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SAR EVALUATION REPORT

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

Date of Testing:
07/09/20 - 09/03/20
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
1M2006240100-01-R1.A3L

FCC ID: **A3LSMN986JPN**

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

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model: SCG06, SC-53A

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	0.11	0.26	0.84	N/A
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	0.25	1.19	2.20
PCE	UMTS 850	826.40 - 846.60 MHz	0.20	0.31	0.68	N/A
PCE	LTE Band 12	699.7 - 715.3 MHz	0.14	0.34	0.45	N/A
PCE	LTE Band 13	779.5 - 784.5 MHz	0.14	0.26	0.45	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.14	0.41	0.84	N/A
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	< 0.1	0.47	0.72	1.88
PCE	LTE Band 41	2498.5 - 2687.5 MHz	< 0.1	0.44	1.22	2.44
DTS	2.4 GHz WLAN	2412 - 2472 MHz	0.60	0.28	0.60	N/A
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	N/A	N/A
NII	U-NII-2A	5260 - 5320 MHz	< 0.1	0.21	N/A	0.96
NII	U-NII-2C	5500 - 5720 MHz	< 0.1	0.33	N/A	0.91
NII	U-NII-3	5745 - 5825 MHz	< 0.1	0.32	0.48	N/A
DSS/DTS	Bluetooth	2402 - 2480 MHz	0.34	< 0.1	0.11	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			0.86	1.41	1.59	3.47

Note: This revised Test Report (S/N: 1M2006240100-01-R1.A3L) 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.

Randy Ortanez
President

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

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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/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 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 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
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz
MST	Data	555 Hz - 8.33 kHz

1.2 Time-Averaging Algorithm for RF Exposure Compliance

The equipment under test (EUT) contains:

a. Qualcomm® SDX55M modem supporting 2G/3G/4G WWAN technologies

Qualcomm® SDX55M modem is enabled with Qualcomm® Smart Transmit feature. This feature performs time averaging algorithm in real time to control and manage transmitting power and ensure the time-averaged RF exposure is in compliance with FCC requirements all the time. Refer to Compliance Summary document for detailed description of Qualcomm® Smart Transmit feature (report SN could be found in Section 1.11 – Bibliography).

Note that WLAN operations are not enabled with Smart Transmit.

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

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

Exposure Scenario:	Body-Worn	Phablet	Phablet	Head	Hotspot	Earjack	Maximum Tune-up Output Power*
Averaging Volume:	1g	10g	10g	1g	1g	10g	
Spacing:	15 mm	10, 6, 13	0 mm	0 mm	10 mm	0 mm	
DSI:	0	0	1	2	3	4	
Technology/Band	Plimit corresponding to 1mW/g (SAR_design_target)						Pmax
GSM/GPRS/EDGE 850 MHz	29.2		26.3	33.0	26.3	26.3	24.8
GSM/GPRS/EDGE 1900 MHz	26.9		18.9	33.3	18.9	18.9	21.8
UMTS B5	30.1		26.7	32.0	26.7	26.7	24.0
LTE FDD B12	28.7		26.8	35.8	27.5	26.8	23.0
LTE FDD B13	29.4		27.3	32.5	27.3	27.3	23.0
LTE FDD B5	27.8		24.6	32.4	24.6	24.6	23.0
LTE FDD B4	26.8		18.5	33.9	18.5	18.5	22.5
LTE TDD B41	26.6		19.8	34.2	19.8	19.8	22.0

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

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

The maximum time-averaged output power (dBm) for any 2G/3G/4G Sub6 WWAN technology, band, and DSI = minimum of "P_{limit} EFS" and "Maximum tune up output power P_{max}" + 1dB device uncertainty. SAR values in this report were scaled to this maximum time-averaged output power to determine compliance per KDB Publication 447498 D01v06.

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

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

1.3 Power Reduction for SAR

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

1.4 Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v06.

1.4.1 2G/3G/4G Maximum Output Power

GSM/GPRS/EDGE 850										
Power Level		Voice (in dBm)	Data - Burst Average GMSK (in dBm)				Data - Burst Average 8-PSK (in dBm)			
		1 TX Slot	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
Max (DSI = 0 - 4)	Max allowed power	32.5	32.5	32.0	30.0	28.0	27.0	25.5	23.5	22.5
	Nominal	31.5	31.5	31.0	29.0	27.0	26.0	24.5	22.5	21.5
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
Max (DSI = 0 or 2)	Max allowed power	30.0	30.0	29.0	26.5	25.0	25.0	23.5	22.5	21.5
	Nominal	29.0	29.0	28.0	25.5	24.0	24.0	22.5	21.5	20.5
Earjack Active (DSI = 4)	Max allowed power	29.1	29.1	26.1	24.3	23.1	25.0	23.5	22.5	21.5
	Nominal	28.1	28.1	25.1	23.3	22.1	24.0	22.5	21.5	20.5
Hotspot Mode Active (DSI = 3)	Max allowed power	N/A	29.1	26.1	24.3	23.1	25.0	23.5	22.5	21.5
	Nominal	N/A	28.1	25.1	23.3	22.1	24.0	22.5	21.5	20.5
Proximity Sensor Active (DSI = 1)	Max allowed power	29.1	29.1	26.1	24.3	23.1	25.0	23.5	22.5	21.5
	Nominal	28.1	28.1	25.1	23.3	22.1	24.0	22.5	21.5	20.5

UMTS Band 5 (850 MHz)				
Power Level		Modulated Average Output Power (in dBm)		
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6
Max (DSI = 0 - 4)	Max allowed power	25.0	23.0	23.0
	Nominal	24.0	22.0	22.0

Mode / Band		Modulated Average Output Power (in dBm)			
		Max (DSI = 0 or 2)	Earjack Active (DSI = 4)	Hotspot Mode Active (DSI = 3)	Proximity Sensor Active (DSI = 1)
LTE FDD Band 12	Max allowed power	24.0	24.0	24.0	24.0
	Nominal	23.0	23.0	23.0	23.0
LTE FDD Band 13	Max allowed power	24.0	24.0	24.0	24.0
	Nominal	23.0	23.0	23.0	23.0
LTE FDD Band 5	Max allowed power	24.0	24.0	24.0	24.0
	Nominal	23.0	23.0	23.0	23.0
LTE FDD Band 4	Max allowed power	23.5	19.5	19.5	19.5
	Nominal	22.5	18.5	18.5	18.5
LTE TDD Band 41 (PC3)	Max allowed power	25.0	22.8	22.8	22.8
	Nominal	24.0	21.8	21.8	21.8

1.4.2 2.4 GHz Maximum Bluetooth and SISO/MIMO WLAN Output Power

Mode	Band	IEEE 802.11 (in dBm)													
		SISO								MIMO					
		Antenna 1 and Antenna 2													
		b		g		n		ax (SU)		g (CDD + STBC)		n (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	18.0	17.0	18.0	17.0	18.0	17.0	18.0	17.0	21.0	20.0	21.0	20.0	18.0	17.0
						ch. 1: 16.5	15.5	ch. 1: 16.5	15.5			ch. 1: 19.5	18.5	ch. 1: 16.5	15.5
						ch. 11: 14.5	13.5	ch. 11: 14.5	13.5			ch. 11: 17.5	16.5	ch. 11: 14.5	13.5
		ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0
		ch. 13: 1.5	0.5	ch. 13: 1.5	0.5	ch. 13: 1.5	0.5	ch. 13: 4.0	3.0	ch. 13: 4.5	3.5	ch. 13: 4.5	3.5	ch. 13: 4.0	3.0

Bluetooth (in dBm)	
Max	**Nom**
16.5	15.5

Bluetooth EDR (in dBm)	
Max	**Nom**
12.0	11.0

Bluetooth LE 2Mbps (in dBm)	
Max	**Nom**
9.0	8.0

Bluetooth LE 1Mbps, 125/500Kbps (in dBm)	
Max	**Nom**
7.5	6.5

1.4.3 2.4 GHz Reduced WLAN Output Powers

The below table is applicable in the following conditions:

- RCV active
- Simultaneous conditions with 5 GHz WLAN

Mode	Band	IEEE 802.11 (in dBm)													
		SISO								MIMO					
		Antenna 1 and Antenna 2													
		b		g		n		ax (SU)		g (CDD + STBC)		n (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	16.0	15.0	16.0	15.0	16.0	15.0	16.0	15.0	19.0	18.0	19.0	18.0	18.0	17.0
														ch. 1: 16.5	15.5
						ch. 11: 14.5	13.5	ch. 11: 14.5	13.5			ch. 11: 17.5	16.5	ch. 11: 14.5	13.5
		ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0
		ch. 13: 1.5	0.5	ch. 13: 1.5	0.5	ch. 13: 1.5	0.5	ch. 13: 4.0	3.0	ch. 13: 4.5	3.5	ch. 13: 4.5	3.5	ch. 13: 4.0	3.0

The below table is applicable in the following conditions:

- RCV active during simultaneous conditions with 5 GHz WLAN

Mode	Band	IEEE 802.11 (in dBm)													
		SISO								MIMO					
		Antenna 1 and Antenna 2													
		b		g		n		ax (SU)		g (CDD + STBC)		n (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	13.0	12.0	13.0	12.0	13.0	12.0	13.0	12.0	16.0	15.0	16.0	15.0	16.0	15.0
														ch. 11: 14.5	13.5
		ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0	ch. 12: 9.0	8.0
		ch. 13: 1.5	0.5	ch. 13: 1.5	0.5	ch. 13: 1.5	0.5	ch. 13: 4.0	3.0	ch. 13: 4.5	3.5	ch. 13: 4.5	3.5	ch. 13: 4.0	3.0

1.4.4 5 GHz Maximum SISO/MIMO WLAN Output Power

Mode	Band	IEEE 802.11 (in dBm)															
		SISO								MIMO							
		Antenna 1 and Antenna 2															
		a		n		ac		ax (SU)		a (CDD + STBC)		n (CDD+STBC, SDM)		ac (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	5200 MHz	17.0	16.0	17.0	16.0	17.0	16.0	17.0	16.0	20.0	19.0	20.0	19.0	20.0	19.0	18.0 ch. 36: 17.0	17.0 16.0
	5300 MHz	17.0	16.0	17.0	16.0	17.0	16.0	17.0	16.0	20.0	19.0	20.0	19.0	20.0	19.0	18.0 ch. 64: 17.0	17.0 16.0
	5500 MHz	17.0	16.0	17.0	16.0	17.0	16.0	17.0	16.0	20.0	19.0	20.0	19.0	20.0	19.0	18.0	17.0
	5800 MHz	17.0	16.0	17.0	16.0	17.0	16.0	17.0	16.0	20.0	19.0	20.0	19.0	20.0	19.0	18.0	17.0
5 GHz WIFI (40MHz BW)	5200 MHz			16.5 ch. 38: 14.0	15.5 13.0	16.5 ch. 38: 14.0	15.5 13.0	16.5 ch. 38: 14.0	15.5 13.0			19.5 ch. 38: 17.0	18.5 16.0	19.5 ch. 38: 17.0	18.5 16.0	17.0 ch. 38: 16.0	16.0 15.0
	5300 MHz			16.5 ch. 62: 15.0	15.5 14.0	16.5 ch. 62: 15.0	15.5 14.0	16.5 ch. 62: 15.0	15.5 14.0			19.5 ch. 62: 18.0	18.5 17.0	19.5 ch. 62: 18.0	18.5 17.0	17.0 ch. 62: 15.0	16.0 14.0
	5500 MHz			16.5	15.5	16.5	15.5	16.5	15.5			19.5	18.5	19.5	18.5	17.0	16.0
	5800 MHz			16.5	15.5	16.5	15.5	16.5	15.5			19.5	18.5	19.5	18.5	17.0	16.0
5 GHz WIFI (80MHz BW)	5200 MHz					15.5	14.5	15.0	14.0					18.0	17.0	15.0	14.0
	5300 MHz					15.5	14.5	12.0	11.0					17.5	16.5	12.0	11.0
	5500 MHz					15.5	14.5	15.5	14.5					18.5	17.5	16.0	15.0
	5800 MHz					15.5	14.5	15.5	14.5					18.5	17.5	16.0	15.0

1.4.5 5 GHz Reduced WLAN Output Power

The below table is applicable in the following conditions:

- RCV active
- Simultaneous conditions with 2.4 GHz WLAN
- RCV active during simultaneous conditions with 2.4 GHz WLAN

Mode	Band	IEEE 802.11 (in dBm)															
		SISO								MIMO							
		Antenna 1 And Antenna 2															
		a		n		ac		ax (SU)		a (CDD + STBC)		n (CDD+STBC, SDM)		ac (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	5200 MHz	13.0	12.0	13.0	12.0	13.0	12.0	13.0	12.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0	15.0
	5300 MHz	13.0	12.0	13.0	12.0	13.0	12.0	13.0	12.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0	15.0
	5500 MHz	13.0	12.0	13.0	12.0	13.0	12.0	13.0	12.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0	15.0
	5800 MHz	13.0	12.0	13.0	12.0	13.0	12.0	13.0	12.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0	15.0
5 GHz WIFI (40MHz BW)	5200 MHz			13.0	12.0	13.0	12.0	13.0	12.0			16.0	15.0	16.0	15.0	16.0	15.0
	5300 MHz			13.0	12.0	13.0	12.0	13.0	12.0			16.0	15.0	16.0	15.0	16.0 ch. 62: 15.0	15.0 14.0
	5500 MHz			13.0	12.0	13.0	12.0	13.0	12.0			16.0	15.0	16.0	15.0	16.0	15.0
	5800 MHz			13.0	12.0	13.0	12.0	13.0	12.0			16.0	15.0	16.0	15.0	16.0	15.0
5 GHz WIFI (80MHz BW)	5200 MHz					13.0	12.0	13.0	12.0					16.0	15.0	15.0	14.0
	5300 MHz					13.0	12.0	12.0	11.0					16.0	15.0	12.0	11.0
	5500 MHz					13.0	12.0	13.0	12.0					16.0	15.0	16.0	15.0
	5800 MHz					13.0	12.0	13.0	12.0					16.0	15.0	16.0	15.0

1.5 DUT Antenna Locations

The overall dimensions of this device are > 9 x 5 cm. A diagram showing the location of the device antennas can be found in Appendix E. Since the diagonal dimension of this device is > 160 mm and <200 mm, it is considered a "phablet."

Table 1-1
Device Edges/Sides for SAR Testing

Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
LTE Band 12	Yes	Yes	No	Yes	Yes	Yes
LTE Band 13	Yes	Yes	No	Yes	Yes	Yes
LTE Band 5 (Cell)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 4 (AWS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 41	Yes	Yes	No	Yes	Yes	No
2.4 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
2.4 GHz WLAN Ant 2	Yes	Yes	Yes	No	No	Yes
2.4 GHz WLAN MIMO	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN Ant 2	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN MIMO	Yes	Yes	Yes	No	No	Yes
Bluetooth	Yes	Yes	Yes	No	No	Yes

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

1.6 Near Field Communications (NFC) Antenna

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

1.7 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be operating simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v06 4.3.2 procedures.

