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SAR EVALUATION REPORT

Applicant Name:
Samsung Electronics Co., Ltd.
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Gyeonggi-do, 16677, Korea

Date of Testing:
12/13/22 - 01/18/23
Test Site/Location:
Element, Columbia, MD, USA
Document Serial No.:
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FCC ID: **A3LSMS911JPN**

APPLICANT: **SAMSUNG ELECTRONICS CO., LTD.**

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): SC-51D, SCG19

Equipment Class	Band & Mode	Tx Frequency	SAR			
			1g Head (W/kg)	1g Body-Worn (W/kg)	1g Hotspot (W/kg)	10g Phablet (W/kg)
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.18	0.22	0.68	N/A
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	<0.1	0.19	0.77	1.18
PCE	UMTS 850	826.40 - 846.60 MHz	0.35	0.34	0.58	N/A
PCE	LTE Band 12	699.7 - 715.3 MHz	0.16	0.25	0.45	N/A
PCE	LTE Band 13	779.5 - 784.5 MHz	0.35	0.36	0.58	N/A
PCE	LTE Band 26 (Cell)	814.7 - 848.3 MHz	0.28	0.34	0.69	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 66 (AWS)	1710.7 - 1779.3 MHz	0.23	0.48	0.73	2.62
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	0.26	0.48	1.09	2.62
PCE	LTE Band 41	2498.5 - 2687.5 MHz	0.35	0.17	0.39	N/A
PCE	NR Band n5 (Cell)	826.5 - 846.5 MHz	0.23	0.28	0.72	N/A
PCE	NR Band n41	2501.01 - 2685 MHz	0.89	0.21	0.59	3.12
DTS	2.4 GHz WLAN	2412 - 2472 MHz	0.39	< 0.1	0.16	N/A
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	N/A	N/A
NII	U-NII-2A	5260 - 5320 MHz	0.44*	0.16*	N/A	1.67*
NII	U-NII-2C	5500 - 5720 MHz	0.22*	0.20*	N/A	1.73*
NII	U-NII-3	5745 - 5825 MHz	0.22*	0.24*	0.25*	N/A
NII	U-NII-4	5845 - 5885 MHz	0.23*	0.29*	N/A	0.73*
DSS/DTS	Bluetooth	2402 - 2480 MHz	0.41	< 0.1	0.11	N/A
DXX	NFC	13.56 MHz	N/A	N/A	N/A	< 0.1
Simultaneous SAR per KDB 690783 D01v01r03:			1.59	0.82	1.24	3.94

* Note: * SAR values represent RF exposure during MIMO operations.

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 1.9 of this report; for North American frequency bands only.

Note: This revised Test Report supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.

RJ Ortanez
Executive Vice President

The SAR Tick is an initiative of the Mobile & Wireless Forum (MWF). While a product may be considered eligible, use of the SAR Tick logo requires an agreement with the MWF. Further details can be obtained by emailing: sartick@mwfai.info.

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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 26 (Cell)	Voice/Data	814.7 - 848.3 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 66 (AWS)	Voice/Data	1710.7 - 1779.3 MHz
LTE Band 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
NR Band n5 (Cell)	Data	826.5 - 846.5 MHz
NR Band n41	Data	2501.01 - 2685 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2472 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
U-NII-4	Voice/Data	5845 - 5885 MHz
U-NII-5	Voice/Data	5935 - 6415 MHz
U-NII-6	Voice/Data	6435 - 6515 MHz
U-NII-7	Voice/Data	6535 - 6875 MHz
U-NII-8	Voice/Data	6895 - 7115 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz

1.2 Time-Averaging Algorithm for RF Exposure Compliance

This Device is enabled with the Qualcomm® Smart Transmit Gen1 feature. This feature performs time averaging algorithm in real time to control and manage transmitting power and ensure the time-averaged RF exposure is in compliance with FCC requirements all the time. Refer to Compliance Summary document for detailed description of Qualcomm® Smart Transmit feature (report SN could be found in Section 1.11 – Bibliography).

Note that WLAN operations are not enabled with Smart Transmit.

The Smart Transmit algorithm maintains the time-averaged transmit power, in turn, time-averaged RF exposure of *SAR_design_target*, below the predefined time-averaged power limit (i.e., P_{limit} for sub-6 radio), for each characterized technology and band (see RF Exposure Part 0 Test Report, report SN could be found in Section 1.11 - Bibliography).

The Smart Transmit algorithm maintains the time-averaged transmit power, in turn, time-averaged RF exposure of *SAR_design_target* or *PD_design_target*, below the predefined time-averaged power limit (i.e., P_{limit} for sub-6 radio, and *input.power.limit* for 5G mmW NR), for each characterized technology and band (see RF Exposure Part 0 Test Report, report SN can be found in Section 1.11 - Bibliography).

Smart Transmit allows the device to transmit at higher power instantaneously, as high as P_{max}, when needed, but enforces power limiting to maintain time-averaged transmit power to P_{limit}. Below table shows P_{limit} EFS settings and maximum tune up output power P_{max} configured for this EUT for various transmit conditions (Device State Index DSI). Note that the device uncertainty for sub-6GHz WWAN is 1.0dB for this EUT.

Exposure Senario		Body-Worn	Phablet with Grip Sensor Inactive	Phablet with Grip Sensor Active	Head	Hotspot	Earjack	Maximum Tune-Up Output Power*
Averaging Volume		1g	10g	10g	1g	1g	10g	
Spacing		15 mm	8 mm, 6 mm, 11 mm, 0 mm	0 mm	0 mm	10 mm	0 mm	
DSI		0	0	1	2	3	4	
Technology/Band	Antenna							Pmax
GSM 850	A	29.3		27.2	31.2	27.2	27.2	25.3
GSM 1900	A	18.8		18.8	32.3	18.8	18.8	22.1
UMTS 850	A	29.7		29.7	29.5	27.4	29.7	24.0
LTE Band 12	A	29.8		26.6	33.0	26.6	26.6	24.5
LTE Band 13	A	29.4		27.1	30.0	27.1	27.1	24.5
LTE Band 26/5 (Cell)	A	29.5		26.5	30.9	26.5	26.5	24.5
LTE Band 66/4 (AWS)	A	20.5		20.5	31.0	19.0	20.5	23.5
LTE Band 2 (PCS)	A	21.0		21.0	30.4	19.0	21.0	23.5
LTE Band 41	B	19.0		19.0	27.8	19.0	19.0	22.0
NR Band n5 (Cell)	A	30.5		26.7	31.4	26.7	26.7	24.5
NR Band n41	F	19.0		19.0	15.0	19.0	19.0	24.0

*Note all P_{limit} EFS and maximum tune up output power P_{max} levels entered in above Table correspond to average power levels after accounting for duty cycle in the case of TDD modulation schemes (e.g. GSM and LTE TDD).

*Maximum tune up output power P_{max} is used to configure EUT during RF tune up procedure. The maximum allowed output power is equal to maximum Tune up output power + 1dB device design uncertainty.

The maximum time-averaged output power (dBm) for any Sub6 WWAN technology, band, and DSI = minimum of "P_{limit} EFS" and "Maximum tune up output power P_{max}" + 1dB device uncertainty. SAR values in this report were scaled to this maximum time-averaged output power to determine compliance per KDB Publication 447498 D04v01.

The purpose of this report (Part 1 test) is to demonstrate that the EUT meets FCC SAR limits when transmitting in static transmission scenario at maximum allowable time-averaged power levels.

Measurement Condition: All conducted power and SAR measurements in this report (Part 1 test) were performed by setting *Reserve_power_margin* (Smart Transmit EFS entry) to 0dB.

1.3 Power Reduction for SAR

This device uses an independent fixed level power reduction mechanism for WLAN/BT operations during voice or VoIP held to ear scenarios and when 5G NR is active. Per FCC Guidance, the held-to-ear exposure conditions were evaluated at reduced power according to the head SAR positions described in IEEE 1528-2013. Detailed descriptions of the power reduction mechanism are included in the operational description.

1.4 Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D04v01.

Note: Targets for 802.11ax RU operations can be found in 802.11ax RU SAR Exclusion Appendix.

1.4.1 WWAN Output Power

GSM/GPRS/EDGE 850									
Power Level		Voice (in dBm)	Data - Burst Average GMSK (in dBm)			Data - Burst Average 8-PSK (in dBm)			
		1 TX Slot	1 TX Slots	2 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
Pmax	Max Allowed Power	33.0	33.0	32.5	28.0	27.5	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	27.0	26.5	25.0	23.0	22.0
DSI = 0 (Body-Worn or Phablet with Grip Sensor Inactive)	Max Allowed Power	33.0	33.0	32.5	28.0	27.5	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	27.0	26.5	25.0	23.0	22.0
DSI = 1 (Phablet with Grip Sensor Active)	Max Allowed Power	33.0	33.0	32.5	28.0	27.5	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	27.0	26.5	25.0	23.0	22.0
DSI = 2 (Head)	Max Allowed Power	33.0	33.0	32.5	28.0	27.5	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	27.0	26.5	25.0	23.0	22.0
DSI = 3 (Hotspot)	Max Allowed Power	N/A	33.0	32.5	28.0	27.5	26.0	24.0	23.0
	Nominal	N/A	32.0	31.5	27.0	26.5	25.0	23.0	22.0
DSI = 4 (Earjack)	Max Allowed Power	33.0	33.0	32.5	28.0	27.5	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	27.0	26.5	25.0	23.0	22.0
GSM/GPRS/EDGE 1900									
Power Level		Voice (in dBm)	Data - Burst Average GMSK (in dBm)			Data - Burst Average 8-PSK (in dBm)			
		1 TX Slot	1 TX Slots	2 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
Pmax	Max Allowed Power	30.0	30.0	29.0	25.5	26.5	25.0	23.0	22.0
	Nominal	29.0	29.0	28.0	24.5	25.5	24.0	22.0	21.0
DSI = 0 (Body-Worn or Phablet with Grip Sensor Inactive)	Max Allowed Power	29.0	29.0	26.0	23.0	26.5	25.0	23.0	22.0
	Nominal	28.0	28.0	25.0	22.0	25.5	24.0	22.0	21.0
DSI = 1 (Phablet with Grip Sensor Active)	Max Allowed Power	29.0	29.0	26.0	23.0	26.5	25.0	23.0	22.0
	Nominal	28.0	28.0	25.0	22.0	25.5	24.0	22.0	21.0
DSI = 2 (Head)	Max Allowed Power	30.0	30.0	29.0	25.5	26.5	25.0	23.0	22.0
	Nominal	29.0	29.0	28.0	24.5	25.5	24.0	22.0	21.0
DSI = 3 (Hotspot)	Max Allowed Power	N/A	29.0	26.0	23.0	26.5	25.0	23.0	22.0
	Nominal	N/A	28.0	25.0	22.0	25.5	24.0	22.0	21.0
DSI = 4 (Earjack)	Max Allowed Power	29.0	29.0	26.0	23.0	26.5	25.0	23.0	22.0
	Nominal	28.0	28.0	25.0	22.0	25.5	24.0	22.0	21.0

For GSM, the above powers listed are GSM burst average values.

UMTS Band 5 (850 MHz)				
Power Level		Modulated Average Output Power		
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6
Pmax	Max Allowed Power	25.0	24.0	24.0
	Nominal	24.0	23.0	23.0
DSI = 0 (Body-Worn or Phablet with Grip Sensor Inactive)	Max Allowed Power	25.0	24.0	24.0
	Nominal	24.0	23.0	23.0
DSI = 1 (Phablet with Grip Sensor Active)	Max Allowed Power	25.0	24.0	24.0
	Nominal	24.0	23.0	23.0
DSI = 2 (Head)	Max Allowed Power	25.0	24.0	24.0
	Nominal	24.0	23.0	23.0
DSI = 3 (Hotspot)	Max Allowed Power	25.0	24.0	24.0
	Nominal	24.0	23.0	23.0
DSI = 4 (Earjack)	Max Allowed Power	25.0	24.0	24.0
	Nominal	24.0	23.0	23.0

Mode / Band	Antenna		Modulated Average Output Power (in dBm)					
			Pmax	DSI = 0 (Body-Worn or Phablet with Grip Sensor Inactive)	DSI = 1 (Phablet with Grip Sensor Active)	DSI = 2 (Head)	DSI = 3 (Hotspot)	DSI = 4 (Earjack)
LTE FDD Band 12	A	Max Allowed Power	25.5	25.5	25.5	25.5	25.5	25.5
		Nominal	24.5	24.5	24.5	24.5	24.5	24.5
LTE FDD Band 13	A	Max Allowed Power	25.5	25.5	25.5	25.5	25.5	25.5
		Nominal	24.5	24.5	24.5	24.5	24.5	24.5
LTE FDD Band 26	A	Max Allowed Power	25.5	25.5	25.5	25.5	25.5	25.5
		Nominal	24.5	24.5	24.5	24.5	24.5	24.5
LTE FDD Band 5	A	Max Allowed Power	25.5	25.5	25.5	25.5	25.5	25.5
		Nominal	24.5	24.5	24.5	24.5	24.5	24.5
LTE FDD Band 66	A	Max Allowed Power	24.5	21.5	21.5	24.5	20.0	21.5
		Nominal	23.5	20.5	20.5	23.5	19.0	20.5
LTE FDD Band 4	A	Max Allowed Power	24.5	21.5	21.5	24.5	20.0	21.5
		Nominal	23.5	20.5	20.5	23.5	19.0	20.5
LTE FDD Band 2	A	Max Allowed Power	24.5	22.0	22.0	24.5	20.0	22.0
		Nominal	23.5	21.0	21.0	23.5	19.0	21.0
LTE TDD Band 41(PC3)	B	Max Allowed Power	25.0	22.0	22.0	25.0	22.0	22.0
		Nominal	24.0	21.0	21.0	24.0	21.0	21.0

Mode / Band	Antenna		Modulated Average Output Power (in dBm)					
			Pmax	DSI = 0 (Body-Worn or Phablet with Grip Sensor Inactive)	DSI = 1 (Phablet with Grip Sensor Active)	DSI = 2 (Head)	DSI = 3 (Hotspot)	DSI = 4 (Earjack)
NR Band n5 (Cell)	A	Max Allowed Power	25.5	25.5	25.5	25.5	25.5	25.5
		Nominal	24.5	24.5	24.5	24.5	24.5	24.5
NR Band n41	F	Max Allowed Power	25.0	20.0	20.0	16.0	20.0	20.0
		Nominal	24.0	19.0	19.0	15.0	19.0	19.0

For LTE TDD and NR TDD, the above powers listed are TDD burst average values.

1.4.2 2.4 GHz Maximum SISO/MIMO WLAN Output Power

Mode	Band	IEEE 802.11 (in dBm)															
		SISO								MIMO							
		Antenna 2															
		b		g		n		ax (SU)		b CDD + STBC		g (CDD + STBC)		n (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	19.0	18.0	18.0	17.0	18.0	17.0	18.0	17.0	22.0	21.0	21.0	20.0	21.0	20.0	21.0	20.0
						ch. 1: 16.0	15.0	ch. 1: 15.5	14.5					ch. 1: 19.0	18.0	ch. 1: 18.5	17.5
								ch. 10: 17.0	16.0							ch. 10: 20.0	19.0
						ch. 11: 16.0	15.0	ch. 11: 15.5	14.5					ch. 11: 19.0	18.0	ch. 11: 18.5	17.5
		ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0
		ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0

1.4.3 2.4 GHz Reduced WLAN Output Powers

The below table is applicable in the following conditions:

- Simultaneous conditions with 5G FR1 NR (RCV not Active)

Mode	Band	IEEE 802.11 (in dBm)															
		SISO								MIMO							
		Antenna 2															
		b		g		n		ax (SU)		b CDD + STBC		g (CDD + STBC)		n (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	17.0	16.0	17.0	16.0	17.0	16.0	17.0	16.0	20.0	19.0	20.0	19.0	20.0	19.0	20.0	19.0
						ch. 1: 16.0	15.0	ch. 1: 15.5	14.5					ch. 1: 19.0	18.0	ch. 1: 18.5	17.5
						ch. 11: 16.0	15.0	ch. 11: 15.5	14.5					ch. 11: 19.0	18.0	ch. 11: 18.5	17.5
		ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0
		ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0

The below table is applicable in the following conditions:

- Simultaneous conditions with 5/6 GHz WLAN (RCV not Active)

Mode	Band	IEEE 802.11 (in dBm)															
		SISO								MIMO							
		Antenna 2															
		b		g		n		ax (SU)		b CDD + STBC		g (CDD + STBC)		n (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	13.0	12.0	13.0	12.0	13.0	12.0	13.0	12.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0	15.0
		ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0
		ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0

The below table is applicable in the following conditions:

- RCV Active

Mode	Band	IEEE 802.11 (in dBm)															
		SISO								MIMO							
		Antenna 2															
		b		g		n		ax (SU)		b CDD + STBC		g (CDD + STBC)		n (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	12.0	11.0	12.0	11.0	12.0	11.0	12.0	11.0	15.0	14.0	15.0	14.0	15.0	14.0	15.0	14.0
		ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0
		ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0

The below table is applicable in the following conditions:

- RCV Active during simultaneous conditions with 5G FR1 NR and/or 5/6 GHz WLAN
- Simultaneous conditions with 5G FR1 NR and 5/6 GHz WLAN (RCV not Active)

Mode	Band	IEEE 802.11 (in dBm)															
		SISO								MIMO							
		Antenna 2															
		b		g		n		ax (SU)		b CDD + STBC		g (CDD + STBC)		n (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	10.0	9.0	10.0	9.0	10.0	9.0	10.0	9.0	13.0	12.0	13.0	12.0	13.0	12.0	13.0	12.0
		ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0
		ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0	ch. 13: 3.0	2.0

1.4.4 5 GHz Maximum SISO/MIMO WLAN Output Power

Mode	Band	IEEE 802.11 (in dBm)							
		MIMO							
		a (CDD + STBC)		n (CDD+STBC, SDM)		ac (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	UNII-1	18.0	17.0	18.0	17.0	18.0	17.0	18.0	17.0
	UNII-2A	21.0	20.0	21.0	20.0	21.0	20.0	21.0	20.0
	UNII-2C	21.0	20.0	21.0	20.0	21.0	20.0	21.0	20.0
	UNII-3	21.0	20.0	21.0	20.0	21.0	20.0	21.0	20.0
	UNII-4	21.0	20.0	21.0	20.0	21.0	20.0	21.0	20.0
5 GHz WIFI (40MHz BW)	UNII-1	[redacted]		20.0	19.0	20.0	19.0	20.0	19.0
	UNII-2A			20.0	19.0	20.0	19.0	20.0	19.0
	UNII-2C			20.0	19.0	20.0	19.0	20.0	19.0
	UNII-3			20.0	19.0	20.0	19.0	20.0	19.0
	UNII-4			20.0	19.0	20.0	19.0	20.0	19.0
5 GHz WIFI (80MHz BW)	UNII-1					18.0	17.0	18.0	17.0
	UNII-2A					19.0	18.0	19.0	18.0
	UNII-2C					19.0	18.0	19.0	18.0
	UNII-3					19.0	18.0	19.0	18.0
	UNII-4					19.0	18.0	19.0	18.0
5 GHz WIFI (160MHz BW)	UNII-1/2A					18.0	17.0	18.0	17.0
	UNII-2C					19.0	18.0	19.0	18.0
	UNII-3/4					19.0	18.0	19.0	18.0

1.4.5 5 GHz Reduced WLAN Output Powers

The below table is applicable in the following conditions:

- Simultaneous conditions with 2.4 GHz WLAN
- Simultaneous conditions with 5G FR1 NR
- RCV Active

Mode	Band	IEEE 802.11 (in dBm)							
		MIMO							
		a (CDD + STBC)		n (CDD+STBC, SDM)		ac (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	UNII-1	17.0	16.0	17.0	16.0	17.0	16.0	17.0	16.0
	UNII-2A	17.0	16.0	17.0	16.0	17.0	16.0	17.0	16.0
	UNII-2C	17.0	16.0	17.0	16.0	17.0	16.0	17.0	16.0
	UNII-3	17.0	16.0	17.0	16.0	17.0	16.0	17.0	16.0
	UNII-4	17.0	16.0	17.0	16.0	17.0	16.0	17.0	16.0
5 GHz WIFI (40MHz BW)	UNII-1			17.0	16.0	17.0	16.0	17.0	16.0
	UNII-2A			17.0	16.0	17.0	16.0	17.0	16.0
	UNII-2C			17.0	16.0	17.0	16.0	17.0	16.0
	UNII-3			17.0	16.0	17.0	16.0	17.0	16.0
	UNII-4			17.0	16.0	17.0	16.0	17.0	16.0
5 GHz WIFI (80MHz BW)	UNII-1					17.0	16.0	17.0	16.0
	UNII-2A					17.0	16.0	17.0	16.0
	UNII-2C					17.0	16.0	17.0	16.0
	UNII-3					17.0	16.0	17.0	16.0
	UNII-4					17.0	16.0	17.0	16.0
5 GHz WIFI (160MHz BW)	UNII-1/2A					17.0	16.0	17.0	16.0
	UNII-2C					17.0	16.0	17.0	16.0
	UNII-3/4					17.0	16.0	17.0	16.0

The below table is applicable in the following conditions:

- Simultaneous conditions with 5G FR1 NR and 2.4 GHz WLAN
- RCV Active during simultaneous conditions with 5G FR1 NR

Mode	Band	IEEE 802.11 (in dBm)							
		MIMO							
		a (CDD + STBC)		n (CDD+STBC, SDM)		ac (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	UNII-1	14.0	13.0	14.0	13.0	14.0	13.0	14.0	13.0
	UNII-2A	14.0	13.0	14.0	13.0	14.0	13.0	14.0	13.0
	UNII-2C	14.0	13.0	14.0	13.0	14.0	13.0	14.0	13.0
	UNII-3	14.0	13.0	14.0	13.0	14.0	13.0	14.0	13.0
	UNII-4	14.0	13.0	14.0	13.0	14.0	13.0	14.0	13.0
5 GHz WIFI (40MHz BW)	UNII-1			14.0	13.0	14.0	13.0	14.0	13.0
	UNII-2A			14.0	13.0	14.0	13.0	14.0	13.0
	UNII-2C			14.0	13.0	14.0	13.0	14.0	13.0
	UNII-3			14.0	13.0	14.0	13.0	14.0	13.0
	UNII-4			14.0	13.0	14.0	13.0	14.0	13.0
5 GHz WIFI (80MHz BW)	UNII-1					14.0	13.0	14.0	13.0
	UNII-2A					14.0	13.0	14.0	13.0
	UNII-2C					14.0	13.0	14.0	13.0
	UNII-3					14.0	13.0	14.0	13.0
	UNII-4					14.0	13.0	14.0	13.0
5 GHz WIFI (160MHz BW)	UNII-1/2A					14.0	13.0	14.0	13.0
	UNII-2C					14.0	13.0	14.0	13.0
	UNII-3/4					14.0	13.0	14.0	13.0

The below table is applicable in the following conditions:

- RCV Active during simultaneous conditions with 2.4 GHz WLAN
- RCV Active during simultaneous conditions with 5G FR1 NR and 2.4 GHz WLAN

Mode	Band	IEEE 802.11 (in dBm)							
		MIMO							
		a (CDD + STBC)		n (CDD+STBC, SDM)		ac (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	UNII-1	12.0	11.0	12.0	11.0	12.0	11.0	12.0	11.0
	UNII-2A	12.0	11.0	12.0	11.0	12.0	11.0	12.0	11.0
	UNII-2C	12.0	11.0	12.0	11.0	12.0	11.0	12.0	11.0
	UNII-3	12.0	11.0	12.0	11.0	12.0	11.0	12.0	11.0
	UNII-4	12.0	11.0	12.0	11.0	12.0	11.0	12.0	11.0
5 GHz WIFI (40MHz BW)	UNII-1			12.0	11.0	12.0	11.0	12.0	11.0
	UNII-2A			12.0	11.0	12.0	11.0	12.0	11.0
	UNII-2C			12.0	11.0	12.0	11.0	12.0	11.0
	UNII-3			12.0	11.0	12.0	11.0	12.0	11.0
	UNII-4			12.0	11.0	12.0	11.0	12.0	11.0
5 GHz WIFI (80MHz BW)	UNII-1					12.0	11.0	12.0	11.0
	UNII-2A					12.0	11.0	12.0	11.0
	UNII-2C					12.0	11.0	12.0	11.0
	UNII-3					12.0	11.0	12.0	11.0
	UNII-4					12.0	11.0	12.0	11.0
5 GHz WIFI (160MHz BW)	UNII-1/2A					12.0	11.0	12.0	11.0
	UNII-2C					12.0	11.0	12.0	11.0
	UNII-3/4					12.0	11.0	12.0	11.0

1.4.6 2.4 GHz Maximum Bluetooth Output Power

Mode	Antenna 1		Antenna 2	
	Max	Nom	Max	Nom
Bluetooth (in dBm)	15.5	14.5	15.5	14.5
Bluetooth EDR (in dBm)	12.5	11.5	12.0	11.0
Bluetooth LE 1/2Mbps (in dBm)	8.0	7.0	8.0	7.0
Bluetooth LE 125/500 kbps (in dBm)	8.0	7.0		

1.4.7 2.4 GHz Reduced Bluetooth Output Power

The below table is applicable in the following conditions:

- RCV active

Mode	Antenna 1		Antenna 2	
	Max	Nom	Max	Nom
Bluetooth (in dBm)	11.0	10.0	11.0	10.0
Bluetooth EDR (in dBm)	11.0	10.0	11.0	10.0
Bluetooth LE 1/2Mbps (in dBm)	8.0	7.0	8.0	7.0
Bluetooth LE 125/500 kbps (in dBm)	8.0	7.0		

1.5 DUT Antenna Locations

The overall dimensions of this device are > 9 x 5 cm. A diagram showing the location of the device antennas can be found in DUT Antenna Diagram & SAR Test Setup Photographs Appendix. Since the display diagonal dimension of this device is > 150 mm and <200 mm, it is considered a "phablet." Exact antenna dimensions and separation distances are shown in the Technical Descriptions in the FCC filing.

Table 1-1
Device Edges/Sides for SAR Testing

Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
LTE Band 12	Yes	Yes	No	Yes	Yes	Yes
LTE Band 13	Yes	Yes	No	Yes	Yes	Yes
LTE Band 26 (Cell)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 5 (Cell)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 66 (AWS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 2 (PCS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 41 Antenna B	Yes	Yes	No	Yes	No	Yes
NR Band n5 (Cell)	Yes	Yes	No	Yes	Yes	Yes
NR Band n41 Antenna F	Yes	Yes	Yes	No	No	Yes
2.4 GHz WLAN Ant 2	Yes	Yes	Yes	No	Yes	No
2.4 GHz WLAN MIMO	Yes	Yes	Yes	No	Yes	Yes
5 GHz WLAN MIMO	Yes	Yes	Yes	No	Yes	Yes
Bluetooth Ant 1	Yes	Yes	Yes	No	No	Yes
Bluetooth Ant 2	Yes	Yes	Yes	No	Yes	No
NFC	Yes	Yes	No	No	Yes	Yes

Note: Particular DUT edges were not required to be evaluated for wireless router SAR or phablet SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v02r01 Section III and FCC KDB Publication 648474 D04v01r03. The distances between the transmit antennas and the edges of the device are included in the filing. When wireless router mode is enabled, U-NII-1, U-NII-2A, U-NII-2C, U-NII-4, and WIFI6E operations are disabled.

1.6 Near Field Communications (NFC) Antenna

This DUT has NFC operations. The NFC antenna is integrated into the device for this model. Therefore, all SAR tests were performed with the device which already incorporates the NFC antenna. A diagram showing the location of the NFC antenna can be found in DUT Antenna Diagram & SAR Test Setup Photographs Appendix.

1.7 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D04v01, transmitters are considered to be operating simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D04v01 procedures.

