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SAR EVALUATION REPORT

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

Date of Testing:
06/20/23 - 07/17/23
Test Site/Location:
Element, Columbia, MD, USA
Document Serial No.:
1M2304260059-01.A3L (R1)

FCC ID: **A3LSMF731JPN**

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

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): SC-54D, SCG23

Equipment Class	Band & Mode	Tx Frequency	SAR			
			1g Head (W/kg)	1g Body-Worn (W/kg)	1g Hotspot (W/kg)	10g Phablet (W/kg)
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.18	0.20	0.41	N/A
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	0.12	0.41	0.34
PCE	UMTS 850	826.40 - 846.60 MHz	0.28	0.39	1.23	N/A
PCE	LTE Band 12	699.7 - 715.3 MHz	0.20	0.24	0.59	N/A
PCE	LTE Band 13	779.5 - 784.5 MHz	0.18	0.20	0.57	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.28	0.38	0.68	N/A
PCE	LTE Band 66 (AWS)	1710.7 - 1779.3 MHz	< 0.1	0.20	0.93	2.17
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	< 0.1	0.20	0.59	2.23
PCE	LTE Band 41	2498.5 - 2687.5 MHz	< 0.1	0.15	0.89	1.44
PCE	NR Band n5	826.5 - 846.5 MHz	0.25	0.43	1.05	N/A
PCE	NR Band n66	1712.5 - 1777.5 MHz	< 0.1	0.18	0.92	N/A
PCE	NR Band n41	2501.01 - 2685 MHz	0.89	0.14	0.55	2.00
DTS	2.4 GHz WLAN	2412 - 2472 MHz	0.26	< 0.1	0.20	N/A
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	N/A	N/A
NII	U-NII-2A	5260 - 5320 MHz	0.87*	0.14*	N/A	0.72*
NII	U-NII-2C	5500 - 5720 MHz	0.66*	0.10*	N/A	0.50*
NII	U-NII-3	5745 - 5825 MHz	0.47*	< 0.1*	N/A	N/A
NII	U-NII-4	5845 - 5885 MHz	0.42*	< 0.1*	N/A	0.56*
DSS/DTS	Bluetooth	2402 - 2480 MHz	0.46	< 0.1	0.26	0.44
DXX	NFC	13.56 MHz	N/A	N/A	N/A	< 0.1
Simultaneous SAR per KDB 690783 D01v01r03:			0.89	0.43	1.23	2.23

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

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 1.9 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.

RJ Ortanez
Executive Vice President

ACCREDITED
CERT #2041.01

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

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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 66 (AWS)	Voice/Data	1710.7 - 1779.3 MHz
LTE Band 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
NR Band n5	Voice/Data	826.5 - 846.5 MHz
NR Band n66	Voice/Data	1712.5 - 1777.5 MHz
NR Band n41	Voice/Data	2501.01 - 2685 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2472 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
U-NII-4	Voice/Data	5845 - 5885 MHz
U-NII-5	Voice/Data	5935 - 6415 MHz
U-NII-6	Voice/Data	6435 - 6515 MHz
U-NII-7	Voice/Data	6535 - 6875 MHz
U-NII-8	Voice/Data	6895 - 7115 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz

1.2 Time-Averaging Algorithm for RF Exposure Compliance

This Device is enabled with the Qualcomm® Smart Transmit Gen2 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).

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 WWAN sub-6/WLAN/BT radio), for each characterized technology and band (see RF Exposure Part 0 Test Report, report SN could be found in Section 1.11 - Bibliography).

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

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

All MIMO P_{max} and P_{limit} are defined per antenna chain.

SARCHAR for WIFI 6 GHz can be found in the WIFI 6 GHz RF Exposure Report (report SN can be found in Section 1.11 – Bibliography)

Exposure Scenario		Maximum Tune-Up Output Power*	Body-Worn	Phablet	Head	Hotspot	Earjack
Averaging Volume			1g	10g	1g	1g	1g/10g
Spacing			15 mm	0 mm	0 mm	10 mm, 5 mm	15 mm, 0 mm
DSI			0	0	2	3	4
Technology/Band	Antenna	Pmax					
GSM 850	A	25.3	21.8		31.8	21.8	21.8
GSM 1900	A	22.3	17.8		35.4	17.8	17.8
UMTS 850	A	24.7	28.7		22.2	24.8	28.7
LTE Band 12	A	24.0	23.0		31.9	23.0	23.0
LTE Band 13	A	24.0	23.0		31.8	23.0	23.0
LTE Band 5 (Cell)	A	24.7	29.9		31.3	23.0	29.9
LTE Band 66 (AWS)	A	23.0	20.0		37.7	20.0	20.0
LTE Band 66/4 (AWS)	1	23.5	19.5		N/A	17.5	19.5
LTE Band 4 (AWS)	A	23.0	18.5		37.7	18.5	18.5
LTE Band 2 (PCS)	A	23.5	19.0		37.3	19.0	19.0
LTE Band 2 (PCS)	1	24.5	19.5		N/A	15.5	19.5
LTE Band 41	B	22.0	20.0		36.8	17.0	20.0
LTE Band 41	1	22.0	18.0		N/A	16.0	18.0
NR Band n5	A	24.7	29.3		31.6	25.5	29.3
NR Band n66	A	23.0	20.0		45.0	20.0	20.0
NR Band n66	1	23.0	19.5		N/A	17.5	19.5
NR Band n41	1	24.0	18.0		13.5	16.0	18.0
2.4 GHz WLAN	2	18.0	23.0		11.0	23.0	23.0
2.4 GHz WLAN	MIMO	18.0	19.5		8.0	19.5	19.5
5 GHz WLAN	MIMO	15.0	21.4		16.6	N/A	21.4
2.4 GHz Bluetooth	1	15.3	22.2		21.7	22.2	22.2
2.4 GHz Bluetooth	2	16.9	24.6		15.4	N/A	24.6

*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, GMSK, or OFDM modulation schemes (e.g. GSM, LTE TDD and WLAN/BT).

*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 WWAN sub-6/WLAN/BT technology, band, and DSI is the minimum of ("P_{limit} EFS" and "Maximum tune up output power P_{max}") + 1dB device uncertainty. SAR values in this report were scaled to this maximum time-averaged output power to determine compliance per KDB Publication 447498 D04v01.

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

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

1.3 Nominal and Maximum Output Power Specifications

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

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

1.3.1 WWAN Output Power

Antenna A										
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
Pmax	Max Allowed Power	33.5	33.5	32.5	30.5	28.5	28.0	26.0	24.0	23.0
	Nominal	32.5	32.5	31.5	29.5	27.5	27.0	25.0	23.0	22.0
DSI = 0 (Body-Worn or Phablet)	Max Allowed Power	32.0	32.0	29.0	27.2	26.0	28.0	26.0	24.0	23.0
	Nominal	31.0	31.0	28.0	26.2	25.0	27.0	25.0	23.0	22.0
DSI = 2 (Head)	Max Allowed Power	33.5	33.5	32.5	30.5	28.5	28.0	26.0	24.0	23.0
	Nominal	32.5	32.5	31.5	29.5	27.5	27.0	25.0	23.0	22.0
DSI = 3 (Hotspot)	Max Allowed Power	N/A	32.0	29.0	27.2	26.0	28.0	26.0	24.0	23.0
	Nominal	N/A	31.0	28.0	26.2	25.0	27.0	25.0	23.0	22.0
DSI = 4 (Earjack)	Max Allowed Power	32.0	32.0	29.0	27.2	26.0	28.0	26.0	24.0	23.0
	Nominal	31.0	31.0	28.0	26.2	25.0	27.0	25.0	23.0	22.0
GSM/GPRS/EDGE 1900										
Power Level		Voice (in dBm)	Data - Burst Average GMSK (in dBm)				Data - Burst Average 8-PSK (in dBm)			
		1 TX Slot	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
Pmax	Max Allowed Power	30.5	30.5	29.5	27.5	25.5	27.0	25.0	23.0	22.0
	Nominal	29.5	29.5	28.5	26.5	24.5	26.0	24.0	22.0	21.0
DSI = 0 (Body-Worn or Phablet)	Max Allowed Power	28.0	28.0	25.0	23.2	22.0	27.0	25.0	23.0	22.0
	Nominal	27.0	27.0	24.0	22.2	21.0	26.0	24.0	22.0	21.0
DSI = 2 (Head)	Max Allowed Power	30.5	30.5	29.5	27.5	25.5	27.0	25.0	23.0	22.0
	Nominal	29.5	29.5	28.5	26.5	24.5	26.0	24.0	22.0	21.0
DSI = 3 (Hotspot)	Max Allowed Power	N/A	28.0	25.0	23.2	22.0	27.0	25.0	23.0	22.0
	Nominal	N/A	27.0	24.0	22.2	21.0	26.0	24.0	22.0	21.0
DSI = 4 (Earjack)	Max Allowed Power	28.0	28.0	25.0	23.2	22.0	27.0	25.0	23.0	22.0
	Nominal	27.0	27.0	24.0	22.2	21.0	26.0	24.0	22.0	21.0

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

Antenna A					
UMTS Band 5 (850 MHz)					
Power Level		Modulated Average Output Power			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
Pmax	Max Allowed Power	25.7	24.7	24.7	24.7
	Nominal	24.7	23.7	23.7	23.7
DSI = 0 (Body-Worn or Phablet)	Max Allowed Power	25.7	24.7	24.7	24.7
	Nominal	24.7	23.7	23.7	23.7
DSI = 2 (Head)	Max Allowed Power	23.2	22.2	22.2	22.2
	Nominal	22.2	21.2	21.2	21.2
DSI = 3 (Hotspot)	Max Allowed Power	25.7	24.7	24.7	24.7
	Nominal	24.7	23.7	23.7	23.7
DSI = 4 (Earjack)	Max Allowed Power	25.7	24.7	24.7	24.7
	Nominal	24.7	23.7	23.7	23.7

Mode / Band	Antenna		Modulated Average Output Power (in dBm)				
			Pmax	DSI = 0 (Body-Worn or Phablet)	DSI = 2 (Head)	DSI = 3 (Hotspot)	DSI = 4 (Earjack)
LTE Band 12	A	Max Allowed Power	25.0	24.0	25.0	24.0	24.0
		Nominal	24.0	23.0	24.0	23.0	23.0
LTE Band 13	A	Max Allowed Power	25.0	24.0	25.0	24.0	24.0
		Nominal	24.0	23.0	24.0	23.0	23.0
LTE Band 5 (Cell)	A	Max Allowed Power	25.7	25.7	25.7	24.0	25.7
		Nominal	24.7	24.7	24.7	23.0	24.7
LTE Band 66 (AWS)	A	Max Allowed Power	24.0	21.0	24.0	21.0	21.0
		Nominal	23.0	20.0	23.0	20.0	20.0
LTE Band 66 (AWS)	I	Max Allowed Power	24.5	20.5	N/A	18.5	20.5
		Nominal	23.5	19.5	N/A	17.5	19.5
LTE Band 4 (AWS)	A	Max Allowed Power	24.0	19.5	24.0	19.5	19.5
		Nominal	23.0	18.5	23.0	18.5	18.5
LTE Band 4 (AWS)	I	Max Allowed Power	24.5	20.5	N/A	18.5	20.5
		Nominal	23.5	19.5	N/A	17.5	19.5
LTE Band 2 (PCS)	A	Max Allowed Power	24.5	20.0	24.5	20.0	20.0
		Nominal	23.5	19.0	23.5	19.0	19.0
LTE Band 2 (PCS)	I	Max Allowed Power	25.5	20.5	N/A	16.5	20.5
		Nominal	24.5	19.5	N/A	15.5	19.5
LTE Band 41	B	Max Allowed Power	25.0	23.0	25.0	20.0	23.0
		Nominal	24.0	22.0	24.0	19.0	22.0
LTE Band 41	I	Max Allowed Power	25.0	21.0	N/A	19.0	21.0
		Nominal	24.0	20.0	N/A	18.0	20.0

Mode / Band	Antenna		Modulated Average Output Power (in dBm)				
			Pmax	DSI = 0 (Body-Worn or Phablet)	DSI = 2 (Head)	DSI = 3 (Hotspot)	DSI = 4 (Earjack)
NR Band n5	A	Max Allowed Power	25.7	25.7	25.7	25.7	25.7
		Nominal	24.7	24.7	24.7	24.7	24.7
NR Band n66	A	Max Allowed Power	24.0	21.0	24.0	21.0	21.0
		Nominal	23.0	20.0	23.0	20.0	20.0
NR Band n66	I	Max Allowed Power	24.0	20.5	N/A	18.5	20.5
		Nominal	23.0	19.5	N/A	17.5	19.5
NR Band n41	I	Max Allowed Power	25.0	19.0	14.5	17.0	19.0
		Nominal	24.0	18.0	13.5	16.0	18.0

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

1.3.2 2.4 GHz SISO/MIMO WLAN Output Power

The below table is applicable is applicable in the following conditions:

- Pmax, DSI=0 (Body-worn or Phablet), DSI=3 (Hotspot), and/or DSI=4 (Earjack)

Mode	Band	IEEE 802.11 Modulated Output Power (in dBm)																					
		SISO										MIMO											
		Antenna 2										Antenna 1 & Antenna 2 in MIMO											
		b		g		n		ac		ax (SU)		b CDD + STBC		g (CDD + STBC)		n (CDD+STBC, SDM)		ac (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.		
2.4 GHz WIFI	2.45 GHz	19.0	18.0	18.0	17.0	18.0	17.0	17.0	16.0	17.0	16.0	19.0	18.0	18.0	17.0	18.0	17.0	17.0	16.0	17.0	16.0		
		ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0		
		ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0		

(Upper tolerance: Target +1.0 dB)

The below table is applicable is applicable in the following conditions:

- DSI=2 (RCV)

Mode	Band	IEEE 802.11 Modulated Output Power (in dBm)																					
		SISO										MIMO											
		Antenna 2										Antenna 1 & Antenna 2 in MIMO											
		b		g		n		ac		ax (SU)		b CDD + STBC		g (CDD + STBC)		n (CDD+STBC, SDM)		ac (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.		
2.4 GHz WIFI	2.45 GHz	12.0	11.0	12.0	11.0	12.0	11.0	12.0	11.0	12.0	11.0	9.0	8.0	9.0	8.0	9.0	8.0	9.0	8.0	9.0	8.0		
		ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0		
		ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0	ch. 13: 0.0	-1.0		

(Upper tolerance: Target +1.0 dB)

1.3.3 5 GHz SISO/MIMO WLAN Output Power

The below table is applicable is applicable in the following conditions:

- Pmax, DSI=0 (Body-worn or Phablet), DSI=2(RCV), DSI=3 (Hotspot), and/or DSI=4 (Earjack)

Mode	IEEE 802.11 Modulated Output Power (in dBm)							
	MIMO							
	Antenna 1 & Antenna 2 in MIMO							
	a (CDD + STBC)		n (CDD+STBC, SDM)		ac (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	16.0	15.0	16.0	15.0	16.0	15.0	16.0	15.0
5 GHz WIFI (40MHz BW)			15.0	14.0	15.0	14.0	15.0	14.0
5 GHz WIFI (80MHz BW)					14.0	13.0	14.0	13.0
5 GHz WIFI (160MHz BW)					13.0	12.0	13.0	12.0

(Upper tolerance: Target +1.0 dB)

1.3.4 2.4 GHz Bluetooth Output Power

The below table is applicable is applicable in the following conditions:

- Pmax, DSI=0 (Body-worn or Phablet), and/or DSI=4 (Earjack)

Mode	Data Rate	Modulated Output Power (in dBm)			
		Single Antenna			
		Antenna 1		Antenna 2	
Maximum / Nominal Power		Max	Nom.	Max	Nom.
Bluetooth	1Mbps	16.5	15.5	17.0	16.0
Bluetooth EDR	2Mbps	13.5	12.5	14.5	13.5
Bluetooth EDR	3Mbps	13.5	12.5	14.5	13.5
Bluetooth LE	1Mbps	17.0	16.0	18.5	17.5
Bluetooth LE	2Mbps	17.0	16.0	18.5	17.5
Bluetooth LE	125kbps	7.5	6.5	8.0	7.0
Bluetooth LE	500kbps	7.5	6.5	8.0	7.0

(Upper tolerance: Target +1.0 dB)

The below table is applicable is applicable in the following conditions:

- DSI=2 (RCV)

Mode	Data Rate	Modulated Output Power (in dBm)			
		Single Antenna			
		Antenna 1		Antenna 2	
Maximum / Nominal Power		Max	Nom.	Max	Nom.
Bluetooth	1Mbps	16.5	15.5	17.0	16.0
Bluetooth EDR	2Mbps	13.5	12.5	14.5	13.5
Bluetooth EDR	3Mbps	13.5	12.5	14.5	13.5
Bluetooth LE	1Mbps	17.0	16.0	17.0	16.0
Bluetooth LE	2Mbps	17.0	16.0	17.5	16.5
Bluetooth LE	125kbps	7.5	6.5	8.0	7.0
Bluetooth LE	500kbps	7.5	6.5	8.0	7.0

(Upper tolerance: Target +1.0 dB)

The below table is applicable is applicable in the following conditions:

- DSI=3 (Hotspot)

Mode	Data Rate	Modulated Output Power (in dBm)			
		Single Antenna			
		Antenna 1		Antenna 2	
Maximum / Nominal Power		Max	Nom.	Max	Nom.
Bluetooth	1Mbps	16.5	15.5	N/A	N/A
Bluetooth EDR	2Mbps	13.5	12.5	N/A	N/A
Bluetooth EDR	3Mbps	13.5	12.5	N/A	N/A
Bluetooth LE	1Mbps	17.0	16.0	N/A	N/A
Bluetooth LE	2Mbps	17.0	16.0	N/A	N/A
Bluetooth LE	125kbps	7.5	6.5	N/A	N/A
Bluetooth LE	500kbps	7.5	6.5	N/A	N/A

(Upper tolerance: Target +1.0 dB)

1.4 DUT Antenna Locations

A diagram showing the location of the device antennas for both open and closed configurations can be found in DUT Antenna Diagram and SAR Test Setup Photographs Appendix. When the device is open, the overall dimensions of this device are > 9 x 5 cm. Since the diagonal dimension of this device when open is > 160 mm and <200 mm, it is considered a “phablet.” and operates similar to a traditional portable handset. In the closed configuration, only a simple display/interaction of notifications occurs and overall dimensions are < 9 x 5 cm. Therefore, when the device is closed, the only testing considered is for body-worn and hotspot.

Table 1-1
Device Edges/Sides for Open Configuration SAR Testing

Antenna	Back	Front	Top	Bottom	Right	Left
A	Yes	Yes	No	Yes	Yes	Yes
B	Yes	Yes	No	Yes	No	Yes
F	Yes	Yes	Yes	No	No	Yes
H	Yes	Yes	Yes	No	Yes	No
I	Yes	Yes	Yes	No	Yes	No

Table 1-2
Device Edges/Sides for Closed Configuration SAR Testing

Antenna	Back	Front	Top	Bottom	Right	Left
A	Yes	Yes	No	Yes	Yes	Yes
B	Yes	Yes	No	Yes	No	Yes
F	Yes	Yes	No	Yes	No	Yes
H	Yes	Yes	No	Yes	Yes	No
I	Yes	Yes	Yes	Yes	Yes	No

Note: Particular DUT edges were not required to be evaluated for wireless router SAR or phablet SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v02r01 Section III and FCC KDB Publication 648474 D04v01r03. The distances between the transmit antennas and the edges of the device are included in the filing. When wireless router mode is enabled, U-NII-1, U-NII-2A, U-NII-2C, U-NII-3 UNII-4, and WIFI6E 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 DUT Antenna Diagram and SAR Test Setup Photographs Appendix.

1.6 Simultaneous Transmission Capabilities

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

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

Table 1-3
Simultaneous Transmission Scenarios

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

1. No other simultaneous scenarios besides described above is supported for this model.
2. When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario.
3. Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, there are no simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table.
4. 5 GHz Wireless Router is not supported, therefore it was not evaluated for wireless router conditions.
5. This device supports 2x2 MIMO Tx for WLAN 802.11a/b/g/n/ac/ax. 802.11a/b/g/n/ac/ax supports CDD and STBC and 802.11n/ac/ax additionally supports SDM.
6. This device supports VoWIFI.
7. This device supports Bluetooth Tethering on ant 1 only.
8. This device supports VoLTE.
9. This device supports VoNR.
10. LTE + 5G NR FR1 Scenarios are limited to EN-DC combinations with anchor bands as shown in the NR FR1 checklist.
11. NFC was evaluated for phablet based on expected usage conditions.
12. 6 GHz Wireless Router is not supported, therefore it was not evaluated for wireless router conditions.

1.7 Miscellaneous SAR Test Considerations

When on the device dimensions when closed, hotspot SAR in the closed configuration was performed at 5mm per KDB Publication 941225 D06v02r01.

(A) WIFI/BT

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

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

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

This device supports IEEE 802.11ax with the following features:

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

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" in open configuration 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 5 GHz WLAN, phablet SAR tests were performed. Phablet SAR was not evaluated for 2.4 GHz operations since wireless router 1g SAR was < 1.2 W/kg.

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

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

(B) Licensed Transmitter(s)

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

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

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

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

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" when it is in an open configuration 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/NR capabilities with overlapping transmission frequency ranges. When the supported frequency range of an LTE/NR Band falls completely within an LTE/NR band with a larger transmission frequency range, both LTE/NR bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and both LTE/NR bands share the same transmission path and signal characteristics, SAR was only assessed for the band with the larger transmission frequency range.

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

This device can transmit with antenna I for LTE B2/4/41/66 and NR Band n66/41. SAR tests for antenna I was additionally performed for these LTE and NR bands to ensure compliance.

NR implementation supports NSA mode 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.

1.8 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r05, D05Av01r02, D06v02r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)

- FCC KDB Publication 447498 D04v01 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 648474 D04v01r03 (Phablet Procedures)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)
- May 2017 TCB Workshop Notes (LTE 4x4 Downlink MIMO, LTE Band 41 Power Class 2/3)
- November 2017, April 2018, October 2018 TCB Workshop Notes (LTE Carrier Aggregation)
- April 2019 TCB Workshop Notes (IEEE 802.11ax)

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.

1.10 Bibliography

Report Type	Report Serial Number
RF Exposure Part 2 Test Report	1M2304260059-20.A3L
RF Exposure Compliance Summary Report	1M2304260059-21.A3L
RF Exposure Part 0 Test Report	1M2304260059-02.A3L
WIFI 6E RF Exposure	1M2304260059-19.A3L

2 LTE AND NR INFORMATION

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

NR Information						
Form Factor	Portable Handset					
	NR Band n5 (826.5 - 846.5 MHz)					
	NR Band n66 (1712.5 - 1777.5 MHz)					
	NR Band n41 (2501.01 - 2685 MHz)					
	NR Band n5: 5 MHz, 10 MHz, 15 MHz, 20 MHz					
	NR Band n66: 5 MHz, 10 MHz, 15 MHz, 20 MHz, 25 MHz, 30 MHz, 40 MHz					
	NR Band n41: 10 MHz, 15 MHz, 20 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz, 70 MHz, 80 MHz, 90 MHz, 100 MHz					
Channel Numbers and Frequencies (MHz)						
NR Band n5: 5 MHz	826.5 (165300)		836.5 (167300)		846.5 (169300)	
NR Band n5: 10 MHz	829 (165800)		836.5 (167300)		844 (168800)	
NR Band n5: 15 MHz	831.5 (166300)		836.5 (167300)		841.5 (168300)	
NR Band n5: 20 MHz	834 (166800)		836.5 (167300)		839 (167800)	
NR Band n66: 5 MHz	1712.5 (342500)		1745 (349000)		1777.5 (355500)	
NR Band n66: 10 MHz	1715 (343000)		1745 (349000)		1775 (355000)	
NR Band n66: 15 MHz	1717.5 (343500)		1745 (349000)		1772.5 (354500)	
NR Band n66: 20 MHz	1720 (344000)		1745 (349000)		1770 (354000)	
NR Band n66: 25 MHz	1722.5 (344500)		1745 (349000)		1767.5 (353500)	
NR Band n66: 30 MHz	1725 (345000)		1745 (349000)		1765 (353000)	
NR Band n66: 40 MHz	1730 (346000)		1745 (349000)		1760 (352000)	
NR Band n41: 10 MHz	2501.01 (500202)	2547 (509400)	2592.99 (518598)		2639.01 (527802)	2685 (537000)
NR Band n41: 15 MHz	2503.5 (500700)	2548.26 (509652)	2592.99 (518598)		2637.75 (527550)	2682.51 (536502)
NR Band n41: 20 MHz	2506.02 (501204)	2549.49 (509898)	2592.99 (518598)		2636.49 (527298)	2679.99 (535998)
NR Band n41: 30 MHz	2511 (502200)	2552.01 (510402)	2592.99 (518598)		2634 (526800)	2674.98 (534996)
NR Band n41: 40 MHz	2516.01 (503202)	2567.34 (513468)	N/A		2618.67 (523734)	2670 (534000)
NR Band n41: 50 MHz	2521.02 (504204)		2592.99 (518598)		2664.99 (532998)	
NR Band n41: 60 MHz	2526 (505200)		2592.99 (518598)		2659.98 (531996)	
NR Band n41: 70 MHz	2531.01 (506202)		N/A		2655 (531000)	
NR Band n41: 80 MHz	2536.02 (507204)		N/A		2649.99 (529998)	
NR Band n41: 90 MHz	2541 (508200)		N/A		2644.98 (528996)	
NR Band n41: 100 MHz	2546.01 (509202)		2592.99 (518598)		2640 (528000)	
SCS for NR Band: n5/66	15 kHz					
SCS for NR Band: n41	30 kHz					
Modulations Supported in UL	DFT-s-OFDM: π/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM					
A-MPR (Additional MPR) disabled for SAR Testing?	YES					
EN-DC Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations					
LTE Anchor Bands for NR Band n5	LTE Band 66					
LTE Anchor Bands for NR Band n66	LTE Band 13					
LTE Anchor Bands for NR Band n41	LTE Band 66					

3 INTRODUCTION

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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

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

where:

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

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

4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

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

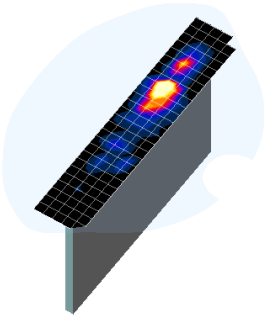

Figure 4-1
Sample SAR Area Scan

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

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

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

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

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

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

*Also compliant to IEEE 1528-2013 Table 6

5 DEFINITION OF REFERENCE POINTS

5.1 EAR REFERENCE POINT

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

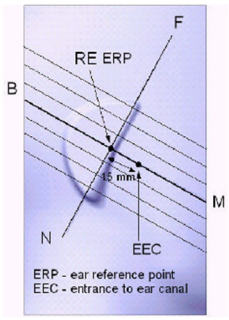

Figure 5-1
Close-Up Side view of ERP

5.2 HANDSET REFERENCE POINTS

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

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

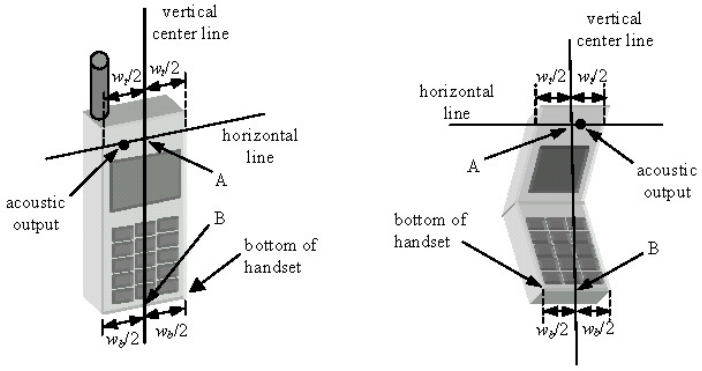

Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

6 TEST CONFIGURATION POSITIONS

6.1 Device Holder

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

6.2 Positioning for Cheek

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

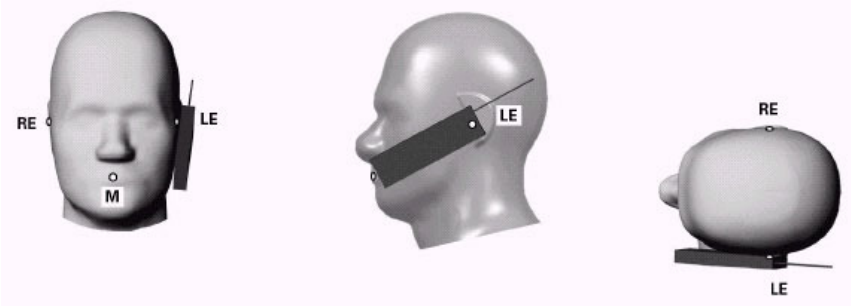

Figure 6-1 Front, Side and Top View of Cheek Position

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

6.3 Positioning for Ear / 15º Tilt

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

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

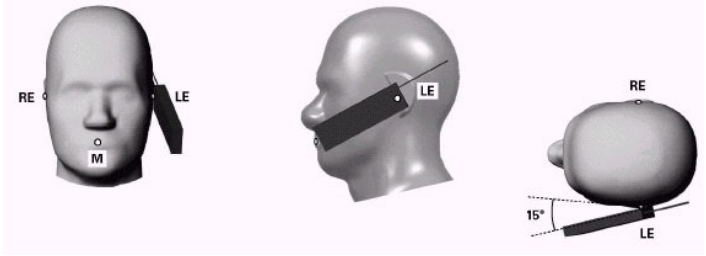

Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

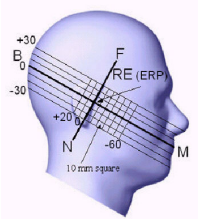

Figure 6-3
Side view w/ relevant markings

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

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

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

6.5 Body-Worn Accessory Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 6-4). Per FCC KDB Publication 648474 D04v01r03, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D04v01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

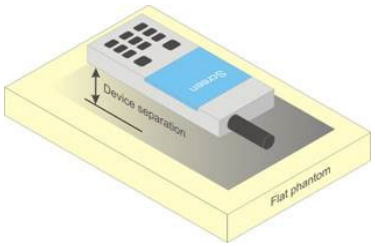

Figure 6-4
Sample Body-Worn Diagram

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested

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

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

6.6 Extremity Exposure Configurations

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

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

6.7 Wireless Router Configurations

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

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

6.8 Phablet Configurations

For smart phones with a display diagonal dimension > 150 mm or an overall diagonal dimension > 160 mm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the phablets procedures outlined in KDB Publication 648474 D04v01r03 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worn accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna <=25 mm from that

surface or edge, in direct contact with the phantom, for 10g SAR. The UMPC mini-tablet 1g SAR at 5 mm is not required. When hotspot mode applies, 10g SAR is required only for the surfaces and edges with hotspot mode 1g SAR > 1.2 W/kg.

7 RF EXPOSURE LIMITS

7.1 Uncontrolled Environment

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

7.2 Controlled Environment

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

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

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

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

8 FCC MEASUREMENT PROCEDURES

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

8.1 Measured and Reported SAR

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

8.2 3G SAR Test Reduction Procedure

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

8.3 Procedures Used to Establish RF Signal for SAR

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

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

8.4 SAR Measurement Conditions for UMTS

8.4.1 Output Power Verification

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

8.4.2 Head SAR Measurements

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

8.4.3 Body SAR Measurements

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

8.4.4 SAR Measurements with Rel 5 HSDPA

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

8.4.5 SAR Measurements with Rel 6 HSUPA

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

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

8.4.6 SAR Measurement Conditions for DC-HSDPA

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

8.5 SAR Measurement Conditions for LTE

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

8.5.1 Spectrum Plots for RB Configurations

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

8.5.2 MPR

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

8.5.3 A-MPR

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

8.5.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r04:

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

8.5.5 TDD

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

8.5.6 Downlink Only Carrier Aggregation

Conducted power measurements with LTE Carrier Aggregation (CA) (downlink only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to specifications when downlink carrier aggregation is inactive on the PCC. Additional conducted output powers are measured with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band. Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for downlink only carrier aggregation configurations when the average output

power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive.

