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SAR EVALUATION REPORT

Applicant Name:
Sony Corporation
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Tokyo, 108-0075, Japan

Date of Testing:
08/30/21 - 10/03/21
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
1M2108040087-01.PY7 (Rev1)

FCC ID: **PY7-95324M**

APPLICANT: **SONY CORPORATION**

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093

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/DTM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.31	0.27	0.25	N/A
PCE	GSM/DTM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	0.26	0.39	N/A
PCE	UMTS 850	826.40 - 846.60 MHz	0.28	0.31	0.35	N/A
PCE	UMTS 1750	1712.4 - 1752.6 MHz	< 0.1	0.42	0.69	N/A
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.11	0.28	0.47	N/A
PCE	LTE Band 71	665.5 - 695.5 MHz	0.14	0.21	0.28	N/A
PCE	LTE Band 12	699.7 - 715.3 MHz	0.20	0.33	0.42	N/A
PCE	LTE Band 13	779.5 - 784.5 MHz	0.24	0.16	0.23	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.27	0.17	0.20	N/A
PCE	LTE Band 66 (AWS)	1710.7 - 1779.3 MHz	0.14	0.41	0.67	1.39
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	0.13	0.30	0.49	1.35
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	N/A	N/A	N/A	N/A
CBE	LTE Band 48	3552.5 - 3649.2 MHz	< 0.1	0.26	0.37	N/A
PCE	LTE Band 41	2498.5 - 2687.5 MHz	< 0.1	0.23	0.25	N/A
PCE	NR Band n71	665.5 - 695.5 MHz	< 0.1	< 0.1	0.14	N/A
PCE	NR Band n5 (Cell)	826.5 - 846.5 MHz	0.20	0.15	0.19	N/A
PCE	NR Band n66 (AWS)	1712.5 - 1777.5 MHz	< 0.1	0.30	0.50	0.94
PCE	NR Band n2 (PCS)	1852.5 - 1907.5 MHz	< 0.1	< 0.1	< 0.1	N/A
PCE	NR Band n41	2506.02 - 2679.99 MHz	0.54	< 0.1	0.11	N/A
PCE	NR Band n77	3710.01 - 3969.99 MHz	<0.1	0.21	0.32	1.39
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.15	< 0.1	< 0.1	N/A
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	< 0.1	N/A
NII	U-NII-2A	5260 - 5320 MHz	0.10	< 0.1	N/A	0.34
NII	U-NII-2C	5500 - 5720 MHz	0.11	< 0.1	N/A	0.27
NII	U-NII-3	5745 - 5825 MHz	0.11	< 0.1	< 0.1	N/A
DSS/DTS	Bluetooth	2402 - 2480 MHz	< 0.1	< 0.1	< 0.1	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			0.86	0.54	0.87	1.86

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.

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 1.8 of this report; for North American frequency bands only.
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.

Randy Ortanez
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/DTM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/DTM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 71	Voice/Data	665.5 - 695.5 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 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 25 (PCS)	Voice/Data	1850.7 - 1914.3 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 48	Voice/Data	3552.5 - 3649.2 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
NR Band n71	Data	665.5 - 695.5 MHz
NR Band n5 (Cell)	Data	826.5 - 846.5 MHz
NR Band n66 (AWS)	Data	1712.5 - 1777.5 MHz
NR Band n2 (PCS)	Data	1852.5 - 1907.5 MHz
NR Band n41	Data	2506.02 - 2679.99 MHz
NR Band n77	Data	3710.01 - 3969.99 MHz
2.4 GHz WLAN	Data	2412 - 2462 MHz
U-NII-1	Data	5180 - 5240 MHz
U-NII-2A	Data	5260 - 5320 MHz
U-NII-2C	Data	5500 - 5720 MHz
U-NII-3	Data	5745 - 5825 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 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).

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, Hotspot	Phablet	Head	Maximum Tune-Up Output Power*
Averaging Volume		1g	10g	1g	
Spacing		10 mm	0 mm	0 mm	
DSI		3	3	2	
Technology/Band	Antenna	Plimit			Pmax
GSM/DTM/GPRS/EDGE 850	Cellular Main 1st Antenna	23.3		23.3	23.3
GSM/DTM/GPRS/EDGE 1900	Cellular Main 1st Antenna	18.8		18.8	18.8
UMTS 850	Cellular Main 1st Antenna	24.0		24.0	24.0
UMTS 1750	Cellular Main 1st Antenna	19.0		19.0	19.0
UMTS 1900	Cellular Main 1st Antenna	19.0		19.0	19.0
LTE Band 71	Cellular Main 1st Antenna	24.0		24.0	24.0
LTE Band 12	Cellular Main 1st Antenna	24.0		24.0	24.0
LTE Band 13	Cellular Main 1st Antenna	22.0		24.0	24.0
LTE Band 13 ENDC	Cellular Main 1st Antenna	22.0		24.0	23.0
LTE Band 13	Cellular Sub Antenna	21.0		N/A	23.0
LTE Band 13 ENDC	Cellular Sub Antenna	21.0		N/A	22.0
LTE Band 5 (Cell)	Cellular Main 1st Antenna	22.0		24.0	24.0
LTE Band 5 (Cell) ENDC	Cellular Main 1st Antenna	22.0		24.0	23.0
LTE Band 5 (Cell)	Cellular Sub Antenna	21.0		N/A	23.0
LTE Band 5 (Cell) ENDC	Cellular Sub Antenna	21.0		N/A	22.0
LTE Band 66 /4 (AWS)	Cellular Main 1st Antenna	19.0		24.0	24.0
LTE Band 66 (AWS) ENDC	Cellular Main 1st Antenna	19.0		24.0	23.0
LTE Band 25/2 (PCS)	Cellular Main 1st Antenna	19.0		24.0	24.0
LTE Band 2 (PCS) ENDC	Cellular Main 1st Antenna	19.0		24.0	23.0
LTE Band 48	Cellular Main 2nd Antenna	18.0		22.0	22.0
LTE Band 41	Cellular Main 1st Antenna	17.0		22.0	22.0
NR Band n71	Cellular Main 1st Antenna	23.0		24.0	24.0
NR Band n5 (Cell)	Cellular Main 1st Antenna	23.0		24.0	24.0
NR Band n5 (Cell)	Cellular Sub Antenna	22.0		N/A	23.0
NR Band n66 (AWS)	Cellular Main 1st Antenna	19.0		24.0	24.0
NR Band n2 (PCS)	Cellular Main 1st Antenna	19.0		24.0	24.0
NR Band n41	Cellular Sub Antenna	15.0		15.0	22.0
NR Band n77	Cellular Main 2nd Antenna	18.0		18.0	24.0

Notes:

*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 2G/3G/4G/5G 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 D01v06.

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 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 D01v06.

1.3.1 2G/3G/4G/5G Output Power

For this device, Only DSI = 2/3 conditions are applicable for SAR for this device. Therefore, only those targets are listed below per manufacturer request.

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	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
All DSI	Max allowed power	33.2	33.2	30.2	28.4	27.2	27.7	24.7	22.9	21.7
	Nominal	32.5	32.5	29.5	27.7	26.5	27.0	24.0	22.2	21.0
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	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
All DSI	Max allowed power	28.7	28.7	25.7	23.9	22.7	26.7	23.7	21.9	20.7
	Nominal	28.0	28.0	25.0	23.2	22.0	26.0	23.0	21.2	20.0

DTM 850					
Power Level		DTM (GSM+GPRS) (in dBm)		DTM (GSM+EGPRS) (in dBm)	
		2 TX Slots	3 TX Slots	2 TX Slots	3 TX Slots
All DSI	Max allowed power	30.2	28.4	24.7	22.9
	Nominal	29.5	27.7	24.0	22.2
DTM 1900					
Power Level		DTM (GSM+GPRS) (in dBm)		DTM (GSM+EGPRS) (in dBm)	
		2 TX Slots	3 TX Slots	2 TX Slots	3 TX Slots
All DSI	Max allowed power	25.7	23.9	23.7	21.9
	Nominal	25.0	23.2	23.0	21.2

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

UMTS Band 5 (850 MHz)					
Power Level		Modulated Average Output Power (in dBm)			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
All DSI	Max allowed power	24.7	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
UMTS Band 4 (1750 MHz)					
Power Level		Modulated Average Output Power (in dBm)			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
All DSI	Max allowed power	19.7	19.0	19.0	19.0
	Nominal	19.0	18.0	18.0	18.0
UMTS Band 2 (1900 MHz)					
Power Level		Modulated Average Output Power (in dBm)			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
All DSI	Max allowed power	19.7	19.0	19.0	19.0
	Nominal	19.0	18.0	18.0	18.0

Mode / Band		Modulated Average Output Power (in dBm)	
		Head (DSI =2)	Body-Worn, Hotspot, Phablet (DSI =3)
LTE FDD Band 71	Max allowed power	25.0	25.0
	Nominal	24.0	24.0
LTE FDD Band 12	Max allowed power	25.0	25.0
	Nominal	24.0	24.0
LTE FDD Band 13	Max allowed power	25.0	23.0
	Nominal	24.0	22.0
LTE FDD Band 13 Ant D	Max allowed power	N/A	22.0
	Nominal	N/A	21.0
LTE FDD Band 5	Max allowed power	25.0	23.0
	Nominal	24.0	22.0
LTE FDD Band 5 Ant D	Max allowed power	N/A	22.0
	Nominal	N/A	21.0
LTE FDD Band 4	Max allowed power	25.0	20.0
	Nominal	24.0	19.0
LTE FDD Band 66	Max allowed power	25.0	20.0
	Nominal	24.0	19.0
LTE FDD Band 2	Max allowed power	25.0	20.0
	Nominal	24.0	19.0
LTE FDD Band 25	Max allowed power	25.0	20.0
	Nominal	24.0	19.0
LTE TDD Band 41	Max allowed power	25.0	20.0
	Nominal	24.0	19.0
LTE TDD Band 48	Max allowed power	25.0	21.0
	Nominal	24.0	20.0

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

Mode / Band		Modulated Average Output Power (in dBm)	
		Head (DSI =2)	Body-Worn, Hotspot, Phablet (DSI =3)
NR FDD Band n71	Max allowed power	25.0	24.0
	Nominal	24.0	23.0
NR FDD Band n5	Max allowed power	25.0	24.0
	Nominal	24.0	23.0
NR FDD Band n5 Ant D	Max allowed power	N/A	23.0
	Nominal	N/A	22.0
NR FDD Band n66	Max allowed power	25.0	20.0
	Nominal	24.0	19.0
NR FDD Band n2	Max allowed power	25.0	20.0
	Nominal	24.0	19.0
NR TDD Band n41	Max allowed power	16.0	16.0
	Nominal	15.0	15.0
NR TDD Band n77	Max allowed power	19.0	19.0
	Nominal	18.0	18.0

1.3.2 2.4 GHz Maximum Bluetooth and SISO WLAN Output Power

Note: Targets for 802.11ax RU operations can be found in Appendix H

Mode	Band	IEEE 802.11 (in dBm)							
		SISO				MIMO			
		Antenna 1							
		b	g	n	ax (SU)	b	g (CDD + STBC)	n (CDD+STBC, SDM)	ax (SU) (CDD+STBC, SDM)
Maximum / Nominal Power		Max	Max	Max	Max	Max	Max	Max	Max
2.4 GHz WIFI	2.45 GHz	14.07	14.57 ch. 10: 14.07 ch. 11: 12.57	14.57 ch. 1: 14.07 ch. 10: 13.57 ch. 11: 12.57	14.57 ch. 1: 14.07 ch. 10: 13.57 ch. 11: 12.57	14.07	14.57 ch. 10: 14.07 ch. 11: 12.57	14.57 ch. 1: 14.07 ch. 10: 13.57 ch. 11: 12.57	14.57 ch. 1: 14.07 ch. 10: 13.57 ch. 11: 12.57

Mode	Band	IEEE 802.11 (in dBm)							
		SISO				MIMO			
		Antenna 2							
		b	g	n	ax (SU)	b	g (CDD + STBC)	n (CDD+STBC, SDM)	ax (SU) (CDD+STBC, SDM)
Maximum / Nominal Power		Max	Max	Max	Max	Max	Max	Max	Max
2.4 GHz WIFI	2.45 GHz	12.30	15.30 ch. 10: 14.80 ch. 11: 13.30	15.30 ch. 1: 14.80 ch. 10: 14.30 ch. 11: 13.30	15.30 ch. 1: 14.80 ch. 10: 14.30 ch. 11: 13.30	12.30	15.30 ch. 10: 14.80 ch. 11: 13.30	15.30 ch. 1: 14.80 ch. 10: 14.30 ch. 11: 13.30	15.30 ch. 1: 14.80 ch. 10: 14.30 ch. 11: 13.30

Note: in MIMO operations, each Chain 0 and Chain 1 transmits at maximum allowed powers as indicated above.

Bluetooth (in dBm)
14.0
EDR (in dBm)
13.0
BLE 1Mbps (in dBm)
9.0
BLE 2Mbps (in dBm)
9.0

1.3.3 5 GHz Maximum SISO/MIMO WLAN Output Power

Note: Targets for 802.11ax RU operations can be found in Appendix H

Mode	Band	IEEE 802.11 (in dBm)							
		SISO				MIMO			
		Antenna 1							
		a	n	ac	ax (SU)	a	n (CDD+STBC, SDM)	ac (CDD+STBC, SDM)	ax (SU) (CDD+STBC, SDM)
Maximum / Nominal Power		Max	Max	Max	Max	Max	Max	Max	Max
5 GHz WIFI (20MHz BW)	5200 MHz	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52
	5300 MHz	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52
	5500 MHz	12.52	12.52 ch. 140: 12.02	12.52 ch. 140: 12.02	12.52 ch. 140: 12.02	12.52	12.52 ch. 140: 12.02	12.52 ch. 140: 12.02	12.52 ch. 140: 12.02
	5800 MHz	12.52 ch. 149: 10.52	12.52 ch. 149: 10.52 ch. 165: 12.02	12.52 ch. 149: 10.52 ch. 165: 12.02	12.52 ch. 149: 10.52 ch. 165: 12.02	12.52 ch. 149: 10.52	12.52 ch. 149: 10.52 ch. 165: 12.02	12.52 ch. 149: 10.52 ch. 165: 12.02	12.52 ch. 149: 10.52 ch. 165: 12.02
5 GHz WIFI (40MHz BW)	5200 MHz		12.52 ch. 38: 11.02	12.52 ch. 38: 11.02	12.52 ch. 38: 11.02		12.52 ch. 38: 11.02	12.52 ch. 38: 11.02	12.52 ch. 38: 11.02
	5300 MHz		12.52 ch. 62: 11.02	12.52 ch. 62: 11.02	12.52 ch. 62: 11.02		12.52 ch. 62: 11.02	12.52 ch. 62: 11.02	12.52 ch. 62: 11.02
	5500 MHz		12.52 ch. 102: 12.02	12.52 ch. 102: 12.02	12.52 ch. 102: 12.02		12.52 ch. 102: 12.02	12.52 ch. 102: 12.02	12.52 ch. 102: 12.02
	5800 MHz		12.52 ch. 151: 10.52	12.52 ch. 151: 10.52	12.52 ch. 151: 10.52		12.52 ch. 151: 10.52	12.52 ch. 151: 10.52	12.52 ch. 151: 10.52
5 GHz WIFI (80MHz BW)	5200 MHz			10.52	10.52			10.52	10.52
	5300 MHz			10.52	10.52			10.52	10.52
	5500 MHz			12.52 ch. 106: 11.52	12.52 ch. 106: 11.52			12.52 ch. 106: 11.52	12.52 ch. 106: 11.52
	5800 MHz			10.52	10.52			10.52	10.52
5 GHz WIFI (160MHz BW)	5250 MHz			10.52	10.52			10.52	10.52
	5570 MHz			11.52	11.52			11.52	11.52

Note: in MIMO operations, each Chain 0 and Chain 1 transmits at maximum allowed powers as indicated above.

Mode	Band	IEEE 802.11 (in dBm)							
		SISO				MIMO			
		Antenna 2							
		a	n	ac	ax (SU)	a (CDD + STBC)	n (CDD+STBC, SDM)	ac (CDD+STBC, SDM)	ax (SU) (CDD+STBC, SDM)
Maximum / Nominal Power		Max	Max	Max	Max	Max	Max	Max	Max
5 GHz WIFI (20MHz BW)	5200 MHz	12.18	12.18	12.18	12.18	12.18	12.18	12.18	12.18
	5300 MHz	12.18	12.18	12.18	12.18	12.18	12.18	12.18	12.18
	5500 MHz	12.18	12.18 ch. 140: 11.68	12.18 ch. 140: 11.68	12.18 ch. 140: 11.68	12.18	12.18 ch. 140: 11.68	12.18 ch. 140: 11.68	12.18 ch. 140: 11.68
	5800 MHz	12.18 ch. 149: 10.18	12.18 ch. 149: 10.18 ch. 165: 11.68	12.18 ch. 149: 10.18 ch. 165: 11.68	12.18 ch. 149: 10.18 ch. 165: 11.68	12.18 ch. 149: 10.18	12.18 ch. 149: 10.18 ch. 165: 11.68	12.18 ch. 149: 10.18 ch. 165: 11.68	12.18 ch. 149: 10.18 ch. 165: 11.68
5 GHz WIFI (40MHz BW)	5200 MHz		12.18 ch. 38: 10.68	12.18 ch. 38: 10.68	12.18 ch. 38: 10.68		12.18 ch. 38: 10.68	12.18 ch. 38: 10.68	12.18 ch. 38: 10.68
	5300 MHz		12.18 ch. 62: 10.68	12.18 ch. 62: 10.68	12.18 ch. 62: 10.68		12.18 ch. 62: 10.68	12.18 ch. 62: 10.68	12.18 ch. 62: 10.68
	5500 MHz		12.18 ch. 102: 11.68	12.18 ch. 102: 11.68	12.18 ch. 102: 11.68		12.18 ch. 102: 11.68	12.18 ch. 102: 11.68	12.18 ch. 102: 11.68
	5800 MHz		12.18 ch. 151: 10.18	12.18 ch. 151: 10.18	12.18 ch. 151: 10.18		12.18 ch. 151: 10.18	12.18 ch. 151: 10.18	12.18 ch. 151: 10.18
5 GHz WIFI (80MHz BW)	5200 MHz			10.18	10.18			10.18	10.18
	5300 MHz			10.18	10.18			10.18	10.18
	5500 MHz			12.18 ch. 106: 11.18	12.18 ch. 106: 11.18			12.18 ch. 106: 11.18	12.18 ch. 106: 11.18
	5800 MHz			10.18	10.18			10.18	10.18
5 GHz WIFI (160MHz BW)	5250 MHz			10.18	10.18			10.18	10.18
	5570 MHz			11.18	11.18			11.18	11.18

1.3.4 2.4 GHz Reduced MIMO WLAN Output Power

Note: Targets for 802.11ax RU operations can be found in Appendix H

The below table is applicable during Simultaneous Conditions with 2.4 GHz and 5 GHz WLAN

Mode	Band	IEEE 802.11 (in dBm)							
		MIMO							
		Antenna 1				Antenna 2			
		b	g (CDD + STBC)	n (CDD+STBC, SDM)	ax (SU) (CDD+STBC, SDM)	b	g (CDD + STBC)	n (CDD+STBC, SDM)	ax (SU) (CDD+STBC, SDM)
Maximum / Nominal Power		Max	Max	Max	Max	Max	Max	Max	Max
2.4 GHz WIFI	2.45 GHz	12.07	12.57	12.57	12.57	12.30	13.30	13.30	13.30

Note: in MIMO operations, each Chain 0 and Chain 1 transmits at maximum allowed powers as indicated above.

1.3.5 5 GHz Reduced MIMO WLAN Output Power

Note: Targets for 802.11ax RU operations can be found in Appendix H

The below table is applicable during Simultaneous Conditions with 2.4 GHz and 5 GHz WLAN

Mode	Band	IEEE 802.11 (in dBm)							
		MIMO							
		Antenna 1				Antenna 2			
		a (CDD + STBC)	n (CDD+STBC, SDM)	ac (CDD+STBC, SDM)	ax (SU) (CDD+STBC, SDM)	a (CDD + STBC)	n (CDD+STBC, SDM)	ac (CDD+STBC, SDM)	ax (SU) (CDD+STBC, SDM)
Maximum / Nominal Power		Max	Max	Max	Max	Max	Max	Max	Max
5 GHz WIFI (20MHz BW)	5200 MHz	10.52	10.52	10.52	10.52	10.18	10.18	10.18	10.18
	5300 MHz	10.52	10.52	10.52	10.52	10.18	10.18	10.18	10.18
	5500 MHz	10.52	10.52	10.52	10.52	10.18	10.18	10.18	10.18
	5800 MHz	10.52	10.52	10.52	10.52	10.18	10.18	10.18	10.18
5 GHz WIFI (40MHz BW)	5200 MHz	[redacted]	10.52	10.52	10.52	[redacted]	10.18	10.18	10.18
	5300 MHz		10.52	10.52	10.52		10.18	10.18	10.18
	5500 MHz		10.52	10.52	10.52		10.18	10.18	10.18
	5800 MHz		10.52	10.52	10.52		10.18	10.18	10.18
5 GHz WIFI (80MHz BW)	5200 MHz	[redacted]	[redacted]	10.52	10.52	[redacted]	[redacted]	10.18	10.18
	5300 MHz			10.52	10.52			10.18	10.18
	5500 MHz			10.52	10.52			10.18	10.18
	5800 MHz			10.52	10.52			10.18	10.18
5 GHz WIFI (160MHz BW)	5250 MHz	[redacted]	[redacted]	10.52	10.52	[redacted]	[redacted]	10.18	10.18
	5570 MHz			10.52	10.52			10.18	10.18

Note: in MIMO operations, each Chain 0 and Chain 1 transmits at maximum allowed powers as indicated above.

1.4 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 Appendix E. Since the diagonal dimension of this device is > 160 mm and <200 mm, it is considered a "phablet."

Table 1-1
Device Edges/Sides for SAR Testing

Mode	Back	Front	Top	Bottom	Right	Left
GPRS/DTM 850	Yes	Yes	No	Yes	No	Yes
GPRS/DTM 1900	Yes	Yes	No	Yes	No	Yes
UMTS 850	Yes	Yes	No	Yes	No	Yes
UMTS 1750	Yes	Yes	No	Yes	No	Yes
UMTS 1900	Yes	Yes	No	Yes	No	Yes
LTE Band 71	Yes	Yes	No	Yes	No	Yes
LTE Band 12	Yes	Yes	No	Yes	No	Yes
LTE Band 13	Yes	Yes	No	Yes	No	Yes
LTE Band 13 Ant D	Yes	Yes	Yes	No	Yes	No
LTE Band 5 (Cell)	Yes	Yes	No	Yes	No	Yes
LTE Band 5 (Cell) Ant D	Yes	Yes	Yes	No	Yes	No
LTE Band 66 (AWS)	Yes	Yes	No	Yes	No	Yes
LTE Band 25 (PCS)	Yes	Yes	No	Yes	No	Yes
LTE Band 48	Yes	Yes	No	Yes	Yes	No
LTE Band 41	Yes	Yes	No	Yes	No	Yes
NR Band n71	Yes	Yes	No	Yes	No	Yes
NR Band n5 (Cell)	Yes	Yes	No	Yes	No	Yes
NR Band n5 (Cell) Ant D	Yes	Yes	Yes	No	Yes	No
NR Band n66 (AWS)	Yes	Yes	No	Yes	No	Yes
NR Band n2 (PCS)	Yes	Yes	No	Yes	No	Yes
NR Band n41	Yes	Yes	Yes	No	Yes	No
NR Band n77	Yes	Yes	No	Yes	Yes	No
2.4 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
2.4 GHz WLAN Ant 2	Yes	Yes	No	No	No	Yes
5 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN Ant 2	Yes	Yes	Yes	No	No	Yes
Bluetooth Ant 1	Yes	Yes	Yes	No	No	Yes
Bluetooth Ant 2	Yes	Yes	No	No	No	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-2A, U-NII-2C operations are disabled.

1.5 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 Appendix E.

1.6 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, 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 D01v06 4.3.2 procedures.

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Phablet	Notes
1	GSM/DTM voice + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2	Yes	Yes	N/A	Yes	
2	GSM/DTM voice + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes	Yes	N/A	Yes	
3	GSM/DTM voice + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes	Yes	N/A	Yes	
4	GSM/DTM voice + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
5	GSM/DTM voice + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
6	GSM/DTM voice + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
7	GSM/DTM voice + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
8	UMTS + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
9	UMTS + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
10	UMTS + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
11	UMTS + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
12	UMTS + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
13	UMTS + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
14	UMTS + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
15	LTE + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
16	LTE + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
17	LTE + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
18	LTE + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
19	LTE + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
20	LTE + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
21	LTE + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
22	LTE + NR	Yes	Yes	N/A	Yes	
23	LTE + NR + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
24	LTE + NR + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
25	LTE + NR + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
26	LTE + NR + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
27	LTE + NR + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
28	LTE + NR + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
29	LTE + NR + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
30	LTE + NR + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
31	LTE + NR + 2.4 GHz Bluetooth Ant 2 + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
32	NR + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
33	NR + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
34	NR + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
35	NR + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
36	NR + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
37	NR + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
38	NR + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
39	NR + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
40	NR + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
41	NR + 2.4 GHz Bluetooth Ant 2 + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
42	GPRS/DTM/EDGE + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
43	GPRS/DTM/EDGE + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
44	GPRS/DTM/EDGE + 2.4 GHz WLAN Ant 1 + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes	Yes	Yes	Yes	
46	GPRS/DTM/EDGE + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
47	GPRS/DTM/EDGE + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
48	GPRS/DTM/EDGE + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
49	GPRS/DTM/EDGE + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN Ant 1 + 5 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered

1. All licensed modes share the same antenna path and cannot transmit simultaneously.
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-1 and U-NII-3 by S/W, therefore U-NII-2A, and U-NII-2C were not evaluated for wireless router conditions.
5. This device supports 2x2 MIMO Tx for WLAN 802.11a/g/n/ac/ax. 802.11a/g/n/ac/ax supports CDD and STBC and 802.11n/ac/ax additionally supports SDM. Each WLAN antenna can transmit independently or together when operating with MIMO.
6. This device supports VOLTE.
7. This device supports Bluetooth Tethering.
8. LTE + 5G NR FR1 Scenarios are limited to EN-DC combinations with anchor bands shown in the NR FR1 Checklist, 5G NR SA operations are only supported by n77.

1.7 Miscellaneous SAR Test Considerations

(A) WIFI/BT

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-2A and U-NII-2C WIFI, only 2.4 GHz, U-NII-1, 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 80 MHz Bandwidth only for 5 GHz
b) Up to 20 MHz Bandwidth only for 2.4 GHz
c) No aggregate channel configurations
d) 2 Tx antenna output
e) Up to 1024 QAM is supported
f) TDWR and Band gap channels are supported for 5 GHz
g) MU-MIMO UL Operations are not supported

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is greater than 160mm 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 WLAN, phablet SAR tests were performed. Phablet SAR was not evaluated for 2.4 GHz and U-NII-3 WLAN operations since wireless router 1g SAR was < 1.2 W/kg. Because wireless router operations are not supported for 5 GHz WLAN, phablet SAR tests were performed. Phablet SAR was not evaluated for 2.4 GHz 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.

(B) Licensed Transmitter(s)

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 Appendix F.

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is greater than 160mm 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 capabilities with overlapping transmission frequency ranges. When the supported frequency range of an LTE Band falls completely within an LTE band with a larger transmission frequency range, both LTE bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and both LTE bands share the same transmission path and signal characteristics, SAR was only assessed for the band with the larger transmission frequency range.

NR implementation supports NSA mode and SA Mode (n77 only). 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.
NR Test Configurations were selected per the following guidelines per FCC guidance: 1. MPR is permanently implemented per 3GPP standards. Conducted power and SAR test configurations were identified for RB configurations/modulations with MPR=0 dB as the most conservative SAR scenarios. 1 RB and 50% RB allocations with a low, mid and high offset within the “Inner RB allocation” range were selected to identify the configurations with the highest power. 2. The SAR test guidance outlined in section 5 of KDB 941225 D05 was generally adapted for the NR testing. DFT-S-OFDM QPSK was used as the lowest order modulation. Additional modulations were not required since conducted power was not > 0.5 dB higher than the lowest order modulation. 3. All available SCS settings for this device were evaluated. The NR checklist contains information about the SCS settings per band.

1.8 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r04, D05Av01r02, D06v02r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 648474 D04v01r03 (Phablet Procedure)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)
- April 2018 TCB Workshop Notes (LTE Carrier Aggregation)
- April 2019 TCB Workshop Notes (IEEE 802.11ax, Dynamic Antenna Tuning)

1.9 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.