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Phablet	Notes
1	GSM voice + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
2	GSM voice + 2.4 GHz Bluetooth Ant 2	Yes	Yes	N/A	Yes	
3	GSM voice + 2.4 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
4	GSM voice + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
5	GSM voice + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
6	GSM voice + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
7	GSM voice + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
8	GSM voice + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
9	GSM voice + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
10	GSM voice + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
11	GSM voice + 2.4 GHz Bluetooth Ant 1 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
12	GSM voice + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
13	GSM voice + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
14	GSM voice + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
15	UMTS + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
16	UMTS + 2.4 GHz Bluetooth Ant 2	Yes	Yes	Yes	Yes	
17	UMTS + 2.4 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
18	UMTS + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
19	UMTS + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
20	UMTS + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
21	UMTS + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
22	UMTS + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
23	UMTS + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
24	UMTS + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
25	UMTS + 2.4 GHz Bluetooth Ant 1 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
26	UMTS + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
27	UMTS + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
28	UMTS + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
29	LTE + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
30	LTE + 2.4 GHz Bluetooth Ant 2	Yes	Yes	Yes	Yes	
31	LTE + 2.4 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
32	LTE + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
33	LTE + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
34	LTE + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
35	LTE + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
36	LTE + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
37	LTE + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
38	LTE + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
39	LTE + 2.4 GHz Bluetooth Ant 1 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
40	LTE + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
41	LTE + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
42	LTE + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
43	LTE + NR	Yes	Yes	N/A	Yes	
44	LTE + NR + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
45	LTE + NR + 2.4 GHz Bluetooth Ant 2	Yes	Yes	Yes	Yes	
46	LTE + NR + 2.4 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
47	LTE + NR + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
48	LTE + NR + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
49	LTE + NR + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
50	LTE + NR + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
51	LTE + NR + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
52	LTE + NR + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
53	LTE + NR + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
54	LTE + NR + 2.4 GHz Bluetooth Ant 1 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
55	LTE + NR + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
56	LTE + NR + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
57	LTE + NR + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
58	GPRS/EDGE + 2.4 GHz Bluetooth Ant 1	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
59	GPRS/EDGE + 2.4 GHz Bluetooth Ant 2	N/A	N/A	Yes	Yes	
60	GPRS/EDGE + 2.4 GHz WLAN MIMO	N/A	N/A	Yes	Yes	
61	GPRS/EDGE + 5 GHz WLAN MIMO	N/A	N/A	Yes	Yes	
62	GPRS/EDGE + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
63	GPRS/EDGE + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	N/A	N/A	Yes	Yes	
64	GPRS/EDGE + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
65	GPRS/EDGE + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
66	GPRS/EDGE + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN MIMO	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
67	GPRS/EDGE + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	N/A	N/A	Yes	Yes	
68	GPRS/EDGE + 2.4 GHz Bluetooth Ant 1 + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
69	GPRS/EDGE + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
70	GPRS/EDGE + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
71	GPRS/EDGE + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 2 + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	

1. No other simultaneous scenarios besides described above is supported for this model.
2. When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario.
3. Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, there are no simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table.
4. 5 GHz Wireless Router is only supported for the U-NII-3 by S/W, therefore U-NII-1, U-NII-2A, U-NII-2C, and U-NII-4 were not evaluated for wireless router conditions.
5. 6 GHz Wireless Router is not supported, therefore it was not evaluated for wireless router conditions.
6. This device supports 2x2 MIMO Tx for WLAN 802.11a/b/g/n/ac/ax. 802.11a/b/g/n/ac/ax supports CDD and STBC and 802.11n/ac/ax additionally supports SDM.
7. This device supports VoWIFI.
8. This device supports Bluetooth Tethering on Ant 1 only.
9. This device supports VoLTE.
10. LTE + 5G NR FR1 Scenarios are limited to EN-DC combinations with anchor bands as shown in the NR FR1 checklist.
11. NFC were evaluated for phablet based on expected usage conditions.

1.8 Miscellaneous SAR Test Considerations

(A) WIFI/BT

This device supports channel 1-13 for 2.4 GHz WLAN. However, because channel 12/13 targets are not higher than that of channels 1-11, channels 1, 6, 11 were considered for SAR testing per FCC KDB 248227 D01V02r02.

Since U-NII-1 and U-NII-2A bands have the same maximum output power and the highest reported SAR for U-NII-2A is less than 1.2 W/kg, SAR is not required for U-NII-1 band according to FCC KDB Publication 248227 D01v02r02.

Since Wireless Router operations are not allowed by the chipset firmware using U-NII-1, U-NII-2A, U-NII-2C, and U-NII-4 WIFI, only 2.4 GHz WIFI, 2.4 GHz Bluetooth, and U-NII-3 WIFI Hotspot SAR tests and combinations are considered for SAR with respect to Wireless Router configurations according to FCC KDB 941225 D06v02r01.

This device supports IEEE 802.11ax with the following features:

a) Up to 160 MHz Bandwidth only for 5/6 GHz
b) Up to 20 MHz Bandwidth only for 2.4 GHz
c) 2 Tx antenna output
d) Up to 1024 QAM is supported
e) TDWR and Band gap channels are supported for 5/6 GHz
f) MU-MIMO UL Operations are not supported

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the display diagonal dimension is greater than 150mm and less than 200mm. Phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg. Because wireless router operations are not supported for U-NII-1, U-NII-2A, U-NII-2C, and U-NII-4 WLAN, phablet SAR tests were performed. Phablet SAR was not evaluated for 2.4 GHz WLAN, 2.4 GHz Bluetooth, and U-NII-3 WLAN operations since wireless router 1g SAR was < 1.2 W/kg.

Per April 2019 TCB Workshop Notes, SAR testing was not required for 802.11ax when applying the initial test configuration procedures of KDB 248227, with 802.11ax considered a higher order 802.11 mode.

This device supports 6 GHz WIFI Operations. RF Exposure assessment for these bands can be found in the WIFI 6E RF Exposure Report (report SN can be found in Section 1.11 – Bibliography). Simultaneous transmission analysis is addressed in Multi-Tx and Antenna SAR Considerations Appendix of this report.

(B) Licensed Transmitter(s)

GSM/GPRS/EDGE DTM is not supported for US bands. Therefore, the GSM Voice modes in this report do not transmit simultaneously with GPRS/EDGE Data.

This device is only capable of QPSK HSUPA in the uplink. Therefore, no additional SAR tests are required beyond that described for devices with HSUPA in KDB 941225 D01v03r01.

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth; and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02r04.

This device supports LTE Carrier Aggregation (CA) in the downlink. All uplink communications are identical to Release 8 specifications. Per FCC KDB Publication 941225 D05A v01r02, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive. The downlink carrier aggregation exclusion analysis can be found in Downlink LTE CA RF Conducted Powers Appendix.

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the display diagonal dimension is greater than 150mm and less than 200mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.

This device supports downlink 4x4 MIMO operations for some LTE Bands. Per May 2017 TCB Workshop Notes, SAR for 4x4 DL MIMO was not needed since the maximum average output power in 4x4 DL MIMO mode was not more than 0.25 dB higher than the maximum output power with 4x4 DL MIMO inactive. Additionally, SAR for 4x4 MIMO Downlink Carrier Aggregation was not needed since the maximum average output power in 4x4 MIMO Downlink Carrier Aggregation mode was not more than 0.25 dB higher than the maximum output power with 4x4 MIMO Downlink and downlink carrier aggregation inactive.

This device supports LTE/NR capabilities with overlapping transmission frequency ranges. When the supported frequency range of an LTE/NR Band falls completely within an LTE/NR band with a larger transmission frequency range, both LTE/NR bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and both LTE/NR bands share the same transmission path and signal characteristics, SAR was only assessed for the band with the larger transmission frequency range.

This device supports LTE Carrier Aggregation (CA) for LTE Band 41 with two component carriers in the uplink. SAR Measurements and conducted powers were evaluated per 2017 Fall TCB Workshop Notes.

NR implementation supports NSA mode. In EN-DC mode, NR operates with the LTE Bands shown in the NR FR1 checklist acting as anchor bands. Per FCC guidance, SAR tests for NR Bands and LTE Anchors Bands were performed separately due to limitations in SAR probe calibration factors.

1.9 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r05, D05Av01r02, D06v02r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D04v01 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 648474 D04v01r03 (Phablet Procedures)
- FCC KDB Publication 616217 D04v01r02 (Proximity Sensor)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)
- May 2017 TCB Workshop Notes (LTE 4x4 Downlink MIMO)
- November 2017, April 2018, October 2018 TCB Workshop Notes (LTE Carrier Aggregation)
- April 2019 TCB Workshop Notes (IEEE 802.11ax, Dynamic Antenna Tuning)

1.10 Device Serial Numbers

Several samples with identical hardware were used to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units. The serial numbers used for each test are indicated alongside the results in Section 11.

1.11 Bibliography

Report Type	Report Serial Number
RF Exposure Part 2 Test Report	1M2212080136-16.A3L
RF Exposure Compliance Summary Report	1M2212080136-23.A3L
RF Exposure Part 0 Test Report	1M2212080136-20.A3L
WIFI 6GHz RF Exposure	1M2212080136-21.A3L

2 LTE AND NR INFORMATION

LTE Information					
Form Factor	Portable Handset				
	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 13 (779.5 - 784.5 MHz)				
	LTE Band 26 (Cell) (814.7 - 848.3 MHz)				
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)				
	LTE Band 66 (AWS) (1710.7 - 1779.3 MHz)				
	LTE Band 4 (AWS) (1710.7 - 1754.3 MHz)				
	LTE Band 2 (PCS) (1850.7 - 1909.3 MHz)				
	LTE Band 41 (2498.5 - 2687.5 MHz)				
	LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 13: 5 MHz, 10 MHz				
	LTE Band 26 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz				
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 66 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 41: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
Channel Numbers and Frequencies (MHz)	Low	Low-Mid	Mid	Mid-High	High
LTE Band 12: 1.4 MHz	699.7 (23017)		707.5 (23095)	715.3 (23173)	
LTE Band 12: 3 MHz	700.5 (23025)		707.5 (23095)	714.5 (23165)	
LTE Band 12: 5 MHz	701.5 (23035)		707.5 (23095)	713.5 (23155)	
LTE Band 12: 10 MHz	704 (23060)		707.5 (23095)	711 (23130)	
LTE Band 13: 5 MHz	779.5 (23205)		782 (23230)	784.5 (23255)	
LTE Band 13: 10 MHz	N/A		782 (23230)	N/A	
LTE Band 26 (Cell): 1.4 MHz	814.7 (26697)		831.5 (26865)	848.3 (27033)	
LTE Band 26 (Cell): 3 MHz	815.5 (26705)		831.5 (26865)	847.5 (27025)	
LTE Band 26 (Cell): 5 MHz	816.5 (26715)		831.5 (26865)	846.5 (27015)	
LTE Band 26 (Cell): 10 MHz	819 (26740)		831.5 (26865)	844 (26990)	
LTE Band 26 (Cell): 15 MHz	821.5 (26765)		831.5 (26865)	841.5 (26965)	
LTE Band 5 (Cell): 1.4 MHz	824.7 (20407)		836.5 (20525)	848.3 (20643)	
LTE Band 5 (Cell): 3 MHz	825.5 (20415)		836.5 (20525)	847.5 (20635)	
LTE Band 5 (Cell): 5 MHz	826.5 (20425)		836.5 (20525)	846.5 (20625)	
LTE Band 5 (Cell): 10 MHz	829 (20450)		836.5 (20525)	844 (20600)	
LTE Band 66 (AWS): 1.4 MHz	1710.7 (131979)		1745 (132322)	1779.3 (132665)	
LTE Band 66 (AWS): 3 MHz	1711.5 (131987)		1745 (132322)	1778.5 (132657)	
LTE Band 66 (AWS): 5 MHz	1712.5 (131997)		1745 (132322)	1777.5 (132647)	
LTE Band 66 (AWS): 10 MHz	1715 (132022)		1745 (132322)	1775 (132622)	
LTE Band 66 (AWS): 15 MHz	1717.5 (132047)		1745 (132322)	1772.5 (132597)	
LTE Band 66 (AWS): 20 MHz	1720 (132072)		1745 (132322)	1770 (132572)	
LTE Band 4 (AWS): 1.4 MHz	1710.7 (19957)		1732.5 (20175)	1754.3 (20393)	
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)		1732.5 (20175)	1753.5 (20385)	
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)		1732.5 (20175)	1752.5 (20375)	
LTE Band 4 (AWS): 10 MHz	1715 (20000)		1732.5 (20175)	1750 (20350)	
LTE Band 4 (AWS): 15 MHz	1717.5 (20025)		1732.5 (20175)	1747.5 (20325)	
LTE Band 4 (AWS): 20 MHz	1720 (20050)		1732.5 (20175)	1745 (20300)	
LTE Band 2 (PCS): 1.4 MHz	1850.7 (18607)		1880 (18900)	1909.3 (19193)	
LTE Band 2 (PCS): 3 MHz	1851.5 (18615)		1880 (18900)	1908.5 (19185)	
LTE Band 2 (PCS): 5 MHz	1852.5 (18625)		1880 (18900)	1907.5 (19175)	
LTE Band 2 (PCS): 10 MHz	1855 (18650)		1880 (18900)	1905 (19150)	
LTE Band 2 (PCS): 15 MHz	1857.5 (18675)		1880 (18900)	1902.5 (19125)	
LTE Band 2 (PCS): 20 MHz	1860 (18700)		1880 (18900)	1900 (19100)	
LTE Band 41: 5 MHz	2506 (39750)	2549.5 (40185)	2549.5 (40185)	2593 (40620)	2636.5 (41055)
LTE Band 41: 10 MHz	2506 (39750)	2549.5 (40185)	2549.5 (40185)	2593 (40620)	2636.5 (41055)
LTE Band 41: 15 MHz	2506 (39750)	2549.5 (40185)	2549.5 (40185)	2593 (40620)	2636.5 (41055)
LTE Band 41: 20 MHz	2506 (39750)	2549.5 (40185)	2549.5 (40185)	2593 (40620)	2636.5 (41055)
UE Category	DL UE Cat 20, UL UE Cat 13				
Modulations Supported in UL	QPSK, 16QAM, 64QAM				
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	YES				
A-MPR (Additional MPR) disabled for SAR Testing?	YES				
LTE Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations				
LTE Additional Information	This device does not support full CA features on 3GPP Release 16. It supports carrier aggregation and downlink MIMO features as shown in the RF Conducted Powers section of this report and the Downlink LTE CA RF Conducted Powers Appendix. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. The following LTE Release 16 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, WIFI Offloading, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

NR Information					
Form Factor	Portable Handset				
Frequency Range of each NR transmission band	NR Band n5 (826.5 - 846.5 MHz)				
	NR Band n41 (2501.01 - 2685 MHz)				
Channel Bandwidths	NR Band n5: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	NR Band n41: 10 MHz, 15 MHz, 20 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz, 70 MHz, 80 MHz, 90 MHz, 100 MHz				
Channel Numbers and Frequencies (MHz)					
NR Band n5: 5 MHz	826.5 (165300)		836.5 (167300)	846.5 (169300)	
NR Band n5: 10 MHz	829 (165800)		836.5 (167300)	844 (168800)	
NR Band n5: 15 MHz	831.5 (166300)		836.5 (167300)	841.5 (168300)	
NR Band n5: 20 MHz	834 (166800)		836.5 (167300)	839 (167800)	
NR Band n41: 10 MHz	2501.01 (500202)	2547 (509400)	2592.99 (518598)	2639.01 (527802)	2685 (537000)
NR Band n41: 15 MHz	2503.5 (500700)	2548.26 (509652)	2592.99 (518598)	2637.75 (527550)	2682.51 (536502)
NR Band n41: 20 MHz	2506.02 (501204)	2549.49 (509898)	2592.99 (518598)	2636.49 (527298)	2679.99 (535998)
NR Band n41: 30 MHz	2511 (502200)	2552.01 (510402)	2592.99 (518598)	2634 (526800)	2674.98 (534996)
NR Band n41: 40 MHz	2516.01 (503202)	2567.34 (513468)	N/A	2618.67 (523734)	2670 (534000)
NR Band n41: 50 MHz	2521.02 (504204)		2592.99 (518598)	2664.99 (532998)	
NR Band n41: 60 MHz	2526 (505200)		2592.99 (518598)	2659.98 (531996)	
NR Band n41: 70 MHz	2531.01 (506202)		N/A	2655 (531000)	
NR Band n41: 80 MHz	2536.02 (507204)		N/A	2649.99 (529998)	
NR Band n41: 90 MHz	2541 (508200)		N/A	2644.98 (528996)	
NR Band n41: 100 MHz	2546.01 (509202)		2592.99 (518598)	2640 (528000)	
SCS for NR Band n5	15 kHz				
SCS for NR Band n41	30 kHz				
Modulations Supported in UL	DFT-s-OFDM: π/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM				
A-MPR (Additional MPR) disabled for SAR Testing?	YES				
EN-DC Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations				
LTE Anchor Bands for NR Band n5	LTE Band 66/2				
LTE Anchor Bands for NR Band n41	LTE Band 66				

3 INTRODUCTION

The FCC and Innovation, Science, and Economic Development Canada have adopted the guidelines for evaluating the environmental effects of radio frequency (RF) radiation in ET Docket 93-62 on Aug. 6, 1996 and Health Canada Safety Code 6 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices. [1]

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [3] and Health Canada RF Exposure Guidelines Safety Code 6 [22]. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave [4] is used for guidance in measuring the Specific Absorption Rate (SAR) due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the International Committee for Non-Ionizing Radiation Protection (ICNIRP) in Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," Report No. Vol 74. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

3.1 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Equation 3-1).

Equation 3-1
SAR Mathematical Equation

$$SAR = \frac{d}{dt}\left(\frac{dU}{dm}\right) = \frac{d}{dt}\left(\frac{dU}{\rho dv}\right)$$

SAR is expressed in units of Watts per Kilogram (W/kg).

$$SAR = \frac{\sigma \cdot E^2}{\rho}$$

where:

σ = conductivity of the tissue-simulating material (S/m)
ρ = mass density of the tissue-simulating material (kg/m^3)
E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relation to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.[6]

4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013:

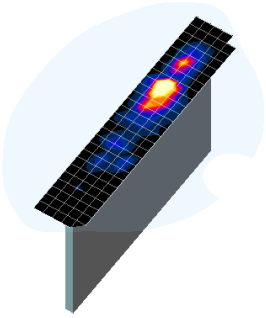


Figure 4-1
Sample SAR Area Scan

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013.
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):

   a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 4-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).

   b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.

   c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

Table 4-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

Frequency	Maximum Area Scan Resolution (mm) (Δx_{area}, Δy_{area})	Maximum Zoom Scan Resolution (mm) (Δx_{zoom}, Δy_{zoom})	Maximum Zoom Scan Spatial Resolution (mm)			Minimum Zoom Scan Volume (mm) (x,y,z)
			Uniform Grid	Graded Grid		
			$\Delta z_{zoom}(n)$	$\Delta z_{zoom}(1)$*	$\Delta z_{zoom}(n>1)$*	
≤ 2 GHz	≤ 15	≤ 8	≤ 5	≤ 4	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 30
2-3 GHz	≤ 12	≤ 5	≤ 5	≤ 4	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 30
3-4 GHz	≤ 12	≤ 5	≤ 4	≤ 3	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 28
4-5 GHz	≤ 10	≤ 4	≤ 3	≤ 2.5	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 25
5-6 GHz	≤ 10	≤ 4	≤ 2	≤ 2	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 22

*Also compliant to IEEE 1528-2013 Table 6

5 DEFINITION OF REFERENCE POINTS

5.1 EAR REFERENCE POINT

Figure 5-2 shows the front, back and side views of the SAM Twin Phantom. The point "M" is the reference point for the center of the mouth, "LE" is the left ear reference point (ERP), and "RE" is the right ERP. The ERP is 15mm posterior to the entrance to the ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 5-1. The plane passing through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck-Front), also called the Reference Pivoting Line, is not perpendicular to the reference plane (see Figure 5-1). Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning [5].

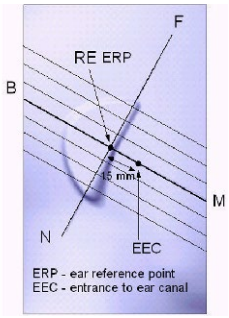


Figure 5-1
Close-Up Side view of ERP

5.2 HANDSET REFERENCE POINTS

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed in a normal operating position with the acoustic output located along the "vertical centerline" on the front of the device aligned to the "ear reference point" (See Figure 5-3). The acoustic output was than located at the same level as the center of the ear reference point. The test device was positioned so that the "vertical centerline" was bisecting the front surface of the handset at its top and bottom edges, positioning the "ear reference point" on the outer surface of the both the left and right head phantoms on the ear reference point.

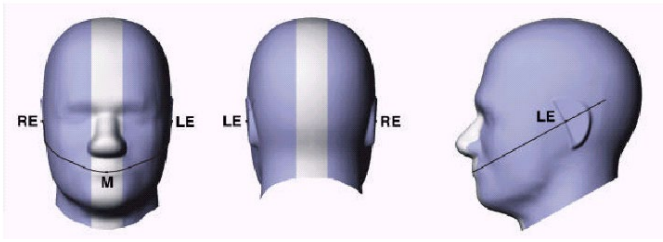


Figure 5-2
Front, back and side view of SAM Twin Phantom

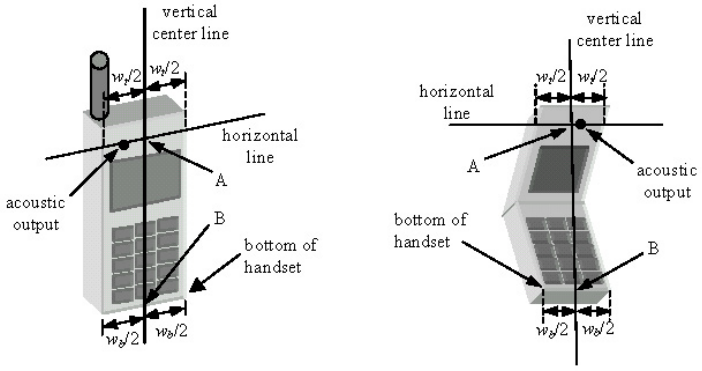


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

6 TEST CONFIGURATION POSITIONS

6.1 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameters: relative permittivity ε = 3 and loss tangent δ = 0.02.

6.2 Positioning for Cheek

1. The test device was positioned with the device close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 6-1), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.

Figure 6-1 Front, Side and Top View of Cheek Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the pinna.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the reference plane.
4. The phone was then rotated around the vertical centerline until the phone (horizontal line) was symmetrical was respect to the line NF.
5. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the device contact with the ear, the device was rotated about the NF line until any point on the handset made contact with a phantom point below the ear (cheek) (See Figure 6-2).

6.3 Positioning for Ear / 15º Tilt

With the test device aligned in the “Cheek Position”:

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15degrees.
2. The phone was then rotated around the horizontal line by 15 degrees.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the handset touched the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. In this situation, the tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 6-2).

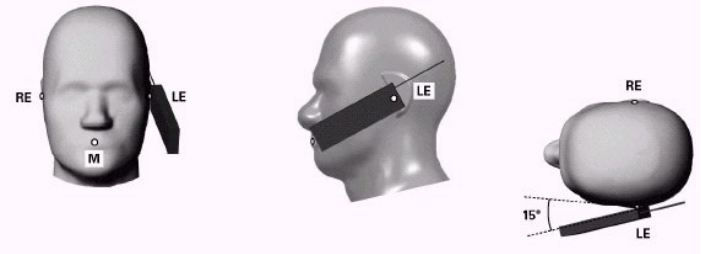


Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

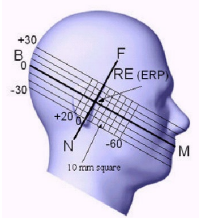


Figure 6-3
Side view w/ relevant markings

6.4 SAR Evaluations near the Mouth/Jaw Regions of the SAM Phantom

Antennas located near the bottom of a phone may require SAR measurements around the mouth and jaw regions of the SAM head phantom. This typically applies to clam-shell style phones that are generally longer in the unfolded normal use positions or to certain older style long rectangular phones. Per IEEE 1528-2013, a rotated SAM phantom is necessary to allow probe access to such regions. Both SAM heads of the TwinSAM-Chin20 are rotated 20 degrees around the NF line. Each head can be removed from the table for emptying and cleaning.

Under these circumstances, the following procedures apply, adopted from the FCC guidance on SAR handsets document FCC KDB Publication 648474 D04v01r03. The SAR required in these regions of SAM should be measured using a flat phantom. The phone should be positioned with a separation distance of 4 mm between the ear reference point (ERP) and the outer surface of the flat phantom shell. While maintaining this distance at the ERP location, the low (bottom) edge of the phone should be lowered from the phantom to establish the same separation distance between the peak SAR location identified by the truncated partial SAR distribution measured with the SAM phantom. The distance from the peak SAR location to the phone is determined by the straight line passing perpendicularly through the phantom surface. When it is not feasible to maintain 4 mm separation at the ERP while also establishing the required separation at the peak SAR location, the top edge of the phone will be allowed to touch the phantom with a separation < 4 mm at the ERP. The phone should not be tilted to the left or right while placed in this inclined position to the flat phantom.

6.5 Body-Worn Accessory Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 6-4). Per FCC KDB Publication 648474 D04v01r03, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D04v01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a 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.

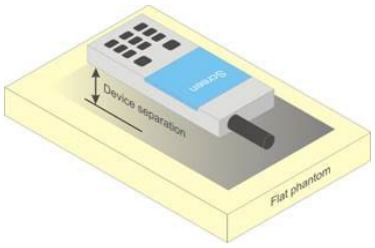


Figure 6-4
Sample Body-Worn Diagram

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not

contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented.
Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

6.6 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1g body and 10g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D04v01 should be applied to determine SAR test requirements.

Per KDB Publication 447498 D04v01, Cell phones (handsets) are not normally designed to be used on extremities or operated in extremity only exposure conditions. The maximum output power levels of handsets generally do not require extremity SAR testing to show compliance. Therefore, extremity SAR was not evaluated for this device.

6.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v02r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D04v01 procedures. The "Portable Hotspot" feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

6.8 Phablet Configurations

For smart phones with a display diagonal dimension > 150 mm or an overall diagonal dimension > 160 mm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that

support voice calls next to the ear, the phablets procedures outlined in KDB Publication 648474 D04v01r03 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worn accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna <=25 mm from that surface or edge, in direct contact with the phantom, for 10g SAR. The UMPC mini-tablet 1g SAR at 5 mm is not required. When hotspot mode applies, 10g SAR is required only for the surfaces and edges with hotspot mode 1g SAR > 1.2 W/kg.

6.9 Proximity Sensor Considerations

This device uses a power reduction mechanism to reduce output powers in certain use conditions when the device is used close the user's body.

When the device's antenna is within a certain distance of the user, the sensor activates and reduces the maximum allowed output power. However, the sensor is not active when the device is moved beyond the sensor triggering distance and the maximum output power is no longer limited. Therefore, additional evaluation is needed in the vicinity of the triggering distance to ensure SAR is compliant when the device is allowed to operate at a non-reduced output power level. FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device at these additional test positions. Sensor triggering distance summary data is included in Power Reduction Verification Appendix.

The sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the sensor entirely covers the antennas.

7 RF EXPOSURE LIMITS

7.1 Uncontrolled Environment

UNCONTROLLED ENVIRONMENTS are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

7.2 Controlled Environment

CONTROLLED ENVIRONMENTS are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Table 7-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT *General Population* (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT *Occupational* (W/kg) or (mW/g)
Peak Spatial Average SAR Head	1.6	8.0
Whole Body SAR	0.08	0.4
Peak Spatial Average SAR Hands, Feet, Ankle, Wrists, etc.	4.0	20

1. The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
2. The Spatial Average value of the SAR averaged over the whole body.
3. The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

8 FCC MEASUREMENT PROCEDURES

Power measurements for licensed transmitters are performed using a base station simulator under digital average power.

8.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D04v01, when SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as *reported* SAR. The highest *reported* SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

8.2 3G SAR Test Reduction Procedure

In FCC KDB Publication 941225 D01v03r01, certain transmission modes within a frequency band and wireless mode evaluated for SAR are defined as primary modes. The equivalent modes considered for SAR test reduction are denoted as secondary modes. When the maximum output power including tune-up tolerance specified for production units in a secondary mode is ≤ 0.25 dB higher than the primary mode or when the highest reported SAR of the primary mode, scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode, is ≤ 1.2 W/kg, SAR measurements are not required for the secondary mode. These criteria are referred to as the 3G SAR test reduction procedure. When the 3G SAR test reduction procedure is not satisfied, SAR measurements are additionally required for the secondary mode.

8.3 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D01v03r01 “3G SAR Measurement Procedures.”

The device is placed into a simulated call using a base station simulator in a RF shielded chamber. Establishing connections in this manner ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. Devices under test are evaluated prior to testing, with a fully charged battery and were configured to operate at maximum output power. In order to verify that the device is tested throughout the SAR test at maximum output power, the SAR measurement system measures a “point SAR” at an arbitrary reference point at the start and end of the 1 gram SAR evaluation, to assess for any power drifts during the evaluation. If the power drift deviates by more than 5%, the SAR test and drift measurements are repeated.

8.4 SAR Measurement Conditions for UMTS

8.4.1 Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC with TPC (transmit power control) set to all “1s” or applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HS-DPCCH etc) are tabulated in this test report. All configurations that are not supported by the DUT or cannot be measured due to technical or equipment limitations are identified.

8.4.2 Head SAR Measurements

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR in 3.4 kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure.

8.4.3 Body SAR Measurements

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits all "1s". The 3G SAR test reduction procedure is applied to other spreading codes and multiple $DPDCH_n$ configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using an applicable RMC configuration with the corresponding spreading code or $DPDCH_n$, for the highest reported SAR configuration in 12.2 kbps RMC.

8.4.4 SAR Measurements with Rel 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, for the highest reported SAR configuration in 12.2 kbps RMC without HSDPA. Handsets with both HSDPA and HSUPA are tested according to Release 6 HSPA test procedures.

8.4.5 SAR Measurements with Rel 6 HSUPA

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA.

When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing.

8.4.6 SAR Measurement Conditions for DC-HSDPA

SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

8.5 SAR Measurement Conditions for LTE

LTE modes are tested according to FCC KDB 941225 D05v02r04 publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 or Anritsu MT8820C simulators are used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

8.5.1 Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

8.5.2 MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

8.5.3 A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

8.5.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r04:

a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
    i. The required channel and offset combination with the highest maximum output power is required for SAR.
    ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
    iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.
b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.
c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.
d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sections 5.2.1 through 5.2.3 is less than or equal to ½ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is <1.45 W/kg.