8.6 SAR Testing with 802.11 Transmitters

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

8.6.1 General Device Setup

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

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

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

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

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

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

8.6.4 Initial Test Position Procedure

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

8.6.5 2.4 GHz SAR Test Requirements

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

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

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

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

8.6.6 OFDM Transmission Mode and SAR Test Channel Selection

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

8.6.7 Initial Test Configuration Procedure

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

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

8.6.8 Subsequent Test Configuration Procedures

For OFDM configurations in each frequency band and aggregated band, SAR is evaluated for initial test configuration using the fixed test position or the initial test position procedure. When the highest reported SAR (for the initial test configuration), adjusted by the ratio of the specified maximum output power of the subsequent test configuration to initial test configuration, is ≤ 1.2 W/kg, no additional SAR tests for the

subsequent test configurations are required. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.6.9 MIMO SAR considerations

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

9 RF CONDUCTED POWERS

All conducted power measurements for WWAN sub6/WLAN/BT technologies and bands in this section were performed by setting *Reserve_power_margin* (Qualcomm® Smart Transmit EFS entry) to 0dB, so that the EUT transmits continuously at minimum (P_{limit}, maximum tune up output power P_{max}).

9.1 GSM Conducted Powers

Table 9-1
Measured P_{max} for DSI = 2 (Head) for GSM 850 and GSM 1900

Maximum Burst-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	31.83	31.67	30.51	28.82	26.51	26.29	24.82	23.03	22.08
	190	31.82	31.80	30.67	28.89	26.50	26.26	24.80	22.79	22.05
	251	31.82	31.82	30.57	28.78	27.09	26.27	24.64	22.84	21.83
GSM 1900	512	30.12	30.13	27.73	**25.86**	24.11	25.22	23.95	22.11	20.95
	661	30.30	30.33	28.10	**26.18**	24.15	25.41	24.03	22.16	21.01
	810	29.79	29.81	28.04	**25.92**	23.64	25.15	23.80	22.00	20.73
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	22.63	22.47	24.32	24.39	23.33	17.09	18.63	18.60	18.90
	190	22.62	22.60	24.48	24.46	23.32	17.06	18.61	18.36	18.87
	251	22.62	22.62	24.38	24.35	23.91	17.07	18.45	18.41	18.65
GSM 1900	512	20.92	20.93	21.54	**21.43**	20.93	16.02	17.76	17.68	17.77
	661	21.10	21.13	21.91	**21.75**	20.97	16.21	17.84	17.73	17.83
	810	20.59	20.61	21.85	**21.49**	20.46	15.95	17.61	17.57	17.55
GSM 850	**Frame Avg.Targets:**	23.30	23.30	25.31	25.07	24.32	17.80	18.81	18.57	18.82
GSM 1900		20.30	20.30	22.31	**22.07**	21.32	16.80	17.81	17.57	17.82

Table 9-2
Measured P_{limit} for DSI = 0 (Body-worn or Phablet), DSI = 3 (Hotspot Mode), or DSI = 4 (Earjack active) for GSM 850 and GSM 1900

Maximum Burst-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	30.28	30.30	27.90	26.06	**24.25**	26.29	24.82	23.03	22.08
	190	30.70	30.72	27.76	26.00	**24.15**	26.26	24.80	22.79	22.05
	251	30.65	30.68	27.66	25.82	**24.10**	26.27	24.64	22.84	21.83
GSM 1900	512	26.71	26.66	23.72	22.11	**20.48**	25.22	23.95	22.11	**20.95**
	661	27.07	27.06	23.77	22.15	**20.80**	25.41	24.03	22.16	**21.01**
	810	26.84	26.84	23.68	21.87	**20.70**	25.15	23.80	22.00	**20.73**
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	21.08	21.10	21.71	21.63	**21.07**	17.09	18.63	18.60	18.90
	190	21.50	21.52	21.57	21.57	**20.97**	17.06	18.61	18.36	18.87
	251	21.45	21.48	21.47	21.39	**20.92**	17.07	18.45	18.41	18.65
GSM 1900	512	17.51	17.46	17.53	17.68	**17.30**	16.02	17.76	17.68	**17.77**
	661	17.87	17.86	17.58	17.72	**17.62**	16.21	17.84	17.73	**17.83**
	810	17.64	17.64	17.49	17.44	**17.52**	15.95	17.61	17.57	**17.55**
GSM 850	**Frame Avg.Targets:**	21.80	21.80	21.81	21.77	**21.82**	17.80	18.81	18.57	18.82
GSM 1900		17.80	17.80	17.81	17.77	**17.82**	16.80	17.81	17.57	**17.82**

Note:

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

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

Figure 9-1
Power Measurement Setup

9.2 UMTS Conducted Powers

Table 9-3
UMTS 850 Measured P_{max} for DSI = 0 (Body-worn or Phablet), DSI = 3 (Hotspot Mode), or DSI = 4 (Earjack active)

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	
99	WCDMA	12.2 kbps RMC	24.12	23.99	23.91	-
99		12.2 kbps AMR	24.10	23.98	23.90	-
6	HSDPA	Subtest 1	23.80	23.65	23.60	0
6		Subtest 2	23.75	23.70	23.58	0
6		Subtest 3	23.27	23.15	23.12	0.5
6		Subtest 4	23.31	23.16	23.10	0.5
6	HSUPA	Subtest 1	23.79	23.58	23.57	0
6		Subtest 2	21.80	21.56	21.57	2
6		Subtest 3	22.77	22.61	22.56	1
6		Subtest 4	21.80	21.66	21.54	2
6		Subtest 5	23.80	23.64	23.57	0
8	DC-HSDPA	Subtest 1	23.67	23.63	23.47	0
8		Subtest 2	23.72	23.57	23.45	0
8		Subtest 3	23.21	23.06	22.97	0.5
8		Subtest 4	23.29	23.07	22.96	0.5

Table 9-4
UMTS 850 Measured P_{limit} for DSI = 2 (Head)

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	
99	WCDMA	12.2 kbps RMC	21.82	21.64	21.55	-
99		12.2 kbps AMR	21.82	21.60	21.54	-
6	HSDPA	Subtest 1	21.29	21.13	21.06	0
6		Subtest 2	21.31	21.14	21.03	0
6		Subtest 3	20.79	20.60	20.51	0.5
6		Subtest 4	20.71	20.59	20.56	0.5
6	HSUPA	Subtest 1	21.22	21.09	21.01	0
6		Subtest 2	19.25	19.11	19.03	2
6		Subtest 3	20.23	20.05	20.01	1
6		Subtest 4	19.20	19.01	18.91	2
6		Subtest 5	21.28	21.12	21.08	0
8	DC-HSDPA	Subtest 1	21.21	21.07	21.01	0
8		Subtest 2	21.26	21.13	21.16	0
8		Subtest 3	20.80	20.63	20.42	0.5
8		Subtest 4	20.90	20.61	20.50	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

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

Figure 9-2
Power Measurement Setup

9.3 LTE Conducted Powers

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

Note: Some bands do not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

LTE Carrier Aggregation Notes:

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

9.3.1 LTE Band 12

Table 9-5
LTE Band 12 Measured P_{Max} for DSI = 2 (Head) - 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	23.61	0	0
	1	25	**23.68**		0
	1	49	23.47		0
	25	0	**22.45**	0-1	1
	25	12	22.44		1
	25	25	22.33		1
	50	0	22.42		1
16QAM	1	0	22.77	0-1	1
	1	25	22.64		1
	1	49	22.68		1
	25	0	21.55	0-2	2
	25	12	21.57		2
	25	25	21.57		2
	50	0	21.68		2
64QAM	1	0	21.94	0-2	2
	1	25	21.72		2
	1	49	21.64		2
	25	0	20.59	0-3	3
	25	12	20.60		3
	25	25	20.58		3
	50	0	20.67		3

Table 9-6
LTE Band 12 Measured P_{Limit} for DSI = 0 (Body-worn or Phablet), DSI = 3 (Hotspot- Mode), or DSI = 4 (Earjack Active) - 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	22.42	0	0
	1	25	**22.51**		0
	1	49	22.41		0
	25	0	22.29	0-1	0
	25	12	**22.33**		0
	25	25	22.24		0
	50	0	22.24		0
16QAM	1	0	22.71	0-1	0
	1	25	22.74		0
	1	49	22.46		0
	25	0	21.59	0-2	1
	25	12	21.64		1
	25	25	21.61		1
	50	0	21.57		1
64QAM	1	0	21.67	0-2	1
	1	25	21.79		1
	1	49	21.65		1
	25	0	20.49	0-3	2
	25	12	20.66		2
	25	25	20.51		2
	50	0	20.53		2

9.3.2 LTE Band 13

Table 9-7
LTE Band 13 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	**24.71**	0	0
	1	25	24.57		0
	1	49	24.26		0
	25	0	23.33	0-1	1
	25	12	**23.37**		1
	25	25	23.18		1
	50	0	23.25		1
16QAM	1	0	23.76	0-1	1
	1	25	23.73		1
	1	49	23.50		1
	25	0	22.65	0-2	2
	25	12	22.61		2
	25	25	22.58		2
	50	0	22.16		2
64QAM	1	0	22.78	0-2	2
	1	25	22.81		2
	1	49	22.73		2
	25	0	21.66	0-3	3
	25	12	21.64		3
	25	25	21.54		3
	50	0	21.03		3

Table 9-8
LTE Band 13 Measured P_{Limit} for DSI = 0 (Body-worn or Phablet), DSI = 3 (Hotspot- Mode), or DSI = 4 (Earjack Active) - 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	**23.56**	0	0
	1	25	23.37		0
	1	49	23.31		0
	25	0	**23.32**	0-1	0
	25	12	23.19		0
	25	25	23.13		0
	50	0	23.15		0
16QAM	1	0	23.77	0-1	0
	1	25	23.72		0
	1	49	23.56		0
	25	0	22.63	0-2	1
	25	12	22.59		1
	25	25	22.49		1
	50	0	22.30		1
64QAM	1	0	22.77	0-2	1
	1	25	22.75		1
	1	49	22.51		1
	25	0	21.63	0-3	2
	25	12	21.59		2
	25	25	21.48		2
	50	0	21.59		2

9.3.3 LTE Band 5

Table 9-9
LTE Band 5 (Cell) Measured P_{max} for DSI = 0 (Body-worn or Phablet), DSI = 2 (Head), or DSI = 4 (Earjack Active) - 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	**24.54**	0	0
	1	25	24.50		0
	1	49	24.40		0
	25	0	**23.43**	0-1	1
	25	12	23.40		1
	25	25	23.35		1
	50	0	23.29		1
16QAM	1	0	23.43	0-1	1
	1	25	23.51		1
	1	49	23.60		1
	25	0	22.55	0-2	2
	25	12	22.50		2
	25	25	22.44		2
	50	0	22.53		2
64QAM	1	0	22.41	0-2	2
	1	25	22.50		2
	1	49	22.53		2
	25	0	21.57	0-3	3
	25	12	21.52		3
	25	25	21.51		3
	50	0	21.44		3

Table 9-10
LTE Band 5 (Cell) Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 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	**22.79**	0	0
	1	25	22.76		0
	1	49	22.70		0
	25	0	**22.63**	0-1	0
	25	12	22.62		0
	25	25	22.61		0
	50	0	22.60		0
16QAM	1	0	23.08	0-1	0
	1	25	22.99		0
	1	49	23.04		0
	25	0	22.63	0-2	0.3
	25	12	22.67		0.3
	25	25	22.66		0.3
	50	0	22.64		0.3
64QAM	1	0	22.91	0-2	0.3
	1	25	22.77		0.3
	1	49	22.74		0.3
	25	0	21.69	0-3	1.3
	25	12	21.68		1.3
	25	25	21.65		1.3
	50	0	21.66		1.3

9.3.4 LTE Band 66 Antenna A

Table 9-11
LTE Band 66 (AWS) Antenna A 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	**23.47**	22.90	23.04	0	0
	1	50	23.05	22.69	23.05		0
	1	99	23.09	23.01	23.12		0
	50	0	22.08	21.93	22.05	0-1	1
	50	25	**22.22**	21.89	22.20		1
	50	50	22.11	21.97	22.21		1
	100	0	22.11	21.88	22.17		1
16QAM	1	0	22.30	22.13	22.14	0-1	1
	1	50	22.70	22.53	22.12		1
	1	99	22.24	22.39	22.31		1
	50	0	21.12	20.84	21.08	0-2	2
	50	25	21.16	20.94	21.20		2
	50	50	21.08	20.99	21.22		2
	100	0	21.09	20.98	21.25		2
64QAM	1	0	21.18	21.02	21.04	0-2	2
	1	50	21.29	20.88	21.13		2
	1	99	21.09	21.08	21.59		2
	50	0	20.03	19.85	20.03	0-3	3
	50	25	20.13	19.89	20.20		3
	50	50	20.05	19.92	20.16		3
	100	0	20.13	19.91	20.27		3

Table 9-12
LTE Band 66 (AWS) Antenna A Measured P_{Limit} for DSI = 0 (Body-worn or Phablet), DSI = 3 (Hotspot-Mode), or DSI = 4 (Earjack Active) - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	**20.37**	19.65	19.96	0	0
	1	50	19.92	19.62	19.93		0
	1	99	19.78	19.88	20.06		0
	50	0	19.90	19.80	19.94	0-1	0
	50	25	20.04	19.76	19.98		0
	50	50	**20.11**	19.78	20.01		0
	100	0	19.93	19.72	19.93		0
16QAM	1	0	20.14	20.02	19.90	0-1	0
	1	50	20.70	20.60	20.72		0
	1	99	19.99	20.10	20.25		0
	50	0	19.86	19.63	19.95	0-2	0
	50	25	19.96	19.78	20.05		0
	50	50	19.98	19.78	20.17		0
	100	0	19.99	19.76	20.03		0
64QAM	1	0	20.00	20.04	19.92	0-2	0
	1	50	20.08	19.82	20.59		0
	1	99	20.07	20.01	20.04		0
	50	0	19.98	19.80	19.89	0-3	0
	50	25	19.98	19.76	20.11		0
	50	50	19.94	19.83	20.13		0
	100	0	19.84	19.74	20.09		0

9.3.5 LTE Band 66 Antenna I

Table 9-13
LTE Band 66 (AWS) Antenna I Measured P_{Limit} for DSI = 0 (Body-worn or Phablet), or DSI = 4(Earjack Active) - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	19.46	19.47	19.18	0	0
	1	50	19.47	19.36	19.19		0
	1	99	**19.68**	19.51	19.11		0
	50	0	19.52	19.45	19.29	0-1	0
	50	25	19.62	19.51	19.36		0
	50	50	**19.63**	19.38	19.28		0
	100	0	19.61	19.44	19.32		0
16QAM	1	0	19.77	19.93	19.40	0-1	0
	1	50	20.02	19.45	20.00		0
	1	99	19.87	19.54	19.30		0
	50	0	19.54	19.39	19.24	0-2	0
	50	25	19.62	19.48	19.35		0
	50	50	19.54	19.38	19.25		0
	100	0	19.68	19.43	19.32		0
64QAM	1	0	19.51	19.66	19.48	0-2	0
	1	50	19.65	19.40	19.22		0
	1	99	19.96	19.50	19.09		0
	50	0	19.55	19.51	19.21	0-3	0
	50	25	19.60	19.47	19.33		0
	50	50	19.59	19.46	19.22		0
	100	0	19.57	19.51	19.27		0

Table 9-14
LTE Band 66 (AWS) Antenna I Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	16.86	17.35	17.43	0	0
	1	50	17.02	17.37	17.44		0
	1	99	17.23	**17.51**	17.42		0
	50	0	17.12	17.41	17.55	0-1	0
	50	25	17.32	**17.56**	17.54		0
	50	50	17.33	17.47	17.49		0
	100	0	17.27	17.50	17.50		0
16QAM	1	0	17.42	17.45	17.70	0-1	0
	1	50	17.69	17.51	17.83		0
	1	99	17.65	17.73	17.71		0
	50	0	17.19	17.46	17.59	0-2	0
	50	25	17.38	17.51	17.62		0
	50	50	17.37	17.49	17.53		0
	100	0	17.34	17.52	17.58		0
64QAM	1	0	17.30	17.48	17.63	0-2	0
	1	50	17.40	17.58	17.74		0
	1	99	17.61	17.70	17.64		0
	50	0	17.20	17.47	17.58	0-3	0
	50	25	17.35	17.54	17.62		0
	50	50	17.39	17.50	17.56		0
	100	0	17.34	17.54	17.59		0

9.3.6 LTE Band 2 Antenna A

Table 9-15
LTE Band 2 (PCS) Antenna A Measured P_{Max} for DSI = 2 (Head) - 20 MHz Bandwidth

LTE Band 2 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18700 (1860.0 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19100 (1900.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.86	23.77	23.83	0	0
	1	50	**23.89**	23.75	23.71		0
	1	99	23.78	23.78	23.76		0
	50	0	23.11	22.91	22.99	0-1	1
	50	25	**23.14**	22.95	23.03		1
	50	50	23.03	23.07	22.98		1
	100	0	23.08	23.01	22.98		1
16QAM	1	0	23.36	23.13	23.09	0-1	1
	1	50	23.21	23.16	23.42		1
	1	99	23.31	23.09	23.12		1
	50	0	22.04	22.02	22.01	0-2	2
	50	25	22.13	21.94	22.06		2
	50	50	22.06	22.00	21.92		2
	100	0	22.04	21.91	21.93		2
64QAM	1	0	22.32	22.28	21.87	0-2	2
	1	50	22.09	21.97	21.90		2
	1	99	22.25	21.94	21.87		2
	50	0	21.13	20.95	20.97	0-3	3
	50	25	21.08	20.92	20.99		3
	50	50	21.08	20.98	20.95		3
	100	0	21.07	20.86	20.97		3

Table 9-16
LTE Band 2 (PCS) Antenna A Measured P_{Limit} for DSI = 0 (Body-worn or Phablet), DSI = 3 (Hotspot- Mode), or DSI = 4 (Earjack Active) - 20 MHz Bandwidth

LTE Band 2 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18700 (1860.0 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19100 (1900.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	19.31	19.21	19.26	0	0
	1	50	19.36	19.25	19.18		0
	1	99	**19.37**	19.30	19.16		0
	50	0	19.41	19.36	19.29	0-1	0
	50	25	19.34	19.36	19.36		0
	50	50	**19.46**	19.42	19.29		0
	100	0	19.35	19.31	19.31		0
16QAM	1	0	19.51	19.53	19.39	0-1	0
	1	50	19.64	19.44	19.52		0
	1	99	19.52	19.51	19.65		0
	50	0	19.46	19.48	19.34	0-2	0
	50	25	19.50	19.38	19.34		0
	50	50	19.48	19.36	19.27		0
	100	0	19.41	19.34	19.31		0
64QAM	1	0	19.45	19.35	19.36	0-2	0
	1	50	19.49	19.39	19.43		0
	1	99	19.30	19.30	19.17		0
	50	0	19.41	19.25	19.32	0-3	0
	50	25	19.47	19.25	19.37		0
	50	50	19.42	19.32	19.25		0
	100	0	19.34	19.30	19.35		0

9.3.7 LTE Band 2 Antenna I

Table 9-17
LTE Band 2 (PCS) Antenna I Measured P_{Limit} for DSI = 0 (Body-worn or Phablet), or DSI = 4(Earjack Active) - 20 MHz Bandwidth

LTE Band 2 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18700 (1860.0 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19100 (1900.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	19.11	19.35	19.24	0	0
	1	50	19.05	19.24	19.24		0
	1	99	19.14	19.20	**19.36**		0
	50	0	19.06	19.21	19.36	0-1	0
	50	25	19.25	19.26	**19.47**		0
	50	50	19.23	19.20	19.44		0
	100	0	19.26	19.21	19.35		0
16QAM	1	0	19.09	19.57	19.47	0-1	0
	1	50	19.19	19.34	19.50		0
	1	99	19.47	19.28	19.63		0
	50	0	19.09	19.12	19.30	0-2	0
	50	25	19.23	19.25	19.33		0
	50	50	19.20	19.28	19.40		0
	100	0	19.19	19.20	19.43		0
64QAM	1	0	19.02	19.17	19.15	0-2	0
	1	50	19.33	19.41	19.43		0
	1	99	19.22	19.12	19.44		0
	50	0	19.16	19.15	19.36	0-3	0
	50	25	19.22	19.21	19.39		0
	50	50	19.19	19.30	19.47		0
	100	0	19.12	19.27	19.37		0

Table 9-18
LTE Band 2 (PCS) Antenna I Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 20 MHz Bandwidth

LTE Band 2 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18700 (1860.0 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19100 (1900.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	16.13	16.07	16.17	0	0
	1	50	15.97	16.14	16.11		0
	1	99	16.00	16.16	**16.29**		0
	50	0	15.99	16.09	16.23	0-1	0
	50	25	16.15	16.18	**16.28**		0
	50	50	16.12	16.23	16.27		0
	100	0	16.12	16.13	16.27		0
16QAM	1	0	16.01	16.18	16.20	0-1	0
	1	50	16.16	16.04	16.16		0
	1	99	15.98	16.36	16.43		0
	50	0	15.83	15.93	16.09	0-2	0
	50	25	16.01	16.00	16.10		0
	50	50	16.01	15.96	16.03		0
	100	0	15.96	15.88	16.19		0
64QAM	1	0	15.79	16.00	16.32	0-2	0
	1	50	16.04	16.09	16.19		0
	1	99	16.00	15.92	15.93		0
	50	0	15.80	15.99	16.00	0-3	0
	50	25	15.93	15.98	16.09		0
	50	50	15.98	16.01	16.15		0
	100	0	15.92	15.94	16.15		0

9.3.8 LTE Band 41 Antenna B

Table 9-19
LTE Band 41 Antenna B Measured P_{Max} for DSI = 2 (Head) - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	23.17	23.04	23.21	**23.36**	23.26	0	0
	1	50	23.23	23.07	23.35	23.34	23.26		0
	1	99	23.11	23.05	23.34	23.28	23.18		0
	50	0	22.44	22.15	22.37	22.46	22.32	0-1	1
	50	25	22.48	22.23	22.47	**22.58**	22.34		1
	50	50	22.41	22.13	22.45	22.49	22.35		1
	100	0	22.41	22.21	22.43	22.50	22.28		1
16QAM	1	0	22.16	22.37	22.20	22.36	22.41	0-1	1
	1	50	22.17	22.28	22.44	22.32	22.54		1
	1	99	22.10	22.13	22.44	22.37	22.45		1
	50	0	21.47	21.23	21.42	21.52	21.39	0-2	2
	50	25	21.50	21.28	21.50	21.63	21.41		2
	50	50	21.46	21.27	21.53	21.52	21.41		2
	100	0	21.46	21.21	21.39	21.51	21.31		2
64QAM	1	0	21.20	21.14	21.26	21.54	21.27	0-2	2
	1	50	21.42	21.17	21.33	21.41	21.21		2
	1	99	21.09	21.00	21.49	21.41	21.27		2
	50	0	20.53	20.24	20.42	20.50	20.37	0-3	3
	50	25	20.54	20.33	20.59	20.61	20.39		3
	50	50	20.47	20.22	20.52	20.57	20.44		3
	100	0	20.43	20.18	20.43	20.51	20.35		3

Table 9-20
LTE Band 41 Antenna B Uplink Carrier Aggregation Measured P_{Max} for DSI = 2 (Head) - 20 MHz Bandwidth

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C	LTE B41	20	41055	2636.5	QPSK	1	0	LTE B41	20	40857	2616.7	QPSK	1	99	23.65	23.36

Table 9-21
LTE Band 41 Antenna B Measured P_{Limit} for DSI = 0 (Body-worn or Phablet), or DSI = 4 (Earjack Active)- 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	21.42	21.22	21.41	**21.61**	21.39	0	0
	1	50	21.48	21.31	21.56	21.55	21.40		0
	1	99	21.31	21.17	21.55	21.53	21.28		0
	50	0	21.61	21.35	21.57	**21.71**	21.52	0-1	0
	50	25	21.65	21.43	21.65	21.67	21.48		0
	50	50	21.58	21.36	21.65	21.65	21.54		0
	100	0	21.55	21.42	21.51	21.60	21.47		0
16QAM	1	0	21.36	21.49	21.46	21.52	21.66	0-1	0
	1	50	21.54	21.45	21.69	21.63	21.71		0
	1	99	21.37	21.37	21.59	21.49	21.54		0
	50	0	21.48	21.18	21.41	21.48	21.40	0-2	0
	50	25	21.52	21.28	21.57	21.60	21.36		0
	50	50	21.44	21.20	21.55	21.55	21.40		0
	100	0	21.41	21.14	21.41	21.47	21.25		0
64QAM	1	0	21.24	21.18	21.15	21.39	21.33	0-2	0
	1	50	21.37	21.22	21.41	21.35	21.35		0
	1	99	21.11	21.05	21.45	21.31	21.31		0
	50	0	20.50	20.22	20.45	20.52	20.40	0-3	1
	50	25	20.52	20.30	20.57	20.61	20.36		1
	50	50	20.44	20.24	20.54	20.56	20.41		1
	100	0	20.47	20.20	20.44	20.49	20.29		1

Table 9-22
LTE Band 41 Antenna B Uplink Carrier Aggregation Measured P_{Limit} for DSI = 0 (Body-worn or Phablet), or DSI = 4 (Earjack Active)- 20 MHz Bandwidth

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C	LTE B41	20	41055	2636.5	QPSK	1	0	LTE B41	20	40857	2616.7	QPSK	1	99	21.57	21.61

Table 9-23
LTE Band 41 Antenna B Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	18.55	18.38	18.50	18.64	18.54	0	0
	1	50	18.58	18.44	18.57	18.57	18.54		0
	1	99	18.49	18.29	**18.66**	18.59	18.47		0
	50	0	18.70	18.47	18.60	18.69	18.59	0-1	0
	50	25	18.75	18.55	18.73	18.69	18.58		0
	50	50	18.70	18.47	**18.79**	18.70	18.63		0
	100	0	18.60	18.52	18.65	18.62	18.57		0
16QAM	1	0	18.48	18.42	18.46	18.45	18.54	0-1	0
	1	50	18.58	18.51	18.58	18.53	18.62		0
	1	99	18.38	18.41	18.69	18.40	18.49		0
	50	0	18.72	18.47	18.58	18.65	18.45	0-2	0
	50	25	18.78	18.57	18.71	18.75	18.52		0
	50	50	18.73	18.47	18.71	18.66	18.52		0
	100	0	18.73	18.52	18.62	18.65	18.44		0
64QAM	1	0	18.41	18.27	18.49	18.62	18.41	0-2	0
	1	50	18.52	18.26	18.48	18.52	18.56		0
	1	99	18.35	18.14	18.71	18.54	18.42		0
	50	0	18.66	18.33	18.58	18.66	18.52	0-3	0
	50	25	18.69	18.46	18.72	18.78	18.52		0
	50	50	18.59	18.38	18.73	18.72	18.51		0
	100	0	18.60	18.38	18.75	18.73	18.49		0

Table 9-24
LTE Band 41 Antenna B Uplink Carrier Aggregation Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 20 MHz Bandwidth

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C	LTE B41	20	40620	2593.0	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	0	18.52	18.66

9.3.9 LTE Band 41 Antenna I

Table 9-25
LTE Band 41 Antenna I Measured P_{Limit} for DSI = 0 (Body-worn or Phablet), or DSI = 4(Earjack Active) - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	19.76	19.79	19.86	19.92	**19.96**	0	0
	1	50	19.82	19.85	19.90	19.89	19.93		0
	1	99	19.73	19.72	19.93	19.86	19.91		0
	50	0	19.95	19.93	19.97	20.05	**20.12**	0-1	0
	50	25	20.04	19.91	20.05	20.10	20.09		0
	50	50	19.99	19.94	20.02	20.11	20.08		0
	100	0	19.93	19.89	19.91	19.92	19.95		0
16QAM	1	0	19.79	20.13	19.97	19.97	20.05	0-1	0
	1	50	19.84	20.00	19.96	19.98	20.13		0
	1	99	19.68	19.95	20.02	19.96	20.12		0
	50	0	19.96	19.97	20.02	20.17	20.11	0-2	0
	50	25	20.04	19.95	20.12	20.13	20.15		0
	50	50	19.99	19.99	20.08	20.09	20.12		0
	100	0	20.01	19.90	20.11	20.13	20.12		0
64QAM	1	0	19.92	19.90	19.84	20.00	20.01	0-2	0
	1	50	19.85	19.97	20.06	19.97	20.04		0
	1	99	19.79	19.85	19.91	19.77	19.98		0
	50	0	19.94	19.94	20.01	20.11	20.07	0-3	0
	50	25	20.04	19.96	20.12	20.10	20.12		0
	50	50	20.01	20.01	20.08	20.07	20.10		0
	100	0	19.98	19.95	20.05	20.10	20.11		0

Table 9-26
LTE Band 41 Antenna I Uplink Carrier Aggregation Measured P_{Limit} for DSI = 0 (Body-worn or Phablet), or DSI = 4(Earjack Active) - 20 MHz Bandwidth

		PCC							SCC							Power	
	Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
SCC lower	CA_41C	LTE B41	20	41490	2680.0	QPSK	1	0	LTE B41	20	41292	2660.2	QPSK	1	99	19.87	19.96

Table 9-27
LTE Band 41 Antenna I Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	17.77	17.78	17.87	17.88	**17.95**	0	0
	1	50	17.84	17.84	17.89	17.85	17.86		0
	1	99	17.66	17.72	17.84	17.82	17.88		0
	50	0	17.92	17.90	17.93	18.03	**18.06**	0-1	0
	50	25	18.03	17.92	18.03	18.05	18.04		0
	50	50	17.96	17.93	18.02	18.01	18.05		0
	100	0	17.91	17.88	17.93	17.92	17.93		0
16QAM	1	0	17.77	17.88	17.85	17.88	18.09	0-1	0
	1	50	17.84	17.97	18.00	17.88	18.18		0
	1	99	17.71	17.82	17.92	17.82	18.08		0
	50	0	17.95	17.95	17.93	18.09	18.08	0-2	0
	50	25	18.07	17.97	18.05	18.15	18.11		0
	50	50	18.04	17.97	18.03	18.10	18.06		0
	100	0	18.01	17.89	18.03	18.10	18.05		0
64QAM	1	0	17.82	17.83	17.82	18.02	17.95	0-2	0
	1	50	17.90	17.96	17.95	17.90	18.09		0
	1	99	17.71	17.58	17.96	17.95	18.09		0
	50	0	18.00	18.01	18.00	18.10	18.06	0-3	0
	50	25	18.10	17.98	18.08	18.16	18.14		0
	50	50	18.03	17.99	18.07	18.10	18.13		0
	100	0	18.08	17.97	18.08	18.13	18.06		0

Table 9-28
LTE Band 41 Antenna I Uplink Carrier Aggregation Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 20 MHz Bandwidth

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C	LTE B41	20	41055	2636.5	QPSK	1	0	LTE B41	20	40857	2616.7	QPSK	1	99	17.84	17.88
CA_41C	LTE B41	20	41490	2680.0	QPSK	1	0	LTE B41	20	41292	2660.2	QPSK	1	99	17.81	17.95

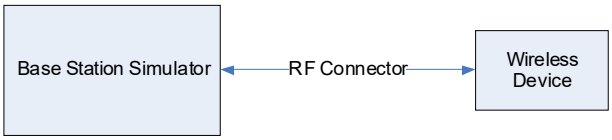

Figure 9-3
Power Measurement Setup

9.4 NR Conducted Powers

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

Note: Some bands do not support non-overlapping channels. Per FCC Guidance, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

9.4.1 NR Band n5

Table 9-29
NR Band n5 Measured P_{Max} for DSI = 0 (Body-worn or Phablet), DSI = 3 (Hotspot Mode), DSI = 2 (Head), or DSI = 4 (Earjack Active) - 20 MHz Bandwidth

NR Band n5 20 MHz Bandwidth					
			Channel		
Modulation	RB Size	RB Offset	167300 (836.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
DFT-s-OFDM QPSK	1	1	**24.72**	0	0.0
	1	53	24.55		0.0
	1	104	24.42		0.0
	50	0	23.58	0-1	1.0
	50	28	**24.50**	0	0.0
	50	56	23.45	0-1	1.0
	100	0	23.55		1.0
DFT-s-OFDM 16QAM	1	1	23.67	0-1	1.0
CP-OFDM QPSK	1	1	23.28	0-1.5	1.5