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Phablet	Notes
1	GSM voice + 2.4 GHz WI-FI	Yes	Yes	N/A	Yes	
2	GSM voice + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
3	GSM voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
4	GSM voice + 2.4 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
5	GSM voice + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
6	GSM voice + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
7	GSM voice + 2.4 GHz Bluetooth + 5 GHz WI-FI	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
8	GSM voice + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
9	GSM voice + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
10	UMTS + 2.4 GHz WI-FI	Yes	Yes	Yes	Yes	
11	UMTS + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
12	UMTS + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
13	UMTS + 2.4 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
14	UMTS + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
15	UMTS + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
16	UMTS + 2.4 GHz Bluetooth + 5 GHz WI-FI	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
17	UMTS + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
18	UMTS + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
19	LTE + 2.4 GHz WI-FI	Yes	Yes	Yes	Yes	
20	LTE + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
21	LTE + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
22	LTE + 2.4 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
23	LTE + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
24	LTE + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
25	LTE + 2.4 GHz Bluetooth + 5 GHz WI-FI	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
26	LTE + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
27	LTE + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
28	GPRS/EDGE + 2.4 GHz WI-FI	N/A	N/A	Yes	Yes	
29	GPRS/EDGE + 5 GHz WI-FI	N/A	N/A	Yes	Yes	
30	GPRS/EDGE + 2.4 GHz Bluetooth	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
31	GPRS/EDGE + 2.4 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	
32	GPRS/EDGE + 5 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	
33	GPRS/EDGE + 2.4 GHz WI-FI + 5 GHz WI-FI	N/A	N/A	Yes	Yes	
34	GPRS/EDGE + 2.4 GHz Bluetooth + 5 GHz WI-FI	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
35	GPRS/EDGE + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	
36	GPRS/EDGE + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered

1. 2.4 GHz WLAN and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
2. All licensed modes share the same antenna path and cannot transmit simultaneously.
3. 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.
4. 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.
5. 5 GHz Wireless Router is only supported for the U-NII-3 by S/W, therefore U-NII-1, U-NII-2A, and U-NII-2C were not evaluated for wireless router conditions.
6. This device supports 2x2 MIMO Tx for WLAN 802.11a/g/n/ac/ax. 802.11a/g/n/ac/ax supports CDD and STBC and 802.11n/ac/ax additionally supports SDM. Each WLAN antenna can transmit independently or together when operating with MIMO.
7. This device supports VOLTE.
8. This device supports VOWIFI.
9. This device supports Bluetooth Tethering.

1.8 Miscellaneous SAR Test Considerations

(A) WIFI/BT

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

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

This device supports IEEE 802.11ax with the following features:

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

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is greater than 160mm and less than 200mm. Phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg. Because wireless router operations are not supported for U-NII-1, U-NII-2A & U-NII-2C WLAN, phablet SAR tests were performed. Phablet SAR was not evaluated for 2.4 GHz WLAN and 2.4 GHz Bluetooth operations since wireless router 1g SAR was < 1.2 W/kg.

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

(B) Licensed Transmitter(s)

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 Appendix F.

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is greater than 160mm and less than 200mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.

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

This device supports LTE 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 supports 64QAM on the uplink and 256QAM on the downlink for LTE Operations. Conducted powers for 64QAM uplink configurations were measured per Section 5.1 of FCC KDB Publication 941225D05v02r05. SAR was not required for 64QAM since the highest maximum output power for 64QAM is ≤ ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45W/kg, per Section 5.2.4 of FCC KDB Publication 941225 D05v02r05.

1.9 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r04, D05Av01r02, D06v02r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 648474 D04v01r03 (Phablet Procedures)
- FCC KDB Publication 616217 D04v01r02 (Proximity Sensor)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)
- May 2017 TCB Workshop Notes (LTE 4x4 Downlink MIMO)
- April 2018 TCB Workshop Notes (LTE Carrier Aggregation)
- April 2019 TCB Workshop Notes (IEEE 802.11ax)

1.10 Device Serial Numbers

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

1.11 Bibliography

Report Type	Report Serial Number
RF Exposure Part 0 Test Report	1M2006240100-17-R1.A3L
RF Exposure Part 2 Test Report	1M2006240100-15-R1.A3L
RF Exposure Compliance Summary Report	1M2006240100-18.A3L

2 LTE INFORMATION

LTE Information					
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	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 4 (AWS) (1710.7 - 1754.3 MHz)				
	LTE Band 41 (2498.5 - 2687.5 MHz)				
Channel Bandwidths	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 4 (AWS): 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 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 41: 5 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 10 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 15 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 20 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
UE Category	DL UE Cat 20, UL UE Cat 13				
Modulations Supported in UL	QPSK, 16QAM, 64QAM				
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	YES				
A-MPR (Additional MPR) disabled for SAR Testing?	YES				
LTE Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations				
LTE Additional Information	This device does not support full CA features on 3GPP Release 14. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. The following LTE Release 14 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, WIFI Offloading, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

3 INTRODUCTION

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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

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

where:

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

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

4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

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

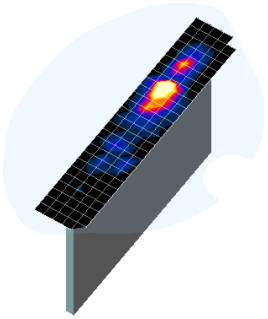


Figure 4-1
Sample SAR Area Scan

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

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

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

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

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

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

*Also compliant to IEEE 1528-2013 Table 6

5 DEFINITION OF REFERENCE POINTS

5.1 EAR REFERENCE POINT

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

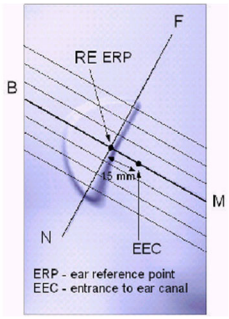


Figure 5-1
Close-Up Side view of ERP

5.2 HANDSET REFERENCE POINTS

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

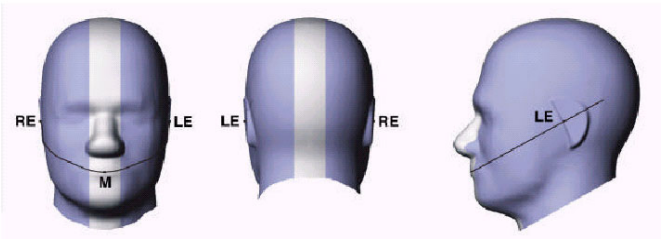


Figure 5-2
Front, back and side view of SAM Twin Phantom

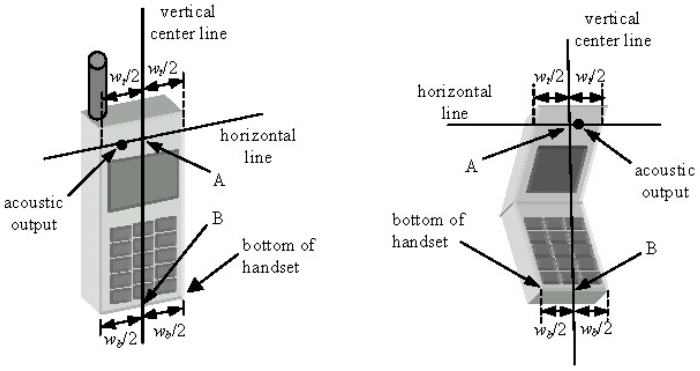


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

6 TEST CONFIGURATION POSITIONS

6.1 Device Holder

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

6.2 Positioning for Cheek

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

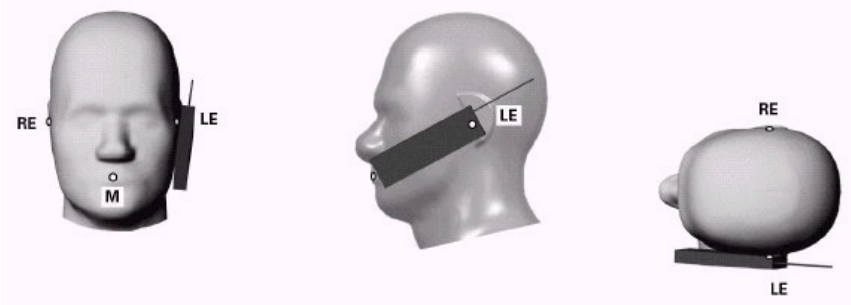


Figure 6-1 Front, Side and Top View of Cheek Position

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

6.3 Positioning for Ear / 15º Tilt

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

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

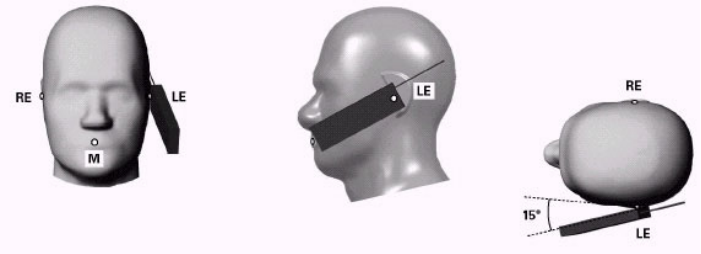


Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

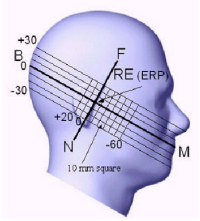


Figure 6-3
Side view w/ relevant markings

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

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

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

6.5 Body-Worn Accessory Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 6-4). Per FCC KDB Publication 648474 D04v01r03, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

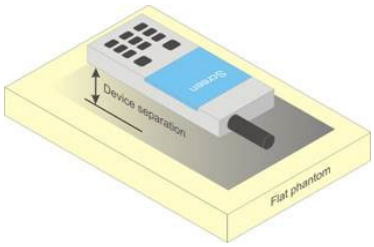


Figure 6-4
Sample Body-Worn Diagram

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

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

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

6.6 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1g body and 10g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D01v06 should be applied to determine SAR test requirements.

Per KDB Publication 447498 D01v06, Cell phones (handsets) are not normally designed to be used on extremities or operated in extremity only exposure conditions. The maximum output power levels of handsets generally do not require extremity SAR testing to show compliance. Therefore, extremity SAR was not evaluated for this device.

6.7 Wireless Router Configurations

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

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 procedures. The "Portable Hotspot" feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

6.8 Phablet Configurations

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

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

6.9 Proximity Sensor Considerations

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

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

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

7 RF EXPOSURE LIMITS

7.1 Uncontrolled Environment

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

7.2 Controlled Environment

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

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

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

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

8 FCC MEASUREMENT PROCEDURES

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

8.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v06, when SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as *reported* SAR. The highest *reported* SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

8.2 3G SAR Test Reduction Procedure

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

8.3 Procedures Used to Establish RF Signal for SAR

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

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

8.4 SAR Measurement Conditions for UMTS

8.4.1 Output Power Verification

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

8.4.2 Head SAR Measurements

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

8.4.3 Body SAR Measurements

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

8.4.4 SAR Measurements with Rel 5 HSDPA

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

8.4.5 SAR Measurements with Rel 6 HSUPA

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

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

8.5 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 D01v06 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

9.1 GSM Conducted Powers

Table 9-1
Measured P_{max}

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	31.12	31.03	30.72	**29.06**	26.91	25.59	24.65	22.52	21.01
	190	31.40	31.36	30.99	**29.23**	27.15	25.49	24.56	22.85	21.57
	251	31.32	31.37	31.18	**29.05**	27.23	25.56	24.59	22.41	21.44
GSM 1900	512	28.17	28.20	**28.14**	26.16	24.66	24.29	22.91	21.52	20.49
	661	28.38	28.40	**28.37**	26.50	24.61	24.34	22.97	21.61	20.76
	810	28.70	28.73	**28.65**	26.35	24.64	24.17	22.76	21.29	20.50

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	21.92	21.83	24.53	**24.63**	23.73	16.39	18.46	18.09	17.83
	190	22.20	22.16	24.80	**24.80**	23.97	16.29	18.37	18.42	18.39
	251	22.12	22.17	24.99	**24.62**	24.05	16.36	18.40	17.98	18.26
GSM 1900	512	18.97	19.00	**21.95**	21.73	21.48	15.09	16.72	17.09	17.31
	661	19.18	19.20	**22.18**	22.07	21.43	15.14	16.78	17.18	17.58
	810	19.50	19.53	**22.46**	21.92	21.46	14.97	16.57	16.86	17.32

GSM 850	**Frame Avg.Targets:**	22.30	22.30	24.81	**24.57**	23.82	16.80	18.31	18.07	18.32
GSM 1900		19.80	19.80	**21.81**	21.07	20.82	14.80	16.31	17.07	17.32

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

Maximum Burst-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (GMSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 1900	512	27.73	27.87	25.06	23.11	**21.48**	24.29	22.91	21.52	20.49
	661	27.71	28.01	25.22	23.26	**21.80**	24.34	22.97	21.61	20.76
	810	28.13	28.14	24.94	22.94	**21.26**	24.17	22.76	21.29	20.50

Calculated Maximum Frame-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (GMSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 1900	512	18.53	18.67	18.87	18.68	**18.30**	15.26	16.89	17.26	17.48
	661	18.51	18.81	19.03	18.83	**18.62**	15.31	16.95	17.35	17.75
	810	18.93	18.94	18.75	18.51	**18.08**	15.14	16.74	17.03	17.49
GSM 1900	**Frame Avg.Targets:**	18.90	18.90	18.91	18.87	**18.92**	14.80	16.31	17.07	17.32

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
Measured P_{max}

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	
99	WCDMA	12.2 kbps RMC	23.62	23.54	23.53	-
99		12.2 kbps AMR	23.66	23.55	23.52	-
6	HSDPA	Subtest 1	21.94	21.84	21.85	0
6		Subtest 2	21.90	21.81	21.37	0
6		Subtest 3	20.45	20.32	20.31	0.5
6		Subtest 4	20.44	20.37	20.32	0.5
6	HSUPA	Subtest 1	21.92	21.79	21.80	0
6		Subtest 2	18.96	18.83	18.84	2
6		Subtest 3	19.94	19.82	19.83	1
6		Subtest 4	18.95	18.83	18.82	2
6		Subtest 5	21.93	21.81	21.81	0

This device does not support DC-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

9.3.1 LTE Band 12

Table 9-4
LTE Band 12 Measured P_{max} for all DSI - 10 MHz Bandwidth

LTE Band 12 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23095 (707.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	22.51	0	0
	1	25	22.53		0
	1	49	**22.55**		0
	25	0	21.59	0-1	1
	25	12	**21.70**		1
	25	25	21.65		1
	50	0	21.66		1
16QAM	1	0	21.99	0-1	1
	1	25	21.97		1
	1	49	22.02		1
	25	0	20.59	0-2	2
	25	12	20.73		2
	25	25	20.69		2
	50	0	20.66		2
64QAM	1	0	20.88	0-2	2
	1	25	20.78		2
	1	49	20.84		2
	25	0	19.60	0-3	3
	25	12	19.76		3
	25	25	19.62		3
	50	0	19.67		3

Note: LTE Band 12 at 10 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

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

LTE Band 12 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23035 (701.5 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23155 (713.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.61	22.52	22.61	0	0
	1	12	22.64	22.58	22.73		0
	1	24	22.61	22.57	22.63		0
	12	0	21.74	21.70	21.71	0-1	1
	12	6	21.77	21.79	21.71		1
	12	13	21.72	21.69	21.71		1
	25	0	21.68	21.75	21.68		1
16QAM	1	0	21.77	21.91	22.01	0-1	1
	1	12	21.77	21.95	22.05		1
	1	24	21.72	21.92	21.96		1
	12	0	20.70	20.69	20.90	0-2	2
	12	6	20.76	20.76	20.87		2
	12	13	20.66	20.74	20.91		2
	25	0	20.72	20.81	20.69		2
64QAM	1	0	20.98	20.70	20.75	0-2	2
	1	12	20.93	20.80	20.79		2
	1	24	20.95	20.75	20.74		2
	12	0	19.85	19.79	19.65	0-3	3
	12	6	19.81	19.89	19.70		3
	12	13	19.78	19.78	19.65		3
	25	0	19.75	19.77	19.72		3