8.5.5 TDD

LTE TDD testing is performed using the SAR test guidance provided in FCC KDB 941225 D05v02r04. TDD is tested at the highest duty factor using UL-DL configuration 0 with special subframe configuration 6 and applying the FDD LTE procedures in KDB 941225 D05v02r04. SAR testing is performed using the extended cyclic prefix listed in 3GPP TS 36.211 Section 4.

8.5.6 Downlink Only Carrier Aggregation

Conducted power measurements with LTE Carrier Aggregation (CA) (downlink only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to specifications when downlink

carrier aggregation is inactive on the PCC. Additional conducted output powers are measured with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band. Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for downlink only carrier aggregation configurations when the average output power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive.

8.6 SAR Testing with 802.11 Transmitters

The normal network operating configurations of 802.11 transmitters are not suitable for SAR measurements. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 D01v02r02 for more details.

8.6.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters.

A periodic duty factor is required for current generation SAR systems to measure SAR. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

8.6.2 U-NII-1 and U-NII-2A

For devices that operate in both U-NII-1 and U-NII-2A bands, when the same maximum output power is specified for both bands, SAR measurement using OFDM SAR test procedures is not required for U-NII-1 unless the highest reported SAR for U-NII-2A is > 1.2 W/kg. When different maximum output powers are specified for the bands, SAR measurement for the U-NII band with the lower maximum output power is not required unless the highest reported SAR for the U-NII band with the higher maximum output power, adjusted by the ratio of lower to higher specified maximum output power for the two bands, is > 1.2 W/kg. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.6.3 U-NII-2C and U-NII-3

The frequency range covered by U-NII-2C and U-NII-3 is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification. Unless band gap channels are permanently disabled, SAR must be considered for these channels. Each band is tested independently according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

8.6.4 Initial Test Position Procedure

For exposure conditions with multiple test positions, such as handset operating next to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.6.5 2.4 GHz SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either the fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.

2) When the reported SAR is > 0.8 W/kg, SAR is required for that position using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11 g/n/ax OFDM are additionally evaluated for SAR if the highest reported SAR for 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power, is > 1.2 W/kg. When SAR is required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.6.6 OFDM Transmission Mode and SAR Test Channel Selection

When the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11a, 802.11n and 802.11ac or 802.11g and 802.11n with the same channel bandwidth, modulation and data rate etc., the lower order 802.11 mode i.e., 802.11a, then 802.11n and 802.11ac or 802.11g then 802.11n, is used for SAR measurement. Per April 2019 TCB Workshop guidance, 802.11ax was considered the highest order 802.11 mode. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

8.6.7 Initial Test Configuration Procedure

For OFDM, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order IEEE 802.11 mode. The channel of the transmission mode with the highest average RF output conducted power will be the initial test configuration.

When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤ 1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurements (See Section 8.6.6). When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.6.8 Subsequent Test Configuration Procedures

For OFDM configurations in each frequency band and aggregated band, SAR is evaluated for initial test configuration using the fixed test position or the initial test position procedure. When the highest reported SAR (for the initial test configuration), adjusted by the ratio of the specified maximum output power of the subsequent test configuration to initial test configuration, is ≤ 1.2 W/kg, no additional SAR tests for the subsequent test configurations are required. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.6.9 MIMO SAR considerations

Per KDB Publication 248227 D01v02r02, the simultaneous SAR provisions in KDB Publication 447498 D04v01 should be applied to determine simultaneous transmission SAR test exclusion for WIFI MIMO. If the sum of 1g single transmission chain SAR measurements is <1.6 W/kg, no additional SAR measurements for MIMO are required. Alternatively, SAR for MIMO can be measured with all antennas transmitting simultaneously at the specified maximum output power of MIMO operation. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

9 RF CONDUCTED POWERS

All conducted power measurements for Sub6 WWAN technologies and bands in this section were performed by setting *Reserve_power_margin* (Qualcomm® Smart Transmit EFS entry) to 0dB, so that the EUT transmits continuously at minimum (P_{limit}, maximum tune up output power P_{max}).

9.1 GSM Conducted Powers

Table 9-1
Measured P_{max} for all DSI for GSM 850

Maximum Burst-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	31.78	31.75	**30.94**	29.12	27.36	26.02	24.86	23.11	22.05
	190	31.80	31.43	**31.05**	29.29	27.28	26.47	24.91	22.90	21.93
	251	32.02	31.74	**30.95**	28.91	27.31	26.54	25.17	22.94	21.85

Calculated Maximum Frame-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	22.58	22.55	**24.75**	24.69	24.18	16.82	18.67	18.68	18.87
	190	22.60	22.23	**24.86**	24.86	24.10	17.27	18.72	18.47	18.75
	251	22.82	22.54	**24.76**	24.48	24.13	17.34	18.98	18.51	18.67
GSM 850	**Frame Avg.Targets:**	22.80	22.80	**25.31**	24.57	23.82	17.30	18.81	18.57	18.82

Table 9-2
Measured P_{limit} for DSI = 0 (Body-worn or Phablet with grip sensor inactive), DSI = 1 (Phablet with grip sensor active), DSI = 3 (Hotspot mode), and/or DSI = 4 (Earjack active) for GSM 1900

Maximum Burst-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 1900	512	27.73	27.63	24.55	22.81	**21.08**	25.10	23.96	21.90	20.99
	661	27.50	27.25	24.46	22.71	**21.48**	25.10	23.69	21.84	20.68
	810	27.72	27.32	24.60	23.53	**21.53**	25.28	24.07	22.01	20.91

Calculated Maximum Frame-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 1900	512	18.53	18.43	18.36	18.38	**17.90**	15.90	17.77	17.47	17.81
	661	18.30	18.05	18.27	18.28	**18.30**	15.90	17.50	17.41	17.50
	810	18.52	18.12	18.41	19.10	**18.35**	16.08	17.88	17.58	17.73
GSM 1900	**Frame Avg.Targets:**	18.80	18.80	18.81	18.77	**18.82**	16.30	17.81	17.57	17.82

Table 9-3
Measured P_{max} for DSI = 2 (Head) for GSM 1900

Maximum Burst-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 1900	512	29.53	29.51	28.25	**26.30**	24.56	25.79	24.49	22.51	21.19
	661	28.97	28.66	27.74	**25.77**	24.49	25.51	24.15	22.20	21.25
	810	29.52	29.38	28.25	**26.59**	24.82	25.64	24.50	22.57	21.56

Calculated Maximum Frame-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 1900	512	20.33	20.31	22.06	**21.87**	21.38	16.59	18.30	18.08	18.01
	661	19.77	19.46	21.55	**21.34**	21.31	16.31	17.96	17.77	18.07
	810	20.32	20.18	22.06	**22.16**	21.64	16.44	18.31	18.14	18.38
GSM 1900	**Frame Avg.Targets:**	19.80	19.80	21.81	**22.07**	21.32	16.30	17.81	17.57	17.82

Note:

1. Both burst-averaged and calculated frame-averaged powers are included. Frame-averaged power was calculated from the measured burst-averaged power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
2. GPRS/EDGE (GMSK) output powers were measured with coding scheme setting of 1 (CS1) on the base station simulator. CS1 was configured to measure GPRS output power measurements and SAR to ensure GMSK modulation in the signal. Our Investigation has shown that CS1 - CS4 settings do not have any impact on the output levels or modulation in the GPRS modes.
3. EDGE (8-PSK) output powers were measured with MCS7 on the base station simulator. MCS7 coding scheme was used to measure the output powers for EDGE since investigation has shown that choosing MCS7 coding scheme will ensure 8-PSK modulation. It has been shown that MCS levels that produce 8-PSK modulation do not have an impact on output power.

GSM Class: B
GPRS Multislot class: 33 (Max 4 Tx uplink slots)
EDGE Multislot class: 33 (Max 4 Tx uplink slots)
DTM Multislot Class: N/A

Figure 9-1
Power Measurement Setup

9.2 UMTS Conducted Powers

Table 9-4
Measured P_{max} for all DSI for UMTS 850

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	
99	WCDMA	12.2 kbps RMC	23.98	23.96	23.89	-
99		12.2 kbps AMR	23.97	23.92	23.95	-
6	HSDPA	Subtest 1	23.02	22.87	22.98	0
6		Subtest 2	23.07	22.83	22.96	0
6		Subtest 3	22.58	22.35	22.43	0.5
6		Subtest 4	22.55	22.34	22.45	0.5
6	HSUPA	Subtest 1	23.24	23.06	23.12	0
6		Subtest 2	21.23	21.02	21.17	2
6		Subtest 3	22.28	22.08	22.19	1
6		Subtest 4	21.22	20.98	20.98	2
6		Subtest 5	23.28	23.09	23.16	0

It is expected by the manufacturer that MPR for some HSPA subtests may be up to 2 dB more than specified by 3GPP, but also as low as 0 dB according to the chipset implementation in this model.

Figure 9-2
Power Measurement Setup

9.3 LTE Conducted Powers

Note: Per FCC KDB Publication 941225 D05v02r05, LTE SAR for the lower bandwidths was not required for testing since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg. Lower bandwidth conducted powers for all LTE bands can be found in LTE and NR Lower Bandwidth RF Conducted Powers Appendix.

Note: Some bands do not support three non-overlapping channels. Per KDB Publication 941225 D05v02, 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.

LTE Carrier Aggregation Notes:

1. This device supports uplink carrier aggregation for LTE CA_41C with a maximum of two component carriers. For intraband contiguous carrier aggregation scenarios, 3GPP 36.101 Table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when non-contiguous RB allocation is implemented. The conducted powers and MPR settings in this device are permanently implemented per the above 3GPP requirements.
2. Per FCC Guidance, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.

9.3.1 LTE Band 12

Table 9-5
LTE Band 12 Measured P_{Max} for all DSI - 10 MHz Bandwidth

LTE Band 12 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23095 (707.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	24.64	0	0
	1	25	24.73		0
	1	49	**25.00**		0
	25	0	23.67	0-1	1
	25	12	23.81		1
	25	25	**23.87**		1
	50	0	23.79		1
16QAM	1	0	24.03	0-1	1
	1	25	24.09		1
	1	49	24.32		1
	25	0	22.66	0-2	2
	25	12	22.83		2
	25	25	22.91		2
	50	0	22.79		2
64QAM	1	0	22.87	0-2	2
	1	25	23.01		2
	1	49	23.19		2
	25	0	21.65	0-3	3
	25	12	21.80		3
	25	25	21.86		3
	50	0	21.81		3

9.3.2 LTE Band 13

Table 9-6
LTE Band 13 Measured P_{Max} for all DSI - 10 MHz Bandwidth

LTE Band 13 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**24.64**	0	0
	1	25	24.31		0
	1	49	24.21		0
	25	0	**23.46**	0-1	1
	25	12	23.31		1
	25	25	23.13		1
	50	0	23.32		1
16QAM	1	0	23.51	0-1	1
	1	25	23.54		1
	1	49	23.44		1
	25	0	22.43	0-2	2
	25	12	22.26		2
	25	25	22.12		2
	50	0	22.34		2
64QAM	1	0	22.74	0-2	2
	1	25	22.49		2
	1	49	22.38		2
	25	0	21.41	0-3	3
	25	12	21.27		3
	25	25	21.08		3
	50	0	21.28		3

9.3.3 LTE Band 26

Table 9-7
LTE Band 26 (Cell) Measured P_{Max} for all DSI - 15 MHz Bandwidth

LTE Band 26 (Cell) 15 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 26865 (831.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	24.24	0	0
	1	36	**24.28**		0
	1	74	24.19		0
	36	0	23.19	0-1	1
	36	18	23.23		1
	36	37	**23.25**		1
	75	0	23.24		1
16QAM	1	0	23.54	0-1	1
	1	36	23.45		1
	1	74	23.42		1
	36	0	22.21	0-2	2
	36	18	22.24		2
	36	37	22.31		2
	75	0	22.27		2
64QAM	1	0	22.38	0-2	2
	1	36	22.47		2
	1	74	22.50		2
	36	0	21.17	0-3	3
	36	18	21.22		3
	36	37	21.25		3
	75	0	21.22		3

9.3.4 LTE Band 66

Table 9-8
LTE Band 66 (AWS) Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.20	20.28	20.30	0	0
	1	50	20.34	20.25	20.32		0
	1	99	20.45	**20.60**	20.39		0
	50	0	20.32	20.31	20.34	0-1	0
	50	25	20.41	20.33	20.45		0
	50	50	20.40	**20.57**	20.52		0
	100	0	20.39	20.44	20.43		0
16QAM	1	0	20.33	20.35	20.31	0-1	0
	1	50	20.40	20.36	20.38		0
	1	99	20.55	20.45	20.45		0
	50	0	20.35	20.35	20.34	0-2	0
	50	25	20.52	20.33	20.47		0
	50	50	20.65	20.36	20.52		0
	100	0	20.40	20.38	20.44		0
64QAM	1	0	20.34	20.34	20.24	0-2	0
	1	50	20.52	20.32	20.41		0
	1	99	20.57	20.32	20.53		0
	50	0	20.40	20.30	20.33	0-3	0
	50	25	20.49	20.31	20.46		0
	50	50	20.54	20.36	20.48		0
	100	0	20.53	20.39	20.49		0

Table 9-9
LTE Band 66 (AWS) Measured P_{Max} for DSI = 2 (Head) - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.36	23.56	23.43	0	0
	1	50	23.74	23.46	23.88		0
	1	99	**23.90**	23.68	23.89		0
	50	0	22.53	22.56	22.55	0-1	1
	50	25	22.62	22.56	22.60		1
	50	50	**22.68**	22.67	22.66		1
	100	0	22.51	22.57	22.58		1
16QAM	1	0	22.64	22.61	22.71	0-1	1
	1	50	22.54	22.86	22.82		1
	1	99	22.80	22.94	22.86		1
	50	0	21.56	21.61	21.55	0-2	2
	50	25	21.65	21.60	21.62		2
	50	50	21.65	21.65	21.76		2
	100	0	21.54	21.59	21.60		2
64QAM	1	0	21.72	21.57	21.65	0-2	2
	1	50	21.73	21.72	21.82		2
	1	99	21.83	21.96	21.79		2
	50	0	20.51	20.51	20.63	0-3	3
	50	25	20.61	20.62	20.59		3
	50	50	20.64	20.66	20.74		3
	100	0	20.49	20.64	20.72		3

Table 9-10
LTE Band 66 (AWS) Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.98	18.90	18.94	0	0
	1	50	19.08	18.87	19.07		0
	1	99	**19.19**	19.10	19.09		0
	50	0	19.04	19.04	18.93	0-1	0
	50	25	19.08	19.04	18.96		0
	50	50	**19.11**	18.99	19.10		0
	100	0	19.05	19.08	19.01		0
16QAM	1	0	19.05	19.40	19.14	0-1	0
	1	50	19.25	18.98	19.15		0
	1	99	19.43	19.02	19.41		0
	50	0	19.05	18.93	18.93	0-2	0
	50	25	19.07	19.08	18.98		0
	50	50	19.17	19.09	19.12		0
	100	0	18.96	18.96	18.94		0
64QAM	1	0	19.12	19.18	19.06	0-2	0
	1	50	19.20	19.26	19.36		0
	1	99	19.33	19.09	19.17		0
	50	0	19.04	19.04	18.99	0-3	0
	50	25	19.14	19.03	19.02		0
	50	50	19.06	19.07	19.09		0
	100	0	19.02	18.98	19.01		0

9.3.5 LTE Band 2

Table 9-11
LTE Band 2 (PCS) Measured P_{Max} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 20 MHz Bandwidth

LTE Band 2 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18700 (1860.0 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19100 (1900.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	**21.80**	21.79	21.60	0	0
	1	50	21.79	21.77	21.71		0
	1	99	21.64	21.57	21.74		0
	50	0	**21.77**	21.52	21.56	0-1	0
	50	25	21.74	21.63	21.62		0
	50	50	21.76	21.64	21.64		0
	100	0	21.75	21.65	21.57		0
16QAM	1	0	21.83	21.65	21.68	0-1	0
	1	50	21.78	21.89	21.86		0
	1	99	21.72	21.67	21.77		0
	50	0	21.70	21.51	21.58	0-2	0
	50	25	21.73	21.58	21.59		0
	50	50	21.71	21.54	21.66		0
	100	0	21.75	21.63	21.55		0
64QAM	1	0	21.96	21.56	21.74	0-2	0
	1	50	21.78	21.62	21.73		0
	1	99	21.84	21.85	21.74		0
	50	0	20.66	20.40	20.61	0-3	0.5
	50	25	20.71	20.67	20.57		0.5
	50	50	20.72	20.54	20.69		0.5
	100	0	20.75	20.60	20.61		0.5

Table 9-12
LTE Band 2 (PCS) Measured P_{Max} for DSI = 2 (Head) - 20 MHz Bandwidth

LTE Band 2 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18700 (1860.0 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19100 (1900.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	**23.88**	23.47	23.80	0	0
	1	50	23.87	23.46	23.87		0
	1	99	23.75	23.39	23.78		0
	50	0	**22.75**	22.52	22.61	0-1	1
	50	25	22.69	22.56	22.63		1
	50	50	22.73	22.58	22.72		1
	100	0	22.74	22.59	22.64		1
16QAM	1	0	23.06	22.79	22.73	0-1	1
	1	50	22.87	22.53	22.85		1
	1	99	22.95	22.67	22.92		1
	50	0	21.75	21.52	21.61	0-2	2
	50	25	21.69	21.58	21.60		2
	50	50	21.71	21.57	21.76		2
	100	0	21.73	21.63	21.56		2
64QAM	1	0	21.89	21.64	21.61	0-2	2
	1	50	21.66	21.75	21.60		2
	1	99	21.80	21.64	21.75		2
	50	0	20.71	20.54	20.63	0-3	3
	50	25	20.74	20.54	20.59		3
	50	50	20.72	20.57	20.67		3
	100	0	20.67	20.49	20.62		3

Table 9-13
LTE Band 2 (PCS) Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 20 MHz Bandwidth

LTE Band 2 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18700 (1860.0 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19100 (1900.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	**19.78**	19.44	19.53	0	0
	1	50	19.65	19.48	19.72		0
	1	99	19.61	19.49	19.77		0
	50	0	**19.77**	19.58	19.61	0-1	0
	50	25	19.74	19.55	19.58		0
	50	50	19.70	19.53	19.62		0
	100	0	19.66	19.59	19.63		0
16QAM	1	0	19.89	19.77	19.64	0-1	0
	1	50	19.61	20.00	19.83		0
	1	99	19.53	19.82	19.86		0
	50	0	19.77	19.53	19.60	0-2	0
	50	25	19.72	19.59	19.63		0
	50	50	19.66	19.56	19.72		0
	100	0	19.76	19.63	19.65		0
64QAM	1	0	19.71	19.77	19.65	0-2	0
	1	50	19.65	19.50	19.72		0
	1	99	19.62	19.75	19.80		0
	50	0	19.74	19.50	19.58	0-3	0
	50	25	19.71	19.46	19.61		0
	50	50	19.70	19.54	19.78		0
	100	0	19.73	19.65	19.58		0

9.3.1 LTE Band 41

Table 9-14
LTE Band 41 Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 3 (Hotspot mode active), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	20.63	20.47	20.54	20.80	20.71	0	0
	1	50	**20.81**	20.62	20.57	20.74	20.58		0
	1	99	20.62	20.59	20.63	20.80	20.76		0
	50	0	20.70	20.57	20.67	20.69	20.68	0-1	0
	50	25	**20.82**	20.68	20.78	20.76	20.79		0
	50	50	20.71	20.66	20.78	20.78	20.78		0
	100	0	20.79	20.71	20.75	20.78	20.69		0
16QAM	1	0	20.65	20.51	20.67	20.67	20.63	0-1	0
	1	50	20.63	20.55	20.74	20.69	20.72		0
	1	99	20.54	20.60	20.79	20.73	20.64		0
	50	0	20.74	20.58	20.71	20.67	20.66	0-2	0
	50	25	20.75	20.69	20.77	20.76	20.77		0
	50	50	20.70	20.66	20.76	20.78	20.75		0
	100	0	20.71	20.69	20.75	20.76	20.68		0
64QAM	1	0	20.52	20.59	20.84	20.71	20.67	0-2	0
	1	50	20.62	20.63	20.77	20.74	20.69		0
	1	99	20.55	20.65	20.85	20.76	20.71		0
	50	0	20.53	20.37	20.47	20.48	20.47	0-3	0
	50	25	20.51	20.48	20.58	20.60	20.57		0
	50	50	20.48	20.45	20.61	20.59	20.56		0
	100	0	20.48	20.46	20.58	20.58	20.50		0

Table 9-15
LTE Band 41 Uplink Carrier Aggregation Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor active), DSI = 1 (Phablet with grip sensor active) or DSI = 3 (Hotspot Mode), and/or DSI = 4 (Earjack Active) - 20 MHz Bandwidth

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C	LTE B41	20	39750	2506.0	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	20.63	20.62
CA_41C	LTE B41	20	39750	2506.0	QPSK	50	50	LTE B41	20	39948	2525.8	QPSK	50	0	20.77	20.71

Table 9-16
LTE Band 41 Measured P_{Max} for DSI = 2 (Head) - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	23.66	23.52	23.62	23.66	23.62	0	0
	1	50	23.67	23.58	23.61	23.68	23.61		0
	1	99	23.65	23.57	**23.72**	23.70	23.69		0
	50	0	22.72	22.55	22.75	22.69	22.60	0-1	1
	50	25	22.70	22.66	**22.80**	22.75	22.68		1
	50	50	22.73	22.67	22.77	22.78	22.71		1
	100	0	22.71	22.65	22.78	22.72	22.65		1
16QAM	1	0	22.75	22.78	22.94	22.88	22.86	0-1	1
	1	50	22.79	22.77	22.83	22.88	22.77		1
	1	99	22.70	22.69	22.91	22.80	22.80		1
	50	0	21.94	21.72	21.92	21.91	21.87	0-2	2
	50	25	21.90	21.74	22.03	21.85	21.95		2
	50	50	21.85	21.81	22.00	21.95	21.97		2
	100	0	21.93	21.70	22.00	21.89	21.94		2
64QAM	1	0	21.88	21.79	22.00	21.91	21.93	0-2	2
	1	50	21.80	21.85	21.88	21.89	21.90		2
	1	99	21.74	21.74	22.06	22.00	21.97		2
	50	0	20.89	20.72	20.91	20.90	20.87	0-3	3
	50	25	20.92	20.74	20.96	20.87	20.95		3
	50	50	20.79	20.79	20.99	20.95	20.95		3
	100	0	20.90	20.72	20.97	20.85	20.92		3

Table 9-17
LTE Band 41 Uplink Carrier Aggregation Measured P_{Max} - for DSI 2 (Head)

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C	LTE B41	20	40620	2593.0	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	0	23.59	23.72

Figure 9-3
Power Measurement Setup

9.4 NR Conducted Powers

Per October 2020 TCB Workshop Guidance, NR FR1 SAR evaluations are being generally based on adapting the existing LTE SAR procedures (FCC KDB Publication 941225 D05v02r05). Therefore, NR SAR for the lower bandwidths was not required for testing based on the measured output power and the reported NR SAR for the highest bandwidth. Lower bandwidth conducted powers for all NR bands can be found in LTE and NR Lower Bandwidth RF Conducted Powers Appendix.

Note: Some bands do not support non-overlapping channels. Per FCC Guidance, 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.

9.4.1 NR Band n5

Table 9-18
NR Band n5 Measured P_{Max} for all DSI - 20 MHz Bandwidth

NR Band n5 20 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	167300 (836.5 MHz) Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	23.82	0	0.0
	1	53	23.98		0.0
	1	104	23.77		0.0
	50	0	23.50	0-0.5	0.5
	50	28	23.90	0	0.0
	50	56	23.44	0-0.5	0.5
	100	0	23.50		0.5
DFT-s-OFDM QPSK	1	1	23.81	0	0.0
	1	53	**23.92**		0.0
	1	104	23.76		0.0
	50	0	23.08	0-1	1.0
	50	28	**23.88**	0	0.0
	50	56	22.93	0-1	1.0
	100	0	23.02		1.0
DFT-s-OFDM 16QAM	1	1	22.81	0-1	1.0
CP-OFDM QPSK	1	1	22.46	0-1.5	1.5

9.4.2 NR Band n41

Table 9-19
NR Band n41 Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), DSI = 3 (Hotspot Mode), DSI = 1 (Phablet with grip sensor active), and/or DSI = 4 (Earjack Active) - 100 MHz Bandwidth

NR Band n41 100 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	518598 (2592.99 MHz) Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	19.12	0	0.0
	1	137	19.31		0.0
	1	271	19.23		0.0
	135	0	19.24	0-0.5	0.0
	135	69	19.28	0	0.0
	135	138	19.14	0-0.5	0.0
	270	0	19.20		0.0
DFT-s-OFDM QPSK	1	1	19.14	0	0.0
	1	137	**19.33**		0.0
	1	271	19.21		0.0
	135	0	19.29	0-1	0.0
	135	69	**19.32**	0	0.0
	135	138	19.18	0-1	0.0
	270	0	19.21		0.0
DFT-s-OFDM 16QAM	1	1	19.13	0-1	0.0
CP-OFDM QPSK	1	1	19.04	0-1.5	0.0

Table 9-20
NR Band n41 Measured P_{Limit} for DSI = 2 (Head) - 100 MHz Bandwidth

NR Band n41 100 MHz Bandwidth					
			Channel		
Modulation	RB Size	RB Offset	518598 (2592.99 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
DFT-s-OFDM π/2 BPSK	1	1	15.01	0	0.0
	1	137	15.19		0.0
	1	271	15.18		0.0
	135	0	15.23	0-0.5	0.0
	135	69	15.24	0	0.0
	135	138	15.14	0-0.5	0.0
	270	0	15.18		0.0
DFT-s-OFDM QPSK	1	1	15.09	0	0.0
	1	137	15.27		0.0
	1	271	**15.28**		0.0
	135	0	15.29	0-1	0.0
	135	69	**15.31**	0	0.0
	135	138	15.23	0-1	0.0
	270	0	15.27		0.0
DFT-s-OFDM 16QAM	1	1	15.25	0-1	0.0
CP-OFDM QPSK	1	1	15.24	0-1.5	0.0

Figure 9-4
Power Measurement Setup – NR FDD

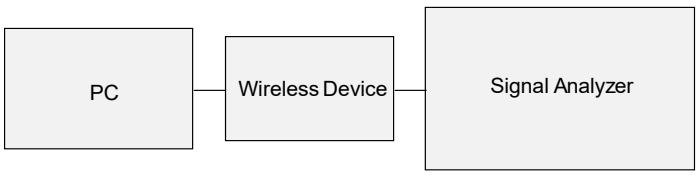


Figure 9-5
Power Measurement Setup – NR TDD

9.5 WLAN Conducted Powers

Table 9-21
2.4 GHz WLAN Maximum Average RF Power – Ant 2

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ax
		Average	Average	Average	Average
2412	1	18.82	17.65	15.68	15.48
2417	2	N/A	N/A	17.42	17.40
2437	6	18.56	17.92	17.70	17.61
2452	9	N/A	N/A	N/A	17.39
2457	10	N/A	N/A	17.52	16.45
2462	11	18.93	17.79	15.64	15.12

Table 9-22
2.4 GHz WLAN Maximum Average RF Power – MIMO

2.4GHz 802.11b Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2412	1	17.55	18.69	21.17
2437	6	16.62	18.56	20.71
2462	11	16.58	18.72	20.79

Table 9-23
2.4 GHz WLAN Reduced Average RF Power During Conditions with 5/6 GHz WLAN – Ant 2

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
		Average	Average	Average
2412	1	12.72	12.81	12.67
2437	6	12.57	12.49	12.87
2462	11	12.56	12.31	12.83

Table 9-24
2.4 GHz WLAN Reduced Average RF Power During Conditions with 5/6 GHz WLAN – MIMO

2.4GHz 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2412	1	11.50	12.82	15.22
2437	6	12.62	10.91	14.86
2462	11	10.27	12.74	14.69

Table 9-25
2.4 GHz WLAN Reduced Average RF Power with RCV Active – Ant 2

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
		Average	Average	Average
2412	1	11.81	11.82	11.91
2437	6	11.49	11.66	11.73
2462	11	11.86	11.86	11.74

Table 9-26
2.4 GHz WLAN Reduced Average RF Power with RCV Active – MIMO

2.4GHz 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2412	1	10.38	11.72	14.11
2437	6	10.23	11.82	14.11
2462	11	9.76	11.96	14.01

Table 9-27
2.4 GHz WLAN Reduced Average RF Powers During Conditions with 5/6 GHz WLAN and 5G NR and During Conditions with 5/6 GHz WLAN and/or 5G NR with RCV Active – Ant 2

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
		Average	Average	Average
2412	1	9.51	9.44	9.88
2437	6	9.78	9.85	9.64
2462	11	9.65	9.64	9.47

Table 9-28
2.4 GHz WLAN Reduced Average RF Powers During Conditions with 5/6 GHz WLAN and 5G NR and During Conditions with 5/6 GHz WLAN and/or 5G NR with RCV Active - MIMO

2.4GHz 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2412	1	8.48	9.41	11.98
2437	6	8.07	9.75	12.00
2462	11	7.61	9.52	11.68

Table 9-29
5 GHz WLAN Maximum Average RF Power – MIMO

5GHz (20MHz) 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
5180	36	14.89	14.86	17.89
5200	40	14.83	14.92	17.89
5220	44	15.00	14.35	17.70
5240	48	14.82	14.41	17.63
5260	52	17.91	17.50	20.72
5280	56	17.76	17.15	20.48
5300	60	17.64	17.52	20.59
5320	64	17.75	17.90	20.84
5500	100	17.49	17.86	20.69
5600	120	16.82	17.54	20.21
5620	124	16.72	17.56	20.17
5720	144	17.16	17.63	20.41
5745	149	17.81	17.86	20.85
5785	157	17.60	17.24	20.43
5825	165	17.91	17.23	20.59
5845	169	17.91	17.34	20.64
5865	173	17.88	17.37	20.64
5885	177	17.69	17.25	20.49

Table 9-30
5 GHz WLAN Reduced Average RF Power with RCV Active or During Conditions with 5G NR or 2.4 GHz WLAN - MIMO

5GHz (80MHz) 802.11ac Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
5210	42	13.99	13.06	16.56
5290	58	13.61	13.35	16.49
5530	106	13.49	13.84	16.68
5610	122	13.52	13.28	16.41
5690	138	13.88	13.79	16.85
5775	155	13.70	12.80	16.28
5855	171	13.75	12.41	16.14

Table 9-31
5 GHz WLAN Reduced Average RF Power During Conditions with 5G FR1 with RCV Active or During Conditions with 5G NR and 2.4 GHz WLAN

5GHz (80MHz) 802.11ac Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
5210	42	10.83	9.99	13.44
5290	58	10.61	10.40	13.52
5530	106	10.43	10.57	13.51
5610	122	10.83	10.46	13.66
5690	138	10.27	10.21	13.25
5775	155	10.59	9.70	13.18
5855	171	10.79	9.56	13.23

Table 9-32
5 GHz WLAN Reduced Average RF Power During Conditions with 2.4 GHz WLAN with RCV Active or During Conditions with 5G NR and 2.4 GHz WLAN with RCV Active

5GHz (80MHz) 802.11ac Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
5210	42	8.94	8.13	11.56
5290	58	8.71	8.52	11.63
5530	106	8.46	8.67	11.58
5610	122	8.36	8.60	11.49
5690	138	8.73	8.76	11.76
5775	155	8.71	7.79	11.28
5855	171	8.90	8.23	11.59

Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02:

- Power measurements were performed for the transmission mode configuration with the highest maximum output power specified for production units.
- For transmission modes with the same maximum output power specification, powers were measured for the largest channel bandwidth, lowest order modulation and lowest data rate.
- For transmission modes with identical maximum specified output power, channel bandwidth, modulation and data rates, power measurements were required for all identical configurations.
- For each transmission mode configuration, powers were measured for the highest and lowest channels; and at the mid-band channel(s) when there were at least 3 channels supported. For configurations with multiple mid-band channels, due to an even number of channels, both channels were measured.