9.4.2 NR Band n66 Antenna A

Table 9-30
NR Band n66 Antenna A Measured P_{Max} for DSI = 2 (Head) - 40 MHz Bandwidth

NR Band n66 40 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	349000 (1745 MHz) Conducted Power [dBm]		
DFT-s-OFDM QPSK	1	1	22.78	0	0.0
	1	108	**22.82**		0.0
	1	214	22.78		0.0
	108	0	21.83	0-1	1.0
	108	54	**22.84**	0	0.0
	108	108	21.89	0-1	1.0
	216	0	21.83		1.0
DFT-s-OFDM 16QAM	1	1	21.92	0-1	1.0
CP-OFDM QPSK	1	1	21.20	0-1.5	1.5

Table 9-31
NR Band n66 Antenna A Measured P_{Limit} for DSI = 0 (Body-worn or Phablet), DSI = 3 (Hotspot Mode), or DSI = 4 (Earjack Active) - 40 MHz Bandwidth

NR Band n66 40 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	349000 (1745 MHz) Conducted Power [dBm]		
DFT-s-OFDM QPSK	1	1	19.59	0	0.0
	1	108	**19.74**		0.0
	1	214	19.58		0.0
	108	0	19.68	0-1	0.0
	108	54	19.76	0	0.0
	108	108	**19.79**	0-1	0.0
	216	0	19.71		0.0
DFT-s-OFDM 16QAM	1	1	19.76	0-1	0.0
CP-OFDM QPSK	1	1	19.75	0-1.5	0.0

9.4.3 NR Band n66 Antenna I

Table 9-32
NR Band n66 Antenna I Measured P_{Limit} for DSI = 0 (Body-worn or Phablet), or DSI = 4 (Earjack Active) - 40 MHz Bandwidth

NR Band n66 40 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	349000 (1745 MHz) Conducted Power [dBm]		
DFT-s-OFDM QPSK	1	1	19.29	0	0.0
	1	108	19.41		0.0
	1	214	**19.58**		0.0
	108	0	19.54	0-1	0.0
	108	54	**19.65**	0	0.0
	108	108	19.64	0-1	0.0
	216	0	19.53		0.0
DFT-s-OFDM 16QAM	1	1	19.37	0-1	0.0
CP-OFDM QPSK	1	1	19.14	0-1.5	0.0

Table 9-33
NR Band n66 Antenna I Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 40 MHz Bandwidth

NR Band n66 40 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	349000 (1745 MHz) Conducted Power [dBm]		
DFT-s-OFDM QPSK	1	1	17.44	0	0.0
	1	108	**17.66**		0.0
	1	214	17.63		0.0
	108	0	17.57	0-1	0.0
	108	54	**17.74**	0	0.0
	108	108	17.70	0-1	0.0
	216	0	17.46		0.0
DFT-s-OFDM 16QAM	1	1	17.42	0-1	0.0
CP-OFDM QPSK	1	1	17.42	0-1.5	0.0

9.4.4 NR Band n41 Antenna I

Table 9-34
NR Band n41 Antenna I Measured P_{Limit} for DSI = 0 (Body-worn or Phablet), or DSI = 4 (Earjack Active) – 100 MHz Bandwidth

NR Band n41 100 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	518598 (2592.99 MHz) Conducted Power [dBm]		
DFT-s-OFDM QPSK	1	1	18.10	0	0.0
	1	137	**18.52**		0.0
	1	271	18.43		0.0
	135	0	18.25	0-1	0.0
	135	69	18.54	0	0.0
	135	138	**18.63**	0-1	0.0
	270	0	18.41		0.0
DFT-s-OFDM 16QAM	1	1	18.31	0-1	0.0
CP-OFDM QPSK	1	1	18.03	0-1.5	0.0

Table 9-35
NR Band n41 Antenna I Measured P_{Limit} for DSI = 3 (Hotspot Mode) – 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 QPSK	1	1	16.07	0	0.0
	1	137	**16.50**		0.0
	1	271	16.39		0.0
	135	0	16.22	0-1	0.0
	135	69	16.48	0	0.0
	135	138	**16.53**	0-1	0.0
	270	0	16.35		0.0
DFT-s-OFDM 16QAM	1	1	16.22	0-1	0.0
CP-OFDM QPSK	1	1	15.97	0-1.5	0.0

Table 9-36
NR Band n41 Antenna I Measured P_{Limit} for DSI = 2 (Head) – 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 QPSK	1	1	13.66	0	0.0
	1	137	**14.08**		0.0
	1	271	14.04		0.0
	135	0	13.80	0-1	0.0
	135	69	13.97	0	0.0
	135	138	**14.12**	0-1	0.0
	270	0	13.92		0.0
DFT-s-OFDM 16QAM	1	1	13.82	0-1	0.0
CP-OFDM QPSK	1	1	13.50	0-1.5	0.0

Figure 9-4
Power Measurement Setup – NR FDD

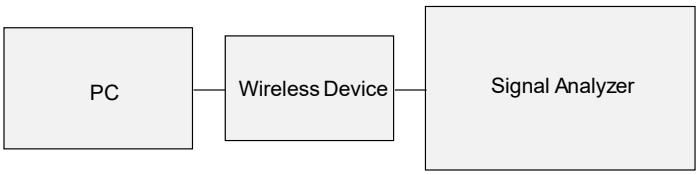

Figure 9-5
Power Measurement Setup – NR TDD

9.5 WLAN Conducted Powers

Table 9-37
2.4 GHz WLAN Measured P_{Max} Average RF Power for DSI = 0 (Body-worn or Phablet), DSI = 3 (Hotspot Mode), or DSI = 4 (Earjack Active) – Ant 2

2.4GHz Conducted Power [dBm]						
Freq [MHz]	Channel	IEEE Transmission Mode				
		802.11b	802.11g	802.11n	802.11ac	802.11ax
		Average	Average	Average	Average	Average
2412	1	18.95	17.68	17.92	16.82	16.95
2437	6	18.62	17.98	17.64	16.93	16.68
2462	11	18.94	17.42	17.81	16.62	16.81

Table 9-38
2.4 GHz WLAN Measured P_{Max} Average RF Power for DSI = 0 (Body-worn or Phablet), DSI = 3 (Hotspot Mode), or DSI = 4 (Earjack Active) – MIMO

2.4GHz 802.11b Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2412	1	18.31	18.73	21.54
2437	6	18.14	18.96	21.58
2462	11	18.13	18.74	21.46

Table 9-39
2.4 GHz WLAN Measured P_{Limit} Average RF Power for DSI = 2 (Head) – Ant 2

2.4GHz Conducted Power [dBm]						
Freq [MHz]	Channel	IEEE Transmission Mode				
		802.11b	802.11g	802.11n	802.11ac	802.11ax
		Average	Average	Average	Average	Average
2412	1	11.92	11.77	11.71	11.81	11.75
2437	6	11.97	11.88	11.95	11.77	11.80
2462	11	11.67	11.80	11.62	11.80	11.69

Table 9-40
2.4 GHz WLAN Measured P_{Limit} Average RF Power for DSI = 2 (Head) – MIMO

2.4GHz 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2412	1	5.32	5.81	8.58
2437	6	5.44	5.56	8.51
2462	11	5.72	5.93	8.84

Table 9-41
5 GHz WLAN Measured P_{Max} Average RF Power for all DSI – MIMO

5GHz (20MHz) 802.11n Conducted Power [dBm]				
Freq [MHz]	**Channel**	**ANT1**	**ANT2**	**MIMO**
5180	36	15.66	15.41	18.55
5200	40	15.63	15.37	18.51
5220	44	15.43	15.45	18.45
5240	48	15.62	15.44	18.54
5260	52	15.47	15.58	18.54
5280	56	15.44	15.55	18.51
5300	60	15.93	15.55	18.75
5320	64	15.88	15.61	18.76
5500	100	15.54	15.68	18.62
5600	120	15.74	15.35	18.56
5620	124	15.68	15.39	18.55
5720	144	15.47	15.61	18.55
5745	149	15.91	15.77	18.85
5785	157	15.89	15.83	18.87
5825	165	15.76	15.81	18.80
5845	169	15.58	15.69	18.65
5865	173	15.47	15.66	18.58
5885	177	15.68	15.13	18.42

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

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

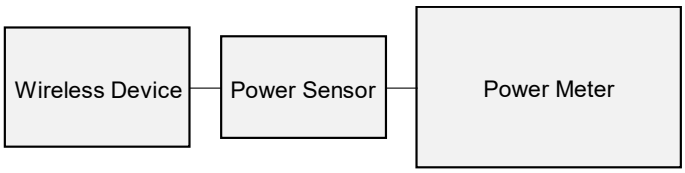

Figure 9-6
Power Measurement Setup

9.6 Bluetooth Conducted Powers

Table 9-42
Bluetooth Measured P_{Max} Average RF Power for all DSI – Antenna 1

Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	1.0	GFSK	0	15.03	31.851
2441	1.0	GFSK	39	16.40	43.612
2480	1.0	GFSK	78	15.12	32.482
Frequency [MHz]	**Data Rate [Mbps]**	**Channel No.**	**Bluetooth Mode**	**Peak Conducted Power**	
				[dBm]	**[mW]**
2402	1.0	0	LE	15.26	33.574
2440	1.0	19	LE	16.42	43.863
2480	1.0	39	LE	15.17	32.847

Table 9-43
Bluetooth Measured P_{Max} Average RF Power for all DSI – Antenna 2

Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	1.0	GFSK	0	16.59	45.556
2441	1.0	GFSK	39	16.74	47.227
2480	1.0	GFSK	78	15.49	35.419
Frequency [MHz]	**Data Rate [Mbps]**	**Channel No.**	**Bluetooth Mode**	**Peak Conducted Power**	
				[dBm]	**[mW]**
2402	1.0	0	LE	18.29	67.391
2440	1.0	19	LE	18.23	66.481
2480	1.0	39	LE	17.12	51.523

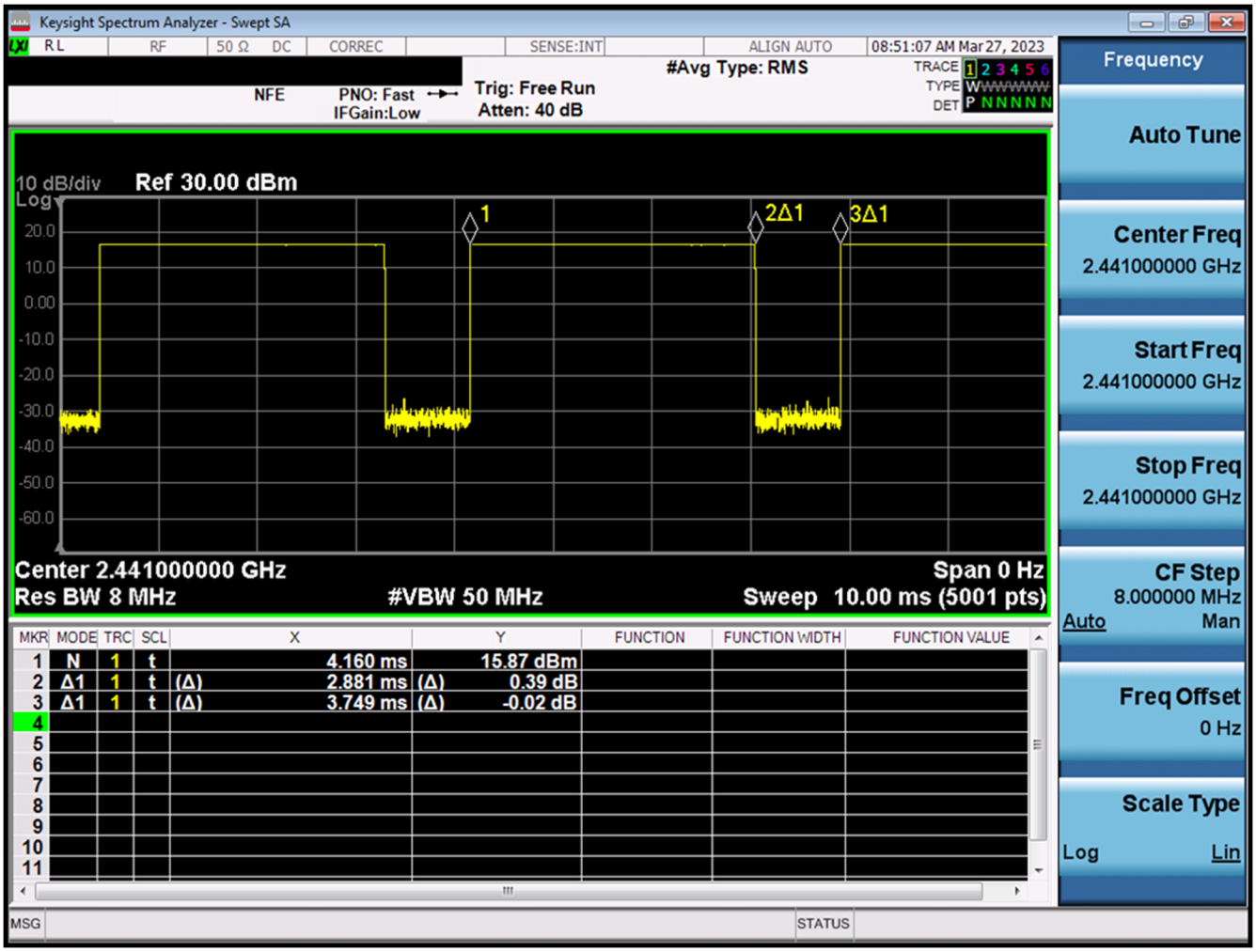

Figure 9-7
Bluetooth Antenna 1 Transmission Plot

Equation 9-1
Bluetooth Antenna 1 Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.881ms}{3.749ms} * 100\% = 76.85\%$$

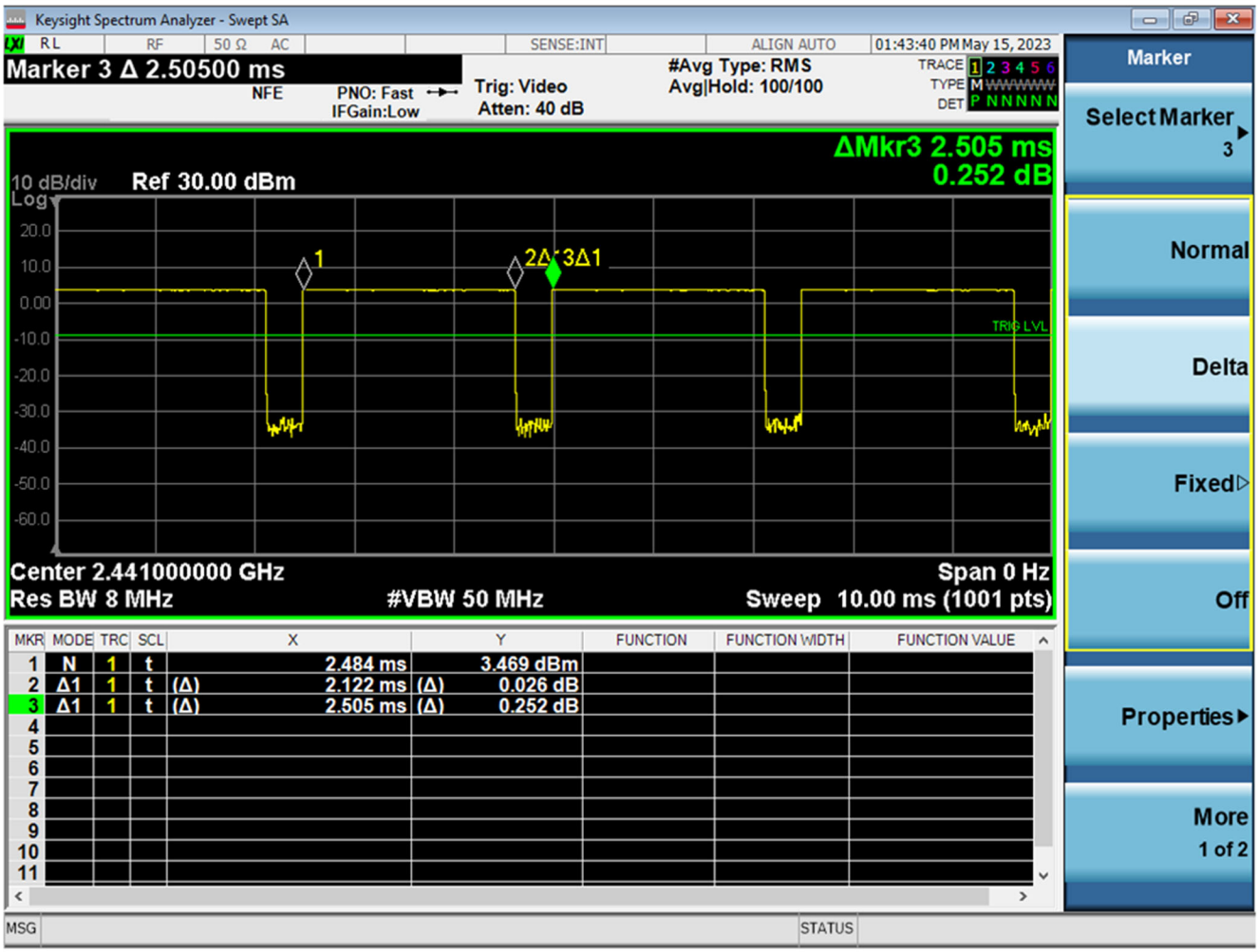

Figure 9-8
Bluetooth Antenna 1 Low Energy Transmission Plot

Equation 9-2
Bluetooth Antenna 1 Low Energy Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.122ms}{2.505ms} * 100\% = 84.71\%$$

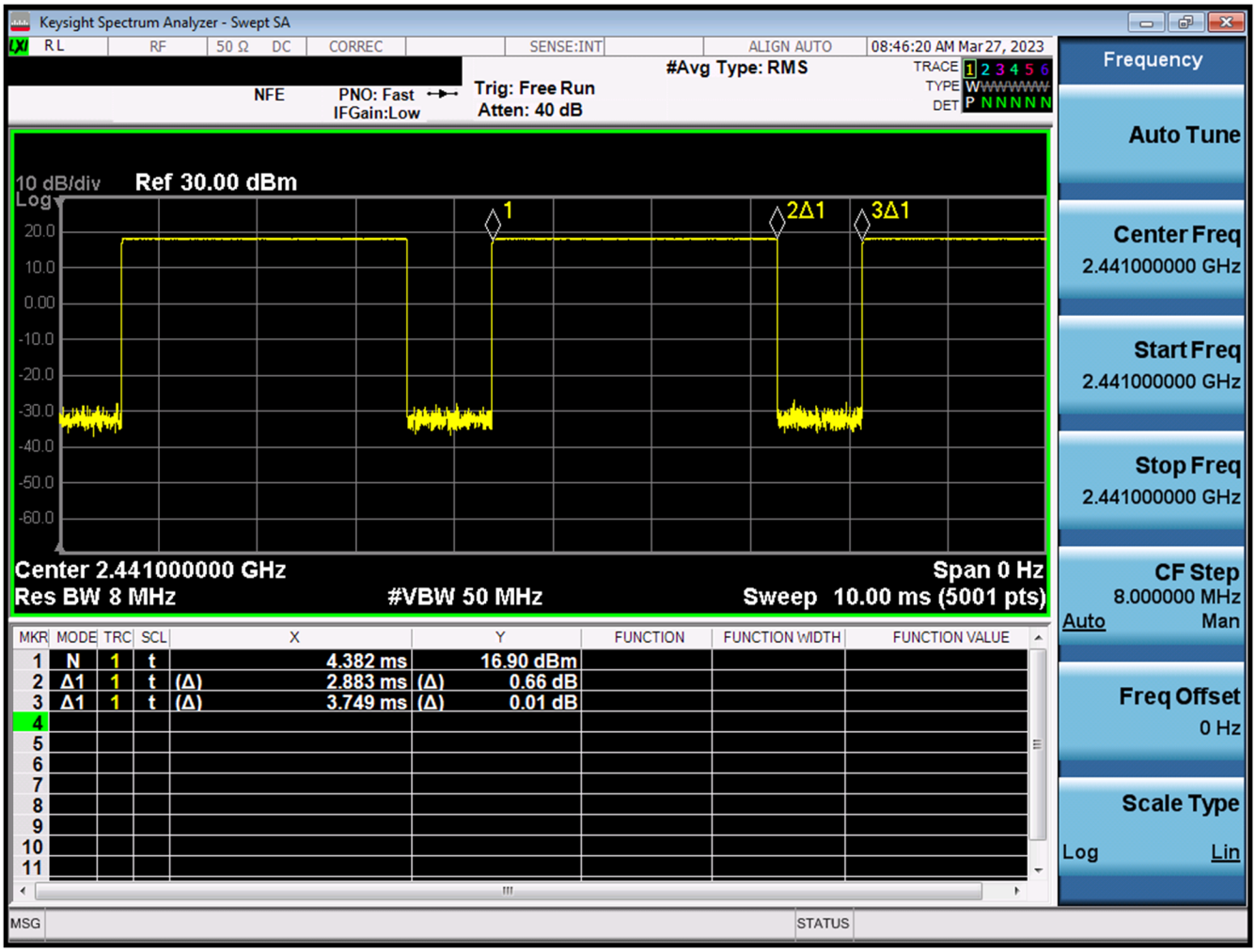

Figure 9-9
Bluetooth Antenna 2 Transmission Plot

Equation 9-3
Bluetooth Antenna 2 Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.883ms}{3.749ms} * 100\% = 76.90\%$$

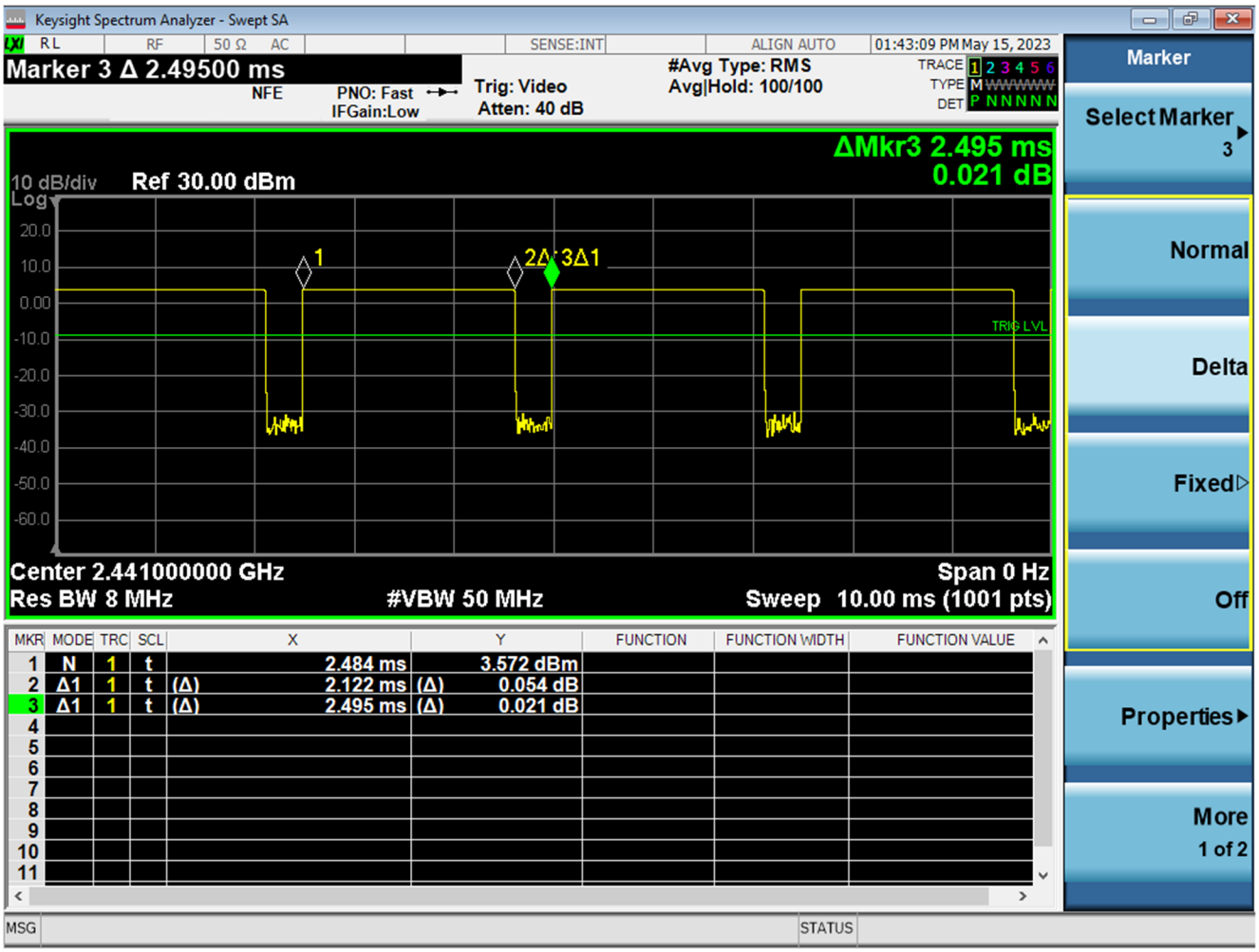

Figure 9-10
Bluetooth Low Energy Antenna 2 Transmission Plot

Equation 9-4
Bluetooth Low Energy Antenna 2 Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.122ms}{2.495ms} * 100\% = 85.05\%$$

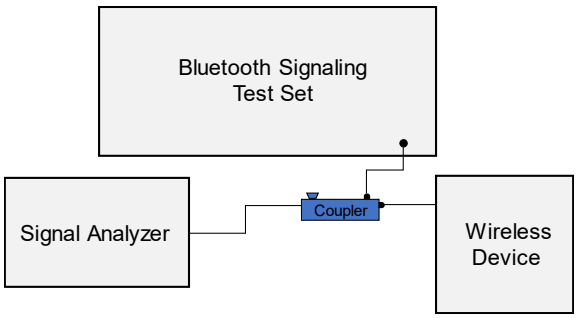

Figure 9-11
Power Measurement Setup

10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
07/06/2023	30 Head	20.6	12	0.717	52.460	0.750	55.000	-4.40%	-4.62%
			13	0.717	52.685	0.750	55.000	-4.40%	-4.21%
			14	0.717	52.780	0.750	55.000	-4.40%	-4.04%
07/06/2023	750 Head	23.4	680	0.850	40.362	0.888	42.305	-4.28%	-4.59%
			695	0.854	40.319	0.889	42.227	-3.94%	-4.52%
			700	0.855	40.307	0.889	42.201	-3.82%	-4.49%
			710	0.858	40.285	0.890	42.149	-3.60%	-4.42%
			725	0.863	40.250	0.891	42.071	-3.14%	-4.33%
			750	0.871	40.181	0.894	41.942	-2.57%	-4.20%
			770	0.878	40.117	0.895	41.838	-1.90%	-4.11%
			785	0.883	40.072	0.896	41.760	-1.45%	-4.04%
			800	0.888	40.030	0.897	41.682	-1.00%	-3.96%
07/10/2023	750 Head	23.3	680	0.844	42.886	0.888	42.305	-4.95%	1.37%
			695	0.849	42.846	0.889	42.227	-4.50%	1.47%
			700	0.850	42.831	0.889	42.201	-4.39%	1.49%
			710	0.853	42.804	0.890	42.149	-4.16%	1.55%
			725	0.858	42.764	0.891	42.071	-3.70%	1.65%
			750	0.866	42.694	0.894	41.942	-3.13%	1.79%
			770	0.872	42.643	0.895	41.838	-2.57%	1.92%
			785	0.877	42.607	0.896	41.760	-2.12%	2.03%
			800	0.883	42.574	0.897	41.682	-1.56%	2.14%
06/30/2023	835 Head	22.3	815	0.871	40.862	0.898	41.594	-3.01%	-1.76%
			820	0.873	40.860	0.899	41.578	-2.89%	-1.73%
			835	0.878	40.831	0.900	41.500	-2.44%	-1.61%
			850	0.883	40.771	0.916	41.500	-3.60%	-1.76%
07/03/2023	835 Head	20.2	815	0.886	42.963	0.898	41.594	-1.34%	3.29%
			820	0.888	42.943	0.899	41.578	-1.22%	3.28%
			835	0.893	42.886	0.900	41.500	-0.78%	3.34%
			850	0.898	42.841	0.916	41.500	-1.97%	3.23%
07/05/2023	835 Head	21.3	815	0.882	41.719	0.898	41.594	-1.78%	0.30%
			820	0.887	41.653	0.899	41.578	-1.33%	0.18%
			835	0.902	41.456	0.900	41.500	0.22%	-0.11%
			850	0.917	41.262	0.916	41.500	0.11%	-0.57%
07/06/2023	835 Head	20.2	815	0.891	41.995	0.898	41.594	-0.78%	0.96%
			820	0.896	41.928	0.899	41.578	-0.33%	0.84%
			835	0.911	41.726	0.900	41.500	1.22%	0.54%
			850	0.926	41.527	0.916	41.500	1.09%	0.07%
07/10/2023	835 Head	21.5	815	0.887	42.237	0.898	41.594	-1.22%	1.55%
			820	0.891	42.172	0.899	41.578	-0.89%	1.43%
			835	0.906	41.980	0.900	41.500	0.67%	1.16%
			850	0.920	41.790	0.916	41.500	0.44%	0.70%
06/26/2023	1750 Head	20.1	1710	1.311	39.339	1.348	40.142	-2.74%	-2.00%
			1720	1.321	39.285	1.354	40.126	-2.44%	-2.10%
			1745	1.347	39.141	1.368	40.087	-1.54%	-2.36%
			1750	1.353	39.112	1.371	40.079	-1.31%	-2.41%
			1770	1.375	39.014	1.383	40.047	-0.58%	-2.58%
			1790	1.396	38.923	1.394	40.016	0.14%	-2.73%
07/05/2023	1750 Head	22.2	1710	1.379	39.227	1.348	40.142	2.30%	-2.28%
			1720	1.385	39.203	1.354	40.126	2.29%	-2.30%
			1745	1.402	39.153	1.368	40.087	2.49%	-2.33%
			1750	1.406	39.145	1.371	40.079	2.55%	-2.33%
			1770	1.417	39.124	1.383	40.047	2.46%	-2.30%
			1790	1.428	39.102	1.394	40.016	2.44%	-2.28%
07/08/2023	1750 Head	20.8	1710	1.360	41.211	1.348	40.142	0.89%	2.66%
			1720	1.366	41.191	1.354	40.126	0.89%	2.65%
			1745	1.383	41.134	1.368	40.087	1.10%	2.61%
			1750	1.386	41.123	1.371	40.079	1.09%	2.60%
			1770	1.399	41.090	1.383	40.047	1.16%	2.60%
			1790	1.411	41.066	1.394	40.016	1.22%	2.62%
07/10/2023	1750 Head	21.5	1710	1.344	38.959	1.348	40.142	-0.30%	-2.95%
			1720	1.350	38.938	1.354	40.126	-0.30%	-2.96%
			1745	1.365	38.886	1.368	40.087	-0.22%	-3.00%
			1750	1.368	38.877	1.371	40.079	-0.22%	-3.00%
			1770	1.380	38.849	1.383	40.047	-0.22%	-2.99%
			1790	1.390	38.818	1.394	40.016	-0.29%	-2.99%
07/13/2023	1750 Head	23.0	1710	1.367	39.068	1.348	40.142	1.41%	-2.68%
			1720	1.373	39.041	1.354	40.126	1.40%	-2.70%
			1745	1.388	38.983	1.368	40.087	1.46%	-2.75%
			1750	1.391	38.974	1.371	40.079	1.46%	-2.76%
			1770	1.402	38.947	1.383	40.047	1.37%	-2.75%
			1790	1.413	38.913	1.394	40.016	1.36%	-2.76%
06/21/2023	1900 Head	21.2	1850	1.351	38.837	1.400	40.000	-3.50%	-2.91%
			1860	1.357	38.825	1.400	40.000	-3.07%	-2.94%
			1880	1.369	38.800	1.400	40.000	-2.21%	-3.00%
			1900	1.381	38.782	1.400	40.000	-1.36%	-3.05%
			1905	1.384	38.776	1.400	40.000	-1.14%	-3.06%
			1910	1.387	38.771	1.400	40.000	-0.93%	-3.07%
			1920	1.392	38.758	1.400	40.000	-0.57%	-3.10%