Table 9-6
LTE Band 12 Measured P_{max} for all DSI - 3 MHz Bandwidth

LTE Band 12 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23025 (700.5 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23165 (714.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.67	22.52	22.63	0	0
	1	7	22.58	22.66	22.56		0
	1	14	22.60	22.55	22.59		0
	8	0	21.73	21.66	21.69	0-1	1
	8	4	21.69	21.73	21.71		1
	8	7	21.71	21.69	21.70		1
	15	0	21.73	21.75	21.67		1
16QAM	1	0	21.90	22.01	22.17	0-1	1
	1	7	21.85	22.00	22.16		1
	1	14	21.84	22.00	22.13		1
	8	0	20.74	20.81	20.80	0-2	2
	8	4	20.77	20.87	20.85		2
	8	7	20.77	20.84	20.84		2
	15	0	20.70	20.84	20.77		2
64QAM	1	0	20.62	20.92	20.69	0-2	2
	1	7	20.49	20.86	20.63		2
	1	14	20.59	20.93	20.62		2
	8	0	19.82	19.69	19.77	0-3	3
	8	4	19.86	19.79	19.80		3
	8	7	19.81	19.76	19.75		3
	15	0	19.91	19.80	19.66		3

Table 9-7
LTE Band 12 Measured P_{max} for all DSI -1.4 MHz Bandwidth

LTE Band 12 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23017 (699.7 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23173 (715.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.56	22.41	22.64	0	0
	1	2	22.62	22.56	22.70		0
	1	5	22.56	22.47	22.65		0
	3	0	22.56	22.55	22.54		0
	3	2	22.63	22.63	22.62		0
	3	3	22.56	22.55	22.56		0
	6	0	21.66	21.68	21.64	0-1	1
16QAM	1	0	21.80	21.92	21.92	0-1	1
	1	2	21.89	22.00	21.98		1
	1	5	21.80	21.97	21.92		1
	3	0	21.82	21.65	21.80		1
	3	2	21.86	21.72	21.84		1
	3	3	21.83	21.65	21.81		1
	6	0	20.70	20.74	20.77	0-2	2
64QAM	1	0	20.53	20.76	21.03	0-2	2
	1	2	20.66	20.88	21.07		2
	1	5	20.50	20.84	20.97		2
	3	0	20.73	20.78	20.77		2
	3	2	20.78	20.83	20.81		2
	3	3	20.73	20.76	20.79		2
	6	0	19.71	19.75	19.58	0-3	3

9.3.2 LTE Band 13

Table 9-8
LTE Band 13 Measured P_{max} for all DSI - 10 MHz Bandwidth

LTE Band 13 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	23.11	0	0
	1	25	23.09		0
	1	49	**23.13**		0
	25	0	**22.28**	0-1	1
	25	12	22.23		1
	25	25	22.26		1
	50	0	22.13		1
16QAM	1	0	22.47	0-1	1
	1	25	22.42		1
	1	49	22.43		1
	25	0	21.28	0-2	2
	25	12	21.24		2
	25	25	21.21		2
	50	0	21.19		2
64QAM	1	0	21.37	0-2	2
	1	25	21.45		2
	1	49	21.41		2
	25	0	20.27	0-3	3
	25	12	20.29		3
	25	25	20.30		3
	50	0	20.25		3

Table 9-9
LTE Band 13 Measured P_{max} for all DSI - 5 MHz Bandwidth

LTE Band 13 5 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	23.11	0	0
	1	12	23.20		0
	1	24	23.22		0
	12	0	22.18	0-1	1
	12	6	22.28		1
	12	13	22.30		1
	25	0	22.19		1
16QAM	1	0	22.24	0-1	1
	1	12	22.35		1
	1	24	22.43		1
	12	0	21.17	0-2	2
	12	6	21.23		2
	12	13	21.25		2
	25	0	21.25		2
64QAM	1	0	21.41	0-2	2
	1	12	21.50		2
	1	24	21.48		2
	12	0	20.30	0-3	3
	12	6	20.36		3
	12	13	20.38		3
	25	0	20.27		3

Note: LTE Band 13 at 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

9.3.3 LTE Band 5 (Cell)

Table 9-10
LTE Band 5 (Cell) Measured P_{max} for all DSI - 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	**22.54**	0	0
	1	25	22.50		0
	1	49	22.49		0
	25	0	**21.61**	0-1	1
	25	12	21.60		1
	25	25	21.58		1
	50	0	21.58		1
16QAM	1	0	22.04	0-1	1
	1	25	21.97		1
	1	49	21.89		1
	25	0	20.60	0-2	2
	25	12	20.62		2
	25	25	20.55		2
	50	0	20.51		2
64QAM	1	0	20.86	0-2	2
	1	25	20.74		2
	1	49	20.78		2
	25	0	19.60	0-3	3
	25	12	19.62		3
	25	25	19.59		3
	50	0	19.57		3

Note: LTE Band 5 (Cell) at 10 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-11
LTE Band 5 (Cell) Measured P_{max} for all DSI - 5 MHz Bandwidth

LTE Band 5 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20425 (826.5 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20625 (846.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.58	22.61	22.69	0	0
	1	12	22.62	22.68	22.75		0
	1	24	22.55	22.66	22.71		0
	12	0	21.79	21.71	21.68	0-1	1
	12	6	21.81	21.75	21.72		1
	12	13	21.77	21.74	21.73		1
	25	0	21.77	21.77	21.71		1
16QAM	1	0	21.95	21.94	21.74	0-1	1
	1	12	21.91	22.09	21.85		1
	1	24	21.92	22.01	21.83		1
	12	0	20.76	20.87	20.70	0-2	2
	12	6	20.87	20.60	20.77		2
	12	13	20.82	20.91	20.74		2
	25	0	20.86	20.75	20.72		2
64QAM	1	0	20.81	20.67	21.00	0-2	2
	1	12	20.86	20.80	21.04		2
	1	24	20.78	20.78	21.06		2
	12	0	19.86	19.66	19.78	0-3	3
	12	6	19.90	19.69	19.84		3
	12	13	19.86	19.74	19.86		3
	25	0	19.78	19.78	19.79		3

Table 9-12
LTE Band 5 (Cell) Measured P_{max} for all DSI - 3 MHz Bandwidth

LTE Band 5 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20415 (825.5 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20635 (847.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.57	22.51	22.62	0	0
	1	7	22.58	22.57	22.66		0
	1	14	22.56	22.61	22.60		0
	8	0	21.78	21.68	21.67	0-1	1
	8	4	21.80	21.72	21.76		1
	8	7	21.75	21.72	21.75		1
	15	0	21.78	21.70	21.66		1
16QAM	1	0	22.06	21.78	22.17	0-1	1
	1	7	22.07	21.84	22.21		1
	1	14	22.03	21.84	22.21		1
	8	0	20.89	20.68	20.80	0-2	2
	8	4	20.88	20.81	20.86		2
	8	7	20.90	20.76	20.83		2
	15	0	20.92	20.68	20.74		2
64QAM	1	0	20.96	20.45	20.66	0-2	2
	1	7	20.88	20.50	20.71		2
	1	14	20.91	20.54	20.68		2
	8	0	19.77	19.75	19.74	0-3	3
	8	4	19.83	19.83	19.85		3
	8	7	19.77	19.77	19.80		3
	15	0	19.85	19.86	19.69		3

Table 9-13
LTE Band 5 (Cell) Measured P_{max} for all DSI -1.4 MHz Bandwidth

LTE Band 5 (Cell) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20407 (824.7 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20643 (848.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.53	22.47	22.67	0	0
	1	2	22.62	22.63	22.74		0
	1	5	22.54	22.56	22.67		0
	3	0	22.62	22.46	22.60		0
	3	2	22.69	22.57	22.65		0
	3	3	22.65	22.53	22.62		0
	6	0	21.74	21.62	21.65	0-1	1
16QAM	1	0	21.99	21.65	21.92	0-1	1
	1	2	22.03	21.77	22.04		1
	1	5	21.98	21.77	21.95		1
	3	0	21.74	21.71	21.82		1
	3	2	21.75	21.79	21.89		1
	3	3	21.70	21.78	21.86		1
	6	0	20.75	20.63	20.77	0-2	2
64QAM	1	0	20.85	20.43	21.06	0-2	2
	1	2	20.92	20.58	21.16		2
	1	5	20.83	20.48	21.04		2
	3	0	20.80	20.58	20.83		2
	3	2	20.84	20.72	20.85		2
	3	3	20.77	20.67	20.80		2
	6	0	19.77	19.65	19.60	0-3	3

9.3.4 LTE Band 4 (AWS)

Table 9-14
LTE Band 4 (AWS) Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered) - 20 MHz Bandwidth

LTE Band 4 (AWS) 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20175 (1732.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	22.21	0	0
	1	50	**22.46**		0
	1	99	22.37		0
	50	0	21.45	0-1	1
	50	25	21.61		1
	50	50	**21.63**		1
	100	0	21.51		1
16QAM	1	0	21.71	0-1	1
	1	50	22.11		1
	1	99	21.89		1
	50	0	20.74	0-2	2
	50	25	20.75		2
	50	50	20.77		2
	100	0	20.76		2
64QAM	1	0	20.70	0-2	2
	1	50	21.05		2
	1	99	20.83		2
	50	0	19.77	0-3	3
	50	25	19.89		3
	50	50	19.86		3
	100	0	19.81		3

Note: LTE Band 4 (AWS) at 20 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-15
LTE Band 4 (AWS) Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered) - 15 MHz Bandwidth

LTE Band 4 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20025 (1717.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20325 (1747.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.30	22.33	22.37	0	0
	1	36	22.50	22.50	22.48		0
	1	74	22.41	22.42	22.40		0
	36	0	21.52	21.42	21.43	0-1	1
	36	18	21.54	21.58	21.56		1
	36	37	21.55	21.61	21.60		1
	75	0	21.51	21.53	21.50		1
16QAM	1	0	21.76	21.69	21.66	0-1	1
	1	36	21.96	21.83	21.88		1
	1	74	21.88	21.73	21.81		1
	36	0	20.52	20.50	20.51	0-2	2
	36	18	20.58	20.51	20.59		2
	36	37	20.56	20.54	20.56		2
	75	0	20.53	20.55	20.56		2
64QAM	1	0	20.48	20.75	20.46	0-2	2
	1	36	20.74	20.97	20.73		2
	1	74	20.61	20.93	20.60		2
	36	0	19.56	19.58	19.63	0-3	3
	36	18	19.62	19.64	19.67		3
	36	37	19.62	19.66	19.71		3
	75	0	19.57	19.57	19.57		3

Table 9-16
LTE Band 4 (AWS) Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered) - 10 MHz Bandwidth

LTE Band 4 (AWS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20000 (1715.0 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20350 (1750.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.37	22.52	22.47	0	0
	1	25	22.61	22.73	22.72		0
	1	49	22.28	22.41	22.40		0
	25	0	21.73	21.68	21.64	0-1	1
	25	12	21.82	21.75	21.72		1
	25	25	21.71	21.70	21.66		1
	50	0	21.71	21.67	21.65		1
16QAM	1	0	21.83	21.72	21.91	0-1	1
	1	25	22.13	21.94	22.20		1
	1	49	21.86	21.65	21.87		1
	25	0	20.81	20.72	20.71	0-2	2
	25	12	20.91	20.86	20.82		2
	25	25	20.79	20.77	20.74		2
	50	0	20.77	20.69	20.67		2
64QAM	1	0	20.70	20.37	20.42	0-2	2
	1	25	21.01	20.77	20.80		2
	1	49	20.67	20.48	20.57		2
	25	0	20.05	19.81	19.72	0-3	3
	25	12	19.92	19.85	19.78		3
	25	25	19.80	19.82	19.76		3
	50	0	19.78	19.71	19.67		3

Table 9-17
LTE Band 4 (AWS) Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered) - 5 MHz Bandwidth

LTE Band 4 (AWS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 19975 (1712.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20375 (1752.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.55	22.56	22.46	0	0
	1	12	22.72	22.78	22.65		0
	1	24	22.58	22.58	22.59		0
	12	0	21.75	21.69	21.72	0-1	1
	12	6	21.76	21.67	21.82		1
	12	13	21.69	21.65	21.73		1
	25	0	21.72	21.66	21.74		1
16QAM	1	0	22.00	21.85	22.01	0-1	1
	1	12	22.04	21.99	21.55		1
	1	24	21.89	21.86	21.87		1
	12	0	20.78	20.74	20.77	0-2	2
	12	6	20.73	20.73	20.80		2
	12	13	20.71	20.71	20.71		2
	25	0	20.72	20.68	20.81		2
64QAM	1	0	20.92	20.87	20.84	0-2	2
	1	12	20.90	20.97	21.03		2
	1	24	20.83	20.72	20.91		2
	12	0	19.77	19.79	19.88	0-3	3
	12	6	19.78	19.85	19.91		3
	12	13	19.78	19.89	19.80		3
	25	0	19.73	19.76	19.76		3

Table 9-18
LTE Band 4 (AWS) Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered) - 3 MHz Bandwidth

LTE Band 4 (AWS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 19965 (1711.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20385 (1753.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.88	22.81	22.88	0	0
	1	7	22.85	22.92	22.81		0
	1	14	22.77	22.80	22.80		0
	8	0	21.96	21.87	21.91	0-1	1
	8	4	21.93	21.92	21.95		1
	8	7	21.90	21.89	21.91		1
	15	0	21.90	21.88	21.91		1
16QAM	1	0	22.21	22.00	22.16	0-1	1
	1	7	22.16	22.09	22.13		1
	1	14	22.14	21.80	22.12		1
	8	0	21.00	20.92	20.99	0-2	2
	8	4	21.03	20.87	21.01		2
	8	7	20.98	20.91	20.95		2
	15	0	20.95	20.82	20.97		2
64QAM	1	0	21.13	21.05	21.13	0-2	2
	1	7	21.05	21.10	21.04		2
	1	14	21.13	21.04	21.04		2
	8	0	19.98	19.93	20.00	0-3	3
	8	4	20.06	19.91	19.96		3
	8	7	19.94	19.91	19.93		3
	15	0	19.99	19.86	19.99		3

Table 9-19
LTE Band 4 (AWS) Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered) - 1.4 MHz Bandwidth

LTE Band 4 (AWS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 19957 (1710.7 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20393 (1754.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.88	22.70	22.71	0	0
	1	2	22.93	22.80	22.80		0
	1	5	22.78	22.71	22.73		0
	3	0	22.84	22.72	22.76		0
	3	2	22.91	22.82	22.76		0
	3	3	22.85	22.73	22.72		0
	6	0	21.91	21.84	21.79	0-1	1
16QAM	1	0	22.17	22.08	22.13	0-1	1
	1	2	22.18	22.20	22.12		1
	1	5	22.15	22.07	22.05		1
	3	0	21.87	21.83	21.84		1
	3	2	21.90	21.93	21.83		1
	3	3	21.91	21.92	21.74		1
	6	0	20.99	20.89	20.90	0-2	2
64QAM	1	0	21.06	20.95	21.06	0-2	2
	1	2	21.16	21.10	21.04		2
	1	5	21.03	20.97	20.97		2
	3	0	21.04	20.90	20.98		2
	3	2	21.08	21.04	20.97		2
	3	3	21.03	21.00	20.93		2
	6	0	19.95	19.82	19.87	0-3	3