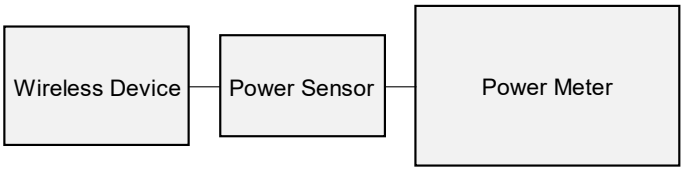


Figure 9-6
Power Measurement Setup

9.6 Bluetooth Conducted Powers

Table 9-33
Bluetooth Maximum Average RF Power– Antenna 1

Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	1.0	GFSK	0	14.18	26.184
2441	1.0	GFSK	39	14.39	27.485
2480	1.0	GFSK	78	12.56	18.047

Table 9-34
Bluetooth Maximum Average RF Power– Antenna 2

Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	1.0	GFSK	0	14.60	28.854
2441	1.0	GFSK	39	14.19	26.228
2480	1.0	GFSK	78	12.64	18.361

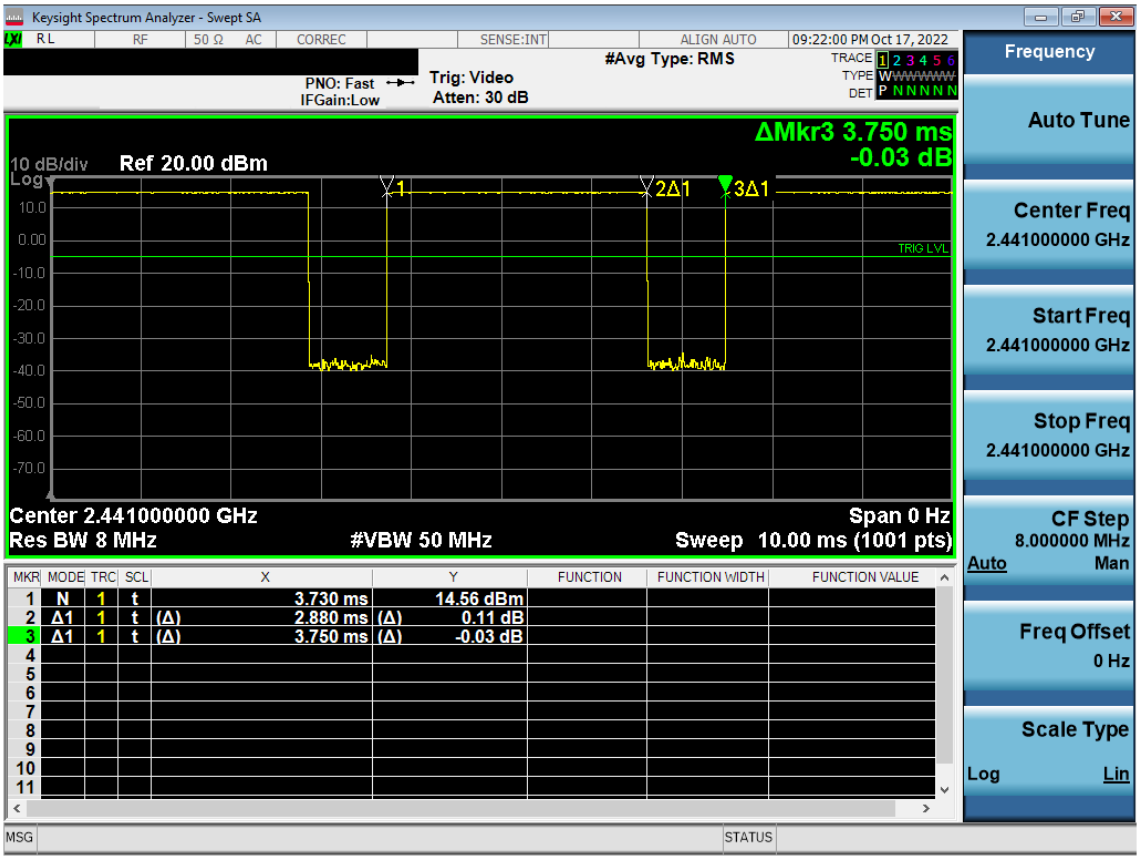
Table 9-35
Bluetooth Reduced Average RF Power (RCV Active) – Antenna 1

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
			[dBm]	[mW]
2402	1.0	0	9.88	9.738
2441	1.0	39	10.67	11.657
2480	1.0	78	9.20	8.312

Table 9-36
Bluetooth Reduced Average RF Power (RCV Active) – Antenna 2

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
			[dBm]	[mW]
2402	1.0	0	10.08	10.175
2441	1.0	39	10.07	10.169
2480	1.0	78	8.54	7.148

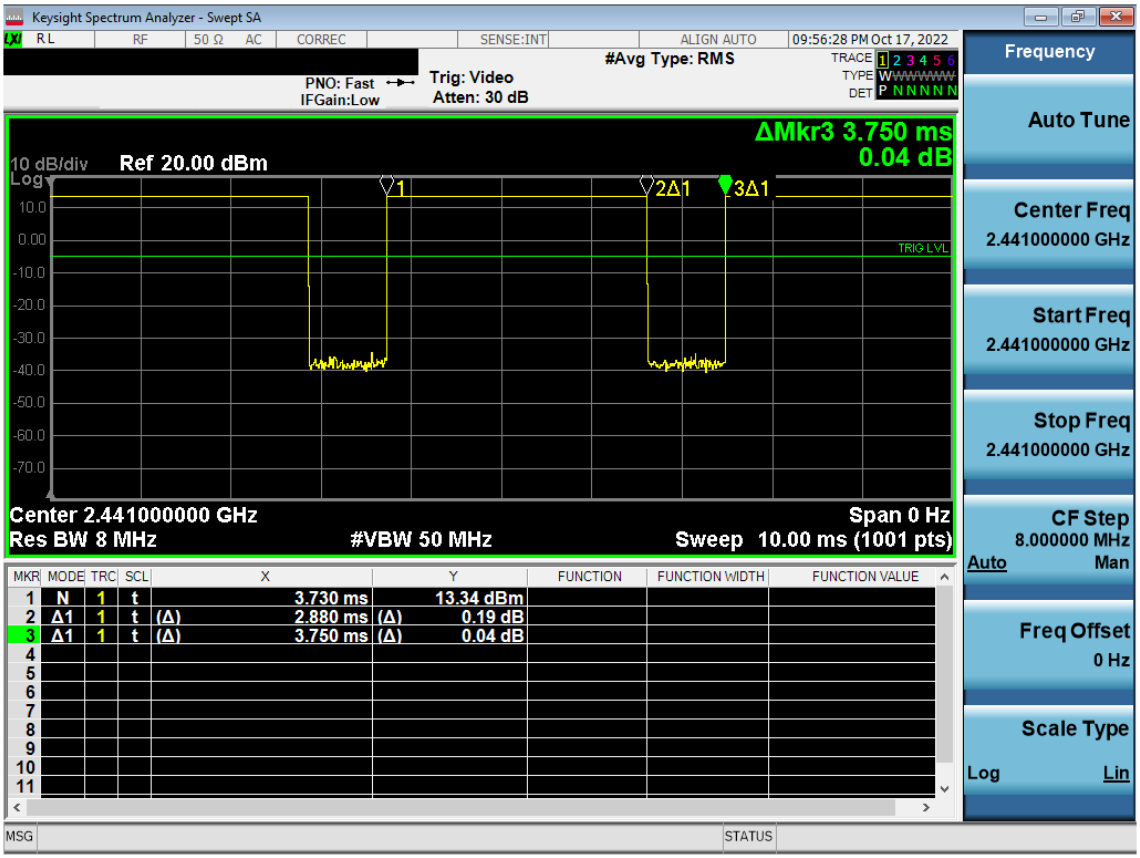
Figure 9-7
Bluetooth Antenna 1 Transmission Plot



Equation 9-1
Bluetooth Antenna 1 Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.880ms}{3.750ms} * 100\% = 76.8\%$$

Figure 9-8
Bluetooth Antenna 2 Transmission Plot



Equation 9-2
Bluetooth Antenna 2 Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.880ms}{3.750ms} * 100\% = 76.8\%$$

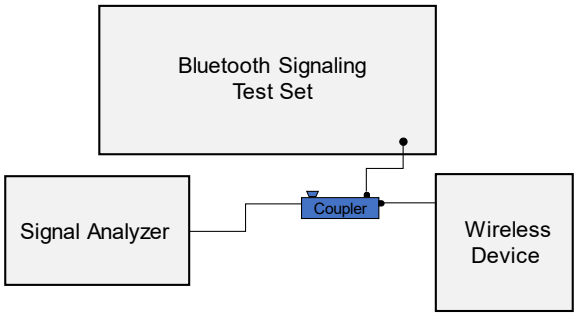


Figure 9-9
Power Measurement Setup

10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (˚C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
01/18/2023	30 Head	22.0	12	0.719	53.010	0.750	55.000	-4.13%	-3.62%
			13	0.719	52.956	0.750	55.000	-4.13%	-3.72%
			14	0.719	52.921	0.750	55.000	-4.13%	-3.78%
12/20/2022	750 Head	21.3	680	0.862	41.996	0.888	42.305	-2.93%	-0.73%
			695	0.867	41.960	0.889	42.227	-2.47%	-0.63%
			700	0.869	41.945	0.889	42.201	-2.25%	-0.61%
			710	0.873	41.914	0.890	42.149	-1.91%	-0.56%
			725	0.877	41.861	0.891	42.071	-1.57%	-0.50%
			750	0.885	41.781	0.894	41.942	-1.01%	-0.38%
			770	0.892	41.737	0.895	41.838	-0.34%	-0.24%
			785	0.898	41.707	0.896	41.760	0.22%	-0.13%
			800	0.903	41.668	0.897	41.682	0.67%	-0.03%
12/19/2022	835 Head	19.4	815	0.861	41.234	0.898	41.594	-4.12%	-0.87%
			820	0.863	41.218	0.899	41.578	-4.00%	-0.87%
			835	0.868	41.173	0.900	41.500	-3.56%	-0.79%
			850	0.874	41.138	0.916	41.500	-4.59%	-0.87%
01/03/2023	835 Head	22.5	815	0.907	42.194	0.898	41.594	1.00%	1.44%
			820	0.909	42.176	0.899	41.578	1.11%	1.44%
			835	0.914	42.132	0.900	41.500	1.56%	1.52%
			850	0.920	42.093	0.916	41.500	0.44%	1.43%
01/16/2023	835 Head	21.0	815	0.898	41.641	0.898	41.594	0.00%	0.11%
			820	0.900	41.625	0.899	41.578	0.11%	0.11%
			835	0.905	41.579	0.900	41.500	0.56%	0.19%
			850	0.911	41.543	0.916	41.500	-0.55%	0.10%
12/27/2022	1750 Head	22.0	1710	1.350	40.295	1.348	40.142	0.15%	0.38%
			1720	1.360	40.246	1.354	40.126	0.44%	0.30%
			1745	1.387	40.129	1.368	40.087	1.39%	0.10%
			1750	1.392	40.103	1.371	40.079	1.53%	0.06%
			1770	1.413	40.006	1.383	40.047	2.17%	-0.10%
			1790	1.434	39.930	1.394	40.016	2.87%	-0.21%
12/19/2022	1900 Head	21.7	1850	1.401	41.449	1.400	40.000	0.07%	3.62%
			1860	1.412	41.411	1.400	40.000	0.86%	3.53%
			1880	1.433	41.335	1.400	40.000	2.36%	3.34%
			1900	1.454	41.251	1.400	40.000	3.86%	3.13%
			1905	1.460	41.229	1.400	40.000	4.29%	3.07%
			1910	1.465	41.208	1.400	40.000	4.64%	3.02%
12/27/2022	1900 Head	22.5	1850	1.345	39.426	1.400	40.000	-3.93%	-1.44%
			1860	1.355	39.387	1.400	40.000	-3.21%	-1.53%
			1880	1.376	39.304	1.400	40.000	-1.71%	-1.74%
			1900	1.397	39.230	1.400	40.000	-0.21%	-1.93%
			1905	1.402	39.212	1.400	40.000	0.14%	-1.97%
			1910	1.407	39.195	1.400	40.000	0.50%	-2.01%
12/19/2022	2450 Head	22.0	2300	1.740	40.791	1.670	39.500	4.19%	3.27%
			2310	1.748	40.780	1.679	39.480	4.11%	3.29%
			2320	1.756	40.769	1.687	39.460	4.09%	3.32%
			2400	1.821	40.643	1.756	39.289	3.70%	3.45%
			2450	1.863	40.555	1.800	39.200	3.50%	3.46%
			2480	1.887	40.503	1.833	39.162	2.95%	3.42%
			2500	1.904	40.466	1.855	39.136	2.64%	3.40%
			2510	1.912	40.445	1.866	39.123	2.47%	3.38%
			2535	1.933	40.394	1.893	39.092	2.11%	3.33%
			2550	1.946	40.366	1.909	39.073	1.94%	3.31%
			2560	1.954	40.346	1.920	39.060	1.77%	3.29%
			2600	1.986	40.280	1.964	39.009	1.12%	3.26%
			2650	2.027	40.180	2.018	38.945	0.45%	3.17%
			2680	2.052	40.125	2.051	38.907	0.05%	3.13%
			2700	2.069	40.101	2.073	38.882	-0.19%	3.14%
12/27/2022	2450 Head	24.4	2300	1.650	40.167	1.670	39.500	-1.20%	1.69%
			2310	1.663	40.125	1.679	39.480	-0.95%	1.63%
			2320	1.675	40.082	1.687	39.460	-0.71%	1.58%
			2400	1.777	39.846	1.756	39.289	1.20%	1.42%
			2450	1.835	39.688	1.800	39.200	1.94%	1.24%
			2480	1.868	39.592	1.833	39.162	1.91%	1.10%
			2500	1.889	39.518	1.855	39.136	1.83%	0.98%
			2510	1.899	39.478	1.866	39.123	1.77%	0.91%
			2535	1.926	39.374	1.893	39.092	1.74%	0.72%
			2550	1.943	39.313	1.909	39.073	1.78%	0.61%
			2560	1.953	39.273	1.920	39.060	1.72%	0.55%
			2600	1.996	39.090	1.964	39.009	1.63%	0.21%
			2650	2.058	38.832	2.018	38.945	1.98%	-0.29%
			2680	2.096	38.694	2.051	38.907	2.19%	-0.55%
			2700	2.121	38.614	2.073	38.882	2.32%	-0.69%

Table 10-2
Measured Head Tissue Properties (Cont.)

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (˚C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
01/09/2023	2450 Head	23.0	2300	1.699	40.538	1.670	39.500	1.74%	2.63%
			2310	1.711	40.507	1.679	39.480	1.91%	2.60%
			2320	1.722	40.473	1.687	39.460	2.07%	2.57%
			2400	1.808	40.198	1.756	39.289	2.96%	2.31%
			2450	1.864	40.009	1.800	39.200	3.56%	2.06%
			2480	1.895	39.904	1.833	39.162	3.38%	1.89%
			2500	1.917	39.836	1.855	39.136	3.34%	1.79%
			2510	1.928	39.800	1.866	39.123	3.32%	1.73%
			2535	1.957	39.709	1.893	39.092	3.38%	1.58%
			2550	1.975	39.653	1.909	39.073	3.46%	1.48%
			2560	1.986	39.615	1.920	39.060	3.44%	1.42%
			2600	2.029	39.483	1.964	39.009	3.31%	1.22%
			2650	2.084	39.289	2.018	38.945	3.27%	0.88%
			2680	2.118	39.183	2.051	38.907	3.27%	0.71%
			2700	2.139	39.133	2.073	38.882	3.18%	0.65%
01/09/2023	5200-5800 Head	19.5	5180	4.673	34.869	4.635	36.009	0.82%	-3.17%
			5190	4.684	34.832	4.645	35.998	0.84%	-3.24%
			5200	4.692	34.813	4.655	35.986	0.79%	-3.26%
			5210	4.703	34.806	4.666	35.975	0.79%	-3.25%
			5220	4.716	34.797	4.676	35.963	0.86%	-3.24%
			5240	4.739	34.758	4.696	35.940	0.92%	-3.29%
			5250	4.747	34.739	4.706	35.929	0.87%	-3.31%
			5260	4.756	34.724	4.717	35.917	0.83%	-3.32%
			5270	4.768	34.706	4.727	35.906	0.87%	-3.34%
			5280	4.781	34.679	4.737	35.894	0.93%	-3.38%
			5290	4.788	34.653	4.748	35.883	0.84%	-3.43%
			5300	4.793	34.626	4.758	35.871	0.74%	-3.47%
			5310	4.800	34.601	4.768	35.860	0.67%	-3.51%
			5320	4.813	34.575	4.778	35.849	0.73%	-3.55%
			5500	5.042	34.214	4.963	35.643	1.59%	-4.01%
			5510	5.047	34.203	4.973	35.632	1.49%	-4.01%
			5520	5.056	34.203	4.983	35.620	1.46%	-3.98%
			5530	5.072	34.197	4.994	35.609	1.56%	-3.97%
			5540	5.091	34.175	5.004	35.597	1.74%	-3.99%
			5550	5.105	34.153	5.014	35.586	1.81%	-4.03%
			5560	5.114	34.128	5.024	35.574	1.79%	-4.06%
			5580	5.139	34.106	5.045	35.551	1.86%	-4.06%
			5600	5.157	34.069	5.065	35.529	1.82%	-4.11%
			5610	5.162	34.056	5.076	35.518	1.69%	-4.12%
			5620	5.170	34.044	5.086	35.506	1.65%	-4.12%
			5640	5.192	33.996	5.106	35.483	1.68%	-4.19%
			5660	5.213	33.957	5.127	35.460	1.68%	-4.24%
			5670	5.223	33.943	5.137	35.449	1.67%	-4.25%
			5680	5.237	33.919	5.147	35.437	1.75%	-4.28%
			5690	5.250	33.897	5.158	35.426	1.78%	-4.32%
			5700	5.261	33.879	5.168	35.414	1.80%	-4.33%
			5710	5.270	33.862	5.178	35.403	1.78%	-4.35%
			5720	5.277	33.840	5.188	35.391	1.72%	-4.38%
			5745	5.301	33.778	5.214	35.363	1.67%	-4.48%
			5750	5.306	33.768	5.219	35.357	1.67%	-4.49%
			5755	5.312	33.759	5.224	35.351	1.68%	-4.50%
			5765	5.325	33.734	5.234	35.340	1.74%	-4.54%
			5775	5.344	33.697	5.245	35.329	1.89%	-4.62%
			5785	5.366	33.665	5.255	35.317	2.11%	-4.68%
			5795	5.384	33.644	5.265	35.305	2.26%	-4.70%
			5800	5.393	33.633	5.270	35.300	2.33%	-4.72%
			5800	5.393	33.633	5.270	35.300	2.33%	-4.72%
			5805	5.399	33.616	5.275	35.294	2.35%	-4.75%
			5825	5.417	33.566	5.296	35.271	2.28%	-4.83%
			5835	5.427	33.554	5.305	35.230	2.30%	-4.76%
			5845	5.439	33.550	5.315	35.210	2.33%	-4.71%
			5855	5.456	33.533	5.325	35.197	2.46%	-4.73%
			5865	5.472	33.504	5.336	35.190	2.55%	-4.79%
			5865	5.472	33.504	5.336	35.190	2.55%	-4.79%
			5865	5.472	33.504	5.336	35.190	2.55%	-4.79%
			5865	5.472	33.504	5.336	35.190	2.55%	-4.79%
			5875	5.494	33.493	5.347	35.183	2.75%	-4.80%
			5885	5.519	33.497	5.357	35.177	3.02%	-4.78%
			5905	5.560	33.471	5.379	35.163	3.36%	-4.81%

Table 10-3
Measured Body Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
01/04/2023	750 Body	20.9	680	0.921	54.448	0.958	55.804	-3.86%	-2.43%
			695	0.927	54.418	0.959	55.745	-3.34%	-2.38%
			700	0.929	54.409	0.959	55.726	-3.13%	-2.36%
			710	0.933	54.390	0.960	55.687	-2.81%	-2.33%
			725	0.938	54.357	0.961	55.629	-2.39%	-2.29%
			750	0.947	54.306	0.964	55.531	-1.76%	-2.21%
			770	0.955	54.268	0.965	55.453	-1.04%	-2.14%
			785	0.961	54.234	0.966	55.395	-0.52%	-2.10%
			800	0.967	54.194	0.967	55.336	0.00%	-2.06%
12/15/2022	835 Body	22.1	815	0.993	53.210	0.968	55.271	2.58%	-3.73%
			820	0.995	53.195	0.969	55.258	2.68%	-3.73%
			835	1.001	53.157	0.970	55.200	3.20%	-3.70%
			850	1.007	53.133	0.988	55.154	1.92%	-3.66%
12/15/2022	835 Body	20.0	815	0.956	54.263	0.968	55.271	-1.24%	-1.82%
			820	0.958	54.248	0.969	55.258	-1.14%	-1.83%
			835	0.964	54.213	0.970	55.200	-0.62%	-1.79%
			850	0.970	54.191	0.988	55.154	-1.82%	-1.75%
12/20/2022	835 Body	21.0	815	0.948	54.059	0.968	55.271	-2.07%	-2.19%
			820	0.950	54.045	0.969	55.258	-1.96%	-2.20%
			835	0.956	54.000	0.970	55.200	-1.44%	-2.17%
			850	0.962	53.963	0.988	55.154	-2.63%	-2.16%
01/17/2023	835 Body	21.4	815	0.922	55.625	0.968	55.271	-4.75%	0.64%
			820	0.927	55.572	0.969	55.258	-4.33%	0.57%
			835	0.943	55.411	0.970	55.200	-2.78%	0.38%
			850	0.958	55.265	0.988	55.154	-3.04%	0.20%
12/21/2022	1750 Body	20.0	1710	1.494	51.651	1.463	53.537	2.12%	-3.52%
			1720	1.506	51.605	1.469	53.511	2.52%	-3.56%
			1745	1.537	51.504	1.485	53.445	3.50%	-3.63%
			1750	1.543	51.485	1.488	53.432	3.70%	-3.64%
			1770	1.566	51.410	1.501	53.379	4.33%	-3.69%
			1790	1.587	51.322	1.514	53.326	4.82%	-3.76%
12/29/2022	1750 Body	20.0	1710	1.470	51.398	1.463	53.537	0.48%	-4.00%
			1720	1.481	51.362	1.469	53.511	0.82%	-4.02%
			1745	1.509	51.260	1.485	53.445	1.62%	-4.09%
			1750	1.515	51.239	1.488	53.432	1.81%	-4.10%
			1770	1.538	51.158	1.501	53.379	2.47%	-4.16%
			1790	1.562	51.089	1.514	53.326	3.17%	-4.19%
01/09/2023	1750 Body	20.7	1710	1.487	51.483	1.463	53.537	1.64%	-3.84%
			1720	1.499	51.444	1.469	53.511	2.04%	-3.86%
			1745	1.532	51.342	1.485	53.445	3.16%	-3.93%
			1750	1.538	51.321	1.488	53.432	3.36%	-3.95%
			1770	1.560	51.241	1.501	53.379	3.93%	-4.01%
			1790	1.582	51.162	1.514	53.326	4.49%	-4.06%
12/18/2022	1900 Body	21.7	1850	1.478	51.536	1.520	53.300	-2.76%	-3.31%
			1860	1.489	51.501	1.520	53.300	-2.04%	-3.38%
			1880	1.510	51.430	1.520	53.300	-0.66%	-3.51%
			1900	1.531	51.347	1.520	53.300	0.72%	-3.66%
			1905	1.537	51.328	1.520	53.300	1.12%	-3.70%
			1910	1.542	51.307	1.520	53.300	1.45%	-3.74%
12/20/2022	1900 Body	23.6	1850	1.469	51.430	1.520	53.300	-3.36%	-3.51%
			1860	1.479	51.403	1.520	53.300	-2.70%	-3.56%
			1880	1.499	51.344	1.520	53.300	-1.38%	-3.67%
			1900	1.520	51.274	1.520	53.300	0.00%	-3.80%
			1905	1.526	51.255	1.520	53.300	0.39%	-3.84%
			1910	1.531	51.238	1.520	53.300	0.72%	-3.87%
01/10/2023	1900 Body	24.7	1850	1.481	52.359	1.520	53.300	-2.57%	-1.77%
			1860	1.492	52.328	1.520	53.300	-1.84%	-1.82%
			1880	1.514	52.266	1.520	53.300	-0.39%	-1.94%
			1900	1.538	52.196	1.520	53.300	1.18%	-2.07%
			1905	1.543	52.179	1.520	53.300	1.51%	-2.10%
			1910	1.549	52.162	1.520	53.300	1.91%	-2.14%
			1920	1.560	52.126	1.520	53.300	2.63%	-2.20%
			1950	1.594	52.009	1.520	53.300	4.87%	-2.42%
12/13/2022	2450 Body	20.1	2300	1.881	51.234	1.809	52.900	3.98%	-3.15%
			2310	1.890	51.220	1.816	52.887	4.07%	-3.15%
			2320	1.898	51.208	1.826	52.873	3.94%	-3.15%
			2400	1.966	51.093	1.902	52.767	3.36%	-3.17%
			2450	2.009	51.034	1.950	52.700	3.03%	-3.16%
			2480	2.035	50.997	1.993	52.662	2.11%	-3.16%
			2500	2.052	50.974	2.021	52.636	1.53%	-3.16%
			2510	2.062	50.960	2.035	52.623	1.33%	-3.16%
			2535	2.087	50.920	2.071	52.592	0.77%	-3.18%
			2550	2.102	50.900	2.092	52.573	0.48%	-3.18%
			2560	2.112	50.887	2.106	52.560	0.28%	-3.18%
			2600	2.149	50.831	2.163	52.509	-0.65%	-3.20%
			2650	2.197	50.733	2.234	52.445	-1.66%	-3.26%
			2680	2.227	50.688	2.277	52.407	-2.20%	-3.28%
			2700	2.246	50.658	2.305	52.382	-2.56%	-3.29%

Table 10-4
Measured Body Tissue Properties (Cont.)