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

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
06/26/2023	1900 Head	21.5	1850	1.368	40.617	1.400	40.000	-2.29%	1.54%
			1860	1.378	40.568	1.400	40.000	-1.57%	1.42%
			1880	1.399	40.468	1.400	40.000	-0.07%	1.17%
			1900	1.421	40.368	1.400	40.000	1.50%	0.92%
			1905	1.426	40.344	1.400	40.000	1.86%	0.86%
			1910	1.432	40.318	1.400	40.000	2.29%	0.79%
07/05/2023	1900 Head	21.1	1850	1.393	39.809	1.400	40.000	-0.50%	-0.48%
			1860	1.406	39.750	1.400	40.000	0.43%	-0.63%
			1880	1.435	39.645	1.400	40.000	2.50%	-0.89%
			1900	1.461	39.574	1.400	40.000	4.36%	-1.07%
			1905	1.466	39.560	1.400	40.000	4.71%	-1.10%
07/12/2023	1900 Head	24.5	1850	1.333	39.304	1.400	40.000	-4.79%	-1.74%
			1860	1.343	39.251	1.400	40.000	-4.07%	-1.87%
			1880	1.364	39.156	1.400	40.000	-2.57%	-2.11%
			1900	1.385	39.089	1.400	40.000	-1.07%	-2.28%
			1905	1.390	39.074	1.400	40.000	-0.71%	-2.32%
			1910	1.395	39.059	1.400	40.000	-0.36%	-2.35%
			1920	1.405	39.030	1.400	40.000	0.36%	-2.43%
07/17/2023	1900 Head	22.6	1850	1.346	38.469	1.400	40.000	-3.86%	-3.83%
			1860	1.358	38.432	1.400	40.000	-3.00%	-3.92%
			1880	1.376	38.404	1.400	40.000	-1.71%	-3.99%
			1900	1.390	38.371	1.400	40.000	-0.71%	-4.07%
			1905	1.394	38.352	1.400	40.000	-0.43%	-4.12%
			1910	1.398	38.326	1.400	40.000	-0.14%	-4.19%
			1920	1.408	38.257	1.400	40.000	0.57%	-4.36%
06/20/2023	2450 Head	22.9	2300	1.696	38.953	1.670	39.500	1.56%	-1.38%
			2310	1.703	38.940	1.679	39.480	1.43%	-1.37%
			2320	1.710	38.927	1.687	39.460	1.36%	-1.35%
			2400	1.769	38.822	1.756	39.289	0.74%	-1.19%
			2450	1.808	38.745	1.800	39.200	0.44%	-1.16%
			2480	1.830	38.694	1.833	39.162	-0.16%	-1.20%
			2500	1.844	38.660	1.855	39.136	-0.59%	-1.22%
			2510	1.851	38.645	1.866	39.123	-0.80%	-1.22%
			2535	1.871	38.601	1.893	39.092	-1.16%	-1.26%
			2550	1.883	38.578	1.909	39.073	-1.36%	-1.27%
			2560	1.892	38.563	1.920	39.060	-1.46%	-1.27%
			2600	1.922	38.509	1.964	39.009	-2.14%	-1.28%
			2650	1.958	38.398	2.018	38.945	-2.97%	-1.40%
			2680	1.984	38.356	2.051	38.907	-3.27%	-1.42%
			2700	1.998	38.344	2.073	38.882	-3.62%	-1.38%
06/25/2023	2450 Head	23.0	2300	1.693	37.857	1.670	39.500	1.38%	-4.16%
			2310	1.700	37.856	1.679	39.480	1.25%	-4.11%
			2320	1.707	37.850	1.687	39.460	1.19%	-4.08%
			2400	1.762	37.719	1.756	39.289	0.34%	-4.00%
			2450	1.803	37.665	1.800	39.200	0.17%	-3.92%
			2480	1.821	37.595	1.833	39.162	-0.65%	-4.00%
			2500	1.836	37.553	1.855	39.136	-1.02%	-4.04%
			2510	1.845	37.539	1.866	39.123	-1.13%	-4.05%
			2535	1.868	37.511	1.893	39.092	-1.32%	-4.04%
			2550	1.881	37.494	1.909	39.073	-1.47%	-4.04%
			2560	1.889	37.478	1.920	39.060	-1.61%	-4.05%
			2600	1.912	37.402	1.964	39.009	-2.65%	-4.12%
			2650	1.956	37.303	2.018	38.945	-3.07%	-4.22%
			2680	1.982	37.273	2.051	38.907	-3.36%	-4.20%
			2700	1.992	37.252	2.073	38.882	-3.91%	-4.19%
06/26/2023	2450 Head	20.4	2300	1.732	39.437	1.670	39.500	3.71%	-0.16%
			2310	1.739	39.421	1.679	39.480	3.57%	-0.15%
			2320	1.745	39.402	1.687	39.460	3.44%	-0.15%
			2400	1.805	39.281	1.756	39.289	2.79%	-0.02%
			2450	1.842	39.191	1.800	39.200	2.33%	-0.02%
			2480	1.865	39.161	1.833	39.162	1.75%	0.00%
			2500	1.879	39.128	1.855	39.136	1.29%	-0.02%
			2510	1.886	39.108	1.866	39.123	1.07%	-0.04%
			2535	1.907	39.058	1.893	39.092	0.74%	-0.09%
			2550	1.920	39.036	1.909	39.073	0.58%	-0.09%
			2560	1.928	39.025	1.920	39.060	0.42%	-0.09%
			2600	1.958	38.974	1.964	39.009	-0.31%	-0.09%
			2650	1.999	38.878	2.018	38.945	-0.94%	-0.17%
			2680	2.025	38.844	2.051	38.907	-1.27%	-0.16%
			2700	2.038	38.814	2.073	38.882	-1.69%	-0.17%
06/28/2023	2450 Head	20.9	2300	1.707	41.166	1.670	39.500	2.22%	4.22%
			2310	1.715	41.158	1.679	39.480	2.14%	4.25%
			2320	1.722	41.147	1.687	39.460	2.07%	4.28%
			2400	1.783	41.038	1.756	39.289	1.54%	4.45%
			2450	1.824	40.963	1.800	39.200	1.33%	4.50%
			2480	1.848	40.912	1.833	39.162	0.82%	4.47%
			2500	1.864	40.883	1.855	39.136	0.49%	4.46%
			2510	1.873	40.869	1.866	39.123	0.38%	4.46%
			2535	1.894	40.828	1.893	39.092	0.05%	4.44%
			2550	1.907	40.800	1.909	39.073	-0.10%	4.42%
			2560	1.915	40.779	1.920	39.060	-0.26%	4.40%
			2600	1.948	40.718	1.964	39.009	-0.81%	4.38%
			2650	1.989	40.622	2.018	38.945	-1.44%	4.31%
			2680	2.014	40.570	2.051	38.907	-1.80%	4.27%
			2700	2.030	40.550	2.073	38.882	-2.07%	4.29%

Table 10-3
Measured Head Tissue Properties (Cont.)

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
07/04/2023	2450 Head	19.2	2300	1.658	41.144	1.670	39.500	-0.72%	4.16%
			2310	1.665	41.130	1.679	39.480	-0.83%	4.18%
			2320	1.672	41.115	1.687	39.460	-0.89%	4.19%
			2400	1.734	41.000	1.756	39.289	-1.25%	4.35%
			2450	1.770	40.938	1.800	39.200	-1.67%	4.43%
			2480	1.795	40.898	1.833	39.162	-2.07%	4.43%
			2500	1.812	40.857	1.855	39.136	-2.32%	4.40%
			2510	1.819	40.835	1.866	39.123	-2.52%	4.38%
			2535	1.837	40.797	1.893	39.092	-2.96%	4.36%
			2550	1.849	40.778	1.909	39.073	-3.14%	4.36%
			2560	1.858	40.764	1.920	39.060	-3.23%	4.36%
			2600	1.893	40.705	1.964	39.009	-3.62%	4.35%
			2650	1.932	40.616	2.018	38.945	-4.26%	4.29%
			2680	1.960	40.570	2.051	38.907	-4.44%	4.27%
			2700	1.978	40.532	2.073	38.882	-4.58%	4.24%
07/06/2023	2450 Head	19.9	2300	1.671	41.376	1.670	39.500	0.06%	4.75%
			2310	1.678	41.360	1.679	39.480	-0.06%	4.76%
			2320	1.686	41.346	1.687	39.460	-0.06%	4.78%
			2400	1.747	41.218	1.756	39.289	-0.51%	4.91%
			2450	1.786	41.148	1.800	39.200	-0.78%	4.97%
			2480	1.809	41.107	1.833	39.162	-1.31%	4.97%
			2500	1.825	41.067	1.855	39.136	-1.62%	4.93%
			2510	1.833	41.046	1.866	39.123	-1.77%	4.92%
			2535	1.853	41.000	1.893	39.092	-2.11%	4.88%
			2550	1.866	40.980	1.909	39.073	-2.25%	4.88%
			2560	1.874	40.969	1.920	39.060	-2.40%	4.89%
			2600	1.906	40.905	1.964	39.009	-2.95%	4.86%
			2650	1.947	40.806	2.018	38.945	-3.52%	4.78%
			2680	1.973	40.761	2.051	38.907	-3.80%	4.77%
			2700	1.989	40.734	2.073	38.882	-4.05%	4.76%
07/10/2023	2450 Head	21.8	2300	1.707	39.004	1.670	39.500	2.22%	-1.26%
			2310	1.714	38.982	1.679	39.480	2.08%	-1.26%
			2320	1.721	38.960	1.687	39.460	2.02%	-1.27%
			2400	1.781	38.835	1.756	39.289	1.42%	-1.16%
			2450	1.820	38.757	1.800	39.200	1.11%	-1.13%
			2480	1.843	38.722	1.833	39.162	0.55%	-1.12%
			2500	1.859	38.697	1.855	39.136	0.22%	-1.12%
			2510	1.866	38.684	1.866	39.123	0.00%	-1.12%
			2535	1.887	38.645	1.893	39.092	-0.32%	-1.14%
			2550	1.900	38.628	1.909	39.073	-0.47%	-1.14%
			2560	1.908	38.620	1.920	39.060	-0.63%	-1.13%
			2600	1.935	38.580	1.964	39.009	-1.48%	-1.10%
			2650	1.973	38.487	2.018	38.945	-2.23%	-1.18%
			2680	1.993	38.438	2.051	38.907	-2.83%	-1.21%
			2700	2.008	38.388	2.073	38.882	-3.14%	-1.27%
07/12/2023	2450 Head	20.5	2300	1.661	40.954	1.670	39.500	-0.54%	3.68%
			2310	1.668	40.942	1.679	39.480	-0.66%	3.70%
			2320	1.676	40.930	1.687	39.460	-0.65%	3.73%
			2400	1.735	40.815	1.756	39.289	-1.20%	3.88%
			2450	1.773	40.755	1.800	39.200	-1.50%	3.97%
			2480	1.796	40.705	1.833	39.162	-2.02%	3.94%
			2500	1.813	40.668	1.855	39.136	-2.26%	3.91%
			2510	1.821	40.653	1.866	39.123	-2.41%	3.91%
			2535	1.843	40.617	1.893	39.092	-2.64%	3.90%
			2550	1.855	40.595	1.909	39.073	-2.83%	3.90%
			2560	1.863	40.581	1.920	39.060	-2.97%	3.89%
			2600	1.894	40.513	1.964	39.009	-3.56%	3.86%
			2650	1.936	40.411	2.018	38.945	-4.06%	3.76%
			2680	1.960	40.370	2.051	38.907	-4.44%	3.76%
			2700	1.976	40.336	2.073	38.882	-4.68%	3.74%
07/14/2023	2450 Head	19.3	2300	1.661	41.025	1.670	39.500	-0.54%	3.86%
			2310	1.668	41.013	1.679	39.480	-0.66%	3.88%
			2320	1.675	41.003	1.687	39.460	-0.71%	3.91%
			2400	1.735	40.895	1.756	39.289	-1.20%	4.09%
			2450	1.772	40.834	1.800	39.200	-1.56%	4.17%
			2480	1.796	40.797	1.833	39.162	-2.02%	4.17%
			2500	1.811	40.761	1.855	39.136	-2.37%	4.15%
			2510	1.818	40.742	1.866	39.123	-2.57%	4.14%
			2535	1.837	40.701	1.893	39.092	-2.96%	4.12%
			2550	1.850	40.682	1.909	39.073	-3.09%	4.12%
			2560	1.858	40.671	1.920	39.060	-3.23%	4.12%
			2600	1.891	40.623	1.964	39.009	-3.72%	4.14%
			2650	1.930	40.536	2.018	38.945	-4.36%	4.09%
			2680	1.956	40.494	2.051	38.907	-4.63%	4.08%
			2700	1.972	40.468	2.073	38.882	-4.87%	4.08%

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

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
06/28/2023	5200-5800 Head	20.3	5180	4.564	35.100	4.635	36.009	-1.53%	-2.52%
			5190	4.574	35.084	4.645	35.998	-1.53%	-2.54%
			5200	4.583	35.065	4.655	35.986	-1.55%	-2.56%
			5210	4.593	35.045	4.666	35.975	-1.56%	-2.59%
			5220	4.602	35.021	4.676	35.963	-1.58%	-2.62%
			5240	4.627	34.982	4.696	35.940	-1.47%	-2.67%
			5250	4.638	34.967	4.706	35.929	-1.44%	-2.68%
			5260	4.650	34.951	4.717	35.917	-1.42%	-2.69%
			5270	4.662	34.937	4.727	35.906	-1.38%	-2.70%
			5280	4.675	34.920	4.737	35.894	-1.31%	-2.71%
			5290	4.684	34.907	4.748	35.883	-1.35%	-2.72%
			5300	4.691	34.897	4.758	35.871	-1.41%	-2.72%
			5310	4.699	34.877	4.768	35.860	-1.45%	-2.74%
			5320	4.710	34.853	4.778	35.849	-1.42%	-2.78%
			5500	4.910	34.517	4.963	35.643	-1.07%	-3.16%
			5510	4.920	34.503	4.973	35.632	-1.07%	-3.17%
			5520	4.929	34.487	4.983	35.620	-1.08%	-3.18%
			5530	4.938	34.463	4.994	35.609	-1.12%	-3.22%
			5540	4.952	34.434	5.004	35.597	-1.04%	-3.27%
			5550	4.965	34.404	5.014	35.586	-0.98%	-3.32%
			5560	4.980	34.378	5.024	35.574	-0.88%	-3.36%
			5580	5.011	34.355	5.045	35.551	-0.67%	-3.36%
			5600	5.032	34.348	5.065	35.529	-0.65%	-3.32%
			5610	5.037	34.336	5.076	35.518	-0.77%	-3.33%
			5620	5.045	34.306	5.086	35.506	-0.81%	-3.38%
			5640	5.068	34.250	5.106	35.483	-0.74%	-3.47%
			5660	5.099	34.213	5.127	35.460	-0.55%	-3.52%
			5670	5.113	34.203	5.137	35.449	-0.47%	-3.51%
			5680	5.123	34.196	5.147	35.437	-0.47%	-3.50%
			5690	5.131	34.187	5.158	35.426	-0.52%	-3.50%
			5700	5.138	34.169	5.168	35.414	-0.58%	-3.52%
			5710	5.149	34.147	5.178	35.403	-0.56%	-3.55%
			5720	5.163	34.121	5.188	35.391	-0.48%	-3.59%
			5745	5.193	34.074	5.214	35.363	-0.40%	-3.65%
			5750	5.196	34.067	5.219	35.357	-0.44%	-3.65%
			5755	5.201	34.057	5.224	35.351	-0.44%	-3.66%
			5765	5.214	34.035	5.234	35.340	-0.38%	-3.69%
			5775	5.226	34.013	5.245	35.329	-0.36%	-3.72%
			5785	5.238	33.993	5.255	35.317	-0.32%	-3.75%
			5795	5.250	33.982	5.265	35.305	-0.28%	-3.75%
			5800	5.254	33.978	5.270	35.300	-0.30%	-3.75%
			5800	5.254	33.978	5.270	35.300	-0.30%	-3.75%
			5805	5.261	33.973	5.275	35.294	-0.27%	-3.74%
			5825	5.280	33.941	5.296	35.271	-0.30%	-3.77%
			5835	5.292	33.924	5.305	35.230	-0.25%	-3.71%
			5845	5.303	33.901	5.315	35.210	-0.23%	-3.72%
			5855	5.313	33.878	5.325	35.197	-0.23%	-3.75%
			5865	5.326	33.850	5.336	35.190	-0.19%	-3.81%
			5865	5.326	33.850	5.336	35.190	-0.19%	-3.81%
			5865	5.326	33.850	5.336	35.190	-0.19%	-3.81%
			5865	5.326	33.850	5.336	35.190	-0.19%	-3.81%
			5875	5.339	33.832	5.347	35.183	-0.15%	-3.84%
			5885	5.351	33.820	5.357	35.177	-0.11%	-3.86%
			5905	5.370	33.799	5.379	35.163	-0.17%	-3.88%
07/03/2023	5200-5800 Head	20.3	5180	4.594	35.391	4.635	36.009	-0.88%	-1.72%
			5190	4.601	35.368	4.645	35.998	-0.95%	-1.75%
			5200	4.611	35.361	4.655	35.986	-0.95%	-1.74%
			5210	4.625	35.350	4.666	35.975	-0.88%	-1.74%
			5220	4.639	35.328	4.676	35.963	-0.79%	-1.77%
			5240	4.661	35.288	4.696	35.940	-0.75%	-1.81%
			5250	4.673	35.278	4.706	35.929	-0.70%	-1.81%
			5260	4.686	35.255	4.717	35.917	-0.66%	-1.84%
			5270	4.699	35.230	4.727	35.906	-0.59%	-1.88%
			5280	4.709	35.206	4.737	35.894	-0.59%	-1.92%
			5290	4.716	35.188	4.748	35.883	-0.67%	-1.94%
			5300	4.725	35.169	4.758	35.871	-0.69%	-1.96%
			5310	4.735	35.140	4.768	35.860	-0.69%	-2.01%
			5320	4.745	35.108	4.778	35.849	-0.69%	-2.07%
			5500	4.948	34.784	4.963	35.643	-0.30%	-2.41%
			5510	4.960	34.760	4.973	35.632	-0.26%	-2.45%
			5520	4.969	34.745	4.983	35.620	-0.28%	-2.46%
			5530	4.980	34.735	4.994	35.609	-0.28%	-2.45%
			5540	4.993	34.720	5.004	35.597	-0.22%	-2.46%
			5550	5.005	34.698	5.014	35.586	-0.18%	-2.50%
			5560	5.015	34.669	5.024	35.574	-0.18%	-2.54%
			5580	5.036	34.623	5.045	35.551	-0.18%	-2.61%
			5600	5.061	34.583	5.065	35.529	-0.08%	-2.66%
			5610	5.073	34.555	5.076	35.518	-0.06%	-2.71%
			5620	5.086	34.535	5.086	35.506	0.00%	-2.73%
			5640	5.113	34.520	5.106	35.483	0.14%	-2.71%
			5660	5.134	34.496	5.127	35.460	0.14%	-2.72%
			5670	5.144	34.477	5.137	35.449	0.14%	-2.74%
			5680	5.154	34.460	5.147	35.437	0.14%	-2.76%
			5690	5.167	34.434	5.158	35.426	0.17%	-2.80%
			5700	5.180	34.400	5.168	35.414	0.23%	-2.86%
			5710	5.190	34.368	5.178	35.403	0.23%	-2.92%
			5720	5.199	34.344	5.188	35.391	0.21%	-2.96%
			5745	5.234	34.316	5.214	35.363	0.38%	-2.96%
			5750	5.241	34.312	5.219	35.357	0.42%	-2.96%
			5755	5.247	34.306	5.224	35.351	0.44%	-2.96%
			5765	5.256	34.294	5.234	35.340	0.42%	-2.96%
			5775	5.264	34.282	5.245	35.329	0.36%	-2.96%
			5785	5.275	34.264	5.255	35.317	0.38%	-2.98%
			5795	5.287	34.234	5.265	35.305	0.42%	-3.03%
			5800	5.292	34.218	5.270	35.300	0.42%	-3.07%
			5800	5.292	34.218	5.270	35.300	0.42%	-3.07%
			5805	5.296	34.205	5.275	35.294	0.40%	-3.09%
			5825	5.318	34.164	5.296	35.271	0.42%	-3.14%
			5835	5.332	34.134	5.305	35.230	0.51%	-3.11%
			5845	5.343	34.107	5.315	35.210	0.53%	-3.13%
			5855	5.355	34.089	5.325	35.197	0.56%	-3.15%
			5865	5.365	34.086	5.336	35.190	0.54%	-3.14%
			5865	5.365	34.086	5.336	35.190	0.54%	-3.14%
			5865	5.365	34.086	5.336	35.190	0.54%	-3.14%
			5865	5.365	34.086	5.336	35.190	0.54%	-3.14%
			5875	5.377	34.083	5.347	35.183	0.56%	-3.13%
			5885	5.389	34.063	5.357	35.177	0.60%	-3.17%
			5905	5.408	34.008	5.379	35.163	0.54%	-3.28%

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

10.2 Test System Verification

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

Table 10-5
System Verification Results

System Verification TARGET & MEASURED																	
SAR System	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp. (C)	Liquid Temp. (C)	Input Power (W)	Source SN	Probe SN	DAE	Measured SAR 1g (W/kg)	1W Target SAR 1g (W/kg)	1W Normalized SAR 1g (W/kg)	Deviation 1g (%)	Measured SAR 10g (W/kg)	1W Target SAR 10g (W/kg)	1W Normalized SAR 10g (W/kg)	Deviation 10g (%)
G	13	HEAD	07/06/2023	22.6	21.6	1.00	1002	7417	665	0.508	0.557	0.508	-8.80%	0.314	0.346	0.314	-9.25%
K5	750	HEAD	07/06/2023	22.4	22.5	0.20	1003	7637	1652	1.720	8.480	8.600	1.42%	1.130	5.560	5.650	1.62%
K5	750	HEAD	07/10/2023	22.5	21.5	0.20	1003	7637	1652	1.630	8.480	8.150	-3.89%	1.090	5.560	5.450	-1.98%
K4	835	HEAD	06/30/2023	22.5	22.3	0.20	4d119	7640	1645	1.960	9.720	9.800	0.82%	1.280	6.380	6.400	0.31%
S	835	HEAD	07/03/2023	21.8	20.4	0.20	4d132	7713	1530	2.090	9.660	10.450	8.18%	1.370	6.270	6.850	9.25%
K4	835	HEAD	07/05/2023	22.2	21.3	0.20	4d119	7640	1645	1.980	9.720	9.900	1.85%	1.300	6.380	6.500	1.88%
K4	835	HEAD	07/06/2023	21.2	20.2	0.20	4d119	7640	1645	2.010	9.720	10.050	3.40%	1.310	6.380	6.550	2.66%
K4	835	HEAD	07/10/2023	21.0	21.5	0.20	4d119	7640	1645	2.010	9.720	10.050	3.40%	1.320	6.380	6.600	3.45%
S	1750	HEAD	06/26/2023	21.4	20.1	0.10	1150	7713	1530	3.660	36.900	36.600	-0.81%	1.960	19.400	19.600	1.03%
C	1750	HEAD	07/05/2023	22.5	22.5	0.10	1148	7661	728	3.780	37.200	37.800	1.61%	1.990	19.400	19.900	2.58%
G	1750	HEAD	07/08/2023	20.8	21.4	0.10	1148	7417	665	3.720	37.200	37.200	0.00%	1.970	19.400	19.700	1.55%
C	1750	HEAD	07/10/2023	21.0	21.0	0.10	1148	7661	728	3.790	37.200	37.900	1.88%	2.010	19.400	20.100	3.61%
C	1750	HEAD	07/13/2023	23.0	23.0	0.10	1148	7661	728	3.780	37.200	37.800	1.61%	1.990	19.400	19.900	2.58%
L	1900	HEAD	06/21/2023	22.9	21.2	0.10	5d149	7410	1583	4.220	40.500	42.200	4.20%	2.200	21.200	22.000	3.77%
D	1900	HEAD	06/26/2023	22.7	21.7	0.10	5d080	7551	1323	4.000	39.600	40.000	1.01%	2.080	20.700	20.800	0.48%
S	1900	HEAD	07/05/2023	22.2	21.1	0.10	5d149	7713	1530	4.130	40.500	41.300	1.98%	2.140	21.200	21.400	0.94%
L	1900	HEAD	07/12/2023	22.0	23.8	0.10	5d149	7409	1334	4.110	40.500	41.100	1.48%	2.120	21.200	21.200	0.00%
D	1900	HEAD	07/17/2023	22.2	22.0	0.10	5d148	7551	1323	3.940	40.100	39.400	-1.75%	2.030	21.000	20.300	-3.33%
O	2450	HEAD	06/20/2023	24.6	22.9	0.10	981	7570	1558	4.940	53.900	49.400	-8.35%	2.330	25.400	23.300	-8.27%
O	2450	HEAD	06/25/2023	23.3	21.5	0.10	981	7570	1558	4.970	53.900	49.700	-7.79%	2.320	25.400	23.200	-8.66%
K2	2450	HEAD	06/26/2023	19.9	20.4	0.10	945	7565	1466	5.530	51.900	55.300	6.55%	2.540	24.600	25.400	3.25%
K3	2450	HEAD	07/04/2023	21.5	21.0	0.10	882	7547	1322	5.470	51.700	54.700	5.80%	2.580	24.200	25.800	6.61%
K3	2450	HEAD	07/06/2023	23.6	20.5	0.10	882	7547	1322	5.540	51.700	55.400	7.16%	2.610	24.200	26.100	7.85%
K3	2450	HEAD	07/12/2023	20.2	20.5	0.10	882	7547	1322	5.530	51.700	55.300	6.96%	2.600	24.200	26.000	7.44%
K3	2450	HEAD	07/14/2023	19.8	19.3	0.10	882	7547	1322	5.430	51.700	54.300	5.03%	2.560	24.200	25.600	5.79%
S	2600	HEAD	06/28/2023	20.5	20.9	0.10	1071	7713	1530	5.500	56.500	55.000	-2.65%	2.510	25.400	25.100	-1.18%
K3	2600	HEAD	07/04/2023	21.5	21.0	0.10	1126	7547	1322	5.730	55.900	57.300	2.50%	2.620	25.200	26.200	3.97%
K3	2600	HEAD	07/06/2023	23.6	20.5	0.10	1126	7547	1322	5.840	55.900	58.400	4.47%	2.670	25.200	26.700	5.95%
O	2600	HEAD	07/10/2023	20.8	21.8	0.10	1071	7570	1558	5.880	56.500	58.800	4.07%	2.660	25.400	26.600	4.72%
K3	2600	HEAD	07/12/2023	20.2	20.5	0.10	1126	7547	1322	5.870	55.900	58.700	5.01%	2.680	25.200	26.800	6.35%
K3	2600	HEAD	07/14/2023	19.8	19.3	0.10	1126	7547	1322	6.010	55.900	60.100	7.51%	2.740	25.200	27.400	8.73%
K2	5250	HEAD	06/28/2023	19.9	20.3	0.05	1120	7565	1466	3.840	81.100	76.800	-5.30%	1.080	23.200	21.600	-6.90%
K2	5250	HEAD	07/03/2023	19.5	20.3	0.05	1237	7565	1466	3.870	80.100	77.400	-3.37%	1.100	22.900	22.000	-3.93%
K2	5600	HEAD	06/28/2023	19.9	20.3	0.05	1120	7565	1466	4.020	83.400	80.400	-3.60%	1.120	23.700	22.400	-5.49%
K2	5600	HEAD	07/03/2023	19.5	20.3	0.05	1237	7565	1466	4.110	84.700	82.200	-2.95%	1.160	24.100	23.200	-3.73%
K2	5750	HEAD	06/28/2023	19.9	20.3	0.05	1120	7565	1466	3.650	79.300	73.000	-7.94%	1.030	22.500	20.600	-8.44%
K2	5750	HEAD	07/03/2023	19.5	20.3	0.05	1237	7565	1466	3.730	81.200	74.600	-8.13%	1.060	22.900	21.200	-7.42%
K2	5800	HEAD	06/28/2023	19.9	20.3	0.05	1120	7565	1466	3.940	80.600	78.800	-2.23%	1.100	22.800	22.000	-3.51%
K2	5800	HEAD	07/03/2023	19.5	20.3	0.05	1237	7565	1466	3.850	80.600	77.000	-4.47%	1.080	22.800	21.600	-5.26%