Table 9-20
LTE Band 4 (AWS) Measured P_{limit} for DSI =1 (Phablet with grip sensor active) or DSI = 3 (Hotspot mode) and/or DSI = 4 (Earjack active) - 20 MHz Bandwidth

LTE Band 4 (AWS) 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20175 (1732.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	18.17	0	0
	1	50	**18.50**		0
	1	99	18.30		0
	50	0	18.43	0-1	0
	50	25	18.51		0
	50	50	**18.53**		0
	100	0	18.49		0
16QAM	1	0	18.70	0-1	0
	1	50	18.80		0
	1	99	18.61		0
	50	0	18.50	0-2	0
	50	25	18.56		0
	50	50	18.56		0
	100	0	18.47		0
64QAM	1	0	18.75	0-2	0
	1	50	18.94		0
	1	99	18.78		0
	50	0	18.53	0-3	0
	50	25	18.60		0
	50	50	18.59		0
	100	0	18.52		0

Note: LTE Band 4 (AWS) at 20 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-21
LTE Band 4 (AWS) Measured P_{limit} for DSI =1 (Phablet with grip sensor active) or DSI = 3 (Hotspot mode) and/or DSI = 4 (Earjack active) - 15 MHz Bandwidth

LTE Band 4 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20025 (1717.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20325 (1747.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.64	18.48	18.33	0	0
	1	36	18.79	18.51	18.47		0
	1	74	18.59	18.37	18.32		0
	36	0	18.57	18.54	18.51	0-1	0
	36	18	18.65	18.58	18.56		0
	36	37	18.50	18.49	18.50		0
	75	0	18.47	18.53	18.49		0
16QAM	1	0	18.59	18.92	18.63	0-1	0
	1	36	18.83	18.99	18.73		0
	1	74	18.54	18.89	18.58		0
	36	0	18.59	18.59	18.51	0-2	0
	36	18	18.67	18.65	18.57		0
	36	37	18.53	18.52	18.52		0
	75	0	18.51	18.55	18.48		0
64QAM	1	0	18.70	18.66	18.45	0-2	0
	1	36	18.87	18.76	18.56		0
	1	74	18.60	18.60	18.35		0
	36	0	18.64	18.61	18.55	0-3	0
	36	18	18.69	18.64	18.63		0
	36	37	18.58	18.53	18.57		0
	75	0	18.54	18.59	18.55		0

Table 9-22
LTE Band 4 (AWS) Measured P_{limit} for DSI =1 (Phablet with grip sensor active) or DSI = 3 (Hotspot mode) and/or DSI = 4 (Earjack active) - 10 MHz Bandwidth

LTE Band 4 (AWS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20000 (1715.0 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20350 (1750.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.53	18.29	18.24	0	0
	1	25	18.77	18.50	18.47		0
	1	49	18.45	18.23	18.21		0
	25	0	18.61	18.53	18.50	0-1	0
	25	12	18.62	18.54	18.58		0
	25	25	18.46	18.42	18.43		0
	50	0	18.54	18.52	18.48		0
16QAM	1	0	18.85	18.79	18.63	0-1	0
	1	25	18.71	18.87	18.91		0
	1	49	18.74	18.76	18.53		0
	25	0	18.63	18.59	18.60	0-2	0
	25	12	18.66	18.60	18.63		0
	25	25	18.54	18.45	18.53		0
	50	0	18.55	18.56	18.51		0
64QAM	1	0	18.61	18.50	18.36	0-2	0
	1	25	18.94	18.80	18.63		0
	1	49	18.53	18.45	18.37		0
	25	0	18.56	18.57	18.53	0-3	0
	25	12	18.59	18.56	18.63		0
	25	25	18.45	18.44	18.47		0
	50	0	18.48	18.51	18.49		0

Table 9-23
LTE Band 4 (AWS) Measured P_{limit} for DSI =1 (Phablet with grip sensor active) or DSI = 3 (Hotspot mode) and/or DSI = 4 (Earjack active) - 5 MHz Bandwidth

LTE Band 4 (AWS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 19975 (1712.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20375 (1752.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.76	18.45	18.34	0	0
	1	12	18.88	18.51	18.37		0
	1	24	18.79	18.31	18.28		0
	12	0	18.68	18.56	18.51	0-1	0
	12	6	18.69	18.55	18.60		0
	12	13	18.64	18.47	18.55		0
	25	0	18.65	18.54	18.51		0
16QAM	1	0	18.83	18.88	18.71	0-1	0
	1	12	18.88	18.88	18.70		0
	1	24	18.78	18.71	18.95		0
	12	0	18.70	18.67	18.67	0-2	0
	12	6	18.75	18.62	18.68		0
	12	13	18.70	18.56	18.58		0
	25	0	18.65	18.58	18.49		0
64QAM	1	0	19.00	18.81	18.46	0-2	0
	1	12	18.82	18.85	18.54		0
	1	24	18.95	18.70	18.40		0
	12	0	18.72	18.66	18.65	0-3	0
	12	6	18.72	18.64	18.67		0
	12	13	18.68	18.52	18.60		0
	25	0	18.58	18.58	18.55		0

Table 9-24
LTE Band 4 (AWS) Measured P_{limit} for DSI =1 (Phablet with grip sensor active) or DSI = 3 (Hotspot mode) and/or DSI = 4 (Earjack active) - 3 MHz Bandwidth

LTE Band 4 (AWS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 19965 (1711.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20385 (1753.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.82	18.53	18.49	0	0
	1	7	18.86	18.53	18.40		0
	1	14	18.84	18.40	18.43		0
	8	0	18.93	18.59	18.58	0-1	0
	8	4	18.97	18.63	18.60		0
	8	7	18.94	18.48	18.55		0
	15	0	18.95	18.53	18.57		0
16QAM	1	0	18.94	18.87	18.83	0-1	0
	1	7	18.87	18.75	18.75		0
	1	14	18.88	18.75	18.77		0
	8	0	18.81	18.63	18.59	0-2	0
	8	4	18.81	18.69	18.59		0
	8	7	18.77	18.54	18.55		0
	15	0	18.69	18.49	18.57		0
64QAM	1	0	18.74	18.76	18.89	0-2	0
	1	7	18.69	18.78	18.82		0
	1	14	18.68	18.64	18.81		0
	8	0	18.71	18.57	18.66	0-3	0
	8	4	18.72	18.53	18.66		0
	8	7	18.68	18.45	18.60		0
	15	0	18.73	18.59	18.52		0

Table 9-25
LTE Band 4 (AWS) Measured P_{limit} for DSI =1 (Phablet with grip sensor active) or DSI = 3 (Hotspot mode) and/or DSI = 4 (Earjack active) - 1.4 MHz Bandwidth

LTE Band 4 (AWS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 19957 (1710.7 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20393 (1754.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.72	18.47	18.32	0	0
	1	2	18.76	18.52	18.38		0
	1	5	18.69	18.45	18.30		0
	3	0	18.74	18.37	18.37		0
	3	2	18.78	18.40	18.42		0
	3	3	18.72	18.36	18.37		0
	6	0	18.85	18.49	18.49	0-1	0
16QAM	1	0	18.97	18.77	18.68	0-1	0
	1	2	18.82	18.83	18.77		0
	1	5	18.93	18.77	18.67		0
	3	0	18.63	18.71	18.53		0
	3	2	18.67	18.72	18.57		0
	3	3	18.62	18.68	18.49		0
	6	0	18.70	18.59	18.39	0-2	0
64QAM	1	0	18.93	18.70	18.80	0-2	0
	1	2	18.97	18.78	18.86		0
	1	5	18.92	18.71	18.77		0
	3	0	18.72	18.59	18.51		0
	3	2	18.77	18.62	18.54		0
	3	3	18.71	18.60	18.48		0
	6	0	18.47	18.62	18.34	0-3	0

9.3.5 LTE Band 41

Table 9-26
LTE Band 41 Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered) - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	23.98	23.85	23.46	23.61	23.51	0	0
	1	50	23.98	23.84	23.74	23.86	23.84		0
	1	99	**23.99**	23.84	23.50	23.42	23.74		0
	50	0	**23.11**	22.98	22.80	22.89	22.80	0-1	1
	50	25	23.07	22.99	22.93	23.00	22.97		1
	50	50	23.03	22.87	22.85	22.84	22.95		1
	100	0	23.01	22.90	22.82	22.92	22.90		1
16QAM	1	0	23.09	22.99	22.51	22.65	22.56	0-1	1
	1	50	23.02	22.92	22.81	22.88	22.93		1
	1	99	23.08	22.86	22.53	22.45	22.73		1
	50	0	22.14	21.98	21.83	21.88	21.81	0-2	2
	50	25	22.08	22.02	21.91	22.01	22.02		2
	50	50	22.07	21.91	21.88	21.87	21.97		2
	100	0	22.01	21.95	21.86	21.95	21.94		2
64QAM	1	0	21.75	21.65	21.21	21.32	21.22	0-2	2
	1	50	21.77	21.62	21.53	21.63	21.64		2
	1	99	21.75	21.53	21.24	21.18	21.48		2
	50	0	21.18	21.03	20.89	20.96	20.84	0-3	3
	50	25	21.14	21.05	20.97	21.06	21.07		3
	50	50	21.11	20.94	20.93	20.92	21.03		3
	100	0	21.01	20.90	20.85	20.94	20.94		3

Table 9-27
LTE Band 41 Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered) - 15 MHz Bandwidth

LTE Band 41 15 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	24.16	23.89	23.71	23.85	23.71	0	0
	1	36	24.14	24.05	23.81	23.90	23.96		0
	1	74	24.11	23.83	23.67	23.63	23.87		0
	36	0	23.20	23.13	22.92	22.96	22.90	0-1	1
	36	18	23.23	23.18	22.95	22.99	23.00		1
	36	37	23.21	23.09	22.93	22.95	23.01		1
	75	0	23.18	23.14	22.92	23.02	23.04		1
16QAM	1	0	23.22	23.08	22.86	23.01	22.84	0-1	1
	1	36	23.21	23.22	22.97	23.07	23.05		1
	1	74	23.29	23.00	22.85	22.81	22.95		1
	36	0	22.16	22.13	21.89	21.92	21.87	0-2	2
	36	18	22.18	22.16	21.95	21.95	21.95		2
	36	37	22.20	22.07	21.91	21.96	21.95		2
	75	0	22.19	22.16	21.96	22.04	22.07		2
64QAM	1	0	21.89	21.68	21.46	21.52	21.41	0-2	2
	1	36	21.90	21.89	21.58	21.68	21.66		2
	1	74	21.92	21.62	21.48	21.38	21.56		2
	36	0	21.18	21.19	20.92	20.98	20.94	0-3	3
	36	18	21.22	21.24	20.99	21.02	21.03		3
	36	37	21.20	21.15	20.92	20.98	21.07		3
	75	0	21.20	21.16	20.97	21.05	21.09		3

Table 9-28
LTE Band 41 Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered) - 10 MHz Bandwidth

LTE Band 41 10 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	24.17	23.91	23.73	23.73	23.84	0	0
	1	25	24.14	24.14	23.88	23.92	24.04		0
	1	49	24.20	23.93	23.66	23.68	23.71		0
	25	0	23.24	23.23	22.99	22.91	22.93	0-1	1
	25	12	23.28	23.27	23.07	23.08	23.10		1
	25	25	23.24	23.13	22.92	22.97	22.99		1
	50	0	23.20	23.20	22.97	23.02	23.01		1
16QAM	1	0	23.26	23.07	22.83	22.91	22.90	0-1	1
	1	25	23.25	23.28	23.02	23.08	23.13		1
	1	49	23.28	23.00	22.75	22.78	22.85		1
	25	0	22.25	22.21	21.95	21.95	21.94	0-2	2
	25	12	22.30	22.31	22.04	22.10	22.11		2
	25	25	22.24	22.19	21.91	21.96	21.99		2
	50	0	22.24	22.26	22.02	22.04	22.13		2
64QAM	1	0	21.85	21.53	21.36	21.30	21.36	0-2	2
	1	25	21.86	21.88	21.63	21.66	21.67		2
	1	49	21.86	21.60	21.18	21.30	21.33		2
	25	0	21.32	21.30	21.06	21.00	21.02	0-3	3
	25	12	21.34	21.38	21.13	21.18	21.23		3
	25	25	21.33	21.25	21.03	21.02	21.04		3
	50	0	21.23	21.25	20.94	21.06	21.04		3

Table 9-29
LTE Band 41 Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered) - 5 MHz Bandwidth

LTE Band 41 5 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	24.11	24.15	23.90	23.83	23.88	0	0
	1	12	24.06	24.12	23.87	23.88	23.95		0
	1	24	24.13	24.09	23.83	23.87	23.89		0
	12	0	23.26	23.24	22.99	22.99	22.99	0-1	1
	12	6	23.26	23.28	23.04	23.08	23.07		1
	12	13	23.27	23.24	23.02	23.07	23.05		1
	25	0	23.22	23.24	23.00	23.02	23.06		1
16QAM	1	0	23.28	23.34	22.80	22.80	22.83	0-1	1
	1	12	23.31	23.27	23.06	23.12	23.15		1
	1	24	23.11	23.08	22.81	22.85	22.85		1
	12	0	22.22	22.25	22.03	21.98	21.99	0-2	2
	12	6	22.23	22.29	21.99	22.05	22.05		2
	12	13	22.20	22.25	22.00	22.02	22.00		2
	25	0	22.25	22.27	22.05	22.09	22.08		2
64QAM	1	0	21.90	21.90	21.70	21.69	21.65	0-2	2
	1	12	21.87	21.94	21.65	21.73	21.68		2
	1	24	21.93	21.93	21.62	21.44	21.66		2
	12	0	21.29	21.37	21.08	21.06	21.11	0-3	3
	12	6	21.33	21.36	21.09	21.13	21.12		3
	12	13	21.30	21.32	21.05	21.10	21.10		3
	25	0	21.29	21.33	21.07	21.11	21.17		3

Table 9-30
LTE Band 41 Measured P_{limit} for DSI =1 (Phablet with grip sensor active) or DSI = 3 (Hotspot mode) and/or DSI = 4 (Earjack active) - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	21.89	21.83	21.43	21.55	21.40	0	0
	1	50	21.91	21.78	21.73	21.76	21.75		0
	1	99	**21.95**	21.77	21.51	21.34	21.63		0
	50	0	**22.02**	21.88	21.72	21.78	21.70	0-1	0
	50	25	21.96	21.91	21.84	21.91	21.90		0
	50	50	21.94	21.80	21.74	21.76	21.87		0
	100	0	21.94	21.81	21.75	21.82	21.83		0
16QAM	1	0	22.01	21.89	21.41	21.55	21.46	0-1	0
	1	50	21.96	21.82	21.73	21.83	21.77		0
	1	99	21.98	21.81	21.44	21.37	21.62		0
	50	0	22.04	21.91	21.74	21.80	21.69	0-2	0
	50	25	22.00	21.93	21.87	21.97	21.92		0
	50	50	21.97	21.81	21.77	21.80	21.88		0
	100	0	21.92	21.83	21.80	21.85	21.91		0
64QAM	1	0	21.66	21.58	21.14	21.23	21.26	0-2	0
	1	50	21.67	21.54	21.45	21.52	21.55		0
	1	99	21.61	21.44	21.18	21.09	21.29		0
	50	0	21.19	21.06	20.90	20.96	21.01	0-3	0.8
	50	25	21.14	21.08	21.01	21.07	21.10		0.8
	50	50	21.12	20.97	20.94	20.94	21.04		0.8
	100	0	21.02	20.95	20.89	20.96	20.97		0.8