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
12/27/2022	2450 Body	22.4	2300	1.886	51.230	1.809	52.900	4.26%	-3.16%
			2310	1.894	51.222	1.816	52.887	4.30%	-3.15%
			2320	1.902	51.208	1.826	52.873	4.16%	-3.15%
			2400	1.972	51.110	1.902	52.767	3.68%	-3.14%
			2450	2.018	51.022	1.950	52.700	3.49%	-3.18%
			2480	2.046	50.980	1.993	52.662	2.66%	-3.19%
			2500	2.063	50.957	2.021	52.636	2.08%	-3.19%
			2510	2.073	50.944	2.035	52.623	1.87%	-3.19%
			2535	2.096	50.903	2.071	52.592	1.21%	-3.21%
			2550	2.110	50.871	2.092	52.573	0.86%	-3.24%
			2560	2.120	50.848	2.106	52.560	0.66%	-3.26%
			2600	2.155	50.781	2.163	52.509	-0.37%	-3.29%
			2650	2.202	50.679	2.234	52.445	-1.43%	-3.37%
			2680	2.232	50.638	2.277	52.407	-1.98%	-3.38%
			2700	2.249	50.621	2.305	52.382	-2.43%	-3.36%
12/29/2022	2450 Body	22.4	2300	1.875	51.333	1.809	52.900	3.65%	-2.96%
			2310	1.884	51.329	1.816	52.887	3.74%	-2.95%
			2320	1.893	51.324	1.826	52.873	3.67%	-2.93%
			2400	1.961	51.219	1.902	52.767	3.10%	-2.93%
			2450	2.006	51.156	1.950	52.700	2.87%	-2.93%
			2480	2.030	51.099	1.993	52.662	1.86%	-2.97%
			2500	2.049	51.067	2.021	52.636	1.39%	-2.98%
			2510	2.058	51.046	2.035	52.623	1.13%	-3.00%
			2535	2.082	51.014	2.071	52.592	0.53%	-3.00%
			2550	2.095	50.996	2.092	52.573	0.14%	-3.00%
			2560	2.103	50.980	2.106	52.560	-0.14%	-3.01%
			2600	2.136	50.915	2.163	52.509	-1.25%	-3.04%
			2650	2.182	50.840	2.234	52.445	-2.33%	-3.06%
			2680	2.209	50.808	2.277	52.407	-2.99%	-3.05%
			2700	2.227	50.786	2.305	52.382	-3.38%	-3.05%
01/03/2023	5200-5800 Body	21.4	5180	5.096	48.145	5.276	49.041	-3.41%	-1.83%
			5190	5.110	48.128	5.288	49.028	-3.37%	-1.84%
			5200	5.128	48.121	5.299	49.014	-3.23%	-1.82%
			5210	5.145	48.087	5.311	49.001	-3.13%	-1.87%
			5220	5.160	48.042	5.323	48.987	-3.06%	-1.93%
			5240	5.191	47.986	5.346	48.960	-2.90%	-1.99%
			5250	5.210	47.979	5.358	48.947	-2.76%	-1.98%
			5260	5.228	47.969	5.369	48.933	-2.63%	-1.97%
			5270	5.244	47.957	5.381	48.919	-2.55%	-1.97%
			5280	5.261	47.948	5.393	48.906	-2.45%	-1.96%
			5290	5.275	47.934	5.404	48.892	-2.39%	-1.96%
			5300	5.286	47.924	5.416	48.879	-2.40%	-1.95%
			5310	5.298	47.905	5.428	48.865	-2.39%	-1.96%
			5320	5.311	47.888	5.439	48.851	-2.35%	-1.97%
			5500	5.530	47.537	5.650	48.607	-2.12%	-2.20%
			5510	5.547	47.521	5.661	48.594	-2.01%	-2.21%
			5520	5.565	47.505	5.673	48.580	-1.90%	-2.21%
			5530	5.578	47.481	5.685	48.566	-1.88%	-2.23%
			5540	5.593	47.456	5.696	48.553	-1.81%	-2.26%
			5550	5.605	47.435	5.708	48.539	-1.80%	-2.27%
			5560	5.620	47.410	5.720	48.526	-1.75%	-2.30%
			5580	5.649	47.357	5.743	48.499	-1.64%	-2.35%
			5600	5.689	47.315	5.766	48.471	-1.34%	-2.38%
			5610	5.708	47.303	5.778	48.458	-1.21%	-2.38%
			5620	5.727	47.291	5.790	48.444	-1.09%	-2.38%
			5640	5.758	47.270	5.813	48.417	-0.95%	-2.37%
			5660	5.786	47.249	5.837	48.390	-0.87%	-2.36%
			5670	5.801	47.236	5.848	48.376	-0.80%	-2.36%
			5680	5.817	47.220	5.860	48.363	-0.73%	-2.36%
			5690	5.833	47.205	5.872	48.349	-0.66%	-2.37%
			5700	5.850	47.187	5.883	48.336	-0.56%	-2.38%
			5710	5.865	47.166	5.895	48.322	-0.51%	-2.39%
			5720	5.881	47.152	5.907	48.309	-0.44%	-2.39%
			5745	5.919	47.142	5.936	48.275	-0.29%	-2.35%
			5750	5.921	47.135	5.942	48.268	-0.35%	-2.35%
			5755	5.923	47.129	5.947	48.261	-0.40%	-2.35%
			5765	5.930	47.105	5.959	48.248	-0.49%	-2.37%
			5775	5.941	47.075	5.971	48.234	-0.50%	-2.40%
			5785	5.956	47.039	5.982	48.220	-0.43%	-2.45%
			5795	5.971	47.026	5.994	48.207	-0.38%	-2.45%
			5800	5.980	47.021	6.000	48.200	-0.33%	-2.45%
			5805	5.987	47.015	6.006	48.193	-0.32%	-2.44%
			5825	6.013	46.983	6.029	48.166	-0.27%	-2.46%
			5835	6.027	46.962	6.042	48.130	-0.25%	-2.43%
			5845	6.036	46.933	6.054	48.110	-0.30%	-2.45%
			5855	6.039	46.900	6.066	48.093	-0.45%	-2.48%
			5865	6.039	46.874	6.077	48.080	-0.63%	-2.51%
			5875	6.047	46.859	6.088	48.067	-0.67%	-2.51%
			5885	6.062	46.825	6.100	48.053	-0.62%	-2.56%
			5905	6.091	46.763	6.122	48.027	-0.51%	-2.63%

The above measured tissue parameters were used in the DASY software. The DASY software was used to perform interpolation to determine the dielectric parameters at the SAR test device frequencies (per KDB Publication 865664 D01v01r04 and IEEE 1528-2013 6.6.1.2. The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

10.2 Test System Verification

Prior to SAR assessment, the system is verified to ±10% of the SAR measurement on the reference dipole at the time of calibration by the calibration facility. Full system validation status and result summary can be found in SAR System Validation Appendix.

Table 10-5
System Verification Results

System Verification TARGET & MEASURED																	
SAR System	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp. (C)	Liquid Temp. (C)	Input Power (W)	Source SN	Probe SN	DAE	Measured SAR 1g (W/kg)	1W Target SAR 1g (W/kg)	1W Normalized SAR 1g (W/kg)	Deviation 1g (%)	Measured SAR 10g (W/kg)	1W Target SAR 10g (W/kg)	1W Normalized SAR 10g (W/kg)	Deviation 10g (%)
G	13	HEAD	01/18/2023	22.6	22.0	1.00	1002	7527	1272	0.513	0.557	0.513	-7.90%	0.318	0.346	0.318	-8.09%
K1	750	HEAD	12/20/2022	22.3	21.3	0.20	1046	7491	1532	1.690	8.540	8.450	-1.05%	1.110	5.610	5.550	-1.07%
K1	835	HEAD	12/19/2022	21.1	19.4	0.20	4d180	7491	1532	2.050	9.750	10.250	5.13%	1.360	6.370	6.800	6.75%
K1	835	HEAD	01/03/2023	21.5	22.5	0.20	4d180	7491	1532	1.990	9.750	9.950	2.05%	1.320	6.370	6.600	3.61%
S	835	HEAD	01/16/2023	22.5	21.0	0.20	4d132	7488	1415	1.930	9.660	9.650	-0.10%	1.270	6.270	6.350	1.28%
C	1750	HEAD	12/27/2022	21.0	21.0	0.10	1150	7406	1677	3.780	36.900	37.800	2.44%	1.920	19.400	19.200	-1.03%
P	1900	HEAD	12/19/2022	18.8	21.9	0.10	5d148	7409	1334	4.170	40.100	41.700	3.99%	2.150	21.000	21.500	2.38%
P	1900	HEAD	12/27/2022	20.5	21.2	0.10	5d148	7409	1334	3.950	40.100	39.500	-1.50%	2.010	21.000	20.100	-4.29%
L	2450	HEAD	12/19/2022	21.0	22.0	0.10	797	7410	1583	5.530	52.000	55.300	6.35%	2.540	24.400	25.400	4.10%
G	2450	HEAD	12/27/2022	22.4	22.8	0.10	797	7527	1272	4.950	52.000	49.500	-4.81%	2.220	24.400	22.200	-9.02%
P	2450	HEAD	01/09/2023	22.6	22.0	0.10	981	7409	1344	5.400	53.900	54.000	0.19%	2.440	25.400	24.400	-3.94%
L	2600	HEAD	12/19/2022	21.0	22.0	0.10	1071	7410	1583	5.760	56.500	57.600	1.95%	2.560	25.400	25.600	0.79%
G	2600	HEAD	12/27/2022	22.4	22.8	0.10	1071	7527	1272	5.430	56.500	54.300	-3.89%	2.330	25.400	23.300	-8.27%
G	5250	HEAD	01/09/2023	22.8	19.8	0.05	1066	7527	1272	3.820	80.300	76.400	-4.86%	1.080	23.100	21.600	-6.49%
G	5600	HEAD	01/09/2023	22.8	19.8	0.05	1057	7527	1272	4.160	84.200	83.200	-1.19%	1.170	23.900	23.400	-2.09%
G	5750	HEAD	01/09/2023	22.8	19.8	0.05	1057	7527	1272	3.920	80.800	78.400	-2.97%	1.130	22.900	22.600	-1.31%
G	5800	HEAD	01/09/2023	22.8	19.8	0.05	1057	7527	1272	3.790	82.100	75.800	-7.67%	1.070	23.000	21.400	-6.96%
K3	750	BODY	01/04/2023	20.0	20.9	0.20	1003	7547	1322	1.740	8.800	8.700	-1.14%	1.170	5.840	5.850	0.17%
K2	835	BODY	12/15/2022	22.5	22.1	0.20	4d180	7640	1645	2.050	9.710	10.250	5.56%	1.340	6.390	6.700	4.85%
K3	835	BODY	12/15/2022	21.4	20.0	0.20	4d119	7547	1322	1.970	9.910	9.850	-0.61%	1.300	6.590	6.500	-1.37%
K3	835	BODY	12/20/2022	20.5	21.0	0.20	4d119	7547	1322	1.980	9.910	9.900	-0.10%	1.320	6.590	6.600	0.15%
S	835	BODY	01/17/2023	24.9	21.1	0.20	4d132	7488	1415	1.910	9.810	9.550	-2.65%	1.260	6.440	6.300	-2.17%
C	1750	BODY	12/21/2022	22.0	20.0	0.10	1150	7406	1677	3.970	37.800	39.700	5.03%	2.090	20.000	20.900	4.50%
C	1750	BODY	12/29/2022	20.0	20.0	0.10	1150	7406	1677	3.840	37.800	38.400	1.59%	2.000	20.000	20.000	0.00%
C	1750	BODY	01/09/2023	21.5	19.1	0.10	1150	7406	1677	3.890	37.800	38.900	2.91%	2.040	20.000	20.400	2.00%
J	1900	BODY	12/18/2022	23.5	23.0	0.10	5d080	7570	1558	4.140	40.700	41.400	1.72%	2.150	21.300	21.500	0.94%
J	1900	BODY	12/20/2022	23.1	23.6	0.10	5d080	7570	1558	4.070	40.700	40.700	0.00%	2.110	21.300	21.100	-0.94%
D	1900	BODY	01/10/2023	21.1	22.7	0.10	5d149	7551	1323	4.080	40.400	40.800	0.99%	2.140	21.100	21.400	1.42%
L	2450	BODY	12/13/2022	20.9	20.1	0.10	719	7410	1583	5.250	52.000	52.500	0.96%	2.420	24.700	24.200	-2.02%
L	2450	BODY	12/27/2022	23.0	22.4	0.10	797	7410	1583	5.130	50.200	51.300	2.19%	2.370	23.600	23.700	0.42%
L	2450	BODY	12/29/2022	24.0	22.4	0.10	981	7410	1583	5.140	50.300	51.400	2.19%	2.380	23.700	23.800	0.42%
L	2600	BODY	12/13/2022	20.9	20.1	0.10	1004	7410	1583	5.460	55.400	54.600	-1.44%	2.420	24.800	24.200	-2.42%
L	2600	BODY	12/27/2022	23.0	22.4	0.10	1071	7410	1583	5.580	54.300	55.800	2.76%	2.490	24.300	24.900	2.47%
K	5250	BODY	01/03/2023	22.6	21.4	0.05	1057	7659	1407	3.660	74.200	73.200	-1.35%	1.040	20.600	20.800	0.97%
K	5600	BODY	01/03/2023	22.6	21.4	0.05	1057	7659	1407	3.890	77.000	77.800	1.04%	1.090	21.200	21.800	2.83%
K	5750	BODY	01/03/2023	22.6	21.4	0.05	1057	7659	1407	3.530	74.900	70.600	-5.74%	0.988	20.700	19.760	-4.54%
K	5800	BODY	01/03/2023	22.6	21.4	0.05	1057	7659	1407	3.530	74.800	70.600	-5.61%	0.989	20.500	19.780	-3.51%

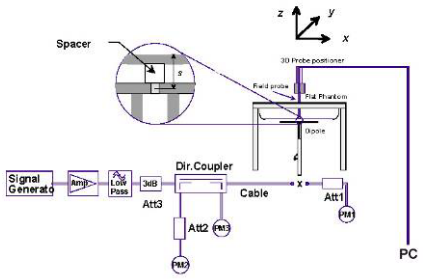


Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
GSM 850 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Device Serial Number	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
848.80	251	Right	Cheek	GSM 850	GSM	A	1060M	33.0	32.02	0.05	1:8.3	0.145	1.253	0.182	A1
848.80	251	Right	Tilt	GSM 850	GSM	A	1060M	33.0	32.02	0.04	1:8.3	0.081	1.253	0.101	
848.80	251	Left	Cheek	GSM 850	GSM	A	1060M	33.0	32.02	0.09	1:8.3	0.109	1.253	0.137	
848.80	251	Left	Tilt	GSM 850	GSM	A	1060M	33.0	32.02	0.06	1:8.3	0.079	1.253	0.099	
ICNIRP 1998 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-2
GSM 1900 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Device Serial Number	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1850.20	512	Right	Cheek	GSM 1900	GSM	A	1046M	30.0	29.53	0.09	1:8.3	0.038	1.114	0.042	
1850.20	512	Right	Tilt	GSM 1900	GSM	A	1046M	30.0	29.53	0.05	1:8.3	0.020	1.114	0.022	
1850.20	512	Left	Cheek	GSM 1900	GSM	A	1046M	30.0	29.53	0.05	1:8.3	0.063	1.114	0.070	A2
1850.20	512	Left	Tilt	GSM 1900	GSM	A	1046M	30.0	29.53	0.04	1:8.3	0.024	1.114	0.027	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-3
UMTS 850 Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Tune State	Device Serial Number	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
826.40	4132	Right	Cheek	UMTS 850	RMC	A	136	1060M	25.0	23.98	0.05	1:1	0.280	1.265	0.354	A3
826.40	4132	Right	Tilt	UMTS 850	RMC	A	136	1060M	25.0	23.98	-0.04	1:1	0.156	1.265	0.197	
826.40	4132	Left	Cheek	UMTS 850	RMC	A	136	1060M	25.0	23.98	0.02	1:1	0.174	1.265	0.220	
826.40	4132	Left	Tilt	UMTS 850	RMC	A	136	1060M	25.0	23.98	0.05	1:1	0.145	1.265	0.183	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-4
LTE Band 12 Head SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Test Position	Mode	Antenna Config.	Tune State	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
707.50	23095	Mid	Right	Cheek	LTE Band 12	A	136	1060M	10	QPSK	1	49	25.5	25.00	0	0.08	1:1	0.145	1.122	0.163	A4
707.50	23095	Mid	Right	Cheek	LTE Band 12	A	136	1060M	10	QPSK	25	25	24.5	23.87	1	0.10	1:1	0.122	1.156	0.141	
707.50	23095	Mid	Right	Tilt	LTE Band 12	A	136	1060M	10	QPSK	1	49	25.5	25.00	0	0.03	1:1	0.090	1.122	0.101	
707.50	23095	Mid	Right	Tilt	LTE Band 12	A	136	1060M	10	QPSK	25	25	24.5	23.87	1	0.09	1:1	0.065	1.156	0.075	
707.50	23095	Mid	Left	Cheek	LTE Band 12	A	136	1060M	10	QPSK	1	49	25.5	25.00	0	0.12	1:1	0.138	1.122	0.155	
707.50	23095	Mid	Left	Cheek	LTE Band 12	A	136	1060M	10	QPSK	25	25	24.5	23.87	1	0.09	1:1	0.119	1.156	0.138	
707.50	23095	Mid	Left	Tilt	LTE Band 12	A	136	1060M	10	QPSK	1	49	25.5	25.00	0	0.01	1:1	0.073	1.122	0.082	
707.50	23095	Mid	Left	Tilt	LTE Band 12	A	136	1060M	10	QPSK	25	25	24.5	23.87	1	0.07	1:1	0.065	1.156	0.075	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Head
Spatial Peak	1.6 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 1 gram

Table 11-5
LTE Band 13 Head SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Test Position	Mode	Antenna Config.	Tune State	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
782.00	23230	Mid	Right	Cheek	LTE Band 13	A	1	1060M	10	QPSK	1	0	25.5	24.64	0	0.03	1:1	0.284	1.219	0.346	A5
782.00	23230	Mid	Right	Cheek	LTE Band 13	A	1	1060M	10	QPSK	25	0	24.5	23.46	1	0.06	1:1	0.220	1.271	0.280	
782.00	23230	Mid	Right	Tilt	LTE Band 13	A	1	1060M	10	QPSK	1	0	25.5	24.64	0	0.01	1:1	0.151	1.219	0.184	
782.00	23230	Mid	Right	Tilt	LTE Band 13	A	1	1060M	10	QPSK	25	0	24.5	23.46	1	0.10	1:1	0.124	1.271	0.158	
782.00	23230	Mid	Left	Cheek	LTE Band 13	A	1	1060M	10	QPSK	1	0	25.5	24.64	0	0.15	1:1	0.206	1.219	0.251	
782.00	23230	Mid	Left	Cheek	LTE Band 13	A	1	1060M	10	QPSK	25	0	24.5	23.46	1	0.13	1:1	0.169	1.271	0.215	
782.00	23230	Mid	Left	Tilt	LTE Band 13	A	1	1060M	10	QPSK	1	0	25.5	24.64	0	0.10	1:1	0.132	1.219	0.161	
782.00	23230	Mid	Left	Tilt	LTE Band 13	A	1	1060M	10	QPSK	25	0	24.5	23.46	1	0.08	1:1	0.105	1.271	0.133	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Head
Spatial Peak	1.6 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 1 gram

Table 11-6
LTE Band 26 (Cell) Head SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Test Position	Mode	Antenna Config.	Tune State	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
831.50	26865	Mid	Right	Cheek	LTE Band 26 (Cell)	A	0	1060M	15	QPSK	1	36	25.5	24.28	0	0.07	1:1	0.212	1.324	0.281	A6
831.50	26865	Mid	Right	Cheek	LTE Band 26 (Cell)	A	0	1060M	15	QPSK	36	37	24.5	23.25	1	0.13	1:1	0.173	1.334	0.231	
831.50	26865	Mid	Right	Tilt	LTE Band 26 (Cell)	A	0	1060M	15	QPSK	1	36	25.5	24.28	0	0.10	1:1	0.142	1.324	0.188	
831.50	26865	Mid	Right	Tilt	LTE Band 26 (Cell)	A	0	1060M	15	QPSK	36	37	24.5	23.25	1	0.13	1:1	0.106	1.334	0.141	
831.50	26865	Mid	Left	Cheek	LTE Band 26 (Cell)	A	0	1060M	15	QPSK	1	36	25.5	24.28	0	0.07	1:1	0.185	1.324	0.245	
831.50	26865	Mid	Left	Cheek	LTE Band 26 (Cell)	A	0	1060M	15	QPSK	36	37	24.5	23.25	1	0.16	1:1	0.143	1.334	0.191	
831.50	26865	Mid	Left	Tilt	LTE Band 26 (Cell)	A	0	1060M	15	QPSK	1	36	25.5	24.28	0	0.09	1:1	0.131	1.324	0.173	
831.50	26865	Mid	Left	Tilt	LTE Band 26 (Cell)	A	0	1060M	15	QPSK	36	37	24.5	23.25	1	0.13	1:1	0.099	1.334	0.132	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Head
Spatial Peak	1.6 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 1 gram

Table 11-7
LTE Band 66 (AWS) Head SAR

MEASUREMENT RESULTS

FREQUENCY			Side	Test Position	Mode	Antenna Config.	Tune State	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																				
1720.00	132072	Low	Right	Cheek	LTE Band 66 (AWS)	A	24	1043M	20	QPSK	1	99	24.5	23.90	0	0.13	1:1	0.087	1.148	0.100	
1720.00	132072	Low	Right	Cheek	LTE Band 66 (AWS)	A	24	1043M	20	QPSK	50	50	23.5	22.68	1	0.10	1:1	0.031	1.208	0.037	
1720.00	132072	Low	Right	Tilt	LTE Band 66 (AWS)	A	31	1043M	20	QPSK	1	99	24.5	23.90	0	0.17	1:1	0.026	1.148	0.030	
1720.00	132072	Low	Right	Tilt	LTE Band 66 (AWS)	A	31	1043M	20	QPSK	50	50	23.5	22.68	1	-0.10	1:1	0.019	1.208	0.023	
1720.00	132072	Low	Left	Cheek	LTE Band 66 (AWS)	A	24	1043M	20	QPSK	1	99	24.5	23.90	0	0.02	1:1	0.197	1.148	0.226	A7
1720.00	132072	Low	Left	Cheek	LTE Band 66 (AWS)	A	31	1043M	20	QPSK	50	50	23.5	22.68	1	0.02	1:1	0.073	1.208	0.088	
1720.00	132072	Low	Left	Tilt	LTE Band 66 (AWS)	A	31	1043M	20	QPSK	1	99	24.5	23.90	0	0.02	1:1	0.061	1.148	0.070	
1720.00	132072	Low	Left	Tilt	LTE Band 66 (AWS)	A	31	1043M	20	QPSK	50	50	23.5	22.68	1	-0.13	1:1	0.024	1.208	0.029	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Head
Spatial Peak	1.6 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 1 gram

Table 11-8
LTE Band 2 (PCS) Head SAR

MEASUREMENT RESULTS

FREQUENCY			Side	Test Position	Mode	Antenna Config.	Tune State	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																				
1860.00	18700	Low	Right	Cheek	LTE Band 2 (PCS)	A	16	1046M	20	QPSK	1	0	24.5	23.88	0	-0.08	1:1	0.121	1.153	0.140	
1860.00	18700	Low	Right	Cheek	LTE Band 2 (PCS)	A	16	1046M	20	QPSK	50	0	23.5	22.75	1	-0.06	1:1	0.100	1.189	0.119	
1860.00	18700	Low	Right	Tilt	LTE Band 2 (PCS)	A	16	1046M	20	QPSK	1	0	24.5	23.88	0	0.01	1:1	0.080	1.153	0.092	
1860.00	18700	Low	Right	Tilt	LTE Band 2 (PCS)	A	16	1046M	20	QPSK	50	0	23.5	22.75	1	-0.03	1:1	0.063	1.189	0.075	
1860.00	18700	Low	Left	Cheek	LTE Band 2 (PCS)	A	16	1046M	20	QPSK	1	0	24.5	23.88	0	0.06	1:1	0.223	1.153	0.257	A8
1860.00	18700	Low	Left	Cheek	LTE Band 2 (PCS)	A	16	1046M	20	QPSK	50	0	23.5	22.75	1	0.10	1:1	0.171	1.189	0.203	
1860.00	18700	Low	Left	Tilt	LTE Band 2 (PCS)	A	16	1046M	20	QPSK	1	0	24.5	23.88	0	-0.16	1:1	0.097	1.153	0.112	
1860.00	18700	Low	Left	Tilt	LTE Band 2 (PCS)	A	16	1046M	20	QPSK	50	0	23.5	22.75	1	-0.02	1:1	0.078	1.189	0.093	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Head
Spatial Peak	1.6 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 1 gram

Table 11-9
LTE Band 41 Head SAR

MEASUREMENT RESULTS

# CC Uplink	Component Carrier	FREQUENCY			Side	Test Position	Mode	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
		MHz	Ch.																			
1 CC Uplink	N/A	2593.00	40620	Mid	Right	Cheek	LTE Band 41	B	1070M	20	QPSK	1	99	25.0	23.72	0	0.04	1:1.58	0.098	1.343	0.132	
1 CC Uplink	N/A	2593.00	40620	Mid	Right	Cheek	LTE Band 41	B	1070M	20	QPSK	50	25	24.0	22.80	1	-0.08	1:1.58	0.077	1.318	0.101	
1 CC Uplink	N/A	2593.00	40620	Mid	Right	Tilt	LTE Band 41	B	1070M	20	QPSK	1	99	25.0	23.72	0	0.04	1:1.58	0.061	1.343	0.082	
1 CC Uplink	N/A	2593.00	40620	Mid	Right	Tilt	LTE Band 41	B	1070M	20	QPSK	50	25	24.0	22.80	1	-0.15	1:1.58	0.051	1.318	0.067	
1 CC Uplink	N/A	2593.00	40620	Mid	Left	Cheek	LTE Band 41	B	1070M	20	QPSK	1	99	25.0	23.72	0	0.06	1:1.58	0.245	1.343	0.329	
1 CC Uplink	N/A	2593.00	40620	Mid	Left	Cheek	LTE Band 41	B	1070M	20	QPSK	50	25	24.0	22.80	1	0.02	1:1.58	0.191	1.318	0.252	
2 CC Uplink	PCC	2593.00	40620	Mid	Left	Cheek	LTE Band 41	B	1070M	20	QPSK	1	99	25.0	23.59	0	0.02	1:1.58	0.256	1.384	0.354	A10
	SCC	2612.80	40818										0									
1 CC Uplink	N/A	2593.00	40620	Mid	Left	Tilt	LTE Band 41	B	1070M	20	QPSK	1	99	25.0	23.72	0	0.05	1:1.58	0.116	1.343	0.156	
1 CC Uplink	N/A	2593.00	40620	Mid	Left	Tilt	LTE Band 41	B	1070M	20	QPSK	50	25	24.0	22.80	1	0.08	1:1.58	0.091	1.318	0.120	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Head
Spatial Peak	1.6 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 1 gram

Table 11-10
NR Band n5 Head SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Test Position	Mode	Antenna Config	Tune State	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																		(W/kg)		(W/kg)	
836.50	167300	Mid	Right	Cheek	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	1	53	25.5	23.92	0	0.03	1:1	0.151	1.439	0.217	
836.50	167300	Mid	Right	Cheek	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	50	28	25.5	23.88	0	0.01	1:1	0.155	1.452	0.225	A10
836.50	167300	Mid	Right	Cheek	NR Band n5	A	5	1061M	20	CP-OFDM	QPSK	1	1	24.0	22.46	1.5	0.00	1:1	0.128	1.426	0.183	
836.50	167300	Mid	Right	Tilt	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	1	53	25.5	23.92	0	-0.02	1:1	0.097	1.439	0.140	
836.50	167300	Mid	Right	Tilt	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	50	28	25.5	23.88	0	0.01	1:1	0.094	1.452	0.136	
836.50	167300	Mid	Left	Cheek	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	1	53	25.5	23.92	0	-0.06	1:1	0.134	1.439	0.193	
836.50	167300	Mid	Left	Cheek	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	50	28	25.5	23.88	0	-0.03	1:1	0.132	1.452	0.192	
836.50	167300	Mid	Left	Tilt	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	1	53	25.5	23.92	0	0.09	1:1	0.101	1.439	0.145	
836.50	167300	Mid	Left	Tilt	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	50	28	25.5	23.88	0	-0.08	1:1	0.100	1.452	0.145	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Head 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-11
NR Band n41 Head SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Test Position	Mode	Antenna Config	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
2592.99	518598	Mid	Right	Cheek	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	1	271	16.0	15.28	0	0.03	1:1	0.737	1.180	0.870	
2592.99	518598	Mid	Right	Cheek	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	135	69	16.0	15.31	0	-0.05	1:1	0.744	1.172	0.872	
2592.99	518598	Mid	Right	Cheek	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	270	0	16.0	15.27	0	0.01	1:1	0.736	1.183	0.871	
2592.99	518598	Mid	Right	Tilt	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	1	271	16.0	15.28	0	-0.01	1:1	0.751	1.180	0.886	A11
2592.99	518598	Mid	Right	Tilt	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	135	69	16.0	15.31	0	0.03	1:1	0.721	1.172	0.845	
2592.99	518598	Mid	Right	Tilt	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	270	0	16.0	15.27	0	0.05	1:1	0.712	1.183	0.842	
2592.99	518598	Mid	Right	Tilt	NR Band n41	F	1059M	100	CP-OFDM	QPSK	1	1	16.0	15.24	0	0.03	1:1	0.639	1.191	0.761	
2592.99	518598	Mid	Left	Cheek	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	1	271	16.0	15.28	0	-0.03	1:1	0.355	1.180	0.419	
2592.99	518598	Mid	Left	Cheek	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	135	69	16.0	15.31	0	-0.04	1:1	0.359	1.172	0.421	
2592.99	518598	Mid	Left	Tilt	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	1	271	16.0	15.28	0	-0.03	1:1	0.431	1.180	0.509	
2592.99	518598	Mid	Left	Tilt	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	135	69	16.0	15.31	0	-0.03	1:1	0.407	1.172	0.477	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Head 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-12
DTS Head SISO SAR