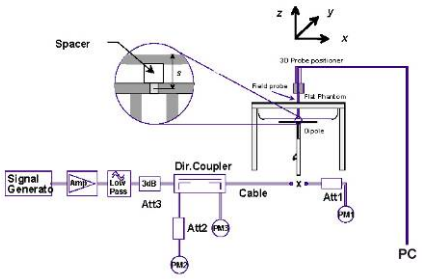

Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
GSM 850 Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
824.20	128	Right	Cheek	GSM 850	GSM	A	Open	0148M	33.5	31.83	0.01	1:8.3	0.122	1.469	0.179	A1
824.20	128	Right	Tilt	GSM 850	GSM	A	Open	0148M	33.5	31.83	0.05	1:8.3	0.060	1.469	0.088	
824.20	128	Left	Cheek	GSM 850	GSM	A	Open	0148M	33.5	31.83	0.09	1:8.3	0.105	1.469	0.154	
824.20	128	Left	Tilt	GSM 850	GSM	A	Open	0148M	33.5	31.83	0.05	1:8.3	0.068	1.469	0.100	
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 1900 Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
1880.00	661	Right	Cheek	GSM 1900	GSM	A	Open	0122M	30.5	30.30	-0.12	1:8.3	0.018	1.047	0.019	
1880.00	661	Right	Tilt	GSM 1900	GSM	A	Open	0122M	30.5	30.30	0.09	1:8.3	0.007	1.047	0.007	
1880.00	661	Left	Cheek	GSM 1900	GSM	A	Open	0122M	30.5	30.30	-0.09	1:8.3	0.037	1.047	0.039	A2
1880.00	661	Left	Tilt	GSM 1900	GSM	A	Open	0122M	30.5	30.30	0.03	1:8.3	0.013	1.047	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		Side	Test Position	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
826.40	4132	Right	Cheek	UMTS 850	RMC	A	Open	0148M	23.2	21.82	0.06	1:1	0.202	1.374	0.278	A3
826.40	4132	Right	Tilt	UMTS 850	RMC	A	Open	0148M	23.2	21.82	0.06	1:1	0.107	1.374	0.147	
826.40	4132	Left	Cheek	UMTS 850	RMC	A	Open	0148M	23.2	21.82	0.18	1:1	0.178	1.374	0.245	
826.40	4132	Left	Tilt	UMTS 850	RMC	A	Open	0148M	23.2	21.82	0.04	1:1	0.109	1.374	0.150	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-4
LTE Band 12 Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Side	Test Position	Mode	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																				
707.50	23095	Mid	Right	Cheek	LTE Band 12	A	Open	0143M	10	QPSK	1	25	25.0	23.68	0	0.13	1:1	0.138	1.355	0.187	
707.50	23095	Mid	Right	Cheek	LTE Band 12	A	Open	0143M	10	QPSK	25	0	24.0	22.45	1	0.14	1:1	0.114	1.429	0.163	
707.50	23095	Mid	Right	Tilt	LTE Band 12	A	Open	0143M	10	QPSK	1	25	25.0	23.68	0	0.04	1:1	0.063	1.355	0.085	
707.50	23095	Mid	Right	Tilt	LTE Band 12	A	Open	0143M	10	QPSK	25	0	24.0	22.45	1	0.19	1:1	0.050	1.429	0.071	
707.50	23095	Mid	Left	Cheek	LTE Band 12	A	Open	0143M	10	QPSK	1	25	25.0	23.68	0	0.11	1:1	0.146	1.355	0.198	A4
707.50	23095	Mid	Left	Cheek	LTE Band 12	A	Open	0143M	10	QPSK	25	0	24.0	22.45	1	0.07	1:1	0.109	1.429	0.156	
707.50	23095	Mid	Left	Tilt	LTE Band 12	A	Open	0143M	10	QPSK	1	25	25.0	23.68	0	0.15	1:1	0.080	1.355	0.108	
707.50	23095	Mid	Left	Tilt	LTE Band 12	A	Open	0143M	10	QPSK	25	0	24.0	22.45	1	0.11	1:1	0.058	1.429	0.083	
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
LTE Band 13 Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Side	Test Position	Mode	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																				
782.00	23230	Mid	Right	Cheek	LTE Band 13	A	Open	0143M	10	QPSK	1	0	25.0	24.71	0	0.00	1:1	0.170	1.069	0.182	A5
782.00	23230	Mid	Right	Cheek	LTE Band 13	A	Open	0143M	10	QPSK	25	12	24.0	23.37	1	0.01	1:1	0.145	1.156	0.168	
782.00	23230	Mid	Right	Tilt	LTE Band 13	A	Open	0143M	10	QPSK	1	0	25.0	24.71	0	-0.08	1:1	0.094	1.069	0.100	
782.00	23230	Mid	Right	Tilt	LTE Band 13	A	Open	0143M	10	QPSK	25	12	24.0	23.37	1	-0.13	1:1	0.072	1.156	0.083	
782.00	23230	Mid	Left	Cheek	LTE Band 13	A	Open	0143M	10	QPSK	1	0	25.0	24.71	0	0.00	1:1	0.163	1.069	0.174	
782.00	23230	Mid	Left	Cheek	LTE Band 13	A	Open	0143M	10	QPSK	25	12	24.0	23.37	1	0.10	1:1	0.119	1.156	0.138	
782.00	23230	Mid	Left	Tilt	LTE Band 13	A	Open	0143M	10	QPSK	1	0	25.0	24.71	0	-0.05	1:1	0.104	1.069	0.111	
782.00	23230	Mid	Left	Tilt	LTE Band 13	A	Open	0143M	10	QPSK	25	12	24.0	23.37	1	0.14	1:1	0.070	1.156	0.081	
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 5 (Cell) Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Side	Test Position	Mode	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																				
836.50	20525	Mid	Right	Cheek	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	1	0	25.7	24.54	0	0.01	1:1	0.212	1.306	0.277	A6
836.50	20525	Mid	Right	Cheek	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	25	0	24.7	23.43	1	0.01	1:1	0.133	1.340	0.178	
836.50	20525	Mid	Right	Tilt	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	1	0	25.7	24.54	0	0.14	1:1	0.108	1.306	0.141	
836.50	20525	Mid	Right	Tilt	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	25	0	24.7	23.43	1	0.13	1:1	0.067	1.340	0.090	
836.50	20525	Mid	Left	Cheek	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	1	0	25.7	24.54	0	0.10	1:1	0.170	1.306	0.222	
836.50	20525	Mid	Left	Cheek	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	25	0	24.7	23.43	1	0.16	1:1	0.100	1.340	0.134	
836.50	20525	Mid	Left	Tilt	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	1	0	25.7	24.54	0	0.07	1:1	0.095	1.306	0.124	
836.50	20525	Mid	Left	Tilt	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	25	0	24.7	23.43	1	0.13	1:1	0.058	1.340	0.078	
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 66 (AWS) Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Side	Test Position	Mode	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																				
1720.00	132072	Low	Right	Cheek	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	1	0	24.0	23.47	0	0.09	1:1	0.038	1.130	0.043	A7
1720.00	132072	Low	Right	Cheek	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	50	25	23.0	22.22	1	-0.13	1:1	0.025	1.197	0.030	
1720.00	132072	Low	Right	Tilt	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	1	0	24.0	23.47	0	0.00	1:1	0.032	1.130	0.036	
1720.00	132072	Low	Right	Tilt	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	50	25	23.0	22.22	1	0.04	1:1	0.024	1.197	0.029	
1720.00	132072	Low	Left	Cheek	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	1	0	24.0	23.47	0	0.04	1:1	0.025	1.130	0.028	
1720.00	132072	Low	Left	Cheek	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	50	25	23.0	22.22	1	-0.02	1:1	0.020	1.197	0.024	
1720.00	132072	Low	Left	Tilt	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	1	0	24.0	23.47	0	0.07	1:1	0.028	1.130	0.032	
1720.00	132072	Low	Left	Tilt	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	50	25	23.0	22.22	1	0.15	1:1	0.013	1.197	0.016	
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 2 (PCS) Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Side	Test Position	Mode	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																				
1860.00	18700	Low	Right	Cheek	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	1	50	24.5	23.89	0	-0.02	1:1	0.029	1.151	0.033	
1860.00	18700	Low	Right	Cheek	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	50	25	23.5	23.14	1	0.03	1:1	0.029	1.086	0.031	
1860.00	18700	Low	Right	Tilt	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	1	50	24.5	23.89	0	0.02	1:1	0.016	1.151	0.018	
1860.00	18700	Low	Right	Tilt	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	50	25	23.5	23.14	1	-0.03	1:1	0.013	1.086	0.014	
1860.00	18700	Low	Left	Cheek	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	1	50	24.5	23.89	0	0.02	1:1	0.046	1.151	0.053	A8
1860.00	18700	Low	Left	Cheek	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	50	25	23.5	23.14	1	0.02	1:1	0.035	1.086	0.038	
1860.00	18700	Low	Left	Tilt	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	1	50	24.5	23.89	0	0.16	1:1	0.019	1.151	0.022	
1860.00	18700	Low	Left	Tilt	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	50	25	23.5	23.14	1	0.11	1:1	0.016	1.086	0.017	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-9
LTE Band 41 Head SAR

MEASUREMENT RESULTS																						
# CC Uplink	Component Carrier	FREQUENCY			Side	Test Position	Mode	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
		MHz	Ch.																			
1 CC Uplink	N/A	2636.50	41055	Mid-High	Right	Cheek	LTE Band 41	B	Open	0153M	20	QPSK	1	0	25.0	23.36	0	0.03	1:1.58	0.016	1.459	0.023	
1 CC Uplink	N/A	2636.50	41055	Mid-High	Right	Cheek	LTE Band 41	B	Open	0153M	20	QPSK	50	25	24.0	22.58	1	0.20	1:1.58	0.012	1.387	0.017	
1 CC Uplink	N/A	2636.50	41055	Mid-High	Right	Tilt	LTE Band 41	B	Open	0153M	20	QPSK	1	0	25.0	23.36	0	0.04	1:1.58	0.020	1.459	0.029	
1 CC Uplink	N/A	2636.50	41055	Mid-High	Right	Tilt	LTE Band 41	B	Open	0153M	20	QPSK	50	25	24.0	22.58	1	0.09	1:1.58	0.017	1.387	0.024	
1 CC Uplink	N/A	2636.50	41055	Mid-High	Left	Cheek	LTE Band 41	B	Open	0153M	20	QPSK	1	0	25.0	23.36	0	0.02	1:1.58	0.026	1.459	0.038	
1 CC Uplink	N/A	2636.50	41055	Mid-High	Left	Cheek	LTE Band 41	B	Open	0153M	20	QPSK	50	25	24.0	22.58	1	0.17	1:1.58	0.024	1.387	0.033	
2 CC Uplink	PCC	2636.50	41055	Mid-High	Left	Cheek	LTE Band 41	B	Open	0153M	20	QPSK	1	0	25.0	23.65	0	-0.03	1:1.58	0.029	1.365	0.040	A9
	SCC	2616.70	40857											99								
1 CC Uplink	N/A	2636.50	41055	Mid-High	Left	Tilt	LTE Band 41	B	Open	0153M	20	QPSK	1	0	25.0	23.36	0	-0.03	1:1.58	0.015	1.459	0.022	
1 CC Uplink	N/A	2636.50	41055	Mid-High	Left	Tilt	LTE Band 41	B	Open	0153M	20	QPSK	50	25	24.0	22.58	1	-0.04	1:1.58	0.012	1.387	0.017	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-10
NR Band n5 Head SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Test Position	Mode	Antenna Config	Form Factor	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																		(W/kg)		(W/kg)	
836.50	167300	Mid	Right	Cheek	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	-0.03	1:1	0.197	1.253	0.247	A10
836.50	167300	Mid	Right	Cheek	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	-0.02	1:1	0.191	1.318	0.252	
836.50	167300	Mid	Right	Cheek	NR Band n5	A	Open	0146M	20	CP-OFDM	QPSK	1	1	24.2	23.28	1.5	0.08	1:1	0.147	1.236	0.182	
836.50	167300	Mid	Right	Tilt	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	-0.06	1:1	0.099	1.253	0.124	
836.50	167300	Mid	Right	Tilt	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	0.00	1:1	0.092	1.318	0.121	
836.50	167300	Mid	Left	Cheek	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	0.15	1:1	0.169	1.253	0.212	
836.50	167300	Mid	Left	Cheek	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	0.01	1:1	0.155	1.318	0.204	
836.50	167300	Mid	Left	Tilt	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	0.14	1:1	0.099	1.253	0.124	
836.50	167300	Mid	Left	Tilt	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	0.05	1:1	0.086	1.318	0.113	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-11
NR Band n66 Head SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Test Position	Mode	Antenna Config	Form Factor	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																		(W/kg)		(W/kg)	
1745.00	349000	Mid	Right	Cheek	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	1	108	24.0	22.82	0	0.03	1:1	0.006	1.312	0.008	A11
1745.00	349000	Mid	Right	Cheek	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	108	54	24.0	22.84	0	0.05	1:1	0.000	1.306	0.000	
1745.00	349000	Mid	Right	Cheek	NR Band n66	A	Open	0146M	40	CP-OFDM	QPSK	1	1	22.5	21.20	1.5	0.01	1:1	0.000	1.349	0.000	
1745.00	349000	Mid	Right	Tilt	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	1	108	24.0	22.82	0	0.03	1:1	0.000	1.312	0.000	
1745.00	349000	Mid	Right	Tilt	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	108	54	24.0	22.84	0	0.08	1:1	0.000	1.306	0.000	
1745.00	349000	Mid	Left	Cheek	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	1	108	24.0	22.82	0	0.05	1:1	0.005	1.312	0.007	
1745.00	349000	Mid	Left	Cheek	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	108	54	24.0	22.84	0	0.20	1:1	0.003	1.306	0.004	
1745.00	349000	Mid	Left	Tilt	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	1	108	24.0	22.82	0	0.05	1:1	0.000	1.312	0.000	
1745.00	349000	Mid	Left	Tilt	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	108	54	24.0	22.84	0	0.08	1:1	0.000	1.306	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							

Table 11-12
NR Band n41 Head SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Test Position	Mode	Antenna Config	Form Factor	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																		(W/kg)		(W/kg)	
2592.99	518598	Mid	Right	Cheek	NR Band n41	I	Open	0140M	100	DFT-S-OFDM	QPSK	1	137	14.5	14.08	0	0.00	1:1	0.187	1.102	0.206	
2592.99	518598	Mid	Right	Cheek	NR Band n41	I	Open	0140M	100	DFT-S-OFDM	QPSK	135	138	14.5	14.12	0	0.02	1:1	0.187	1.091	0.204	
2592.99	518598	Mid	Right	Tilt	NR Band n41	I	Open	0140M	100	DFT-S-OFDM	QPSK	1	137	14.5	14.08	0	-0.08	1:1	0.041	1.102	0.045	
2592.99	518598	Mid	Right	Tilt	NR Band n41	I	Open	0140M	100	DFT-S-OFDM	QPSK	135	138	14.5	14.12	0	-0.07	1:1	0.050	1.091	0.055	
2592.99	518598	Mid	Left	Cheek	NR Band n41	I	Open	0140M	100	DFT-S-OFDM	QPSK	1	137	14.5	14.08	0	-0.01	1:1	0.598	1.102	0.659	
2592.99	518598	Mid	Left	Cheek	NR Band n41	I	Open	0140M	100	DFT-S-OFDM	QPSK	135	138	14.5	14.12	0	0.05	1:1	0.774	1.091	0.844	
2592.99	518598	Mid	Left	Cheek	NR Band n41	I	Open	0140M	100	DFT-S-OFDM	QPSK	270	0	14.5	13.92	0	-0.02	1:1	0.778	1.143	0.889	A12
2592.99	518598	Mid	Left	Cheek	NR Band n41	I	Open	0140M	100	CP-OFDM	QPSK	1	1	14.5	13.50	0	0.03	1:1	0.467	1.259	0.588	
2592.99	518598	Mid	Left	Tilt	NR Band n41	I	Open	0140M	100	DFT-S-OFDM	QPSK	1	137	14.5	14.08	0	0.00	1:1	0.115	1.102	0.127	
2592.99	518598	Mid	Left	Tilt	NR Band n41	I	Open	0140M	100	DFT-S-OFDM	QPSK	135	138	14.5	14.12	0	-0.09	1:1	0.125	1.091	0.136	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-13
DTS Head SISO SAR

MEASUREMENT RESULTS																				
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)			(W/kg)	
2437	6	Right	Cheek	802.11b	DSSS	2	Open	0881M	22	1	12.0	11.97	0.00	100.00	98.74	0.088	1.007	1.013	0.090	
2437	6	Right	Tilt	802.11b	DSSS	2	Open	0881M	22	1	12.0	11.97	-0.11	100.00	98.74	0.069	1.007	1.013	0.070	
2437	6	Left	Cheek	802.11b	DSSS	2	Open	0881M	22	1	12.0	11.97	0.04	100.00	98.74	0.258	1.007	1.013	0.263	A13
2437	6	Left	Tilt	802.11b	DSSS	2	Open	0881M	22	1	12.0	11.97	0.00	100.00	98.74	0.146	1.007	1.013	0.149	
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
DTS Head MIMO SAR

MEASUREMENT RESULTS																				
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)			(W/kg)	
2462	11	Right	Cheek	802.11n	OFDM	MIMO	Open	0865M	20	13	9.0	8.64	9.0	8.80	0.08	100.00	97.96	0.050	1.086	1.021	0.055	
2462	11	Right	Tilt	802.11n	OFDM	MIMO	Open	0865M	20	13	9.0	8.64	9.0	8.80	0.06	100.00	97.96	0.041	1.086	1.021	0.045	
2462	11	Left	Cheek	802.11n	OFDM	MIMO	Open	0865M	20	13	9.0	8.64	9.0	8.80	-0.01	100.00	97.96	0.108	1.086	1.021	0.120	
2462	11	Left	Tilt	802.11n	OFDM	MIMO	Open	0865M	20	13	9.0	8.64	9.0	8.80	0.07	100.00	97.96	0.066	1.086	1.021	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				

Note: To achieve the 12.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 9.0 dBm.

Table 11-15
NII MIMO Head SAR

MEASUREMENT RESULTS																				
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)			(W/kg)	
5260	52	Right	Cheek	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.47	16.0	15.58	-0.01	100.00	98.11	0.755	1.130	1.019	0.869	A14
5300	60	Right	Cheek	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.93	16.0	15.55	0.05	100.00	98.11	0.743	1.109	1.019	0.840	
5320	64	Right	Cheek	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.88	16.0	15.61	0.01	100.00	98.11	0.679	1.094	1.019	0.757	
5320	64	Right	Tilt	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.88	16.0	15.61	0.00	100.00	98.11	0.507	1.094	1.019	0.565	
5320	64	Left	Cheek	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.88	16.0	15.61	0.07	100.00	98.11	0.283	1.094	1.019	0.315	
5320	64	Left	Tilt	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.88	16.0	15.61	-0.15	100.00	98.11	0.220	1.094	1.019	0.245	
5500	100	Right	Cheek	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.54	16.0	15.68	-0.10	100.00	98.11	0.534	1.112	1.019	0.605	
5600	120	Right	Cheek	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.74	16.0	15.35	-0.03	100.00	98.11	0.560	1.161	1.019	0.663	
5720	144	Right	Cheek	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.47	16.0	15.61	-0.09	100.00	98.11	0.407	1.130	1.019	0.469	
5500	100	Right	Tilt	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.54	16.0	15.68	-0.06	100.00	98.11	0.391	1.112	1.019	0.443	
5500	100	Left	Cheek	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.54	16.0	15.68	0.18	100.00	98.11	0.250	1.112	1.019	0.283	
5500	100	Left	Tilt	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.54	16.0	15.68	-0.20	100.00	98.11	0.242	1.112	1.019	0.274	
5785	157	Right	Cheek	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.89	16.0	15.83	0.05	100.00	98.11	0.444	1.040	1.019	0.471	
5785	157	Right	Tilt	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.89	16.0	15.83	-0.07	100.00	98.11	0.307	1.040	1.019	0.325	
5785	157	Left	Cheek	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.89	16.0	15.83	-0.05	100.00	98.11	0.231	1.040	1.019	0.245	
5785	157	Left	Tilt	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.89	16.0	15.83	0.07	100.00	98.11	0.286	1.040	1.019	0.303	
5845	169	Right	Cheek	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.58	16.0	15.69	-0.03	100.00	98.11	0.375	1.102	1.019	0.421	
5845	169	Right	Tilt	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.58	16.0	15.69	-0.04	100.00	98.11	0.246	1.102	1.019	0.276	
5845	169	Left	Cheek	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.58	16.0	15.69	0.07	100.00	98.11	0.335	1.102	1.019	0.376	
5845	169	Left	Tilt	802.11n	OFDM	MIMO	Open	1014M	20	13	16.0	15.58	16.0	15.69	0.10	100.00	98.11	0.267	1.102	1.019	0.300	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																	Head 1.6 W/kg (mW/g) averaged over 1 gram				

Note: To achieve the 19.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 16.0 dBm.

Table 11-16
DSS Head SISO SAR

MEASUREMENT RESULTS																			
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.														(W/kg)			(W/kg)	
2440	19	Right	Cheek	Bluetooth LE	DSSS	1	Open	0880M	1	17.0	16.42	0.03	86.00	84.71	0.018	1.143	1.015	0.021	
2441	39	Right	Cheek	Bluetooth	FHSS	1	Open	0880M	1	16.5	16.40	0.09	78.00	76.85	0.289	1.023	1.015	0.300	
2441	39	Right	Tilt	Bluetooth	FHSS	1	Open	0880M	1	16.5	16.40	-0.03	78.00	76.85	0.200	1.023	1.015	0.208	
2441	39	Left	Cheek	Bluetooth	FHSS	1	Open	0880M	1	16.5	16.40	0.09	78.00	76.85	0.068	1.023	1.015	0.071	
2441	39	Left	Tilt	Bluetooth	FHSS	1	Open	0880M	1	16.5	16.40	0.03	78.00	76.85	0.068	1.023	1.015	0.071	
2441	39	Right	Cheek	Bluetooth	FHSS	2	Open	0880M	1	17.0	16.74	0.16	78.00	76.90	0.168	1.062	1.014	0.181	
2441	39	Right	Tilt	Bluetooth	FHSS	2	Open	0880M	1	17.0	16.74	0.16	78.00	76.90	0.164	1.062	1.014	0.177	
2402	0	Left	Cheek	Bluetooth LE	DSSS	2	Open	0880M	1	18.5	18.29	-0.16	87.00	85.05	0.024	1.050	1.023	0.026	
2441	39	Left	Cheek	Bluetooth	FHSS	2	Open	0880M	1	17.0	16.74	0.05	78.00	76.90	0.424	1.062	1.014	**0.457**	A15
2441	39	Left	Tilt	Bluetooth	FHSS	2	Open	0880M	1	17.0	16.74	-0.07	78.00	76.90	0.255	1.062	1.014	0.275	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram									

Note: 1) Light green entries indicate an additional check on the worst case exposure condition for BT LE that is not fully evaluated. 2) BT LE Antenna 2 was tested at a higher level than listed in the tune-up and is therefore a more conservative result.

11.2 Standalone Body-Worn SAR Data

Table 11-17
GSM Body-Worn SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
836.60	190	back	15 mm	GSM 850	GSM	A	Open	0148M	32.0	30.70	0.18	1:8.3	0.082	1.349	0.111	
836.60	190	back	15 mm	GSM 850	GSM	A	Closed	0148M	32.0	30.70	-0.06	1:8.3	0.149	1.349	0.201	A16
1880.00	661	back	15 mm	GSM 1900	GSM	A	Open	0122M	28.0	27.07	-0.03	1:8.3	0.099	1.239	0.123	A17
1880.00	661	back	15 mm	GSM 1900	GSM	A	Closed	0194M	28.0	27.07	-0.13	1:8.3	0.023	1.239	0.028	
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 11-18
UMTS Body-Worn SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
826.40	4132	back	15 mm	UMTS 850	RMC	A	Open	0148M	25.7	24.12	-0.02	1:1	0.177	1.439	0.255	
826.40	4132	back	15 mm	UMTS 850	RMC	A	Closed	0148M	25.7	24.12	0.01	1:1	0.274	1.439	0.394	A18
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-19
LTE Body-Worn SAR

MEASUREMENT RESULTS																								
# CC Uplink	Component Carrier	FREQUENCY			Side	Spacing	Mode	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
		MHz	Ch.																				
1 CC Uplink	N/A	707.50	23095	Mid	back	15 mm	LTE Band 12	A	Open	0143M	10	QPSK	1	25	24.0	22.51	0	0.00	1:1	0.159	1.409	0.224	
1 CC Uplink	N/A	707.50	23095	Mid	back	15 mm	LTE Band 12	A	Open	0143M	10	QPSK	25	12	24.0	22.33	0	0.03	1:1	0.164	1.469	0.241	A19
1 CC Uplink	N/A	707.50	23095	Mid	back	15 mm	LTE Band 12	A	Closed	0143M	10	QPSK	1	25	24.0	22.51	0	-0.05	1:1	0.119	1.409	0.168	
1 CC Uplink	N/A	707.50	23095	Mid	back	15 mm	LTE Band 12	A	Closed	0143M	10	QPSK	25	12	24.0	22.33	0	-0.08	1:1	0.119	1.469	0.175	
1 CC Uplink	N/A	782.00	23230	Mid	back	15 mm	LTE Band 13	A	Open	0143M	10	QPSK	1	0	24.0	23.56	0	-0.01	1:1	0.139	1.107	0.154	
1 CC Uplink	N/A	782.00	23230	Mid	back	15 mm	LTE Band 13	A	Open	0143M	10	QPSK	25	0	24.0	23.32	0	0.05	1:1	0.145	1.169	0.170	
1 CC Uplink	N/A	782.00	23230	Mid	back	15 mm	LTE Band 13	A	Closed	0143M	10	QPSK	1	0	24.0	23.56	0	0.02	1:1	0.163	1.107	0.180	
1 CC Uplink	N/A	782.00	23230	Mid	back	15 mm	LTE Band 13	A	Closed	0143M	10	QPSK	25	0	24.0	23.32	0	-0.04	1:1	0.167	1.169	0.195	A20
1 CC Uplink	N/A	836.50	20525	Mid	back	15 mm	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	1	0	25.7	24.54	0	-0.04	1:1	0.152	1.306	0.199	
1 CC Uplink	N/A	836.50	20525	Mid	back	15 mm	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	25	0	24.7	23.43	1	0.04	1:1	0.117	1.340	0.157	
1 CC Uplink	N/A	836.50	20525	Mid	back	15 mm	LTE Band 5 (Cell)	A	Closed	0148M	10	QPSK	1	0	25.7	24.54	0	0.06	1:1	0.294	1.306	0.384	A21
1 CC Uplink	N/A	836.50	20525	Mid	back	15 mm	LTE Band 5 (Cell)	A	Closed	0148M	10	QPSK	25	0	24.7	23.43	1	0.03	1:1	0.141	1.340	0.189	
1 CC Uplink	N/A	1720.00	132072	Low	back	15 mm	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	1	0	21.0	20.37	0	-0.06	1:1	0.125	1.156	0.145	
1 CC Uplink	N/A	1720.00	132072	Low	back	15 mm	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	50	50	21.0	20.11	0	0.05	1:1	0.126	1.227	0.155	
1 CC Uplink	N/A	1720.00	132072	Low	back	15 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	1	0	21.0	20.37	0	0.00	1:1	0.059	1.156	0.068	
1 CC Uplink	N/A	1720.00	132072	Low	back	15 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	50	50	21.0	20.11	0	0.01	1:1	0.060	1.227	0.074	
1 CC Uplink	N/A	1720.00	132072	Low	back	15 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	1	99	20.5	19.68	0	0.00	1:1	0.167	1.208	0.202	A22
1 CC Uplink	N/A	1720.00	132072	Low	back	15 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	50	50	20.5	19.63	0	0.00	1:1	0.160	1.222	0.196	
1 CC Uplink	N/A	1720.00	132072	Low	back	15 mm	LTE Band 66 (AWS)	I	Closed	0194M	20	QPSK	1	99	20.5	19.68	0	0.06	1:1	0.013	1.208	0.016	
1 CC Uplink	N/A	1720.00	132072	Low	back	15 mm	LTE Band 66 (AWS)	I	Closed	0194M	20	QPSK	50	50	20.5	19.63	0	0.06	1:1	0.012	1.222	0.015	
1 CC Uplink	N/A	1860.00	18700	Low	back	15 mm	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	1	99	20.0	19.37	0	0.01	1:1	0.133	1.156	0.154	
1 CC Uplink	N/A	1860.00	18700	Low	back	15 mm	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	50	50	20.0	19.46	0	0.01	1:1	0.136	1.132	0.154	
1 CC Uplink	N/A	1860.00	18700	Low	back	15 mm	LTE Band 2 (PCS)	A	Closed	0122M	20	QPSK	1	99	20.0	19.37	0	0.04	1:1	0.034	1.156	0.039	
1 CC Uplink	N/A	1860.00	18700	Low	back	15 mm	LTE Band 2 (PCS)	A	Closed	0122M	20	QPSK	50	50	20.0	19.46	0	-0.12	1:1	0.033	1.132	0.037	
1 CC Uplink	N/A	1900.00	19100	High	back	15 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	1	99	20.5	19.36	0	0.03	1:1	0.147	1.300	0.191	
1 CC Uplink	N/A	1900.00	19100	High	back	15 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	50	25	20.5	19.47	0	0.00	1:1	0.154	1.268	0.195	A23
1 CC Uplink	N/A	1900.00	19100	High	back	15 mm	LTE Band 2 (PCS)	I	Closed	0122M	20	QPSK	1	99	20.5	19.36	0	-0.08	1:1	0.025	1.300	0.033	
1 CC Uplink	N/A	1900.00	19100	High	back	15 mm	LTE Band 2 (PCS)	I	Closed	0122M	20	QPSK	50	25	20.5	19.47	0	0.07	1:1	0.027	1.268	0.034	
1 CC Uplink	N/A	2636.50	41055	Mid-High	back	15 mm	LTE Band 41	B	Open	0153M	20	QPSK	1	0	23.0	21.61	0	-0.01	1:1.58	0.062	1.377	0.085	
1 CC Uplink	N/A	2636.50	41055	Mid-High	back	15 mm	LTE Band 41	B	Open	0153M	20	QPSK	50	0	23.0	21.71	0	-0.08	1:1.58	0.050	1.346	0.067	
2 CC Uplink	PCC	2636.50	41055	Mid-High	back	15 mm	LTE Band 41	B	Open	0153M	20	QPSK	1	0	23.0	21.57	0	-0.08	1:1.58	0.066	1.390	0.092	
	SCC	2616.70	40857											99									
1 CC Uplink	N/A	2636.50	41055	Mid-High	back	15 mm	LTE Band 41	B	Closed	0153M	20	QPSK	1	0	23.0	21.61	0	-0.01	1:1.58	0.033	1.377	0.045	
1 CC Uplink	N/A	2636.50	41055	Mid-High	back	15 mm	LTE Band 41	B	Closed	0153M	20	QPSK	50	0	23.0	21.71	0	0.02	1:1.58	0.030	1.346	0.040	
1 CC Uplink	N/A	2680.00	41490	High	back	15 mm	LTE Band 41	I	Open	0153M	20	QPSK	1	0	21.0	19.96	0	0.05	1:1.58	0.106	1.271	0.135	
1 CC Uplink	N/A	2680.00	41490	High	back	15 mm	LTE Band 41	I	Open	0153M	20	QPSK	50	0	21.0	20.12	0	-0.08	1:1.58	0.106	1.225	0.130	
2 CC Uplink	PCC	2680.00	41490	High	back	15 mm	LTE Band 41	I	Open	0153M	20	QPSK	1	0	21.0	19.87	0	0.05	1:1.58	0.114	1.297	0.148	A24
	SCC	2660.20	41292											99									
1 CC Uplink	N/A	2680.00	41490	High	back	15 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	0	21.0	19.96	0	-0.15	1:1.58	0.035	1.271	0.044	
1 CC Uplink	N/A	2680.00	41490	High	back	15 mm	LTE Band 41	I	Closed	0153M	20	QPSK	50	0	21.0	20.12	0	-0.14	1:1.58	0.035	1.225	0.043	

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

Table 11-20
NR Body-Worn SAR

MEASUREMENT RESULTS																							
FREQUENCY			Side	Spacing	Mode	Antenna Config	Form Factor	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																		(W/kg)		(W/kg)	
836.50	167300	Mid	back	15 mm	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	0.03	1:1	0.189	1.253	0.237	
836.50	167300	Mid	back	15 mm	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	0.02	1:1	0.182	1.318	0.240	
836.50	167300	Mid	back	15 mm	NR Band n5	A	Open	0146M	20	CP-OFDM	QPSK	1	1	24.2	23.28	1.5	0.05	1:1	0.136	1.236	0.168	
836.50	167300	Mid	back	15 mm	NR Band n5	A	Closed	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	-0.03	1:1	0.345	1.253	**0.432**	A25
836.50	167300	Mid	back	15 mm	NR Band n5	A	Closed	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	-0.05	1:1	0.322	1.318	0.424	
836.50	167300	Mid	back	15 mm	NR Band n5	A	Closed	0146M	20	CP-OFDM	QPSK	1	1	24.2	23.28	1.5	-0.15	1:1	0.247	1.236	0.305	
1745.00	349000	Mid	back	15 mm	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	1	108	21.0	19.74	0	-0.01	1:1	0.124	1.337	0.166	
1745.00	349000	Mid	back	15 mm	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	108	108	21.0	19.79	0	-0.04	1:1	0.135	1.321	0.178	A26
1745.00	349000	Mid	back	15 mm	NR Band n66	A	Open	0146M	40	CP-OFDM	QPSK	1	1	21.0	19.75	0	0.20	1:1	0.120	1.334	0.160	
1745.00	349000	Mid	back	15 mm	NR Band n66	A	Closed	0146M	40	DFT-S-OFDM	QPSK	1	108	21.0	19.74	0	0.05	1:1	0.009	1.337	0.012	
1745.00	349000	Mid	back	15 mm	NR Band n66	A	Closed	0146M	40	DFT-S-OFDM	QPSK	108	108	21.0	19.79	0	0.01	1:1	0.009	1.321	0.012	
1745.00	349000	Mid	back	15 mm	NR Band n66	A	Closed	0146M	40	CP-OFDM	QPSK	1	1	21.0	19.75	0	0.01	1:1	0.009	1.334	0.012	
1745.00	349000	Mid	back	15 mm	NR Band n66	I	Open	0146M	40	DFT-S-OFDM	QPSK	1	214	20.5	19.58	0	-0.05	1:1	0.076	1.236	0.094	
1745.00	349000	Mid	back	15 mm	NR Band n66	I	Open	0146M	40	DFT-S-OFDM	QPSK	108	54	20.5	19.65	0	0.01	1:1	0.078	1.216	0.095	
1745.00	349000	Mid	back	15 mm	NR Band n66	I	Open	0146M	40	CP-OFDM	QPSK	1	1	20.5	19.14	0	0.00	1:1	0.078	1.368	0.107	
1745.00	349000	Mid	back	15 mm	NR Band n66	I	Closed	0146M	40	DFT-S-OFDM	QPSK	1	214	20.5	19.58	0	0.08	1:1	0.007	1.236	0.009	
1745.00	349000	Mid	back	15 mm	NR Band n66	I	Closed	0146M	40	DFT-S-OFDM	QPSK	108	54	20.5	19.65	0	0.03	1:1	0.009	1.216	0.011	
1745.00	349000	Mid	back	15 mm	NR Band n66	I	Closed	0146M	40	CP-OFDM	QPSK	1	1	20.5	19.14	0	0.07	1:1	0.007	1.368	0.010	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram												

Table 11-21
NR Band 41 Body-Worn SAR

MEASUREMENT RESULTS																							
FREQUENCY			Side	Spacing	Mode	Antenna Config	Form Factor	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																		(W/kg)		(W/kg)	
2592.99	518598	Mid	back	15 mm	NR Band n41	I	Open	0194M	100	DFT-S-OFDM	QPSK	1	137	19.0	18.52	0	-0.10	1:1	0.111	1.117	0.124	
2592.99	518598	Mid	back	15 mm	NR Band n41	I	Open	0194M	100	DFT-S-OFDM	QPSK	135	138	19.0	18.63	0	0.00	1:1	0.125	1.089	0.136	A27
2592.99	518598	Mid	back	15 mm	NR Band n41	I	Open	0194M	100	CP-OFDM	QPSK	1	1	19.0	18.03	0	-0.08	1:1	0.079	1.250	0.099	
2592.99	518598	Mid	back	15 mm	NR Band n41	I	Closed	0140M	100	DFT-s-OFDM	QPSK	1	137	19.0	18.52	0	0.14	1:1	0.043	1.117	0.048	
2592.99	518598	Mid	back	15 mm	NR Band n41	I	Closed	0140M	100	DFT-s-OFDM	QPSK	135	138	19.0	18.63	0	-0.02	1:1	0.045	1.089	0.049	
2592.99	518598	Mid	back	15 mm	NR Band n41	I	Closed	0140M	100	CP-OFDM	QPSK	1	1	19.0	18.03	0	0.02	1:1	0.029	1.250	0.036	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram												

Table 11-22
DTS SISO Body-Worn SAR

MEASUREMENT RESULTS																	
FREQUENCY		Side	Spacing	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													(W/kg)			(W/kg)	
2412	1	back	15 mm	2	Open	1014M	22	1	19.0	18.95	0.04	100.00	98.74	0.031	1.012	1.013	**0.032**	
2412	1	back	15 mm	2	Closed	1014M	22	1	19.0	18.95	-0.19	100.00	98.74	0.015	1.012	1.013	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 11-23
DTS MIMO Body-Worn SAR

MEASUREMENT RESULTS																						
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)			(W/kg)	
2437	6	back	15 mm	802.11b	DSSS	MIMO	Open	0881M	22	1	19.0	18.14	19.0	18.96	0.04	100.00	98.90	0.082	1.219	1.011	0.101	A28
2437	6	back	15 mm	802.11b	DSSS	MIMO	Closed	0881M	22	1	19.0	18.14	19.0	18.96	-0.18	100.00	98.90	0.031	1.219	1.011	0.038	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram											

Note: To achieve the 22.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 19.0 dBm.