Table 9-31
LTE Band 41 Measured P_{limit} for DSI =1 (Phablet with grip sensor active) or DSI = 3 (Hotspot mode) and/or DSI = 4 (Earjack active) - 15 MHz Bandwidth

LTE Band 41 15 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	21.85	21.75	21.55	21.61	21.54	0	0
	1	36	21.84	21.71	21.61	21.66	21.71		0
	1	74	21.80	21.78	21.54	21.54	21.75		0
	36	0	21.95	21.90	21.75	21.70	21.61	0-1	0
	36	18	21.98	21.82	21.77	21.85	21.88		0
	36	37	21.90	21.87	21.78	21.80	21.83		0
	75	0	21.85	21.77	21.64	21.71	21.65		0
16QAM	1	0	21.99	21.80	21.54	21.66	21.55	0-1	0
	1	36	21.99	21.74	21.67	21.82	21.64		0
	1	74	21.85	21.81	21.55	21.45	21.60		0
	36	0	21.88	21.88	21.61	21.77	21.59	0-2	0
	36	18	21.79	21.90	21.88	21.85	21.88		0
	36	37	21.81	21.75	21.81	21.74	21.71		0
	75	0	21.86	21.70	21.71	21.81	21.65		0
64QAM	1	0	21.71	21.66	21.22	21.45	21.35	0-2	0
	1	36	21.61	21.68	21.44	21.48	21.47		0
	1	74	21.61	21.55	21.35	21.33	21.33		0
	36	0	21.10	21.00	21.00	21.01	21.11	0-3	0.8
	36	18	21.15	21.05	21.05	20.94	21.05		0.8
	36	37	21.14	21.11	20.91	20.98	21.06		0.8
	75	0	21.09	21.04	20.89	21.11	20.94		0.8

Table 9-32
LTE Band 41 Measured P_{limit} for DSI =1 (Phablet with grip sensor active) or DSI = 3 (Hotspot mode) and/or DSI = 4 (Earjack active) - 10 MHz Bandwidth

LTE Band 41 10 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	21.82	21.73	21.52	21.58	21.44	0	0
	1	25	21.77	21.68	21.58	21.63	21.68		0
	1	49	21.75	21.75	21.51	21.51	21.72		0
	25	0	21.85	21.75	21.69	21.67	21.58	0-1	0
	25	12	21.77	21.79	21.74	21.82	21.85		0
	25	25	21.89	21.84	21.75	21.77	21.80		0
	50	0	21.80	21.72	21.65	21.68	21.62		0
16QAM	1	0	21.92	21.73	21.47	21.59	21.48	0-1	0
	1	25	21.84	21.67	21.60	21.75	21.57		0
	1	49	21.78	21.74	21.55	21.38	21.53		0
	25	0	21.76	21.81	21.55	21.70	21.52	0-2	0
	25	12	21.69	21.77	21.81	21.78	21.81		0
	25	25	21.74	21.68	21.74	21.67	21.64		0
	50	0	21.65	21.65	21.62	21.74	21.58		0
64QAM	1	0	21.63	21.58	21.14	21.37	21.27	0-2	0
	1	25	21.45	21.60	21.36	21.40	21.39		0
	1	49	21.51	21.47	21.27	21.25	21.25		0
	25	0	21.02	20.92	20.90	20.93	21.03	0-3	0.8
	25	12	21.07	20.89	20.97	20.86	20.97		0.8
	25	25	21.16	21.03	20.95	20.90	20.98		0.8
	50	0	21.01	20.99	20.81	21.03	20.86		0.8

Table 9-33
LTE Band 41 Measured P_{limit} for DSI =1 (Phablet with grip sensor active) or DSI = 3 (Hotspot mode) and/or DSI = 4 (Earjack active) - 5 MHz Bandwidth

LTE Band 41 5 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	21.91	21.77	21.65	21.61	21.34	0	0
	1	12	21.84	21.88	21.71	21.62	21.66		0
	1	24	21.87	21.71	21.66	21.66	21.54		0
	12	0	22.11	21.91	21.70	21.78	21.61	0-1	0
	12	6	22.00	21.85	21.71	21.80	21.81		0
	12	13	21.91	21.71	21.68	21.69	21.85		0
	25	0	21.86	21.66	21.75	21.70	21.74		0
16QAM	1	0	22.11	21.91	21.66	21.65	21.37	0-1	0
	1	12	22.00	21.83	21.68	21.61	21.71		0
	1	24	21.94	21.77	21.65	21.44	21.64		0
	12	0	21.83	21.77	21.78	21.65	21.65	0-2	0
	12	6	21.84	21.70	21.81	21.82	21.83		0
	12	13	21.91	21.78	21.78	21.82	21.79		0
	25	0	21.90	21.85	21.80	21.77	21.82		0
64QAM	1	0	21.85	21.66	21.35	21.33	21.17	0-2	0
	1	12	21.88	21.80	21.34	21.45	21.46		0
	1	24	21.74	21.72	21.45	21.32	21.20		0
	12	0	21.22	21.11	21.05	20.96	20.92	0-3	0.8
	12	6	21.16	21.03	21.02	21.03	21.01		0.8
	12	13	21.19	20.91	20.95	20.95	20.95		0.8
	25	0	21.05	20.99	20.90	20.91	20.88		0.8

9.3.6 LTE Uplink Carrier Aggregation Conducted Powers

Table 9-34
LTE Uplink Carrier Aggregation Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered)

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C	LTE B41	20	39750	2506.0	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	24.34	23.99

Table 9-35
LTE Uplink Carrier Aggregation Measured P_{limit} for DSI = 3 (Hotspot)

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C	LTE B41	20	39750	2506.0	QPSK	50	50	LTE B41	20	39948	2525.8	QPSK	50	0	22.30	21.94

Table 9-36
LTE Uplink Carrier Aggregation Measured P_{limit} for DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack active)

	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	21.90	21.55

Notes:

1. This device supports uplink carrier aggregation for LTE CA_41C with a maximum of two 20 MHz 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.

Figure 9-3
Power Measurement Setup

9.4 WLAN Conducted Powers

Table 9-37
2.4 GHz WLAN Maximum Average RF Power – Ant 1

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ax
2412	1	17.90	17.56	15.51	16.24
2417	2			17.64	17.46
2437	6	17.82	17.92	17.27	17.56
2457	10			17.93	17.45
2462	11	17.90	17.78	14.17	13.90

Table 9-38
2.4 GHz WLAN Maximum Average RF Power – Ant 2

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ax
		Average	Average	Average	Average
2412	1	17.95	17.15	16.40	15.86
2417	2			17.39	17.66
2437	6	17.12	17.56	17.72	17.42
2457	10			17.28	17.44
2462	11	17.05	17.30	13.86	14.18

Table 9-39
2.4 GHz WLAN Maximum Average RF Power – MIMO

2.4GHz 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2412	1	15.51	16.40	18.99
2417	2	17.64	17.39	20.53
2437	6	17.27	17.72	20.51
2457	10	17.93	17.28	20.63
2462	11	14.17	13.86	17.03

Table 9-40
5 GHz WLAN Maximum Average RF Power – Ant 1

5GHz (20MHz) Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11a	802.11n	802.11ac	802.11ax
5180	36	16.70	16.67	16.73	16.99
5200	40	16.70	16.73	16.87	16.88
5220	44	16.72	16.81	16.74	16.91
5240	48	16.84	16.73	16.75	16.59
5260	52	16.15	16.93	16.05	16.71
5280	56	16.58	16.95	16.11	16.75
5300	60	16.90	16.91	16.22	16.60
5320	64	16.95	16.85	16.63	16.98
5500	100	16.61	16.56	16.13	16.77
5600	120	16.72	16.65	16.67	16.87
5620	124	16.75	16.95	16.94	16.86
5720	144	16.57	16.35	16.44	16.96
5745	149	16.53	16.83	16.75	16.73
5785	157	16.44	16.45	16.54	16.85
5825	165	16.65	16.86	16.83	16.57

Table 9-41
5 GHz WLAN Maximum Average RF Power – Ant 2

5GHz (20MHz) Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11a	802.11n	802.11ac	802.11ax
		Average	Average	Average	Average
5180	36	16.90	16.94	16.63	16.97
5200	40	16.64	16.54	16.95	16.18
5220	44	16.54	16.61	16.64	16.18
5240	48	16.60	16.59	16.62	16.23
5260	52	16.70	16.65	16.76	16.26
5280	56	16.71	16.70	16.75	16.26
5300	60	16.83	16.74	16.83	16.26
5320	64	16.73	16.90	16.89	16.43
5500	100	16.95	16.92	16.97	16.33
5600	120	16.54	16.55	16.55	16.45
5620	124	16.65	16.57	16.59	16.52
5720	144	16.55	16.97	16.58	16.37
5745	149	16.77	16.26	16.85	16.13
5785	157	16.61	16.50	16.58	16.27
5825	165	16.35	16.35	16.42	16.14

Table 9-42
5 GHz WLAN Maximum Average RF Power – MIMO

5GHz (20MHz) 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
5180	36	16.67	16.94	19.82
5200	40	16.73	16.54	19.65
5220	44	16.81	16.61	19.72
5240	48	16.73	16.59	19.67
5260	52	16.93	16.65	19.80
5280	56	16.95	16.70	19.84
5300	60	16.91	16.74	19.84
5320	64	16.85	16.90	19.89
5500	100	16.56	16.92	19.75
5600	120	16.65	16.55	19.61
5620	124	16.95	16.57	19.77
5720	144	16.35	16.97	19.68
5745	149	16.83	16.26	19.56
5785	157	16.45	16.50	19.49
5825	165	16.86	16.35	19.62

Table 9-43
Maximum Output Powers During Conditions with 2.4 GHz and 5 GHz WLAN

2.4GHz 802.11n Conducted Power [dBm]			
Freq [MHz]	Channel	ANT1	ANT2
2412	1	15.95	15.69
2437	6	15.72	15.60
2457	10	15.44	15.49
2462	11	13.60	13.88
5GHz (80MHz) 802.11ac Conducted Power [dBm]			
Freq [MHz]	Channel	ANT1	ANT2
5210	42	12.53	12.33
5290	58	12.13	12.94
5530	106	12.53	12.45
5610	122	12.62	12.39
5690	138	12.71	12.40
5775	155	12.45	12.21

Table 9-44
2.4 GHz WLAN Reduced Average RF Power – Ant 1

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ax
2412	1	15.70	15.94	15.95	15.98
2437	6	15.04	15.74	15.72	15.70
2457	10			15.44	15.41
2462	11	15.89	15.39	13.60	14.35

Table 9-45
2.4 GHz WLAN Reduced Average RF Power – Ant 2

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ax
2412	1	15.71	15.78	15.69	15.12
2437	6	15.60	15.44	15.60	15.07
2457	10			15.49	15.26
2462	11	15.21	15.72	13.88	14.49

Table 9-46
5 GHz WLAN Reduced Average RF Power – Ant 1

5GHz (80MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11ac	802.11ax
5210	42	12.53	12.43
5290	58	12.13	11.38
5530	106	12.53	12.19
5610	122	12.62	12.25
5690	138	12.71	12.16
5775	155	12.45	12.35

Table 9-47
5 GHz WLAN Reduced Average RF Power – Ant 2

5GHz (80MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11ac	802.11ax
5210	42	12.33	12.30
5290	58	12.94	11.12
5530	106	12.45	12.37
5610	122	12.39	12.20
5690	138	12.40	12.15
5775	155	12.21	12.42

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.

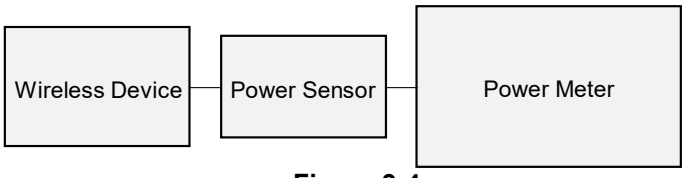


Figure 9-4
Power Measurement Setup

9.5 Bluetooth Conducted Powers

Table 9-48
Bluetooth Average RF Power

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
			[dBm]	[mW]
2402	1.0	0	14.69	29.448
2441	1.0	39	15.69	37.052
2480	1.0	78	16.26	42.235
2402	2.0	0	10.45	11.096
2441	2.0	39	10.73	11.832
2480	2.0	78	10.62	11.524
2402	3.0	0	10.68	11.705
2441	3.0	39	11.41	13.836
2480	3.0	78	10.70	11.759

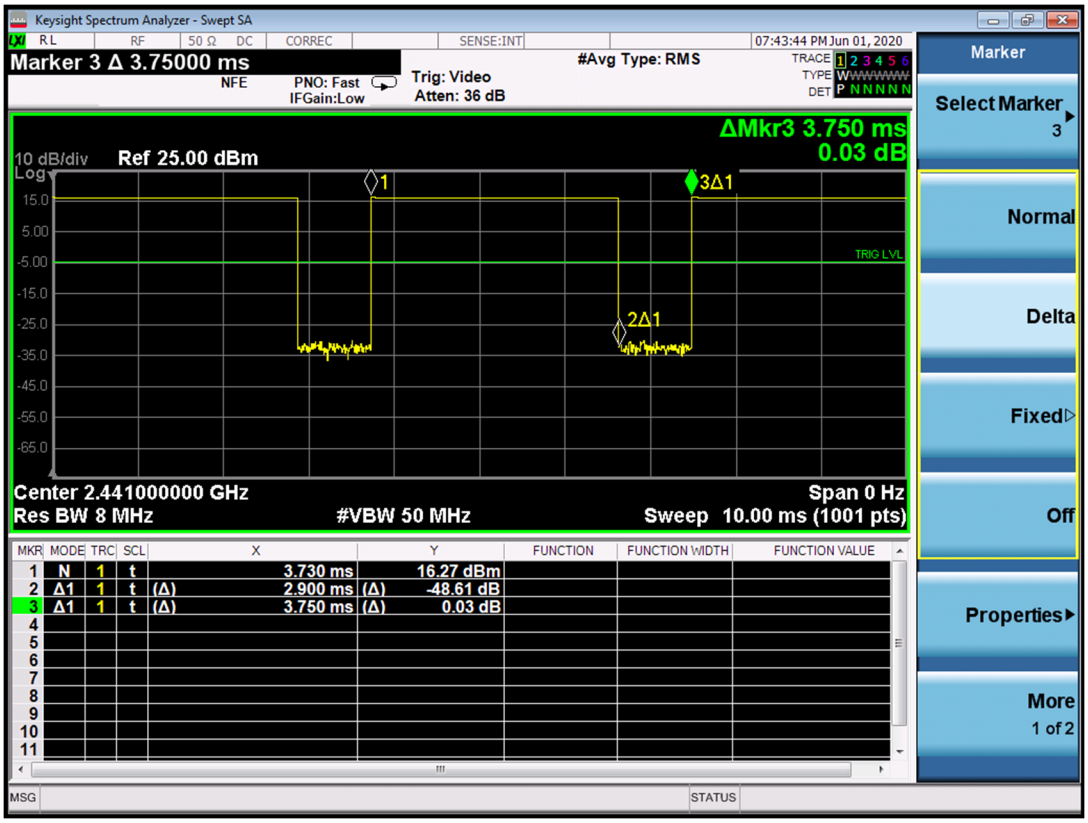


Figure 9-5
Bluetooth Transmission Plot

Equation 9-1
Bluetooth Duty Cycle Calculation

$$\boldsymbol{Duty\ Cycle} = \frac{\boldsymbol{Pulse\ Width}}{\boldsymbol{Period}} * \mathbf{100\%} = \frac{\mathbf{2.90}\boldsymbol{ms}}{\mathbf{3.75}\boldsymbol{ms}} * \mathbf{100\%} = \mathbf{77.3\%}$$