1.1 Bibliography

Report Type	Report Serial Number
RF Exposure Part 0 Test Report	
RF Exposure Part 2 Test Report	1M2108040087-20.PY7
RF Exposure Compliance Summary Report	1M2108040087-21.PY7

2 LTE INFORMATION

LTE Information					
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 71 (665.5 - 695.5 MHz)				
	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 13 (779.5 - 784.5 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 25 (PCS) (1850.7 - 1914.3 MHz)				
	LTE Band 2 (PCS) (1850.7 - 1909.3 MHz)				
	LTE Band 48 (3552.5 - 3649.2 MHz)				
	LTE Band 41 (2498.5 - 2687.5 MHz)				
Channel Bandwidths	LTE Band 71: 5 MHz, 10 MHz, 15 MHz				
	LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 13: 5 MHz, 10 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 25 (PCS): 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 48: 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 71: 5 MHz	665.5 (133147)		680.5 (133297)	695.5 (133447)	
LTE Band 71: 10 MHz	668 (133172)		680.5 (133297)	693 (133422)	
LTE Band 71: 15 MHz	670.5 (133197)		680.5 (133297)	690.5 (133397)	
LTE Band 71: 20 MHz	673 (133222)		680.5 (133297)	688 (133372)	
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 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 25 (PCS): 1.4 MHz	1850.7 (26047)		1882.5 (26365)	1914.3 (26683)	
LTE Band 25 (PCS): 3 MHz	1851.5 (26055)		1882.5 (26365)	1913.5 (26675)	
LTE Band 25 (PCS): 5 MHz	1852.5 (26065)		1882.5 (26365)	1912.5 (26665)	
LTE Band 25 (PCS): 10 MHz	1855 (26090)		1882.5 (26365)	1910 (26640)	
LTE Band 25 (PCS): 15 MHz	1857.5 (26115)		1882.5 (26365)	1907.5 (26615)	
LTE Band 25 (PCS): 20 MHz	1860 (26140)		1882.5 (26365)	1905 (26590)	
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 48: 5 MHz	3552.5 (55265)	3600.8 (55748)	N/A	3649.2 (56232)	3697.5 (56715)
LTE Band 48: 10 MHz	3555 (55290)	3601.7 (55757)	N/A	3648.3 (56223)	3695 (56690)
LTE Band 48: 15 MHz	3557.5 (55315)	3602.5 (55765)	N/A	3647.5 (56215)	3692.5 (56665)
LTE Band 48: 20 MHz	3560 (55340)	3603.3 (55773)	N/A	3646.7 (56207)	3690 (56640)
LTE Band 41: 5 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 10 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 15 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 20 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
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 15. It supports carrier aggregation, downlink MIMO, LAA features as shown in Section 9 and Appendix F. 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, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

NR Information						
Form Factor	Portable Handset					
Frequency Range of each NR transmission band	NR Band n71 (665.5 - 695.5 MHz)					
	NR Band n5 (Cell) (826.5 - 846.5 MHz)					
	NR Band n66 (AWS) (1712.5 - 1777.5 MHz)					
	NR Band n2 (PCS) (1852.5 - 1907.5 MHz)					
	NR Band n41 (2506.02 - 2679.99 MHz)					
	NR Band n77 (3710.01 - 3969.99 MHz)					
Channel Bandwidths	NR Band n71: 5 MHz, 10 MHz, 15 MHz, 20 MHz					
	NR Band n5 (Cell): 5 MHz, 10 MHz, 15 MHz, 20 MHz					
	NR Band n66 (AWS): 5 MHz, 10 MHz, 15 MHz, 20 MHz					
	NR Band n2 (PCS): 5 MHz, 10 MHz, 15 MHz, 20 MHz					
	NR Band n41: 20 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz, 80 MHz, 90 MHz, 100 MHz					
	NR Band n77: 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 n71: 5 MHz	665.5 (133147)		680.5 (136100)		695.5 (133447)	
NR Band n71: 10 MHz	668 (133600)		680.5 (136100)		693 (138600)	
NR Band n71: 15 MHz	670.5 (134100)		680.5 (136100)		690.5 (138100)	
NR Band n71: 20 MHz	673 (134600)		680.5 (136100)		688 (137600)	
NR Band n5 (Cell): 5 MHz	826.5 (165300)		836.5 (167300)		846.5 (169300)	
NR Band n5 (Cell): 10 MHz	829 (165800)		836.5 (167300)		844 (168800)	
NR Band n5 (Cell): 15 MHz	831.5 (166300)		836.5 (167300)		841.5 (168300)	
NR Band n5 (Cell): 20 MHz	834 (166800)		836.5 (167300)		839 (167800)	
NR Band n66 (AWS): 5 MHz	1712.5 (342500)		1745 (349000)		1777.5 (355500)	
NR Band n66 (AWS): 10 MHz	1715 (343000)		1745 (349000)		1775 (355000)	
NR Band n66 (AWS): 15 MHz	1717.5 (343500)		1745 (349000)		1772.5 (354500)	
NR Band n66 (AWS): 20 MHz	1720 (344000)		1745 (349000)		1770 (354000)	
NR Band n2 (PCS): 5 MHz	1852.5 (370500)		1880 (376000)		1907.5 (381500)	
NR Band n2 (PCS): 10 MHz	1855 (371000)		1880 (376000)		1905 (381000)	
NR Band n2 (PCS): 15 MHz	1857.5 (371500)		1880 (376000)		1902.5 (380500)	
NR Band n2 (PCS): 20 MHz	1860 (372000)		1880 (376000)		1900 (380000)	
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: 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)	
NR Band n77: 20 MHz	3710.01 (647334)	3762 (650800)	3813.99 (654266)	3866.01 (657734)	3918 (661200)	3969.99 (664666)
NR Band n77: 30 MHz	3715.02 (647668)	3765 (651000)	3815.01 (654334)	3864.99 (657666)	3915 (661000)	3964.98 (664332)
NR Band n77: 40 MHz	3720 (648000)	3768 (651200)	3816 (654400)	3864 (657600)	3912 (660800)	3960 (664000)
NR Band n77: 50 MHz	3725.01 (648334)	3782.49 (652166)	3840 (656000)		3897.51 (659834)	3954.99 (663666)
NR Band n77: 60 MHz	3730.02 (648668)	3803.34 (653556)	N/A	N/A	3876.66 (658444)	3949.98 (663332)
NR Band n77: 70 MHz	3735 (649000)	3804.99 (653666)	N/A		3875.01 (658334)	3945 (663000)
NR Band n77: 80 MHz	3740.01 (649334)	N/A	3840 (656000)		N/A	3939.99 (662666)
NR Band n77: 90 MHz	3745.02 (649668)	N/A	3840 (656000)		N/A	3934.98 (662332)
NR Band n77: 100 MHz	3750 (650000)	N/A	N/A	N/A	N/A	3930 (662000)
SCS for NR Band n71/n5/n66/n2	15 kHz					
SCS for NR Band n41/n77	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 n71	LTE Band 66/2					
LTE Anchor Bands for NR Band n5 (Cell)	LTE Band 66/2					
LTE Anchor Bands for NR Band n66 (AWS)	LTE Band 13/5					
LTE Anchor Bands for NR Band n2 (PCS)	LTE Band 13/5					
LTE Anchor Bands for NR Band n41	LTE Band 66					
LTE Anchor Bands for NR Band n77	SA Only					

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:

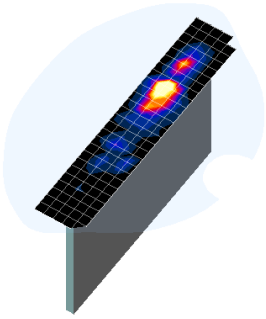


Figure 4-1
Sample SAR Area Scan

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].

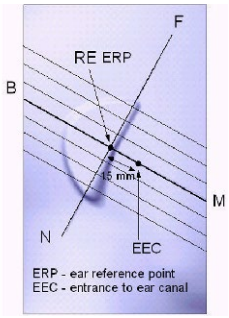


Figure 5-1
Close-Up Side view of ERP

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.

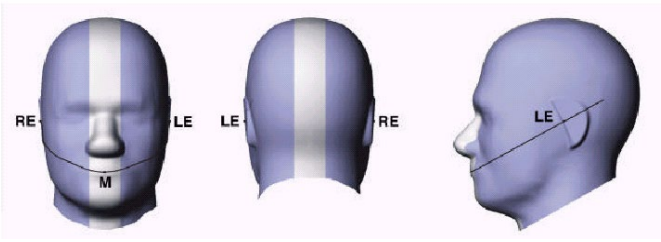


Figure 5-2
Front, back and side view of SAM Twin Phantom

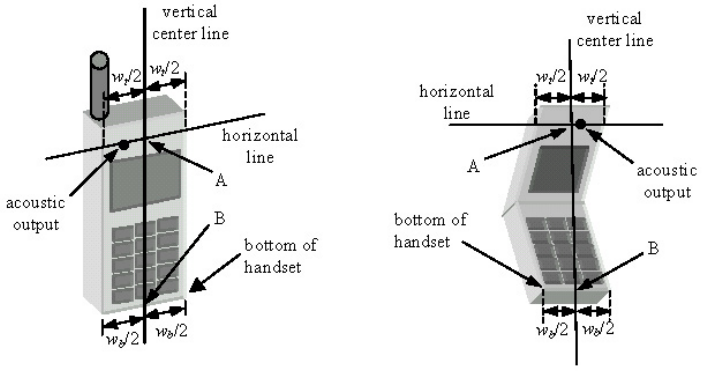


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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).

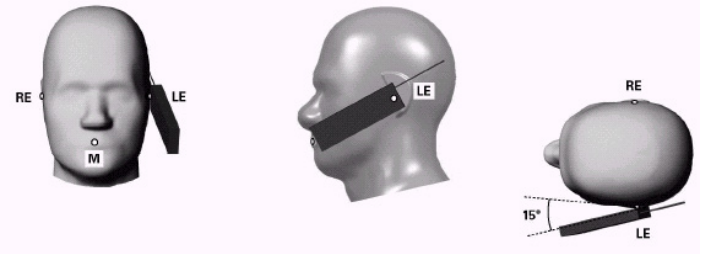


Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

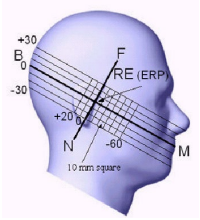


Figure 6-3
Side view w/ relevant markings

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 D01v06 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.

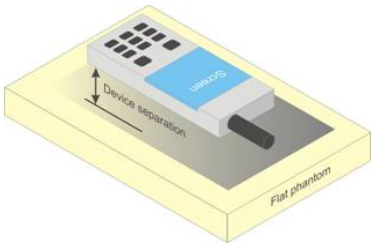


Figure 6-4
Sample Body-Worn Diagram

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 D01v06 should be applied to determine SAR test requirements.

Per KDB Publication 447498 D01v06, 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 D01v06 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 SAR Testing for Tablet per KDB Publication 616217 D04v01r02

Per FCC KDB Publication 616217 D04v01r02, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR Exclusion Threshold in KDB 447498 D01v06 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

6.10 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 Appendix G.

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 D01v06, 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.

9 RF CONDUCTED POWERS

All conducted power measurements for 2G/3G/4G/5G 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
GSM/GPRS/EDGE Measured P_{Max} for all DSI

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	31.79	31.81	29.04	27.15	**26.10**	27.27	23.72	22.02	21.02
	190	31.92	31.91	29.10	27.02	**26.13**	27.32	23.69	22.04	20.95
	251	31.78	31.76	28.99	27.15	**26.12**	27.26	23.76	22.02	21.05
GSM 1900	512	27.21	27.17	24.29	22.48	**21.03**	25.02	22.12	20.09	18.97
	661	27.63	27.61	24.78	22.89	**21.44**	25.41	22.43	20.57	19.26
	810	27.57	27.54	24.84	22.89	**21.43**	25.34	22.48	20.53	19.31

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	22.59	22.61	22.85	22.72	**22.92**	18.07	17.53	17.59	17.84
	190	22.72	22.71	22.91	22.59	**22.95**	18.12	17.50	17.61	17.57
	251	22.58	22.56	22.80	22.72	**22.94**	18.06	17.57	17.59	17.87
GSM 1900	512	18.01	17.97	18.10	18.05	**17.85**	15.82	15.93	15.66	15.79
	661	18.43	18.41	18.59	18.46	**18.26**	16.21	16.24	16.14	16.08
	810	18.37	18.34	18.65	18.46	**18.25**	16.14	16.29	16.10	16.13
GSM 850	**Frame Avg.Targets:**	23.30	23.30	23.31	23.27	**23.32**	17.80	17.81	17.77	17.82
GSM 1900		18.80	18.80	18.81	18.77	**18.82**	16.80	16.81	16.77	16.82

Table 9-2
DTM Measured P_{Max} for all DSI

Maximum Burst-Averaged Output Power					
		DTM (GSM + GPRS)		*DTM (GSM + EGPRS)*	
Band	**Channel**	**DTM [dBm] CS + PS (2 Slots)**	**DTM [dBm] CS + 2PS (3 Slots)**	**DTM [dBm] CS + PS (2 Slots)**	**DTM [dBm] CS + 2PS (3 Slots)**
GSM 850	128	28.99	**26.98**	23.70	22.51
	190	28.77	**27.34**	23.75	22.57
	251	29.17	**27.32**	23.71	22.49
GSM 1900	512	23.80	**22.25**	22.17	21.80
	661	24.40	**22.72**	22.31	21.90
	810	23.88	**22.67**	22.37	21.76

Calculated Maximum Frame-Averaged Output Power					
		DTM (GSM + GPRS)		*DTM (GSM + EGPRS)*	
Band	**Channel**	**DTM [dBm] CS + PS (2 Slots)**	**DTM [dBm] CS + 2PS (3 Slots)**	**DTM [dBm] CS + PS (2 Slots)**	**DTM [dBm] CS + 2PS (3 Slots)**
GSM 850	128	22.80	**22.55**	17.51	18.08
	190	22.58	**22.91**	17.56	18.14
	251	22.98	**22.89**	17.52	18.06
GSM 1900	512	17.61	**17.82**	15.98	17.37
	661	18.21	**18.29**	16.12	17.47
	810	17.69	**18.24**	16.18	17.33

GSM 850	**Frame Avg.Targets:**	23.31	**23.27**	17.81	17.77
GSM 1900		18.81	**18.77**	16.81	16.77

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.
4. DTM output powers were measured with a communication test set with DTM supported when the device was operating in DTM using one CS slot plus PS multislots. The bolded DTM modes were selected for SAR testing according to the according to the maximum CS and PS slots according to KDB 941225 D04v01.

GSM Class: A
GPRS Multislot class: 33 (Max 4 Tx uplink slots)
EDGE Multislot class: 33 (Max 4 Tx uplink slots)
DTM Multislot Class: 11 (Max 3 Tx Uplink Slots)

Figure 9-1
Power Measurement Setup

9.2 UMTS Conducted Powers

Table 9-3
Measured P_{Max} for all DSI

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	24.03	24.10	24.04	18.84	18.97	19.06	18.82	18.97	18.82	-
99		12.2 kbps AMR	24.02	24.10	24.04	18.84	18.97	19.06	18.82	18.96	18.81	-
6	HSDPA	Subtest 1	23.04	23.10	23.04	17.84	17.97	18.05	17.85	17.97	17.83	0
6		Subtest 2	23.03	23.09	23.02	17.84	17.97	18.07	17.84	17.97	17.83	0
6		Subtest 3	22.52	22.59	22.55	17.37	17.49	17.55	17.41	17.47	17.33	0.5
6		Subtest 4	22.53	22.57	22.54	17.35	17.45	17.57	17.35	17.49	17.31	0.5
6	HSUPA	Subtest 1	23.04	23.09	23.05	17.85	17.96	18.05	17.86	17.97	17.81	0
6		Subtest 2	21.03	21.07	21.06	15.86	15.95	16.04	15.82	15.96	15.82	2
6		Subtest 3	22.03	22.06	22.02	16.84	16.97	17.03	16.83	16.95	16.83	1
6		Subtest 4	21.04	21.08	21.05	15.87	15.97	16.04	15.86	15.97	15.81	2
6		Subtest 5	23.03	23.10	23.04	17.86	17.97	18.07	17.87	18.08	17.82	0
8	DC-HSDPA	Subtest 1	23.05	23.11	23.05	17.82	17.93	18.02	17.83	17.93	17.80	0
8		Subtest 2	23.03	23.09	23.02	17.81	17.95	18.03	17.83	17.93	17.80	0
8		Subtest 3	22.53	22.59	22.55	17.33	17.44	17.54	17.34	17.46	17.28	0.5
8		Subtest 4	22.51	22.59	22.53	17.36	17.45	17.53	17.35	17.45	17.27	0.5

DC-HSDPA considerations

- 3GPP Specification 34.121-1 Release 8 Ver 8.10.0 was used for DC-HSDPA guidance
- H-Set 12 (QPSK) was confirmed to be used during DC-HSDPA measurements
- The DUT supports UE category 24 for HSDPA

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 Appendix H.

9.3.1 LTE Band 71

Table 9-4
LTE Band 71 Measured P_{Max} for all DSI - 20 MHz Bandwidth

LTE Band 71 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 133297 (680.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**23.50**	0	0
	1	50	23.46		0
	1	99	23.33		0
	50	0	**22.65**	0-1	1
	50	25	22.56		1
	50	50	22.63		1
	100	0	22.48		1
16QAM	1	0	22.92	0-1	1
	1	50	22.85		1
	1	99	22.68		1
	50	0	21.62	0-2	2
	50	25	21.52		2
	50	50	21.48		2
	100	0	21.52		2
64QAM	1	0	21.73	0-2	2
	1	50	21.59		2
	1	99	21.53		2
	50	0	20.62	0-3	3
	50	25	20.54		3
	50	50	20.53		3
	100	0	20.53		3

Note: LTE Band 71 at 20 MHz bandwidth does 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.

9.3.2 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	**23.48**	0	0
	1	25	23.46		0
	1	49	23.45		0
	25	0	**22.61**	0-1	1
	25	12	22.57		1
	25	25	22.53		1
	50	0	22.60		1
16QAM	1	0	22.83	0-1	1
	1	25	22.72		1
	1	49	22.79		1
	25	0	21.59	0-2	2
	25	12	21.61		2
	25	25	21.52		2
	50	0	21.55		2
64QAM	1	0	21.66	0-2	2
	1	25	21.76		2
	1	49	21.78		2
	25	0	20.66	0-3	3
	25	12	20.62		3
	25	25	20.61		3
	50	0	20.56		3

Note: LTE Band 12 at 10 MHz bandwidth does 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.

9.3.1 LTE Band 13

Table 9-6
LTE Band 13 Cellular Main 1st Antenna Measured P_{Max} for DSI = 2 (Head) - 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	23.46	0	0
	1	25	23.44		0
	1	49	**23.47**		0
	25	0	22.56	0-1	1
	25	12	22.52		1
	25	25	**22.68**		1
	50	0	22.57		1
16QAM	1	0	22.76	0-1	1
	1	25	22.82		1
	1	49	22.81		1
	25	0	21.62	0-2	2
	25	12	21.61		2
	25	25	21.57		2
	50	0	21.59		2
64QAM	1	0	21.68	0-2	2
	1	25	21.71		2
	1	49	21.72		2
	25	0	20.58	0-3	3
	25	12	20.62		3
	25	25	20.63		3
	50	0	20.62		3

Table 9-7
LTE Band 13 Cellular Main 1st Antenna Measured P_{limit} for DSI = 3 (Body-worn, Hotspot or Phablet) - 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	**21.85**	0	0
	1	25	21.77		0
	1	49	21.81		0
	25	0	**21.88**	0-1	0
	25	12	21.82		0
	25	25	21.85		0
	50	0	21.82		0
16QAM	1	0	22.15	0-1	0
	1	25	22.11		0
	1	49	22.18		0
	25	0	21.68	0-2	0
	25	12	21.72		0
	25	25	21.65		0
	50	0	21.68		0
64QAM	1	0	21.76	0-2	0
	1	25	21.82		0
	1	49	21.74		0
	25	0	20.73	0-3	1
	25	12	20.70		1
	25	25	20.76		1
	50	0	20.69		1

Table 9-8
LTE Band 13 Cellular Sub Antenna Measured P_{limit} for DSI = 3 (Body-worn, Hotspot or Phablet)
- 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	20.91	0	0
	1	25	20.85		0
	1	49	**20.94**		0
	25	0	21.05	0-1	0
	25	12	21.07		0
	25	25	**21.08**		0
	50	0	20.92		0
16QAM	1	0	21.14	0-1	0
	1	25	21.25		0
	1	49	21.08		0
	25	0	20.87	0-2	0
	25	12	20.84		0
	25	25	20.83		0
	50	0	20.79		0
64QAM	1	0	20.91	0-2	0
	1	25	20.94		0
	1	49	20.91		0
	25	0	19.94	0-3	1
	25	12	19.91		1
	25	25	19.90		1
	50	0	20.02		1

9.3.2 LTE Band 5 (Cell)

Table 9-9
LTE Band 5 (Cell) Cellular Main 1st Antenna Measured P_{Max} for DSI = 2 (Head) - 10 MHz Bandwidth

LTE Band 5 (Cell) 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20525 (836.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	23.67	0	0
	1	25	23.72		0
	1	49	**23.79**		0
	25	0	22.76	0-1	1
	25	12	22.65		1
	25	25	**22.77**		1
	50	0	22.73		1
16QAM	1	0	23.10	0-1	1
	1	25	23.05		1
	1	49	23.02		1
	25	0	21.79	0-2	2
	25	12	21.81		2
	25	25	21.82		2
	50	0	21.68		2
64QAM	1	0	21.89	0-2	2
	1	25	21.91		2
	1	49	21.85		2
	25	0	20.74	0-3	3
	25	12	20.72		3
	25	25	20.79		3
	50	0	20.77		3

Note: LTE Band 5 (Cell) at 10 MHz bandwidth does 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.

Table 9-10
LTE Band 5 (Cell) Cellular Main 1st Antenna P_{limit} for DSI = 3 (Body-worn, Hotspot or Phablet) - 10 MHz Bandwidth

LTE Band 5 (Cell) 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20525 (836.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	22.00	0	0
	1	25	21.98		0
	1	49	**22.09**		0
	25	0	22.10	0-1	0
	25	12	**22.16**		0
	25	25	22.14		0
	50	0	22.06		0
16QAM	1	0	22.36	0-1	0
	1	25	22.33		0
	1	49	22.34		0
	25	0	21.90	0-2	0
	25	12	21.95		0
	25	25	21.97		0
	50	0	22.01		0
64QAM	1	0	22.03	0-2	0
	1	25	22.10		0
	1	49	21.72		0
	25	0	20.99	0-3	1
	25	12	20.99		1
	25	25	20.96		1
	50	0	20.85		1

Note: LTE Band 5 (Cell) at 10 MHz bandwidth does 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.

Table 9-11
LTE Band 5 (Cell) Cellular Sub Antenna Measured P_{limit} for DSI = 3 (Body-worn, Hotspot or Phablet) - 10 MHz Bandwidth

LTE Band 5 (Cell) 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20525 (836.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	20.95	0	0
	1	25	20.99		0
	1	49	**21.09**		0
	25	0	21.03	0-1	0
	25	12	21.04		0
	25	25	**21.05**		0
	50	0	21.01		0
16QAM	1	0	21.25	0-1	0
	1	25	21.23		0
	1	49	21.26		0
	25	0	20.83	0-2	0
	25	12	20.80		0
	25	25	20.91		0
	50	0	20.85		0
64QAM	1	0	20.63	0-2	0
	1	25	20.98		0
	1	49	21.02		0
	25	0	19.89	0-3	1
	25	12	19.90		1
	25	25	19.97		1
	50	0	19.91		1

Note: LTE Band 5 (Cell) at 10 MHz bandwidth does 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.

9.3.3 LTE Band 66 (AWS)

Table 9-12
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	23.28	23.36	23.25	0	0
	1	50	23.24	23.34	23.30		0
	1	99	23.36	**23.42**	23.34		0
	50	0	22.36	22.38	22.36	0-1	1
	50	25	22.43	22.42	22.42		1
	50	50	22.46	**22.47**	22.41		1
	100	0	22.37	22.39	22.43		1
16QAM	1	0	22.65	22.73	22.75	0-1	1
	1	50	22.59	22.65	22.58		1
	1	99	22.63	22.72	22.67		1
	50	0	21.32	21.41	21.32	0-2	2
	50	25	21.37	21.35	21.47		2
	50	50	21.42	21.44	21.44		2
	100	0	21.35	21.36	21.41		2
64QAM	1	0	21.52	21.47	21.55	0-2	2
	1	50	21.61	21.61	21.51		2
	1	99	21.55	21.64	21.58		2
	50	0	20.34	20.38	20.35	0-3	3
	50	25	20.40	20.35	20.45		3
	50	50	20.42	20.44	20.43		3
	100	0	20.41	20.38	20.40		3

Table 9-13
LTE Band 66 (AWS) Measured P_{limit} for DSI = 3 (Body-worn, Hotspot or Phablet) - 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	18.36	**18.49**	18.26	0	0
	1	50	18.24	18.33	18.25		0
	1	99	18.37	18.31	18.14		0
	50	0	18.34	**18.55**	18.34	0-1	0
	50	25	18.44	18.54	18.34		0
	50	50	18.45	18.45	18.32		0
	100	0	18.42	18.48	18.42		0
16QAM	1	0	18.67	18.81	18.82	0-1	0
	1	50	18.62	18.62	18.64		0
	1	99	18.73	18.65	18.62		0
	50	0	18.32	18.54	18.48	0-2	0
	50	25	18.44	18.56	18.46		0
	50	50	18.46	18.46	18.40		0
	100	0	18.44	18.45	18.42		0
64QAM	1	0	18.52	18.61	18.62	0-2	0
	1	50	18.56	18.55	18.46		0
	1	99	18.69	18.50	18.44		0
	50	0	18.37	18.54	18.45	0-3	0
	50	25	18.48	18.51	18.48		0
	50	50	18.47	18.48	18.35		0
	100	0	18.47	18.54	18.42		0

9.3.4 LTE Band 25 (PCS)

Table 9-14
LTE Band 25 (PCS) Measured P_{Max} for DSI = 2 (Head) - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.31	23.34	23.29	0	0
	1	50	23.25	23.40	23.26		0
	1	99	23.28	**23.43**	23.33		0
	50	0	22.37	22.47	22.41	0-1	1
	50	25	22.47	22.48	22.44		1
	50	50	22.44	**22.52**	22.42		1
	100	0	22.43	22.41	22.45		1
16QAM	1	0	22.57	22.64	22.58	0-1	1
	1	50	22.57	22.74	22.57		1
	1	99	22.55	22.75	22.66		1
	50	0	21.37	21.42	21.36	0-2	2
	50	25	21.51	21.48	21.52		2
	50	50	21.47	21.51	21.43		2
	100	0	21.43	21.44	21.42		2
64QAM	1	0	21.51	21.55	21.42	0-2	2
	1	50	21.52	21.62	21.55		2
	1	99	21.51	21.58	21.58		2
	50	0	20.43	20.42	20.39	0-3	3
	50	25	20.44	20.46	20.45		3
	50	50	20.46	20.52	20.44		3
	100	0	20.42	20.46	20.45		3

Table 9-15
LTE Band 25 (PCS) Measured P_{limit} for DSI = 3 (Body-worn, Hotspot or Phablet) - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.69	18.62	18.67	0	0
	1	50	18.64	18.76	18.57		0
	1	99	18.66	**18.78**	18.49		0
	50	0	18.74	18.72	18.71	0-1	0
	50	25	18.76	18.77	18.74		0
	50	50	18.75	**18.81**	18.67		0
	100	0	18.75	18.75	18.72		0
16QAM	1	0	18.97	19.06	19.03	0-1	0
	1	50	18.92	19.05	18.88		0
	1	99	18.94	19.03	18.86		0
	50	0	18.73	18.80	18.74	0-2	0
	50	25	18.79	18.83	18.72		0
	50	50	18.76	18.76	18.73		0
	100	0	18.75	18.73	18.73		0
64QAM	1	0	18.85	18.86	18.82	0-2	0
	1	50	18.91	18.95	18.78		0
	1	99	18.95	18.96	18.76		0
	50	0	18.77	18.83	18.75	0-3	0
	50	25	18.84	18.76	18.73		0
	50	50	18.81	18.91	18.71		0
	100	0	18.79	18.76	18.73		0

9.3.5 LTE Band 48

Table 9-16
LTE Band 48 Measured P_{Max} for DSI = 2 (Head) - 20 MHz Bandwidth

LTE Band 48 20 MHz Bandwidth								
Modulation	RB Size	RB Offset	Low Channel 55340 (3560.0 MHz)	Low-Mid Channel 55773 (3603.3 MHz)	Mid-High Channel 56207 (3646.7 MHz)	High Channel 56640 (3690.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]					
QPSK	1	0	**23.65**	23.64	23.58	23.39	0	0
	1	50	23.49	23.46	23.42	23.22		0
	1	99	23.56	23.55	23.47	23.27		0
	50	0	**22.76**	22.75	22.58	22.33	0-1	1
	50	25	22.72	22.71	22.54	22.31		1
	50	50	22.71	22.67	22.61	22.34		1
	100	0	22.71	22.71	22.55	22.32		1
16QAM	1	0	22.79	22.78	22.73	22.59	0-1	1
	1	50	22.63	22.61	22.57	22.31		1
	1	99	22.71	22.66	22.62	22.36		1
	50	0	21.78	21.77	21.63	21.40	0-2	2
	50	25	21.78	21.72	21.61	21.33		2
	50	50	21.72	21.70	21.64	21.38		2
	100	0	21.76	21.72	21.61	21.33		2
64QAM	1	0	21.21	21.23	21.21	20.98	0-2	2
	1	50	21.16	21.12	21.09	20.81		2
	1	99	21.22	21.18	21.15	20.86		2
	50	0	20.73	20.78	20.61	20.36	0-3	3
	50	25	20.76	20.74	20.60	20.33		3
	50	50	20.72	20.68	20.65	20.40		3
	100	0	20.73	20.72	20.57	20.32		3

Table 9-17
LTE Band 48 Measured P_{limit} for DSI = 3 (Body-worn, Hotspot or Phablet) - 20 MHz Bandwidth

LTE Band 48 20 MHz Bandwidth								
Modulation	RB Size	RB Offset	Low Channel 55340 (3560.0 MHz)	Low-Mid Channel 55773 (3603.3 MHz)	Mid-High Channel 56207 (3646.7 MHz)	High Channel 56640 (3690.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]					
QPSK	1	0	**20.22**	20.17	20.01	19.83	0	0
	1	50	20.04	19.98	19.85	19.56		0
	1	99	20.07	19.96	19.92	19.55		0
	50	0	**20.23**	20.02	19.88	19.64	0-1	0
	50	25	20.21	20.08	19.86	19.58		0
	50	50	20.22	20.01	19.91	19.59		0
	100	0	20.18	20.10	19.87	19.58		0
16QAM	1	0	20.26	20.23	19.98	19.75	0-1	0
	1	50	20.19	19.98	19.85	19.59		0
	1	99	20.21	19.96	19.93	19.56		0
	50	0	20.23	20.06	19.88	19.67	0-2	0
	50	25	20.22	20.09	19.87	19.61		0
	50	50	20.25	20.01	19.90	19.66		0
	100	0	20.26	20.09	19.89	19.62		0
64QAM	1	0	19.67	19.64	19.43	19.25	0-2	0
	1	50	19.66	19.48	19.38	19.09		0
	1	99	19.75	19.53	19.45	19.06		0
	50	0	20.28	20.07	19.92	19.66	0-3	0
	50	25	20.26	20.12	19.87	19.59		0
	50	50	20.24	20.04	19.91	19.62		0
	100	0	20.25	20.11	19.85	19.61		0

9.3.6 LTE Band 41

Table 9-18
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	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	23.36	23.71	23.64	23.84	**23.90**	0	0
	1	50	23.34	23.56	23.57	23.69	23.67		0
	1	99	23.36	23.67	23.69	23.80	23.62		0
	50	0	22.49	22.65	22.65	22.83	**22.91**	0-1	1
	50	25	22.53	22.72	22.72	22.87	22.87		1
	50	50	22.54	22.71	22.71	22.88	22.71		1
	100	0	22.57	22.72	22.72	22.87	22.88		1
16QAM	1	0	22.54	22.75	22.78	23.01	23.06	0-1	1
	1	50	22.51	22.68	22.68	22.84	22.83		1
	1	99	22.48	22.78	22.74	22.93	22.76		1
	50	0	21.51	21.69	21.69	21.89	21.96	0-2	2
	50	25	21.58	21.77	21.76	21.94	21.91		2
	50	50	21.58	21.78	21.77	21.92	21.77		2
	100	0	21.59	21.77	21.75	21.95	21.89		2
64QAM	1	0	21.12	21.25	21.27	21.57	21.57	0-2	2
	1	50	21.08	21.27	21.24	21.42	21.39		2
	1	99	21.06	21.37	21.33	21.48	21.29		2
	50	0	20.53	20.69	20.69	20.89	20.99	0-3	3
	50	25	20.58	20.75	20.76	20.93	20.91		3
	50	50	20.57	20.76	20.77	20.93	20.78		3
	100	0	20.60	20.76	20.76	20.95	20.91		3

Table 9-19
LTE Band 41 Measured P_{limit} for DSI = 3 (Body-worn, Hotspot or Phablet) - 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	18.71	18.63	19.03	19.15	**19.36**	0	0
	1	50	18.76	18.56	18.82	18.91	19.03		0
	1	99	18.74	18.54	18.95	19.05	18.99		0
	50	0	18.77	18.78	18.94	19.15	**19.24**	0-1	0
	50	25	18.84	18.78	19.01	19.14	19.18		0
	50	50	18.83	18.75	19.01	19.13	19.05		0
	100	0	18.86	18.81	19.02	19.17	19.17		0
16QAM	1	0	18.81	18.83	19.04	19.26	19.23	0-1	0
	1	50	18.80	18.79	18.95	19.11	19.14		0
	1	99	18.82	18.77	18.99	19.17	19.08		0
	50	0	18.78	18.79	18.97	19.14	19.26	0-2	0
	50	25	18.90	18.87	19.07	19.19	19.22		0
	50	50	18.87	18.82	19.03	19.16	19.09		0
	100	0	18.88	18.83	19.02	19.21	19.20		0
64QAM	1	0	18.43	18.34	18.58	18.82	18.81	0-2	0
	1	50	18.40	18.38	18.61	18.68	18.68		0
	1	99	18.38	18.37	18.66	18.73	18.57		0
	50	0	18.83	18.81	19.01	19.18	19.28	0-3	0
	50	25	18.92	18.85	19.09	19.19	19.22		0
	50	50	18.90	18.83	19.09	19.17	19.08		0
	100	0	18.89	18.86	19.10	19.21	19.21		0

Figure 9-3
Power Measurement Setup

9.4 NR Conducted Powers

Per FCC guidance, NR 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 NR SAR for the highest bandwidth was less than 1.45 W/kg. Lower bandwidth conducted powers for all NR bands can be found in Appendix H.