Table 11-24
NII MIMO Body-Worn SAR

MEASUREMENT RESULTS																					
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)			(W/kg)	
5320	64	back	15 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.88	16.0	15.61	-0.03	100.00	98.11	0.126	1.094	1.019	**0.140**	A29
5320	64	back	15 mm	802.11n	OFDM	MIMO	Closed	0881M	20	13	16.0	15.88	16.0	15.61	0.08	100.00	98.11	0.006	1.094	1.019	0.007	
5500	100	back	15 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.54	16.0	15.68	0.05	100.00	98.11	0.087	1.112	1.019	0.099	
5500	100	back	15 mm	802.11n	OFDM	MIMO	Closed	0881M	20	13	16.0	15.54	16.0	15.68	0.06	100.00	98.11	0.002	1.112	1.019	0.002	
5785	157	back	15 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.89	16.0	15.83	0.05	100.00	98.11	0.079	1.040	1.019	0.084	
5785	157	back	15 mm	802.11n	OFDM	MIMO	Closed	0881M	20	13	16.0	15.89	16.0	15.83	0.08	100.00	98.11	0.007	1.040	1.019	0.007	
5845	169	back	15 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.58	16.0	15.69	-0.10	100.00	98.11	0.058	1.102	1.019	0.065	
5845	169	back	15 mm	802.11n	OFDM	MIMO	Closed	0881M	20	13	16.0	15.58	16.0	15.69	0.06	100.00	98.11	0.006	1.102	1.019	0.007	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Body 1.6 W/kg (mW/g) averaged over 1 gram										

Note: To achieve the 19.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 16.0 dBm.

Table 11-25
DSS SISO Body-Worn SAR

MEASUREMENT RESULTS																		
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.														(W/kg)			(W/kg)	
2441	39	back	15 mm	Bluetooth	FHSS	1	Open	0880M	1	16.5	16.40	0.14	78.00	76.85	0.031	1.023	1.015	**0.032**	A30
2441	39	back	15 mm	Bluetooth	FHSS	1	Closed	0880M	1	16.5	16.40	0.12	78.00	76.85	0.010	1.023	1.015	0.010	
2441	39	back	15 mm	Bluetooth	FHSS	2	Open	0880M	1	17.0	16.74	0.01	78.00	76.90	0.017	1.062	1.014	0.018	
2441	39	back	15 mm	Bluetooth	FHSS	2	Closed	0880M	1	17.0	16.74	0.04	78.00	76.90	0.006	1.062	1.014	0.006	
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 11-26
GPRS Hotspot SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	# of Time Slots	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.													(W/kg)		(W/kg)	
824.20	128	back	10 mm	GSM 850	GPRS	A	Open	0148M	4	26.0	24.25	0.05	1:2.076	0.131	1.496	0.196	
824.20	128	front	10 mm	GSM 850	GPRS	A	Open	0148M	4	26.0	24.25	0.00	1:2.076	0.085	1.496	0.127	
824.20	128	bottom	10 mm	GSM 850	GPRS	A	Open	0148M	4	26.0	24.25	-0.01	1:2.076	0.071	1.496	0.106	
824.20	128	right	10 mm	GSM 850	GPRS	A	Open	0148M	4	26.0	24.25	0.12	1:2.076	0.093	1.496	0.139	
824.20	128	left	10 mm	GSM 850	GPRS	A	Open	0148M	4	26.0	24.25	0.01	1:2.076	0.097	1.496	0.145	
824.20	128	back	5 mm	GSM 850	GPRS	A	Closed	0148M	4	26.0	24.25	-0.13	1:2.076	0.275	1.496	0.411	A31
824.20	128	front	5 mm	GSM 850	GPRS	A	Closed	0148M	4	26.0	24.25	0.20	1:2.076	0.050	1.496	0.075	
824.20	128	bottom	5 mm	GSM 850	GPRS	A	Closed	0148M	4	26.0	24.25	0.07	1:2.076	0.059	1.496	0.088	
824.20	128	right	5 mm	GSM 850	GPRS	A	Closed	0148M	4	26.0	24.25	0.00	1:2.076	0.038	1.496	0.057	
824.20	128	left	5 mm	GSM 850	GPRS	A	Closed	0148M	4	26.0	24.25	-0.20	1:2.076	0.065	1.496	0.097	
1880.00	661	back	10 mm	GSM 1900	GPRS	A	Open	0122M	4	22.0	20.80	-0.02	1:2.076	0.203	1.318	0.268	
1880.00	661	front	10 mm	GSM 1900	GPRS	A	Open	0122M	4	22.0	20.80	0.04	1:2.076	0.168	1.318	0.221	
1880.00	661	bottom	10 mm	GSM 1900	GPRS	A	Open	0122M	4	22.0	20.80	-0.03	1:2.076	0.310	1.318	0.409	A32
1880.00	661	right	10 mm	GSM 1900	GPRS	A	Open	0122M	4	22.0	20.80	-0.09	1:2.076	0.019	1.318	0.025	
1880.00	661	left	10 mm	GSM 1900	GPRS	A	Open	0122M	4	22.0	20.80	-0.11	1:2.076	0.035	1.318	0.046	
1880.00	661	back	5 mm	GSM 1900	GPRS	A	Closed	0122M	4	22.0	20.80	0.20	1:2.076	0.085	1.318	0.112	
1880.00	661	front	5 mm	GSM 1900	GPRS	A	Closed	0122M	4	22.0	20.80	0.04	1:2.076	0.121	1.318	0.159	
1880.00	661	bottom	5 mm	GSM 1900	GPRS	A	Closed	0122M	4	22.0	20.80	-0.04	1:2.076	0.222	1.318	0.293	
1880.00	661	right	5 mm	GSM 1900	GPRS	A	Closed	0122M	4	22.0	20.80	0.04	1:2.076	0.004	1.318	0.005	
1880.00	661	left	5 mm	GSM 1900	GPRS	A	Closed	0122M	4	22.0	20.80	-0.04	1:2.076	0.006	1.318	0.008	
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
UMTS Hotspot SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
826.40	4132	back	10 mm	UMTS 850	RMC	A	Open	0148M	25.7	24.12	-0.01	1:1	0.374	1.439	0.538	
826.40	4132	front	10 mm	UMTS 850	RMC	A	Open	0148M	25.7	24.12	-0.01	1:1	0.205	1.439	0.295	
826.40	4132	bottom	10 mm	UMTS 850	RMC	A	Open	0148M	25.7	24.12	0.02	1:1	0.118	1.439	0.170	
826.40	4132	right	10 mm	UMTS 850	RMC	A	Open	0148M	25.7	24.12	0.01	1:1	0.218	1.439	0.314	
826.40	4132	left	10 mm	UMTS 850	RMC	A	Open	0148M	25.7	24.12	0.03	1:1	0.116	1.439	0.167	
826.40	4132	back	5 mm	UMTS 850	RMC	A	Closed	0148M	25.7	24.12	0.00	1:1	0.798	1.439	1.148	
836.60	4183	back	5 mm	UMTS 850	RMC	A	Closed	0148M	25.7	23.99	0.00	1:1	0.800	1.483	1.186	
846.60	4233	back	5 mm	UMTS 850	RMC	A	Closed	0148M	25.7	23.91	0.08	1:1	0.813	1.510	**1.228**	A33
826.40	4132	front	5 mm	UMTS 850	RMC	A	Closed	0148M	25.7	24.12	0.01	1:1	0.123	1.439	0.177	
826.40	4132	bottom	5 mm	UMTS 850	RMC	A	Closed	0148M	25.7	24.12	0.00	1:1	0.203	1.439	0.292	
826.40	4132	right	5 mm	UMTS 850	RMC	A	Closed	0148M	25.7	24.12	0.04	1:1	0.111	1.439	0.160	
826.40	4132	left	5 mm	UMTS 850	RMC	A	Closed	0148M	25.7	24.12	-0.07	1:1	0.161	1.439	0.232	
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
LTE Band 12 Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Spacing	Mode	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
707.50	23095	Mid	back	10 mm	LTE Band 12	A	Open	0143M	10	QPSK	1	25	24.0	22.51	0	-0.09	1:1	0.156	1.409	0.220	
707.50	23095	Mid	back	10 mm	LTE Band 12	A	Open	0143M	10	QPSK	25	12	24.0	22.33	0	-0.11	1:1	0.172	1.469	0.253	
707.50	23095	Mid	front	10 mm	LTE Band 12	A	Open	0143M	10	QPSK	1	25	24.0	22.51	0	-0.10	1:1	0.158	1.409	0.223	
707.50	23095	Mid	front	10 mm	LTE Band 12	A	Open	0143M	10	QPSK	25	12	24.0	22.33	0	0.04	1:1	0.159	1.469	0.234	
707.50	23095	Mid	bottom	10 mm	LTE Band 12	A	Open	0143M	10	QPSK	1	25	24.0	22.51	0	-0.09	1:1	0.029	1.409	0.041	
707.50	23095	Mid	bottom	10 mm	LTE Band 12	A	Open	0143M	10	QPSK	25	12	24.0	22.33	0	-0.15	1:1	0.031	1.469	0.046	
707.50	23095	Mid	right	10 mm	LTE Band 12	A	Open	0143M	10	QPSK	1	25	24.0	22.51	0	0.04	1:1	0.180	1.409	0.254	
707.50	23095	Mid	right	10 mm	LTE Band 12	A	Open	0143M	10	QPSK	25	12	24.0	22.33	0	0.01	1:1	0.182	1.469	0.267	
707.50	23095	Mid	left	10 mm	LTE Band 12	A	Open	0143M	10	QPSK	1	25	24.0	22.51	0	0.09	1:1	0.189	1.409	0.266	
707.50	23095	Mid	left	10 mm	LTE Band 12	A	Open	0143M	10	QPSK	25	12	24.0	22.33	0	0.00	1:1	0.194	1.469	0.285	
707.50	23095	Mid	back	5 mm	LTE Band 12	A	Closed	0143M	10	QPSK	1	25	24.0	22.51	0	-0.05	1:1	0.393	1.409	0.554	
707.50	23095	Mid	back	5 mm	LTE Band 12	A	Closed	0143M	10	QPSK	25	12	24.0	22.33	0	-0.04	1:1	0.402	1.469	0.591	A34
707.50	23095	Mid	front	5 mm	LTE Band 12	A	Closed	0143M	10	QPSK	1	25	24.0	22.51	0	-0.03	1:1	0.116	1.409	0.163	
707.50	23095	Mid	front	5 mm	LTE Band 12	A	Closed	0143M	10	QPSK	25	12	24.0	22.33	0	0.11	1:1	0.118	1.469	0.173	
707.50	23095	Mid	bottom	5 mm	LTE Band 12	A	Closed	0143M	10	QPSK	1	25	24.0	22.51	0	0.06	1:1	0.095	1.409	0.134	
707.50	23095	Mid	bottom	5 mm	LTE Band 12	A	Closed	0143M	10	QPSK	25	12	24.0	22.33	0	0.00	1:1	0.097	1.469	0.142	
707.50	23095	Mid	right	5 mm	LTE Band 12	A	Closed	0143M	10	QPSK	1	25	24.0	22.51	0	0.17	1:1	0.037	1.409	0.052	
707.50	23095	Mid	right	5 mm	LTE Band 12	A	Closed	0143M	10	QPSK	25	12	24.0	22.33	0	0.06	1:1	0.037	1.469	0.054	
707.50	23095	Mid	left	5 mm	LTE Band 12	A	Closed	0143M	10	QPSK	1	25	24.0	22.51	0	-0.02	1:1	0.077	1.409	0.108	
707.50	23095	Mid	left	5 mm	LTE Band 12	A	Closed	0143M	10	QPSK	25	12	24.0	22.33	0	-0.05	1:1	0.078	1.469	0.115	
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
LTE Band 13 Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Spacing	Mode	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
782.00	23230	Mid	back	10 mm	LTE Band 13	A	Open	0143M	10	QPSK	1	0	24.0	23.56	0	-0.06	1:1	0.206	1.107	0.228	
782.00	23230	Mid	back	10 mm	LTE Band 13	A	Open	0143M	10	QPSK	25	0	24.0	23.32	0	0.01	1:1	0.210	1.169	0.245	
782.00	23230	Mid	front	10 mm	LTE Band 13	A	Open	0143M	10	QPSK	1	0	24.0	23.56	0	0.00	1:1	0.151	1.107	0.167	
782.00	23230	Mid	front	10 mm	LTE Band 13	A	Open	0143M	10	QPSK	25	0	24.0	23.32	0	-0.03	1:1	0.155	1.169	0.181	
782.00	23230	Mid	bottom	10 mm	LTE Band 13	A	Open	0143M	10	QPSK	1	0	24.0	23.56	0	-0.12	1:1	0.077	1.107	0.085	
782.00	23230	Mid	bottom	10 mm	LTE Band 13	A	Open	0143M	10	QPSK	25	0	24.0	23.32	0	-0.10	1:1	0.077	1.169	0.090	
782.00	23230	Mid	right	10 mm	LTE Band 13	A	Open	0143M	10	QPSK	1	0	24.0	23.56	0	0.01	1:1	0.179	1.107	0.198	
782.00	23230	Mid	right	10 mm	LTE Band 13	A	Open	0143M	10	QPSK	25	0	24.0	23.32	0	-0.01	1:1	0.183	1.169	0.214	
782.00	23230	Mid	left	10 mm	LTE Band 13	A	Open	0143M	10	QPSK	1	0	24.0	23.56	0	-0.10	1:1	0.074	1.107	0.082	
782.00	23230	Mid	left	10 mm	LTE Band 13	A	Open	0143M	10	QPSK	25	0	24.0	23.32	0	-0.03	1:1	0.081	1.169	0.095	
782.00	23230	Mid	back	5 mm	LTE Band 13	A	Closed	0143M	10	QPSK	1	0	24.0	23.56	0	-0.05	1:1	0.489	1.107	0.541	A35
782.00	23230	Mid	back	5 mm	LTE Band 13	A	Closed	0143M	10	QPSK	25	0	24.0	23.32	0	-0.06	1:1	0.485	1.169	0.567	
782.00	23230	Mid	front	5 mm	LTE Band 13	A	Closed	0143M	10	QPSK	1	0	24.0	23.56	0	0.02	1:1	0.170	1.107	0.188	
782.00	23230	Mid	front	5 mm	LTE Band 13	A	Closed	0143M	10	QPSK	25	0	24.0	23.32	0	0.02	1:1	0.179	1.169	0.209	
782.00	23230	Mid	bottom	5 mm	LTE Band 13	A	Closed	0143M	10	QPSK	1	0	24.0	23.56	0	-0.02	1:1	0.130	1.107	0.144	
782.00	23230	Mid	bottom	5 mm	LTE Band 13	A	Closed	0143M	10	QPSK	25	0	24.0	23.32	0	0.09	1:1	0.130	1.169	0.152	
782.00	23230	Mid	right	5 mm	LTE Band 13	A	Closed	0143M	10	QPSK	1	0	24.0	23.56	0	0.17	1:1	0.047	1.107	0.052	
782.00	23230	Mid	right	5 mm	LTE Band 13	A	Closed	0143M	10	QPSK	25	0	24.0	23.32	0	0.15	1:1	0.047	1.169	0.055	
782.00	23230	Mid	left	5 mm	LTE Band 13	A	Closed	0143M	10	QPSK	1	0	24.0	23.56	0	-0.08	1:1	0.095	1.107	0.105	
782.00	23230	Mid	left	5 mm	LTE Band 13	A	Closed	0143M	10	QPSK	25	0	24.0	23.32	0	0.14	1:1	0.097	1.169	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 11-30
LTE Band 5 (Cell) Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY			Side	Spacing	Mode	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
836.50	20525	Mid	back	10 mm	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	1	0	24.0	22.79	0	-0.01	1:1	0.243	1.321	0.321	
836.50	20525	Mid	back	10 mm	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	25	0	24.0	22.63	0	-0.03	1:1	0.210	1.371	0.288	
836.50	20525	Mid	front	10 mm	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	1	0	24.0	22.79	0	-0.01	1:1	0.130	1.321	0.172	
836.50	20525	Mid	front	10 mm	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	25	0	24.0	22.63	0	0.05	1:1	0.119	1.371	0.163	
836.50	20525	Mid	bottom	10 mm	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	1	0	24.0	22.79	0	0.06	1:1	0.068	1.321	0.090	
836.50	20525	Mid	bottom	10 mm	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	25	0	24.0	22.63	0	0.02	1:1	0.062	1.371	0.085	
836.50	20525	Mid	right	10 mm	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	1	0	24.0	22.79	0	-0.03	1:1	0.132	1.321	0.174	
836.50	20525	Mid	right	10 mm	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	25	0	24.0	22.63	0	0.03	1:1	0.133	1.371	0.182	
836.50	20525	Mid	left	10 mm	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	1	0	24.0	22.79	0	0.07	1:1	0.084	1.321	0.111	
836.50	20525	Mid	left	10 mm	LTE Band 5 (Cell)	A	Open	0148M	10	QPSK	25	0	24.0	22.63	0	0.05	1:1	0.083	1.371	0.114	
836.50	20525	Mid	back	5 mm	LTE Band 5 (Cell)	A	Closed	0148M	10	QPSK	1	0	24.0	22.79	0	-0.03	1:1	0.503	1.321	0.664	A36
836.50	20525	Mid	back	5 mm	LTE Band 5 (Cell)	A	Closed	0148M	10	QPSK	25	0	24.0	22.63	0	0.04	1:1	0.492	1.371	0.675	
836.50	20525	Mid	front	5 mm	LTE Band 5 (Cell)	A	Closed	0148M	10	QPSK	1	0	24.0	22.79	0	0.06	1:1	0.093	1.321	0.123	
836.50	20525	Mid	front	5 mm	LTE Band 5 (Cell)	A	Closed	0148M	10	QPSK	25	0	24.0	22.63	0	-0.02	1:1	0.091	1.371	0.125	
836.50	20525	Mid	bottom	5 mm	LTE Band 5 (Cell)	A	Closed	0148M	10	QPSK	1	0	24.0	22.79	0	0.05	1:1	0.132	1.321	0.174	
836.50	20525	Mid	bottom	5 mm	LTE Band 5 (Cell)	A	Closed	0148M	10	QPSK	25	0	24.0	22.63	0	0.08	1:1	0.131	1.371	0.180	
836.50	20525	Mid	right	5 mm	LTE Band 5 (Cell)	A	Closed	0148M	10	QPSK	1	0	24.0	22.79	0	0.03	1:1	0.064	1.321	0.085	
836.50	20525	Mid	right	5 mm	LTE Band 5 (Cell)	A	Closed	0148M	10	QPSK	25	0	24.0	22.63	0	-0.08	1:1	0.064	1.371	0.088	
836.50	20525	Mid	left	5 mm	LTE Band 5 (Cell)	A	Closed	0148M	10	QPSK	1	0	24.0	22.79	0	0.00	1:1	0.096	1.321	0.127	
836.50	20525	Mid	left	5 mm	LTE Band 5 (Cell)	A	Closed	0148M	10	QPSK	25	0	24.0	22.63	0	0.04	1:1	0.091	1.371	0.125	

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
LTE Band 66 (AWS) Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Spacing	Mode	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
1720.00	132072	Low	back	10 mm	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	1	0	21.0	20.37	0	-0.01	1:1	0.248	1.156	0.287	
1720.00	132072	Low	back	10 mm	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	50	50	21.0	20.11	0	0.00	1:1	0.277	1.227	0.340	
1720.00	132072	Low	front	10 mm	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	1	0	21.0	20.37	0	0.02	1:1	0.208	1.156	0.240	
1720.00	132072	Low	front	10 mm	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	50	50	21.0	20.11	0	0.00	1:1	0.210	1.227	0.258	
1720.00	132072	Low	bottom	10 mm	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	1	0	21.0	20.37	0	0.09	1:1	0.394	1.156	0.455	
1720.00	132072	Low	bottom	10 mm	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	50	50	21.0	20.11	0	-0.03	1:1	0.411	1.227	0.504	
1720.00	132072	Low	right	10 mm	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	1	0	21.0	20.37	0	0.08	1:1	0.024	1.156	0.028	
1720.00	132072	Low	right	10 mm	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	50	50	21.0	20.11	0	-0.12	1:1	0.029	1.227	0.036	
1720.00	132072	Low	left	10 mm	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	1	0	21.0	20.37	0	0.06	1:1	0.046	1.156	0.053	
1720.00	132072	Low	left	10 mm	LTE Band 66 (AWS)	A	Open	0194M	20	QPSK	50	50	21.0	20.11	0	-0.13	1:1	0.045	1.227	0.055	
1720.00	132072	Low	back	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	1	0	21.0	20.37	0	0.02	1:1	0.390	1.156	0.451	
1720.00	132072	Low	back	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	50	50	21.0	20.11	0	-0.01	1:1	0.398	1.227	0.488	
1720.00	132072	Low	front	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	1	0	21.0	20.37	0	0.12	1:1	0.063	1.156	0.073	
1720.00	132072	Low	front	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	50	50	21.0	20.11	0	-0.09	1:1	0.064	1.227	0.079	
1720.00	132072	Low	bottom	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	1	0	21.0	20.37	0	0.06	1:1	0.642	1.156	0.742	
1745.00	132322	Mid	bottom	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	1	99	21.0	19.88	0	-0.03	1:1	0.661	1.294	0.855	
1770.00	132572	High	bottom	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	1	99	21.0	20.06	0	0.00	1:1	0.702	1.242	0.872	
1720.00	132072	Low	bottom	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	50	50	21.0	20.11	0	0.04	1:1	0.653	1.227	0.801	
1745.00	132322	Mid	bottom	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	50	0	21.0	19.80	0	0.00	1:1	0.672	1.318	0.886	
1770.00	132572	High	bottom	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	50	50	21.0	20.01	0	-0.01	1:1	0.740	1.256	0.929	A37
1720.00	132072	Low	bottom	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	100	0	21.0	19.93	0	0.01	1:1	0.655	1.279	0.838	
1720.00	132072	Low	right	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	1	0	21.0	20.37	0	-0.19	1:1	0.008	1.156	0.009	
1720.00	132072	Low	right	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	50	50	21.0	20.11	0	0.08	1:1	0.007	1.227	0.009	
1720.00	132072	Low	left	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	1	0	21.0	20.37	0	-0.20	1:1	0.078	1.156	0.090	
1720.00	132072	Low	left	5 mm	LTE Band 66 (AWS)	A	Closed	0194M	20	QPSK	50	50	21.0	20.11	0	-0.01	1:1	0.082	1.227	0.101	
1745.00	132322	Mid	back	10 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	1	99	18.5	17.51	0	-0.01	1:1	0.209	1.256	0.263	
1745.00	132322	Mid	back	10 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	50	25	18.5	17.56	0	0.02	1:1	0.197	1.242	0.245	
1745.00	132322	Mid	front	10 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	1	99	18.5	17.51	0	0.02	1:1	0.225	1.256	0.283	
1745.00	132322	Mid	front	10 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	50	25	18.5	17.56	0	0.01	1:1	0.215	1.242	0.267	
1745.00	132322	Mid	top	10 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	1	99	18.5	17.51	0	-0.06	1:1	0.041	1.256	0.051	
1745.00	132322	Mid	top	10 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	50	25	18.5	17.56	0	0.08	1:1	0.040	1.242	0.050	
1745.00	132322	Mid	right	10 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	1	99	18.5	17.51	0	0.01	1:1	0.310	1.256	0.389	
1745.00	132322	Mid	right	10 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	50	25	18.5	17.56	0	0.01	1:1	0.294	1.242	0.365	
1745.00	132322	Mid	back	5 mm	LTE Band 66 (AWS)	I	Closed	0194M	20	QPSK	1	99	18.5	17.51	0	-0.01	1:1	0.039	1.256	0.049	
1745.00	132322	Mid	back	5 mm	LTE Band 66 (AWS)	I	Closed	0194M	20	QPSK	50	25	18.5	17.56	0	0.05	1:1	0.038	1.242	0.047	
1745.00	132322	Mid	front	5 mm	LTE Band 66 (AWS)	I	Closed	0194M	20	QPSK	1	99	18.5	17.51	0	-0.08	1:1	0.248	1.256	0.311	
1745.00	132322	Mid	front	5 mm	LTE Band 66 (AWS)	I	Closed	0194M	20	QPSK	50	25	18.5	17.56	0	-0.04	1:1	0.233	1.242	0.289	
1745.00	132322	Mid	top	5 mm	LTE Band 66 (AWS)	I	Closed	0194M	20	QPSK	1	99	18.5	17.51	0	-0.05	1:1	0.019	1.256	0.024	
1745.00	132322	Mid	top	5 mm	LTE Band 66 (AWS)	I	Closed	0194M	20	QPSK	50	25	18.5	17.56	0	-0.10	1:1	0.021	1.242	0.026	
1745.00	132322	Mid	bottom	5 mm	LTE Band 66 (AWS)	I	Closed	0194M	20	QPSK	1	99	18.5	17.51	0	-0.15	1:1	0.068	1.256	0.085	
1745.00	132322	Mid	bottom	5 mm	LTE Band 66 (AWS)	I	Closed	0194M	20	QPSK	50	25	18.5	17.56	0	0.00	1:1	0.067	1.242	0.083	
1745.00	132322	Mid	right	5 mm	LTE Band 66 (AWS)	I	Closed	0194M	20	QPSK	1	99	18.5	17.51	0	0.04	1:1	0.394	1.256	0.495	
1745.00	132322	Mid	right	5 mm	LTE Band 66 (AWS)	I	Closed	0194M	20	QPSK	50	25	18.5	17.56	0	0.04	1:1	0.385	1.242	0.478	

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Table 11-32
LTE Band 2 (PCS) Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Spacing	Mode	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
1860.00	18700	Low	back	10 mm	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	1	99	20.0	19.37	0	-0.01	1:1	0.281	1.156	0.325	
1860.00	18700	Low	back	10 mm	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	50	50	20.0	19.46	0	0.01	1:1	0.286	1.132	0.324	
1860.00	18700	Low	front	10 mm	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	1	99	20.0	19.37	0	-0.04	1:1	0.177	1.156	0.205	
1860.00	18700	Low	front	10 mm	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	50	50	20.0	19.46	0	-0.01	1:1	0.181	1.132	0.205	
1860.00	18700	Low	bottom	10 mm	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	1	99	20.0	19.37	0	0.01	1:1	0.426	1.156	0.492	
1860.00	18700	Low	bottom	10 mm	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	50	50	20.0	19.46	0	0.00	1:1	0.429	1.132	0.486	
1860.00	18700	Low	right	10 mm	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	1	99	20.0	19.37	0	-0.08	1:1	0.029	1.156	0.034	
1860.00	18700	Low	right	10 mm	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	50	50	20.0	19.46	0	0.05	1:1	0.029	1.132	0.033	
1860.00	18700	Low	left	10 mm	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	1	99	20.0	19.37	0	0.03	1:1	0.046	1.156	0.053	
1860.00	18700	Low	left	10 mm	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	50	50	20.0	19.46	0	0.00	1:1	0.048	1.132	0.054	
1860.00	18700	Low	back	5 mm	LTE Band 2 (PCS)	A	Closed	0122M	20	QPSK	1	99	20.0	19.37	0	-0.03	1:1	0.170	1.156	0.197	
1860.00	18700	Low	back	5 mm	LTE Band 2 (PCS)	A	Closed	0122M	20	QPSK	50	50	20.0	19.46	0	0.04	1:1	0.165	1.132	0.187	
1860.00	18700	Low	front	5 mm	LTE Band 2 (PCS)	A	Closed	0122M	20	QPSK	1	99	20.0	19.37	0	0.01	1:1	0.263	1.156	0.304	
1860.00	18700	Low	front	5 mm	LTE Band 2 (PCS)	A	Closed	0122M	20	QPSK	50	50	20.0	19.46	0	0.00	1:1	0.286	1.132	0.324	
1860.00	18700	Low	bottom	5 mm	LTE Band 2 (PCS)	A	Closed	0122M	20	QPSK	1	99	20.0	19.37	0	-0.02	1:1	0.350	1.156	0.405	
1860.00	18700	Low	bottom	5 mm	LTE Band 2 (PCS)	A	Closed	0122M	20	QPSK	50	50	20.0	19.46	0	-0.02	1:1	0.374	1.132	0.423	
1860.00	18700	Low	right	5 mm	LTE Band 2 (PCS)	A	Closed	0122M	20	QPSK	1	99	20.0	19.37	0	-0.05	1:1	0.016	1.156	0.018	
1860.00	18700	Low	right	5 mm	LTE Band 2 (PCS)	A	Closed	0122M	20	QPSK	50	50	20.0	19.46	0	-0.08	1:1	0.013	1.132	0.015	
1860.00	18700	Low	left	5 mm	LTE Band 2 (PCS)	A	Closed	0122M	20	QPSK	1	99	20.0	19.37	0	0.00	1:1	0.020	1.156	0.023	
1860.00	18700	Low	left	5 mm	LTE Band 2 (PCS)	A	Closed	0122M	20	QPSK	50	50	20.0	19.46	0	0.04	1:1	0.022	1.132	0.025	
1900.00	19100	High	back	10 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	1	99	16.5	16.29	0	0.02	1:1	0.126	1.050	0.132	
1900.00	19100	High	back	10 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	50	25	16.5	16.28	0	0.01	1:1	0.143	1.052	0.150	
1900.00	19100	High	front	10 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	1	99	16.5	16.29	0	0.02	1:1	0.117	1.050	0.123	
1900.00	19100	High	front	10 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	50	25	16.5	16.28	0	-0.01	1:1	0.120	1.052	0.126	
1900.00	19100	High	top	10 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	1	99	16.5	16.29	0	-0.04	1:1	0.042	1.050	0.044	
1900.00	19100	High	top	10 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	50	25	16.5	16.28	0	0.02	1:1	0.042	1.052	0.044	
1900.00	19100	High	right	10 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	1	99	16.5	16.29	0	-0.01	1:1	0.278	1.050	0.292	
1900.00	19100	High	right	10 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	50	25	16.5	16.28	0	0.00	1:1	0.288	1.052	0.303	
1900.00	19100	High	back	5 mm	LTE Band 2 (PCS)	I	Closed	0122M	20	QPSK	1	99	16.5	16.29	0	-0.01	1:1	0.024	1.050	0.025	
1900.00	19100	High	back	5 mm	LTE Band 2 (PCS)	I	Closed	0122M	20	QPSK	50	25	16.5	16.28	0	-0.09	1:1	0.022	1.052	0.023	
1900.00	19100	High	front	5 mm	LTE Band 2 (PCS)	I	Closed	0122M	20	QPSK	1	99	16.5	16.29	0	-0.04	1:1	0.249	1.050	0.261	
1900.00	19100	High	front	5 mm	LTE Band 2 (PCS)	I	Closed	0122M	20	QPSK	50	25	16.5	16.28	0	0.00	1:1	0.261	1.052	0.275	
1900.00	19100	High	top	5 mm	LTE Band 2 (PCS)	I	Closed	0122M	20	QPSK	1	99	16.5	16.29	0	0.03	1:1	0.005	1.050	0.005	
1900.00	19100	High	top	5 mm	LTE Band 2 (PCS)	I	Closed	0122M	20	QPSK	50	25	16.5	16.28	0	-0.16	1:1	0.007	1.052	0.007	
1900.00	19100	High	bottom	5 mm	LTE Band 2 (PCS)	I	Closed	0122M	20	QPSK	1	99	16.5	16.29	0	0.02	1:1	0.066	1.050	0.069	
1900.00	19100	High	bottom	5 mm	LTE Band 2 (PCS)	I	Closed	0122M	20	QPSK	50	25	16.5	16.28	0	-0.01	1:1	0.065	1.052	0.068	
1900.00	19100	High	right	5 mm	LTE Band 2 (PCS)	I	Closed	0122M	20	QPSK	1	99	16.5	16.29	0	-0.01	1:1	0.537	1.050	0.564	
1900.00	19100	High	right	5 mm	LTE Band 2 (PCS)	I	Closed	0122M	20	QPSK	50	25	16.5	16.28	0	0.01	1:1	0.560	1.052	0.589	A38
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Table 11-33
LTE Band 41 Hotspot SAR