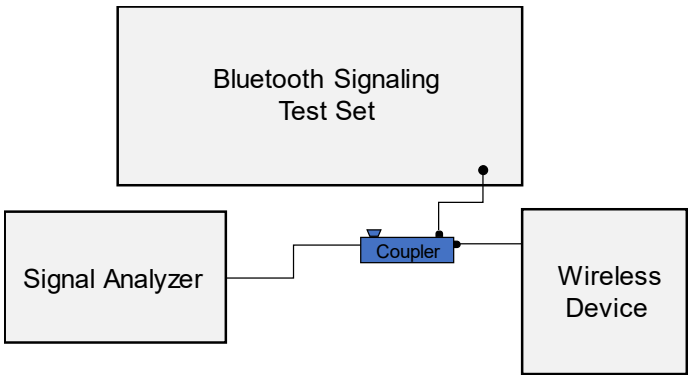


Figure 9-6
Power Measurement Setup

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
07/23/2020	750 Head	24.2	680	0.851	43.279	0.888	42.305	-4.17%	2.30%
			695	0.856	43.234	0.889	42.227	-3.71%	2.38%
			700	0.857	43.213	0.889	42.201	-3.60%	2.40%
			710	0.860	43.180	0.890	42.149	-3.37%	2.45%
			725	0.865	43.134	0.891	42.071	-2.92%	2.53%
			750	0.873	43.074	0.894	41.942	-2.35%	2.70%
			770	0.880	43.037	0.895	41.838	-1.68%	2.87%
			785	0.885	42.999	0.896	41.760	-1.23%	2.97%
			800	0.891	42.950	0.897	41.682	-0.67%	3.04%
9/3/2020	750 Head	24.8	680	0.845	41.552	0.888	42.305	-4.84%	-1.78%
			695	0.849	41.5	0.889	42.227	-4.50%	-1.72%
			700	0.85	41.477	0.889	42.201	-4.39%	-1.72%
			710	0.853	41.443	0.89	42.149	-4.16%	-1.68%
			725	0.859	41.406	0.891	42.071	-3.59%	-1.58%
			750	0.867	41.367	0.894	41.942	-3.02%	-1.37%
			770	0.874	41.321	0.895	41.838	-2.35%	-1.24%
			785	0.878	41.276	0.896	41.76	-2.01%	-1.16%
			800	0.883	41.219	0.897	41.682	-1.56%	-1.11%
07/09/2020	835 Head	22.2	820	0.885	41.501	0.899	41.578	-1.56%	-0.19%
			835	0.889	41.453	0.900	41.500	-1.22%	-0.11%
			850	0.895	41.420	0.916	41.500	-2.29%	-0.19%
07/17/2020	835 Head	22.0	820	0.861	41.558	0.899	41.578	-4.23%	-0.05%
			835	0.865	41.519	0.900	41.500	-3.89%	0.05%
			850	0.871	41.480	0.916	41.500	-4.91%	-0.05%
07/28/2020	1750 Head	22.8	1710	1.321	39.432	1.348	40.142	-2.00%	-1.77%
			1720	1.331	39.385	1.354	40.126	-1.70%	-1.85%
			1745	1.358	39.265	1.368	40.087	-0.73%	-2.05%
			1750	1.363	39.253	1.371	40.079	-0.58%	-2.06%
			1770	1.384	39.174	1.383	40.047	0.07%	-2.18%
			1790	1.405	39.087	1.394	40.016	0.79%	-2.32%
07/15/2020	1900 Head	22.9	1850	1.335	39.993	1.400	40.000	-4.64%	-0.02%
			1860	1.340	39.981	1.400	40.000	-4.29%	-0.05%
			1880	1.351	39.965	1.400	40.000	-3.50%	-0.09%
			1900	1.362	39.950	1.400	40.000	-2.71%	-0.12%
			1905	1.364	39.946	1.400	40.000	-2.57%	-0.14%
			1910	1.367	39.943	1.400	40.000	-2.36%	-0.14%
07/20/2020	2450 Head	22	2310	1.681	40.900	1.679	39.480	0.12%	3.60%
			2320	1.689	40.886	1.687	39.460	0.12%	3.61%
			2400	1.746	40.788	1.756	39.289	-0.57%	3.82%
			2450	1.788	40.696	1.800	39.200	-0.67%	3.82%
			2480	1.809	40.656	1.833	39.162	-1.31%	3.81%
			2500	1.823	40.628	1.855	39.136	-1.73%	3.81%
			2510	1.830	40.614	1.866	39.123	-1.93%	3.81%
			2535	1.849	40.570	1.893	39.092	-2.32%	3.78%
08/04/2020	2450 Head	24.1	2310	1.701	39.304	1.679	39.480	1.31%	-0.45%
			2320	1.712	39.268	1.687	39.460	1.48%	-0.49%
			2400	1.807	38.963	1.756	39.289	2.90%	-0.83%
			2450	1.867	38.764	1.800	39.200	3.72%	-1.11%
			2480	1.903	38.630	1.833	39.162	3.82%	-1.36%
			2500	1.926	38.549	1.855	39.136	3.83%	-1.50%
			2510	1.938	38.510	1.866	39.123	3.86%	-1.57%
			2535	1.967	38.409	1.893	39.092	3.91%	-1.75%
08/12/2020	5200~5800 Head	23.3	5180	4.426	35.925	4.635	36.009	-4.51%	-0.23%
			5190	4.424	35.912	4.645	35.998	-4.76%	-0.24%
			5200	4.429	35.883	4.655	35.986	-4.85%	-0.29%
			5210	4.436	35.848	4.666	35.975	-4.93%	-0.35%
			5220	4.454	35.825	4.676	35.963	-4.75%	-0.38%
			5240	4.487	35.798	4.696	35.940	-4.45%	-0.40%
			5250	4.502	35.772	4.706	35.929	-4.33%	-0.44%
			5260	4.512	35.756	4.717	35.917	-4.35%	-0.45%
			5270	4.520	35.761	4.727	35.906	-4.38%	-0.40%
			5280	4.534	35.757	4.737	35.894	-4.29%	-0.38%
			5290	4.546	35.745	4.748	35.883	-4.25%	-0.38%
			5300	4.559	35.698	4.758	35.871	-4.18%	-0.48%
			5310	4.564	35.697	4.768	35.860	-4.28%	-0.45%
			5320	4.571	35.694	4.778	35.849	-4.33%	-0.43%
			5500	4.759	35.374	4.963	35.643	-4.11%	-0.75%
			5510	4.773	35.364	4.973	35.632	-4.02%	-0.75%
			5520	4.789	35.352	4.983	35.620	-3.89%	-0.75%
			5530	4.799	35.356	4.994	35.609	-3.90%	-0.71%
			5540	4.811	35.333	5.004	35.597	-3.86%	-0.74%
			5550	4.819	35.310	5.014	35.586	-3.89%	-0.78%
			5560	4.820	35.289	5.024	35.574	-4.06%	-0.80%
			5580	4.846	35.246	5.045	35.551	-3.94%	-0.86%
			5600	4.873	35.202	5.065	35.529	-3.79%	-0.92%
			5610	4.891	35.174	5.076	35.518	-3.64%	-0.97%
			5620	4.909	35.144	5.086	35.506	-3.48%	-1.02%
			5640	4.933	35.154	5.106	35.483	-3.39%	-0.93%
			5660	4.949	35.127	5.127	35.460	-3.47%	-0.94%
			5670	4.955	35.098	5.137	35.449	-3.54%	-0.99%
			5680	4.962	35.081	5.147	35.437	-3.59%	-1.00%
			5690	4.979	35.065	5.158	35.426	-3.47%	-1.02%
			5700	4.994	35.044	5.168	35.414	-3.37%	-1.04%
			5710	5.008	35.053	5.178	35.403	-3.28%	-0.99%
			5720	5.024	35.012	5.188	35.391	-3.16%	-1.07%
			5745	5.045	34.978	5.214	35.363	-3.24%	-1.09%
			5750	5.047	34.965	5.219	35.357	-3.30%	-1.11%
			5755	5.050	34.963	5.224	35.351	-3.33%	-1.10%
			5765	5.057	34.946	5.234	35.340	-3.38%	-1.11%
			5775	5.064	34.945	5.245	35.329	-3.45%	-1.09%
			5785	5.076	34.940	5.255	35.317	-3.41%	-1.07%
			5795	5.086	34.901	5.265	35.305	-3.40%	-1.14%
			5800	5.091	34.890	5.270	35.300	-3.40%	-1.16%
			5805	5.100	34.885	5.275	35.294	-3.32%	-1.16%
			5825	5.128	34.871	5.296	35.271	-3.17%	-1.13%

Table 10-2
Measured Body Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
07/24/2020	750 Body	22.2	680	0.945	53.853	0.958	55.804	-1.36%	-3.50%
			695	0.950	53.824	0.959	55.745	-0.94%	-3.45%
			700	0.952	53.813	0.959	55.726	-0.73%	-3.43%
			710	0.956	53.784	0.960	55.687	-0.42%	-3.42%
			725	0.961	53.732	0.961	55.629	0.00%	-3.41%
			750	0.970	53.656	0.964	55.531	0.62%	-3.38%
			770	0.977	53.614	0.965	55.453	1.24%	-3.32%
			785	0.983	53.590	0.966	55.395	1.76%	-3.26%
			800	0.989	53.561	0.967	55.336	2.28%	-3.21%
			820	0.996	53.502	0.969	55.258	2.79%	-3.18%
			835	1.002	53.462	0.970	55.200	3.30%	-3.15%
			850	1.008	53.428	0.988	55.154	2.02%	-3.13%
8/24/2020	750 Body	21.7	680	0.921	53.650	0.958	55.804	-3.86%	-3.86%
			695	0.926	53.613	0.959	55.745	-3.44%	-3.82%
			700	0.928	53.599	0.959	55.726	-3.23%	-3.82%
			710	0.932	53.574	0.960	55.687	-2.92%	-3.79%
			725	0.937	53.536	0.961	55.629	-2.50%	-3.76%
			750	0.947	53.467	0.964	55.531	-1.76%	-3.72%
			770	0.955	53.419	0.965	55.453	-1.04%	-3.67%
			785	0.960	53.386	0.966	55.395	-0.62%	-3.63%
			800	0.966	53.350	0.967	55.336	-0.10%	-3.59%
07/09/2020	835 Body	21.9	820	0.962	54.578	0.969	55.258	-0.72%	-1.23%
			835	0.976	54.437	0.970	55.200	0.62%	-1.38%
			850	0.991	54.293	0.988	55.154	0.30%	-1.56%
07/11/2020	835 Body	21.7	820	0.937	53.735	0.969	55.258	-3.30%	-2.76%
			835	0.952	53.592	0.970	55.200	-1.86%	-2.91%
			850	0.969	53.422	0.988	55.154	-1.92%	-3.14%
08/24/2020	835 Body	21.3	820	0.938	54.559	0.969	55.258	-3.20%	-1.26%
			835	0.954	54.414	0.970	55.200	-1.65%	-1.42%
			850	0.969	54.267	0.988	55.154	-1.92%	-1.61%
07/20/2020	1750 Body	21.9	1710	1.463	51.916	1.463	53.537	0.00%	-3.03%
			1720	1.474	51.880	1.469	53.511	0.34%	-3.05%
			1745	1.502	51.777	1.485	53.445	1.14%	-3.12%
			1750	1.507	51.756	1.488	53.432	1.28%	-3.14%
			1770	1.529	51.676	1.501	53.379	1.87%	-3.19%
			1790	1.551	51.606	1.514	53.326	2.44%	-3.23%
08/12/2020	1750 Body	22.7	1710	1.449	51.181	1.463	53.537	-0.96%	-4.40%
			1720	1.460	51.144	1.469	53.511	-0.61%	-4.42%
			1745	1.487	51.049	1.485	53.445	0.13%	-4.48%
			1750	1.492	51.030	1.488	53.432	0.27%	-4.50%
			1770	1.513	50.952	1.501	53.379	0.80%	-4.55%
			1790	1.534	50.856	1.514	53.326	1.32%	-4.63%
07/22/2020	1900 Body	23.5	1850	1.509	54.041	1.520	53.300	-0.72%	1.39%
			1860	1.520	54.013	1.520	53.300	0.00%	1.34%
			1880	1.542	53.956	1.520	53.300	1.45%	1.23%
			1900	1.564	53.890	1.520	53.300	2.89%	1.11%
			1905	1.570	53.871	1.520	53.300	3.29%	1.07%
			1910	1.575	53.855	1.520	53.300	3.62%	1.04%
07/15/2020	2450 Body	23.2	2300	1.808	52.033	1.809	52.900	-0.06%	-1.64%
			2310	1.821	52.005	1.816	52.887	0.28%	-1.67%
			2320	1.834	51.977	1.826	52.873	0.44%	-1.69%
			2400	1.945	51.713	1.902	52.767	2.26%	-2.00%
			2450	2.014	51.525	1.950	52.700	3.28%	-2.23%
			2480	2.058	51.401	1.993	52.662	3.26%	-2.39%
			2500	2.086	51.328	2.021	52.636	3.22%	-2.48%
			2510	2.099	51.291	2.035	52.623	3.14%	-2.53%
			2535	2.134	51.190	2.071	52.592	3.04%	-2.67%
			2550	2.155	51.120	2.092	52.573	3.01%	-2.76%
			2560	2.169	51.072	2.106	52.560	2.99%	-2.83%
			2600	2.228	50.912	2.163	52.509	3.01%	-3.04%
			2650	2.296	50.706	2.234	52.445	2.78%	-3.32%
			2680	2.338	50.579	2.277	52.407	2.68%	-3.49%
			2700	2.366	50.502	2.305	52.382	2.65%	-3.59%
07/27/2020	2450 Body	21.9	2300	1.870	51.707	1.809	52.900	3.37%	-2.26%
			2310	1.881	51.682	1.816	52.887	3.58%	-2.28%
			2320	1.893	51.659	1.826	52.873	3.67%	-2.30%
			2400	1.986	51.443	1.902	52.767	4.42%	-2.51%
			2450	2.046	51.291	1.950	52.700	4.92%	-2.67%
			2480	2.080	51.200	1.993	52.662	4.37%	-2.78%
			2500	2.104	51.134	2.021	52.636	4.11%	-2.85%
			2510	2.116	51.102	2.035	52.623	3.98%	-2.89%
			2535	2.147	51.028	2.071	52.592	3.67%	-2.97%
			2550	2.165	50.987	2.092	52.573	3.49%	-3.02%
			2560	2.176	50.958	2.106	52.560	3.32%	-3.05%
			2600	2.222	50.834	2.163	52.509	2.73%	-3.19%
			2650	2.283	50.679	2.234	52.445	2.19%	-3.37%
			2680	2.320	50.597	2.277	52.407	1.89%	-3.45%
			2700	2.344	50.536	2.305	52.382	1.69%	-3.52%
08/16/2020	2450 Body	23.9	2300	1.790	51.982	1.809	52.900	-1.05%	-1.74%
			2310	1.803	51.950	1.816	52.887	-0.72%	-1.77%
			2320	1.815	51.914	1.826	52.873	-0.60%	-1.81%
			2400	1.919	51.613	1.902	52.767	0.89%	-2.19%
			2450	1.986	51.438	1.950	52.700	1.85%	-2.39%
			2480	2.026	51.327	1.993	52.662	1.66%	-2.54%
			2500	2.054	51.256	2.021	52.636	1.63%	-2.62%
			2510	2.068	51.219	2.035	52.623	1.62%	-2.67%
			2535	2.104	51.132	2.071	52.592	1.59%	-2.78%
08/26/2020	2450 Body	23.5	2310	1.841	51.653	1.816	52.887	1.38%	-2.33%
			2320	1.854	51.614	1.826	52.873	1.53%	-2.38%
			2400	1.961	51.326	1.902	52.767	3.10%	-2.73%
			2450	2.030	51.137	1.950	52.700	4.10%	-2.97%
			2480	2.070	51.018	1.993	52.662	3.86%	-3.12%
			2500	2.098	50.946	2.021	52.636	3.81%	-3.21%
			2510	2.112	50.912	2.035	52.623	3.78%	-3.25%
			2535	2.147	50.819	2.071	52.592	3.67%	-3.37%