9.4.1 NR Band n71

Table 9-20
NR Band n71 Measured P_{Max} for DSI = 2 (Head) - 20 MHz Bandwidth

NR Band n71 20 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	136100 (680.5 MHz) Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	24.12	0	0.0
	1	53	24.03		0.0
	1	104	23.95		0.0
	50	0	23.61	0-0.5	0.5
	50	28	24.05	0	0.0
	50	56	23.46	0-0.5	0.5
	100	0	23.56		0.5
DFT-s-OFDM QPSK	1	1	**24.25**	0	0.0
	1	53	24.22		0.0
	1	104	24.15		0.0
	50	0	23.07	0-1	1.0
	50	28	**24.09**	0	0.0
	50	56	22.92	0-1	1.0
	100	0	23.09		1.0
DFT-s-OFDM 16QAM	1	1	22.92	0-1	1.0
CP-OFDM QPSK	1	1	22.69	0-1.5	1.5

Note: NR Band n71 at 20 MHz bandwidth does 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.

Table 9-21
NR Band n71 Measured (Body-worn, Hotspot or Phablet) - 20 MHz Bandwidth

NR Band n71 20 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	136100 (680.5 MHz) Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	23.12	0	0.0
	1	53	22.96		0.0
	1	104	22.92		0.0
	50	0	23.11	0-0.5	0.0
	50	28	23.03	0	0.0
	50	56	22.89	0-0.5	0.0
	100	0	22.99		0.0
DFT-s-OFDM QPSK	1	1	**23.30**	0	0.0
	1	53	23.18		0.0
	1	104	23.02		0.0
	50	0	**23.13**	0-1	0.0
	50	28	23.01	0	0.0
	50	56	22.91	0-1	0.0
	100	0	23.04		0.0
DFT-s-OFDM 16QAM	1	1	22.98	0-1	0.0
CP-OFDM QPSK	1	1	22.71	0-1.5	0.5

Note: NR Band n71 at 20 MHz bandwidth does 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.

9.4.2 NR Band n5

Table 9-22
NR Band n5 Cellular Main 1st Antenna Measured P_{Max} for DSI = 2 (Head) - 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	24.01	0	0.0
	1	53	24.03		0.0
	1	104	23.61		0.0
	50	0	23.42	0-0.5	0.5
	50	28	23.99	0	0.0
	50	56	23.45	0-0.5	0.5
	100	0	23.48		0.5
DFT-s-OFDM QPSK	1	1	**23.97**	0	0.0
	1	53	23.92		0.0
	1	104	23.96		0.0
	50	0	23.09	0-1	1.0
	50	28	**24.06**	0	0.0
	50	56	22.96	0-1	1.0
	100	0	23.12		1.0
DFT-s-OFDM 16QAM	1	1	23.12	0-1	1.0
CP-OFDM QPSK	1	1	22.43	0-1.5	1.5

Note: NR Band n5 (Cell) at 20 MHz bandwidth does 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.

Table 9-23
NR Band n5 Cellular Main 1st Antenna Measured P_{limit} for DSI = 3 (Body-worn, Hotspot or Phablet) - 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	23.17	0	0.0
	1	53	23.04		0.0
	1	104	22.62		0.0
	50	0	23.15	0-0.5	0.0
	50	28	23.06	0	0.0
	50	56	23.03	0-0.5	0.0
	100	0	23.07		0.0
DFT-s-OFDM QPSK	1	1	**23.33**	0	0.0
	1	53	23.19		0.0
	1	104	22.61		0.0
	50	0	**23.18**	0-1	0.0
	50	28	23.12	0	0.0
	50	56	23.05	0-1	0.0
	100	0	23.12		0.0
DFT-s-OFDM 16QAM	1	1	23.02	0-1	0.0
CP-OFDM QPSK	1	1	22.46	0-1.5	0.5

Note: NR Band n5 (Cell) at 20 MHz bandwidth does 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.

Table 9-24
NR Band n5 Cellular Sub Antenna Measured P_{limit} for DSI = 3 (Body-worn, Hotspot or Phablet) - 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	22.21	0	0.0
	1	53	22.03		0.0
	1	104	22.06		0.0
	50	0	22.11	0-0.5	0.0
	50	28	22.11	0	0.0
	50	56	21.99	0-0.5	0.0
	100	0	22.12		0.0
DFT-s-OFDM QPSK	1	1	22.30	0	0.0
	1	53	22.27		0.0
	1	104	**22.32**		0.0
	50	0	22.05	0-1	0.0
	50	28	22.10	0	0.0
	50	56	**22.16**	0-1	0.0
	100	0	22.15		0.0
DFT-s-OFDM 16QAM	1	1	21.92	0-1	0.0
CP-OFDM QPSK	1	1	21.90	0-1.5	0.5

Note: NR Band n5 (Cell) at 20 MHz bandwidth does 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.

9.4.3 NR Band n66

Table 9-25
NR Band n66 Measured P_{Max} for DSI = 2 (Head) - 20 MHz Bandwidth

NR Band n66 20 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	344000 (1720 MHz)	349000 (1745 MHz)	354000 (1770 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	23.71	23.79	23.73	0	0.0
	1	53	23.68	23.76	23.70		0.0
	1	104	23.61	23.71	23.67		0.0
	50	0	23.15	23.21	23.21	0-0.5	0.5
	50	28	23.62	23.69	23.66	0	0.0
	50	56	23.03	23.23	23.05	0-0.5	0.5
	100	0	23.10	23.16	23.17		0.5
DFT-s-OFDM QPSK	1	1	**23.94**	23.87	23.92	0	0.0
	1	53	23.83	23.91	23.81		0.0
	1	104	23.80	23.73	23.73		0.0
	50	0	22.69	22.66	22.73	0-1	1.0
	50	28	**23.69**	23.65	23.67	0	0.0
	50	56	22.58	22.69	22.57	0-1	1.0
	100	0	22.68	22.63	22.66		1.0
DFT-s-OFDM 16QAM	1	1	22.68	22.57	22.46	0-1	1.0
CP-OFDM QPSK	1	1	22.37	22.36	22.27	0-1.5	1.5

Table 9-26
NR Band n66 Measured P_{limit} for DSI = 3 (Body-worn, Hotspot or Phablet) – 20 MHz Bandwidth

NR Band n66 20 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	344000 (1720 MHz)	349000 (1745 MHz)	354000 (1770 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	18.85	18.74	18.66	0	0.0
	1	53	18.68	18.68	18.64		0.0
	1	104	18.76	18.68	18.57		0.0
	50	0	18.72	18.74	18.60	0-0.5	0.0
	50	28	18.68	18.64	18.57	0	0.0
	50	56	18.55	18.59	18.53	0-0.5	0.0
	100	0	18.63	18.63	18.56		0.0
DFT-s-OFDM QPSK	1	1	**18.94**	18.84	18.85	0	0.0
	1	53	18.89	18.88	18.76		0.0
	1	104	18.85	18.74	18.67		0.0
	50	0	**18.74**	18.72	18.63	0-1	0.0
	50	28	18.65	18.67	18.62	0	0.0
	50	56	18.61	18.59	18.55	0-1	0.0
	100	0	18.69	18.71	18.61		0.0
DFT-s-OFDM 16QAM	1	1	18.59	18.49	18.47	0-1	0.0
CP-OFDM QPSK	1	1	18.93	18.76	18.76	0-1.5	0.0

9.4.4 NR Band n2

Table 9-27
NR Band n2 Measured P_{Max} for DSI = 2 (Head) - 20 MHz Bandwidth

NR Band n2 20 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	372000 (1860 MHz)	376000 (1880 MHz)	380000 (1900 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	24.05	24.05	23.88	0	0.0
	1	53	23.94	24.01	23.69		0.0
	1	104	24.03	23.96	23.61		0.0
	50	0	23.48	23.49	23.33	0-0.5	0.5
	50	28	23.96	24.02	23.73	0	0.0
	50	56	23.44	23.47	23.15	0-0.5	0.5
	100	0	23.42	23.49	23.31		0.5
DFT-s-OFDM QPSK	1	1	24.06	23.92	24.04	0	0.0
	1	53	**24.14**	24.13	23.94		0.0
	1	104	24.07	24.05	23.84		0.0
	50	0	22.93	22.96	22.82	0-1	1.0
	50	28	**24.05**	23.98	23.76	0	0.0
	50	56	22.95	22.97	22.73	0-1	1.0
	100	0	22.98	22.93	22.83		1.0
DFT-s-OFDM 16QAM	1	1	22.94	22.87	22.79	0-1	1.0
CP-OFDM QPSK	1	1	22.61	22.58	22.46	0-1.5	1.5

Table 9-28
NR Band n2 Measured P_{limit} for DSI = 3 (Body-worn, Hotspot or Phablet) - 20 MHz Bandwidth

NR Band n2 20 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	372000 (1860 MHz)	376000 (1880 MHz)	380000 (1900 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	19.03	18.97	18.92	0	0.0
	1	53	19.02	18.95	18.77		0.0
	1	104	19.04	18.92	18.72		0.0
	50	0	18.89	18.96	18.73	0-0.5	0.0
	50	28	18.92	18.97	18.72	0	0.0
	50	56	18.86	18.94	18.65	0-0.5	0.0
	100	0	18.86	18.93	18.72		0.0
DFT-s-OFDM QPSK	1	1	19.07	19.03	19.03	0	0.0
	1	53	19.06	**19.12**	18.95		0.0
	1	104	19.08	19.06	18.78		0.0
	50	0	18.93	18.95	18.73	0-1	0.0
	50	28	18.96	**19.01**	18.71	0	0.0
	50	56	18.92	18.97	18.68	0-1	0.0
	100	0	18.90	18.98	18.74		0.0
DFT-s-OFDM 16QAM	1	1	19.07	18.76	18.74	0-1	0.0
CP-OFDM QPSK	1	1	18.94	18.95	18.94	0-1.5	0.0

9.4.5 NR Band n41

Table 9-29
NR Band n41 Measured P_{Limit} for all DSI - 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	14.85	0	0.0
	1	137	15.10		0.0
	1	271	15.05		0.0
	135	0	15.09	0-0.5	0.0
	135	69	15.13	0	0.0
	135	138	15.15	0-0.5	0.0
	270	0	15.19		0.0
DFT-s-OFDM QPSK	1	1	14.88	0	0.0
	1	137	**15.12**		0.0
	1	271	15.03		0.0
	135	0	15.09	0-1	0.0
	135	69	**15.16**	0	0.0
	135	138	15.15	0-1	0.0
	270	0	15.13		0.0
DFT-s-OFDM 16QAM	1	1	14.65	0-1	0.0
CP-OFDM QPSK	1	1	14.75	0-1.5	0.0

Note: NR Band n41 at 100 MHz bandwidth does 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.

9.4.6 NR Band n77

Table 9-30
NR Band n77 Measured P_{Limit} for all DSI - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth						
			Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	650000 (3750 MHz)	662000 (3930 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM π/2 BPSK	1	1	17.24	17.54	0	0.0
	1	137	17.46	17.73		0.0
	1	271	17.19	17.38		0.0
	135	0	17.44	17.66	0-0.5	0.0
	135	69	17.33	17.66	0	0.0
	135	138	17.27	17.63	0-0.5	0.0
	270	0	17.42	17.58		0.0
DFT-s-OFDM QPSK	1	1	17.35	17.48	0	0.0
	1	137	17.43	**17.90**		0.0
	1	271	17.15	17.32		0.0
	135	0	17.44	17.66	0-1	0.0
	135	69	17.34	**17.68**	0	0.0
	135	138	17.25	17.53	0-1	0.0
	270	0	17.46	17.45		0.0
DFT-s-OFDM 16QAM	1	1	17.21	17.58	0-1	0.0
CP-OFDM QPSK	1	1	17.29	17.60	0-1.5	0.0

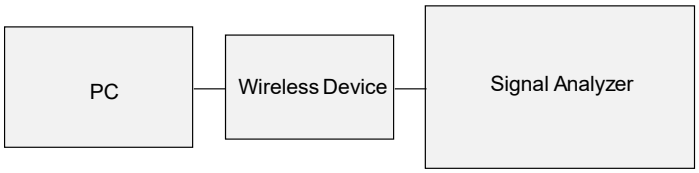


Figure 9-4
Power Measurement Setup

9.5 WLAN Conducted Powers

Table 9-31
2.4 GHz WLAN Maximum Average RF Power – Ant 1

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	13.68	14.56	13.78	14.06
2417	2	N/A	N/A	14.41	14.42
2437	6	14.06	14.28	14.29	14.22
2452	9	N/A	14.45	14.39	14.18
2457	10	N/A	14.02	13.32	13.53
2462	11	13.97	12.56	12.47	12.12

Table 9-32
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	11.99	15.15	14.77	14.78
2417	2	N/A	N/A	14.86	14.91
2437	6	12.11	15.28	15.01	15.09
2452	9	N/A	15.19	15.03	15.06
2457	10	N/A	14.72	14.10	14.13
2462	11	11.94	12.96	13.24	13.23

Table 9-33
5 GHz WLAN Maximum Average RF Power – Ant 1

5GHz (40MHz) Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11n	802.11ac	802.11ax
		Average	Average	Average
5190	38	10.79	10.74	10.65
5230	46	12.29	12.38	12.22
5270	54	12.24	12.19	12.09
5310	62	10.69	10.66	10.52
5755	151	10.51	10.51	10.39
5795	159	12.44	12.12	12.39

5GHz (80MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11ac	802.11ax
		Average	Average
5530	106	11.17	11.14
5610	122	12.38	12.49
5690	138	12.45	12.46

Table 9-34
5 GHz WLAN Maximum Average RF Power – Ant 2

5GHz (40MHz) Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11n	802.11ac	802.11ax
		Average	Average	Average
5190	38	10.07	10.09	10.49
5230	46	11.99	12.05	11.88
5270	54	12.02	12.17	11.92
5310	62	10.57	10.57	10.41
5755	151	9.97	9.91	9.77
5795	159	11.74	11.77	11.60

5GHz (80MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11ac	802.11ax
		Average	Average
5530	106	10.93	11.07
5610	122	11.92	11.96
5690	138	11.78	11.77

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.

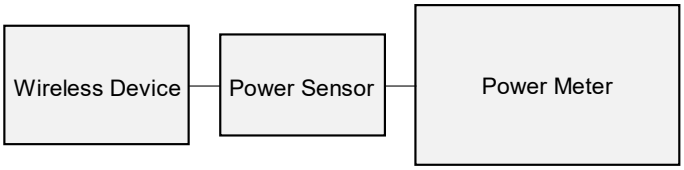


Figure 9-5
Power Measurement Setup

9.6 Bluetooth Conducted Powers

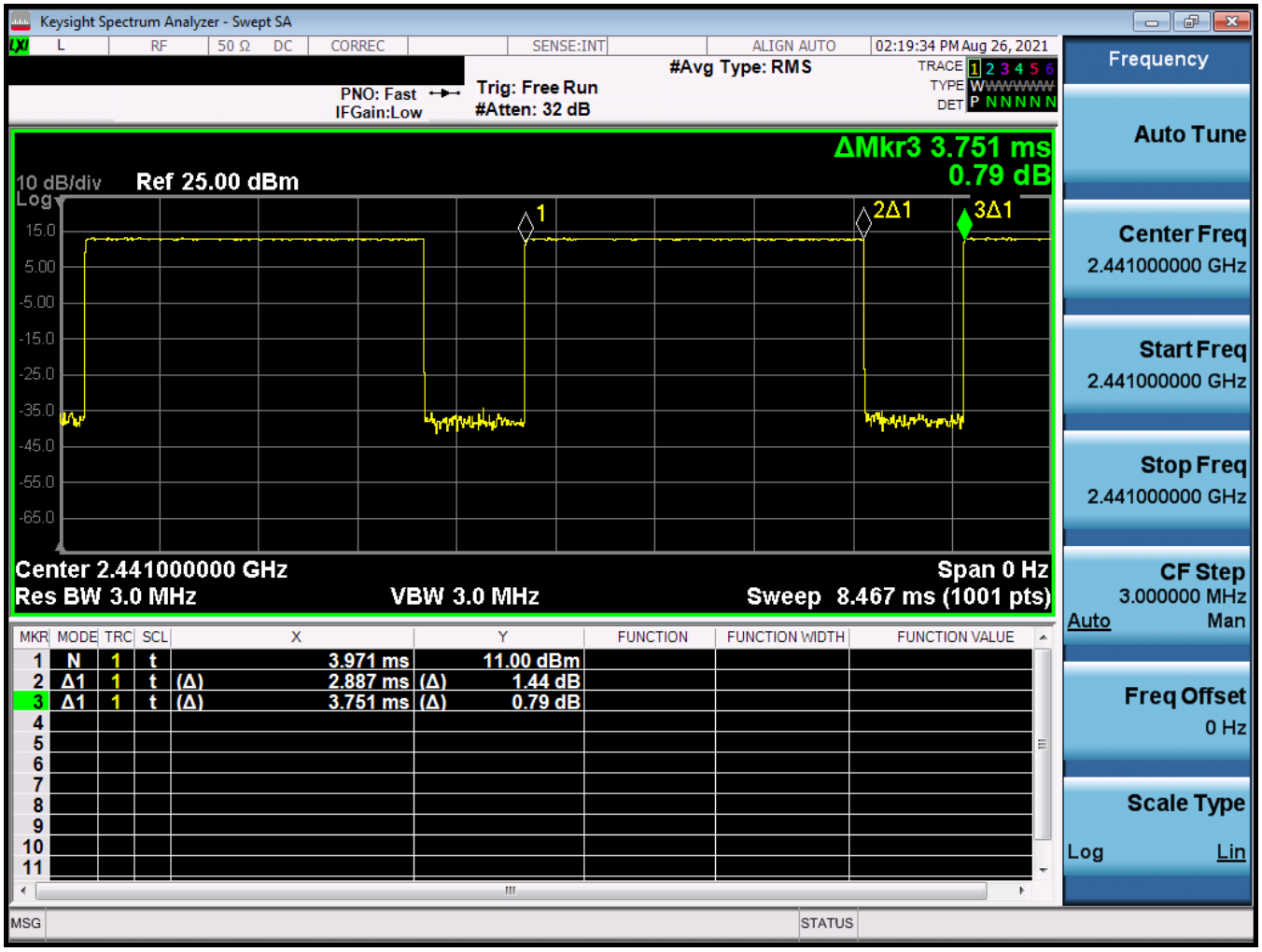
Table 9-35
Bluetooth Average RF Power - Ant 1

Frequency [MHz]	Data Rate [Mbps]	Mod.	Power Scheme	Channel No.	Avg Conducted Power	
					[dBm]	[mW]
2402	1.0	GFSK	ePA	0	12.91	19.525
2441	1.0	GFSK	ePA	39	12.80	19.046
2480	1.0	GFSK	ePA	78	13.10	20.417
2402	2.0	π/4-DQPSK	ePA	0	12.25	16.792
2441	2.0	π/4-DQPSK	ePA	39	12.21	16.630
2480	2.0	π/4-DQPSK	ePA	78	12.47	17.664
2402	3.0	8DPSK	ePA	0	12.25	16.769
2441	3.0	8DPSK	ePA	39	12.19	16.569
2480	3.0	8DPSK	ePA	78	12.49	17.754

Bluetooth Average RF Power - Ant 2

Frequency [MHz]	Data Rate [Mbps]	Mod.	Power Scheme	Channel No.	Avg Conducted Power	
					[dBm]	[mW]
2402	1.0	GFSK	ePA	0	12.88	19.391
2441	1.0	GFSK	ePA	39	13.16	20.711
2480	1.0	GFSK	ePA	78	12.96	19.779
2402	2.0	π/4-DQPSK	ePA	0	12.11	16.259
2441	2.0	π/4-DQPSK	ePA	39	12.31	17.014
2480	2.0	π/4-DQPSK	ePA	78	12.14	16.383
2402	3.0	8DPSK	ePA	0	12.12	16.304
2441	3.0	8DPSK	ePA	39	12.30	16.982
2480	3.0	8DPSK	ePA	78	12.13	16.346

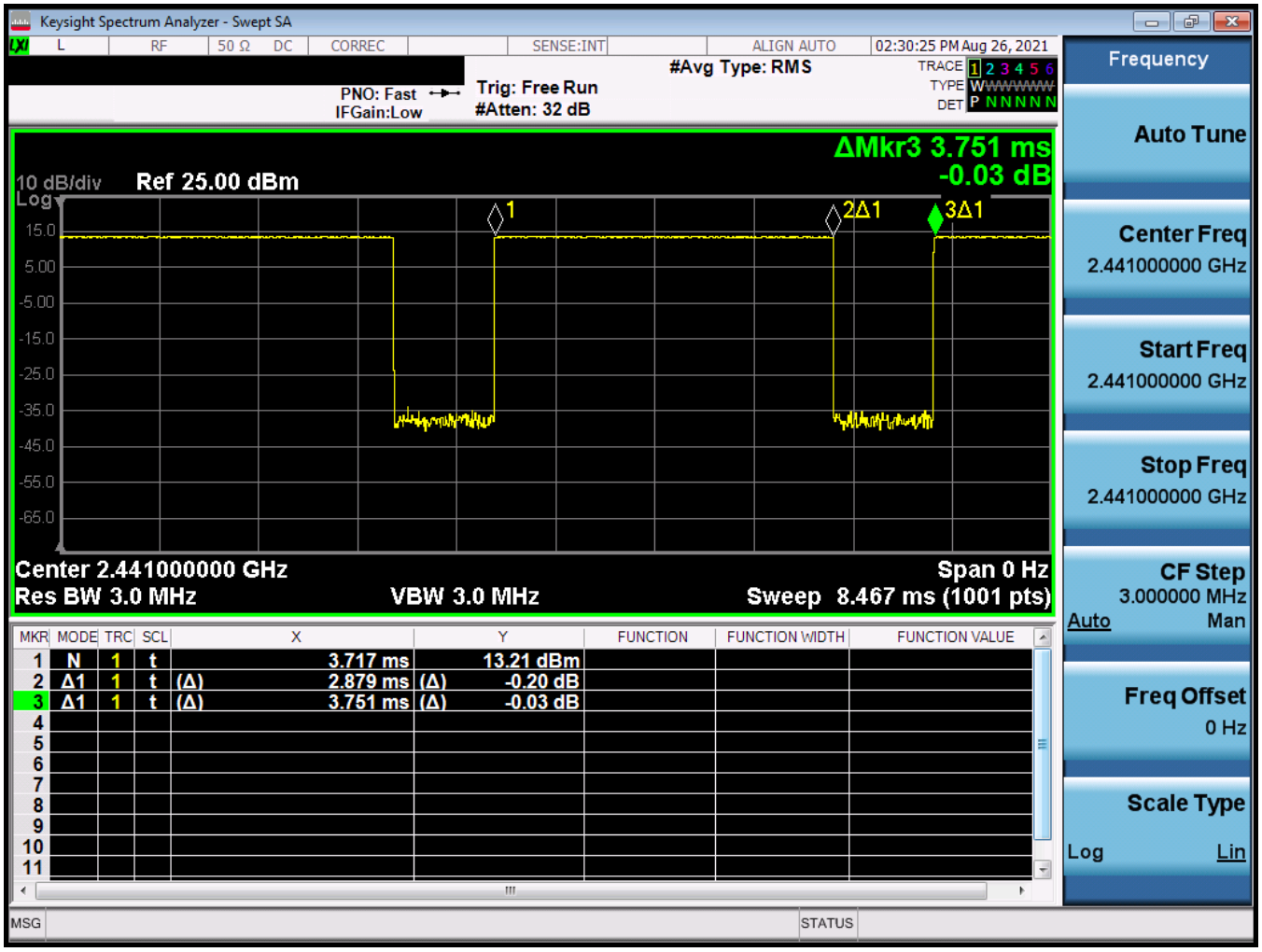
Figure 9-6
Bluetooth Transmission Plot - Ant 1



Equation 9-1
Bluetooth Duty Cycle Calculation - Ant 1

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.887ms}{3.751ms} * 100\% = 77.0\%$$

Figure 9-7
Bluetooth Transmission Plot - Ant 2



Equation 9-2
Bluetooth Duty Cycle Calculation - Ant 2

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.879ms}{3.751ms} * 100\% = 76.8\%$$

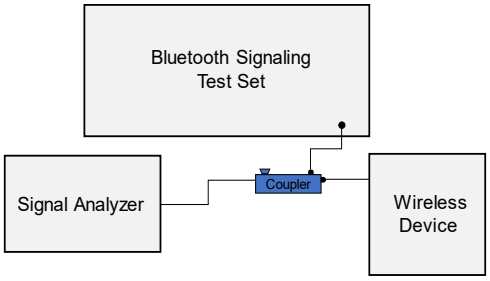


Figure 9-8
Power Measurement Setup

10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Tissue Properties - Head

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
09/07/2021	750 Head	21.2	680	0.870	40.375	0.888	42.305	-2.03%	-4.56%
			695	0.875	40.325	0.889	42.227	-1.57%	-4.50%
			700	0.876	40.310	0.889	42.201	-1.46%	-4.48%
			710	0.880	40.282	0.890	42.149	-1.12%	-4.43%
			725	0.885	40.247	0.891	42.071	-0.67%	-4.34%
			750	0.894	40.187	0.894	41.942	0.00%	-4.18%
			770	0.901	40.125	0.895	41.838	0.67%	-4.09%
			785	0.906	40.074	0.896	41.760	1.12%	-4.04%
			800	0.911	40.026	0.897	41.682	1.56%	-3.97%
09/14/2021	750 Head	21.8	680	0.879	42.548	0.888	42.305	-1.01%	0.57%
			695	0.884	42.507	0.889	42.227	-0.56%	0.66%
			700	0.886	42.492	0.889	42.201	-0.34%	0.69%
			710	0.889	42.463	0.890	42.149	-0.11%	0.74%
			725	0.895	42.417	0.891	42.071	0.45%	0.82%
			750	0.903	42.344	0.894	41.942	1.01%	0.96%
			770	0.910	42.282	0.895	41.838	1.68%	1.06%
			785	0.915	42.235	0.896	41.760	2.12%	1.14%
			800	0.921	42.194	0.897	41.682	2.68%	1.23%
09/14/2021	835 Head	22.2	815	0.866	40.948	0.898	41.594	-3.56%	-1.55%
			820	0.871	40.886	0.899	41.578	-3.11%	-1.66%
			835	0.886	40.704	0.900	41.500	-1.56%	-1.92%
			850	0.901	40.518	0.916	41.500	-1.64%	-2.37%
09/21/2021	835 Head	21.1	815	0.913	42.175	0.898	41.594	1.67%	1.40%
			820	0.915	42.157	0.899	41.578	1.78%	1.39%
			835	0.920	42.115	0.900	41.500	2.22%	1.48%
			850	0.925	42.088	0.916	41.500	0.98%	1.42%
08/31/2021	1750 Head	19.0	1710	1.337	39.088	1.348	40.142	-0.82%	-2.63%
			1720	1.344	39.072	1.354	40.126	-0.74%	-2.63%
			1745	1.361	39.037	1.368	40.087	-0.51%	-2.62%
			1750	1.363	39.029	1.371	40.079	-0.58%	-2.62%
			1770	1.375	38.993	1.383	40.047	-0.58%	-2.63%
			1790	1.387	38.956	1.394	40.016	-0.50%	-2.65%
09/10/2021	1750 Head	22.1	1710	1.337	40.262	1.348	40.142	-0.82%	0.30%
			1720	1.343	40.249	1.354	40.126	-0.81%	0.31%
			1745	1.359	40.217	1.368	40.087	-0.66%	0.32%
			1750	1.362	40.211	1.371	40.079	-0.66%	0.33%
			1770	1.373	40.181	1.383	40.047	-0.72%	0.33%
			1790	1.385	40.149	1.394	40.016	-0.65%	0.33%
09/08/2021	1900 Head	22.3	1850	1.428	38.258	1.400	40.000	2.00%	-4.35%
			1860	1.434	38.241	1.400	40.000	2.43%	-4.40%
			1880	1.446	38.215	1.400	40.000	3.29%	-4.46%
			1900	1.459	38.189	1.400	40.000	4.21%	-4.53%
			1905	1.462	38.180	1.400	40.000	4.43%	-4.55%
			1910	1.465	38.171	1.400	40.000	4.64%	-4.57%
09/19/2021	1900 Head	22.7	1850	1.386	39.131	1.400	40.000	-1.00%	-2.17%
			1860	1.397	39.087	1.400	40.000	-0.21%	-2.28%
			1880	1.418	39.005	1.400	40.000	1.29%	-2.49%
			1900	1.440	38.927	1.400	40.000	2.86%	-2.68%
			1905	1.445	38.906	1.400	40.000	3.21%	-2.74%
			1910	1.450	38.885	1.400	40.000	3.57%	-2.79%
09/07/2021	2450 Head	24.9	2400	1.724	40.529	1.756	39.289	-1.82%	3.16%
			2450	1.782	40.338	1.800	39.200	-1.00%	2.90%
			2480	1.817	40.232	1.833	39.162	-0.87%	2.73%
			2500	1.840	40.160	1.855	39.136	-0.81%	2.62%
			2510	1.851	40.120	1.866	39.123	-0.80%	2.55%
			2535	1.882	40.021	1.893	39.092	-0.58%	2.38%
			2550	1.900	39.964	1.909	39.073	-0.47%	2.28%
			2560	1.913	39.929	1.920	39.060	-0.36%	2.22%
			2600	1.958	39.789	1.964	39.009	-0.31%	2.00%
			2650	2.015	39.591	2.018	38.945	-0.15%	1.66%
			2680	2.051	39.477	2.051	38.907	0.00%	1.47%
			2700	2.074	39.403	2.073	38.882	0.05%	1.34%
09/14/2021	2450 Head	22.2	2400	1.788	39.487	1.756	39.289	1.82%	0.50%
			2450	1.827	39.422	1.800	39.200	1.50%	0.57%
			2480	1.851	39.391	1.833	39.162	0.98%	0.58%
			2500	1.867	39.367	1.855	39.136	0.65%	0.59%
			2510	1.876	39.352	1.866	39.123	0.54%	0.59%
			2535	1.897	39.309	1.893	39.092	0.21%	0.56%
			2550	1.910	39.284	1.909	39.073	0.05%	0.54%
			2560	1.919	39.269	1.920	39.060	-0.05%	0.54%
			2600	1.950	39.207	1.964	39.009	-0.71%	0.51%
			2650	1.989	39.108	2.018	38.945	-1.44%	0.42%
			2680	2.013	39.046	2.051	38.907	-1.85%	0.36%
			2700	2.029	39.007	2.073	38.882	-2.12%	0.32%