MEASUREMENT RESULTS																								
# CC Uplink	Component Carrier	FREQUENCY			Side	Spacing	Mode	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
		MHz	Ch.																				
1 CC Uplink	N/A	2593.00	40620	Mid	back	10 mm	LTE Band 41	B	Open	0153M	20	QPSK	1	99	20.0	18.66	0	-0.06	1:1.58	0.040	1.361	0.054	
1 CC Uplink	N/A	2593.00	40620	Mid	back	10 mm	LTE Band 41	B	Open	0153M	20	QPSK	50	50	20.0	18.79	0	0.02	1:1.58	0.042	1.321	0.055	
1 CC Uplink	N/A	2593.00	40620	Mid	front	10 mm	LTE Band 41	B	Open	0153M	20	QPSK	1	99	20.0	18.66	0	-0.03	1:1.58	0.032	1.361	0.044	
1 CC Uplink	N/A	2593.00	40620	Mid	front	10 mm	LTE Band 41	B	Open	0153M	20	QPSK	50	50	20.0	18.79	0	0.01	1:1.58	0.033	1.321	0.044	
1 CC Uplink	N/A	2593.00	40620	Mid	bottom	10 mm	LTE Band 41	B	Open	0153M	20	QPSK	1	99	20.0	18.66	0	-0.04	1:1.58	0.085	1.361	0.116	
1 CC Uplink	N/A	2593.00	40620	Mid	bottom	10 mm	LTE Band 41	B	Open	0153M	20	QPSK	50	50	20.0	18.79	0	-0.02	1:1.58	0.085	1.321	0.112	
2 CC Uplink	PCC	2593.00	40620	Mid	bottom	10 mm	LTE Band 41	B	Open	0153M	20	QPSK	1	99	20.0	18.52	0	-0.02	1:1.58	0.085	1.406	0.120	
	SCC	2612.80	40818						Open					0									
1 CC Uplink	N/A	2593.00	40620	Mid	left	10 mm	LTE Band 41	B	Open	0153M	20	QPSK	1	99	20.0	18.66	0	-0.04	1:1.58	0.037	1.361	0.050	
1 CC Uplink	N/A	2593.00	40620	Mid	left	10 mm	LTE Band 41	B	Open	0153M	20	QPSK	50	50	20.0	18.79	0	0.13	1:1.58	0.036	1.321	0.048	
1 CC Uplink	N/A	2593.00	40620	Mid	back	5 mm	LTE Band 41	B	Closed	0153M	20	QPSK	1	99	20.0	18.66	0	-0.03	1:1.58	0.130	1.361	0.177	
1 CC Uplink	N/A	2593.00	40620	Mid	back	5 mm	LTE Band 41	B	Closed	0153M	20	QPSK	50	50	20.0	18.79	0	0.01	1:1.58	0.131	1.321	0.173	
1 CC Uplink	N/A	2593.00	40620	Mid	front	5 mm	LTE Band 41	B	Closed	0153M	20	QPSK	1	99	20.0	18.66	0	0.00	1:1.58	0.009	1.361	0.012	
1 CC Uplink	N/A	2593.00	40620	Mid	front	5 mm	LTE Band 41	B	Closed	0153M	20	QPSK	50	50	20.0	18.79	0	-0.11	1:1.58	0.004	1.321	0.005	
1 CC Uplink	N/A	2593.00	40620	Mid	bottom	5 mm	LTE Band 41	B	Closed	0153M	20	QPSK	1	99	20.0	18.66	0	-0.01	1:1.58	0.143	1.361	0.195	
1 CC Uplink	N/A	2593.00	40620	Mid	bottom	5 mm	LTE Band 41	B	Closed	0153M	20	QPSK	50	50	20.0	18.79	0	-0.02	1:1.58	0.142	1.321	0.188	
2 CC Uplink	PCC	2593.00	40620	Mid	bottom	5 mm	LTE Band 41	B	Closed	0153M	20	QPSK	1	99	20.0	18.52	0	-0.05	1:1.58	0.140	1.406	0.197	
	SCC	2612.80	40818						Closed					0									
1 CC Uplink	N/A	2593.00	40620	Mid	left	5 mm	LTE Band 41	B	Closed	0153M	20	QPSK	1	99	20.0	18.66	0	-0.05	1:1.58	0.109	1.361	0.148	
1 CC Uplink	N/A	2593.00	40620	Mid	left	5 mm	LTE Band 41	B	Closed	0153M	20	QPSK	50	50	20.0	18.79	0	-0.02	1:1.58	0.090	1.321	0.119	
1 CC Uplink	N/A	2680.00	41490	High	back	10 mm	LTE Band 41	I	Open	0153M	20	QPSK	1	0	19.0	17.95	0	0.03	1:1.58	0.154	1.274	0.196	
1 CC Uplink	N/A	2680.00	41490	High	back	10 mm	LTE Band 41	I	Open	0153M	20	QPSK	50	0	19.0	18.06	0	-0.05	1:1.58	0.156	1.242	0.194	
1 CC Uplink	N/A	2680.00	41490	High	front	10 mm	LTE Band 41	I	Open	0153M	20	QPSK	1	0	19.0	17.95	0	0.00	1:1.58	0.153	1.274	0.195	
1 CC Uplink	N/A	2680.00	41490	High	front	10 mm	LTE Band 41	I	Open	0153M	20	QPSK	50	0	19.0	18.06	0	-0.10	1:1.58	0.157	1.242	0.195	
1 CC Uplink	N/A	2680.00	41490	High	top	10 mm	LTE Band 41	I	Open	0153M	20	QPSK	1	0	19.0	17.95	0	-0.06	1:1.58	0.067	1.274	0.085	
1 CC Uplink	N/A	2680.00	41490	High	top	10 mm	LTE Band 41	I	Open	0153M	20	QPSK	50	0	19.0	18.06	0	-0.02	1:1.58	0.066	1.242	0.082	
1 CC Uplink	N/A	2680.00	41490	High	right	10 mm	LTE Band 41	I	Open	0153M	20	QPSK	1	0	19.0	17.95	0	0.01	1:1.58	0.304	1.274	0.387	
1 CC Uplink	N/A	2680.00	41490	High	right	10 mm	LTE Band 41	I	Open	0153M	20	QPSK	50	0	19.0	18.06	0	-0.01	1:1.58	0.303	1.242	0.376	
2 CC Uplink	PCC	2680.00	41490	High	right	10 mm	LTE Band 41	I	Open	0153M	20	QPSK	1	0	19.0	17.81	0	-0.01	1:1.58	0.306	1.315	0.402	
	SCC	2660.20	41292											99									
1 CC Uplink	N/A	2680.00	41490	High	back	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	0	19.0	17.95	0	0.00	1:1.58	0.235	1.274	0.299	
1 CC Uplink	N/A	2680.00	41490	High	back	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	50	0	19.0	18.06	0	-0.01	1:1.58	0.230	1.242	0.286	
1 CC Uplink	N/A	2506.00	39750	Low	front	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	50	19.0	17.84	0	-0.07	1:1.58	0.397	1.306	0.518	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	front	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	50	19.0	17.84	0	-0.05	1:1.58	0.494	1.306	0.645	
1 CC Uplink	N/A	2593.00	40620	Mid	front	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	50	19.0	17.89	0	0.01	1:1.58	0.424	1.291	0.547	
1 CC Uplink	N/A	2636.50	41055	Mid-High	front	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	0	19.0	17.88	0	-0.03	1:1.58	0.445	1.294	0.576	
1 CC Uplink	N/A	2680.00	41490	High	front	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	0	19.0	17.95	0	-0.06	1:1.58	0.518	1.274	0.660	
1 CC Uplink	N/A	2506.00	39750	Low	front	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	50	25	19.0	18.03	0	-0.02	1:1.58	0.411	1.250	0.514	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	front	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	50	50	19.0	17.93	0	0.02	1:1.58	0.335	1.279	0.428	
1 CC Uplink	N/A	2593.00	40620	Mid	front	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	50	25	19.0	18.03	0	-0.05	1:1.58	0.410	1.250	0.513	
1 CC Uplink	N/A	2636.50	41055	Mid-High	front	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	50	25	19.0	18.05	0	0.00	1:1.58	0.470	1.245	0.585	
1 CC Uplink	N/A	2680.00	41490	High	front	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	50	0	19.0	18.06	0	-0.08	1:1.58	0.508	1.242	0.631	
1 CC Uplink	N/A	2680.00	41490	High	front	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	100	0	19.0	17.93	0	-0.01	1:1.58	0.511	1.279	0.654	
1 CC Uplink	N/A	2680.00	41490	High	top	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	0	19.0	17.95	0	-0.11	1:1.58	0.032	1.274	0.041	
1 CC Uplink	N/A	2680.00	41490	High	top	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	50	0	19.0	18.06	0	-0.11	1:1.58	0.031	1.242	0.039	
1 CC Uplink	N/A	2680.00	41490	High	bottom	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	0	19.0	17.95	0	-0.02	1:1.58	0.101	1.274	0.129	
1 CC Uplink	N/A	2680.00	41490	High	bottom	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	50	0	19.0	18.06	0	0.03	1:1.58	0.100	1.242	0.124	
1 CC Uplink	N/A	2506.00	39750	Low	right	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	50	19.0	17.84	0	0.04	1:1.58	0.451	1.306	0.589	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	right	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	50	19.0	17.84	0	0.00	1:1.58	0.473	1.306	0.618	
1 CC Uplink	N/A	2593.00	40620	Mid	right	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	50	19.0	17.89	0	-0.07	1:1.58	0.587	1.291	0.758	
1 CC Uplink	N/A	2636.50	41055	Mid-High	right	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	0	19.0	17.88	0	-0.04	1:1.58	0.686	1.294	0.888	
1 CC Uplink	N/A	2680.00	41490	High	right	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	0	19.0	17.95	0	0.05	1:1.58	0.565	1.274	0.720	
1 CC Uplink	N/A	2506.00	39750	Low	right	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	50	25	19.0	18.03	0	0.02	1:1.58	0.471	1.250	0.589	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	right	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	50	50	19.0	17.93	0	0.02	1:1.58	0.543	1.279	0.694	
1 CC Uplink	N/A	2593.00	40620	Mid	right	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	50	25	19.0	18.03	0	-0.03	1:1.58	0.602	1.250	0.753	
1 CC Uplink	N/A	2636.50	41055	Mid-High	right	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	50	25	19.0	18.05	0	0.08	1:1.58	0.689	1.245	0.858	A39
1 CC Uplink	N/A	2680.00	41490	High	right	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	50	0	19.0	18.06	0	-0.02	1:1.58	0.572	1.242	0.710	
1 CC Uplink	N/A	2680.00	41490	High	right	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	100	0	19.0	17.93	0	-0.02	1:1.58	0.585	1.279	0.748	
2 CC Uplink	PCC	2636.50	41055	Mid-High	right	5 mm	LTE Band 41	I	Closed	0153M	20	QPSK	1	0	19.0	17.84	0	-0.02	1:1.58	0.659	1.306	0.861	
	SCC	2616.70	40857											99									

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Spatial Peak	1.6 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 1 gram

Table 11-34
NR Band n5 Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Spacing	Mode	Antenna Config	Form Factor	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																		(W/kg)		(W/kg)	
836.50	167300	Mid	back	10 mm	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	0.04	1:1	0.321	1.253	0.402	
836.50	167300	Mid	back	10 mm	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	-0.02	1:1	0.316	1.318	0.416	
836.50	167300	Mid	back	10 mm	NR Band n5	A	Open	0146M	20	CP-OFDM	QPSK	1	1	24.2	23.28	1.5	-0.18	1:1	0.244	1.236	0.302	
836.50	167300	Mid	front	10 mm	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	-0.07	1:1	0.200	1.253	0.251	
836.50	167300	Mid	front	10 mm	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	-0.04	1:1	0.179	1.318	0.236	
836.50	167300	Mid	bottom	10 mm	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	-0.03	1:1	0.105	1.253	0.132	
836.50	167300	Mid	bottom	10 mm	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	0.20	1:1	0.103	1.318	0.136	
836.50	167300	Mid	right	10 mm	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	0.03	1:1	0.243	1.253	0.304	
836.50	167300	Mid	right	10 mm	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	0.02	1:1	0.228	1.318	0.301	
836.50	167300	Mid	left	10 mm	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	0.07	1:1	0.179	1.253	0.224	
836.50	167300	Mid	left	10 mm	NR Band n5	A	Open	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	-0.02	1:1	0.162	1.318	0.214	
836.50	167300	Mid	back	5 mm	NR Band n5	A	Closed	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	-0.10	1:1	0.836	1.253	1.048	A40
836.50	167300	Mid	back	5 mm	NR Band n5	A	Closed	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	0.00	1:1	0.761	1.318	1.003	
836.50	167300	Mid	back	5 mm	NR Band n5	A	Closed	0146M	20	DFT-S-OFDM	QPSK	100	0	24.7	23.55	1	0.00	1:1	0.609	1.303	0.794	
836.50	167300	Mid	back	5 mm	NR Band n5	A	Closed	0146M	20	CP-OFDM	QPSK	1	1	24.2	23.28	1.5	-0.02	1:1	0.580	1.236	0.717	
836.50	167300	Mid	front	5 mm	NR Band n5	A	Closed	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	-0.07	1:1	0.181	1.253	0.227	
836.50	167300	Mid	front	5 mm	NR Band n5	A	Closed	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	0.00	1:1	0.169	1.318	0.223	
836.50	167300	Mid	bottom	5 mm	NR Band n5	A	Closed	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	0.04	1:1	0.183	1.253	0.229	
836.50	167300	Mid	bottom	5 mm	NR Band n5	A	Closed	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	-0.02	1:1	0.177	1.318	0.233	
836.50	167300	Mid	right	5 mm	NR Band n5	A	Closed	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	-0.16	1:1	0.088	1.253	0.110	
836.50	167300	Mid	right	5 mm	NR Band n5	A	Closed	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	0.01	1:1	0.084	1.318	0.111	
836.50	167300	Mid	left	5 mm	NR Band n5	A	Closed	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	0.09	1:1	0.152	1.253	0.190	
836.50	167300	Mid	left	5 mm	NR Band n5	A	Closed	0146M	20	DFT-S-OFDM	QPSK	50	28	25.7	24.50	0	-0.03	1:1	0.141	1.318	0.186	
836.50	167300	Mid	back	5 mm	NR Band n5	A	Closed	0146M	20	DFT-S-OFDM	QPSK	1	1	25.7	24.72	0	0.02	1:1	0.815	1.253	1.021	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram											

Note: Blue entry represents variability measurement.

Table 11-35
NR Band n66 Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Spacing	Mode	Antenna Config	Form Factor	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																		(W/kg)		(W/kg)	
1745.00	349000	Mid	back	10 mm	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	1	108	21.0	19.74	0	0.12	1:1	0.251	1.337	0.336	
1745.00	349000	Mid	back	10 mm	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	108	108	21.0	19.79	0	-0.03	1:1	0.270	1.321	0.357	
1745.00	349000	Mid	front	10 mm	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	1	108	21.0	19.74	0	-0.11	1:1	0.194	1.337	0.259	
1745.00	349000	Mid	front	10 mm	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	108	108	21.0	19.79	0	0.06	1:1	0.194	1.321	0.256	
1745.00	349000	Mid	bottom	10 mm	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	1	108	21.0	19.74	0	0.02	1:1	0.388	1.337	0.519	
1745.00	349000	Mid	bottom	10 mm	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	108	108	21.0	19.79	0	0.02	1:1	0.412	1.321	0.544	
1745.00	349000	Mid	bottom	10 mm	NR Band n66	A	Open	0146M	40	CP-OFDM	QPSK	1	1	21.0	19.75	0	-0.01	1:1	0.394	1.334	0.526	
1745.00	349000	Mid	right	10 mm	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	1	108	21.0	19.74	0	0.09	1:1	0.012	1.337	0.016	
1745.00	349000	Mid	right	10 mm	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	108	108	21.0	19.79	0	0.09	1:1	0.014	1.321	0.018	
1745.00	349000	Mid	left	10 mm	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	1	108	21.0	19.74	0	-0.15	1:1	0.012	1.337	0.016	
1745.00	349000	Mid	left	10 mm	NR Band n66	A	Open	0146M	40	DFT-S-OFDM	QPSK	108	108	21.0	19.79	0	0.09	1:1	0.011	1.321	0.015	
1745.00	349000	Mid	back	5 mm	NR Band n66	A	Closed	0146M	40	DFT-S-OFDM	QPSK	1	108	21.0	19.74	0	0.00	1:1	0.441	1.337	0.590	
1745.00	349000	Mid	back	5 mm	NR Band n66	A	Closed	0146M	40	DFT-S-OFDM	QPSK	108	108	21.0	19.79	0	0.00	1:1	0.435	1.321	0.575	
1745.00	349000	Mid	front	5 mm	NR Band n66	A	Closed	0146M	40	DFT-S-OFDM	QPSK	1	108	21.0	19.74	0	-0.12	1:1	0.209	1.337	0.279	
1745.00	349000	Mid	front	5 mm	NR Band n66	A	Closed	0146M	40	DFT-S-OFDM	QPSK	108	108	21.0	19.79	0	0.00	1:1	0.236	1.321	0.312	
1745.00	349000	Mid	bottom	5 mm	NR Band n66	A	Closed	0146M	40	DFT-S-OFDM	QPSK	1	108	21.0	19.74	0	0.04	1:1	0.665	1.337	0.889	
1745.00	349000	Mid	bottom	5 mm	NR Band n66	A	Closed	0146M	40	DFT-S-OFDM	QPSK	108	108	21.0	19.79	0	0.01	1:1	0.696	1.321	0.919	A41
1745.00	349000	Mid	bottom	5 mm	NR Band n66	A	Closed	0146M	40	DFT-S-OFDM	QPSK	216	0	21.0	19.71	0	-0.03	1:1	0.682	1.346	0.918	
1745.00	349000	Mid	bottom	5 mm	NR Band n66	A	Closed	0146M	40	CP-OFDM	QPSK	1	1	21.0	19.75	0	-0.03	1:1	0.641	1.334	0.855	
1745.00	349000	Mid	right	5 mm	NR Band n66	A	Closed	0146M	40	DFT-S-OFDM	QPSK	1	108	21.0	19.74	0	-0.03	1:1	0.406	1.337	0.543	
1745.00	349000	Mid	right	5 mm	NR Band n66	A	Closed	0146M	40	DFT-S-OFDM	QPSK	108	108	21.0	19.79	0	-0.03	1:1	0.448	1.321	0.592	
1745.00	349000	Mid	left	5 mm	NR Band n66	A	Closed	0146M	40	DFT-S-OFDM	QPSK	1	108	21.0	19.74	0	0.07	1:1	0.017	1.337	0.023	
1745.00	349000	Mid	left	5 mm	NR Band n66	A	Closed	0146M	40	DFT-S-OFDM	QPSK	108	108	21.0	19.79	0	0.07	1:1	0.016	1.321	0.021	
1745.00	349000	Mid	back	10 mm	NR Band n66	I	Open	0146M	40	DFT-S-OFDM	QPSK	1	108	18.5	17.66	0	0.13	1:1	0.093	1.213	0.113	
1745.00	349000	Mid	back	10 mm	NR Band n66	I	Open	0146M	40	DFT-S-OFDM	QPSK	108	54	18.5	17.74	0	-0.07	1:1	0.094	1.191	0.112	
1745.00	349000	Mid	front	10 mm	NR Band n66	I	Open	0146M	40	DFT-S-OFDM	QPSK	1	108	18.5	17.66	0	-0.13	1:1	0.101	1.213	0.123	
1745.00	349000	Mid	front	10 mm	NR Band n66	I	Open	0146M	40	DFT-S-OFDM	QPSK	108	54	18.5	17.74	0	0.09	1:1	0.107	1.191	0.127	
1745.00	349000	Mid	top	10 mm	NR Band n66	I	Open	0146M	40	DFT-S-OFDM	QPSK	1	108	18.5	17.66	0	0.10	1:1	0.014	1.213	0.017	
1745.00	349000	Mid	top	10 mm	NR Band n66	I	Open	0146M	40	DFT-S-OFDM	QPSK	108	54	18.5	17.74	0	0.03	1:1	0.014	1.191	0.017	
1745.00	349000	Mid	right	10 mm	NR Band n66	I	Open	0146M	40	DFT-S-OFDM	QPSK	1	108	18.5	17.66	0	-0.02	1:1	0.193	1.213	0.234	
1745.00	349000	Mid	right	10 mm	NR Band n66	I	Open	0146M	40	DFT-S-OFDM	QPSK	108	54	18.5	17.74	0	-0.04	1:1	0.194	1.191	0.231	
1745.00	349000	Mid	right	10 mm	NR Band n66	I	Open	0146M	40	CP-OFDM	QPSK	1	1	18.5	17.42	0	-0.01	1:1	0.174	1.282	0.223	
1745.00	349000	Mid	back	5 mm	NR Band n66	I	Closed	0146M	40	DFT-S-OFDM	QPSK	1	108	18.5	17.66	0	-0.05	1:1	0.011	1.213	0.013	
1745.00	349000	Mid	back	5 mm	NR Band n66	I	Closed	0146M	40	DFT-S-OFDM	QPSK	108	54	18.5	17.74	0	0.09	1:1	0.013	1.191	0.015	
1745.00	349000	Mid	front	5 mm	NR Band n66	I	Closed	0146M	40	DFT-S-OFDM	QPSK	1	108	18.5	17.66	0	0.01	1:1	0.182	1.213	0.221	
1745.00	349000	Mid	front	5 mm	NR Band n66	I	Closed	0146M	40	DFT-S-OFDM	QPSK	108	54	18.5	17.74	0	-0.07	1:1	0.191	1.191	0.227	
1745.00	349000	Mid	top	5 mm	NR Band n66	I	Closed	0146M	40	DFT-S-OFDM	QPSK	1	108	18.5	17.66	0	0.04	1:1	0.014	1.213	0.017	
1745.00	349000	Mid	top	5 mm	NR Band n66	I	Closed	0146M	40	DFT-S-OFDM	QPSK	108	54	18.5	17.74	0	0.10	1:1	0.013	1.191	0.015	
1745.00	349000	Mid	bottom	5 mm	NR Band n66	I	Closed	0146M	40	DFT-S-OFDM	QPSK	1	108	18.5	17.66	0	-0.06	1:1	0.011	1.213	0.013	
1745.00	349000	Mid	bottom	5 mm	NR Band n66	I	Closed	0146M	40	DFT-S-OFDM	QPSK	108	54	18.5	17.74	0	0.06	1:1	0.011	1.191	0.013	
1745.00	349000	Mid	right	5 mm	NR Band n66	I	Closed	0146M	40	DFT-S-OFDM	QPSK	1	108	18.5	17.66	0	0.12	1:1	0.283	1.213	0.343	
1745.00	349000	Mid	right	5 mm	NR Band n66	I	Closed	0146M	40	DFT-S-OFDM	QPSK	108	54	18.5	17.74	0	0.09	1:1	0.289	1.191	0.344	
1745.00	349000	Mid	right	5 mm	NR Band n66	I	Closed	0146M	40	CP-OFDM	QPSK	1	1	18.5	17.42	0	-0.01	1:1	0.236	1.282	0.303	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-36
NR Band n41 Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Side	Spacing	Mode	Antenna Config	Form Factor	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																		(W/kg)		(W/kg)	
2592.99	518598	Mid	back	10 mm	NR Band n41	I	Open	0194M	100	DFT-S-OFDM	QPSK	1	137	17.0	16.50	0	-0.08	1:1	0.147	1.122	0.165	
2592.99	518598	Mid	back	10 mm	NR Band n41	I	Open	0194M	100	DFT-S-OFDM	QPSK	135	138	17.0	16.53	0	0.03	1:1	0.165	1.114	0.184	
2592.99	518598	Mid	front	10 mm	NR Band n41	I	Open	0194M	100	DFT-S-OFDM	QPSK	1	137	17.0	16.50	0	-0.01	1:1	0.171	1.122	0.192	
2592.99	518598	Mid	front	10 mm	NR Band n41	I	Open	0194M	100	DFT-S-OFDM	QPSK	135	138	17.0	16.53	0	-0.04	1:1	0.194	1.114	0.216	
2592.99	518598	Mid	top	10 mm	NR Band n41	I	Open	0194M	100	DFT-S-OFDM	QPSK	1	137	17.0	16.50	0	-0.05	1:1	0.027	1.122	0.030	
2592.99	518598	Mid	top	10 mm	NR Band n41	I	Open	0194M	100	DFT-S-OFDM	QPSK	135	138	17.0	16.53	0	0.07	1:1	0.030	1.114	0.033	
2592.99	518598	Mid	right	10 mm	NR Band n41	I	Open	0194M	100	DFT-S-OFDM	QPSK	1	137	17.0	16.50	0	-0.09	1:1	0.234	1.122	0.263	
2592.99	518598	Mid	right	10 mm	NR Band n41	I	Open	0194M	100	DFT-S-OFDM	QPSK	135	138	17.0	16.53	0	-0.08	1:1	0.257	1.114	0.286	
2592.99	518598	Mid	right	10 mm	NR Band n41	I	Open	0194M	100	CP-OFDM	QPSK	1	1	17.0	15.97	0	0.01	1:1	0.172	1.268	0.218	
2592.99	518598	Mid	back	5 mm	NR Band n41	I	Closed	0140M	100	DFT-s-OFDM	QPSK	1	137	17.0	16.50	0	0.00	1:1	0.117	1.122	0.131	
2592.99	518598	Mid	back	5 mm	NR Band n41	I	Closed	0140M	100	DFT-s-OFDM	QPSK	135	138	17.0	16.53	0	0.02	1:1	0.137	1.114	0.153	
2592.99	518598	Mid	front	5 mm	NR Band n41	I	Closed	0140M	100	DFT-s-OFDM	QPSK	1	137	17.0	16.50	0	-0.13	1:1	0.292	1.122	0.328	
2592.99	518598	Mid	front	5 mm	NR Band n41	I	Closed	0140M	100	DFT-s-OFDM	QPSK	135	138	17.0	16.53	0	0.01	1:1	0.294	1.114	0.328	
2592.99	518598	Mid	top	5 mm	NR Band n41	I	Closed	0140M	100	DFT-s-OFDM	QPSK	1	137	17.0	16.50	0	0.12	1:1	0.026	1.122	0.029	
2592.99	518598	Mid	top	5 mm	NR Band n41	I	Closed	0140M	100	DFT-s-OFDM	QPSK	135	138	17.0	16.53	0	0.15	1:1	0.025	1.114	0.028	
2592.99	518598	Mid	bottom	5 mm	NR Band n41	I	Closed	0140M	100	DFT-s-OFDM	QPSK	1	137	17.0	16.50	0	0.02	1:1	0.058	1.122	0.065	
2592.99	518598	Mid	bottom	5 mm	NR Band n41	I	Closed	0140M	100	DFT-s-OFDM	QPSK	135	138	17.0	16.53	0	-0.06	1:1	0.061	1.114	0.068	
2592.99	518598	Mid	right	5 mm	NR Band n41	I	Closed	0140M	100	DFT-s-OFDM	QPSK	1	137	17.0	16.50	0	0.02	1:1	0.482	1.122	0.541	
2592.99	518598	Mid	right	5 mm	NR Band n41	I	Closed	0140M	100	DFT-s-OFDM	QPSK	135	138	17.0	16.53	0	0.05	1:1	0.495	1.114	0.551	A42
2592.99	518598	Mid	right	5 mm	NR Band n41	I	Closed	0140M	100	CP-OFDM	QPSK	1	1	17.0	15.97	0	0.07	1:1	0.385	1.268	0.488	
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
DTS SISO WLAN Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)			(W/kg)	
2412	1	back	10 mm	802.11b	DSSS	2	Open	1014M	22	1	19.0	18.95	0.09	100.00	98.74	0.066	1.012	1.013	0.068	
2412	1	front	10 mm	802.11b	DSSS	2	Open	1014M	22	1	19.0	18.95	0.08	100.00	98.74	0.099	1.012	1.013	0.101	
2412	1	top	10 mm	802.11b	DSSS	2	Open	1014M	22	1	19.0	18.95	0.02	100.00	98.74	0.059	1.012	1.013	0.060	
2412	1	right	10 mm	802.11b	DSSS	2	Open	1014M	22	1	19.0	18.95	0.03	100.00	98.74	0.043	1.012	1.013	0.044	
2412	1	back	5 mm	802.11b	DSSS	2	Closed	1014M	22	1	19.0	18.95	0.14	100.00	98.74	0.041	1.012	1.013	0.042	
2412	1	front	5 mm	802.11b	DSSS	2	Closed	1014M	22	1	19.0	18.95	-0.03	100.00	98.74	0.181	1.012	1.013	0.186	
2412	1	bottom	5 mm	802.11b	DSSS	2	Closed	1014M	22	1	19.0	18.95	-0.10	100.00	98.74	0.191	1.012	1.013	**0.196**	
2412	1	right	5 mm	802.11b	DSSS	2	Closed	1014M	22	1	19.0	18.95	0.04	100.00	98.74	0.114	1.012	1.013	0.117	
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
WLAN MIMO Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)			(W/kg)	
2437	6	back	10 mm	802.11b	DSSS	MIMO	Open	0881M	22	1	19.0	18.14	19.0	18.96	-0.08	100.00	98.90	0.140	1.219	1.011	0.173	
2437	6	front	10 mm	802.11b	DSSS	MIMO	Open	0881M	22	1	19.0	18.14	19.0	18.96	-0.06	100.00	98.90	0.199	1.219	1.011	0.245	
2437	6	top	10 mm	802.11b	DSSS	MIMO	Open	0881M	22	1	19.0	18.14	19.0	18.96	-0.02	100.00	98.90	0.335	1.219	1.011	0.413	
2437	6	right	10 mm	802.11b	DSSS	MIMO	Open	0881M	22	1	19.0	18.14	19.0	18.96	0.17	100.00	98.90	0.111	1.219	1.011	0.137	
2437	6	left	10 mm	802.11b	DSSS	MIMO	Open	0881M	22	1	19.0	18.14	19.0	18.96	-0.01	100.00	98.90	0.188	1.219	1.011	0.232	
2437	6	back	5 mm	802.11b	DSSS	MIMO	Closed	0881M	22	1	19.0	18.14	19.0	18.96	0.14	100.00	98.90	0.107	1.219	1.011	0.132	
2437	6	front	5 mm	802.11b	DSSS	MIMO	Closed	0881M	22	1	19.0	18.14	19.0	18.96	0.03	100.00	98.90	0.345	1.219	1.011	0.425	
2412	1	bottom	5 mm	802.11b	DSSS	MIMO	Closed	0881M	22	1	19.0	18.31	19.0	18.73	-0.12	100.00	98.90	0.529	1.172	1.011	0.627	
2437	6	bottom	5 mm	802.11b	DSSS	MIMO	Closed	0881M	22	1	19.0	18.14	19.0	18.96	0.08	100.00	98.90	0.630	1.219	1.011	0.776	A43
2462	11	bottom	5 mm	802.11b	DSSS	MIMO	Closed	0881M	22	1	19.0	18.13	19.0	18.74	-0.05	100.00	98.90	0.538	1.222	1.011	0.665	
2437	6	right	5 mm	802.11b	DSSS	MIMO	Closed	0881M	22	1	19.0	18.14	19.0	18.96	-0.05	100.00	98.90	0.186	1.219	1.011	0.229	
2437	6	left	5 mm	802.11b	DSSS	MIMO	Closed	0881M	22	1	19.0	18.14	19.0	18.96	0.09	100.00	98.90	0.510	1.219	1.011	0.629	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																		Body 1.6 W/kg (mW/g) averaged over 1 gram				

Note: For 2.4 GHz WLAN, to achieve the 22.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 19.0 dBm.