MEASUREMENT RESULTS																			
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.														(W/kg)			(W/kg)	
2462	11	Right	Cheek	802.11b	DSSS	2	1053M	22	1	12.0	11.86	0.04	100.00	98.89	0.172	1.033	1.011	0.180	
2462	11	Right	Tilt	802.11b	DSSS	2	1053M	22	1	12.0	11.86	-0.02	100.00	98.89	0.022	1.033	1.011	0.023	
2462	11	Left	Cheek	802.11b	DSSS	2	1053M	22	1	12.0	11.86	0.02	100.00	98.89	0.377	1.033	1.011	**0.394**	
2462	11	Left	Tilt	802.11b	DSSS	2	1053M	22	1	12.0	11.86	-0.03	100.00	98.89	0.096	1.033	1.011	0.100	
2437	6	Right	Cheek	802.11b	DSSS	2	1053M	22	1	10.0	9.78	-0.10	100.00	98.89	0.130	1.052	1.011	0.138	
2437	6	Right	Tilt	802.11b	DSSS	2	1053M	22	1	10.0	9.78	0.04	100.00	98.89	0.016	1.052	1.011	0.017	
2437	6	Left	Cheek	802.11b	DSSS	2	1053M	22	1	10.0	9.78	0.07	100.00	98.89	0.243	1.052	1.011	0.258	
2437	6	Left	Tilt	802.11b	DSSS	2	1053M	22	1	10.0	9.78	0.04	100.00	98.89	0.054	1.052	1.011	0.057	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-13
DTS Head MIMO SAR

MEASUREMENT RESULTS																				
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)			(W/kg)	
2437	6	Right	Cheek	802.11n	OFDM	MIMO	1052M	20	13	12.0	10.23	12.0	11.82	-0.05	100.00	92.33	0.237	1.503	1.083	0.386	
2437	6	Right	Tilt	802.11n	OFDM	MIMO	1052M	20	13	12.0	10.23	12.0	11.82	-0.05	100.00	92.33	0.128	1.503	1.083	0.208	
2412	1	Left	Cheek	802.11n	OFDM	MIMO	1052M	20	13	12.0	10.38	12.0	11.72	-0.04	100.00	92.33	0.445	1.452	1.083	0.700	A12
2437	6	Left	Cheek	802.11n	OFDM	MIMO	1052M	20	13	12.0	10.23	12.0	11.82	0.02	100.00	92.33	0.412	1.503	1.083	0.671	
2462	11	Left	Cheek	802.11n	OFDM	MIMO	1052M	20	13	12.0	9.76	12.0	11.96	-0.04	100.00	92.33	0.345	1.675	1.083	0.626	
2437	6	Left	Tilt	802.11n	OFDM	MIMO	1052M	20	13	12.0	10.23	12.0	11.82	-0.07	100.00	92.33	0.063	1.503	1.083	0.103	
2437	6	Right	Cheek	802.11n	OFDM	MIMO	1052M	20	13	10.0	8.07	10.0	9.75	0.00	100.00	92.33	0.134	1.560	1.083	0.226	
2437	6	Right	Tilt	802.11n	OFDM	MIMO	1052M	20	13	10.0	8.07	10.0	9.75	-0.05	100.00	92.33	0.071	1.560	1.083	0.120	
2437	6	Left	Cheek	802.11n	OFDM	MIMO	1052M	20	13	10.0	8.07	10.0	9.75	0.03	100.00	92.33	0.224	1.560	1.083	0.378	
2437	6	Left	Tilt	802.11n	OFDM	MIMO	1052M	20	13	10.0	8.07	10.0	9.75	-0.04	100.00	92.33	0.028	1.560	1.083	0.047	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Head 1.6 W/kg (mW/g) averaged over 1 gram										

Note: To achieve the 15.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 12.0 dBm. During simultaneous conditions with 5G NR and/or 5/6 GHz WLAN, to achieve the 13.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 10.0 dBm.

Table 11-14
NII MIMO Head SAR

MEASUREMENT RESULTS																					
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																				
5290	58	Right	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.61	14.0	13.35	-0.03	100.00	92.39	0.351	1.161	1.082	0.441	A13
5290	58	Right	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.61	14.0	13.35	-0.02	100.00	92.39	0.264	1.161	1.082	0.332	
5290	58	Left	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.61	14.0	13.35	-0.02	100.00	92.39	0.217	1.161	1.082	0.273	
5290	58	Left	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.61	14.0	13.35	0.08	100.00	92.39	0.210	1.161	1.082	0.264	
5690	138	Right	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.88	14.0	13.79	-0.09	100.00	92.39	0.134	1.050	1.082	0.152	
5690	138	Right	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.88	14.0	13.79	0.02	100.00	92.39	0.125	1.050	1.082	0.142	
5690	138	Left	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.88	14.0	13.79	0.02	100.00	92.39	0.190	1.050	1.082	0.216	
5690	138	Left	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.88	14.0	13.79	0.00	100.00	92.39	0.159	1.050	1.082	0.181	
5775	155	Right	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.70	14.0	12.80	0.01	100.00	92.39	0.094	1.318	1.082	0.134	
5775	155	Right	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.70	14.0	12.80	-0.01	100.00	92.39	0.069	1.318	1.082	0.098	
5775	155	Left	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.70	14.0	12.80	-0.12	100.00	92.39	0.152	1.318	1.082	0.217	
5775	155	Left	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.70	14.0	12.80	-0.15	100.00	92.39	0.137	1.318	1.082	0.195	
5855	171	Right	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.75	14.0	12.41	-0.16	100.00	92.39	0.148	1.442	1.082	0.231	
5855	171	Right	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.75	14.0	12.41	0.02	100.00	92.39	0.055	1.442	1.082	0.086	
5855	171	Left	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.75	14.0	12.41	0.04	100.00	92.39	0.099	1.442	1.082	0.154	
5855	171	Left	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.75	14.0	12.41	0.08	100.00	92.39	0.079	1.442	1.082	0.123	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																Head 1.6 W/kg (mW/g) averaged over 1 gram					

Note: To achieve the 17.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 14.0 dBm.

Table 11-15
NII MIMO Head SAR During Conditions with 5G NR

MEASUREMENT RESULTS																					
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																				
5290	58	Right	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.61	11.0	10.40	0.08	100.00	92.39	0.093	1.148	1.082	0.116	
5290	58	Right	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.61	11.0	10.40	0.09	100.00	92.39	0.065	1.148	1.082	0.081	
5290	58	Left	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.61	11.0	10.40	0.06	100.00	92.39	0.049	1.148	1.082	0.061	
5290	58	Left	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.61	11.0	10.40	0.10	100.00	92.39	0.035	1.148	1.082	0.043	
5610	122	Right	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.83	11.0	10.46	0.02	100.00	92.39	0.065	1.132	1.082	0.080	
5610	122	Right	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.83	11.0	10.46	0.04	100.00	92.39	0.059	1.132	1.082	0.072	
5610	122	Left	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.83	11.0	10.46	0.04	100.00	92.39	0.063	1.132	1.082	0.077	
5610	122	Left	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.83	11.0	10.46	0.01	100.00	92.39	0.046	1.132	1.082	0.056	
5775	155	Right	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.59	11.0	9.70	0.08	100.00	92.39	0.021	1.349	1.082	0.031	
5775	155	Right	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.59	11.0	9.70	-0.17	100.00	92.39	0.013	1.349	1.082	0.019	
5775	155	Left	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.59	11.0	9.70	0.03	100.00	92.39	0.023	1.349	1.082	0.034	
5775	155	Left	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.59	11.0	9.70	-0.17	100.00	92.39	0.015	1.349	1.082	0.022	
5855	171	Right	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.79	11.0	9.56	0.09	100.00	92.39	0.016	1.393	1.082	0.024	
5855	171	Right	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.79	11.0	9.56	0.01	100.00	92.39	0.011	1.393	1.082	0.017	
5855	171	Left	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.79	11.0	9.56	0.13	100.00	92.39	0.020	1.393	1.082	0.030	
5855	171	Left	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	11.0	10.79	11.0	9.56	0.03	100.00	92.39	0.011	1.393	1.082	0.017	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																Head 1.6 W/kg (mW/g) averaged over 1 gram					

Note: During simultaneous conditions with 5G NR, to achieve the 14.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 11.0 dBm.

Table 11-16
NII MIMO Head SAR During Conditions with 2.4 GHz WLAN or 2.4 GHz WLAN and 5G NR

MEASUREMENT RESULTS																					
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)			(W/kg)	
5290	58	Right	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.71	9.0	8.52	0.02	100.00	92.39	0.065	1.117	1.082	0.079	
5290	58	Right	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.71	9.0	8.52	0.08	100.00	92.39	0.065	1.117	1.082	0.079	
5290	58	Left	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.71	9.0	8.52	-0.12	100.00	92.39	0.064	1.117	1.082	0.077	
5290	58	Left	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.71	9.0	8.52	0.04	100.00	92.39	0.044	1.117	1.082	0.053	
5690	138	Right	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.73	9.0	8.76	0.02	100.00	92.39	0.026	1.064	1.082	0.030	
5690	138	Right	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.73	9.0	8.76	0.09	100.00	92.39	0.023	1.064	1.082	0.026	
5690	138	Left	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.73	9.0	8.76	0.05	100.00	92.39	0.036	1.064	1.082	0.041	
5690	138	Left	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.73	9.0	8.76	0.07	100.00	92.39	0.027	1.064	1.082	0.031	
5775	155	Right	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.71	9.0	7.79	0.04	100.00	92.39	0.019	1.321	1.082	0.027	
5775	155	Right	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.71	9.0	7.79	0.04	100.00	92.39	0.013	1.321	1.082	0.019	
5775	155	Left	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.71	9.0	7.79	0.02	100.00	92.39	0.029	1.321	1.082	0.041	
5775	155	Left	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.71	9.0	7.79	0.09	100.00	92.39	0.021	1.321	1.082	0.030	
5855	171	Right	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.90	9.0	8.23	0.20	100.00	92.39	0.013	1.194	1.082	0.017	
5855	171	Right	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.90	9.0	8.23	0.15	100.00	92.39	0.012	1.194	1.082	0.016	
5855	171	Left	Cheek	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.90	9.0	8.23	0.03	100.00	92.39	0.021	1.194	1.082	0.027	
5855	171	Left	Tilt	802.11ac	OFDM	MIMO	2064M	80	58.5	9.0	8.90	9.0	8.23	0.03	100.00	92.39	0.010	1.194	1.082	0.013	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																	Head 1.6 W/kg (mW/g) averaged over 1 gram				

Note: During simultaneous conditions with 2.4 GHz WLAN or 2.4 GHz WLAN and 5G NR, to achieve the 12.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 9.0 dBm.

Table 11-17
DSS Head SISO SAR

MEASUREMENT RESULTS																	
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													(W/kg)			(W/kg)	
2441	39	Right	Cheek	Bluetooth	FHSS	1	1053M	1	11.0	10.67	0.20	78.00	76.80	0.369	1.080	1.016	**0.405**	A14
2441	39	Right	Tilt	Bluetooth	FHSS	1	1053M	1	11.0	10.67	-0.05	78.00	76.80	0.273	1.080	1.016	0.300	
2441	39	Left	Cheek	Bluetooth	FHSS	1	1053M	1	11.0	10.67	0.01	78.00	76.80	0.092	1.080	1.016	0.101	
2441	39	Left	Tilt	Bluetooth	FHSS	1	1053M	1	11.0	10.67	0.11	78.00	76.80	0.092	1.080	1.016	0.101	
2402	0	Right	Cheek	Bluetooth	FHSS	2	1053M	1	11.0	10.08	0.06	78.00	76.80	0.116	1.237	1.016	0.146	
2402	0	Right	Tilt	Bluetooth	FHSS	2	1053M	1	11.0	10.08	0.20	78.00	76.80	0.015	1.237	1.016	0.019	
2402	0	Left	Cheek	Bluetooth	FHSS	2	1053M	1	11.0	10.08	0.07	78.00	76.80	0.168	1.237	1.016	0.211	
2402	0	Left	Tilt	Bluetooth	FHSS	2	1053M	1	11.0	10.08	0.04	78.00	76.80	0.027	1.237	1.016	0.034	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Head 1.6 W/kg (mW/g) averaged over 1 gram				

11.2 Standalone Body-Worn SAR Data

Table 11-18
GSM Body-Worn SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Device Serial Number	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
848.80	251	back	15 mm	GSM 850	GSM	A	1060M	33.0	32.02	0.00	1:8.3	0.172	1.253	0.216	A15
1850.20	512	back	15 mm	GSM 1900	GSM	A	1043M	29.0	27.73	-0.04	1:8.3	0.139	1.340	0.186	A16
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-19
UMTS Body-Worn SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Tune State	Device Serial Number	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
826.40	4132	back	15 mm	UMTS 850	RMC	A	2	1047M	25.0	23.98	-0.03	1:1	0.269	1.265	0.340	A17
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-20
LTE Body-Worn SAR

MEASUREMENT RESULTS																								
# CC Uplink	Component Carrier	FREQUENCY			Side	Spacing	Mode	Antenna Config.	Tune State	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
		MHz	Ch.																	(W/kg)		(W/kg)	
1 CC Uplink	N/A	707.50	23095	Mid	back	15 mm	LTE Band 12	A	136	1047M	10	QPSK	1	49	25.5	25.00	0	-0.04	1:1	0.221	1.122	0.248	A17
1 CC Uplink	N/A	707.50	23095	Mid	back	15 mm	LTE Band 12	A	136	1047M	10	QPSK	25	25	24.5	23.87	1	0.04	1:1	0.185	1.156	0.214	
1 CC Uplink	N/A	782.00	23230	Mid	back	15 mm	LTE Band 13	A	1	1047M	10	QPSK	1	0	25.5	24.64	0	-0.02	1:1	0.293	1.219	0.357	A18
1 CC Uplink	N/A	782.00	23230	Mid	back	15 mm	LTE Band 13	A	1	1047M	10	QPSK	25	0	24.5	23.46	1	0.04	1:1	0.242	1.271	0.308	
1 CC Uplink	N/A	831.50	26865	Mid	back	15 mm	LTE Band 26 (Cell)	A	0	1047M	15	QPSK	1	36	25.5	24.28	0	-0.02	1:1	0.259	1.324	0.343	A19
1 CC Uplink	N/A	831.50	26865	Mid	back	15 mm	LTE Band 26 (Cell)	A	0	1047M	15	QPSK	36	37	24.5	23.25	1	0.00	1:1	0.207	1.334	0.276	
1 CC Uplink	N/A	1745.00	132322	Mid	back	15 mm	LTE Band 66 (AWS)	A	23	1043M	20	QPSK	1	99	21.5	20.60	0	-0.05	1:1	0.392	1.230	0.482	A20
1 CC Uplink	N/A	1745.00	132322	Mid	back	15 mm	LTE Band 66 (AWS)	A	23	1043M	20	QPSK	50	50	21.5	20.57	0	0.01	1:1	0.377	1.239	0.467	
1 CC Uplink	N/A	1860.00	18700	Low	back	15 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	0	22.0	21.80	0	0.04	1:1	0.456	1.047	0.477	A21
1 CC Uplink	N/A	1860.00	18700	Low	back	15 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	0	22.0	21.77	0	-0.02	1:1	0.451	1.054	0.475	
1 CC Uplink	N/A	2506.00	39750	Low	back	15 mm	LTE Band 41	B	N/A	1070M	20	QPSK	1	50	22.0	20.81	0	-0.10	1:1.58	0.124	1.315	0.163	
1 CC Uplink	N/A	2506.00	39750	Low	back	15 mm	LTE Band 41	B	N/A	1070M	20	QPSK	50	25	22.0	20.82	0	0.01	1:1.58	0.127	1.312	0.167	
1 CC Uplink	N/A	2506.00	39750	Low	back	15 mm	LTE Band 41	B	N/A	1070M	20	QPSK	50	50	22.0	20.71	0	0.03	1:1.58	0.128	1.346	0.172	
2 CC Uplink	PCC	2506.00	39750	Low	back	15 mm	LTE Band 41	B	N/A	1070M	20	QPSK	50	50	22.0	20.77	0	-0.02	1:1.58	0.131	1.327	0.174	A22
	SCC	2525.80	39948											0									
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Body 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-21
NR Band 5 Body-Worn SAR

MEASUREMENT RESULTS																							
FREQUENCY			Side	Spacing	Mode	Antenna Config	Tune State	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																					
836.50	167300	Mid	back	15 mm	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	1	53	25.5	23.92	0	0.00	1:1	0.195	1.439	0.281	
836.50	167300	Mid	back	15 mm	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	50	28	25.5	23.88	0	0.01	1:1	0.195	1.452	0.283	A24
836.50	167300	Mid	back	15 mm	NR Band n5	A	5	1061M	20	CP-OFDM	QPSK	1	1	24.0	22.46	1.5	-0.07	1:1	0.140	1.426	0.200	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Body 1.6 W/kg (mW/g) averaged over 1 gram										

Table 11-22
NR Band 41 Body-Worn SAR

MEASUREMENT RESULTS																					
FREQUENCY			Side	Spacing	Mode	Antenna Config	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																				
2592.99	518598	Mid	back	15 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	1	137	20.0	19.33	0	-0.11	1:1	0.183	1.167	0.214	A25
2592.99	518598	Mid	back	15 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	135	69	20.0	19.32	0	0.03	1:1	0.179	1.169	0.209	
2592.99	518598	Mid	back	15 mm	NR Band n41	F	1059M	100	CP-OFDM	QPSK	1	1	20.0	19.04	0	0.01	1:1	0.167	1.247	0.208	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Body 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-23
DTS SISO Body-Worn SAR

MEASUREMENT RESULTS																		
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																		
2462	11	back	15 mm	802.11b	DSSS	2	1052M	22	1	19.0	18.93	0.05	100.00	98.89	0.059	1.016	1.011	**0.061**	
2412	1	back	15 mm	802.11b	DSSS	2	1052M	22	1	13.0	12.72	0.02	100.00	98.89	0.019	1.067	1.011	0.020	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-24
DTS MIMO Body-Worn SAR

MEASUREMENT RESULTS																				
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																				
2412	1	back	15 mm	802.11b	DSSS	MIMO	1052M	22	1	19.0	17.55	19.0	18.69	-0.04	100.00	98.72	0.241	1.396	1.013	0.341	A26
2412	1	back	15 mm	802.11n	OFDM	MIMO	1052M	20	13	13.0	11.50	13.0	12.82	0.06	100.00	92.33	0.035	1.413	1.083	0.054	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram								

Note: To achieve the 22.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 19.0 dBm. During simultaneous conditions with 5/6 GHz WLAN, to achieve the 16.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 13.0 dBm.

Table 11-25
NII MIMO Body-Worn SAR

MEASUREMENT RESULTS																					
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																				
5320	64	back	15 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	17.75	18.0	17.90	0.08	100.00	92.79	0.141	1.059	1.078	0.161	
5500	100	back	15 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	17.49	18.0	17.86	0.03	100.00	92.79	0.161	1.125	1.078	0.195	
5745	149	back	15 mm	802.11n	OFDM	MIMO	2064M	20	13	18.0	17.81	18.0	17.86	0.06	100.00	92.79	0.214	1.045	1.078	0.241	
5845	169	back	15 mm	802.11n	OFDM	MIMO	2064M	20	13	18.0	17.91	18.0	17.34	0.07	100.00	92.79	0.232	1.021	1.078	0.291	A27
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram										

Note: To achieve the 21.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 18.0 dBm.

Table 11-26
NII MIMO Body-Worn SAR During Conditions with 2.4 GHz WLAN or 5G NR

MEASUREMENT RESULTS																					
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																				
5290	58	back	15 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.61	14.0	13.35	0.09	100.00	92.39	0.023	1.094	1.082	0.029	
5690	138	back	15 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.88	14.0	13.79	0.05	100.00	92.39	0.034	1.028	1.082	0.039	
5775	155	back	15 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.70	14.0	12.80	0.06	100.00	92.39	0.027	1.072	1.082	0.039	
5855	171	back	15 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.75	14.0	12.41	0.07	100.00	92.39	0.038	1.059	1.082	0.059	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram										

Note: During simultaneous conditions with 2.4 GHz WLAN or 5G NR, to achieve the 17.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 14.0 dBm.

Table 11-27
DSS SISO Body-Worn SAR

MEASUREMENT RESULTS																		
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g) (W/kg)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																	
2441	39	back	15 mm	Bluetooth	FHSS	1	1052M	1	15.5	14.39	0.03	78.00	76.80	0.023	1.291	1.016	**0.030**	A28
2402	0	back	15 mm	Bluetooth	FHSS	2	1052M	1	15.5	14.60	0.01	78.00	76.80	0.020	1.230	1.016	**0.025**	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram								

11.3 Standalone Hotspot SAR Data

Table 11-28
GPRS Hotspot SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Device Serial Number	# of Time Slots	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
824.20	128	back	10 mm	GSM 850	GPRS	A	1060M	2	32.5	30.94	-0.03	1:4.15	0.473	1.432	0.677	A29
836.60	190	back	10 mm	GSM 850	GPRS	A	1060M	2	32.5	31.05	-0.04	1:4.15	0.460	1.396	0.642	
848.80	251	back	10 mm	GSM 850	GPRS	A	1060M	2	32.5	30.95	0.04	1:4.15	0.454	1.429	0.649	
836.60	190	front	10 mm	GSM 850	GPRS	A	1060M	2	32.5	31.05	-0.03	1:4.15	0.319	1.396	0.445	
836.60	190	bottom	10 mm	GSM 850	GPRS	A	1060M	2	32.5	31.05	0.03	1:4.15	0.124	1.396	0.173	
836.60	190	right	10 mm	GSM 850	GPRS	A	1060M	2	32.5	31.05	-0.12	1:4.15	0.343	1.396	0.479	
836.60	190	left	10 mm	GSM 850	GPRS	A	1060M	2	32.5	31.05	-0.20	1:4.15	0.235	1.396	0.328	
1909.80	810	back	10 mm	GSM 1900	GPRS	A	1043M	4	23.0	21.53	-0.02	1:2.076	0.293	1.403	0.411	
1909.80	810	front	10 mm	GSM 1900	GPRS	A	1043M	4	23.0	21.53	0.01	1:2.076	0.287	1.403	0.403	
1850.20	512	bottom	10 mm	GSM 1900	GPRS	A	1043M	4	23.0	21.08	-0.07	1:2.076	0.393	1.556	0.612	
1880.00	661	bottom	10 mm	GSM 1900	GPRS	A	1043M	4	23.0	21.48	-0.02	1:2.076	0.495	1.419	0.702	
1909.80	810	bottom	10 mm	GSM 1900	GPRS	A	1043M	4	23.0	21.53	0.01	1:2.076	0.547	1.403	0.767	A30
1909.80	810	right	10 mm	GSM 1900	GPRS	A	1043M	4	23.0	21.53	-0.08	1:2.076	0.043	1.403	0.060	
1909.80	810	left	10 mm	GSM 1900	GPRS	A	1043M	4	23.0	21.53	0.01	1:2.076	0.060	1.403	0.084	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-29
UMTS Hotspot SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Tune State	Device Serial Number	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
826.40	4132	back	10 mm	UMTS 850	RMC	A	136	1047M	25.0	23.98	-0.02	1:1	0.457	1.265	0.578	A31
826.40	4132	front	10 mm	UMTS 850	RMC	A	136	1047M	25.0	23.98	-0.01	1:1	0.295	1.265	0.373	
826.40	4132	bottom	10 mm	UMTS 850	RMC	A	2	1047M	25.0	23.98	-0.02	1:1	0.106	1.265	0.134	
826.40	4132	right	10 mm	UMTS 850	RMC	A	2	1047M	25.0	23.98	0.03	1:1	0.282	1.265	0.357	
826.40	4132	left	10 mm	UMTS 850	RMC	A	50	1047M	25.0	23.98	0.04	1:1	0.288	1.265	0.364	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-30
LTE Band 12 Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Spacing	Mode	Antenna Config.	Tune State	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
707.50	23095	Mid	back	10 mm	LTE Band 12	A	136	1047M	10	QPSK	1	49	25.5	25.00	0	0.00	1:1	0.336	1.122	0.377	
707.50	23095	Mid	back	10 mm	LTE Band 12	A	136	1047M	10	QPSK	25	25	24.5	23.87	1	-0.01	1:1	0.274	1.156	0.317	
707.50	23095	Mid	front	10 mm	LTE Band 12	A	136	1047M	10	QPSK	1	49	25.5	25.00	0	0.04	1:1	0.232	1.122	0.260	
707.50	23095	Mid	front	10 mm	LTE Band 12	A	136	1047M	10	QPSK	25	25	24.5	23.87	1	0.00	1:1	0.193	1.156	0.223	
707.50	23095	Mid	bottom	10 mm	LTE Band 12	A	136	1047M	10	QPSK	1	49	25.5	25.00	0	-0.07	1:1	0.040	1.122	0.045	
707.50	23095	Mid	bottom	10 mm	LTE Band 12	A	136	1047M	10	QPSK	25	25	24.5	23.87	1	0.02	1:1	0.033	1.156	0.038	
707.50	23095	Mid	right	10 mm	LTE Band 12	A	136	1047M	10	QPSK	1	49	25.5	25.00	0	0.07	1:1	0.221	1.122	0.248	
707.50	23095	Mid	right	10 mm	LTE Band 12	A	136	1047M	10	QPSK	25	25	24.5	23.87	1	0.00	1:1	0.190	1.156	0.220	
707.50	23095	Mid	left	10 mm	LTE Band 12	A	136	1047M	10	QPSK	1	49	25.5	25.00	0	0.00	1:1	0.403	1.122	0.452	A32
707.50	23095	Mid	left	10 mm	LTE Band 12	A	136	1047M	10	QPSK	25	25	24.5	23.87	1	-0.01	1:1	0.329	1.156	0.380	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Body
Spatial Peak	1.6 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 1 gram

Table 11-31
LTE Band 13 Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Spacing	Mode	Antenna Config.	Tune State	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
782.00	23230	Mid	back	10 mm	LTE Band 13	A	1	1047M	10	QPSK	1	0	25.5	24.64	0	0.02	1:1	0.479	1.219	0.584	A33
782.00	23230	Mid	back	10 mm	LTE Band 13	A	1	1047M	10	QPSK	25	0	24.5	23.46	1	0.01	1:1	0.403	1.271	0.512	
782.00	23230	Mid	front	10 mm	LTE Band 13	A	1	1047M	10	QPSK	1	0	25.5	24.64	0	-0.01	1:1	0.334	1.219	0.407	
782.00	23230	Mid	front	10 mm	LTE Band 13	A	1	1047M	10	QPSK	25	0	24.5	23.46	1	0.00	1:1	0.280	1.271	0.356	
782.00	23230	Mid	bottom	10 mm	LTE Band 13	A	1	1047M	10	QPSK	1	0	25.5	24.64	0	-0.08	1:1	0.096	1.219	0.117	
782.00	23230	Mid	bottom	10 mm	LTE Band 13	A	1	1047M	10	QPSK	25	0	24.5	23.46	1	0.01	1:1	0.082	1.271	0.104	
782.00	23230	Mid	right	10 mm	LTE Band 13	A	1	1047M	10	QPSK	1	0	25.5	24.64	0	0.00	1:1	0.253	1.219	0.308	
782.00	23230	Mid	right	10 mm	LTE Band 13	A	1	1047M	10	QPSK	25	0	24.5	23.46	1	0.00	1:1	0.204	1.271	0.259	
782.00	23230	Mid	left	10 mm	LTE Band 13	A	1	1047M	10	QPSK	1	0	25.5	24.64	0	0.02	1:1	0.262	1.219	0.319	
782.00	23230	Mid	left	10 mm	LTE Band 13	A	1	1047M	10	QPSK	25	0	24.5	23.46	1	-0.01	1:1	0.220	1.271	0.280	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Body
Spatial Peak	1.6 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 1 gram