Table 10-2
Measured Tissue Properties – Head Continued

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
10/03/2021	2450 Head	22.2	2300	1.745	39.186	1.670	39.500	4.49%	-0.79%
			2310	1.753	39.167	1.679	39.480	4.41%	-0.79%
			2320	1.761	39.150	1.687	39.460	4.39%	-0.79%
			2400	1.821	39.022	1.756	39.289	3.70%	-0.68%
			2450	1.859	38.938	1.800	39.200	3.28%	-0.67%
			2480	1.881	38.892	1.833	39.162	2.62%	-0.69%
			2500	1.896	38.860	1.855	39.136	2.21%	-0.71%
			2510	1.904	38.842	1.866	39.123	2.04%	-0.72%
			2535	1.925	38.801	1.893	39.092	1.69%	-0.74%
			2550	1.937	38.779	1.909	39.073	1.47%	-0.75%
			2560	1.945	38.764	1.920	39.060	1.30%	-0.76%
			2600	1.977	38.702	1.964	39.009	0.66%	-0.79%
			2650	2.017	38.623	2.018	38.945	-0.05%	-0.83%
			2680	2.042	38.583	2.051	38.907	-0.44%	-0.83%
			2700	2.058	38.553	2.073	38.882	-0.72%	-0.85%
09/13/2021	3600 Head	19.8	3300	2.602	38.692	2.708	38.157	-3.91%	1.40%
			3350	2.644	38.608	2.759	38.100	-4.17%	1.33%
			3450	2.736	38.436	2.861	37.986	-4.37%	1.18%
			3500	2.776	38.340	2.913	37.929	-4.70%	1.08%
			3550	2.833	38.262	2.964	37.871	-4.42%	1.03%
			3560	2.840	38.248	2.974	37.860	-4.51%	1.02%
			3600	2.869	38.157	3.015	37.814	-4.84%	0.91%
			3650	2.924	38.079	3.066	37.757	-4.63%	0.85%
			3690	2.956	38.014	3.107	37.711	-4.86%	0.80%
			3700	2.964	37.999	3.117	37.700	-4.91%	0.79%
			3750	3.021	37.913	3.169	37.643	-4.67%	0.72%
			3900	3.164	37.696	3.323	37.471	-4.78%	0.60%
			3930	3.191	37.613	3.353	37.437	-4.83%	0.47%
			4100	3.374	37.374	3.528	37.243	-4.37%	0.35%
			4150	3.419	37.287	3.579	37.186	-4.47%	0.27%
09/21/2021	3600 Head	18.0	3300	2.600	38.261	2.708	38.157	-3.99%	0.27%
			3350	2.650	38.170	2.759	38.100	-3.95%	0.18%
			3450	2.741	37.983	2.861	37.986	-4.19%	-0.01%
			3500	2.787	37.900	2.913	37.929	-4.33%	-0.08%
			3550	2.833	37.802	2.964	37.871	-4.42%	-0.18%
			3560	2.845	37.787	2.974	37.860	-4.34%	-0.19%
			3600	2.885	37.730	3.015	37.814	-4.31%	-0.22%
			3650	2.930	37.638	3.066	37.757	-4.44%	-0.32%
			3690	2.969	37.577	3.107	37.711	-4.44%	-0.36%
			3700	2.978	37.560	3.117	37.700	-4.46%	-0.37%
			3750	3.028	37.464	3.169	37.643	-4.45%	-0.48%
			3900	3.178	37.208	3.323	37.471	-4.36%	-0.70%
			3930	3.211	37.160	3.353	37.437	-4.24%	-0.74%
			4100	3.395	36.888	3.528	37.243	-3.77%	-0.95%
			4150	3.448	36.808	3.579	37.186	-3.66%	-1.02%
09/13/2021	5200-5800 Head	21.9	5180	4.580	35.488	4.635	36.009	-1.19%	-1.45%
			5190	4.590	35.466	4.645	35.998	-1.18%	-1.48%
			5200	4.600	35.446	4.655	35.986	-1.18%	-1.50%
			5210	4.612	35.424	4.666	35.975	-1.16%	-1.53%
			5220	4.625	35.400	4.676	35.963	-1.09%	-1.57%
			5240	4.649	35.357	4.696	35.940	-1.00%	-1.62%
			5250	4.661	35.334	4.706	35.929	-0.96%	-1.66%
			5260	4.675	35.317	4.717	35.917	-0.89%	-1.67%
			5270	4.689	35.294	4.727	35.906	-0.80%	-1.70%
			5280	4.698	35.280	4.737	35.894	-0.82%	-1.71%
			5290	4.708	35.271	4.748	35.883	-0.84%	-1.71%
			5300	4.719	35.259	4.758	35.871	-0.82%	-1.71%
			5310	4.732	35.242	4.768	35.860	-0.76%	-1.72%
			5320	4.746	35.225	4.778	35.849	-0.67%	-1.74%
			5500	4.950	34.898	4.963	35.643	-0.26%	-2.09%
			5510	4.963	34.882	4.973	35.632	-0.20%	-2.10%
			5520	4.978	34.869	4.983	35.620	-0.10%	-2.11%
			5530	4.992	34.855	4.994	35.609	-0.04%	-2.12%
			5540	5.005	34.838	5.004	35.597	0.02%	-2.13%
			5550	5.018	34.822	5.014	35.586	0.08%	-2.15%
			5560	5.030	34.805	5.024	35.574	0.12%	-2.16%
			5580	5.053	34.771	5.045	35.551	0.16%	-2.19%
			5600	5.076	34.733	5.065	35.529	0.22%	-2.24%
			5610	5.088	34.715	5.076	35.518	0.24%	-2.26%
			5620	5.099	34.699	5.086	35.506	0.26%	-2.27%
			5640	5.122	34.663	5.106	35.483	0.31%	-2.31%
			5660	5.147	34.630	5.127	35.460	0.39%	-2.34%
			5670	5.159	34.619	5.137	35.449	0.43%	-2.34%
			5680	5.170	34.610	5.147	35.437	0.45%	-2.33%
			5690	5.181	34.597	5.158	35.426	0.45%	-2.34%
			5700	5.193	34.583	5.168	35.414	0.48%	-2.35%
			5710	5.204	34.563	5.178	35.403	0.50%	-2.37%
			5720	5.216	34.541	5.188	35.391	0.54%	-2.40%
			5745	5.246	34.492	5.214	35.363	0.61%	-2.46%
			5750	5.253	34.481	5.219	35.357	0.65%	-2.48%
			5755	5.258	34.475	5.224	35.351	0.65%	-2.48%
			5765	5.268	34.460	5.234	35.340	0.65%	-2.49%
			5775	5.277	34.445	5.245	35.329	0.61%	-2.50%
			5785	5.285	34.433	5.255	35.317	0.57%	-2.50%
			5795	5.296	34.414	5.265	35.305	0.59%	-2.52%
			5805	5.309	34.392	5.275	35.294	0.64%	-2.56%
			5825	5.332	34.350	5.296	35.271	0.68%	-2.61%

Table 10-3
Measured Tissue Properties – Body

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
09/10/2021	750 Body	22.6	680	0.934	55.917	0.958	55.804	-2.51%	0.20%
			695	0.939	55.872	0.959	55.745	-2.09%	0.23%
			700	0.940	55.860	0.959	55.726	-1.98%	0.24%
			710	0.944	55.838	0.960	55.687	-1.67%	0.27%
			725	0.949	55.816	0.961	55.629	-1.25%	0.34%
			750	0.958	55.775	0.964	55.531	-0.62%	0.44%
			770	0.965	55.722	0.965	55.453	0.00%	0.49%
			785	0.971	55.673	0.966	55.395	0.52%	0.50%
			800	0.976	55.637	0.967	55.336	0.93%	0.54%
09/12/2021	750 Body	21.9	680	0.927	55.832	0.958	55.804	-3.24%	0.05%
			695	0.932	55.795	0.959	55.745	-2.82%	0.09%
			700	0.934	55.784	0.959	55.726	-2.61%	0.10%
			710	0.938	55.761	0.960	55.687	-2.29%	0.13%
			725	0.944	55.731	0.961	55.629	-1.77%	0.18%
			750	0.954	55.666	0.964	55.531	-1.04%	0.24%
			770	0.961	55.609	0.965	55.453	-0.41%	0.28%
			785	0.966	55.563	0.966	55.395	0.00%	0.30%
			800	0.971	55.526	0.967	55.336	0.41%	0.34%
09/07/2021	835 Body	22.1	815	0.923	53.867	0.968	55.271	-4.65%	-2.54%
			820	0.929	53.821	0.969	55.258	-4.13%	-2.60%
			835	0.944	53.684	0.970	55.200	-2.68%	-2.75%
			850	0.960	53.542	0.988	55.154	-2.83%	-2.92%
09/09/2021	835 Body	22.2	815	0.932	54.467	0.968	55.271	-3.72%	-1.45%
			820	0.937	54.420	0.969	55.258	-3.30%	-1.52%
			835	0.953	54.283	0.970	55.200	-1.75%	-1.66%
			850	0.968	54.143	0.988	55.154	-2.02%	-1.83%
09/18/2021	835 Body	22.6	815	0.925	55.370	0.968	55.271	-4.44%	0.18%
			820	0.930	55.329	0.969	55.258	-4.02%	0.13%
			835	0.946	55.204	0.970	55.200	-2.47%	0.01%
			850	0.961	55.062	0.988	55.154	-2.73%	-0.17%
09/20/2021	835 Body	22.2	815	0.926	54.850	0.968	55.271	-4.34%	-0.76%
			820	0.931	54.811	0.969	55.258	-3.92%	-0.81%
			835	0.947	54.693	0.970	55.200	-2.37%	-0.92%
			850	0.962	54.566	0.988	55.154	-2.63%	-1.07%
09/07/2021	1750 Body	21.4	1710	1.498	51.624	1.463	53.537	2.39%	-3.57%
			1720	1.510	51.584	1.469	53.511	2.79%	-3.60%
			1745	1.538	51.489	1.485	53.445	3.57%	-3.66%
			1750	1.544	51.470	1.488	53.432	3.76%	-3.67%
			1770	1.567	51.391	1.501	53.379	4.40%	-3.72%
			1790	1.589	51.312	1.514	53.326	4.95%	-3.78%
09/21/2021	1750 Body	21.7	1710	1.452	52.392	1.463	53.537	-0.75%	-2.14%
			1720	1.464	52.360	1.469	53.511	-0.34%	-2.15%
			1745	1.493	52.279	1.485	53.445	0.54%	-2.18%
			1750	1.499	52.262	1.488	53.432	0.74%	-2.19%
			1770	1.521	52.189	1.501	53.379	1.33%	-2.23%
			1790	1.544	52.120	1.514	53.326	1.98%	-2.26%
09/26/2021	1750 Body	21.8	1710	1.474	53.622	1.463	53.537	0.75%	0.16%
			1720	1.486	53.583	1.469	53.511	1.16%	0.13%
			1745	1.514	53.480	1.485	53.445	1.95%	0.07%
			1750	1.520	53.459	1.488	53.432	2.15%	0.05%
			1770	1.542	53.376	1.501	53.379	2.73%	-0.01%
			1790	1.563	53.302	1.514	53.326	3.24%	-0.05%
09/14/2021	1900 Body	25.0	1850	1.456	52.438	1.520	53.300	-4.21%	-1.62%
			1860	1.467	52.401	1.520	53.300	-3.49%	-1.69%
			1880	1.489	52.334	1.520	53.300	-2.04%	-1.81%
			1900	1.511	52.268	1.520	53.300	-0.59%	-1.94%
			1905	1.516	52.250	1.520	53.300	-0.26%	-1.97%
			1910	1.521	52.232	1.520	53.300	0.07%	-2.00%
09/16/2021	1900 Body	22.3	1850	1.496	50.927	1.520	53.300	-1.58%	-4.45%
			1860	1.507	50.894	1.520	53.300	-0.86%	-4.51%
			1880	1.530	50.839	1.520	53.300	0.66%	-4.62%
			1900	1.553	50.785	1.520	53.300	2.17%	-4.72%
			1905	1.558	50.771	1.520	53.300	2.50%	-4.74%
			1910	1.564	50.754	1.520	53.300	2.89%	-4.78%
09/22/2021	1900 Body	23.2	1850	1.494	51.121	1.520	53.300	-1.71%	-4.09%
			1860	1.505	51.094	1.520	53.300	-0.99%	-4.14%
			1880	1.527	51.047	1.520	53.300	0.46%	-4.23%
			1900	1.550	50.996	1.520	53.300	1.97%	-4.32%
			1905	1.555	50.981	1.520	53.300	2.30%	-4.35%
			1910	1.561	50.965	1.520	53.300	2.70%	-4.38%

Table 10-4
Measured Tissue Properties – Body Continued

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
08/30/2021	2450 Body	23.0	2300	1.805	54.167	1.809	52.900	-0.22%	2.40%
			2310	1.819	54.124	1.816	52.887	0.17%	2.34%
			2320	1.833	54.093	1.826	52.873	0.38%	2.31%
			2400	1.935	53.840	1.902	52.767	1.74%	2.03%
			2450	2.005	53.644	1.950	52.700	2.82%	1.79%
			2480	2.045	53.585	1.993	52.662	2.61%	1.75%
			2500	2.069	53.510	2.021	52.636	2.38%	1.66%
			2510	2.081	53.458	2.035	52.623	2.26%	1.59%
			2535	2.115	53.325	2.071	52.592	2.12%	1.39%
			2550	2.138	53.269	2.092	52.573	2.20%	1.32%
			2560	2.154	53.242	2.106	52.560	2.28%	1.30%
			2600	2.209	53.164	2.163	52.509	2.13%	1.25%
			2650	2.273	52.917	2.234	52.445	1.75%	0.90%
			2680	2.322	52.823	2.277	52.407	1.98%	0.79%
			2700	2.351	52.785	2.305	52.382	2.00%	0.77%
09/07/2021	2450 Body	24.2	2300	1.846	53.005	1.809	52.900	2.05%	0.20%
			2310	1.857	52.984	1.816	52.887	2.26%	0.18%
			2320	1.869	52.960	1.826	52.873	2.35%	0.16%
			2400	1.962	52.773	1.902	52.767	3.15%	0.01%
			2450	2.021	52.650	1.950	52.700	3.64%	-0.09%
			2480	2.055	52.574	1.993	52.662	3.11%	-0.17%
			2500	2.079	52.523	2.021	52.636	2.87%	-0.21%
			2510	2.091	52.494	2.035	52.623	2.75%	-0.25%
			2535	2.121	52.421	2.071	52.592	2.41%	-0.33%
			2550	2.139	52.379	2.092	52.573	2.25%	-0.37%
			2560	2.151	52.354	2.106	52.560	2.14%	-0.39%
			2600	2.196	52.248	2.163	52.509	1.53%	-0.50%
			2650	2.253	52.088	2.234	52.445	0.85%	-0.68%
			2680	2.288	51.998	2.277	52.407	0.48%	-0.78%
			2700	2.311	51.938	2.305	52.382	0.26%	-0.85%
09/13/2021	2450 Body	24.2	2300	1.811	54.643	1.809	52.900	0.11%	3.29%
			2310	1.825	54.616	1.816	52.887	0.50%	3.27%
			2320	1.838	54.588	1.826	52.873	0.66%	3.24%
			2400	1.948	54.278	1.902	52.767	2.42%	2.86%
			2450	2.016	54.106	1.950	52.700	3.38%	2.67%
			2480	2.055	53.980	1.993	52.662	3.11%	2.50%
			2500	2.084	53.904	2.021	52.636	3.12%	2.41%
			2510	2.099	53.869	2.035	52.623	3.14%	2.37%
			2535	2.136	53.791	2.071	52.592	3.14%	2.28%
			2550	2.158	53.743	2.092	52.573	3.15%	2.23%
			2560	2.171	53.705	2.106	52.560	3.09%	2.18%
			2600	2.225	53.547	2.163	52.509	2.87%	1.98%
			2650	2.300	53.361	2.234	52.445	2.95%	1.75%
			2680	2.342	53.251	2.277	52.407	2.85%	1.61%
			2700	2.369	53.173	2.305	52.382	2.78%	1.51%
10/01/2021	2450 Body	24.7	2300	1.852	51.797	1.809	52.900	2.38%	-2.09%
			2310	1.863	51.766	1.816	52.887	2.59%	-2.12%
			2320	1.875	51.737	1.826	52.873	2.68%	-2.15%
			2400	1.971	51.525	1.902	52.767	3.63%	-2.35%
			2450	2.031	51.376	1.950	52.700	4.15%	-2.51%
			2480	2.068	51.285	1.993	52.662	3.76%	-2.61%
			2500	2.092	51.221	2.021	52.636	3.51%	-2.69%
			2510	2.104	51.187	2.035	52.623	3.39%	-2.73%
			2535	2.135	51.114	2.071	52.592	3.09%	-2.81%
			2550	2.154	51.069	2.092	52.573	2.96%	-2.86%
			2560	2.166	51.037	2.106	52.560	2.85%	-2.90%
			2600	2.217	50.902	2.163	52.509	2.50%	-3.06%
			2650	2.279	50.745	2.234	52.445	2.01%	-3.24%
			2680	2.317	50.644	2.277	52.407	1.76%	-3.36%
			2700	2.341	50.576	2.305	52.382	1.56%	-3.45%
09/13/2021	3600 Body	22.3	3300	3.227	49.637	3.080	51.593	4.77%	-3.79%
			3350	3.282	49.584	3.139	51.525	4.56%	-3.77%
			3450	3.383	49.435	3.256	51.389	3.90%	-3.80%
			3500	3.430	49.378	3.314	51.321	3.50%	-3.79%
			3550	3.483	49.295	3.372	51.254	3.29%	-3.82%
			3560	3.495	49.279	3.384	51.240	3.28%	-3.83%
			3600	3.534	49.248	3.431	51.186	3.00%	-3.79%
			3650	3.582	49.162	3.489	51.118	2.67%	-3.83%
			3690	3.624	49.109	3.536	51.063	2.49%	-3.83%
			3700	3.635	49.096	3.548	51.050	2.45%	-3.83%
			3750	3.687	49.009	3.606	50.982	2.25%	-3.87%
			3900	3.853	48.749	3.781	50.779	1.90%	-4.00%
			3930	3.888	48.694	3.816	50.738	1.89%	-4.03%
			4100	4.098	48.418	4.015	50.507	2.07%	-4.14%
			4150	4.162	48.337	4.073	50.439	2.19%	-4.17%
			3600	3.534	49.248	3.431	51.186	3.00%	-3.79%

Table 10-5
Measured Tissue Properties – Body Continued

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
09/21/2021	3600 Body	22.4	3300	3.234	49.800	3.080	51.593	5.00%	-3.48%
			3350	3.284	49.728	3.139	51.525	4.62%	-3.49%
			3450	3.387	49.574	3.256	51.389	4.02%	-3.53%
			3500	3.439	49.501	3.314	51.321	3.77%	-3.55%
			3550	3.494	49.420	3.372	51.254	3.62%	-3.58%
			3560	3.506	49.404	3.384	51.240	3.61%	-3.58%
			3600	3.550	49.353	3.431	51.186	3.47%	-3.58%
			3650	3.604	49.283	3.489	51.118	3.30%	-3.59%
			3690	3.648	49.241	3.536	51.063	3.17%	-3.57%
			3700	3.660	49.225	3.548	51.050	3.16%	-3.57%
			3750	3.717	49.149	3.606	50.982	3.08%	-3.60%
			3900	3.889	48.972	3.781	50.779	2.86%	-3.56%
			3930	3.928	48.926	3.816	50.738	2.94%	-3.57%
			4100	4.135	48.678	4.015	50.507	2.99%	-3.62%
			4150	4.190	48.607	4.073	50.439	2.87%	-3.63%
09/01/2021	5200-5800 Body	22.3	5180	5.365	49.170	5.276	49.041	1.69%	0.26%
			5190	5.379	49.169	5.288	49.028	1.72%	0.29%
			5200	5.392	49.167	5.299	49.014	1.76%	0.31%
			5210	5.408	49.145	5.311	49.001	1.83%	0.29%
			5220	5.422	49.115	5.323	48.987	1.86%	0.26%
			5240	5.450	49.067	5.346	48.960	1.95%	0.22%
			5250	5.466	49.047	5.358	48.947	2.02%	0.20%
			5260	5.479	49.018	5.369	48.933	2.05%	0.17%
			5270	5.489	48.993	5.381	48.919	2.01%	0.15%
			5280	5.502	48.969	5.393	48.906	2.02%	0.13%
			5290	5.516	48.951	5.404	48.892	2.07%	0.12%
			5300	5.533	48.931	5.416	48.879	2.16%	0.11%
			5310	5.549	48.913	5.428	48.865	2.23%	0.10%
			5320	5.563	48.895	5.439	48.851	2.28%	0.09%
			5500	5.818	48.535	5.650	48.607	2.97%	-0.15%
			5510	5.833	48.505	5.661	48.594	3.04%	-0.18%
			5520	5.850	48.477	5.673	48.580	3.12%	-0.21%
			5530	5.867	48.456	5.685	48.566	3.20%	-0.23%
			5540	5.883	48.432	5.696	48.553	3.28%	-0.25%
			5550	5.899	48.417	5.708	48.539	3.35%	-0.25%
			5560	5.917	48.399	5.720	48.526	3.44%	-0.26%
			5580	5.947	48.362	5.743	48.499	3.55%	-0.28%
			5600	5.976	48.324	5.766	48.471	3.64%	-0.30%
			5610	5.992	48.303	5.778	48.458	3.70%	-0.32%
			5620	6.005	48.282	5.790	48.444	3.71%	-0.33%
			5640	6.034	48.244	5.813	48.417	3.80%	-0.36%
			5660	6.069	48.199	5.837	48.390	3.97%	-0.39%
			5670	6.086	48.181	5.848	48.376	4.07%	-0.40%
			5680	6.101	48.175	5.860	48.363	4.11%	-0.39%
			5690	6.117	48.167	5.872	48.349	4.17%	-0.38%
			5700	6.132	48.147	5.883	48.336	4.23%	-0.39%
			5710	6.146	48.122	5.895	48.322	4.26%	-0.41%
			5720	6.162	48.101	5.907	48.309	4.32%	-0.43%
			5745	6.202	48.055	5.936	48.275	4.48%	-0.46%
			5750	6.209	48.047	5.942	48.268	4.49%	-0.46%
			5755	6.215	48.039	5.947	48.261	4.51%	-0.46%
			5765	6.228	48.027	5.959	48.248	4.51%	-0.46%
			5775	6.241	48.017	5.971	48.234	4.52%	-0.45%
			5785	6.253	47.999	5.982	48.220	4.53%	-0.46%
			5795	6.268	47.985	5.994	48.207	4.57%	-0.46%
			5800	6.276	47.979	6.000	48.200	4.60%	-0.46%
			5805	6.285	47.974	6.006	48.193	4.65%	-0.45%
			5825	6.321	47.933	6.029	48.166	4.84%	-0.48%

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 Appendix E.

Table 10-6
System Verification Results – 1g

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	Measured SAR1g (W/kg)	1W Target SAR1g (W/kg)	1W Normalized SAR 1g (W/kg)	Deviation1g (%)
A	750	HEAD	09/07/2021	22.6	21.6	0.20	1161	7406	1.70	8.03	8.500	5.85%
A	750	HEAD	09/14/2021	21.5	21.5	0.20	1161	7406	1.63	8.03	8.150	1.49%
E	835	HEAD	09/14/2021	23.0	22.2	0.20	4d133	7571	2.01	9.43	10.050	6.57%
A	835	HEAD	09/21/2021	23.3	21.1	0.20	4d132	7406	1.99	9.66	9.950	3.00%
A	1750	HEAD	08/31/2021	24.3	20.9	0.10	1150	7406	3.80	36.50	38.000	4.11%
A	1750	HEAD	09/10/2021	23.6	22.1	0.10	1150	7406	3.70	36.50	37.000	1.37%
A	1900	HEAD	09/08/2021	23.5	22.3	0.10	5d149	7406	4.28	39.30	42.800	8.91%
A	1900	HEAD	09/19/2021	22.9	22.7	0.10	5d080	7406	4.27	39.80	42.700	7.29%
B	2450	HEAD	09/07/2021	24.0	23.6	0.10	981	7660	4.89	52.30	48.900	-6.50%
B	2450	HEAD	09/14/2021	23.5	22.2	0.10	981	7660	4.87	52.30	48.700	-6.88%
B	2450	HEAD	10/03/2021	24.1	22.2	0.10	981	7660	4.92	52.30	49.200	-5.93%
B	2600	HEAD	09/07/2021	24.0	23.6	0.10	1071	7660	5.60	56.10	56.000	-0.18%
B	2600	HEAD	09/14/2021	23.5	22.2	0.10	1071	7660	5.94	56.10	59.400	5.88%
B	2600	HEAD	10/03/2021	24.1	22.2	0.10	1071	7660	5.40	56.10	54.000	-3.74%
L	3500	HEAD	09/13/2021	20.5	19.8	0.10	1097	7539	6.56	66.40	65.600	-1.20%
L	3700	HEAD	09/13/2021	20.5	19.8	0.10	1067	7539	7.10	67.20	71.000	5.65%
L	3700	HEAD	09/21/2021	21.1	19.5	0.10	1067	7539	7.09	67.20	70.900	5.51%
L	3900	HEAD	09/21/2021	21.1	19.5	0.10	1056	7539	7.32	68.90	73.200	6.24%
J	5250	HEAD	09/13/2021	21.3	21.9	0.05	1057	7526	3.74	79.70	74.800	-6.15%
J	5600	HEAD	09/13/2021	21.3	21.9	0.05	1057	7526	3.93	83.80	78.600	-6.21%
J	5750	HEAD	09/13/2021	21.3	21.9	0.05	1057	7526	3.68	80.10	73.600	-8.11%
H	750	BODY	09/10/2021	23.0	22.6	0.20	1161	7409	1.78	8.43	8.900	5.58%
H	750	BODY	09/12/2021	22.0	22.0	0.20	1161	7409	1.68	8.43	8.400	-0.36%
H	835	BODY	09/07/2021	22.5	22.5	0.20	4d132	7409	1.96	9.81	9.800	-0.10%
H	835	BODY	09/09/2021	21.6	22.3	0.20	4d132	7409	2.04	9.81	10.200	3.98%
H	835	BODY	09/18/2021	23.0	22.6	0.20	4d132	7409	1.98	9.81	9.900	0.92%
H	835	BODY	09/20/2021	23.5	22.2	0.20	4d133	7409	1.99	9.75	9.950	2.05%
G	1750	BODY	09/07/2021	23.3	21.4	0.10	1150	7357	4.02	36.60	40.200	9.84%
G	1750	BODY	09/26/2021	22.4	21.8	0.10	1150	7357	3.76	36.60	37.600	2.73%
H	1900	BODY	09/14/2021	23.5	23.0	0.10	5d080	7409	4.15	39.20	41.500	5.87%
H	1900	BODY	09/16/2021	23.8	20.3	0.10	5d148	7409	3.92	39.10	39.200	0.26%
H	1900	BODY	09/22/2021	23.8	23.2	0.10	5d080	7409	4.12	39.20	41.200	5.10%
L	2450	BODY	08/30/2021	21.7	21.2	0.10	981	7539	4.93	50.10	49.300	-1.60%
K	2450	BODY	09/07/2021	22.6	23.2	0.10	981	3914	5.01	50.10	50.100	0.00%
L	2450	BODY	09/13/2021	20.9	22.5	0.10	797	7539	4.86	50.10	48.600	-1.62%
K	2450	BODY	10/01/2021	24.4	23.4	0.10	981	3914	4.65	50.10	46.500	-7.19%
L	2600	BODY	09/13/2021	20.9	22.5	0.10	1004	7539	5.25	55.40	52.500	-5.23%
K	2600	BODY	10/01/2021	24.4	23.4	0.10	1071	3914	5.26	54.30	52.600	-3.13%
I	3500	BODY	09/13/2021	22.3	22.0	0.10	1059	7551	6.93	63.00	69.300	10.00%
I	3700	BODY	09/13/2021	22.3	22.0	0.10	1018	7551	6.36	63.50	63.600	0.16%
I	3700	BODY	09/21/2021	22.3	22.5	0.10	1018	7551	6.66	63.50	66.600	4.88%
I	3900	BODY	09/21/2021	22.3	22.5	0.10	1073	7551	6.78	64.30	67.800	5.44%
J	5250	BODY	09/01/2021	21.3	21.3	0.05	1191	7526	3.79	74.60	75.800	1.61%
J	5600	BODY	09/01/2021	21.3	21.3	0.05	1191	7526	3.91	78.10	78.200	0.13%
J	5750	BODY	09/01/2021	21.3	21.3	0.05	1191	7526	3.750	74.90	75.000	0.13%

Table 10-7
System Verification Results – 10g

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	Measured SAR10g (W/kg)	1W Target SAR10g (W/kg)	1W Normalized SAR10g (W/kg)	Deviation10g (%)
G	1750	BODY	09/21/2021	23.5	21.7	0.10	1150	7357	2.07	19.40	20.700	6.70%
G	1750	BODY	09/26/2021	22.4	21.8	0.10	1150	7357	2.00	19.40	20.000	3.09%
H	1900	BODY	09/22/2021	23.8	23.2	0.10	5d080	7409	2.10	20.60	21.000	1.94%
I	3700	BODY	09/21/2021	22.3	22.5	0.10	1018	7551	2.41	22.50	24.100	7.11%
I	3900	BODY	09/21/2021	22.3	22.5	0.10	1073	7551	2.32	22.00	23.200	5.45%
J	5250	BODY	09/01/2021	21.3	21.3	0.05	1191	7526	1.06	21.00	21.200	0.95%
J	5600	BODY	09/01/2021	21.3	21.3	0.05	1191	7526	1.08	21.70	21.600	-0.46%
J	5750	BODY	09/01/2021	21.3	21.3	0.05	1191	7526	1.05	20.80	21.000	0.96%