Table 11-39
DSS Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.														(W/kg)			(W/kg)	
2441	39	back	10 mm	Bluetooth	FHSS	1	Open	0880M	1	16.5	16.40	-0.06	78.00	76.85	0.058	1.023	1.015	0.060	
2441	39	front	10 mm	Bluetooth	FHSS	1	Open	0880M	1	16.5	16.40	0.06	78.00	76.85	0.035	1.023	1.015	0.036	
2441	39	top	10 mm	Bluetooth	FHSS	1	Open	0880M	1	16.5	16.40	-0.11	78.00	76.85	0.026	1.023	1.015	0.027	
2440	19	left	10 mm	Bluetooth LE	DSSS	1	Open	0880M	1	17.0	16.42	-0.01	86.00	84.71	0.008	1.143	1.015	0.009	
2441	39	left	10 mm	Bluetooth	FHSS	1	Open	0880M	1	16.5	16.40	-0.09	78.00	76.85	0.073	1.023	1.015	0.076	
2441	39	back	5 mm	Bluetooth	FHSS	1	Closed	0880M	1	16.5	16.40	-0.05	78.00	76.85	0.032	1.023	1.015	0.033	
2441	39	front	5 mm	Bluetooth	FHSS	1	Closed	0880M	1	16.5	16.40	0.01	78.00	76.85	0.136	1.023	1.015	0.141	
2441	39	bottom	5 mm	Bluetooth	FHSS	1	Closed	0880M	1	16.5	16.40	0.00	78.00	76.85	0.087	1.023	1.015	0.090	
2440	19	left	5 mm	Bluetooth LE	DSSS	1	Closed	0880M	1	17.0	16.42	0.01	86.00	84.71	0.030	1.143	1.015	0.035	
2441	39	left	5 mm	Bluetooth	FHSS	1	Closed	0880M	1	16.5	16.40	0.03	78.00	76.85	0.253	1.023	1.015	**0.263**	A44
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																		Body 1.6 W/kg (mW/g) averaged over 1 gram	

Note: 1) Light green entries indicate an additional check on the worst case exposure condition for BT LE that is not fully evaluated.

11.4 Standalone Phablet SAR Data

Table 11-40
GSM 1900 Phablet SAR Data

MEASUREMENT RESULTS																	
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	# of Time Slots	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.													(W/kg)		(W/kg)	
1880.00	661	bottom	0 mm	GSM 1900	GPRS	A	Open	0194M	4	22.0	20.80	-0.06	1:2.076	0.260	1.318	0.343	A45
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 11-41
LTE Band 66 (AWS) Phablet SAR

MEASUREMENT RESULTS																				
FREQUENCY			Side	Spacing	Mode	Antenna Config.	Form Factor	Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
1720.00	132072	Low	right	0 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	1	99	20.5	19.68	0	-0.01	1:1	1.710	1.208	2.066	
1745.00	132322	Mid	right	0 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	1	99	20.5	19.51	0	-0.01	1:1	1.590	1.256	1.997	
1770.00	132572	High	right	0 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	1	50	20.5	19.19	0	-0.01	1:1	1.510	1.352	2.042	
1720.00	132072	Low	right	0 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	50	50	20.5	19.63	0	0.02	1:1	1.750	1.222	2.139	
1745.00	132322	Mid	right	0 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	50	25	20.5	19.51	0	0.00	1:1	1.600	1.256	2.010	
1770.00	132572	High	right	0 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	50	25	20.5	19.36	0	-0.01	1:1	1.600	1.300	2.080	
1720.00	132072	Low	right	0 mm	LTE Band 66 (AWS)	I	Open	0194M	20	QPSK	100	0	20.5	19.61	0	0.00	1:1	1.770	1.227	2.172	A46
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 11-42
LTE Band 2 (PCS) Phablet SAR

MEASUREMENT RESULTS																				
FREQUENCY			Side	Spacing	Mode	Antenna Config.	Form Factor	Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
1860.00	18700	Low	bottom	0 mm	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	1	99	20.0	19.37	0	0.02	1:1	0.356	1.156	0.412	
1860.00	18700	Low	bottom	0 mm	LTE Band 2 (PCS)	A	Open	0122M	20	QPSK	50	50	20.0	19.46	0	0.04	1:1	0.371	1.132	0.420	
1860.00	18700	Low	right	0 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	1	99	20.5	19.14	0	0.05	1:1	1.590	1.368	2.175	
1880.00	18900	Mid	right	0 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	1	0	20.5	19.35	0	0.01	1:1	1.520	1.303	1.981	
1900.00	19100	High	right	0 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	1	99	20.5	19.36	0	0.02	1:1	1.370	1.300	1.781	
1860.00	18700	Low	right	0 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	50	25	20.5	19.25	0	0.00	1:1	1.520	1.334	2.028	
1880.00	18900	Mid	right	0 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	50	25	20.5	19.26	0	0.01	1:1	1.680	1.330	2.234	A47
1900.00	19100	High	right	0 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	50	25	20.5	19.47	0	0.03	1:1	1.340	1.268	1.699	
1900.00	19100	High	right	0 mm	LTE Band 2 (PCS)	I	Open	0122M	20	QPSK	100	0	20.5	19.35	0	0.01	1:1	1.650	1.303	2.150	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Phablet 4.0 W/kg (mW/g) averaged over 10 grams										

Table 11-43
LTE Band 41 Phablet SAR

MEASUREMENT RESULTS																								
# CC Uplink	Component Carrier	FREQUENCY			Side	Spacing	Mode	Antenna Config.	Form Factor	Serial Number	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (10g) (W/kg)	Scaling Factor	Reported SAR (10g) (W/kg)	Plot #
		MHz	Ch.																				
1 CC Uplink	N/A	2680.00	41490	High	right	0 mm	LTE Band 41	I	Open	0153M	20	QPSK	1	0	21.0	19.96	0	0.04	1:1.58	1.050	1.271	1.335	
1 CC Uplink	N/A	2680.00	41490	High	right	0 mm	LTE Band 41	I	Open	0153M	20	QPSK	50	0	21.0	20.12	0	0.03	1:1.58	1.040	1.225	1.274	
2 CC Uplink	PCC	2680.00	41490	High	right	0 mm	LTE Band 41	I	Open	0153M	20	QPSK	1	0	21.0	19.87	0	0.05	1:1.58	1.110	1.297	1.440	A48
	SCC	2660.20	41292					I	Open					99									
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 11-44
NR Band n41 Phablet SAR

MEASUREMENT RESULTS																							
FREQUENCY			Side	Spacing	Mode	Antenna Config	Form Factor	Serial Number	Bandwidth [MHz]	Waveform	Modulation	RB Size	RB Offset	Maximum Allowed Power [dBm]	Conducted Power [dBm]	MPR [dB]	Power Drift [dB]	Duty Cycle	SAR (10g) (W/kg)	Scaling Factor	Reported SAR (10g) (W/kg)	Plot #
MHz	Ch.																						
2592.99	518598	Mid	front	0 mm	NR Band n41	I	Open	0140M	100	DFT-S-OFDM	QPSK	1	137	19.0	18.52	0	0.20	1:1	1.180	1.117	1.318	
2592.99	518598	Mid	front	0 mm	NR Band n41	I	Open	0140M	100	DFT-S-OFDM	QPSK	135	138	19.0	18.63	0	-0.03	1:1	1.310	1.089	1.427	
2592.99	518598	Mid	right	0 mm	NR Band n41	I	Open	0140M	100	DFT-S-OFDM	QPSK	1	137	19.0	18.52	0	-0.08	1:1	1.610	1.117	1.798	
2592.99	518598	Mid	right	0 mm	NR Band n41	I	Open	0140M	100	DFT-S-OFDM	QPSK	135	138	19.0	18.63	0	-0.01	1:1	1.510	1.089	1.644	
2592.99	518598	Mid	right	0 mm	NR Band n41	I	Open	0140M	100	DFT-S-OFDM	QPSK	270	0	19.0	18.41	0	0.08	1:1	1.640	1.146	1.879	A49
2592.99	518598	Mid	right	0 mm	NR Band n41	I	Open	0140M	100	CP-OFDM	QPSK	1	1	19.0	18.03	0	0.04	1:1	1.600	1.250	2.000	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Phablet 4.0 W/kg (mW/g) averaged over 10 grams									

Table 11-45
WLAN MIMO Phablet SAR

MEASUREMENT RESULTS																							
FREQUENCY		Side	Spacing	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Bandwidth [MHz]	Data Rate (Mbps)	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (10g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g) (W/kg)	Plot #
MHz	Ch.																						
5320	64	back	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.88	16.0	15.61	-0.05	100.00	98.11	0.349	1.094	1.019	0.389	
5320	64	front	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.88	16.0	15.61	0.05	100.00	98.11	0.307	1.094	1.019	0.342	
5320	64	top	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.88	16.0	15.61	0.01	100.00	98.11	0.206	1.094	1.019	0.230	
5320	64	right	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.88	16.0	15.61	0.00	100.00	98.11	0.134	1.094	1.019	0.149	
5320	64	left	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.88	16.0	15.61	-0.04	100.00	98.11	0.644	1.094	1.019	0.718	A50
5500	100	back	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.54	16.0	15.68	-0.16	100.00	98.11	0.264	1.112	1.019	0.299	
5500	100	front	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.54	16.0	15.68	-0.01	100.00	98.11	0.227	1.112	1.019	0.257	
5500	100	top	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.54	16.0	15.68	0.04	100.00	98.11	0.161	1.112	1.019	0.182	
5500	100	right	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.54	16.0	15.68	-0.01	100.00	98.11	0.106	1.112	1.019	0.120	
5500	100	left	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.54	16.0	15.68	0.11	100.00	98.11	0.444	1.112	1.019	0.503	
5785	157	back	0 mm	802.11n	OFDM	MIMO	Open	0865M	20	13	16.0	15.89	16.0	15.83	-0.01	100.00	98.11	0.386	1.040	1.019	0.409	
5785	157	front	0 mm	802.11n	OFDM	MIMO	Open	0865M	20	13	16.0	15.89	16.0	15.83	-0.04	100.00	98.11	0.409	1.040	1.019	0.433	
5785	157	top	0 mm	802.11n	OFDM	MIMO	Open	0865M	20	13	16.0	15.89	16.0	15.83	-0.09	100.00	98.11	0.127	1.040	1.019	0.135	
5785	157	right	0 mm	802.11n	OFDM	MIMO	Open	0865M	20	13	16.0	15.89	16.0	15.83	-0.08	100.00	98.11	0.093	1.040	1.019	0.099	
5785	157	left	0 mm	802.11n	OFDM	MIMO	Open	0865M	20	13	16.0	15.89	16.0	15.83	-0.02	100.00	98.11	0.551	1.040	1.019	0.584	
5845	169	back	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.58	16.0	15.69	0.00	100.00	98.11	0.223	1.102	1.019	0.250	
5845	169	front	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.58	16.0	15.69	-0.09	100.00	98.11	0.235	1.102	1.019	0.264	
5845	169	top	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.58	16.0	15.69	0.07	100.00	98.11	0.095	1.102	1.019	0.107	
5845	169	right	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.58	16.0	15.69	-0.05	100.00	98.11	0.080	1.102	1.019	0.090	
5845	169	left	0 mm	802.11n	OFDM	MIMO	Open	0881M	20	13	16.0	15.58	16.0	15.69	0.06	100.00	98.11	0.498	1.102	1.019	0.559	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Phablet 4.0 W/kg (mW/g) averaged over 10 grams								

Note: To achieve the 19.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 16 dBm.

Table 11-46
DSS Phablet SAR

MEASUREMENT RESULTS																			
FREQUENCY		Side	Test Position	Mode	Service	Antenna Config.	Form Factor	Device Serial Number	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift	Maximum Duty Cycle (%)	Duty Cycle (%)	SAR (10g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.														(W/kg)			(W/kg)	
2441	39	back	0 mm	Bluetooth	FHSS	2	Open	0865M	1	17.0	16.74	0.01	78.00	76.90	0.255	1.062	1.014	0.275	
2402	0	front	0 mm	Bluetooth LE	DSSS	2	Open	0865M	1	18.5	18.29	-0.03	87.00	85.05	0.021	1.050	1.023	0.023	
2441	39	front	0 mm	Bluetooth	FHSS	2	Open	0865M	1	17.0	16.74	0.06	78.00	76.90	0.406	1.062	1.014	**0.437**	A51
2441	39	top	0 mm	Bluetooth	FHSS	2	Open	0865M	1	17.0	16.74	0.01	78.00	76.90	0.347	1.062	1.014	0.374	
2441	39	right	0 mm	Bluetooth	FHSS	2	Open	0865M	1	17.0	16.74	0.04	78.00	76.90	0.097	1.062	1.014	0.104	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Phablet 4.0 W/kg (mW/g) averaged over 10 grams							

Note: 1) Light green entries indicate an additional check on the worst case exposure condition for BT LE that is not fully evaluated.

Table 11-47
DSS Phablet SAR

MEASUREMENT RESULTS										
FREQUENCY		Side	Test Position	Mode	Type	Form Factor	Device Serial Number	Power Drift	SAR (10g)	Plot #
MHz	Ch.								(W/kg)	
13.56	N/A	back	0 mm	NFC	B	Open	0880M	0.06	0.009	A52
13.56	N/A	front	0 mm	NFC	B	Open	0880M	0.03	0.000	
13.56	N/A	bottom	0 mm	NFC	B	Open	0880M	0.05	0.000	
13.56	N/A	right	0 mm	NFC	B	Open	0880M	0.01	0.000	
13.56	N/A	left	0 mm	NFC	B	Open	0880M	0.20	0.000	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Phablet 4.0 W/kg (mW/g) averaged over 10 grams		

11.5 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D04v01.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D04v01.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.

7. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.
8. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 12 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).
10. Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" when it is in open configuration 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.
11. Additional SAR tests for phablet SAR were evaluated per KDB 616217 Section 6 (See Section 6.9 for more information).
12. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the 1g thresholds for the equivalent test cases.
13. This device uses Qualcomm Smart Transmit for WWAN/WLAN/BT operations to control and manage transmitting power in real time to ensure RF Exposure compliance. Per FCC Guidance, compliance for was assessed at the minimum of the time averaged power and the maximum output power for each band/mode/exposure condition (DSI).
14. This device has an open and closed configuration. When closed, 1g SAR test are required for back side at a test separation distance of 15mm for body-worn, and on all surfaces and edges with an antenna <=25 mm from that surface or edge at a test separation distance 5mm for hotspot.

GSM Test Notes:

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

UMTS Notes:

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

LTE Notes:

1. LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r04. The general test procedures used for testing can be found in Section 8.5.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 and MCC=001 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
4. Per FCC KDB Publication 447498 D04v01, when the reported 1g SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for LTE B41/48, testing at the other channels was required for such test configurations.
5. TDD LTE was tested per the guidance provided in FCC KDB Publication 941225 D05v02r04. Testing was performed using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.
6. Per KDB Publication 941225 D05Av01r02, SAR for downlink only LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.
7. For LTE Band 41, per FCC guidance, SAR was first measured with only a single carrier active in the uplink (carrier aggregation not active). For each exposure condition, the uplink CA scenario with two component carriers was additionally tested for the configuration with the highest SAR when carrier aggregation was not active. The SCC was configured with the closest available contiguous channel. The two component carriers were configured so the resource blocks are physically allocated side by side to achieve the maximum output power.

NR Notes:

1. NR implementation supports NSA mode 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.
2. Due to test setup limitations, SAR testing for NR TDD was performed using test mode software to establish the connection.
3. Simultaneous transmission analysis for EN-DC operations is addressed in the Part 2 Test Report (Serial Number can be found in the bibliography).

4. 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 D04v01, when the reported NR Band n41 SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for 1g evaluations and > 1.5 W/kg for 10g evaluation, testing at the other channels was required for such test configurations.
7. For final implementation, NR Band n41 slot configuration is synchronized using maximum duty cycle of 100%. SAR testing was performed using FTM mode with a 100% duty cycle applied to match final duty cycle.

WLAN Notes:

1. For held-to-ear, 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 operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg for 1g evaluations. See Section 8.6.6 for more information.
4. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D04v01 by either evaluating the sum of the 1g SAR values of each antenna transmitting independently or making a SAR measurement with both antennas transmitting simultaneously. Please see Multi-Tx and Antenna SAR Consideration Appendix for complete analysis.
5. When the maximum reported 1g averaged SAR is ≤0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg for 1g evaluations or all test channels were measured.
6. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated EMC test reports.
7. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

Bluetooth Notes

1. Bluetooth SAR was measured with the device connected to a call box with hopping disabled with DH5 operation and Tx Tests test mode type. Per October 2016 TCB Workshop Notes, the reported SAR was scaled to the 78% transmission duty factor for Bluetooth and 86% transmission duty factor for Bluetooth LE to determine compliance. See Section 9 for the time domain plot and calculation for the duty factor of the device.
2. Head and Hotspot Bluetooth SAR were evaluated for BT BDR tethering applications.
3. The highest frame average power configurations for both Bluetooth and Bluetooth LE were evaluated for SAR. The worst case configuration was used for the remaining test positions as the most conservative scenario.

12 SAR MEASUREMENT VARIABILITY

12.1 Measurement Variability

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

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

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

Table 12-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS															
Band	FREQUENCY		Mode	Service	Side	Spacing	Antenna Config	Form Factor	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.							(W/kg)	(W/kg)		(W/kg)		(W/kg)	
835	836.50	167300	NR Band n5, 20 MHz Bandwidth	DFT-S-OFDM, QPSK, 1 RB, 1 RB Offset	back	5 mm	A	Closed	0.836	0.815	1.03	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					Body 1.6 W/kg (mW/g) averaged over 1 gram										

12.2 Measurement Uncertainty

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

13 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E4404B	Spectrum Analyzer	N/A	N/A	N/A	MY45113242
Agilent	E4438C	ESG Vector Signal Generator	1/18/2023	Annual	1/18/2024	MY47270002
Agilent	E4438C	ESG Vector Signal Generator	4/25/2023	Annual	4/25/2024	US41460739
Agilent	N5182A	MXG Vector Signal Generator	11/30/2022	Annual	11/30/2023	MY47420603
Agilent	N5182A	MXG Vector Signal Generator	7/4/2022	Annual	7/4/2023	MY48180366
Agilent	8753ES	S-Parameter Vector Network Analyzer	1/12/2023	Annual	1/12/2024	MY40001472
Agilent	8753ES	S-Parameter Vector Network Analyzer	6/2/2023	Annual	6/2/2024	MY40003841
Agilent	E5515C	Wireless Communications Test Set	1/12/2023	Annual	1/12/2024	MY50262130
Agilent	E5515C	Wireless Communications Test Set	4/24/2019	Triennial	CBT	GB46310798
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433972
Amplifier Research	15S1G6	Amplifier	7/4/2022	Annual	7/4/2023	433971
Amplifier Research	150A100C	Amplifier	CBT	N/A	CBT	350132
Anritsu	ML2496A	Power Meter	8/16/2022	Annual	8/16/2023	1351001
Anritsu	ML2496A	Power Meter	6/15/2023	Annual	6/15/2024	1138001
Anritsu	MA2411B	Pulse Power Sensor	1/10/2023	Annual	1/10/2024	1315051
Anritsu	MA2411B	Pulse Power Sensor	10/21/2022	Annual	10/21/2023	1207364
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	1/10/2023	Annual	1/10/2024	6201524637
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	11/28/2022	Annual	11/28/2023	6262150047
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	6/27/2022	Annual	6/27/2023	6261895213
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	3/31/2023	Annual	3/31/2024	6201381794
Anritsu	MT8000A	Radio Communication Test Station	6/15/2023	Annual	6/15/2024	6261914237
Anritsu	MT8000A	Radio Communication Test Station	3/1/2023	Annual	3/1/2024	6272337419
Anritsu	MT8000A	Radio Communication Test Station	2/9/2023	Annual	2/9/2024	6272337408
Anritsu	MA24106A	USB Power Sensor	2/9/2023	Annual	2/9/2024	1520505
Anritsu	MA24106A	USB Power Sensor	1/13/2023	Annual	1/13/2024	1344557
Mini-Circuits	PWR-4GHS	USB Power Sensor	11/11/2022	Annual	11/11/2023	11710030062
Control Company	4352	Long Stem Thermometer	9/10/2021	Biennial	9/10/2023	210774678
Control Company	4352	Long Stem Thermometer	9/10/2021	Biennial	9/10/2023	210774685
Control Company	4352	Long Stem Thermometer	9/10/2021	Biennial	9/10/2023	210774675
Control Company	4040	Therm./ Clock/ Humidity Monitor	1/17/2023	Annual	1/17/2024	160574418
Mitutoyo	500-196-30	CD-6"ASX 6Inch Digital Caliper	2/16/2022	Triennial	2/16/2025	A20238413
Keysight Technologies	N6705B	DC Power Analyzer	5/5/2021	Triennial	5/5/2024	MY53004059
Keysight Technologies	N9020A	MXA Signal Analyzer	3/15/2023	Annual	3/15/2024	US46470561
Keysight Technologies	N9020A	MXA Signal Analyzer	4/6/2023	Annual	4/6/2024	MY48010233
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
Mini-Circuits	VLF-6000+	Low Pass Filter DC to 6000 MHz	7/5/2022	Annual	7/5/2023	31634
Mini-Circuits	VLF-6000+	Low Pass Filter DC to 6000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mini-Circuits	ZUDC10-83-S+	Directional Coupler	CBT	N/A	CBT	2050
Mini-Circuits	ZUDC10-83-S+	Directional Coupler	7/4/2022	Annual	7/4/2023	2111
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Seekonk	TSF-100	Torque Wrench	7/11/2022	Annual	7/11/2023	47639-29
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	3/8/2023	Annual	3/8/2024	128635
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	1/12/2023	Annual	1/12/2024	150117
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	2/17/2023	Annual	2/17/2024	164948
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	9/6/2022	Annual	9/6/2023	167286
SPEAG	DAK-3.5	Dielectric Assessment Kit	12/15/2022	Annual	12/15/2023	1278
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	8/15/2022	Annual	8/15/2023	1041
SPEAG	DAK-12	Dielectric Assessment Kit (10MHz - 3GHz)	11/16/2021	Annual	11/16/2022	1121
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1379
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1237
SPEAG	CLA-13	Confined Loop Antenna	9/13/2022	Annual	9/13/2023	1002
SPEAG	D750V3	750 MHz SAR Dipole	5/11/2023	Annual	5/11/2024	1003
SPEAG	D835V2	835 MHz SAR Dipole	4/13/2023	Annual	4/13/2024	4d119
SPEAG	D835V2	835 MHz SAR Dipole	1/21/2021	Triennial	1/21/2024	4d132
SPEAG	D1750V2	1750 MHz SAR Dipole	10/22/2021	Biennial	10/22/2023	1150
SPEAG	D1750V2	1750 MHz SAR Dipole	1/18/2022	Biennial	1/18/2024	1148
SPEAG	D1900V2	1900 MHz SAR Dipole	9/21/2021	Biennial	9/21/2023	5d149
SPEAG	D1900V2	1900 MHz SAR Dipole	2/21/2022	Biennial	2/21/2024	5d148
SPEAG	D1900V2	1900 MHz SAR Dipole	8/8/2022	Annual	8/8/2023	5d080
SPEAG	D2450V2	2450 MHz SAR Dipole	11/25/2021	Biennial	11/25/2023	981
SPEAG	D2450V2	2450 MHz SAR Dipole	5/11/2023	Annual	5/11/2024	945
SPEAG	D2450V2	2450 MHz SAR Dipole	2/13/2023	Annual	2/13/2024	882
SPEAG	D2600V2	2600 MHz SAR Dipole	11/15/2022	Annual	11/15/2023	1071
SPEAG	D2600V2	2600 MHz SAR Dipole	8/18/2022	Annual	8/18/2023	1126
SPEAG	D5GHzV2	5 GHz SAR Dipole	2/15/2023	Annual	2/15/2024	1120
SPEAG	D5GHzV2	5 GHz SAR Dipole	4/17/2023	Annual	4/17/2024	1237
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/15/2023	Annual	2/15/2024	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/16/2023	Annual	3/16/2024	1652
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/16/2023	Annual	2/16/2024	1645
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/18/2023	Annual	1/18/2024	1530
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/11/2023	Annual	5/11/2024	728
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/18/2022	Annual	7/18/2023	1583
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/10/2022	Annual	11/10/2023	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/15/2023	Annual	6/15/2024	1334
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/17/2023	Annual	1/17/2024	1558
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/20/2023	Annual	1/20/2024	1466
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/17/2022	Annual	10/17/2023	1322
SPEAG	EX3DV4	SAR Probe	2/8/2023	Annual	2/8/2024	7417
SPEAG	EX3DV4	SAR Probe	3/16/2023	Annual	3/16/2024	7637
SPEAG	EX3DV4	SAR Probe	2/10/2023	Annual	2/10/2024	7640
SPEAG	EX3DV4	SAR Probe	1/17/2023	Annual	1/17/2024	7713
SPEAG	EX3DV4	SAR Probe	6/14/2023	Annual	6/14/2024	7661
SPEAG	EX3DV4	SAR Probe	7/19/2022	Annual	7/19/2023	7410
SPEAG	EX3DV4	SAR Probe	11/11/2022	Annual	11/11/2023	7551
SPEAG	EX3DV4	SAR Probe	6/15/2023	Annual	6/15/2024	7409
SPEAG	EX3DV4	SAR Probe	1/11/2023	Annual	1/11/2024	7570
SPEAG	EX3DV4	SAR Probe	1/12/2023	Annual	1/12/2024	7565
SPEAG	EX3DV4	SAR Probe	10/19/2022	Annual	10/19/2023	7547

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

14 MEASUREMENT UNCERTAINTIES

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

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

15 CONCLUSION

15.1 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]

16 REFERENCES

[1] Federal Communications Commission, ET Docket 93-62, Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation, Aug. 1996.

[2] ANSI/IEEE C95.1-2005, American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 3kHz to 300GHz, New York: IEEE, 2006.

[3] ANSI/IEEE C95.1-1992, American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 3kHz to 300GHz, New York: IEEE, Sept. 1992.

[4] ANSI/IEEE C95.3-2002, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave, New York: IEEE, December 2002.

[5] IEEE Standards Coordinating Committee 39 –Standards Coordinating Committee 34 – IEEE Std. 1528-2013, IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.

[6] NCRP, National Council on Radiation Protection and Measurements, Biological Effects and Exposure Criteria for RadioFrequency Electromagnetic Fields, NCRP Report No. 86, 1986. Reprinted Feb. 1995.

[7] T. Schmid, O. Egger, N. Kuster, Automated E-field scanning system for dosimetric assessments, IEEE Transaction on Microwave Theory and Techniques, vol. 44, Jan. 1996, pp. 105-113.

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

[9] K. Pokovic, T. Schmid, and N. Kuster, E-field Probe with improved isotropy in brain simulating liquids, Proceedings of the ELMAR, Zadar, Croatia, June 23-25, 1996, pp. 172-175.

[10] Schmid & Partner Engineering AG, Application Note: Data Storage and Evaluation, June 1998, p2.

[11] V. Hombach, K. Meier, M. Burkhardt, E. Kuhn, N. Kuster, The Dependence of EM Energy Absorption upon Human Modeling at 900 MHz, IEEE Transaction on Microwave Theory and Techniques, vol. 44 no. 10, Oct. 1996, pp. 1865-1873.

[12] N. Kuster and Q. Balzano, Energy absorption mechanism by biological bodies in the near field of dipole antennas above 300MHz, IEEE Transaction on Vehicular Technology, vol. 41, no. 1, Feb. 1992, pp. 17-23.

[13] G. Hartsgrove, A. Kraszewski, A. Surowiec, Simulated Biological Materials for Electromagnetic Radiation Absorption Studies, University of Ottawa, Bioelectromagnetics, Canada: 1987, pp. 29-36.

[14] Q. Balzano, O. Garay, T. Manning Jr., Electromagnetic Energy Exposure of Simulated Users of Portable Cellular Telephones, IEEE Transactions on Vehicular Technology, vol. 44, no.3, Aug. 1995.

[15] W. Gander, Computermathematick, Birkhaeuser, Basel, 1992.

[16] W.H. Press, S.A. Teukolsky, W.T. Vetterling, and B.P. Flannery, Numerical Recipes in C, The Art of Scientific Computing, Second edition, Cambridge University Press, 1992.

[17] N. Kuster, R. Kastle, T. Schmid, Dosimetric evaluation of mobile communications equipment with known precision, IEEE Transaction on Communications, vol. E80-B, no. 5, May 1997, pp. 645-652.

[18] CENELEC CLC/SC111B, European Prestandard (prENV 50166-2), Human Exposure to Electromagnetic Fields High-frequency: 10kHz-300GHz, Jan. 1995.

[19] Prof. Dr. Niels Kuster, ETH, Eidgenössische Technische Hoschschule Zürich, Dosimetric Evaluation of the Cellular Phone.

[20] IEC 62209-1, Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 1: Devices used next to the ear (Frequency range of 300 MHz to 6 GHz), July 2016.

[21] Innovation, Science, Economic Development Canada RSS-102 Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) Issue 5, March 2015.

[22] Health Canada Safety Code 6 Limits of Human Exposure to Radio Frequency Electromagnetic Fields in the Frequency Range from 3 kHz – 300 GHz, 2015

[23] FCC SAR Test Procedures for 2G-3G Devices, Mobile Hotspot and UMPC Devices KDB Publications 941225, D01-D07

[24] SAR Measurement Guidance for IEEE 802.11 Transmitters, KDB Publication 248227 D01

[25] FCC SAR Considerations for Handsets with Multiple Transmitters and Antennas, KDB Publications 648474 D03-D04

[26] FCC SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers, FCC KDB Publication 616217 D04

[27] FCC SAR Measurement and Reporting Requirements for 100MHz – 6 GHz, KDB Publications 865664 D01-D02

[28] FCC General RF Exposure Guidance and SAR Procedures for Dongles, KDB Publication 447498, D01-D04

[29] Anexo à Resolução No. 533, de 10 de Septembro de 2009.

[30] IEC 62209-2, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz), Mar. 2010.