Table 11-32
LTE Band 26 (Cell) Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Spacing	Mode	Antenna Config.	Tune State	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
831.50	26865	Mid	back	10 mm	LTE Band 26 (Cell)	A	0	1047M	15	QPSK	1	36	25.5	24.28	0	-0.08	1:1	0.520	1.324	0.688	A34
831.50	26865	Mid	back	10 mm	LTE Band 26 (Cell)	A	0	1047M	15	QPSK	36	37	24.5	23.25	1	-0.01	1:1	0.431	1.334	0.575	
831.50	26865	Mid	front	10 mm	LTE Band 26 (Cell)	A	0	1047M	15	QPSK	1	36	25.5	24.28	0	-0.06	1:1	0.321	1.324	0.425	
831.50	26865	Mid	front	10 mm	LTE Band 26 (Cell)	A	0	1047M	15	QPSK	36	37	24.5	23.25	1	0.01	1:1	0.261	1.334	0.348	
831.50	26865	Mid	bottom	10 mm	LTE Band 26 (Cell)	A	0	1047M	15	QPSK	1	36	25.5	24.28	0	-0.06	1:1	0.138	1.324	0.183	
831.50	26865	Mid	bottom	10 mm	LTE Band 26 (Cell)	A	0	1047M	15	QPSK	36	37	24.5	23.25	1	0.02	1:1	0.114	1.334	0.152	
831.50	26865	Mid	right	10 mm	LTE Band 26 (Cell)	A	0	1047M	15	QPSK	1	36	25.5	24.28	0	0.04	1:1	0.207	1.324	0.274	
831.50	26865	Mid	right	10 mm	LTE Band 26 (Cell)	A	0	1047M	15	QPSK	36	37	24.5	23.25	1	-0.01	1:1	0.152	1.334	0.203	
831.50	26865	Mid	left	10 mm	LTE Band 26 (Cell)	A	0	1047M	15	QPSK	1	36	25.5	24.28	0	-0.01	1:1	0.202	1.324	0.267	
831.50	26865	Mid	left	10 mm	LTE Band 26 (Cell)	A	0	1047M	15	QPSK	36	37	24.5	23.25	1	0.01	1:1	0.144	1.334	0.192	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Body
Spatial Peak	1.6 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 1 gram

Table 11-33
LTE Band 66 (AWS) Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY			Side	Spacing	Mode	Antenna Config.	Tune State	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
1720.00	132072	Low	back	10 mm	LTE Band 66 (AWS)	A	31	1043M	20	QPSK	1	99	20.0	19.19	0	0.00	1:1	0.233	1.205	0.281	
1720.00	132072	Low	back	10 mm	LTE Band 66 (AWS)	A	31	1043M	20	QPSK	50	50	20.0	19.11	0	0.02	1:1	0.235	1.227	0.288	
1720.00	132072	Low	front	10 mm	LTE Band 66 (AWS)	A	26	1043M	20	QPSK	1	99	20.0	19.19	0	-0.01	1:1	0.312	1.205	0.376	
1720.00	132072	Low	front	10 mm	LTE Band 66 (AWS)	A	26	1043M	20	QPSK	50	50	20.0	19.11	0	0.02	1:1	0.310	1.227	0.380	
1720.00	132072	Low	bottom	10 mm	LTE Band 66 (AWS)	A	16	1046M	20	QPSK	1	99	20.0	19.19	0	0.00	1:1	0.501	1.205	0.604	
1720.00	132072	Low	bottom	10 mm	LTE Band 66 (AWS)	A	16	1046M	20	QPSK	50	50	20.0	19.11	0	0.01	1:1	0.501	1.227	0.615	
1745.00	132322	Mid	bottom	10 mm	LTE Band 66 (AWS)	A	16	1046M	20	QPSK	50	0	20.0	19.04	0	-0.01	1:1	0.504	1.247	0.628	
1770.00	132572	High	bottom	10 mm	LTE Band 66 (AWS)	A	16	1046M	20	QPSK	50	50	20.0	19.10	0	-0.01	1:1	0.597	1.230	0.734	A35
1720.00	132072	Low	right	10 mm	LTE Band 66 (AWS)	A	31	1043M	20	QPSK	1	99	20.0	19.19	0	-0.10	1:1	0.020	1.205	0.024	
1720.00	132072	Low	right	10 mm	LTE Band 66 (AWS)	A	31	1043M	20	QPSK	50	50	20.0	19.11	0	-0.09	1:1	0.021	1.227	0.026	
1720.00	132072	Low	left	10 mm	LTE Band 66 (AWS)	A	24	1043M	20	QPSK	1	99	20.0	19.19	0	-0.02	1:1	0.039	1.205	0.047	
1720.00	132072	Low	left	10 mm	LTE Band 66 (AWS)	A	31	1043M	20	QPSK	50	50	20.0	19.11	0	0.02	1:1	0.038	1.227	0.047	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-34
LTE Band 2 (PCS) Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY			Side	Spacing	Mode	Antenna Config.	Tune State	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
1860.00	18700	Low	back	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	0	20.0	19.78	0	0.02	1:1	0.585	1.052	0.615	
1860.00	18700	Low	back	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	0	20.0	19.77	0	-0.01	1:1	0.584	1.054	0.616	
1860.00	18700	Low	front	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	0	20.0	19.78	0	0.01	1:1	0.504	1.052	0.530	
1860.00	18700	Low	front	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	0	20.0	19.77	0	-0.01	1:1	0.502	1.054	0.529	
1860.00	18700	Low	bottom	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	0	20.0	19.78	0	0.04	1:1	0.901	1.052	0.948	
1880.00	18900	Mid	bottom	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	99	20.0	19.49	0	0.03	1:1	0.970	1.125	1.091	A36
1900.00	19100	High	bottom	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	99	20.0	19.77	0	0.01	1:1	0.968	1.054	1.020	
1860.00	18700	Low	bottom	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	0	20.0	19.77	0	0.01	1:1	0.931	1.054	0.981	
1880.00	18900	Mid	bottom	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	0	20.0	19.58	0	-0.01	1:1	0.934	1.102	1.029	
1900.00	19100	High	bottom	10 mm	LTE Band 2 (PCS)	A	0	1043M	20	QPSK	50	50	20.0	19.62	0	-0.05	1:1	0.968	1.091	1.056	
1860.00	18700	Low	bottom	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	100	0	20.0	19.66	0	0.01	1:1	0.906	1.081	0.979	
1860.00	18700	Low	right	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	0	20.0	19.78	0	-0.04	1:1	0.046	1.052	0.048	
1860.00	18700	Low	right	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	0	20.0	19.77	0	0.03	1:1	0.044	1.054	0.046	
1860.00	18700	Low	left	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	0	20.0	19.78	0	-0.07	1:1	0.152	1.052	0.160	
1860.00	18700	Low	left	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	0	20.0	19.77	0	-0.01	1:1	0.154	1.054	0.162	
1880.00	18900	Mid	bottom	10 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	99	20.0	19.49	0	-0.02	1:1	0.933	1.125	1.050	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram								

Note: Blue entry represents variability measurement.

Table 11-35
LTE Band 41 Hotspot SAR

MEASUREMENT RESULTS																							
# CC Uplink	Component Carrier	FREQUENCY			Side	Spacing	Mode	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
		MHz	Ch.																			
1 CC Uplink	N/A	2506.00	39750	Low	back	10 mm	LTE Band 41	B	1070M	20	QPSK	1	50	22.0	20.81	0	0.04	1:1.58	0.250	1.315	0.329	
1 CC Uplink	N/A	2506.00	39750	Low	back	10 mm	LTE Band 41	B	1070M	20	QPSK	50	25	22.0	20.82	0	0.01	1:1.58	0.256	1.312	0.336	
1 CC Uplink	N/A	2506.00	39750	Low	front	10 mm	LTE Band 41	B	1070M	20	QPSK	1	50	22.0	20.81	0	0.00	1:1.58	0.182	1.315	0.239	
1 CC Uplink	N/A	2506.00	39750	Low	front	10 mm	LTE Band 41	B	1070M	20	QPSK	50	25	22.0	20.82	0	0.01	1:1.58	0.184	1.312	0.241	
1 CC Uplink	N/A	2506.00	39750	Low	bottom	10 mm	LTE Band 41	B	1070M	20	QPSK	1	50	22.0	20.81	0	0.00	1:1.58	0.288	1.315	0.379	A37
1 CC Uplink	N/A	2506.00	39750	Low	bottom	10 mm	LTE Band 41	B	1070M	20	QPSK	1	99	22.0	20.62	0	0.05	1:1.58	0.284	1.374	0.390	
1 CC Uplink	N/A	2506.00	39750	Low	bottom	10 mm	LTE Band 41	B	1070M	20	QPSK	50	25	22.0	20.82	0	0.01	1:1.58	0.288	1.312	0.378	
2 CC Uplink	PCC	2506.00	39750	Low	bottom	10 mm	LTE Band 41	B	1070M	20	QPSK	1	99	22.0	20.63	0	0.00	1:1.58	0.286	1.371	0.392	
	SCC	2525.80	39948										0									
1 CC Uplink	N/A	2506.00	39750	Low	left	10 mm	LTE Band 41	B	1070M	20	QPSK	1	50	22.0	20.81	0	0.00	1:1.58	0.193	1.315	0.254	
1 CC Uplink	N/A	2506.00	39750	Low	left	10 mm	LTE Band 41	B	1070M	20	QPSK	50	25	22.0	20.82	0	-0.04	1:1.58	0.203	1.312	0.266	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram												

Table 11-36
NR Band n5 Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Spacing	Mode	Antenna Config	Tune State	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																					
836.50	167300	Mid	back	10 mm	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	1	53	25.5	23.92	0	-0.05	1:1	0.427	1.439	0.614	
836.50	167300	Mid	back	10 mm	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	50	28	25.5	23.88	0	-0.01	1:1	0.498	1.452	0.723	A38
836.50	167300	Mid	back	10 mm	NR Band n5	A	5	1061M	20	CP-OFDM	QPSK	1	1	24.0	22.46	1.5	-0.03	1:1	0.322	1.426	0.459	
836.50	167300	Mid	front	10 mm	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	1	53	25.5	23.92	0	0.00	1:1	0.252	1.439	0.363	
836.50	167300	Mid	front	10 mm	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	50	28	25.5	23.88	0	0.01	1:1	0.251	1.452	0.364	
836.50	167300	Mid	bottom	10 mm	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	1	53	25.5	23.92	0	-0.06	1:1	0.245	1.439	0.353	
836.50	167300	Mid	bottom	10 mm	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	50	28	25.5	23.88	0	-0.03	1:1	0.246	1.452	0.357	
836.50	167300	Mid	right	10 mm	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	1	53	25.5	23.92	0	0.13	1:1	0.190	1.439	0.273	
836.50	167300	Mid	right	10 mm	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	50	28	25.5	23.88	0	-0.05	1:1	0.190	1.452	0.276	
836.50	167300	Mid	left	10 mm	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	1	53	25.5	23.92	0	0.05	1:1	0.106	1.439	0.153	
836.50	167300	Mid	left	10 mm	NR Band n5	A	5	1061M	20	DFT-S-OFDM	QPSK	50	28	25.5	23.88	0	-0.02	1:1	0.103	1.452	0.150	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-37
NR Band n41 Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Spacing	Mode	Antenna Config	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																					
2592.99	518598	Mid	back	10 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	1	137	20.0	19.33	0	0.01	1:1	0.333	1.167	0.389	
2592.99	518598	Mid	back	10 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	135	69	20.0	19.32	0	-0.01	1:1	0.331	1.169	0.387	
2592.99	518598	Mid	front	10 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	1	137	20.0	19.33	0	0.06	1:1	0.220	1.167	0.257	
2592.99	518598	Mid	front	10 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	135	69	20.0	19.32	0	0.00	1:1	0.221	1.169	0.258	
2592.99	518598	Mid	top	10 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	1	137	20.0	19.33	0	-0.07	1:1	0.506	1.167	0.591	A39
2592.99	518598	Mid	top	10 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	135	69	20.0	19.32	0	-0.07	1:1	0.499	1.169	0.583	
2592.99	518598	Mid	top	10 mm	NR Band n41	F	1059M	100	CP-OFDM	QPSK	1	1	20.0	19.04	0	-0.01	1:1	0.469	1.247	0.585	
2592.99	518598	Mid	left	10 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	1	137	20.0	19.33	0	-0.08	1:1	0.050	1.167	0.058	
2592.99	518598	Mid	left	10 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	135	69	20.0	19.32	0	0.05	1:1	0.050	1.169	0.058	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram												

Table 11-38
DTS SISO WLAN Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.														(W/kg)			(W/kg)	
2462	11	back	10 mm	802.11b	DSSS	2	1052M	22	1	19.0	18.93	-0.04	100.00	98.89	0.120	1.016	1.011	0.123	
2462	11	front	10 mm	802.11b	DSSS	2	1052M	22	1	19.0	18.93	-0.03	100.00	98.89	0.155	1.016	1.011	0.159	
2462	11	top	10 mm	802.11b	DSSS	2	1052M	22	1	19.0	18.93	0.03	100.00	98.89	0.012	1.016	1.011	0.012	
2462	11	right	10 mm	802.11b	DSSS	2	1052M	22	1	19.0	18.93	-0.09	100.00	98.89	0.064	1.016	1.011	0.066	
2412	1	back	10 mm	802.11b	DSSS	2	1052M	22	1	13.0	12.72	-0.03	100.00	98.89	0.041	1.067	1.011	0.044	
2412	1	front	10 mm	802.11b	DSSS	2	1052M	22	1	13.0	12.72	-0.01	100.00	98.89	0.054	1.067	1.011	0.058	
2412	1	top	10 mm	802.11b	DSSS	2	1052M	22	1	13.0	12.72	0.09	100.00	98.89	0.004	1.067	1.011	0.004	
2412	1	right	10 mm	802.11b	DSSS	2	1052M	22	1	13.0	12.72	0.10	100.00	98.89	0.022	1.067	1.011	0.024	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-39
DTS MIMO WLAN Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)			(W/kg)	
2412	1	back	10 mm	802.11b	DSSS	MIMO	1052M	22	1	19.0	17.55	19.0	18.69	0.04	100.00	98.72	0.364	1.396	1.013	0.515	A40
2412	1	front	10 mm	802.11b	DSSS	MIMO	1052M	22	1	19.0	17.55	19.0	18.69	-0.01	100.00	98.72	0.355	1.396	1.013	0.502	
2412	1	top	10 mm	802.11b	DSSS	MIMO	1052M	22	1	19.0	17.55	19.0	18.69	0.08	100.00	98.72	0.122	1.396	1.013	0.173	
2412	1	right	10 mm	802.11b	DSSS	MIMO	1052M	22	1	19.0	17.55	19.0	18.69	-0.06	100.00	98.72	0.106	1.396	1.013	0.150	
2412	1	left	10 mm	802.11b	DSSS	MIMO	1052M	22	1	19.0	17.55	19.0	18.69	0.16	100.00	98.72	0.265	1.396	1.013	0.375	
2412	1	back	10 mm	802.11n	OFDM	MIMO	1052M	20	13	13.0	11.50	13.0	12.82	-0.01	100.00	92.33	0.063	1.413	1.083	0.096	
2412	1	front	10 mm	802.11n	OFDM	MIMO	1052M	20	13	13.0	11.50	13.0	12.82	0.08	100.00	92.33	0.057	1.413	1.083	0.087	
2412	1	top	10 mm	802.11n	OFDM	MIMO	1052M	20	13	13.0	11.50	13.0	12.82	0.00	100.00	92.33	0.046	1.413	1.083	0.070	
2412	1	right	10 mm	802.11n	OFDM	MIMO	1052M	20	13	13.0	11.50	13.0	12.82	-0.05	100.00	92.33	0.022	1.413	1.083	0.034	
2412	1	left	10 mm	802.11n	OFDM	MIMO	1052M	20	13	13.0	11.50	13.0	12.82	0.04	100.00	92.33	0.061	1.413	1.083	0.093	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram							

Note: To achieve the 22.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 19.0 dBm. During simultaneous conditions with 5/6 GHz WLAN, to achieve the 16.0 dBm maximum allowed MIMO power shown in the documentation each antenna transmits at a maximum allowed power of 13.0 dBm.

Table 11-40
NII MIMO WLAN Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)			(W/kg)	
5745	149	back	10 mm	802.11n	OFDM	MIMO	2064M	20	13	18.0	17.81	18.0	17.86	0.05	100.00	92.79	0.223	1.045	1.078	0.251	A41
5745	149	front	10 mm	802.11n	OFDM	MIMO	2064M	20	13	18.0	17.81	18.0	17.86	0.20	100.00	92.79	0.083	1.045	1.078	0.094	
5745	149	top	10 mm	802.11n	OFDM	MIMO	2064M	20	13	18.0	17.81	18.0	17.86	-0.07	100.00	92.79	0.136	1.045	1.078	0.153	
5745	149	right	10 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	17.81	18.0	17.86	0.20	100.00	92.79	0.056	1.045	1.078	0.063	
5745	149	left	10 mm	802.11n	OFDM	MIMO	2064M	20	13	18.0	17.81	18.0	17.86	0.01	100.00	92.79	0.113	1.045	1.078	0.127	
5775	155	back	10 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.70	14.0	12.80	0.04	100.00	92.39	0.042	1.072	1.082	0.060	
5775	155	front	10 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.70	14.0	12.80	0.20	100.00	92.39	0.013	1.072	1.082	0.019	
5775	155	top	10 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.70	14.0	12.80	0.13	100.00	92.39	0.025	1.072	1.082	0.036	
5775	155	right	10 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.70	14.0	12.80	0.07	100.00	92.39	0.007	1.072	1.082	0.010	
5775	155	left	10 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.70	14.0	12.80	-0.14	100.00	92.39	0.022	1.072	1.082	0.031	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Body 1.6 W/kg (mW/g) averaged over 1 gram							

Note: To achieve the 21.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 18.0 dBm. During simultaneous conditions with 2.4 GHz WLAN or 5G NR, to achieve the 17.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 14.0 dBm.

Table 11-41
DSS Hotspot SAR

MEASUREMENT RESULTS																		
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													(W/kg)			(W/kg)	
2441	39	back	10 mm	Bluetooth	FHSS	1	1052M	1	15.5	14.39	0.01	78.00	76.80	0.050	1.291	1.016	0.066	
2441	39	front	10 mm	Bluetooth	FHSS	1	1052M	1	15.5	14.39	-0.05	78.00	76.80	0.045	1.291	1.016	0.059	
2441	39	top	10 mm	Bluetooth	FHSS	1	1052M	1	15.5	14.39	0.07	78.00	76.80	0.046	1.291	1.016	0.060	
2441	39	left	10 mm	Bluetooth	FHSS	1	1052M	1	15.5	14.39	-0.01	78.00	76.80	0.084	1.291	1.016	**0.110**	A42
2402	0	back	10 mm	Bluetooth	FHSS	2	1052M	1	15.5	14.60	0.04	78.00	76.80	0.040	1.230	1.016	0.050	
2402	0	front	10 mm	Bluetooth	FHSS	2	1052M	1	15.5	14.60	-0.03	78.00	76.80	0.055	1.230	1.016	0.069	
2402	0	top	10 mm	Bluetooth	FHSS	2	1052M	1	15.5	14.60	0.08	78.00	76.80	0.002	1.230	1.016	0.002	
2402	0	right	10 mm	Bluetooth	FHSS	2	1052M	1	15.5	14.60	0.07	78.00	76.80	0.020	1.230	1.016	0.025	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Body 1.6 W/kg (mW/g) averaged over 1 gram						

11.4 Standalone Phablet SAR Data

Table 11-42
GSM 1900 Phablet SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Device Serial Number	# of Time Slots	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
1909.80	810	bottom	0 mm	GSM 1900	GPRS	A	1043M	4	23.0	21.53	0.03	1:2.076	0.839	1.403	1.177	A43
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Phablet 4.0 W/kg (mW/g) averaged over 10 grams							

Table 11-43
LTE Band 66 (AWS) Phablet SAR

MEASUREMENT RESULTS																				
FREQUENCY			Side	Spacing	Mode	Antenna Config.	Tune State	Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
1720.00	132072	Low	bottom	0 mm	LTE Band 66 (AWS)	A	23	1046M	20	QPSK	1	99	21.5	20.45	0	0.01	1:1	1.970	1.274	2.510	
1745.00	132322	Mid	bottom	0 mm	LTE Band 66 (AWS)	A	23	1046M	20	QPSK	1	99	21.5	20.60	0	0.00	1:1	1.760	1.230	2.165	
1770.00	132572	High	bottom	0 mm	LTE Band 66 (AWS)	A	23	1046M	20	QPSK	1	99	21.5	20.39	0	0.01	1:1	1.720	1.291	2.221	
1720.00	132072	Low	bottom	0 mm	LTE Band 66 (AWS)	A	23	1046M	20	QPSK	50	25	21.5	20.41	0	-0.03	1:1	2.040	1.285	2.621	A44
1745.00	132322	Mid	bottom	0 mm	LTE Band 66 (AWS)	A	23	1046M	20	QPSK	50	50	21.5	20.57	0	-0.03	1:1	1.760	1.239	2.181	
1770.00	132572	High	bottom	0 mm	LTE Band 66 (AWS)	A	23	1046M	20	QPSK	50	50	21.5	20.52	0	0.00	1:1	1.760	1.253	2.205	
1745.00	132322	Mid	bottom	0 mm	LTE Band 66 (AWS)	A	23	1046M	20	QPSK	100	0	21.5	20.44	0	-0.03	1:1	1.790	1.276	2.284	
1720.00	132072	Low	bottom	0 mm	LTE Band 66 (AWS)	A	23	1046M	20	QPSK	50	25	21.5	20.41	0	0.02	1:1	2.030	1.285	2.609	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Phablet 4.0 W/kg (mW/g) averaged over 10 grams										

Note: Blue entry represents variability measurement.

Table 11-44
LTE Band 2 (PCS) Phablet SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Spacing	Mode	Antenna Config.	Tune State	Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
1860.00	18700	Low	back	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	0	22.0	21.80	0	0.00	1:1	2.390	1.047	2.502	
1880.00	18900	Mid	back	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	0	22.0	21.79	0	0.00	1:1	2.330	1.050	2.447	
1900.00	19100	High	back	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	99	22.0	21.74	0	-0.04	1:1	2.240	1.062	2.379	
1860.00	18700	Low	back	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	0	22.0	21.77	0	-0.02	1:1	2.390	1.054	2.519	
1880.00	18900	Mid	back	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	50	22.0	21.64	0	0.00	1:1	2.280	1.086	2.476	
1900.00	19100	High	back	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	50	22.0	21.64	0	0.03	1:1	2.410	1.086	2.617	A45
1860.00	18700	Low	back	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	100	0	22.0	21.75	0	0.03	1:1	2.370	1.059	2.510	
1860.00	18700	Low	front	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	0	22.0	21.80	0	-0.01	1:1	2.080	1.047	2.178	
1880.00	18900	Mid	front	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	0	22.0	21.79	0	0.00	1:1	1.960	1.050	2.058	
1900.00	19100	High	front	0 mm	LTE Band 2 (PCS)	A	1	1043M	20	QPSK	1	99	22.0	21.74	0	0.03	1:1	1.780	1.062	1.890	
1860.00	18700	Low	front	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	0	22.0	21.77	0	0.00	1:1	2.080	1.054	2.192	
1880.00	18900	Mid	front	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	50	22.0	21.64	0	0.01	1:1	1.860	1.086	2.020	
1900.00	19100	High	front	0 mm	LTE Band 2 (PCS)	A	1	1043M	20	QPSK	50	50	22.0	21.64	0	0.00	1:1	1.850	1.086	2.009	
1860.00	18700	Low	front	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	100	0	22.0	21.75	0	0.01	1:1	2.030	1.059	2.150	
1860.00	18700	Low	bottom	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	0	22.0	21.80	0	-0.08	1:1	1.910	1.047	2.000	
1880.00	18900	Mid	bottom	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	1	0	22.0	21.79	0	0.00	1:1	1.930	1.050	2.027	
1900.00	19100	High	bottom	0 mm	LTE Band 2 (PCS)	A	11	1043M	20	QPSK	1	99	22.0	21.74	0	0.02	1:1	2.340	1.062	2.485	
1860.00	18700	Low	bottom	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	0	22.0	21.77	0	0.02	1:1	2.100	1.054	2.213	
1880.00	18900	Mid	bottom	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	50	22.0	21.64	0	0.02	1:1	1.830	1.086	1.987	
1900.00	19100	High	bottom	0 mm	LTE Band 2 (PCS)	A	11	1043M	20	QPSK	50	50	22.0	21.64	0	0.02	1:1	2.390	1.086	2.596	
1860.00	18700	Low	bottom	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	100	0	22.0	21.75	0	0.01	1:1	2.050	1.059	2.171	
1900.00	19100	High	back	0 mm	LTE Band 2 (PCS)	A	16	1043M	20	QPSK	50	50	22.0	21.64	0	0.00	1:1	2.410	1.086	2.617	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Phablet 4.0 W/kg (mW/g) averaged over 10 grams							

Note: Blue entry represents variability measurement.

Table 11-45
NR Band n41 Phablet SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Spacing	Mode	Antenna Config	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
2592.99	518598	Mid	back	0 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	1	137	20.0	19.33	0	-0.05	1:1	1.190	1.167	1.389	
2592.99	518598	Mid	back	0 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	135	69	20.0	19.32	0	-0.02	1:1	1.210	1.169	1.414	
2592.99	518598	Mid	top	0 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	1	137	20.0	19.33	0	0.04	1:1	2.590	1.167	3.023	
2592.99	518598	Mid	top	0 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	135	69	20.0	19.32	0	-0.05	1:1	2.580	1.169	3.016	
2592.99	518598	Mid	top	0 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	270	0	20.0	19.21	0	0.05	1:1	2.600	1.199	3.117	A46
2592.99	518598	Mid	top	0 mm	NR Band n41	F	1059M	100	CP-OFDM	QPSK	1	1	20.0	19.04	0	0.06	1:1	2.380	1.247	2.968	
2592.99	518598	Mid	top	0 mm	NR Band n41	F	1059M	100	DFT-S-OFDM	QPSK	270	0	20.0	19.21	0	-0.02	1:1	2.530	1.199	3.033	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Phablet 4.0 W/kg (mW/g) averaged over 10 grams							

Note: Blue entry represents variability measurement.

Table 11-46
WLAN MIMO Phablet SAR

MEASUREMENT RESULTS																					
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (10g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g) (W/kg)	Plot #
MHz	Ch.																				
5320	64	back	0 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	17.75	18.0	17.90	0.00	100.00	92.79	0.849	1.059	1.078	0.969	
5320	64	front	0 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	17.75	18.0	17.90	0.07	100.00	92.79	0.436	1.059	1.078	0.498	
5320	64	top	0 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	17.75	18.0	17.90	0.11	100.00	92.79	0.377	1.059	1.078	0.430	
5320	64	right	0 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	17.75	18.0	17.90	-0.18	100.00	92.79	0.100	1.059	1.078	0.114	
5320	64	left	0 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	17.75	18.0	17.90	-0.14	100.00	92.79	1.460	1.059	1.078	1.667	A47
5500	100	back	0 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	17.49	18.0	17.86	0.20	100.00	92.79	1.070	1.125	1.078	1.298	
5500	100	front	0 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	17.49	18.0	17.86	0.04	100.00	92.79	0.392	1.125	1.078	0.475	
5500	100	top	0 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	17.49	18.0	17.86	0.10	100.00	92.79	0.280	1.125	1.078	0.340	
5500	100	right	0 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	17.49	18.0	17.86	0.01	100.00	92.79	0.113	1.125	1.078	0.137	
5500	100	left	0 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	17.49	18.0	17.86	-0.17	100.00	92.79	1.430	1.125	1.078	1.734	
5600	120	left	0 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	16.82	18.0	17.54	0.03	100.00	92.79	0.874	1.312	1.078	1.236	
5720	144	left	0 mm	802.11n	OFDM	MIMO	1053M	20	13	18.0	17.16	18.0	17.63	-0.16	100.00	92.79	0.486	1.213	1.078	0.636	
5845	169	back	0 mm	802.11n	OFDM	MIMO	2064M	20	13	18.0	17.91	18.0	17.34	-0.07	100.00	92.79	0.575	1.021	1.078	0.722	
5845	169	front	0 mm	802.11n	OFDM	MIMO	2064M	20	13	18.0	17.91	18.0	17.34	0.03	100.00	92.79	0.313	1.021	1.078	0.393	
5845	169	top	0 mm	802.11n	OFDM	MIMO	2064M	20	13	18.0	17.91	18.0	17.34	0.02	100.00	92.79	0.269	1.021	1.078	0.338	
5845	169	right	0 mm	802.11n	OFDM	MIMO	2064M	20	13	18.0	17.91	18.0	17.34	-0.04	100.00	92.79	0.123	1.021	1.078	0.154	
5845	169	left	0 mm	802.11n	OFDM	MIMO	2064M	20	13	18.0	17.91	18.0	17.34	0.03	100.00	92.79	0.581	1.021	1.078	0.729	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Phablet 4.0 W/kg (mW/g) averaged over 10 grams										

Note: To achieve the 21.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 18.0 dBm.