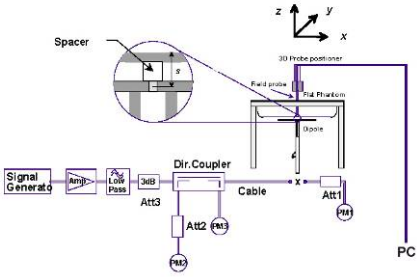


Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
GSM/DTM 850 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	# of Time Slots	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.2	31.92	-0.01	Right	Cheek	44701	1	1:8.3	0.203	1.343	0.273	
836.60	190	GSM 850	GSM	33.2	31.92	0.04	Right	Tilt	44701	1	1:8.3	0.093	1.343	0.125	
836.60	190	GSM 850	GSM	33.2	31.92	-0.17	Left	Cheek	44701	1	1:8.3	0.230	1.343	0.309	A1
836.60	190	GSM 850	GSM	33.2	31.92	-0.07	Left	Tilt	44701	1	1:8.3	0.110	1.343	0.148	
836.60	190	GSM 850	DTM	28.4	27.34	-0.17	Right	Cheek	45047	3	1:2.76	0.129	1.276	0.165	
836.60	190	GSM 850	DTM	28.4	27.34	0.00	Right	Tilt	45047	3	1:2.76	0.056	1.276	0.071	
836.60	190	GSM 850	DTM	28.4	27.34	-0.01	Left	Cheek	45047	3	1:2.76	0.149	1.276	0.190	
836.60	190	GSM 850	DTM	28.4	27.34	-0.02	Left	Tilt	45047	3	1:2.76	0.050	1.276	0.064	
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 11-2
GSM/DTM 1900 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	# of Time Slots	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1880.00	661	GSM 1900	GSM	28.7	27.63	0.00	Right	Cheek	44941	1	1:8.3	0.044	1.279	0.056	A2
1880.00	661	GSM 1900	GSM	28.7	27.63	-0.04	Right	Tilt	44941	1	1:8.3	0.016	1.279	0.020	
1880.00	661	GSM 1900	GSM	28.7	27.63	0.14	Left	Cheek	44941	1	1:8.3	0.037	1.279	0.047	
1880.00	661	GSM 1900	GSM	28.7	27.63	-0.03	Left	Tilt	44941	1	1:8.3	0.030	1.279	0.038	
1880.00	661	GSM 1900	DTM	23.9	22.72	0.00	Right	Cheek	44701	3	1:2.76	0.021	1.312	0.028	
1880.00	661	GSM 1900	DTM	23.9	22.72	0.00	Right	Tilt	44701	3	1:2.76	0.007	1.312	0.009	
1880.00	661	GSM 1900	DTM	23.9	22.72	0.02	Left	Cheek	44701	3	1:2.76	0.016	1.312	0.021	
1880.00	661	GSM 1900	DTM	23.9	22.72	0.00	Left	Tilt	44701	3	1:2.76	0.011	1.312	0.014	
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		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	24.7	24.10	-0.10	Right	Cheek	45047	1:1	0.211	1.148	0.242	
836.60	4183	UMTS 850	RMC	24.7	24.10	-0.02	Right	Tilt	45047	1:1	0.108	1.148	0.124	
836.60	4183	UMTS 850	RMC	24.7	24.10	0.01	Left	Cheek	45047	1:1	0.242	1.148	0.278	A3
836.60	4183	UMTS 850	RMC	24.7	24.10	-0.01	Left	Tilt	45047	1:1	0.117	1.148	0.134	
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
UMTS 1750 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1752.60	1513	UMTS 1750	RMC	19.7	19.06	-0.04	Right	Cheek	44701	1:1	0.077	1.159	0.089	A4
1752.60	1513	UMTS 1750	RMC	19.7	19.06	0.09	Right	Tilt	44701	1:1	0.055	1.159	0.064	
1752.60	1513	UMTS 1750	RMC	19.7	19.06	-0.02	Left	Cheek	44701	1:1	0.050	1.159	0.058	
1752.60	1513	UMTS 1750	RMC	19.7	19.06	0.09	Left	Tilt	44701	1:1	0.059	1.159	0.068	
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 11-5
UMTS 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	9400	UMTS 1900	RMC	19.7	18.97	-0.05	Right	Cheek	44941	1:1	0.089	1.183	0.105	A5
1880.00	9400	UMTS 1900	RMC	19.7	18.97	0.01	Right	Tilt	44941	1:1	0.032	1.183	0.038	
1880.00	9400	UMTS 1900	RMC	19.7	18.97	0.01	Left	Cheek	44941	1:1	0.068	1.183	0.080	
1880.00	9400	UMTS 1900	RMC	19.7	18.97	0.01	Left	Tilt	44941	1:1	0.055	1.183	0.065	
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 11-6
LTE Band 71 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
680.50	133297	Mid	LTE Band 71	20	25.0	23.50	0.00	0	Right	Cheek	QPSK	1	0	45120	1:1	0.076	1.413	0.107	
680.50	133297	Mid	LTE Band 71	20	24.0	22.65	-0.01	1	Right	Cheek	QPSK	50	0	45120	1:1	0.066	1.365	0.090	
680.50	133297	Mid	LTE Band 71	20	25.0	23.50	0.02	0	Right	Tilt	QPSK	1	0	45120	1:1	0.030	1.413	0.042	
680.50	133297	Mid	LTE Band 71	20	24.0	22.65	0.01	1	Right	Tilt	QPSK	50	0	45120	1:1	0.023	1.365	0.031	
680.50	133297	Mid	LTE Band 71	20	25.0	23.50	-0.20	0	Left	Cheek	QPSK	1	0	45120	1:1	0.096	1.413	0.136	A6
680.50	133297	Mid	LTE Band 71	20	24.0	22.65	0.06	1	Left	Cheek	QPSK	50	0	45120	1:1	0.079	1.365	0.108	
680.50	133297	Mid	LTE Band 71	20	25.0	23.50	-0.03	0	Left	Tilt	QPSK	1	0	45120	1:1	0.037	1.413	0.052	
680.50	133297	Mid	LTE Band 71	20	24.0	22.65	0.06	1	Left	Tilt	QPSK	50	0	45120	1:1	0.031	1.365	0.042	
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 11-7
LTE Band 12 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.0	23.48	-0.03	0	Right	Cheek	QPSK	1	0	45120	1:1	0.121	1.419	0.172	
707.50	23095	Mid	LTE Band 12	10	24.0	22.61	0.02	1	Right	Cheek	QPSK	25	0	45120	1:1	0.101	1.377	0.139	
707.50	23095	Mid	LTE Band 12	10	25.0	23.48	0.04	0	Right	Tilt	QPSK	1	0	45120	1:1	0.058	1.419	0.082	
707.50	23095	Mid	LTE Band 12	10	24.0	22.61	-0.12	1	Right	Tilt	QPSK	25	0	45120	1:1	0.046	1.377	0.063	
707.50	23095	Mid	LTE Band 12	10	25.0	23.48	-0.07	0	Left	Cheek	QPSK	1	0	45120	1:1	0.139	1.419	0.197	A7
707.50	23095	Mid	LTE Band 12	10	24.0	22.61	0.01	1	Left	Cheek	QPSK	25	0	45120	1:1	0.110	1.377	0.151	
707.50	23095	Mid	LTE Band 12	10	25.0	23.48	0.06	0	Left	Tilt	QPSK	1	0	45120	1:1	0.053	1.419	0.075	
707.50	23095	Mid	LTE Band 12	10	24.0	22.61	0.00	1	Left	Tilt	QPSK	25	0	45120	1:1	0.041	1.377	0.056	
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 11-8
LTE Band 13 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	25.0	23.47	23	0.00	0	Right	Cheek	QPSK	1	49	45120	1:1	0.152	1.422	0.216	
782.00	23230	Mid	LTE Band 13	10	24.0	22.68	23	-0.06	1	Right	Cheek	QPSK	25	25	45120	1:1	0.138	1.355	0.187	
782.00	23230	Mid	LTE Band 13	10	25.0	23.47	23	-0.09	0	Right	Tilt	QPSK	1	49	45120	1:1	0.059	1.422	0.084	
782.00	23230	Mid	LTE Band 13	10	24.0	22.68	23	0.04	1	Right	Tilt	QPSK	25	25	45120	1:1	0.057	1.355	0.077	
782.00	23230	Mid	LTE Band 13	10	25.0	23.47	23	-0.05	0	Left	Cheek	QPSK	1	49	45120	1:1	0.168	1.422	0.239	A8
782.00	23230	Mid	LTE Band 13	10	24.0	22.68	23	-0.15	1	Left	Cheek	QPSK	25	25	45120	1:1	0.148	1.355	0.201	
782.00	23230	Mid	LTE Band 13	10	25.0	23.47	23	-0.05	0	Left	Tilt	QPSK	1	49	45120	1:1	0.058	1.422	0.082	
782.00	23230	Mid	LTE Band 13	10	24.0	22.68	23	0.04	1	Left	Tilt	QPSK	25	25	45120	1:1	0.051	1.355	0.069	
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 11-9
LTE Band 5 (Cell) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	23.79	47	0.00	0	Right	Cheek	QPSK	1	49	44669	1:1	0.173	1.321	0.229	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.77	47	-0.03	1	Right	Cheek	QPSK	25	25	44669	1:1	0.151	1.327	0.200	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	23.79	47	-0.07	0	Right	Tilt	QPSK	1	49	44669	1:1	0.082	1.321	0.108	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.77	47	-0.04	1	Right	Tilt	QPSK	25	25	44669	1:1	0.068	1.327	0.090	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	23.79	47	-0.03	0	Left	Cheek	QPSK	1	49	44669	1:1	0.204	1.321	0.269	A9
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.77	47	-0.01	1	Left	Cheek	QPSK	25	25	44669	1:1	0.150	1.327	0.199	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.0	23.79	47	0.04	0	Left	Tilt	QPSK	1	49	44669	1:1	0.076	1.321	0.100	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.77	47	0.02	1	Left	Tilt	QPSK	25	25	44669	1:1	0.055	1.327	0.073	
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 11-10
LTE Band 66 (AWS) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	23.42	0.04	0	Right	Cheek	QPSK	1	99	44669	1:1	0.100	1.439	0.144	A10	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	22.47	0.12	1	Right	Cheek	QPSK	50	50	44669	1:1	0.085	1.422	0.121		
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	23.42	-0.14	0	Right	Tilt	QPSK	1	99	44669	1:1	0.073	1.439	0.105		
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	22.47	0.00	1	Right	Tilt	QPSK	50	50	44669	1:1	0.052	1.422	0.074		
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	23.42	-0.01	0	Left	Cheek	QPSK	1	99	44669	1:1	0.071	1.439	0.102		
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	22.47	0.01	1	Left	Cheek	QPSK	50	50	44669	1:1	0.047	1.422	0.067		
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.0	23.42	0.02	0	Left	Tilt	QPSK	1	99	44669	1:1	0.080	1.439	0.115		
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	22.47	0.02	1	Left	Tilt	QPSK	50	50	44669	1:1	0.064	1.422	0.091		
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
LTE Band 25 (PCS) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
1882.50	26365	Mid	LTE Band 25 (PCS)	20	25.0	23.43	-0.09	0	Right	Cheek	QPSK	1	99	45047	1:1	0.088	1.435	0.126	A11	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.52	-0.03	1	Right	Cheek	QPSK	50	50	45047	1:1	0.075	1.406	0.105		
1882.50	26365	Mid	LTE Band 25 (PCS)	20	25.0	23.43	0.05	0	Right	Tilt	QPSK	1	99	45047	1:1	0.019	1.435	0.027		
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.52	0.05	1	Right	Tilt	QPSK	50	50	45047	1:1	0.018	1.406	0.025		
1882.50	26365	Mid	LTE Band 25 (PCS)	20	25.0	23.43	0.20	0	Left	Cheek	QPSK	1	99	45047	1:1	0.055	1.435	0.079		
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.52	-0.07	1	Left	Cheek	QPSK	50	50	45047	1:1	0.046	1.406	0.065		
1882.50	26365	Mid	LTE Band 25 (PCS)	20	25.0	23.43	0.02	0	Left	Tilt	QPSK	1	99	45047	1:1	0.043	1.435	0.062		
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.52	-0.02	1	Left	Tilt	QPSK	50	50	45047	1:1	0.034	1.406	0.048		
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
LTE Band 48 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
3560.00	55340	Low	LTE Band 48	20	25.0	23.65	0.00	0	Right	Cheek	QPSK	1	0	44669	1:1.58	0.034	1.365	0.046	A12
3560.00	55340	Low	LTE Band 48	20	24.0	22.76	0.00	1	Right	Cheek	QPSK	50	0	44669	1:1.58	0.022	1.330	0.029	
3560.00	55340	Low	LTE Band 48	20	25.0	23.65	0.00	0	Right	Tilt	QPSK	1	0	44669	1:1.58	0.018	1.365	0.025	
3560.00	55340	Low	LTE Band 48	20	24.0	22.76	0.00	1	Right	Tilt	QPSK	50	0	44669	1:1.58	0.012	1.330	0.016	
3560.00	55340	Low	LTE Band 48	20	25.0	23.65	0.00	0	Left	Cheek	QPSK	1	0	44669	1:1.58	0.032	1.365	0.044	
3560.00	55340	Low	LTE Band 48	20	24.0	22.76	0.00	1	Left	Cheek	QPSK	50	0	44669	1:1.58	0.020	1.330	0.027	
3560.00	55340	Low	LTE Band 48	20	25.0	23.65	-0.07	0	Left	Tilt	QPSK	1	0	44669	1:1.58	0.027	1.365	0.037	
3560.00	55340	Low	LTE Band 48	20	24.0	22.76	0.17	1	Left	Tilt	QPSK	50	0	44669	1:1.58	0.023	1.330	0.031	
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
LTE Band 41 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
2680.00	41490	High	LTE Band 41	20	25.0	23.90	-0.20	0	Right	Cheek	QPSK	1	0	44669	1:1.58	0.020	1.288	0.026	
2680.00	41490	High	LTE Band 41	20	24.0	22.91	0.01	t	Right	Cheek	QPSK	50	0	44669	1:1.58	0.012	1.285	0.015	
2680.00	41490	High	LTE Band 41	20	25.0	23.90	0.02	0	Right	Tilt	QPSK	1	0	44669	1:1.58	0.016	1.288	0.021	
2680.00	41490	High	LTE Band 41	20	24.0	22.91	0.14	1	Right	Tilt	QPSK	50	0	44669	1:1.58	0.012	1.285	0.015	
2680.00	41490	High	LTE Band 41	20	25.0	23.90	0.10	0	Left	Cheek	QPSK	1	0	44669	1:1.58	0.021	1.288	0.027	A13
2680.00	41490	High	LTE Band 41	20	24.0	22.91	-0.14	1	Left	Cheek	QPSK	50	0	44669	1:1.58	0.016	1.285	0.021	
2680.00	41490	High	LTE Band 41	20	25.0	23.90	0.13	0	Left	Tilt	QPSK	1	0	44669	1:1.58	0.009	1.288	0.012	
2680.00	41490	High	LTE Band 41	20	24.0	22.91	0.00	1	Left	Tilt	QPSK	50	0	44669	1:1.58	0.006	1.285	0.008	
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 11-14
NR Band n71 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
680.50	136100	Mid	NR Band n71	20	25.0	24.25	-0.19	0	Right	Cheek	DFT-S-OFDM	QPSK	1	1	44925	1:1	0.054	1.189	0.064	
680.50	136100	Mid	NR Band n71	20	25.0	24.09	0.03	0	Right	Cheek	DFT-S-OFDM	QPSK	50	28	44925	1:1	0.059	1.233	0.073	
680.50	136100	Mid	NR Band n71	20	25.0	24.25	0.01	0	Right	Tilt	DFT-S-OFDM	QPSK	1	1	44925	1:1	0.020	1.189	0.024	
680.50	136100	Mid	NR Band n71	20	25.0	24.09	0.11	0	Right	Tilt	DFT-S-OFDM	QPSK	50	28	44925	1:1	0.023	1.233	0.028	
680.50	136100	Mid	NR Band n71	20	25.0	24.25	-0.19	0	Left	Cheek	DFT-S-OFDM	QPSK	1	1	44925	1:1	0.056	1.189	0.067	
680.50	136100	Mid	NR Band n71	20	25.0	24.09	0.06	0	Left	Cheek	DFT-S-OFDM	QPSK	50	28	44925	1:1	0.060	1.233	0.074	A14
680.50	136100	Mid	NR Band n71	20	23.5	22.69	0.11	1.5	Left	Cheek	CP-OFDM	QPSK	1	1	44925	1:1	0.038	1.205	0.046	
680.50	136100	Mid	NR Band n71	20	25.0	24.25	0.02	0	Left	Tilt	DFT-S-OFDM	QPSK	1	1	44925	1:1	0.022	1.189	0.026	
680.50	136100	Mid	NR Band n71	20	25.0	24.09	0.04	0	Left	Tilt	DFT-S-OFDM	QPSK	50	28	44925	1:1	0.021	1.233	0.026	
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 11-15
NR Band n5 Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.97	0.09	0	Right	Cheek	DFT-S-OFDM	QPSK	1	1	44925	1:1	0.131	1.268	0.166	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.06	-0.02	0	Right	Cheek	DFT-S-OFDM	QPSK	50	28	44925	1:1	0.140	1.242	0.174	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.97	0.03	0	Right	Tilt	DFT-S-OFDM	QPSK	1	1	44925	1:1	0.072	1.268	0.091	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.06	-0.05	0	Right	Tilt	DFT-S-OFDM	QPSK	50	28	44925	1:1	0.073	1.242	0.091	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.97	0.00	0	Left	Cheek	DFT-S-OFDM	QPSK	1	1	44925	1:1	0.150	1.268	0.190	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.06	-0.03	0	Left	Cheek	DFT-S-OFDM	QPSK	50	28	44925	1:1	0.160	1.242	0.199	A15
836.50	167300	Mid	NR Band n5 (Cell)	20	23.5	22.43	-0.06	1.5	Left	Cheek	CP-OFDM	QPSK	1	1	44925	1:1	0.108	1.279	0.138	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.97	0.00	0	Left	Tilt	DFT-S-OFDM	QPSK	1	1	44925	1:1	0.075	1.268	0.095	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.06	-0.03	0	Left	Tilt	DFT-S-OFDM	QPSK	50	28	44925	1:1	0.078	1.242	0.097	
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 11-16
NR Band n66 Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	23.94	-0.02	0	Right	Cheek	DFT-S-OFDM	QPSK	1	1	45120	1:1	0.035	1.276	0.045	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	23.69	0.02	0	Right	Cheek	DFT-S-OFDM	QPSK	50	28	45120	1:1	0.040	1.352	0.054	A16
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.37	0.00	1.5	Right	Cheek	CP-OFDM	QPSK	1	1	45120	1:1	0.022	1.297	0.029	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	23.94	0.09	0	Right	Tilt	DFT-S-OFDM	QPSK	1	1	45120	1:1	0.023	1.276	0.029	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	23.69	0.06	0	Right	Tilt	DFT-S-OFDM	QPSK	50	28	45120	1:1	0.025	1.352	0.034	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	23.94	-0.04	0	Left	Cheek	DFT-S-OFDM	QPSK	1	1	45120	1:1	0.031	1.276	0.040	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	23.69	-0.02	0	Left	Cheek	DFT-S-OFDM	QPSK	50	28	45120	1:1	0.025	1.352	0.034	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	23.94	-0.15	0	Left	Tilt	DFT-S-OFDM	QPSK	1	1	45120	1:1	0.039	1.276	0.050	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	23.69	0.05	0	Left	Tilt	DFT-S-OFDM	QPSK	50	28	45120	1:1	0.034	1.352	0.046	
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 11-17
NR Band n2 Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
1860.00	372000	Low	NR Band n2 (PCS)	20	25.0	24.14	0.00	0	Right	Cheek	DFT-S-OFDM	QPSK	1	53	45120	1:1	0.004	1.219	0.005	A17
1860.00	372000	Low	NR Band n2 (PCS)	20	25.0	24.05	0.00	0	Right	Cheek	DFT-S-OFDM	QPSK	50	28	45120	1:1	0.003	1.245	0.004	
1860.00	372000	Low	NR Band n2 (PCS)	20	23.5	22.61	0.00	1.5	Right	Cheek	CP-OFDM	QPSK	1	1	45120	1:1	0.002	1.227	0.002	
1860.00	372000	Low	NR Band n2 (PCS)	20	25.0	24.14	0.02	0	Right	Tilt	DFT-S-OFDM	QPSK	1	53	45120	1:1	0.000	1.219	0.000	
1860.00	372000	Low	NR Band n2 (PCS)	20	25.0	24.05	0.00	0	Right	Tilt	DFT-S-OFDM	QPSK	50	28	45120	1:1	0.000	1.245	0.000	
1860.00	372000	Low	NR Band n2 (PCS)	20	25.0	24.14	0.00	0	Left	Cheek	DFT-S-OFDM	QPSK	1	53	45120	1:1	0.003	1.219	0.004	
1860.00	372000	Low	NR Band n2 (PCS)	20	25.0	24.05	0.00	0	Left	Cheek	DFT-S-OFDM	QPSK	50	28	45120	1:1	0.003	1.245	0.004	
1860.00	372000	Low	NR Band n2 (PCS)	20	25.0	24.14	0.01	0	Left	Tilt	DFT-S-OFDM	QPSK	1	53	45120	1:1	0.003	1.219	0.004	
1860.00	372000	Low	NR Band n2 (PCS)	20	25.0	24.05	0.15	0	Left	Tilt	DFT-S-OFDM	QPSK	50	28	45120	1:1	0.003	1.245	0.004	
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 11-18
NR Band n41 Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
2592.99	518598	Mid	NR Band n41	100	16.0	15.12	0.10	0	Right	Cheek	DFT-S-OFDM	QPSK	1	137	45229	1:1	0.143	1.225	0.175	
2592.99	518598	Mid	NR Band n41	100	16.0	15.16	0.01	0	Right	Cheek	DFT-S-OFDM	QPSK	135	69	45229	1:1	0.184	1.213	0.223	
2592.99	518598	Mid	NR Band n41	100	16.0	15.12	0.01	0	Right	Tilt	DFT-S-OFDM	QPSK	1	137	45229	1:1	0.093	1.225	0.114	
2592.99	518598	Mid	NR Band n41	100	16.0	15.16	0.10	0	Right	Tilt	DFT-S-OFDM	QPSK	135	69	45229	1:1	0.081	1.213	0.098	
2592.99	518598	Mid	NR Band n41	100	16.0	15.12	0.02	0	Left	Cheek	DFT-S-OFDM	QPSK	1	137	45229	1:1	0.441	1.225	**0.540**	A18
2592.99	518598	Mid	NR Band n41	100	16.0	15.16	0.01	0	Left	Cheek	DFT-S-OFDM	QPSK	135	69	45229	1:1	0.355	1.213	0.431	
2592.99	518598	Mid	NR Band n41	100	16.0	14.75	0.10	0	Left	Cheek	CP-OFDM	QPSK	1	1	45229	1:1	0.353	1.334	0.471	
2592.99	518598	Mid	NR Band n41	100	16.0	15.12	0.10	0	Left	Tilt	DFT-S-OFDM	QPSK	1	137	45229	1:1	0.231	1.225	0.283	
2592.99	518598	Mid	NR Band n41	100	16.0	15.16	0.01	0	Left	Tilt	DFT-S-OFDM	QPSK	135	69	45229	1:1	0.232	1.213	0.281	
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 11-19
NR Band n77 Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
3930.00	662000	High	NR Band n77	100	19.0	17.90	0.02	0	Right	Cheek	DFT-S-OFDM	QPSK	1	137	44925	1:1	0.014	1.288	0.018	
3930.00	662000	High	NR Band n77	100	19.0	17.68	0.00	0	Right	Cheek	DFT-S-OFDM	QPSK	135	69	44925	1:1	0.015	1.355	0.020	A19
3930.00	662000	High	NR Band n77	100	19.0	17.60	0.00	0	Right	Cheek	CP-OFDM	QPSK	1	1	44925	1:1	0.013	1.380	0.018	
3930.00	662000	High	NR Band n77	100	19.0	17.90	0.01	0	Right	Tilt	DFT-S-OFDM	QPSK	1	137	44925	1:1	0.006	1.288	0.008	
3930.00	662000	High	NR Band n77	100	19.0	17.68	0.00	0	Right	Tilt	DFT-S-OFDM	QPSK	135	69	44925	1:1	0.006	1.355	0.008	
3930.00	662000	High	NR Band n77	100	19.0	17.90	0.02	0	Left	Cheek	DFT-S-OFDM	QPSK	1	137	44925	1:1	0.001	1.288	0.001	
3930.00	662000	High	NR Band n77	100	19.0	17.68	0.00	0	Left	Cheek	DFT-S-OFDM	QPSK	135	69	44925	1:1	0.001	1.355	0.001	
3930.00	662000	High	NR Band n77	100	19.0	17.90	0.00	0	Left	Tilt	DFT-S-OFDM	QPSK	1	137	44925	1:1	0.004	1.288	0.005	
3930.00	662000	High	NR Band n77	100	19.0	17.68	0.01	0	Left	Tilt	DFT-S-OFDM	QPSK	135	69	44925	1:1	0.003	1.355	0.004	
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 11-20
DTS Head SISO SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan W/kg	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																		
2437	6	802.11b	DSSS	22	14.07	14.06	-0.04	Right	Cheek	1	45203	1	99.9	0.204	0.153	1.002	1.001	**0.153**	A20
2437	6	802.11b	DSSS	22	14.07	14.06	0.04	Right	Tilt	1	45203	1	99.9	0.132	-	1.002	1.001	-	
2437	6	802.11b	DSSS	22	14.07	14.06	0.01	Left	Cheek	1	45203	1	99.9	0.155	-	1.002	1.001	-	
2437	6	802.11b	DSSS	22	14.07	14.06	0.00	Left	Tilt	1	45203	1	99.9	0.052	-	1.002	1.001	-	
2437	6	802.11b	DSSS	22	12.30	12.11	0.18	Right	Cheek	2	45203	1	99.8	0.013	0.007	1.045	1.002	0.007	
2437	6	802.11b	DSSS	22	12.30	12.11	0.01	Right	Tilt	2	45203	1	99.8	0.005	-	1.045	1.002	-	
2437	6	802.11b	DSSS	22	12.30	12.11	0.00	Left	Cheek	2	45203	1	99.8	0.013	-	1.045	1.002	-	
2437	6	802.11b	DSSS	22	12.30	12.11	0.00	Left	Tilt	2	45203	1	99.8	0.001	-	1.045	1.002	-	
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 11-21
NII Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5270	54	802.11n	OFDM	40	12.52	12.24	-0.20	Right	Cheek	1	45369	13.5	99.7	0.018	0.003	1.067	1.003	0.003	
5270	54	802.11n	OFDM	40	12.52	12.24	0.00	Right	Tilt	1	45369	13.5	99.7	0.000	-	1.067	1.003	-	
5270	54	802.11n	OFDM	40	12.52	12.24	0.00	Left	Cheek	1	45369	13.5	99.7	0.000	-	1.067	1.003	-	
5270	54	802.11n	OFDM	40	12.52	12.24	0.00	Left	Tilt	1	45369	13.5	99.7	0.012	-	1.067	1.003	-	
5270	54	802.11n	OFDM	40	12.18	12.02	0.17	Right	Cheek	2	45369	13.5	99.7	0.143	0.096	1.038	1.003	0.100	
5270	54	802.11n	OFDM	40	12.18	12.02	0.00	Right	Tilt	2	45369	13.5	99.7	0.136	-	1.038	1.003	-	
5270	54	802.11n	OFDM	40	12.18	12.02	0.00	Left	Cheek	2	45369	13.5	99.7	0.036	-	1.038	1.003	-	
5270	54	802.11n	OFDM	40	12.18	12.02	0.00	Left	Tilt	2	45369	13.5	99.7	0.039	-	1.038	1.003	-	
5690	138	802.11ac	OFDM	80	12.52	12.45	0.10	Right	Cheek	1	45369	29.3	99.7	0.054	0.048	1.016	1.003	0.049	
5690	138	802.11ac	OFDM	80	12.52	12.45	0.00	Right	Tilt	1	45369	29.3	99.7	0.007	-	1.016	1.003	-	
5690	138	802.11ac	OFDM	80	12.52	12.45	0.00	Left	Cheek	1	45369	29.3	99.7	0.000	-	1.016	1.003	-	
5690	138	802.11ac	OFDM	80	12.52	12.45	0.00	Left	Tilt	1	45369	29.3	99.7	0.000	-	1.016	1.003	-	
5610	122	802.11ac	OFDM	80	12.18	11.92	0.00	Right	Cheek	2	45369	29.3	99.7	0.127	0.105	1.062	1.003	**0.112**	A21
5610	122	802.11ac	OFDM	80	12.18	11.92	0.00	Right	Tilt	2	45369	29.3	99.7	0.090	-	1.062	1.003	-	
5610	122	802.11ac	OFDM	80	12.18	11.92	0.00	Left	Cheek	2	45369	29.3	99.7	0.036	-	1.062	1.003	-	
5610	122	802.11ac	OFDM	80	12.18	11.92	0.00	Left	Tilt	2	45369	29.3	99.7	0.028	-	1.062	1.003	-	
5795	159	802.11n	OFDM	40	12.52	12.44	0.20	Right	Cheek	1	45369	13.5	99.7	0.032	0.030	1.019	1.003	0.031	
5795	159	802.11n	OFDM	40	12.52	12.44	0.00	Right	Tilt	1	45369	13.5	99.7	0.006	-	1.019	1.003	-	
5795	159	802.11n	OFDM	40	12.52	12.44	0.00	Left	Cheek	1	45369	13.5	99.7	0.000	-	1.019	1.003	-	
5795	159	802.11n	OFDM	40	12.52	12.44	0.00	Left	Tilt	1	45369	13.5	99.7	0.000	-	1.019	1.003	-	
5795	159	802.11n	OFDM	40	12.18	11.74	-0.19	Right	Cheek	2	45369	13.5	99.7	0.148	0.100	1.107	1.003	**0.111**	
5795	159	802.11n	OFDM	40	12.18	11.74	0.00	Right	Tilt	2	45369	13.5	99.7	0.072	-	1.107	1.003	-	
5795	159	802.11n	OFDM	40	12.18	11.74	0.00	Left	Cheek	2	45369	13.5	99.7	0.037	-	1.107	1.003	-	
5795	159	802.11n	OFDM	40	12.18	11.74	0.00	Left	Tilt	2	45369	13.5	99.7	0.025	-	1.107	1.003	-	
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 11-22
DSS Head SAR

MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)			(W/kg)	
2480.00	78	Bluetooth	FHSS	14.0	13.10	-0.02	Right	Cheek	1	45203	1	77.00	0.042	1.230	1.299	**0.067**	A22
2480.00	78	Bluetooth	FHSS	14.0	13.10	0.00	Right	Tilt	1	45203	1	77.00	0.016	1.230	1.299	0.026	
2480.00	78	Bluetooth	FHSS	14.0	13.10	0.03	Left	Cheek	1	45203	1	77.00	0.028	1.230	1.299	0.045	
2480.00	78	Bluetooth	FHSS	14.0	13.10	-0.02	Left	Tilt	1	45203	1	77.00	0.005	1.230	1.299	0.008	
2441.00	39	Bluetooth	FHSS	14.0	13.16	0.00	Right	Cheek	2	44982	1	76.80	0.005	1.213	1.302	0.008	
2441.00	39	Bluetooth	FHSS	14.0	13.16	0.00	Right	Tilt	2	44982	1	76.80	0.000	1.213	1.302	0.000	
2441.00	39	Bluetooth	FHSS	14.0	13.16	0.00	Left	Cheek	2	44982	1	76.80	0.007	1.213	1.302	0.011	
2441.00	39	Bluetooth	FHSS	14.0	13.16	0.00	Left	Tilt	2	44982	1	76.80	0.000	1.213	1.302	0.000	
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 11-23
GSM/DTM/UMTS Body-Worn SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.2	31.92	0.00	10 mm	45047	1	1:8.3	back	0.203	1.343	0.273	A23
836.60	190	GSM 850	DTM	28.4	27.34	-0.05	10 mm	44701	3	1:2.76	back	0.173	1.276	0.221	
1880.00	661	GSM 1900	GSM	28.7	27.63	0.10	10 mm	44701	1	1:8.3	back	0.194	1.279	0.248	
1880.00	661	GSM 1900	DTM	23.9	22.72	-0.01	10 mm	44701	3	1:2.76	back	0.197	1.312	0.258	A25
836.60	4183	UMTS 850	RMC	24.7	24.10	-0.02	10 mm	44669	N/A	1:1	back	0.266	1.148	0.305	A27
1752.60	1513	UMTS 1750	RMC	19.7	19.06	0.02	10 mm	44941	N/A	1:1	back	0.362	1.159	**0.420**	A29
1880.00	9400	UMTS 1900	RMC	19.7	18.97	0.01	10 mm	44701	N/A	1:1	back	0.239	1.183	0.283	A31
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
LTE Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
680.50	133297	Mid	LTE Band 71	20	25.0	23.50	0.02	0	44669	QPSK	1	0	10 mm	back	1:1	0.151	1.413	0.213	A33
680.50	133297	Mid	LTE Band 71	20	24.0	22.65	0.02	1	44669	QPSK	50	0	10 mm	back	1:1	0.125	1.365	0.171	
707.50	23095	Mid	LTE Band 12	10	25.0	23.48	0.02	0	44669	QPSK	1	0	10 mm	back	1:1	0.230	1.419	0.326	A35
707.50	23095	Mid	LTE Band 12	10	24.0	22.61	0.02	1	44669	QPSK	25	0	10 mm	back	1:1	0.190	1.377	0.262	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.49	0.01	0	44701	QPSK	1	0	10 mm	back	1:1	0.288	1.416	0.408	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.55	0.08	0	44701	QPSK	50	0	10 mm	back	1:1	0.293	1.396	0.409	A41
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	18.78	0.04	0	44701	QPSK	1	99	10 mm	back	1:1	0.222	1.324	0.294	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	18.81	-0.03	0	44701	QPSK	50	50	10 mm	back	1:1	0.228	1.315	0.300	A43
3560.00	55340	Low	LTE Band 48	20	21.0	20.22	0.01	0	44941	QPSK	1	0	10 mm	back	1:1.58	0.211	1.197	0.253	
3560.00	55340	Low	LTE Band 48	20	21.0	20.23	0.03	0	44941	QPSK	50	0	10 mm	back	1:1.58	0.215	1.194	**0.257**	A45
2680.00	41490	High	LTE Band 41	20	20.0	19.36	0.00	0	44941	QPSK	1	0	10 mm	back	1:1.58	0.190	1.159	0.220	
2680.00	41490	High	LTE Band 41	20	20.0	19.24	-0.02	0	44941	QPSK	50	0	10 mm	back	1:1.58	0.191	1.191	0.227	A47
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 11-25
LTE Band 13 Body-Worn SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
782.00	23230	Mid	LTE Band 13	10	23.0	21.85	47	0.00	0	Cellular Main 1st Antenna	44701	QPSK	1	0	10 mm	back	1:1	0.120	1.303	0.156	A37
782.00	23230	Mid	LTE Band 13	10	23.0	21.88	47	0.04	0	Cellular Main 1st Antenna	44701	QPSK	25	0	10 mm	back	1:1	0.120	1.294	0.155	
782.00	23230	Mid	LTE Band 13	10	22.0	20.94	N/A	0.01	0	Cellular Sub Antenna	44701	QPSK	1	49	10 mm	back	1:1	0.117	1.276	0.149	
782.00	23230	Mid	LTE Band 13	10	22.0	21.08	N/A	-0.01	0	Cellular Sub Antenna	44701	QPSK	25	25	10 mm	back	1:1	0.116	1.236	0.143	
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 11-26
LTE Band 5 Body-Worn SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.09	23	0.00	0	Cellular Main 1st Antenna	44701	QPSK	1	49	10 mm	back	1:1	0.131	1.233	0.162	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.16	23	-0.01	0	Cellular Main 1st Antenna	44701	QPSK	25	12	10 mm	back	1:1	0.136	1.213	0.165	A39
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.0	21.09	N/A	0.04	0	Cellular Sub Antenna	44701	QPSK	1	49	10 mm	back	1:1	0.097	1.233	0.120	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.0	21.05	N/A	0.05	0	Cellular Sub Antenna	44701	QPSK	25	25	10 mm	back	1:1	0.102	1.245	0.127	
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 11-27
NR Body-Worn SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
680.50	136100	Mid	NR Band n71	20	24.0	23.30	-0.13	0	45229	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.068	1.175	0.080	
680.50	136100	Mid	NR Band n71	20	24.0	23.13	-0.08	0	45229	DFT-S-OFDM	QPSK	50	0	10 mm	back	1:1	0.069	1.222	0.084	A49
680.50	136100	Mid	NR Band n71	20	23.5	22.71	0.00	0.5	45229	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.061	1.199	0.073	
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.94	0.00	0	44867	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.223	1.276	0.285	
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.74	-0.01	0	44867	DFT-S-OFDM	QPSK	50	0	10 mm	back	1:1	0.225	1.337	0.301	
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.93	-0.12	0	44867	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.231	1.279	0.295	A53
1880.00	376000	Mid	NR Band n2 (PCS)	20	20.0	19.12	-0.02	0	44867	DFT-S-OFDM	QPSK	1	53	10 mm	back	1:1	0.025	1.225	0.031	A55
1880.00	376000	Mid	NR Band n2 (PCS)	20	20.0	19.01	0.00	0	44867	DFT-S-OFDM	QPSK	50	28	10 mm	back	1:1	0.025	1.256	0.031	
1880.00	376000	Mid	NR Band n2 (PCS)	20	20.0	18.95	0.02	0	44867	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.022	1.274	0.028	
2592.99	518598	Mid	NR Band n41	100	16.0	15.12	0.02	0	45229	DFT-S-OFDM	QPSK	1	137	10 mm	back	1:1	0.050	1.225	0.061	A57
2592.99	518598	Mid	NR Band n41	100	16.0	15.16	0.01	0	45229	DFT-S-OFDM	QPSK	135	69	10 mm	back	1:1	0.046	1.213	0.056	
2592.99	518598	Mid	NR Band n41	100	16.0	14.75	0.01	0	45229	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.042	1.334	0.056	
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 11-28
NR Band n5 Body-Worn SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
836.50	167300	Mid	NR Band n5 (Cell)	20	24.0	23.33	Cellular Main 1st Antenna	-0.02	0	45229	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.116	1.167	0.135	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.0	23.18	Cellular Main 1st Antenna	-0.11	0	45229	DFT-S-OFDM	QPSK	50	0	10 mm	back	1:1	0.124	1.208	0.150	A51
836.50	167300	Mid	NR Band n5 (Cell)	20	23.5	22.46	Cellular Main 1st Antenna	-0.07	0.5	45229	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.102	1.271	0.130	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.0	22.32	Cellular Sub Antenna	-0.17	0	44941	DFT-S-OFDM	QPSK	1	104	10 mm	back	1:1	0.096	1.169	0.112	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.0	22.16	Cellular Sub Antenna	-0.01	0	44941	DFT-S-OFDM	QPSK	50	56	10 mm	back	1:1	0.098	1.213	0.119	
836.50	167300	Mid	NR Band n5 (Cell)	20	22.5	21.90	Cellular Sub Antenna	-0.04	0.5	44941	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.082	1.148	0.094	
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
NR Band n77 Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
3930.00	662000	High	NR Band n77	100	19.0	17.90	0.00	0	44867	DFT-S-OFDM	QPSK	1	137	10 mm	back	1:1	0.150	1.288	0.150	
3930.00	662000	High	NR Band n77	100	19.0	17.68	0.08	0	44867	DFT-S-OFDM	QPSK	135	69	10 mm	back	1:1	0.153	1.355	0.207	A59
3930.00	662000	High	NR Band n77	100	19.0	17.60	0.00	0	44867	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.148	1.380	0.204	
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
DTS Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	14.07	14.06	0.01	10 mm	1	44842	1	back	99.9	0.043	0.033	1.002	1.001	**0.033**	A61
2437	6	802.11b	DSSS	22	12.30	12.11	0.00	10 mm	2	44842	1	back	99.8	0.003	0.000	1.045	1.002	0.000	
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 11-31
NII Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5270	54	802.11n	OFDM	40	12.52	12.24	0.01	10 mm	1	45369	13.5	back	99.7	0.037	0.016	1.067	1.003	0.017	
5270	54	802.11n	OFDM	40	12.18	12.02	0.00	10 mm	2	45369	13.5	back	99.7	0.111	0.066	1.038	1.003	**0.069**	A63
5690	138	802.11ac	OFDM	80	12.52	12.45	0.00	10 mm	1	45369	29.3	back	99.7	0.049	0.021	1.016	1.003	**0.021**	
5610	122	802.11ac	OFDM	80	12.18	11.92	0.02	10 mm	2	45369	29.3	back	99.7	0.042	0.019	1.062	1.003	0.020	
5795	159	802.11n	OFDM	40	12.52	12.44	0.10	10 mm	1	45369	13.5	back	99.7	0.034	0.011	1.019	1.003	0.011	
5795	159	802.11n	OFDM	40	12.18	11.74	0.00	10 mm	2	45369	13.5	back	99.7	0.043	0.024	1.107	1.003	**0.027**	
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 11-32
DSS Body-Worn SAR

MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)			(W/kg)	
2480	78	Bluetooth	FHSS	14.0	13.10	0.01	10 mm	1	44982	1	back	77.0	0.012	1.230	1.299	0.019	
2441	39	Bluetooth	FHSS	14.0	13.16	-0.08	10 mm	2	44982	1	back	76.8	0.020	1.213	1.302	**0.032**	A65
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 11-33
GPRS/DTM/UMTS Hotspot SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GPRS	27.2	26.13	0.00	10 mm	45047	4	1:2.076	back	0.172	1.279	0.220	
836.60	190	GSM 850	GPRS	27.2	26.13	0.00	10 mm	45047	4	1:2.076	front	0.142	1.279	0.182	
836.60	190	GSM 850	GPRS	27.2	26.13	0.11	10 mm	45047	4	1:2.076	bottom	0.052	1.279	0.067	
836.60	190	GSM 850	GPRS	27.2	26.13	-0.13	10 mm	45047	4	1:2.076	left	0.169	1.279	0.216	
836.60	190	GSM 850	DTM	28.4	27.34	-0.05	10 mm	44701	3	1:2.76	back	0.173	1.276	0.221	
836.60	190	GSM 850	DTM	28.4	27.34	0.04	10 mm	44701	3	1:2.76	front	0.185	1.276	0.236	
836.60	190	GSM 850	DTM	28.4	27.34	-0.03	10 mm	44701	3	1:2.76	bottom	0.073	1.276	0.093	
836.60	190	GSM 850	DTM	28.4	27.34	-0.03	10 mm	44701	3	1:2.76	left	0.195	1.276	0.249	A24
1880.00	661	GSM 1900	GPRS	22.7	21.44	0.10	10 mm	44701	4	1:2.076	back	0.166	1.337	0.222	
1880.00	661	GSM 1900	GPRS	22.7	21.44	-0.05	10 mm	44701	4	1:2.076	front	0.149	1.337	0.199	
1880.00	661	GSM 1900	GPRS	22.7	21.44	0.05	10 mm	44701	4	1:2.076	bottom	0.275	1.337	0.368	
1880.00	661	GSM 1900	GPRS	22.7	21.44	0.04	10 mm	44701	4	1:2.076	left	0.032	1.337	0.043	
1880.00	661	GSM 1900	DTM	23.9	22.72	-0.01	10 mm	44701	3	1:2.76	back	0.197	1.312	0.258	
1880.00	661	GSM 1900	DTM	23.9	22.72	-0.18	10 mm	44701	3	1:2.76	front	0.189	1.312	0.248	
1880.00	661	GSM 1900	DTM	23.9	22.72	-0.01	10 mm	44701	3	1:2.76	bottom	0.300	1.312	0.394	A26
1880.00	661	GSM 1900	DTM	23.9	22.72	-0.09	10 mm	44701	3	1:2.76	left	0.029	1.312	0.038	
836.60	4183	UMTS 850	RMC	24.7	24.10	-0.02	10 mm	44669	N/A	1:1	back	0.266	1.148	0.305	
836.60	4183	UMTS 850	RMC	24.7	24.10	-0.01	10 mm	44669	N/A	1:1	front	0.258	1.148	0.296	
836.60	4183	UMTS 850	RMC	24.7	24.10	0.00	10 mm	44669	N/A	1:1	bottom	0.093	1.148	0.107	
836.60	4183	UMTS 850	RMC	24.7	24.10	0.02	10 mm	44669	N/A	1:1	left	0.303	1.148	0.348	A28
1752.60	1513	UMTS 1750	RMC	19.7	19.06	0.02	10 mm	44941	N/A	1:1	back	0.362	1.159	0.420	
1752.60	1513	UMTS 1750	RMC	19.7	19.06	-0.01	10 mm	44941	N/A	1:1	front	0.324	1.159	0.376	
1712.40	1312	UMTS 1750	RMC	19.7	18.84	0.01	10 mm	44941	N/A	1:1	bottom	0.569	1.219	**0.694**	
1732.40	1412	UMTS 1750	RMC	19.7	18.97	0.02	10 mm	44941	N/A	1:1	bottom	0.580	1.183	0.686	A30
1752.60	1513	UMTS 1750	RMC	19.7	19.06	0.00	10 mm	44941	N/A	1:1	bottom	0.543	1.159	0.629	
1752.60	1513	UMTS 1750	RMC	19.7	19.06	0.05	10 mm	44941	N/A	1:1	left	0.043	1.159	0.050	
1880.00	9400	UMTS 1900	RMC	19.7	18.97	0.01	10 mm	44701	N/A	1:1	back	0.239	1.183	0.283	
1880.00	9400	UMTS 1900	RMC	19.7	18.97	0.05	10 mm	44701	N/A	1:1	front	0.178	1.183	0.211	
1880.00	9400	UMTS 1900	RMC	19.7	18.97	-0.03	10 mm	44701	N/A	1:1	bottom	0.401	1.183	0.474	A32
1880.00	9400	UMTS 1900	RMC	19.7	18.97	0.02	10 mm	44701	N/A	1:1	left	0.038	1.183	0.045	
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 71 Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
680.50	133297	Mid	LTE Band 71	20	25.0	23.50	0.02	0	44669	QPSK	1	0	10 mm	back	1:1	0.151	1.413	0.213	
680.50	133297	Mid	LTE Band 71	20	24.0	22.65	0.02	1	44669	QPSK	50	0	10 mm	back	1:1	0.125	1.365	0.171	
680.50	133297	Mid	LTE Band 71	20	25.0	23.50	0.02	0	44669	QPSK	1	0	10 mm	front	1:1	0.119	1.413	0.168	
680.50	133297	Mid	LTE Band 71	20	24.0	22.65	0.01	1	44669	QPSK	50	0	10 mm	front	1:1	0.100	1.365	0.137	
680.50	133297	Mid	LTE Band 71	20	25.0	23.50	0.02	0	44669	QPSK	1	0	10 mm	bottom	1:1	0.054	1.413	0.076	
680.50	133297	Mid	LTE Band 71	20	24.0	22.65	0.08	1	44669	QPSK	50	0	10 mm	bottom	1:1	0.045	1.365	0.061	
680.50	133297	Mid	LTE Band 71	20	25.0	23.50	0.03	0	44669	QPSK	1	0	10 mm	left	1:1	0.198	1.413	0.280	A34
680.50	133297	Mid	LTE Band 71	20	24.0	22.65	-0.01	1	44669	QPSK	50	0	10 mm	left	1:1	0.171	1.365	0.233	
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 11-35
LTE Band 12 Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.0	23.48	0.02	0	44669	QPSK	1	0	10 mm	back	1:1	0.230	1.419	0.326	
707.50	23095	Mid	LTE Band 12	10	24.0	22.61	0.02	1	44669	QPSK	25	0	10 mm	back	1:1	0.190	1.377	0.262	
707.50	23095	Mid	LTE Band 12	10	25.0	23.48	0.00	0	44669	QPSK	1	0	10 mm	front	1:1	0.198	1.419	0.281	
707.50	23095	Mid	LTE Band 12	10	24.0	22.61	0.00	1	44669	QPSK	25	0	10 mm	front	1:1	0.165	1.377	0.227	
707.50	23095	Mid	LTE Band 12	10	25.0	23.48	0.01	0	44669	QPSK	1	0	10 mm	bottom	1:1	0.076	1.419	0.108	
707.50	23095	Mid	LTE Band 12	10	24.0	22.61	-0.01	1	44669	QPSK	25	0	10 mm	bottom	1:1	0.063	1.377	0.087	
707.50	23095	Mid	LTE Band 12	10	25.0	23.48	-0.02	0	44669	QPSK	1	0	10 mm	left	1:1	0.298	1.419	0.423	A36
707.50	23095	Mid	LTE Band 12	10	24.0	22.61	-0.01	1	44669	QPSK	25	0	10 mm	left	1:1	0.252	1.377	0.347	
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
LTE Band 13 Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	23.0	21.85	47	0.00	0	Cellular Main 1st Antenna	44701	QPSK	1	0	10 mm	back	1:1	0.120	1.303	0.156	
782.00	23230	Mid	LTE Band 13	10	23.0	21.88	47	0.04	0	Cellular Main 1st Antenna	44701	QPSK	25	0	10 mm	back	1:1	0.120	1.294	0.155	
782.00	23230	Mid	LTE Band 13	10	23.0	21.85	47	0.01	0	Cellular Main 1st Antenna	44701	QPSK	1	0	10 mm	front	1:1	0.113	1.303	0.147	
782.00	23230	Mid	LTE Band 13	10	23.0	21.88	47	0.03	0	Cellular Main 1st Antenna	44701	QPSK	25	0	10 mm	front	1:1	0.114	1.294	0.148	
782.00	23230	Mid	LTE Band 13	10	23.0	21.85	47	0.01	0	Cellular Main 1st Antenna	44701	QPSK	1	0	10 mm	bottom	1:1	0.072	1.303	0.094	
782.00	23230	Mid	LTE Band 13	10	23.0	21.88	47	0.02	0	Cellular Main 1st Antenna	44701	QPSK	25	0	10 mm	bottom	1:1	0.075	1.294	0.097	
782.00	23230	Mid	LTE Band 13	10	23.0	21.85	47	-0.02	0	Cellular Main 1st Antenna	44701	QPSK	1	0	10 mm	left	1:1	0.178	1.303	0.232	A38
782.00	23230	Mid	LTE Band 13	10	23.0	21.88	47	0.03	0	Cellular Main 1st Antenna	44701	QPSK	25	0	10 mm	left	1:1	0.174	1.294	0.225	
782.00	23230	Mid	LTE Band 13	10	22.0	20.94	N/A	0.01	0	Cellular Sub Antenna	44701	QPSK	1	49	10 mm	back	1:1	0.117	1.276	0.149	
782.00	23230	Mid	LTE Band 13	10	22.0	21.08	N/A	-0.01	0	Cellular Sub Antenna	44701	QPSK	25	25	10 mm	back	1:1	0.116	1.236	0.143	
782.00	23230	Mid	LTE Band 13	10	22.0	20.94	N/A	0.09	0	Cellular Sub Antenna	44701	QPSK	1	49	10 mm	front	1:1	0.112	1.276	0.143	
782.00	23230	Mid	LTE Band 13	10	22.0	21.08	N/A	0.06	0	Cellular Sub Antenna	44701	QPSK	25	25	10 mm	front	1:1	0.108	1.236	0.133	
782.00	23230	Mid	LTE Band 13	10	22.0	20.94	N/A	0.03	0	Cellular Sub Antenna	44701	QPSK	1	49	10 mm	top	1:1	0.042	1.276	0.054	
782.00	23230	Mid	LTE Band 13	10	22.0	21.08	N/A	0.08	0	Cellular Sub Antenna	44701	QPSK	25	25	10 mm	top	1:1	0.045	1.236	0.056	
782.00	23230	Mid	LTE Band 13	10	22.0	20.94	N/A	0.00	0	Cellular Sub Antenna	44701	QPSK	1	49	10 mm	right	1:1	0.160	1.276	0.204	
782.00	23230	Mid	LTE Band 13	10	22.0	21.08	N/A	0.00	0	Cellular Sub Antenna	44701	QPSK	25	25	10 mm	right	1:1	0.169	1.236	0.209	
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
LTE Band 5 (Cell) Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.09	23	0.00	0	Cellular Main 1st Antenna	44701	QPSK	1	49	10 mm	back	1:1	0.131	1.233	0.162	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.16	23	-0.01	0	Cellular Main 1st Antenna	44701	QPSK	25	12	10 mm	back	1:1	0.136	1.213	0.165	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.09	23	-0.02	0	Cellular Main 1st Antenna	44701	QPSK	1	49	10 mm	front	1:1	0.113	1.233	0.139	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.16	23	-0.01	0	Cellular Main 1st Antenna	44701	QPSK	25	12	10 mm	front	1:1	0.113	1.213	0.137	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.09	23	-0.04	0	Cellular Main 1st Antenna	44701	QPSK	1	49	10 mm	bottom	1:1	0.056	1.233	0.069	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.16	23	-0.01	0	Cellular Main 1st Antenna	44701	QPSK	25	12	10 mm	bottom	1:1	0.064	1.213	0.078	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.09	23	-0.15	0	Cellular Main 1st Antenna	44701	QPSK	1	49	10 mm	left	1:1	0.140	1.233	0.173	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.16	23	-0.05	0	Cellular Main 1st Antenna	44701	QPSK	25	12	10 mm	left	1:1	0.133	1.213	0.161	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.0	21.09	N/A	0.04	0	Cellular Sub Antenna	44701	QPSK	1	49	10 mm	back	1:1	0.097	1.233	0.120	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.0	21.05	N/A	0.05	0	Cellular Sub Antenna	44701	QPSK	25	25	10 mm	back	1:1	0.102	1.245	0.127	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.0	21.09	N/A	0.03	0	Cellular Sub Antenna	44701	QPSK	1	49	10 mm	front	1:1	0.103	1.233	0.127	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.0	21.05	N/A	0.04	0	Cellular Sub Antenna	44701	QPSK	25	25	10 mm	front	1:1	0.107	1.245	0.133	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.0	21.09	N/A	0.10	0	Cellular Sub Antenna	44701	QPSK	1	49	10 mm	top	1:1	0.034	1.233	0.042	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.0	21.05	N/A	0.00	0	Cellular Sub Antenna	44701	QPSK	25	25	10 mm	top	1:1	0.035	1.245	0.044	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.0	21.09	N/A	0.00	0	Cellular Sub Antenna	44701	QPSK	1	49	10 mm	right	1:1	0.156	1.233	0.192	
836.50	20525	Mid	LTE Band 5 (Cell)	10	22.0	21.05	N/A	0.04	0	Cellular Sub Antenna	44701	QPSK	25	25	10 mm	right	1:1	0.163	1.245	0.203	A40
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
LTE Band 66 (AWS) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.49	0.01	0	44701	QPSK	1	0	10 mm	back	1:1	0.288	1.416	0.408	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.55	0.08	0	44701	QPSK	50	0	10 mm	back	1:1	0.293	1.396	0.409	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.49	0.00	0	44701	QPSK	1	0	10 mm	front	1:1	0.320	1.416	0.453	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.55	0.03	0	44701	QPSK	50	0	10 mm	front	1:1	0.321	1.396	0.448	
1720.00	132072	Low	LTE Band 66 (AWS)	20	20.0	18.37	-0.02	0	44701	QPSK	1	99	10 mm	bottom	1:1	0.460	1.455	0.669	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.49	-0.05	0	44701	QPSK	1	0	10 mm	bottom	1:1	0.467	1.416	0.661	
1770.00	132572	High	LTE Band 66 (AWS)	20	20.0	18.26	-0.03	0	44701	QPSK	1	0	10 mm	bottom	1:1	0.429	1.493	0.640	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.55	0.00	0	44701	QPSK	50	0	10 mm	bottom	1:1	0.473	1.396	0.660	A42
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.49	0.11	0	44701	QPSK	1	0	10 mm	left	1:1	0.037	1.416	0.052	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.55	0.17	0	44701	QPSK	50	0	10 mm	left	1:1	0.038	1.396	0.053	
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
LTE Band 25 (PCS) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	18.78	0.04	0	44701	QPSK	1	99	10 mm	back	1:1	0.222	1.324	0.294	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	18.81	-0.03	0	44701	QPSK	50	50	10 mm	back	1:1	0.228	1.315	0.300	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	18.78	0.05	0	44701	QPSK	1	99	10 mm	front	1:1	0.177	1.324	0.234	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	18.81	0.00	0	44701	QPSK	50	50	10 mm	front	1:1	0.180	1.315	0.237	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	18.78	0.00	0	44701	QPSK	1	99	10 mm	bottom	1:1	0.365	1.324	0.483	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	18.81	-0.02	0	44701	QPSK	50	50	10 mm	bottom	1:1	0.372	1.315	0.489	A44
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	18.78	0.07	0	44701	QPSK	1	99	10 mm	left	1:1	0.042	1.324	0.056	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	18.81	0.06	0	44701	QPSK	50	50	10 mm	left	1:1	0.044	1.315	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 11-40
LTE Band 48 Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
3560.00	55340	Low	LTE Band 48	20	21.0	20.22	0.01	0	44941	QPSK	1	0	10 mm	back	1:1.58	0.211	1.197	0.253	
3560.00	55340	Low	LTE Band 48	20	21.0	20.23	0.03	0	44941	QPSK	50	0	10 mm	back	1:1.58	0.215	1.194	0.257	
3560.00	55340	Low	LTE Band 48	20	21.0	20.22	-0.06	0	44941	QPSK	1	0	10 mm	front	1:1.58	0.126	1.197	0.151	
3560.00	55340	Low	LTE Band 48	20	21.0	20.23	0.00	0	44941	QPSK	50	0	10 mm	front	1:1.58	0.127	1.194	0.152	
3560.00	55340	Low	LTE Band 48	20	21.0	20.22	0.05	0	44941	QPSK	1	0	10 mm	bottom	1:1.58	0.306	1.197	0.366	
3560.00	55340	Low	LTE Band 48	20	21.0	20.23	0.05	0	44941	QPSK	50	0	10 mm	bottom	1:1.58	0.310	1.194	**0.370**	A46
3560.00	55340	Low	LTE Band 48	20	21.0	20.22	-0.16	0	44941	QPSK	1	0	10 mm	right	1:1.58	0.124	1.197	0.148	
3560.00	55340	Low	LTE Band 48	20	21.0	20.23	0.00	0	44941	QPSK	50	0	10 mm	right	1:1.58	0.120	1.194	0.143	
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 11-41
LTE Band 41 Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
2680.00	41490	High	LTE Band 41	20	20.0	19.36	0.00	0	44941	QPSK	1	0	10 mm	back	1:1.58	0.190	1.159	0.220	
2680.00	41490	High	LTE Band 41	20	20.0	19.24	-0.02	0	44941	QPSK	50	0	10 mm	back	1:1.58	0.191	1.191	0.227	
2680.00	41490	High	LTE Band 41	20	20.0	19.36	-0.03	0	44941	QPSK	1	0	10 mm	front	1:1.58	0.107	1.159	0.124	
2680.00	41490	High	LTE Band 41	20	20.0	19.24	0.10	0	44941	QPSK	50	0	10 mm	front	1:1.58	0.098	1.191	0.117	
2680.00	41490	High	LTE Band 41	20	20.0	19.36	0.10	0	44941	QPSK	1	0	10 mm	bottom	1:1.58	0.212	1.159	0.246	A48
2680.00	41490	High	LTE Band 41	20	20.0	19.24	0.00	0	44941	QPSK	50	0	10 mm	bottom	1:1.58	0.190	1.191	0.226	
2680.00	41490	High	LTE Band 41	20	20.0	19.36	-0.02	0	44941	QPSK	1	0	10 mm	left	1:1.58	0.204	1.159	0.236	
2680.00	41490	High	LTE Band 41	20	20.0	19.24	-0.05	0	44941	QPSK	50	0	10 mm	left	1:1.58	0.193	1.191	0.230	
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 11-42
NR Band n71 Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
680.50	136100	Mid	NR Band n71	20	24.0	23.30	-0.13	0	45229	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.068	1.175	0.080	
680.50	136100	Mid	NR Band n71	20	24.0	23.13	-0.08	0	45229	DFT-S-OFDM	QPSK	50	0	10 mm	back	1:1	0.069	1.222	0.084	
680.50	136100	Mid	NR Band n71	20	24.0	23.30	0.17	0	45229	DFT-S-OFDM	QPSK	1	1	10 mm	front	1:1	0.047	1.175	0.055	
680.50	136100	Mid	NR Band n71	20	24.0	23.13	0.03	0	45229	DFT-S-OFDM	QPSK	50	0	10 mm	front	1:1	0.046	1.222	0.056	
680.50	136100	Mid	NR Band n71	20	24.0	23.30	-0.01	0	45229	DFT-S-OFDM	QPSK	1	1	10 mm	bottom	1:1	0.048	1.175	0.056	
680.50	136100	Mid	NR Band n71	20	24.0	23.13	-0.01	0	45229	DFT-S-OFDM	QPSK	50	0	10 mm	bottom	1:1	0.047	1.222	0.057	
680.50	136100	Mid	NR Band n71	20	24.0	23.30	-0.01	0	45229	DFT-S-OFDM	QPSK	1	1	10 mm	left	1:1	0.115	1.175	0.135	
680.50	136100	Mid	NR Band n71	20	24.0	23.13	0.03	0	45229	DFT-S-OFDM	QPSK	50	0	10 mm	left	1:1	0.115	1.222	0.141	A50
680.50	136100	Mid	NR Band n71	20	23.5	22.71	0.04	0.5	45229	CP-OFDM	QPSK	1	1	10 mm	left	1:1	0.094	1.199	0.113	
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 11-43
NR Band n5 Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.0	23.33	Cellular Main 1st Antenna	-0.02	0	45229	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.116	1.167	0.135	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.0	23.18	Cellular Main 1st Antenna	-0.11	0	45229	DFT-S-OFDM	QPSK	50	0	10 mm	back	1:1	0.124	1.208	0.150	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.0	23.33	Cellular Main 1st Antenna	-0.07	0	45229	DFT-S-OFDM	QPSK	1	1	10 mm	front	1:1	0.139	1.167	0.162	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.0	23.18	Cellular Main 1st Antenna	-0.04	0	45229	DFT-S-OFDM	QPSK	50	0	10 mm	front	1:1	0.137	1.208	0.165	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.0	23.33	Cellular Main 1st Antenna	0.09	0	45229	DFT-S-OFDM	QPSK	1	1	10 mm	bottom	1:1	0.045	1.167	0.053	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.0	23.18	Cellular Main 1st Antenna	-0.07	0	45229	DFT-S-OFDM	QPSK	50	0	10 mm	bottom	1:1	0.045	1.208	0.054	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.0	23.33	Cellular Main 1st Antenna	0.02	0	45229	DFT-S-OFDM	QPSK	1	1	10 mm	left	1:1	0.157	1.167	0.183	A52
836.50	167300	Mid	NR Band n5 (Cell)	20	24.0	23.18	Cellular Main 1st Antenna	0.11	0	45229	DFT-S-OFDM	QPSK	50	0	10 mm	left	1:1	0.147	1.208	0.178	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.5	22.46	Cellular Main 1st Antenna	-0.03	0.5	45229	CP-OFDM	QPSK	1	1	10 mm	left	1:1	0.133	1.271	0.169	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.0	22.32	Cellular Sub Antenna	-0.17	0	44941	DFT-S-OFDM	QPSK	1	104	10 mm	back	1:1	0.096	1.169	0.112	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.0	22.16	Cellular Sub Antenna	-0.01	0	44941	DFT-S-OFDM	QPSK	50	56	10 mm	back	1:1	0.098	1.213	0.119	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.0	22.32	Cellular Sub Antenna	0.05	0	44941	DFT-S-OFDM	QPSK	1	104	10 mm	front	1:1	0.115	1.169	0.134	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.0	22.16	Cellular Sub Antenna	0.03	0	44941	DFT-S-OFDM	QPSK	50	56	10 mm	front	1:1	0.095	1.213	0.115	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.0	22.32	Cellular Sub Antenna	0.05	0	44941	DFT-S-OFDM	QPSK	1	104	10 mm	top	1:1	0.026	1.169	0.030	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.0	22.16	Cellular Sub Antenna	-0.12	0	44941	DFT-S-OFDM	QPSK	50	56	10 mm	top	1:1	0.026	1.213	0.032	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.0	22.32	Cellular Sub Antenna	-0.02	0	44941	DFT-S-OFDM	QPSK	1	104	10 mm	right	1:1	0.155	1.169	0.181	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.0	22.16	Cellular Sub Antenna	-0.02	0	44941	DFT-S-OFDM	QPSK	50	56	10 mm	right	1:1	0.156	1.213	0.189	
836.50	167300	Mid	NR Band n5 (Cell)	20	22.5	21.90	Cellular Sub Antenna	0.00	0.5	44941	CP-OFDM	QPSK	1	1	10 mm	right	1:1	0.134	1.148	0.154	
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 11-44
NR Band n66 Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.94	0.00	0	44867	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.223	1.276	0.285	
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.74	-0.01	0	44867	DFT-S-OFDM	QPSK	50	0	10 mm	back	1:1	0.225	1.337	0.301	
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.94	0.02	0	44867	DFT-S-OFDM	QPSK	1	1	10 mm	front	1:1	0.213	1.276	0.272	
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.74	-0.03	0	44867	DFT-S-OFDM	QPSK	50	0	10 mm	front	1:1	0.225	1.337	0.301	
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.94	0.02	0	44867	DFT-S-OFDM	QPSK	1	1	10 mm	bottom	1:1	0.384	1.276	0.490	A54
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.74	0.01	0	44867	DFT-S-OFDM	QPSK	50	0	10 mm	bottom	1:1	0.373	1.337	0.499	
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.93	0.00	0	44867	CP-OFDM	QPSK	1	1	10 mm	bottom	1:1	0.379	1.279	0.485	
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.94	0.11	0	44867	DFT-S-OFDM	QPSK	1	1	10 mm	left	1:1	0.029	1.276	0.037	
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.74	0.03	0	44867	DFT-S-OFDM	QPSK	50	0	10 mm	left	1:1	0.029	1.337	0.039	
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 11-45
NR Band n2 Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	MPR [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
1880.00	376000	Mid	NR Band n2 (PCS)	20	20.0	19.12	-0.02	0	44867	DFT-S-OFDM	QPSK	1	53	10 mm	back	1:1	0.025	1.225	0.031	
1880.00	376000	Mid	NR Band n2 (PCS)	20	20.0	19.01	0.00	0	44867	DFT-S-OFDM	QPSK	50	28	10 mm	back	1:1	0.025	1.256	0.031	
1880.00	376000	Mid	NR Band n2 (PCS)	20	20.0	19.12	0.00	0	44867	DFT-S-OFDM	QPSK	1	53	10 mm	front	1:1	0.030	1.225	0.037	
1880.00	376000	Mid	NR Band n2 (PCS)	20	20.0	19.01	0.14	0	44867	DFT-S-OFDM	QPSK	50	28	10 mm	front	1:1	0.031	1.256	0.039	
1880.00	376000	Mid	NR Band n2 (PCS)	20	20.0	19.12	-0.01	0	44867	DFT-S-OFDM	QPSK	1	53	10 mm	bottom	1:1	0.039	1.225	0.048	
1880.00	376000	Mid	NR Band n2 (PCS)	20	20.0	19.01	-0.03	0	44867	DFT-S-OFDM	QPSK	50	28	10 mm	bottom	1:1	0.041	1.256	0.051	A56
1880.00	376000	Mid	NR Band n2 (PCS)	20	20.0	18.95	0.01	0	44867	CP-OFDM	QPSK	1	1	10 mm	bottom	1:1	0.039	1.274	0.050	
1880.00	376000	Mid	NR Band n2 (PCS)	20	20.0	19.12	0.00	0	44867	DFT-S-OFDM	QPSK	1	53	10 mm	left	1:1	0.013	1.225	0.016	
1880.00	376000	Mid	NR Band n2 (PCS)	20	20.0	19.01	-0.10	0	44867	DFT-S-OFDM	QPSK	50	28	10 mm	left	1:1	0.012	1.256	0.015	
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 11-46
NR Band n41 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	MPR [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
2592.99	518598	Mid	NR Band n41	100	16.0	15.12	0.02	0	45229	DFT-S-OFDM	QPSK	1	137	10 mm	back	1:1	0.050	1.225	0.061	
2592.99	518598	Mid	NR Band n41	100	16.0	15.16	0.01	0	45229	DFT-S-OFDM	QPSK	135	69	10 mm	back	1:1	0.046	1.213	0.056	
2592.99	518598	Mid	NR Band n41	100	16.0	15.12	0.01	0	45229	DFT-S-OFDM	QPSK	1	137	10 mm	front	1:1	0.063	1.225	0.077	
2592.99	518598	Mid	NR Band n41	100	16.0	15.16	0.01	0	45229	DFT-S-OFDM	QPSK	135	69	10 mm	front	1:1	0.069	1.213	0.084	
2592.99	518598	Mid	NR Band n41	100	16.0	15.12	0.01	0	45229	DFT-S-OFDM	QPSK	1	137	10 mm	top	1:1	0.016	1.225	0.020	
2592.99	518598	Mid	NR Band n41	100	16.0	15.16	0.10	0	45229	DFT-S-OFDM	QPSK	135	69	10 mm	top	1:1	0.021	1.213	0.025	
2592.99	518598	Mid	NR Band n41	100	16.0	15.12	0.01	0	45229	DFT-S-OFDM	QPSK	1	137	10 mm	right	1:1	0.086	1.225	0.105	
2592.99	518598	Mid	NR Band n41	100	16.0	15.16	-0.10	0	45229	DFT-S-OFDM	QPSK	135	69	10 mm	right	1:1	0.092	1.213	0.112	A58
2592.99	518598	Mid	NR Band n41	100	16.0	14.75	0.01	0	45229	CP-OFDM	QPSK	1	1	10 mm	right	1:1	0.084	1.334	0.112	
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 11-47
NR Band n77 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	MPR [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
3930.00	662000	High	NR Band n77	100	19.0	17.90	0.00	0	44867	DFT-S-OFDM	QPSK	1	137	10 mm	back	1:1	0.150	1.288	0.150	
3930.00	662000	High	NR Band n77	100	19.0	17.68	0.08	0	44867	DFT-S-OFDM	QPSK	135	69	10 mm	back	1:1	0.153	1.355	0.207	
3930.00	662000	High	NR Band n77	100	19.0	17.90	0.00	0	44867	DFT-S-OFDM	QPSK	1	137	10 mm	front	1:1	0.087	1.288	0.112	
3930.00	662000	High	NR Band n77	100	19.0	17.68	0.00	0	44867	DFT-S-OFDM	QPSK	135	69	10 mm	front	1:1	0.084	1.355	0.114	
3930.00	662000	High	NR Band n77	100	19.0	17.90	0.15	0	44867	DFT-S-OFDM	QPSK	1	137	10 mm	bottom	1:1	0.214	1.288	0.276	
3930.00	662000	High	NR Band n77	100	19.0	17.68	0.00	0	44867	DFT-S-OFDM	QPSK	135	69	10 mm	bottom	1:1	0.218	1.355	0.295	
3930.00	662000	High	NR Band n77	100	19.0	17.60	0.00	0	44867	CP-OFDM	QPSK	1	1	10 mm	bottom	1:1	0.234	1.380	0.323	A60
3930.00	662000	High	NR Band n77	100	19.0	17.90	0.00	0	44867	DFT-S-OFDM	QPSK	1	137	10 mm	right	1:1	0.067	1.288	0.086	
3930.00	662000	High	NR Band n77	100	19.0	17.68	0.00	0	44867	DFT-S-OFDM	QPSK	135	69	10 mm	right	1:1	0.071	1.355	0.096	
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 11-48
WLAN Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	14.07	14.06	0.01	10 mm	1	44842	1	back	99.9	0.043	-	1.002	1.001	-	
2437	6	802.11b	DSSS	22	14.07	14.06	0.02	10 mm	1	44842	1	front	99.9	0.044	-	1.002	1.001	-	
2437	6	802.11b	DSSS	22	14.07	14.06	0.00	10 mm	1	44842	1	top	99.9	0.013	-	1.002	1.001	-	
2437	6	802.11b	DSSS	22	14.07	14.06	-0.19	10 mm	1	44842	1	left	99.9	0.106	0.079	1.002	1.001	**0.079**	A62
2437	6	802.11b	DSSS	22	12.30	12.11	0.00	10 mm	2	44842	1	back	99.8	0.003	-	1.045	1.002	-	
2437	6	802.11b	DSSS	22	12.30	12.11	0.02	10 mm	2	44842	1	front	99.8	0.009	0.000	1.045	1.002	0.000	
2437	6	802.11b	DSSS	22	12.30	12.11	0.00	10 mm	2	44842	1	left	99.8	0.004	-	1.045	1.002	-	
5230	46	802.11n	OFDM	40	12.52	12.29	-0.01	10 mm	1	45369	13.5	back	99.7	0.064	0.024	1.054	1.003	0.025	
5230	46	802.11n	OFDM	40	12.52	12.29	0.00	10 mm	1	45369	13.5	front	99.7	0.000	-	1.054	1.003	-	
5230	46	802.11n	OFDM	40	12.52	12.29	0.01	10 mm	1	45369	13.5	top	99.7	0.000	-	1.054	1.003	-	
5230	46	802.11n	OFDM	40	12.52	12.29	0.00	10 mm	1	45369	13.5	left	99.7	0.003	-	1.054	1.003	-	
5230	46	802.11n	OFDM	40	12.18	11.99	0.02	10 mm	2	45369	13.5	back	99.7	0.097	0.067	1.045	1.003	**0.070**	
5230	46	802.11n	OFDM	40	12.18	11.99	0.04	10 mm	2	45369	13.5	front	99.7	0.009	-	1.045	1.003	-	
5230	46	802.11n	OFDM	40	12.2	11.99	0.01	10 mm	2	45369	13.5	top	99.7	0.037	-	1.045	1.003	-	
5230	46	802.11n	OFDM	40	12.18	11.99	0.10	10 mm	2	45369	13.5	left	99.7	0.079	-	1.045	1.003	-	
5795	159	802.11n	OFDM	40	12.52	12.44	0.10	10 mm	1	45369	13.5	back	99.7	0.034	0.011	1.019	1.003	0.011	
5795	159	802.11n	OFDM	40	12.52	12.44	0.20	10 mm	1	45369	13.5	front	99.7	0.000	-	1.019	1.003	-	
5795	159	802.11n	OFDM	40	12.52	12.44	0.00	10 mm	1	45369	13.5	top	99.7	0.000	-	1.019	1.003	-	
5795	159	802.11n	OFDM	40	12.52	12.44	0.00	10 mm	1	45369	13.5	left	99.7	0.015	-	1.019	1.003	-	
5795	159	802.11n	OFDM	40	12.18	11.74	0.00	10 mm	2	45369	13.5	back	99.7	0.043	-	1.107	1.003	-	
5795	159	802.11n	OFDM	40	12.18	11.74	0.00	10 mm	2	45369	13.5	front	99.7	0.003	-	1.107	1.003	-	
5795	159	802.11n	OFDM	40	12.2	11.74	0.10	10 mm	2	45369	13.5	top	99.7	0.055	-	1.107	1.003	-	
5795	159	802.11n	OFDM	40	12.18	11.74	0.01	10 mm	2	45369	13.5	left	99.7	0.103	0.067	1.107	1.003	**0.074**	A64
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 11-49
DSS Hotspot SAR

MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)			(W/kg)	
2480	78	Bluetooth	FHSS	14.0	13.10	0.01	10 mm	1	44982	1	back	77.00	0.012	1.230	1.299	0.019	
2480	78	Bluetooth	FHSS	14.0	13.10	-0.02	10 mm	1	44982	1	front	77.00	0.009	1.230	1.299	0.014	
2480	78	Bluetooth	FHSS	14.0	13.10	0.00	10 mm	1	44982	1	top	77.00	0.003	1.230	1.299	0.005	
2480	78	Bluetooth	FHSS	14.0	13.10	-0.05	10 mm	1	44982	1	left	77.00	0.034	1.230	1.299	**0.054**	A66
2441	39	Bluetooth	FHSS	14.0	13.16	-0.08	10 mm	2	44982	1	back	76.80	0.020	1.213	1.302	0.032	
2441	39	Bluetooth	FHSS	14.0	13.16	-0.07	10 mm	2	44982	1	front	76.80	0.002	1.213	1.302	0.003	
2441	39	Bluetooth	FHSS	14.0	13.16	0.00	10 mm	2	44982	1	left	76.80	0.011	1.213	1.302	0.017	
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 11-50
LTE Band 66/25 Phablet SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.49	0.01	0	44941	QPSK	1	0	0 mm	back	1:1	0.779	1.416	1.103	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.55	0.00	0	44941	QPSK	50	0	0 mm	back	1:1	0.793	1.396	1.107	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.49	0.00	0	44941	QPSK	1	0	0 mm	front	1:1	0.956	1.416	1.354	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.55	0.00	0	44941	QPSK	50	0	0 mm	front	1:1	0.998	1.396	**1.393**	A67
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.49	0.01	0	44941	QPSK	1	0	0 mm	bottom	1:1	0.894	1.416	1.266	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	20.0	18.55	0.02	0	44941	QPSK	50	0	0 mm	bottom	1:1	0.913	1.396	1.275	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	18.78	-0.08	0	44701	QPSK	1	99	0 mm	bottom	1:1	0.966	1.324	1.279	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	18.81	-0.09	0	44701	QPSK	50	50	0 mm	bottom	1:1	1.030	1.315	1.354	A68
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 11-51
NR Band n66 Phablet SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.94	0.09	0	44867	DFT-S-OFDM	QPSK	1	1	0 mm	bottom	1:1	0.674	1.276	0.860	
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.74	0.06	0	44867	DFT-S-OFDM	QPSK	50	0	0 mm	bottom	1:1	0.612	1.337	0.818	
1720.00	344000	Low	NR Band n66 (AWS)	20	20.0	18.93	0.01	0	44867	CP-OFDM	QPSK	1	1	0 mm	bottom	1:1	0.735	1.279	0.940	A69
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 11-52
NR Band n77 Phablet SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	MPR [dB]	Duty Cycle	Scaling Factor	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																	(W/kg)	(W/kg)	
3750.00	650000	Low	NR Band n77	100	19.0	17.43	0.01	0	44867	DFT-S-OFDM	QPSK	1	137	0 mm	bottom	1:1	1.435	0.857	1.230	
3930.00	662000	High	NR Band n77	100	19.0	17.90	0.00	0	44867	DFT-S-OFDM	QPSK	1	137	0 mm	bottom	1:1	1.288	0.964	1.242	
3750.00	650000	Low	NR Band n77	100	19.0	17.44	0.02	0	44867	DFT-S-OFDM	QPSK	135	0	0 mm	bottom	1:1	1.431	0.852	1.219	
3930.00	662000	High	NR Band n77	100	19.0	17.68	0.00	0	44867	DFT-S-OFDM	QPSK	135	69	0 mm	bottom	1:1	1.355	0.934	1.266	
3750.00	650000	Low	NR Band n77	100	19.0	17.46	0.01	0	44867	DFT-S-OFDM	QPSK	270	0	0 mm	bottom	1:1	1.426	0.856	1.221	
3930.00	662000	High	NR Band n77	100	19.0	17.60	0.00	0	44867	CP-OFDM	QPSK	1	1	0 mm	bottom	1:1	1.380	1.010	**1.394**	A70
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Extremity 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11-53
WLAN Phablet SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5270	54	802.11n	OFDM	40	12.52	12.24	0.10	0 mm	1	45369	13.5	back	99.7	0.655	0.107	1.067	1.003	0.115	
5270	54	802.11n	OFDM	40	12.52	12.24	0.00	0 mm	1	45369	13.5	front	99.7	0.094	-	1.067	1.003	-	
5270	54	802.11n	OFDM	40	12.52	12.24	0.02	0 mm	1	45369	13.5	top	99.7	0.008	-	1.067	1.003	-	
5270	54	802.11n	OFDM	40	12.52	12.24	0.00	0 mm	1	45369	13.5	left	99.7	0.458	-	1.067	1.003	-	
5270	54	802.11n	OFDM	40	12.18	12.02	0.10	0 mm	2	45369	13.5	back	99.7	0.745	-	1.038	1.003	-	
5270	54	802.11n	OFDM	40	12.18	12.02	0.00	0 mm	2	45369	13.5	front	99.7	0.418	-	1.038	1.003	-	
5270	54	802.11n	OFDM	40	12.18	12.02	0.02	0 mm	2	45369	13.5	top	99.7	0.271	-	1.038	1.003	-	
5270	54	802.11n	OFDM	40	12.18	12.02	-0.02	0 mm	2	45369	13.5	left	99.7	1.920	0.325	1.038	1.003	**0.338**	A71
5690	138	802.11ac	OFDM	80	12.52	12.45	0.03	0 mm	1	45369	29.3	back	99.7	0.564	0.126	1.016	1.003	0.128	
5690	138	802.11ac	OFDM	80	12.52	12.45	0.00	0 mm	1	45369	29.3	front	99.7	0.189	-	1.016	1.003	-	
5690	138	802.11ac	OFDM	80	12.52	12.45	0.00	0 mm	1	45369	29.3	top	99.7	0.032	-	1.016	1.003	-	
5690	138	802.11ac	OFDM	80	12.52	12.45	0.20	0 mm	1	45369	29.3	left	99.7	0.447	-	1.016	1.003	-	
5610	122	802.11ac	OFDM	80	12.18	11.92	0.10	0 mm	2	45369	29.3	back	99.7	0.571	-	1.062	1.003	-	
5610	122	802.11ac	OFDM	80	12.18	11.92	0.00	0 mm	2	45369	29.3	front	99.7	0.504	-	1.062	1.003	-	
5610	122	802.11ac	OFDM	80	12.18	11.92	0.10	0 mm	2	45369	29.3	top	99.7	0.326	-	1.062	1.003	-	
5610	122	802.11ac	OFDM	80	12.18	11.92	0.02	0 mm	2	45369	29.3	left	99.7	1.420	0.253	1.062	1.003	0.269	
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 D01v06.
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 D01v06.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10 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. 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).
9. Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is > 160 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.
10. 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 14 for supplemental data.

11. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds below.
12. This device uses Qualcomm Smart Transmit for 2G/3G/4G/5G operations to control and manage transmitting power in real time to ensure RF Exposure compliance. Per FCC Guidance, compliance was assessed at the minimum of the time averaged power and the maximum output power for each band/mode/exposure condition (DSI).
13. Per FCC KDB Publication 865664 D01v01r04, variability SAR tests were not required since measured SAR results for all frequency bands were less than 0.8 W/kg.

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 D01v06, if the reported (scaled) SAR measured at the middle channel or 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). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.
4. DTM SAR was evaluated with CMW500 Radio Communication Tester FW version 3.7.26 when the device was operating in DTM using maximum CS and PS slots according to FCC KDB 941225 D04v01.

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 D01v06, if the reported (scaled) SAR measured at the middle channel or 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). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

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 D01v06, when the reported LTE Band 41 or LTE Band 48 SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for 1g evaluations, 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.

NR Notes:

1. NR implementation is limited to EN-DC operations only, with the LTE Bands shown in the NR FR1 checklist acting as anchor bands. For n77 operations, only 5G NR SA is supported. 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 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 in section 1-12).
4. This device additionally supports some EN-DC conditions where additional LTE carriers are added on the downlink only.
5. 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.
6. Per FCC KDB Publication 447498 D01v06, when the reported NR Band n77 SAR measured at the highest output power channel in a given a test configuration was > 0.4 W/kg for 1g evaluations and > 1 W/kg for 10g evaluation, testing at the other channels was required for such test configurations.

WLAN Notes:

1. For held-to-ear, and 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 single transmission chain 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 D01v06 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 Section 12 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.

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 100% transmission duty factor to determine compliance. See Section 9.6 for the time domain plot and calculation for the duty factor of the device.
2. Head and Hotspot Bluetooth SAR were evaluated for BT BR tethering applications.

12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v06 are applicable to devices with built-in unlicensed transmitters such as 802.11 and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

12.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore, simultaneous transmission analysis is required. Per FCC KDB Publication 447498 D01v06 4.3.2 and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 1g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤1.6 W/kg. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1g or 10g SAR.

Qualcomm Smart Transmit algorithm in WWAN adds directly the time-averaged RF exposure from 4G and time-averaged RF exposure from 5G NR. Smart Transmit algorithm controls the total RF exposure from both 4G and 5G NR conditions to not exceed FCC limit. Therefore, simultaneous transmission compliance between 4G+5G operations is demonstrated in the Part 2 Report during algorithm validation.
Per FCC KDB Publication 941225 D06v02r01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR ("-").

(*) For test positions that were not required to be evaluated for WLAN SAR per FCC KDB publication 248227, the worst case WLAN SAR result for the applicable exposure conditions was used for simultaneous transmission analysis.

12.3 Head SAR Simultaneous Transmission Analysis

Table 12-1
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Held to Ear)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM/DTM 850	0.309	0.153	0.007	0.462	0.316	0.469
	GSM/DTM 1900	0.056	0.153	0.007	0.209	0.063	0.216
	UMTS 850	0.278	0.153	0.007	0.431	0.285	0.438
	UMTS 1750	0.089	0.153	0.007	0.242	0.096	0.249
	UMTS 1900	0.105	0.153	0.007	0.258	0.112	0.265
	LTE Band 71	0.136	0.153	0.007	0.289	0.143	0.296
	LTE Band 12	0.197	0.153	0.007	0.350	0.204	0.357
	LTE Band 13	0.239	0.153	0.007	0.392	0.246	0.399
	LTE Band 5 (Cell)	0.269	0.153	0.007	0.422	0.276	0.429
	LTE Band 66 (AWS)	0.144	0.153	0.007	0.297	0.151	0.304
	LTE Band 25 (PCS)	0.126	0.153	0.007	0.279	0.133	0.286
	LTE Band 48	0.046	0.153	0.007	0.199	0.053	0.206
	LTE Band 41	0.027	0.153	0.007	0.180	0.034	0.187
	NR Band n71	0.074	0.153	0.007	0.227	0.081	0.234
	NR Band n5 (Cell)	0.199	0.153	0.007	0.352	0.206	0.359
	NR Band n66 (AWS)	0.054	0.153	0.007	0.207	0.061	0.214
	NR Band n2 (PCS)	0.005	0.153	0.007	0.158	0.012	0.165
	NR Band n41	0.540	0.153	0.007	0.693	0.547	**0.700**
	NR Band n77	0.020	0.153	0.007	0.173	0.027	0.180

Table 12-2
Simultaneous Transmission Scenario with 5 GHz WLAN (Held to Ear)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM/DTM 850	0.309	0.049	0.112	0.358	0.421	0.470
	GSM/DTM 1900	0.056	0.049	0.112	0.105	0.168	0.217
	UMTS 850	0.278	0.049	0.112	0.327	0.390	0.439
	UMTS 1750	0.089	0.049	0.112	0.138	0.201	0.250
	UMTS 1900	0.105	0.049	0.112	0.154	0.217	0.266
	LTE Band 71	0.136	0.049	0.112	0.185	0.248	0.297
	LTE Band 12	0.197	0.049	0.112	0.246	0.309	0.358
	LTE Band 13	0.239	0.049	0.112	0.288	0.351	0.400
	LTE Band 5 (Cell)	0.269	0.049	0.112	0.318	0.381	0.430
	LTE Band 66 (AWS)	0.144	0.049	0.112	0.193	0.256	0.305
	LTE Band 25 (PCS)	0.126	0.049	0.112	0.175	0.238	0.287
	LTE Band 48	0.046	0.049	0.112	0.095	0.158	0.207
	LTE Band 41	0.027	0.049	0.112	0.076	0.139	0.188
	NR Band n71	0.074	0.049	0.112	0.123	0.186	0.235
	NR Band n5 (Cell)	0.199	0.049	0.112	0.248	0.311	0.360
	NR Band n66 (AWS)	0.054	0.049	0.112	0.103	0.166	0.215
	NR Band n2 (PCS)	0.005	0.049	0.112	0.054	0.117	0.166
	NR Band n41	0.540	0.049	0.112	0.589	0.652	**0.701**
	NR Band n77	0.020	0.049	0.112	0.069	0.132	0.181

Table 12-3
Simultaneous Transmission Scenario with 2.4 GHz WLAN MIMO and 5 GHz WLAN MIMO (Held to Ear)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	5	1+2+3+4+5
Head SAR	GSM/DTM 850	0.309	0.153	0.007	0.049	0.112	0.630
	GSM/DTM 1900	0.056	0.153	0.007	0.049	0.112	0.377
	UMTS 850	0.278	0.153	0.007	0.049	0.112	0.599
	UMTS 1750	0.089	0.153	0.007	0.049	0.112	0.410
	UMTS 1900	0.105	0.153	0.007	0.049	0.112	0.426
	LTE Band 71	0.136	0.153	0.007	0.049	0.112	0.457
	LTE Band 12	0.197	0.153	0.007	0.049	0.112	0.518
	LTE Band 13	0.239	0.153	0.007	0.049	0.112	0.560
	LTE Band 5 (Cell)	0.269	0.153	0.007	0.049	0.112	0.590
	LTE Band 66 (AWS)	0.144	0.153	0.007	0.049	0.112	0.465
	LTE Band 25 (PCS)	0.126	0.153	0.007	0.049	0.112	0.447
	LTE Band 48	0.046	0.153	0.007	0.049	0.112	0.367
	LTE Band 41	0.027	0.153	0.007	0.049	0.112	0.348
	NR Band n71	0.074	0.153	0.007	0.049	0.112	0.395
	NR Band n5 (Cell)	0.199	0.153	0.007	0.049	0.112	0.520
	NR Band n66 (AWS)	0.054	0.153	0.007	0.049	0.112	0.375
	NR Band n2 (PCS)	0.005	0.153	0.007	0.049	0.112	0.326
	NR Band n41	0.540	0.153	0.007	0.049	0.112	**0.861**
	NR Band n77	0.020	0.153	0.007	0.049	0.112	0.341

Table 12-4
Simultaneous Transmission Scenario with Bluetooth (Held to Ear)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz Bluetooth Ant 1 SAR (W/kg)	2.4 GHz Bluetooth Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Head SAR	GSM/DTM 850	0.309	0.067	0.011	0.376	0.320
	GSM/DTM 1900	0.056	0.067	0.011	0.123	0.067
	UMTS 850	0.278	0.067	0.011	0.345	0.289
	UMTS 1750	0.089	0.067	0.011	0.156	0.100
	UMTS 1900	0.105	0.067	0.011	0.172	0.116
	LTE Band 71	0.136	0.067	0.011	0.203	0.147
	LTE Band 12	0.197	0.067	0.011	0.264	0.208
	LTE Band 13	0.239	0.067	0.011	0.306	0.250
	LTE Band 5 (Cell)	0.269	0.067	0.011	0.336	0.280
	LTE Band 66 (AWS)	0.144	0.067	0.011	0.211	0.155
	LTE Band 25 (PCS)	0.126	0.067	0.011	0.193	0.137
	LTE Band 48	0.046	0.067	0.011	0.113	0.057
	LTE Band 41	0.027	0.067	0.011	0.094	0.038
	NR Band n71	0.074	0.067	0.011	0.141	0.085
	NR Band n5 (Cell)	0.199	0.067	0.011	0.266	0.210
	NR Band n66 (AWS)	0.054	0.067	0.011	0.121	0.065
	NR Band n2 (PCS)	0.005	0.067	0.011	0.072	0.016
	NR Band n41	0.540	0.067	0.011	**0.607**	0.551
	NR Band n77	0.020	0.067	0.011	0.087	0.031

Table 12-5
Simultaneous Transmission Scenario with Bluetooth Ant 1 and 5 GHz WLAN (Held to Ear)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz Bluetooth Ant 1 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Head SAR	GSM/DTM 850	0.309	0.067	0.049	0.112	0.425	0.488	0.537
	GSM/DTM 1900	0.056	0.067	0.049	0.112	0.172	0.235	0.284
	UMTS 850	0.278	0.067	0.049	0.112	0.394	0.457	0.506
	UMTS 1750	0.089	0.067	0.049	0.112	0.205	0.268	0.317
	UMTS 1900	0.105	0.067	0.049	0.112	0.221	0.284	0.333
	LTE Band 71	0.136	0.067	0.049	0.112	0.252	0.315	0.364
	LTE Band 12	0.197	0.067	0.049	0.112	0.313	0.376	0.425
	LTE Band 13	0.239	0.067	0.049	0.112	0.355	0.418	0.467
	LTE Band 5 (Cell)	0.269	0.067	0.049	0.112	0.385	0.448	0.497
	LTE Band 66 (AWS)	0.144	0.067	0.049	0.112	0.260	0.323	0.372
	LTE Band 25 (PCS)	0.126	0.067	0.049	0.112	0.242	0.305	0.354
	LTE Band 48	0.046	0.067	0.049	0.112	0.162	0.225	0.274
	LTE Band 41	0.027	0.067	0.049	0.112	0.143	0.206	0.255
	NR Band n71	0.074	0.067	0.049	0.112	0.190	0.253	0.302
	NR Band n5 (Cell)	0.199	0.067	0.049	0.112	0.315	0.378	0.427
	NR Band n66 (AWS)	0.054	0.067	0.049	0.112	0.170	0.233	0.282
	NR Band n2 (PCS)	0.005	0.067	0.049	0.112	0.121	0.184	0.233
	NR Band n41	0.540	0.067	0.049	0.112	0.656	0.719	**0.768**
	NR Band n77	0.020	0.067	0.049	0.112	0.136	0.199	0.248

Table 12-6
Simultaneous Transmission Scenario with Bluetooth Ant 2 and 5 GHz WLAN (Held to Ear)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz Bluetooth Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Head SAR	GSM/DTM 850	0.309	0.011	0.049	0.112	0.369	0.432	0.481
	GSM/DTM 1900	0.056	0.011	0.049	0.112	0.116	0.179	0.228
	UMTS 850	0.278	0.011	0.049	0.112	0.338	0.401	0.450
	UMTS 1750	0.089	0.011	0.049	0.112	0.149	0.212	0.261
	UMTS 1900	0.105	0.011	0.049	0.112	0.165	0.228	0.277
	LTE Band 71	0.136	0.011	0.049	0.112	0.196	0.259	0.308
	LTE Band 12	0.197	0.011	0.049	0.112	0.257	0.320	0.369
	LTE Band 13	0.239	0.011	0.049	0.112	0.299	0.362	0.411
	LTE Band 5 (Cell)	0.269	0.011	0.049	0.112	0.329	0.392	0.441
	LTE Band 66 (AWS)	0.144	0.011	0.049	0.112	0.204	0.267	0.316
	LTE Band 25 (PCS)	0.126	0.011	0.049	0.112	0.186	0.249	0.298
	LTE Band 48	0.046	0.011	0.049	0.112	0.106	0.169	0.218
	LTE Band 41	0.027	0.011	0.049	0.112	0.087	0.150	0.199
	NR Band n71	0.074	0.011	0.049	0.112	0.134	0.197	0.246
	NR Band n5 (Cell)	0.199	0.011	0.049	0.112	0.259	0.322	0.371
	NR Band n66 (AWS)	0.054	0.011	0.049	0.112	0.114	0.177	0.226
	NR Band n2 (PCS)	0.005	0.011	0.049	0.112	0.065	0.128	0.177
	NR Band n41	0.540	0.011	0.049	0.112	0.600	0.663	**0.712**
	NR Band n77	0.020	0.011	0.049	0.112	0.080	0.143	0.192

12.1 Body-Worn Simultaneous Transmission Analysis

Table 12-7
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn SAR	GSM/DTM 850	0.273	0.033	0.000	0.306	0.273	0.306
	GSM/DTM 1900	0.258	0.033	0.000	0.291	0.258	0.291
	UMTS 850	0.305	0.033	0.000	0.338	0.305	0.338
	UMTS 1750	0.420	0.033	0.000	**0.453**	0.420	**0.453**
	UMTS 1900	0.283	0.033	0.000	0.316	0.283	0.316
	LTE Band 71	0.213	0.033	0.000	0.246	0.213	0.246
	LTE Band 12	0.326	0.033	0.000	0.359	0.326	0.359
	LTE Band 13	0.156	0.033	0.000	0.189	0.156	0.189
	LTE Band 5 (Cell)	0.165	0.033	0.000	0.198	0.165	0.198
	LTE Band 66 (AWS)	0.409	0.033	0.000	0.442	0.409	0.442
	LTE Band 25 (PCS)	0.300	0.033	0.000	0.333	0.300	0.333
	LTE Band 48	0.257	0.033	0.000	0.290	0.257	0.290
	LTE Band 41	0.227	0.033	0.000	0.260	0.227	0.260
	NR Band n71	0.084	0.033	0.000	0.117	0.084	0.117
	NR Band n5 (Cell)	0.150	0.033	0.000	0.183	0.150	0.183
	NR Band n66 (AWS)	0.301	0.033	0.000	0.334	0.301	0.334
	NR Band n2 (PCS)	0.031	0.033	0.000	0.064	0.031	0.064
	NR Band n41	0.061	0.033	0.000	0.094	0.061	0.094
	NR Band n77	0.207	0.033	0.000	0.240	0.207	0.240

Table 12-8
Simultaneous Transmission Scenario with 5 GHz WLAN (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn SAR	GSM/DTM 850	0.273	0.021	0.069	0.294	0.342	0.363
	GSM/DTM 1900	0.258	0.021	0.069	0.279	0.327	0.348
	UMTS 850	0.305	0.021	0.069	0.326	0.374	0.395
	UMTS 1750	0.420	0.021	0.069	0.441	0.489	**0.510**
	UMTS 1900	0.283	0.021	0.069	0.304	0.352	0.373
	LTE Band 71	0.213	0.021	0.069	0.234	0.282	0.303
	LTE Band 12	0.326	0.021	0.069	0.347	0.395	0.416
	LTE Band 13	0.156	0.021	0.069	0.177	0.225	0.246
	LTE Band 5 (Cell)	0.165	0.021	0.069	0.186	0.234	0.255
	LTE Band 66 (AWS)	0.409	0.021	0.069	0.430	0.478	0.499
	LTE Band 25 (PCS)	0.300	0.021	0.069	0.321	0.369	0.390
	LTE Band 48	0.257	0.021	0.069	0.278	0.326	0.347
	LTE Band 41	0.227	0.021	0.069	0.248	0.296	0.317
	NR Band n71	0.084	0.021	0.069	0.105	0.153	0.174
	NR Band n5 (Cell)	0.150	0.021	0.069	0.171	0.219	0.240
	NR Band n66 (AWS)	0.301	0.021	0.069	0.322	0.370	0.391
	NR Band n2 (PCS)	0.031	0.021	0.069	0.052	0.100	0.121
	NR Band n41	0.061	0.021	0.069	0.082	0.130	0.151
	NR Band n77	0.207	0.021	0.069	0.228	0.276	0.297