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

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
08/16/2020	5200~5800 Body	22.6	5180	5.380	47.316	5.276	49.041	1.97%	-3.52%
			5190	5.390	47.298	5.288	49.028	1.93%	-3.53%
			5200	5.400	47.282	5.299	49.014	1.91%	-3.53%
			5210	5.414	47.264	5.311	49.001	1.94%	-3.54%
			5220	5.428	47.236	5.323	48.987	1.97%	-3.57%
			5240	5.463	47.200	5.346	48.960	2.19%	-3.59%
			5250	5.476	47.185	5.358	48.947	2.20%	-3.60%
			5260	5.486	47.171	5.369	48.933	2.18%	-3.60%
			5270	5.497	47.165	5.381	48.919	2.16%	-3.59%
			5280	5.511	47.154	5.393	48.906	2.19%	-3.58%
			5290	5.526	47.133	5.404	48.892	2.26%	-3.60%
			5300	5.538	47.109	5.416	48.879	2.25%	-3.62%
			5310	5.545	47.096	5.428	48.865	2.16%	-3.62%
			5320	5.554	47.074	5.439	48.851	2.11%	-3.64%
			5500	5.801	46.759	5.650	48.607	2.67%	-3.80%
			5510	5.814	46.740	5.661	48.594	2.70%	-3.82%
			5520	5.827	46.729	5.673	48.580	2.71%	-3.81%
			5530	5.838	46.725	5.685	48.566	2.69%	-3.79%
			5540	5.848	46.714	5.696	48.553	2.67%	-3.79%
			5550	5.860	46.690	5.708	48.539	2.66%	-3.81%
			5560	5.871	46.659	5.720	48.526	2.64%	-3.85%
			5580	5.906	46.635	5.743	48.499	2.84%	-3.84%
			5600	5.937	46.607	5.766	48.471	2.97%	-3.85%
			5610	5.950	46.587	5.778	48.458	2.98%	-3.86%
			5620	5.962	46.582	5.790	48.444	2.97%	-3.84%
			5640	5.990	46.558	5.813	48.417	3.04%	-3.84%
			5660	6.018	46.512	5.837	48.390	3.10%	-3.88%
			5670	6.028	46.496	5.848	48.376	3.08%	-3.89%
			5680	6.037	46.481	5.860	48.363	3.02%	-3.89%
			5690	6.053	46.457	5.872	48.349	3.08%	-3.91%
			5700	6.068	46.438	5.883	48.336	3.14%	-3.93%
			5710	6.083	46.420	5.895	48.322	3.19%	-3.94%
			5720	6.098	46.407	5.907	48.309	3.23%	-3.94%
			5745	6.135	46.360	5.936	48.275	3.35%	-3.97%
			5750	6.140	46.354	5.942	48.268	3.33%	-3.97%
			5755	6.145	46.352	5.947	48.261	3.33%	-3.96%
			5765	6.156	46.345	5.959	48.248	3.31%	-3.94%
			5775	6.169	46.337	5.971	48.234	3.32%	-3.93%
			5785	6.184	46.317	5.982	48.220	3.38%	-3.95%
			5795	6.199	46.299	5.994	48.207	3.42%	-3.96%
			5800	6.206	46.294	6.000	48.200	3.43%	-3.95%
			5805	6.215	46.285	6.006	48.193	3.48%	-3.96%
			5825	6.246	46.246	6.029	48.166	3.60%	-3.99%
08/31/2020	5200~5800 Body	21.0	5180	5.362	47.941	5.276	49.041	1.63%	-2.24%
			5190	5.381	47.917	5.288	49.028	1.76%	-2.27%
			5200	5.399	47.889	5.299	49.014	1.89%	-2.30%
			5210	5.410	47.861	5.311	49.001	1.86%	-2.33%
			5220	5.420	47.854	5.323	48.987	1.82%	-2.31%
			5240	5.434	47.842	5.346	48.960	1.65%	-2.28%
			5250	5.450	47.801	5.358	48.947	1.72%	-2.34%
			5260	5.462	47.768	5.369	48.933	1.73%	-2.38%
			5270	5.474	47.739	5.381	48.919	1.73%	-2.41%
			5280	5.490	47.740	5.393	48.906	1.80%	-2.38%
			5290	5.506	47.713	5.404	48.892	1.89%	-2.41%
			5300	5.514	47.732	5.416	48.879	1.81%	-2.35%
			5310	5.519	47.728	5.428	48.865	1.68%	-2.33%
			5320	5.534	47.684	5.439	48.851	1.75%	-2.39%
			5500	5.786	47.406	5.650	48.607	2.41%	-2.47%
			5510	5.794	47.398	5.661	48.594	2.35%	-2.46%
			5520	5.807	47.369	5.673	48.580	2.36%	-2.49%
			5530	5.819	47.338	5.685	48.566	2.36%	-2.53%
			5540	5.826	47.318	5.696	48.553	2.28%	-2.54%
			5550	5.836	47.322	5.708	48.539	2.24%	-2.51%
			5560	5.862	47.314	5.720	48.526	2.48%	-2.50%
			5580	5.901	47.202	5.743	48.499	2.75%	-2.67%
			5600	5.905	47.207	5.766	48.471	2.41%	-2.61%
			5610	5.931	47.202	5.778	48.458	2.65%	-2.59%
			5620	5.963	47.186	5.790	48.444	2.99%	-2.60%
			5640	5.979	47.202	5.813	48.417	2.86%	-2.51%
			5660	6.001	47.146	5.837	48.390	2.81%	-2.57%
			5670	6.026	47.088	5.848	48.376	3.04%	-2.66%
			5680	6.048	47.063	5.860	48.363	3.21%	-2.69%
			5690	6.067	47.043	5.872	48.349	3.32%	-2.70%
			5700	6.081	47.026	5.883	48.336	3.37%	-2.71%
			5710	6.093	47.031	5.895	48.322	3.36%	-2.67%
			5720	6.100	47.049	5.907	48.309	3.27%	-2.61%
			5745	6.128	47.003	5.936	48.275	3.23%	-2.63%
			5750	6.135	46.990	5.942	48.268	3.25%	-2.65%
			5755	6.143	46.974	5.947	48.261	3.30%	-2.67%
			5765	6.159	46.958	5.959	48.248	3.36%	-2.67%
			5775	6.167	46.938	5.971	48.234	3.28%	-2.69%
			5785	6.184	46.921	5.982	48.220	3.38%	-2.69%
			5795	6.209	46.894	5.994	48.207	3.59%	-2.72%
			5800	6.219	46.886	6.000	48.200	3.65%	-2.73%
			5805	6.230	46.866	6.006	48.193	3.73%	-2.75%
			5825	6.245	46.843	6.029	48.166	3.58%	-2.75%

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

10.2 Test System Verification

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

Table 10-4
System Verification Results – 1g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Source SN	Probe SN	Measured SAR_{1g} (W/kg)	1 W Target SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	$Deviation_{1g}$ (%)
E	750	HEAD	07/23/2020	22.9	22.7	0.200	1003	3589	1.630	8.780	8.150	-7.18%
D	750	HEAD	09/03/2020	23.0	22.8	0.200	1161	7488	1.530	8.030	7.650	-4.73%
L	835	HEAD	07/09/2020	22.3	22.2	0.200	4d132	7406	1.980	9.650	9.900	2.59%
L	835	HEAD	07/17/2020	24.2	22.0	0.200	4d132	7406	1.840	9.650	9.200	-4.66%
E	1750	HEAD	07/28/2020	23.2	22.8	0.100	1008	3589	3.900	36.200	39.000	7.73%
L	1900	HEAD	07/15/2020	24.8	22.3	0.100	5d148	7406	4.180	39.100	41.800	6.91%
E	2450	HEAD	07/20/2020	22.7	21.7	0.100	797	3589	5.110	52.700	51.100	-3.04%
E	2450	HEAD	08/04/2020	22.8	22.3	0.100	719	3589	5.280	53.100	52.800	-0.56%
H	5250	HEAD	08/12/2020	24.0	23.3	0.050	1057	7357	3.690	79.200	73.800	-6.82%
H	5600	HEAD	08/12/2020	24.0	23.3	0.050	1057	7357	3.970	84.100	79.400	-5.59%
H	5750	HEAD	08/12/2020	24.0	23.3	0.050	1057	7357	3.930	80.500	78.600	-2.36%
P	750	BODY	07/24/2020	23.1	22.2	0.200	1054	7551	1.790	8.530	8.950	4.92%
E	750	BODY	08/24/2020	23.1	21.7	0.200	1161	3589	1.790	8.430	8.950	6.17%
D	835	BODY	07/09/2020	22.3	21.9	0.200	4d047	7488	1.990	9.470	9.950	5.07%
P	835	BODY	07/11/2020	22.2	21.7	0.200	4d132	7551	2.010	9.960	10.050	0.90%
P	835	BODY	08/24/2020	21.9	21.2	0.200	4d047	7551	2.000	9.470	10.000	5.60%
L	1750	BODY	07/20/2020	24.3	21.9	0.100	1148	7406	3.880	36.300	38.800	6.89%
J	1900	BODY	07/22/2020	22.7	23.5	0.100	5d080	7571	4.270	39.200	42.700	8.93%
K	2450	BODY	07/27/2020	22.4	21.9	0.100	719	7409	5.400	50.800	54.000	6.30%
O	2450	BODY	08/16/2020	23.1	22.8	0.100	797	7552	5.040	51.100	50.400	-1.37%
O	2450	BODY	08/26/2020	24.1	23.5	0.100	797	7552	5.280	51.100	52.800	3.33%
O	2600	BODY	07/15/2020	24.3	22.8	0.100	1004	7552	5.720	54.800	57.200	4.38%
G	5250	BODY	08/16/2020	22.1	22.6	0.050	1237	7538	3.580	75.600	71.600	-5.29%
G	5600	BODY	08/16/2020	22.1	22.6	0.050	1237	7538	3.720	78.500	74.400	-5.22%
G	5750	BODY	08/16/2020	22.1	22.6	0.050	1237	7538	3.570	75.900	71.400	-5.93%

Table 10-5
System Verification Results – 10g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Source SN	Probe SN	Measured SAR_{10g} (W/kg)	1 W Target SAR_{10g} (W/kg)	1 W Normalized SAR_{10g} (W/kg)	$Deviation_{10g}$ (%)
I	1750	BODY	08/12/2020	24.2	22.7	0.100	1148	7570	1.950	19.300	19.500	1.04%
J	1900	BODY	07/22/2020	22.7	23.5	0.100	5d080	7571	2.210	20.600	22.100	7.28%
K	2450	BODY	07/27/2020	22.4	21.9	0.100	719	7409	2.470	24.000	24.700	2.92%
K	2600	BODY	07/27/2020	22.4	21.9	0.100	1064	7409	2.450	25.000	24.500	-2.00%
G	5250	BODY	08/31/2020	21.1	20.8	0.050	1237	7538	0.987	21.200	19.740	-6.89%
G	5600	BODY	08/31/2020	21.1	20.8	0.050	1237	7538	1.050	22.000	21.000	-4.55%
G	5750	BODY	08/31/2020	21.1	20.8	0.050	1237	7538	0.994	21.200	19.880	-6.23%

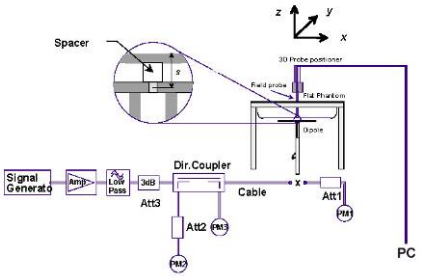


Figure 10-1
System Verification Setup Diagram

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		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	32.5	31.40	0.00	Right	Cheek	1790M	1:8.3	0.049	1.288	0.063	
836.60	190	GSM 850	GSM	32.5	31.40	0.00	Right	Tilt	1790M	1:8.3	0.029	1.288	0.037	
836.60	190	GSM 850	GSM	32.5	31.40	0.18	Left	Cheek	1790M	1:8.3	0.083	1.288	0.107	A1
836.60	190	GSM 850	GSM	32.5	31.40	0.16	Left	Tilt	1790M	1:8.3	0.036	1.288	0.046	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-2
GSM 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1909.80	810	GSM 1900	GSM	30.0	28.70	0.15	Right	Cheek	1755M	1:8.3	0.042	1.349	0.057	A2
1909.80	810	GSM 1900	GSM	30.0	28.70	0.15	Right	Tilt	1755M	1:8.3	0.018	1.349	0.024	
1909.80	810	GSM 1900	GSM	30.0	28.70	0.13	Left	Cheek	1755M	1:8.3	0.033	1.349	0.045	
1909.80	810	GSM 1900	GSM	30.0	28.70	-0.12	Left	Tilt	1755M	1:8.3	0.032	1.349	0.043	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-3
UMTS 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	25.0	23.54	-0.06	Right	Cheek	1786M	1:1	0.104	1.400	0.146	
836.60	4183	UMTS 850	RMC	25.0	23.54	-0.06	Right	Tilt	1786M	1:1	0.064	1.400	0.090	
836.60	4183	UMTS 850	RMC	25.0	23.54	0.02	Left	Cheek	1786M	1:1	0.142	1.400	**0.199**	A3
836.60	4183	UMTS 850	RMC	25.0	23.54	0.03	Left	Tilt	1786M	1:1	0.064	1.400	0.090	
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			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	24.0	22.55	0.12	0	Right	Cheek	QPSK	1	49	1671M	1:1	0.036	1.396	0.050	
707.50	23095	Mid	LTE Band 12	10	23.0	21.70	0.17	1	Right	Cheek	QPSK	25	12	1671M	1:1	0.027	1.349	0.036	
707.50	23095	Mid	LTE Band 12	10	24.0	22.55	0.13	0	Right	Tilt	QPSK	1	49	1671M	1:1	0.019	1.396	0.027	
707.50	23095	Mid	LTE Band 12	10	23.0	21.70	0.15	1	Right	Tilt	QPSK	25	12	1671M	1:1	0.014	1.349	0.019	
707.50	23095	Mid	LTE Band 12	10	24.0	22.55	0.03	0	Left	Cheek	QPSK	1	49	0493M	1:1	0.099	1.396	0.138	A4
707.50	23095	Mid	LTE Band 12	10	23.0	21.70	-0.14	1	Left	Cheek	QPSK	25	12	0493M	1:1	0.069	1.349	0.093	
707.50	23095	Mid	LTE Band 12	10	24.0	22.55	0.13	0	Left	Tilt	QPSK	1	49	1671M	1:1	0.016	1.396	0.022	
707.50	23095	Mid	LTE Band 12	10	23.0	21.70	0.12	1	Left	Tilt	QPSK	25	12	1671M	1:1	0.013	1.349	0.018	
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			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	24.0	23.13	0.07	0	Right	Cheek	QPSK	1	49	1671M	1:1	0.091	1.222	0.111	
782.00	23230	Mid	LTE Band 13	10	23.0	22.28	0.05	1	Right	Cheek	QPSK	25	0	1671M	1:1	0.069	1.180	0.081	
782.00	23230	Mid	LTE Band 13	10	24.0	23.13	-0.02	0	Right	Tilt	QPSK	1	49	1671M	1:1	0.059	1.222	0.072	
782.00	23230	Mid	LTE Band 13	10	23.0	22.28	0.03	1	Right	Tilt	QPSK	25	0	1671M	1:1	0.043	1.180	0.051	
782.00	23230	Mid	LTE Band 13	10	24.0	23.13	0.00	0	Left	Cheek	QPSK	1	49	1671M	1:1	0.115	1.222	0.141	A5
782.00	23230	Mid	LTE Band 13	10	23.0	22.28	0.00	1	Left	Cheek	QPSK	25	0	1671M	1:1	0.091	1.180	0.107	
782.00	23230	Mid	LTE Band 13	10	24.0	23.13	0.04	0	Left	Tilt	QPSK	1	49	1671M	1:1	0.052	1.222	0.064	
782.00	23230	Mid	LTE Band 13	10	23.0	22.28	0.13	1	Left	Tilt	QPSK	25	0	1671M	1:1	0.040	1.180	0.047	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram										