Table 11-47
WLAN MIMO Phablet SAR During Conditions with 2.4 GHz WLAN or 5G NR

MEASUREMENT RESULTS																					
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (10g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g) (W/kg)	Plot #
MHz	Ch.																				
5290	58	back	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.61	14.0	13.35	0.08	100.00	92.39	0.177	1.094	1.082	0.222	
5290	58	front	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.61	14.0	13.35	0.20	100.00	92.39	0.264	1.094	1.082	0.332	
5290	58	top	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.61	14.0	13.35	-0.04	100.00	92.39	0.152	1.094	1.082	0.191	
5290	58	right	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.61	14.0	13.35	0.02	100.00	92.39	0.032	1.094	1.082	0.040	
5290	58	left	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.61	14.0	13.35	0.04	100.00	92.39	0.499	1.094	1.082	0.627	
5690	138	back	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.88	14.0	13.79	0.01	100.00	92.39	0.213	1.028	1.082	0.242	
5690	138	front	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.88	14.0	13.79	-0.01	100.00	92.39	0.172	1.028	1.082	0.195	
5690	138	top	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.88	14.0	13.79	0.05	100.00	92.39	0.100	1.028	1.082	0.114	
5690	138	right	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.88	14.0	13.79	0.06	100.00	92.39	0.056	1.028	1.082	0.064	
5690	138	left	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.88	14.0	13.79	0.07	100.00	92.39	0.201	1.028	1.082	0.228	
5855	171	back	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.75	14.0	12.41	0.01	100.00	92.39	0.193	1.059	1.082	0.301	
5855	171	front	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.75	14.0	12.41	-0.09	100.00	92.39	0.153	1.059	1.082	0.239	
5855	171	top	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.75	14.0	12.41	0.11	100.00	92.39	0.083	1.059	1.082	0.130	
5855	171	right	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.75	14.0	12.41	0.03	100.00	92.39	0.050	1.059	1.082	0.078	
5855	171	left	0 mm	802.11ac	OFDM	MIMO	2064M	80	58.5	14.0	13.75	14.0	12.41	0.02	100.00	92.39	0.128	1.059	1.082	0.200	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Phablet 4.0 W/kg (mW/g) averaged over 10 grams										

Note: During simultaneous conditions with 2.4 GHz WLAN or 5G NR, to achieve the 17.0 dBm maximum allowed MIMO power shown in the documentation each antenna transmits at a maximum allowed power of 14.0 dBm.

Table 11-48
NFC Phablet SAR

MEASUREMENT RESULTS									
FREQUENCY MHz	Side	Test Position	Mode	Type	Antenna Config.	Device Serial Number	Power Drift	SAR (10g) (W/kg)	Plot #
13.56	back	0 mm	NFC	B	NFC	1043M	-0.07	0.025	A48
13.56	front	0 mm	NFC	B	NFC	1043M	0.09	0.000	
13.56	right	0 mm	NFC	B	NFC	1043M	0.03	0.000	
13.56	left	0 mm	NFC	B	NFC	1043M	0.01	0.000	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Phablet 4.0 W/kg (mW/g) averaged over 10 grams		

11.5 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D04v01.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D04v01.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.
8. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 12 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).
10. Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the display diagonal dimension is > 150 mm and < 200 mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.
11. This device supports dynamic antenna tuning for some bands. Per FCC Guidance, SAR was measured according to the normally required SAR measurement configurations with tuner active. The auto-tune state determined by the device was verified before and after each SAR measurement and is listed in tables above. Please see Section 13 for supplemental data.
12. Additional SAR tests for phablet SAR were evaluated per KDB 616217 Section 6 (See Section 6.9 for more information).
13. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the 1g thresholds for the equivalent test cases.
14. This device uses Qualcomm Smart Transmit for WWAN operations to control and manage transmitting power in real time to ensure RF Exposure compliance. Per FCC Guidance, compliance for was assessed at the minimum of the time averaged power and the maximum output power for each band/mode/exposure condition (DSI).

GSM Test Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
3. Per FCC KDB Publication 447498 D04v01, if the reported (scaled) SAR measured at the highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s).

UMTS Notes:

1. UMTS mode was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. AMR and HSPA SAR was not required per the 3G Test Reduction Procedure in KDB Publication 941225 D01v03r01.
2. Per FCC KDB Publication 447498 D04v01, if the reported (scaled) SAR measured at the highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s).

LTE Notes:

1. LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r04. The general test procedures used for testing can be found in Section 8.5.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 and MCC=001 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
4. Per FCC KDB Publication 447498 D04v01, when the reported 1g SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for LTE B41, testing at the other channels was required for such test configurations.
5. TDD LTE was tested per the guidance provided in FCC KDB Publication 941225 D05v02r04. Testing was performed using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.
6. Per KDB Publication 941225 D05Av01r02, SAR for downlink only LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.
7. For LTE Band 41, per FCC guidance, SAR was first measured with only a single carrier active in the uplink (carrier aggregation not active). For each exposure condition, the uplink CA scenario with two component carriers was additionally tested for the configuration with the highest SAR when carrier aggregation was not active. The SCC was configured with the closest available contiguous channel. The two component carriers were configured so the resource blocks are physically allocated side by side to achieve the maximum output power.

NR Notes:

1. NR implementation supports NSA mode. In EN-DC mode, NR operates with the LTE Bands shown in the NR FR1 checklist acting as anchor bands. Per FCC guidance, SAR tests for NR Bands and LTE Anchors Bands were performed separately due to limitations in SAR probe calibration factors.
2. Due to test setup limitations, SAR testing for NR TDD was performed using test mode software to establish the connection.
3. Simultaneous transmission analysis for EN-DC operations is addressed in the Part 2 Test Report (Serial Number can be found in the bibliography).
4. Per FCC Guidance, NR modulations and RB Sizes/Offsets were selected for testing such that configurations with the highest output power were evaluated for SAR tests.
5. Per FCC KDB Publication 447498 D04v01, when the reported NR Band n41 SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for 1g evaluations and > 1.5 W/kg for 10g evaluation, testing at the other channels was required for such test configurations.
6. For final implementation, NR Band n41 slot configuration is synchronized using maximum duty cycle of 100%. SAR testing was performed using FTM mode with a 100% duty cycle applied to match final duty cycle.

WLAN Notes:

1. For held-to-ear, hotspot, and phablet operations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg for 1g evaluations, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n/ax) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 8.6.5 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg for 1g evaluations. See Section 8.6.6 for more information.
4. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D04v01 by either evaluating the sum of the 1g SAR values of each antenna transmitting independently or making a SAR measurement with both antennas transmitting simultaneously. Please see Multi-TX and Antenna SAR Considerations Appendix for complete analysis.
5. When the maximum reported 1g averaged SAR is ≤0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg for 1g evaluations or all test channels were measured.
6. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated EMC test reports.
7. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

Bluetooth Notes

1. Bluetooth SAR was measured with the device connected to a call box with hopping disabled with DH5 operation and Tx Tests test mode type. Per October 2016 TCB Workshop Notes, the reported SAR was scaled to the 78% transmission duty factor to determine compliance. See RF Conducted Power Section for the time domain plot and calculation for the duty factor of the device.
2. Head and Hotspot Bluetooth SAR were evaluated for BT BDR tethering applications.

12 SAR MEASUREMENT VARIABILITY

12.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1g SAR limit).
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg
5) When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

Table 12-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS														
Band	FREQUENCY		Mode	Service	Side	Spacing	Antenna Config	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1900	1880.00	18900	LTE Band 2 (PCS), 20 MHz Bandwidth	QPSK, 1 RB, 99 RB Offset	bottom	10 mm	A	0.970	0.933	1.04	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Body 1.6 W/kg (mW/g) averaged over 1 gram								

Table 12-2
Phablet SAR Measurement Variability Results

PHABLET VARIABILITY RESULTS														
Band	FREQUENCY		Mode	Service	Side	Spacing	Antenna Config	Measured SAR (10g)	1st Repeated SAR (10g)	Ratio	2nd Repeated SAR (10g)	Ratio	3rd Repeated SAR (10g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1750	1720.00	132072	LTE Band 66 (AWS), 20 MHz Bandwidth	QPSK, 50 RB, 25 RB Offset	bottom	0 mm	A	2.040	2.030	1.00	N/A	N/A	N/A	N/A
1900	1900.00	19100	LTE Band 2 (PCS), 20 MHz Bandwidth	QPSK, 50 RB, 50 RB Offset	back	0 mm	A	2.410	2.410	1.00	N/A	N/A	N/A	N/A
2600	2592.99	518598	NR Band n41, 100 MHz Bandwidth	DFT-S-OFDM, QPSK, 270 RB, 0	top	0 mm	F	2.600	2.530	1.03	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Phablet 4.0 W/kg (mW/g) averaged over 10 grams								

12.2 Measurement Uncertainty

The measured SAR was <1.5 W/kg for 1g and <3.75 W/kg for 10g for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

13 ADDITIONAL TESTING PER FCC GUIDANCE

13.1 Tuner Testing

Per April 2019 TCB Workshop Notes, the following test procedures were followed to demonstrate that the SAR results in Section 11 represented the appropriate SAR test conditions. For bands with dynamic tuning implemented, SAR was measured according to the required FCC SAR test procedures with the dynamic tuner active to allow the device to automatically tune to the antenna state for the respective RF exposure test configurations. Additional single point SAR time-sweep measurements were evaluated for other tuner states to determine that the other tuner configurations would result in equivalent or lower SAR values. The additional tuner hardware has no influence on the antenna characteristics, other than impedance matching.

To evaluate all the tuner states, the 144 tuner states were divided among the aggregate band, mode and exposure combinations. Single point time-sweep measurements were performed at the peak SAR location determined by the zoom scan of the configuration with the highest measured SAR for each combination. The tuner state was able to be established remotely so that the device was not moved for the entire series of single point SAR for the tuner states in each combination. The SAR probe remained stationary at the same position throughout the entire series of single point measurements for each combination. When the single point SAR or 1g SAR was > 1.2 W/kg for a particular band/mode/exposure condition, point SAR measurements were made for all 144 states.

The operational description contains more information about the design and implementation of the dynamic antenna tuning.

Table 13-1
UMTS Supplemental Head SAR Data

Supplemental Head SAR Data	
UMTS B5	
RMC	
Test Position	Right Cheek
Frequency (MHz)	826.40
Channel	4132
Measured 1g SAR (W/kg)	0.280
Average Value of Time Sweep (W/kg)	
Auto-tune (State 136)	0.353
Default (State 0)	0.377
State 0	0.377
State 11	0.197
State 29	0.099
State 44	0.019
State 58	0.110
State 77	0.010
State 80	0.326
State 108	0.036
State 112	0.102
State 136	0.374
State 137	0.296
State 143	0.102

Table 13-2
LTE Supplemental Head SAR Data

Supplemental Head SAR Data									
LTE B12		LTE B13		LTE B26		LTE B66		LTE B2	
QPSK, 10 MHz Bandwidth, 1 RB, 49 RB Offset		QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offset		QPSK, 15 MHz Bandwidth, 1 RB, 36 RB Offset		QPSK, 20 MHz Bandwidth, 1 RB, 99 RB Offset		QPSK, 20 MHz Bandwidth, 1 RB, 0 RB Offset	
Test Position	Right Cheek	Test Position	Right Cheek	Test Position	Right Cheek	Test Position	Left Cheek	Test Position	Left Cheek
Frequency (MHz)	707.50	Frequency (MHz)	782.00	Frequency (MHz)	831.50	Frequency (MHz)	1720.00	Frequency (MHz)	1860.00
Channel	23095	Channel	23230	Channel	26865	Channel	132072	Channel	18700
Measured 1g SAR (W/kg)	0.145	Measured 1g SAR (W/kg)	0.284	Measured 1g SAR (W/kg)	0.212	Measured 1g SAR (W/kg)	0.197	Measured 1g SAR (W/kg)	0.223
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 136)	0.184	Auto-tune (State 1)	0.330	Auto-tune (State 0)	0.300	Auto-tune (State 24)	0.211	Auto-tune (State 16)	0.254
Default (State 0)	0.190	Default (State 0)	0.283	Default (State 0)	0.299	Default (State 16)	0.208	Default (State 16)	0.206
State 4	0.145	State 1	0.320	State 0	0.299	State 2	0.164	State 1	0.177
State 7	0.119	State 6	0.323	State 3	0.274	State 10	0.125	State 12	0.092
State 30	0.017	State 8	0.323	State 9	0.207	State 24	0.193	State 16	0.206
State 40	0.022	State 31	0.008	State 32	0.111	State 35	0.219	State 34	0.195
State 59	0.025	State 39	0.079	State 36	0.102	State 37	0.196	State 41	0.185
State 73	0.043	State 62	0.055	State 63	0.007	State 64	0.190	State 65	0.188
State 81	0.165	State 72	0.171	State 69	0.120	State 68	0.189	State 67	0.191
State 106	0.015	State 86	0.212	State 87	0.168	State 95	0.008	State 91	0.016
State 114	0.085	State 105	0.114	State 102	0.136	State 101	0.053	State 100	0.056
State 136	0.198	State 115	0.106	State 119	0.163	State 120	0.067	State 123	0.040
State 139	0.155	State 138	0.051	State 135	0.094	State 134	0.063	State 129	0.198
State 140	0.043	State 141	0.233	State 142	0.149	State 138	0.230	State 133	0.028

Table 13-3
NR Supplemental Head SAR Data

Supplemental Head SAR Data	
NR Band n5	
DFT-s-OFDM QPSK, 20 MHz Bandwidth, 50 RB, 28 RB Offset	
Test Position	Right Cheek
Frequency (MHz)	836.50
Channel	167300
Measured 1g SAR (W/kg)	0.155
Average Value of Time Sweep (W/kg)	
Auto-tune (State 5)	0.162
Default (State 5)	0.167
State 5	0.167
State 15	0.025
State 21	0.161
State 42	0.033
State 48	0.130
State 66	0.061
State 84	0.139
State 94	0.013
State 113	0.077
State 118	0.094
State 124	0.026

Table 13-4
UMTS Supplemental Body SAR Data

Supplemental Body SAR Data	
UMTS B5	
RMC	
Test Position	Back
Spacing	10 mm
Frequency (MHz)	826.40
Channel	4132
Measured 1g SAR (W/kg)	0.457
Average Value of Time Sweep (W/kg)	
Auto-tune (State 136)	0.527
Default (State 0)	0.517
State 16	0.368
State 27	0.269
State 43	0.080
State 60	0.137
State 70	0.232
State 90	0.183
State 96	0.202
State 101	0.245
State 104	0.230
State 125	0.031
State 126	0.016
State 136	0.517

Table 13-5
LTE Supplemental Body SAR Data

Supplemental Body SAR Data									
LTE B12		LTE B13		LTE B26		LTE B66		LTE B2	
QPSK, 10 MHz Bandwidth, 1 RB, 49 RB Offset		QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offset		QPSK, 15 MHz Bandwidth, 1 RB, 36 RB Offset		QPSK, 20 MHz Bandwidth, 50 RB, 50 RB Offset		QPSK, 20 MHz Bandwidth,1 RB, 99 RB Offset	
Test Position	Left	Test Position	Back	Test Position	Back	Test Position	Bottom	Test Position	Bottom
Spacing	10 mm	Spacing	10 mm	Spacing	10 mm	Spacing	10 mm	Spacing	10 mm
Frequency (MHz)	707.50	Frequency (MHz)	782.00	Frequency (MHz)	831.50	Frequency (MHz)	1770.00	Frequency (MHz)	1880.00
Channel	23095	Channel	23230	Channel	26865	Channel	132572	Channel	18900
Measured 1g SAR (W/kg)	0.403	Measured 1g SAR (W/kg)	0.479	Measured 1g SAR (W/kg)	0.520	Measured 1g SAR (W/kg)	0.597	Measured 1g SAR (W/kg)	0.970
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 136)	0.430	Auto-tune (State 1)	0.538	Auto-tune (State 0)	0.575	Auto-tune (State 16)	0.650	Auto-tune (State 16)	1.070
Default (State 0)	0.427	Default (State 0)	0.466	Default (State 0)	0.615	Default (State 16)	0.646	Default (State 16)	1.060
State 0	0.427	State 0	0.466	State 0	0.615	State 16	0.646	State 16	1.070
State 20	0.394	State 1	0.530	State 19	0.519	State 18	0.639	State 17	1.050
State 23	0.360	State 14	0.173	State 24	0.486	State 25	0.610	State 25	0.957
State 33	0.139	State 22	0.352	State 49	0.426	State 38	0.531	State 26	0.925
State 45	0.014	State 46	0.030	State 52	0.398	State 51	0.072	State 50	0.145
State 56	0.179	State 47	0.016	State 65	0.208	State 53	0.067	State 54	0.123
State 71	0.173	State 55	0.443	State 75	0.089	State 76	0.422	State 78	0.482
State 82	0.355	State 74	0.109	State 85	0.436	State 82	0.088	State 83	0.16
State 89	0.210	State 78	0.006	State 92	0.103	State 97	0.192	State 109	0.095
State 98	0.173	State 88	0.203	State 103	0.278	State 107	0.124	State 110	0.067
State 122	0.102	State 99	0.187	State 118	0.325	State 117	0.228	State 116	0.337
State 127	0.006	State 121	0.292	State 129	0.460	State 131	0.072	State 132	0.888
State 136	0.425	State 128	0.467						

Table 13-6
NR Supplemental Body SAR Data

Supplemental Body SAR Data	
NR Band n5	
DFT-s-OFDM QPSK, 20 MHz Bandwidth, 50 RB, 28 RB Offset	
Test Position	Back
Spacing	10 mm
Frequency (MHz)	836.50
Channel	167300
Measured 1g SAR (W/kg)	0.498
Average Value of Time Sweep (W/kg)	
Auto-tune (State 5)	0.558
Default (State 5)	0.556
State 5	0.556
State 6	0.208
State 13	0.208
State 28	0.218
State 38	0.178
State 57	0.247
State 61	0.078
State 79	0.012
State 93	0.064
State 111	0.018
State 130	0.180
State 136	0.583

14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E4404B	Spectrum Analyzer	N/A	N/A	N/A	MY45113242
Agilent	E4438C	ESG Vector Signal Generator	5/10/2022	Annual	5/10/2023	MY42082659
Agilent	E4438C	ESG Vector Signal Generator	2/14/2022	Annual	2/14/2023	MY42082385
Agilent	N5182A	MXG Vector Signal Generator	11/30/2022	Annual	11/30/2023	MY47420603
Agilent	N5182A	MXG Vector Signal Generator	7/4/2022	Annual	7/4/2023	MY48180366
Agilent	8753ES	S-Parameter Vector Network Analyzer	2/11/2022	Annual	2/11/2023	MY40003841
Agilent	8753ES	S-Parameter Vector Network Analyzer	6/14/2022	Annual	6/14/2023	US39170118
Agilent	E5515C	Wireless Communications Test Set	5/12/2022	Annual	5/12/2023	GB43304278
Agilent	E5515C	Wireless Communications Test Set	1/14/2020	Triennial	1/14/2023	GB43304447
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433972
Amplifier Research	1551G6	Amplifier	7/4/2022	Annual	7/4/2023	433971
Amplifier Research	150A100C	Amplifier	CBT	N/A	CBT	350132
Anritsu	MN8110B	I/O Adaptor	CBT	N/A	CBT	6261747881
Anritsu	ML2496A	Power Meter	8/16/2022	Annual	8/16/2023	1351001
Anritsu	ML2495A	Power Meter	3/17/2022	Annual	3/17/2023	941001
Anritsu	ML2496A	Power Meter	3/31/2022	Annual	3/31/2023	1138001
Anritsu	ML2496A	Power Meter	3/29/2022	Annual	3/29/2023	1306009
Anritsu	ML2496A	Power Meter	2/11/2022	Annual	2/11/2023	1405003
Anritsu	MA2411B	Pulse Power Sensor	10/21/2022	Annual	10/21/2023	1207364
Anritsu	MA2411B	Pulse Power Sensor	10/20/2022	Annual	10/20/2023	1339018
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	1/10/2023	Annual	1/10/2024	6201524637
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	11/28/2022	Annual	11/28/2023	6262150047
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	6/27/2022	Annual	6/27/2023	6261895213
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	5/24/2022	Annual	5/24/2023	6201144418
Anritsu	MT8000A	Radio Communication Test Station	1/5/2023	Annual	1/5/2024	6272337436
Anritsu	MT8000A	Radio Communication Test Station	9/29/2022	Annual	9/29/2023	6272337438
Anritsu	MT8000A	Radio Communication Test Station	8/3/2022	Annual	8/3/2023	6272337405
Anritsu	MA24106A	USB Power Sensor	1/9/2023	Annual	1/9/2024	1344545
Anritsu	MA24106A	USB Power Sensor	7/4/2022	Annual	7/4/2023	1244512
Mini-Circuits	PWR-4GHS	USB Power Sensor	11/11/2022	Annual	11/11/2023	11710030062
Control Company	4352	Long Stem Thermometer	9/10/2021	Biennial	9/10/2023	210774678
Control Company	4352	Long Stem Thermometer	9/10/2021	Biennial	9/10/2023	210774685
Control Company	4040	Therm./ Clock/ Humidity Monitor	1/21/2022	Annual	1/21/2023	160574418
Mitutoyo	500-196-30	CD-6"ASX 6Inch Digital Caliper	2/16/2022	Triennial	2/16/2025	A20238413
Keysight Technologies	N6705B	DC Power Analyzer	5/5/2021	Triennial	5/5/2024	MY53004059
Keysight Technologies	N9020A	MXA Signal Analyzer	3/4/2022	Annual	3/4/2023	US46470561
Keysight Technologies	N9020A	MXA Signal Analyzer	4/14/2022	Annual	4/14/2023	MY48010233
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
Mini-Circuits	VLF-6000+	Low Pass Filter DC to 6000 MHz	7/5/2022	Annual	7/5/2023	31634
Mini-Circuits	VLF-6000+	Low Pass Filter DC to 6000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mini-Circuits	ZUDC10-83-S+	Directional Coupler	CBT	N/A	CBT	2050
Mini-Circuits	ZUDC10-83-S+	Directional Coupler	7/4/2022	Annual	7/4/2023	2111
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Seekonk	TSF-100	Torque Wrench	7/11/2022	Annual	7/11/2023	47639-29
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	11/30/2022	Annual	11/30/2023	128635
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	8/26/2022	Annual	8/26/2023	166818
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	9/6/2022	Annual	9/6/2023	167286
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	9/1/2022	Annual	9/1/2023	128636
SPEAG	DAK-12	Dielectric Assessment Kit (4MHz - 3 GHz)	3/21/2022	Annual	3/21/2023	1102
SPEAG	DAK-3.5	Dielectric Assessment Kit	12/15/2022	Annual	12/15/2023	1278
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	8/15/2022	Annual	8/15/2023	1041
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	7/5/2022	Annual	7/5/2023	1039
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1379
SPEAG	CLA-13	Confined Loop Antenna	9/13/2022	Annual	9/13/2023	1002
SPEAG	D750V3	750 MHz SAR Dipole	2/14/2022	Annual	2/14/2023	1046
SPEAG	D750V3	750 MHz SAR Dipole	5/9/2022	Annual	5/9/2023	1003
SPEAG	D835V2	835 MHz SAR Dipole	5/9/2022	Annual	5/9/2023	4d180
SPEAG	D835V2	835 MHz SAR Dipole	1/21/2021	Biennial	1/21/2023	4d132
SPEAG	D835V2	835 MHz SAR Dipole	4/14/2022	Annual	4/14/2023	4d119
SPEAG	D1750V2	1750 MHz SAR Dipole	10/22/2021	Biennial	10/22/2023	1150
SPEAG	D1900V2	1900 MHz SAR Dipole	2/21/2022	Annual	2/21/2023	5d148
SPEAG	D1900V2	1900 MHz SAR Dipole	8/8/2022	Annual	8/8/2023	5d080
SPEAG	D1900V2	1900 MHz SAR Dipole	9/21/2021	Biennial	9/21/2023	5d149
SPEAG	D2450V2	2450 MHz SAR Dipole	11/15/2022	Annual	11/15/2023	797
SPEAG	D2450V2	2450 MHz SAR Dipole	11/25/2021	Biennial	11/25/2023	981
SPEAG	D2450V2	2450 MHz SAR Dipole	8/18/2021	Biennial	8/18/2023	719
SPEAG	D2600V2	2600 MHz SAR Dipole	11/15/2022	Annual	11/15/2023	1071
SPEAG	D2600V2	2600 MHz SAR Dipole	4/14/2021	Biennial	4/14/2023	1004
SPEAG	D5GHzV2	5GHz SAR Dipole	11/17/2022	Annual	11/17/2023	1066
SPEAG	D5GHzV2	5 GHz SAR Dipole	1/10/2022	Annual	1/10/2023	1057
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/14/2022	Annual	6/14/2023	1532
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/14/2022	Annual	6/14/2023	1334
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/18/2022	Annual	7/18/2023	1677
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/18/2022	Annual	7/18/2023	1583
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/23/2022	Annual	2/23/2023	1415
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/16/2022	Annual	3/16/2023	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/21/2022	Annual	2/21/2023	1645
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/14/2022	Annual	1/14/2023	1558
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/17/2022	Annual	10/17/2023	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/13/2022	Annual	4/13/2023	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/10/2022	Annual	11/10/2023	1323
SPEAG	EX3DV4	SAR Probe	3/21/2022	Annual	3/21/2023	7527
SPEAG	EX3DV4	SAR Probe	6/29/2022	Annual	6/29/2023	7491
SPEAG	EX3DV4	SAR Probe	2/21/2022	Annual	2/21/2023	7488
SPEAG	EX3DV4	SAR Probe	7/18/2022	Annual	7/18/2023	7406
SPEAG	EX3DV4	SAR Probe	6/16/2022	Annual	6/16/2023	7409
SPEAG	EX3DV4	SAR Probe	7/19/2022	Annual	7/19/2023	7410
SPEAG	EX3DV4	SAR Probe	10/19/2022	Annual	10/19/2023	7547
SPEAG	EX3DV4	SAR Probe	1/19/2022	Annual	1/19/2023	7570
SPEAG	EX3DV4	SAR Probe	11/11/2022	Annual	11/11/2023	7551
SPEAG	EX3DV4	SAR Probe	4/20/2022	Annual	4/20/2023	7659
SPEAG	EX3DV4	SAR Probe	2/24/2022	Annual	2/24/2023	7640

Note: CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.
Note: All equipment was used solely within its respective calibration period.

15 MEASUREMENT UNCERTAINTIES

a	b	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	IEEE 1528 Sec.	Tol. (± %)	Prob. Dist.	Div.	c_i 1gm	c_i 10 gms	1gm u_i (± %)	10gms u_i (± %)	v_i
Measurement System									
Probe Calibration	E.2.1	7	N	1	1	1	7.0	7.0	∞
Axial Isotropy	E.2.2	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	E.2.2	1.3	N	1	0.7	0.7	0.9	0.9	∞
Boundary Effect	E.2.3	2	R	1.732	1	1	1.2	1.2	∞
Linearity	E.2.4	0.3	N	1	1	1	0.3	0.3	∞
System Detection Limits	E.2.4	0.25	R	1.732	1	1	0.1	0.1	∞
Modulation Response	E.2.5	4.8	R	1.732	1	1	2.8	2.8	∞
Readout Electronics	E.2.6	0.3	N	1	1	1	0.3	0.3	∞
Response Time	E.2.7	0.8	R	1.732	1	1	0.5	0.5	∞
Integration Time	E.2.8	2.6	R	1.732	1	1	1.5	1.5	∞
RF Ambient Conditions - Noise	E.6.1	3	R	1.732	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	3	R	1.732	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.8	R	1.732	1	1	0.5	0.5	∞
Probe Positioning w/ respect to Phantom	E.6.3	6.7	R	1.732	1	1	3.9	3.9	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	E.5	4	R	1.732	1	1	2.3	2.3	∞
Test Sample Related									
Test Sample Positioning	E.4.2	3.12	N	1	1	1	3.1	3.1	35
Device Holder Uncertainty	E.4.1	1.67	N	1	1	1	1.7	1.7	5
Output Power Variation - SAR drift measurement	E.2.9	5	R	1.732	1	1	2.9	2.9	∞
SAR Scaling	E.6.5	0	R	1.732	1	1	0.0	0.0	∞
Phantom & Tissue Parameters									
Phantom Uncertainty (Shape & Thickness tolerances)	E.3.1	7.6	R	1.73	1.0	1.0	4.4	4.4	∞
Liquid Conductivity - measurement uncertainty	E.3.3	4.3	N	1	0.78	0.71	3.3	3.0	76
Liquid Permittivity - measurement uncertainty	E.3.3	4.2	N	1	0.23	0.26	1.0	1.1	75
Liquid Conductivity - Temperature Uncertainty	E.3.4	3.4	R	1.732	0.78	0.71	1.5	1.4	∞
Liquid Permittivity - Temperature Unceritainty	E.3.4	0.6	R	1.732	0.23	0.26	0.1	0.1	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Permittivity - deviation from target values	E.3.2	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Combined Standard Uncertainty (k=1)			RSS				12.2	12.0	191
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				24.4	24.0	

The above measurement uncertainties are according to IEEE Std. 1528-2013

16 CONCLUSION

16.1 Measurement Conclusion

The SAR evaluation indicates that the EUT complies with the RF radiation exposure limits of the FCC and Innovation, Science, and Economic Development Canada, with respect to all parameters subject to this test. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables. [3]

17 REFERENCES

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[8] K. Pokovic, T. Schmid, N. Kuster, Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequencies, ICECOM97, Oct. 1997, pp. 1 -124.

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