Table 12-9
Simultaneous Transmission Scenario with 2.4 GHz WLAN MIMO and 5 GHz WLAN MIMO (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	5	1+2+3+4+5
Body-Worn SAR	GSM/DTM 850	0.273	0.033	0.000	0.021	0.069	0.396
	GSM/DTM 1900	0.258	0.033	0.000	0.021	0.069	0.381
	UMTS 850	0.305	0.033	0.000	0.021	0.069	0.428
	UMTS 1750	0.420	0.033	0.000	0.021	0.069	**0.543**
	UMTS 1900	0.283	0.033	0.000	0.021	0.069	0.406
	LTE Band 71	0.213	0.033	0.000	0.021	0.069	0.336
	LTE Band 12	0.326	0.033	0.000	0.021	0.069	0.449
	LTE Band 13	0.156	0.033	0.000	0.021	0.069	0.279
	LTE Band 5 (Cell)	0.165	0.033	0.000	0.021	0.069	0.288
	LTE Band 66 (AWS)	0.409	0.033	0.000	0.021	0.069	0.532
	LTE Band 25 (PCS)	0.300	0.033	0.000	0.021	0.069	0.423
	LTE Band 48	0.257	0.033	0.000	0.021	0.069	0.380
	LTE Band 41	0.227	0.033	0.000	0.021	0.069	0.350
	NR Band n71	0.084	0.033	0.000	0.021	0.069	0.207
	NR Band n5 (Cell)	0.150	0.033	0.000	0.021	0.069	0.273
	NR Band n66 (AWS)	0.301	0.033	0.000	0.021	0.069	0.424
	NR Band n2 (PCS)	0.031	0.033	0.000	0.021	0.069	0.154
	NR Band n41	0.061	0.033	0.000	0.021	0.069	0.184
	NR Band n77	0.207	0.033	0.000	0.021	0.069	0.330

Table 12-10
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz Bluetooth Ant 1 SAR (W/kg)	2.4 GHz Bluetooth Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Body - Worn SAR	GSM/DTM 850	0.273	0.019	0.032	0.292	0.305
	GSM/DTM 1900	0.258	0.019	0.032	0.277	0.290
	UMTS 850	0.305	0.019	0.032	0.324	0.337
	UMTS 1750	0.420	0.019	0.032	0.439	**0.452**
	UMTS 1900	0.283	0.019	0.032	0.302	0.315
	LTE Band 71	0.213	0.019	0.032	0.232	0.245
	LTE Band 12	0.326	0.019	0.032	0.345	0.358
	LTE Band 13	0.156	0.019	0.032	0.175	0.188
	LTE Band 5 (Cell)	0.165	0.019	0.032	0.184	0.197
	LTE Band 66 (AWS)	0.409	0.019	0.032	0.428	0.441
	LTE Band 25 (PCS)	0.300	0.019	0.032	0.319	0.332
	LTE Band 48	0.257	0.019	0.032	0.276	0.289
	LTE Band 41	0.227	0.019	0.032	0.246	0.259
	NR Band n71	0.084	0.019	0.032	0.103	0.116
	NR Band n5 (Cell)	0.150	0.019	0.032	0.169	0.182
	NR Band n66 (AWS)	0.301	0.019	0.032	0.320	0.333
	NR Band n2 (PCS)	0.031	0.019	0.032	0.050	0.063
	NR Band n41	0.061	0.019	0.032	0.080	0.093
	NR Band n77	0.207	0.019	0.032	0.226	0.239

Table 12-11
Simultaneous Transmission Scenario with Bluetooth Ant 1 and 5 GHz WLAN (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz Bluetooth Ant 1 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Body-Worn SAR	GSM/DTM 850	0.273	0.019	0.021	0.069	0.313	0.361	0.382
	GSM/DTM 1900	0.258	0.019	0.021	0.069	0.298	0.346	0.367
	UMTS 850	0.305	0.019	0.021	0.069	0.345	0.393	0.414
	UMTS 1750	0.420	0.019	0.021	0.069	0.460	0.508	**0.529**
	UMTS 1900	0.283	0.019	0.021	0.069	0.323	0.371	0.392
	LTE Band 71	0.213	0.019	0.021	0.069	0.253	0.301	0.322
	LTE Band 12	0.326	0.019	0.021	0.069	0.366	0.414	0.435
	LTE Band 13	0.156	0.019	0.021	0.069	0.196	0.244	0.265
	LTE Band 5 (Cell)	0.165	0.019	0.021	0.069	0.205	0.253	0.274
	LTE Band 66 (AWS)	0.409	0.019	0.021	0.069	0.449	0.497	0.518
	LTE Band 25 (PCS)	0.300	0.019	0.021	0.069	0.340	0.388	0.409
	LTE Band 48	0.257	0.019	0.021	0.069	0.297	0.345	0.366
	LTE Band 41	0.227	0.019	0.021	0.069	0.267	0.315	0.336
	NR Band n71	0.084	0.019	0.021	0.069	0.124	0.172	0.193
	NR Band n5 (Cell)	0.150	0.019	0.021	0.069	0.190	0.238	0.259
	NR Band n66 (AWS)	0.301	0.019	0.021	0.069	0.341	0.389	0.410
	NR Band n2 (PCS)	0.031	0.019	0.021	0.069	0.071	0.119	0.140
	NR Band n41	0.061	0.019	0.021	0.069	0.101	0.149	0.170
	NR Band n77	0.207	0.019	0.021	0.069	0.247	0.295	0.316

Table 12-12
Simultaneous Transmission Scenario with Bluetooth Ant 2 and 5 GHz WLAN (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz Bluetooth Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Body-Worn SAR	GSM/DTM 850	0.273	0.032	0.021	0.069	0.326	0.374	0.395
	GSM/DTM 1900	0.258	0.032	0.021	0.069	0.311	0.359	0.380
	UMTS 850	0.305	0.032	0.021	0.069	0.358	0.406	0.427
	UMTS 1750	0.420	0.032	0.021	0.069	0.473	0.521	**0.542**
	UMTS 1900	0.283	0.032	0.021	0.069	0.336	0.384	0.405
	LTE Band 71	0.213	0.032	0.021	0.069	0.266	0.314	0.335
	LTE Band 12	0.326	0.032	0.021	0.069	0.379	0.427	0.448
	LTE Band 13	0.156	0.032	0.021	0.069	0.209	0.257	0.278
	LTE Band 5 (Cell)	0.165	0.032	0.021	0.069	0.218	0.266	0.287
	LTE Band 66 (AWS)	0.409	0.032	0.021	0.069	0.462	0.510	0.531
	LTE Band 25 (PCS)	0.300	0.032	0.021	0.069	0.353	0.401	0.422
	LTE Band 48	0.257	0.032	0.021	0.069	0.310	0.358	0.379
	LTE Band 41	0.227	0.032	0.021	0.069	0.280	0.328	0.349
	NR Band n71	0.084	0.032	0.021	0.069	0.137	0.185	0.206
	NR Band n5 (Cell)	0.150	0.032	0.021	0.069	0.203	0.251	0.272
	NR Band n66 (AWS)	0.301	0.032	0.021	0.069	0.354	0.402	0.423
	NR Band n2 (PCS)	0.031	0.032	0.021	0.069	0.084	0.132	0.153
	NR Band n41	0.061	0.032	0.021	0.069	0.114	0.162	0.183
	NR Band n77	0.207	0.032	0.021	0.069	0.260	0.308	0.329

12.2 Hotspot SAR Simultaneous Transmission Analysis

Table 12-13
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS/DTM 850	0.249	0.079	0.000	0.328	0.249	0.328
	GPRS/DTM 1900	0.394	0.079	0.000	0.473	0.394	0.473
	UMTS 850	0.348	0.079	0.000	0.427	0.348	0.427
	UMTS 1750	0.694	0.079	0.000	**0.773**	0.694	**0.773**
	UMTS 1900	0.474	0.079	0.000	0.553	0.474	0.553
	LTE Band 71	0.280	0.079	0.000	0.359	0.280	0.359
	LTE Band 12	0.423	0.079	0.000	0.502	0.423	0.502
	LTE Band 13	0.232	0.079	0.000	0.311	0.232	0.311
	LTE Band 5 (Cell)	0.203	0.079	0.000	0.282	0.203	0.282
	LTE Band 66 (AWS)	0.669	0.079	0.000	0.748	0.669	0.748
	LTE Band 25 (PCS)	0.489	0.079	0.000	0.568	0.489	0.568
	LTE Band 48	0.370	0.079	0.000	0.449	0.370	0.449
	LTE Band 41	0.246	0.079	0.000	0.325	0.246	0.325
	NR Band n71	0.141	0.079	0.000	0.220	0.141	0.220
	NR Band n5 (Cell)	0.189	0.079	0.000	0.268	0.189	0.268
	NR Band n66 (AWS)	0.499	0.079	0.000	0.578	0.499	0.578
	NR Band n2 (PCS)	0.051	0.079	0.000	0.130	0.051	0.130
	NR Band n41	0.112	0.079	0.000	0.191	0.112	0.191
	NR Band n77	0.323	0.079	0.000	0.402	0.323	0.402

Table 12-14
Simultaneous Transmission Scenario with 5 GHz WLAN (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS/DTM 850	0.249	0.025	0.074	0.274	0.323	0.348
	GPRS/DTM 1900	0.394	0.025	0.074	0.419	0.468	0.493
	UMTS 850	0.348	0.025	0.074	0.373	0.422	0.447
	UMTS 1750	0.694	0.025	0.074	0.719	0.768	**0.793**
	UMTS 1900	0.474	0.025	0.074	0.499	0.548	0.573
	LTE Band 71	0.280	0.025	0.074	0.305	0.354	0.379
	LTE Band 12	0.423	0.025	0.074	0.448	0.497	0.522
	LTE Band 13	0.232	0.025	0.074	0.257	0.306	0.331
	LTE Band 5 (Cell)	0.203	0.025	0.074	0.228	0.277	0.302
	LTE Band 66 (AWS)	0.669	0.025	0.074	0.694	0.743	0.768
	LTE Band 25 (PCS)	0.489	0.025	0.074	0.514	0.563	0.588
	LTE Band 48	0.370	0.025	0.074	0.395	0.444	0.469
	LTE Band 41	0.246	0.025	0.074	0.271	0.320	0.345
	NR Band n71	0.141	0.025	0.074	0.166	0.215	0.240
	NR Band n5 (Cell)	0.189	0.025	0.074	0.214	0.263	0.288
	NR Band n66 (AWS)	0.499	0.025	0.074	0.524	0.573	0.598
	NR Band n2 (PCS)	0.051	0.025	0.074	0.076	0.125	0.150
	NR Band n41	0.112	0.025	0.074	0.137	0.186	0.211
	NR Band n77	0.323	0.025	0.074	0.348	0.397	0.422

Table 12-15
Simultaneous Transmission Scenario with 2.4 GHz WLAN MIMO and 5 GHz WLAN MIMO (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	5	1+2+3+4+5
Hotspot SAR	GPRS/DTM 850	0.249	0.079	0.000	0.025	0.074	0.427
	GPRS/DTM 1900	0.394	0.079	0.000	0.025	0.074	0.572
	UMTS 850	0.348	0.079	0.000	0.025	0.074	0.526
	UMTS 1750	0.694	0.079	0.000	0.025	0.074	**0.872**
	UMTS 1900	0.474	0.079	0.000	0.025	0.074	0.652
	LTE Band 71	0.280	0.079	0.000	0.025	0.074	0.458
	LTE Band 12	0.423	0.079	0.000	0.025	0.074	0.601
	LTE Band 13	0.232	0.079	0.000	0.025	0.074	0.410
	LTE Band 5 (Cell)	0.203	0.079	0.000	0.025	0.074	0.381
	LTE Band 66 (AWS)	0.669	0.079	0.000	0.025	0.074	0.847
	LTE Band 25 (PCS)	0.489	0.079	0.000	0.025	0.074	0.667
	LTE Band 48	0.370	0.079	0.000	0.025	0.074	0.548
	LTE Band 41	0.246	0.079	0.000	0.025	0.074	0.424
	NR Band n71	0.141	0.079	0.000	0.025	0.074	0.319
	NR Band n5 (Cell)	0.189	0.079	0.000	0.025	0.074	0.367
	NR Band n66 (AWS)	0.499	0.079	0.000	0.025	0.074	0.677
	NR Band n2 (PCS)	0.051	0.079	0.000	0.025	0.074	0.229
	NR Band n41	0.112	0.079	0.000	0.025	0.074	0.290
	NR Band n77	0.323	0.079	0.000	0.025	0.074	0.501

Table 12-16
Simultaneous Transmission Scenario with Bluetooth (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz Bluetooth Ant 1 SAR (W/kg)	2.4 GHz Bluetooth Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Hotspot SAR	GPRS/DTM 850	0.249	0.054	0.032	0.303	0.281
	GPRS/DTM 1900	0.394	0.054	0.032	0.448	0.426
	UMTS 850	0.348	0.054	0.032	0.402	0.380
	UMTS 1750	0.694	0.054	0.032	**0.748**	0.726
	UMTS 1900	0.474	0.054	0.032	0.528	0.506
	LTE Band 71	0.280	0.054	0.032	0.334	0.312
	LTE Band 12	0.423	0.054	0.032	0.477	0.455
	LTE Band 13	0.232	0.054	0.032	0.286	0.264
	LTE Band 5 (Cell)	0.203	0.054	0.032	0.257	0.235
	LTE Band 66 (AWS)	0.669	0.054	0.032	0.723	0.701
	LTE Band 25 (PCS)	0.489	0.054	0.032	0.543	0.521
	LTE Band 48	0.370	0.054	0.032	0.424	0.402
	LTE Band 41	0.246	0.054	0.032	0.300	0.278
	NR Band n71	0.141	0.054	0.032	0.195	0.173
	NR Band n5 (Cell)	0.189	0.054	0.032	0.243	0.221
	NR Band n66 (AWS)	0.499	0.054	0.032	0.553	0.531
	NR Band n2 (PCS)	0.051	0.054	0.032	0.105	0.083
	NR Band n41	0.112	0.054	0.032	0.166	0.144
	NR Band n77	0.323	0.054	0.032	0.377	0.355

Table 12-17
Simultaneous Transmission Scenario with Bluetooth Ant 1 and 5 GHz WLAN (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz Bluetooth Ant 1 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Hotspot SAR	GPRS/DTM 850	0.249	0.054	0.025	0.074	0.328	0.377	0.402
	GPRS/DTM 1900	0.394	0.054	0.025	0.074	0.473	0.522	0.547
	UMTS 850	0.348	0.054	0.025	0.074	0.427	0.476	0.501
	UMTS 1750	0.694	0.054	0.025	0.074	0.773	0.822	**0.847**
	UMTS 1900	0.474	0.054	0.025	0.074	0.553	0.602	0.627
	LTE Band 71	0.280	0.054	0.025	0.074	0.359	0.408	0.433
	LTE Band 12	0.423	0.054	0.025	0.074	0.502	0.551	0.576
	LTE Band 13	0.232	0.054	0.025	0.074	0.311	0.360	0.385
	LTE Band 5 (Cell)	0.203	0.054	0.025	0.074	0.282	0.331	0.356
	LTE Band 66 (AWS)	0.669	0.054	0.025	0.074	0.748	0.797	0.822
	LTE Band 25 (PCS)	0.489	0.054	0.025	0.074	0.568	0.617	0.642
	LTE Band 48	0.370	0.054	0.025	0.074	0.449	0.498	0.523
	LTE Band 41	0.246	0.054	0.025	0.074	0.325	0.374	0.399
	NR Band n71	0.141	0.054	0.025	0.074	0.220	0.269	0.294
	NR Band n5 (Cell)	0.189	0.054	0.025	0.074	0.268	0.317	0.342
	NR Band n66 (AWS)	0.499	0.054	0.025	0.074	0.578	0.627	0.652
	NR Band n2 (PCS)	0.051	0.054	0.025	0.074	0.130	0.179	0.204
	NR Band n41	0.112	0.054	0.025	0.074	0.191	0.240	0.265
	NR Band n77	0.323	0.054	0.025	0.074	0.402	0.451	0.476

Table 12-18
Simultaneous Transmission Scenario with Bluetooth Ant 2 and 5 GHz WLAN (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G/5G SAR (W/kg)	2.4 GHz Bluetooth Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Hotspot SAR	GPRS/DTM 850	0.249	0.032	0.025	0.074	0.306	0.355	0.380
	GPRS/DTM 1900	0.394	0.032	0.025	0.074	0.451	0.500	0.525
	UMTS 850	0.348	0.032	0.025	0.074	0.405	0.454	0.479
	UMTS 1750	0.694	0.032	0.025	0.074	0.751	0.800	**0.825**
	UMTS 1900	0.474	0.032	0.025	0.074	0.531	0.580	0.605
	LTE Band 71	0.280	0.032	0.025	0.074	0.337	0.386	0.411
	LTE Band 12	0.423	0.032	0.025	0.074	0.480	0.529	0.554
	LTE Band 13	0.232	0.032	0.025	0.074	0.289	0.338	0.363
	LTE Band 5 (Cell)	0.203	0.032	0.025	0.074	0.260	0.309	0.334
	LTE Band 66 (AWS)	0.669	0.032	0.025	0.074	0.726	0.775	0.800
	LTE Band 25 (PCS)	0.489	0.032	0.025	0.074	0.546	0.595	0.620
	LTE Band 48	0.370	0.032	0.025	0.074	0.427	0.476	0.501
	LTE Band 41	0.246	0.032	0.025	0.074	0.303	0.352	0.377
	NR Band n71	0.141	0.032	0.025	0.074	0.198	0.247	0.272
	NR Band n5 (Cell)	0.189	0.032	0.025	0.074	0.246	0.295	0.320
	NR Band n66 (AWS)	0.499	0.032	0.025	0.074	0.556	0.605	0.630
	NR Band n2 (PCS)	0.051	0.032	0.025	0.074	0.108	0.157	0.182
	NR Band n41	0.112	0.032	0.025	0.074	0.169	0.218	0.243
	NR Band n77	0.323	0.032	0.025	0.074	0.380	0.429	0.454

12.3 Phablet Simultaneous Transmission Analysis

Per FCC KDB Publication 648474 D04 Handset SAR, Phablet SAR tests were not required if wireless router 1g SAR (scaled to the maximum output power, including tolerance) < 1.2 W/kg. Therefore no further analysis beyond the tables included in this section was required to determine that possible simultaneous transmission scenarios would not exceed the SAR limit.

Table 12-19
Simultaneous Transmission Scenario with 5 GHz WLAN (Phablet)

Configuration	Mode	4G/5G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Phablet SAR	LTE Band 66 (AWS)	1.393	0.128	0.338	1.521	1.731	**1.859**
	LTE Band 25 (PCS)	1.354	0.128	0.338	1.482	1.692	1.820
	NR Band n66 (AWS)	0.940	0.128	0.338	1.068	1.278	1.406
	NR Band n77	1.394	0.128	0.338	1.522	1.732	**1.860**

12.4 Simultaneous Transmission Conclusion

The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06 and IEEE 1528-2013 Section 6.3.4.1.2.

13 SAR MEASUREMENT VARIABILITY

13.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, variability SAR tests were not required since measured SAR results for all frequency bands were less than 0.8 W/kg for 1g SAR and less than 2.0 W/kg for 10g SAR.

13.2 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 IEC/IEEE 62209-1528:2020 was not required.

14 ADDITIONAL TESTING PER FCC GUIDANCE

14.1 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 reported 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 14-1
LTE Supplemental Head SAR Data

Supplemental Head SAR Data			
LTE B13		LTE B5	
QPSK, 10 MHz Bandwidth, 1 RB, 49 RB Offset		QPSK, 10 MHz Bandwidth, 1 RB, 49 RB Offset	
Test Position	Left Cheek	Test Position	Left Cheek
Frequency (MHz)	782.00	Frequency (MHz)	836.50
Channel	23230	Channel	20525
Measured 1g SAR (W/kg)	0.168	Measured 1g SAR (W/kg)	0.204
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 23)	0.184	Auto-tune (State 47)	0.233
Default (State 23)	0.177	Default (State 23)	0.245
State 0	0.005	State 1	0.013
State 4	0.022	State 5	0.048
State 8	0.056	State 9	0.108
State 12	0.087	State 13	0.084
State 16	0.122	State 17	0.141
State 20	0.169	State 21	0.208
State 23	0.183	State 25	0.108
State 24	0.100	State 29	0.161
State 28	0.128	State 33	0.211
State 32	0.153	State 37	0.014
State 36	0.007	State 41	0.064
State 40	0.034	State 45	0.155
State 44	0.099	State 47	0.231
State 48	0.003	State 49	0.012
State 52	0.016	State 53	0.043
State 56	0.043	State 57	0.102
State 60	0.094	State 61	0.126
State 64	0.115	State 65	0.129
State 68	0.130	State 69	0.208
State 72	0.086	State 73	0.077
State 76	0.138	State 77	0.154
State 80	0.173	State 81	0.229
State 84	0.072	State 85	0.081
State 88	0.110	State 89	0.137
State 92	0.148	State 93	0.206
State 96	0.110	State 97	0.101
State 100	0.151	State 101	0.173
State 104	0.158	State 105	0.224
State 108	0.086	State 109	0.100
State 112	0.119	State 113	0.147
State 116	0.152	State 117	0.205
State 120	0.009	State 121	0.015
State 124	0.036	State 125	0.062
State 128	0.091	State 129	0.158
State 132	0.119	State 133	0.122
State 136	0.162	State 137	0.196
State 140	0.146	State 141	0.222

Table 14-2
LTE Supplemental Body SAR Data

Supplemental Body SAR Data			
LTE B13		LTE B5	
QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offset		QPSK, 10 MHz Bandwidth, 1 RB, 49 RB Offset	
Test Position	Left	Test Position	Left
Spacing	10 mm	Spacing	10 mm
Frequency (MHz)	782.00	Frequency (MHz)	836.50
Channel	23230	Channel	20525
Measured 1g SAR (W/kg)	0.178	Measured 1g SAR (W/kg)	0.140
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 47)	0.196	Auto-tune (State 23)	0.194
Default (State 23)	0.197	Default (State 23)	0.203
State 2	0.020	State 3	0.024
State 6	0.047	State 7	0.069
State 10	0.085	State 11	0.157
State 14	0.145	State 15	0.103
State 18	0.187	State 19	0.165
State 22	0.206	State 23	0.208
State 26	0.118	State 27	0.123
State 30	0.149	State 31	0.173
State 34	0.154	State 35	0.180
State 38	0.025	State 39	0.029
State 42	0.075	State 43	0.098
State 46	0.148	State 47	0.195
State 47	0.197	State 51	0.020
State 50	0.016	State 55	0.059
State 54	0.037	State 59	0.143
State 58	0.069	State 63	0.133
State 62	0.089	State 67	0.171
State 66	0.108	State 71	0.147
State 70	0.108	State 75	0.104
State 74	0.146	State 79	0.177
State 78	0.177	State 83	0.177
State 82	0.162	State 87	0.095
State 86	0.129	State 91	0.155
State 90	0.162	State 95	0.204
State 94	0.198	State 99	0.134
State 98	0.149	State 101	0.169
State 102	0.169	State 103	0.189
State 106	0.125	State 107	0.135
State 110	0.104	State 111	0.114
State 114	0.137	State 115	0.164
State 118	0.155	State 119	0.183
State 122	0.027	State 123	0.030
State 126	0.075	State 127	0.095
State 130	0.138	State 131	0.189
State 134	0.132	State 135	0.152
State 138	0.152	State 139	0.189
State 142	0.097	State 143	0.105

15 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	85033E	3.5mm Standard Calibration Kit	7/7/2021	Annual	7/7/2022	MY53402352
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	8753ES	S-Parameter Vector Network Analyzer	2/19/2021	Annual	2/19/2022	MY40001472
Agilent	8753ES	S-Parameter Vector Network Analyzer	4/14/2021	Annual	4/14/2022	US39170118
Agilent	E4432B	ESG-D Series Signal Generator	2/24/2021	Annual	2/24/2022	US40053896
Agilent	E4438C	ESG Vector Signal Generator	5/6/2021	Annual	5/6/2022	MY42082659
Agilent	E4438C	ESG Vector Signal Generator	9/8/2020	Biennial	9/8/2022	MY45090700
Agilent	E4440A	PSA Series Spectrum Analyzer	1/29/2021	Annual	1/29/2022	MY46186272
Agilent	E5515C	Wireless Communications Test Set	12/15/2020	Annual	12/15/2021	GB42361078
Agilent	E5515C	Wireless Communications Test Set	2/4/2021	Annual	2/4/2022	GB43193563
Agilent	N5182A	MXG Vector Signal Generator	12/1/2020	Annual	12/1/2021	MY47420837
Agilent	N9020A	MXA Signal Analyzer	12/21/2020	Annual	12/21/2021	MY50200571
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433972
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433974
Anritsu	MA24106A	USB Power Sensor	3/2/2021	Annual	3/2/2022	1244524
Anritsu	MA24106A	USB Power Sensor	5/17/2021	Annual	5/17/2022	1349501
Anritsu	MA24106A	USB Power Sensor	1/15/2021	Annual	1/15/2022	1349503
Anritsu	MA2411B	Pulse Power Sensor	9/22/2020	Annual	9/22/2021	1339008
Anritsu	MA2411B	Pulse Power Sensor	12/18/2020	Annual	12/18/2021	1126066
Anritsu	ML2495A	Power Meter	11/3/2020	Annual	11/3/2021	1039008
Anritsu	ML2495A	Power Meter	1/18/2021	Annual	1/18/2022	941001
Anritsu	MT8821C	Radio Communication Analyzer	4/16/2021	Annual	4/16/2022	6200901190
Anritsu	MT8821C	Radio Communication Analyzer	3/23/2021	Annual	3/23/2022	6201144418
Anritsu	MT8821C	Radio Communication Analyzer	5/21/2021	Annual	5/21/2022	6201144419
Anritsu	MT8862A	Wireless Connectivity Test Set	10/29/2020	Annual	10/29/2021	6261782395
Control Company	4040	Therm./ Clock/ Humidity Monitor	2/17/2020	Biennial	2/17/2022	200113269
Control Company	4040	Therm./ Clock/ Humidity Monitor	2/17/2020	Biennial	2/17/2022	200113274
Control Company	4352	Long Stem Thermometer	1/24/2020	Biennial	1/24/2022	200043634
Control Company	4352	Long Stem Thermometer	1/24/2020	Biennial	1/24/2022	200043644
HEWLETT PACKARD	8753E	Network Analyzer	12/10/2020	Annual	12/10/2021	US38161081
Insize	1108-150	Digital Caliper	1/17/2020	Biennial	1/17/2022	409193536
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Agilent	85033E	3.5mm Standard Calibration Kit	7/7/2021	Annual	7/7/2022	MY53402352
Keysight Technologies	N6705B	DC Power Analyzer	5/5/2021	Triennial	5/5/2024	MY53004059
Keysight Technologies	N9020A	MXA Signal Analyzer	2/24/2021	Annual	2/24/2022	MY48010233
Keysight Technologies	U3401A	Digital Multimeter	5/14/2020	Biennial	5/14/2022	MY57201470
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
Mini Circuits	PWR-4GHS	USB Power Sensor	5/24/2021	Annual	5/24/2022	12010120004
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
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
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	NC-100	Torque Wrench	12/1/2020	Annual	12/1/2021	N/A
Pasternack	NC-100	Torque Wrench	8/4/2020	Biennial	8/4/2022	N/A
Pasternack	NC-100	Torque Wrench (Bin-lbs)	8/5/2020	Biennial	8/5/2022	47639-47
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMW500	Radio Communication Tester	5/7/2020	Biennial	5/7/2022	108798
Rohde & Schwarz	CMW500	Radio Communication Tester	1/19/2021	Annual	1/19/2022	111427
Rohde & Schwarz	CMW500	Radio Communication Tester	1/20/2021	Annual	1/20/2022	122206
Rohde & Schwarz	ZVC	Vector Network Analyzer	10/26/2020	Biennial	10/26/2022	100056
Anritsu	MS46322A	Vector Network Analyzer	11/6/2020	Annual	11/6/2021	1521001
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1237
SPEAG	D750V3	750 MHz SAR Dipole	10/19/2018	Triennial	10/19/2021	1161
SPEAG	D835V2	835 MHz SAR Dipole	10/19/2018	Triennial	10/19/2021	4d133
SPEAG	D835V2	835 MHz SAR Dipole	1/21/2021	Annual	1/21/2022	4d132
SPEAG	D1750V2	1750 MHz SAR Dipole	10/22/2018	Triennial	10/22/2021	1150
SPEAG	D1900V2	1900 MHz SAR Dipole	10/23/2018	Triennial	10/23/2021	5d080
SPEAG	D1900V2	1900 MHz SAR Dipole	10/23/2018	Triennial	10/23/2021	5d149
SPEAG	D1900V2	1900 MHz SAR Dipole	2/21/2019	Triennial	2/21/2022	5d148
SPEAG	D2450V2	2450 MHz SAR Dipole	1/19/2021	Annual	1/19/2022	981
SPEAG	D2450V2	2450 MHz SAR Dipole	9/10/2021	Biennial	9/10/2023	797
SPEAG	D2600V2	2600 MHz SAR Dipole	11/12/2019	Biennial	11/12/2021	1071
SPEAG	D2600V2	2600 MHz SAR Dipole	4/14/2021	Annual	4/14/2022	1004
SPEAG	D3500V2	3500 MHz SAR Dipole	1/21/2020	Biennial	1/21/2022	1097
SPEAG	D3500V2	3500 MHz SAR Dipole	1/19/2021	Annual	1/19/2022	1059
SPEAG	D3700V2	3700 MHz SAR Dipole	1/21/2020	Biennial	1/21/2022	1067
SPEAG	D3900V2	3900 MHz SAR Dipole	10/9/2020	Annual	10/9/2021	1056
SPEAG	D3700V2	3700 MHz SAR Dipole	1/19/2021	Annual	1/19/2022	1018
SPEAG	D3900V2	3900 MHz SAR Dipole	6/10/2021	Annual	6/10/2022	1073
SPEAG	D5GHzV2	5 GHz SAR Dipole	9/10/2020	Annual	9/10/2021	1191
SPEAG	D5GHzV2	5 GHz SAR Dipole	1/20/2021	Annual	1/20/2022	1057
SPEAG	EX3DV4	SAR Probe	7/20/2021	Annual	7/20/2022	7406
SPEAG	EX3DV4	SAR Probe	12/11/2020	Annual	12/11/2021	7571
SPEAG	EX3DV4	SAR Probe	10/20/2020	Annual	10/20/2021	7539
SPEAG	EX3DV4	SAR Probe	6/28/2021	Annual	6/28/2022	7660
SPEAG	EX3DV4	SAR Probe	3/16/2021	Annual	3/16/2022	7526
SPEAG	EX3DV4	SAR Probe	6/21/2021	Annual	6/21/2022	7409
SPEAG	EX3DV4	SAR Probe	4/19/2021	Annual	4/19/2022	7357
SPEAG	EX3DV4	SAR Probe	10/20/2020	Annual	10/20/2021	7551
SPEAG	EX3DV4	SAR Probe	5/18/2021	Annual	5/18/2022	3914
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/18/2021	Annual	3/18/2022	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/18/2021	Annual	6/21/2022	1676
SPEAG	DAE4	Data Acquisition Electronics	12/7/2020	Annual	12/7/2021	1533
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/10/2021	Annual	3/10/2022	1415
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/22/2021	Annual	6/22/2022	1677
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/15/2021	Annual	6/15/2022	1334
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/15/2021	Annual	6/15/2022	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/16/2020	Annual	10/16/2021	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/11/2021	Annual	5/11/2022	728
SPEAG	DAK-3.5	Dielectric Assessment Kit	10/14/2020	Annual	10/14/2021	1091

Note:

1. 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.
2. Each equipment item is used solely within its respective calibration period.

16 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	

17 CONCLUSION

17.1 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]

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