR (W/kg)	Largest to Smallest SAR Ratio	Measured SAR (W/kg)	Largest to Smallest SAR Ratio	Measured SAR (W/kg)
700	LTE Band 12	Body & Hotspot	Back	No	0.115	N/A	N/A	N/A	N/A	N/A
	LTE Band 13	Body & Hotspot	Back	No	0.217	N/A	N/A	N/A	N/A	N/A
850	GSM 850	Body & Hotspot	Back	No	0.376	N/A	N/A	N/A	N/A	N/A
	WCDMA Band V	Body & Hotspot	Back	No	0.335	N/A	N/A	N/A	N/A	N/A
	LTE Band 5	Body & Hotspot	Back	No	0.225	N/A	N/A	N/A	N/A	N/A
1900	GSM 1900	Hotspot	Edge Bottom	No	0.217	N/A	N/A	N/A	N/A	N/A
2400	Wi-Fi 802.11b/g/n	Head	Right Cheek	No	0.387	N/A	N/A	N/A	N/A	N/A
	BT	Head	Right Cheek	No	0.265	N/A	N/A	N/A	N/A	N/A
2600	LTE Band 66	Head	Left Tilt	No	0.407	N/A	N/A	N/A	N/A	N/A
5200	Wi-Fi 802.11a/n/ac	Hotspot	Back	No	0.054	N/A	N/A	N/A	N/A	N/A
5300	Wi-Fi 802.11a/n/ac	Head	Right Cheek	No	0.186	N/A	N/A	N/A	N/A	N/A
5500	Wi-Fi 802.11a/n/ac	Head	Right Cheek	No	0.149	N/A	N/A	N/A	N/A	N/A
5800	Wi-Fi 802.11a/n/ac	Head	Right Cheek	No	0.099	N/A	N/A	N/A	N/A	N/A

Note(s):

Repeated measurement is not required since the original highest measured SAR is <0.8 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	CELL Sub	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	✓	✓			✓			✓	✓	
	15	✓	✓		✓	✓		✓	✓		
	16		✓	✓	✓			✓			
	17		✓	✓		✓			✓		
	18		✓	✓		✓	✓		✓		
	19		✓	✓		✓			✓	✓	
	20		✓	✓	✓	✓		✓	✓		
Extremity	21					✓			✓		✓

Note(s):
-WLAN 2.4 GHz and Bluetooth radio cannot transmit simultaneously
-WLAN 2.4 GHz and WLAN 5 GHz radio can transmit simultaneously
-10-g extremity SAR is not required since hotspot mode 1-g reported SAR < 1.2 W/kg for all bands that support hotspot

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. 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
	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
Head	0.132	0.445	0.077	0.241	0.089	0.265	0.058	0.654	0.462	0.727	0.520
Body	0.446	0.074	0.077	0.041	0.089	0.036	0.058	0.597	0.576	0.612	0.634
Hotspot	0.446	0.121	0.077	0.077	0.070	0.093	0.002	0.644	0.593	0.686	0.595

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.

12.3. 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	0.132	0.145	0.036	0.164	0.050	0.527
Body	0.446	0.031	0.036	0.034	0.050	0.597
Hotspot	0.446	0.056	0.036	0.058	0.041	0.637

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 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
	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
Head	0.045	0.445	0.077	0.241	0.089	0.265	0.058	0.567	0.375	0.640	0.433
Body	0.201	0.074	0.077	0.041	0.089	0.036	0.058	0.352	0.331	0.367	0.389
Hotspot	0.293	0.121	0.077	0.077	0.070	0.093	0.002	0.491	0.440	0.533	0.442

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 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	① + ② + ③ + ④ + ⑤
Head	0.045	0.145	0.036	0.164	0.050	0.440
Body	0.201	0.031	0.036	0.034	0.050	0.352
Hotspot	0.293	0.056	0.036	0.058	0.041	0.484

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 DC_66A_n5A & 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
	CELL Main1 + 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
Head	0.138	0.445	0.077	0.241	0.089	0.265	0.058	0.660	0.468	0.733	0.526
Body	0.480	0.074	0.077	0.041	0.089	0.036	0.058	0.631	0.610	0.646	0.668
Hotspot	0.416	0.121	0.077	0.077	0.070	0.093	0.002	0.614	0.563	0.656	0.565

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 WWAN DC_66A_n5A & 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 + Main2 ①	WiFi Main ②	WiFi Sub ③	WiFi Main ④	WiFi Sub ⑤	① + ② + ③ + ④ + ⑤
Head	0.138	0.145	0.036	0.164	0.050	0.533
Body	0.480	0.031	0.036	0.034	0.050	0.631
Hotspot	0.416	0.056	0.036	0.058	0.041	0.607

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.

12.8. Sum of the SAR for WWAN DC_66A_n41A & 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
	CELL Main2 + CELL Sub 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
Head	0.540	0.445	0.077	0.241	0.089	0.265	0.058	**1.062**	0.870	**1.135**	0.928
Body	0.314	0.074	0.077	0.041	0.089	0.036	0.058	0.465	0.444	0.480	0.502
Hotspot	0.422	0.121	0.077	0.077	0.070	0.093	0.002	0.620	0.569	0.662	0.571

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.

12.9. Sum of the SAR for WWAN DC_66A_n41A & 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 + CELL Sub ①	WiFi Main ②	WiFi Sub ③	WiFi Main ④	WiFi Sub ⑤	① + ② + ③ + ④ + ⑤
Head	0.540	0.145	0.036	0.164	0.050	0.935
Body	0.314	0.031	0.036	0.034	0.050	0.465
Hotspot	0.422	0.056	0.036	0.058	0.041	0.613

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.

12.10. 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	WLAN 5 GHz + NFC
	WiFi Main ①	WiFi Sub ②	NFC ③	① + ② + ③
Extremity	0.339	0.211	0.059	**0.609**

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