Table 11-6
LTE Band 5 (Cell) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.54	0.04	0	Right	Cheek	QPSK	1	0	1786M	1:1	0.076	1.400	0.106	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	21.61	-0.06	1	Right	Cheek	QPSK	25	0	1786M	1:1	0.054	1.377	0.074	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.54	0.02	0	Right	Tilt	QPSK	1	0	1786M	1:1	0.053	1.400	0.074	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	21.61	0.08	1	Right	Tilt	QPSK	25	0	1786M	1:1	0.038	1.377	0.052	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.54	-0.03	0	Left	Cheek	QPSK	1	0	1786M	1:1	0.103	1.400	0.144	A6
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	21.61	0.12	1	Left	Cheek	QPSK	25	0	1786M	1:1	0.080	1.377	0.110	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.54	-0.01	0	Left	Tilt	QPSK	1	0	1786M	1:1	0.052	1.400	0.073	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	21.61	0.17	1	Left	Tilt	QPSK	25	0	1786M	1:1	0.044	1.377	0.061	
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 4 (AWS) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.46	0.20	0	Right	Cheek	QPSK	1	50	1785M	1:1	0.072	1.271	0.092	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.63	0.06	1	Right	Cheek	QPSK	50	50	1785M	1:1	0.057	1.222	0.070	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.46	0.06	0	Right	Tilt	QPSK	1	50	1785M	1:1	0.072	1.271	0.092	A7
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.63	0.07	1	Right	Tilt	QPSK	50	50	1785M	1:1	0.052	1.222	0.064	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.46	0.07	0	Left	Cheek	QPSK	1	50	1785M	1:1	0.051	1.271	0.065	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.63	0.18	1	Left	Cheek	QPSK	50	50	1785M	1:1	0.035	1.222	0.043	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.46	0.00	0	Left	Tilt	QPSK	1	50	1785M	1:1	0.064	1.271	0.081	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.63	0.04	1	Left	Tilt	QPSK	50	50	1785M	1:1	0.051	1.222	0.062	
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 41 Head SAR

MEASUREMENT RESULTS																						
1 CC Uplink | 2 CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
		MHz	Ch.															(W/kg)		(W/kg)	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	25.0	23.99	-0.05	0	Right	Cheek	QPSK	1	99	1782M	1:1.58	0.061	1.262	0.077	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.0	23.11	0.03	1	Right	Cheek	QPSK	50	0	1782M	1:1.58	0.042	1.227	0.052	
2 CC Uplink - Power Class 3	PCC	2506.00	39750	Low	LTE Band 41	20	25.0	24.34	-0.17	0	Right	Cheek	QPSK	1	99	1782M	1:1.58	0.063	1.164	0.073	A8
	SCC	2525.80	39948											1	0						
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	25.0	23.99	0.15	0	Right	Tilt	QPSK	1	99	1782M	1:1.58	0.025	1.262	0.032	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.0	23.11	0.12	1	Right	Tilt	QPSK	50	0	1782M	1:1.58	0.020	1.227	0.025	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	25.0	23.99	0.19	0	Left	Cheek	QPSK	1	99	1782M	1:1.58	0.049	1.262	0.062	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.0	23.11	0.16	1	Left	Cheek	QPSK	50	0	1782M	1:1.58	0.032	1.227	0.039	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	25.0	23.99	0.17	0	Left	Tilt	QPSK	1	99	1782M	1:1.58	0.040	1.262	0.050	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.0	23.11	0.13	1	Left	Tilt	QPSK	50	0	1782M	1:1.58	0.028	1.227	0.034	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-9
DTS Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2462	11	802.11b	DSSS	22	16.0	15.89	-0.09	Right	Cheek	1	1786M	1	99.9	0.851	-	1.026	1.001	-	
2462	11	802.11b	DSSS	22	16.0	15.89	0.13	Right	Tilt	1	1786M	1	99.9	0.929	0.579	1.026	1.001	**0.595**	A9
2462	11	802.11b	DSSS	22	16.0	15.89	0.02	Left	Cheek	1	1786M	1	99.9	0.884	-	1.026	1.001	-	
2462	11	802.11b	DSSS	22	16.0	15.89	0.00	Left	Tilt	1	1786M	1	99.9	0.896	0.573	1.026	1.001	0.588	
2412	1	802.11b	DSSS	22	16.0	15.71	0.10	Right	Cheek	2	1786M	1	99.0	0.015	-	1.069	1.010	-	
2412	1	802.11b	DSSS	22	16.0	15.71	0.12	Right	Tilt	2	1786M	1	99.0	0.012	-	1.069	1.010	-	
2412	1	802.11b	DSSS	22	16.0	15.71	0.08	Left	Cheek	2	1786M	1	99.0	0.017	-	1.069	1.010	-	
2412	1	802.11b	DSSS	22	16.0	15.71	0.16	Left	Tilt	2	1786M	1	99.0	0.029	0.016	1.069	1.010	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
NII Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5290	58	802.11ac	OFDM	80	13.0	12.13	0.00	Right	Cheek	1	1785M	29.3	93.9	0.044	0.016	1.222	1.065	**0.021**	
5290	58	802.11ac	OFDM	80	13.0	12.13	0.19	Right	Tilt	1	1785M	29.3	93.9	0.023	-	1.222	1.065	-	
5290	58	802.11ac	OFDM	80	13.0	12.13	0.00	Left	Cheek	1	1785M	29.3	93.9	0.012	-	1.222	1.065	-	
5290	58	802.11ac	OFDM	80	13.0	12.13	0.00	Left	Tilt	1	1785M	29.3	93.9	0.008	-	1.222	1.065	-	
5290	58	802.11ac	OFDM	80	13.0	12.94	0.19	Right	Cheek	2	1785M	29.3	94.8	0.010	0.001	1.014	1.055	0.001	
5290	58	802.11ac	OFDM	80	13.0	12.94	0.19	Right	Tilt	2	1785M	29.3	94.8	0.007	-	1.014	1.055	-	
5290	58	802.11ac	OFDM	80	13.0	12.94	0.00	Left	Cheek	2	1785M	29.3	94.8	0.008	-	1.014	1.055	-	
5290	58	802.11ac	OFDM	80	13.0	12.94	0.00	Left	Tilt	2	1785M	29.3	94.8	0.004	-	1.014	1.055	-	
5690	138	802.11ac	OFDM	80	13.0	12.71	0.00	Right	Cheek	1	1785M	29.3	93.9	0.088	0.037	1.069	1.065	**0.042**	A10
5690	138	802.11ac	OFDM	80	13.0	12.71	0.00	Right	Tilt	1	1785M	29.3	93.9	0.038	-	1.069	1.065	-	
5690	138	802.11ac	OFDM	80	13.0	12.71	0.00	Left	Cheek	1	1785M	29.3	93.9	0.026	-	1.069	1.065	-	
5690	138	802.11ac	OFDM	80	13.0	12.71	0.00	Left	Tilt	1	1785M	29.3	93.9	0.024	-	1.069	1.065	-	
5530	106	802.11ac	OFDM	80	13.0	12.45	0.00	Right	Cheek	2	1785M	29.3	94.8	0.013	-	1.135	1.055	-	
5530	106	802.11ac	OFDM	80	13.0	12.45	0.19	Right	Tilt	2	1785M	29.3	94.8	0.021	0.006	1.135	1.055	0.007	
5530	106	802.11ac	OFDM	80	13.0	12.45	0.00	Left	Cheek	2	1785M	29.3	94.8	0.017	-	1.135	1.055	-	
5530	106	802.11ac	OFDM	80	13.0	12.45	0.19	Left	Tilt	2	1785M	29.3	94.8	0.017	-	1.135	1.055	-	
5775	155	802.11ac	OFDM	80	13.0	12.45	0.00	Right	Cheek	1	1785M	29.3	93.9	0.091	0.030	1.135	1.065	**0.036**	
5775	155	802.11ac	OFDM	80	13.0	12.45	0.00	Right	Tilt	1	1785M	29.3	93.9	0.039	-	1.135	1.065	-	
5775	155	802.11ac	OFDM	80	13.0	12.45	0.00	Left	Cheek	1	1785M	29.3	93.9	0.024	-	1.135	1.065	-	
5775	155	802.11ac	OFDM	80	13.0	12.45	0.00	Left	Tilt	1	1785M	29.3	93.9	0.018	-	1.135	1.065	-	
5775	155	802.11ac	OFDM	80	13.0	12.21	0.19	Right	Cheek	2	1785M	29.3	94.8	0.016	-	1.199	1.055	-	
5775	155	802.11ac	OFDM	80	13.0	12.21	0.00	Right	Tilt	2	1785M	29.3	94.8	0.018	0.005	1.199	1.055	0.006	
5775	155	802.11ac	OFDM	80	13.0	12.21	0.00	Left	Cheek	2	1785M	29.3	94.8	0.009	-	1.199	1.055	-	
5775	155	802.11ac	OFDM	80	13.0	12.21	0.00	Left	Tilt	2	1785M	29.3	94.8	0.015	-	1.199	1.055	-	
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
DSS Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2480.00	78	Bluetooth	FHSS	16.5	16.26	0.00	Right	Cheek	1790M	1	77.3	0.180	1.057	1.294	0.246	
2480.00	78	Bluetooth	FHSS	16.5	16.26	0.12	Right	Tilt	1790M	1	77.3	0.244	1.057	1.294	0.334	
2480.00	78	Bluetooth	FHSS	16.5	16.26	0.08	Left	Cheek	1790M	1	77.3	0.197	1.057	1.294	0.269	
2480.00	78	Bluetooth	FHSS	16.5	16.26	-0.19	Left	Tilt	1790M	1	77.3	0.246	1.057	1.294	**0.336**	A11
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**									**Head** **1.6 W/kg (mW/g)** averaged over 1 gram							

11.2 Standalone Body-Worn SAR Data

Table 11-12
GSM/UMTS Body-Worn SAR Data

MEASUREMENT RESULTS													
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	32.5	31.40	-0.01	15 mm	1775M	1:8.3	back	0.198	1.288	0.255	A12
1909.80	810	GSM 1900	GSM	30.0	28.70	-0.13	15 mm	1785M	1:8.3	back	0.184	1.349	0.248	A14
836.60	4183	UMTS 850	RMC	25.0	23.54	-0.02	15 mm	1775M	1:1	back	0.221	1.400	0.309	A16
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**					**Body** **1.6 W/kg (mW/g)** averaged over 1 gram									

Table 11-13
LTE Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	24.0	22.55	0.01	0	0430M	QPSK	1	49	15 mm	back	1:1	0.241	1.396	0.336	A18
707.50	23095	Mid	LTE Band 12	10	23.0	21.70	0.00	1	0430M	QPSK	25	12	15 mm	back	1:1	0.187	1.349	0.252	
782.00	23230	Mid	LTE Band 13	10	24.0	23.13	0.02	0	1782M	QPSK	1	49	15 mm	back	1:1	0.215	1.222	0.263	A20
782.00	23230	Mid	LTE Band 13	10	23.0	22.28	0.01	1	1782M	QPSK	25	0	15 mm	back	1:1	0.194	1.180	0.229	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.54	0.00	0	0329M	QPSK	1	0	15 mm	back	1:1	0.292	1.400	0.409	A22
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	21.61	0.00	1	0329M	QPSK	25	0	15 mm	back	1:1	0.243	1.377	0.335	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.46	0.00	0	1786M	QPSK	1	50	15 mm	back	1:1	0.370	1.271	**0.470**	A24
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.63	0.02	1	1786M	QPSK	50	50	15 mm	back	1:1	0.300	1.222	0.367	
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 11-14
LTE Band 41 Body-Worn SAR

MEASUREMENT RESULTS																						
1 CC Uplink | 2 CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
		MHz	Ch.															(W/kg)		(W/kg)	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	25.0	23.99	-0.03	0	1786M	QPSK	1	99	15 mm	back	1:1.58	0.349	1.262	0.440	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.0	23.11	-0.04	1	1786M	QPSK	50	0	15 mm	back	1:1.58	0.277	1.227	0.340	
2 CC Uplink - Power Class 3	PCC	2506.00	39750	Low	LTE Band 41	20	25.0	24.34	-0.07	0	1786M	QPSK	1	99	15 mm	back	1:1.58	0.374	1.164	0.435	A26
	SCC	2525.80	39948										1	0							
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-15
DTS Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2462	11	802.11b	DSSS	22	18.0	17.90	-0.05	15 mm	1	0329M	1	back	99.9	0.393	0.270	1.023	1.001	**0.276**	A28
2412	1	802.11b	DSSS	22	18.0	17.95	-0.08	15 mm	2	0329M	1	back	99.0	0.161	0.127	1.012	1.010	0.130	
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 11-16
NII Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5320	64	802.11a	OFDM	20	17.0	16.95	0.01	15 mm	1	1782M	6	back	99.0	0.290	0.132	1.012	1.010	0.135	
5300	60	802.11a	OFDM	20	17.0	16.83	-0.02	15 mm	2	1782M	6	back	98.9	0.459	0.200	1.040	1.011	0.210	
5620	124	802.11a	OFDM	20	17.0	16.75	0.10	15 mm	1	1782M	6	back	99.0	0.646	0.306	1.059	1.010	**0.327**	A30
5500	100	802.11a	OFDM	20	17.0	16.95	0.07	15 mm	2	1782M	6	back	98.9	0.290	0.141	1.012	1.011	0.144	
5825	165	802.11a	OFDM	20	17.0	16.65	0.03	15 mm	1	1782M	6	back	99.0	0.643	0.294	1.084	1.010	0.322	
5745	149	802.11a	OFDM	20	17.0	16.77	0.09	15 mm	2	1782M	6	back	98.9	0.407	0.194	1.054	1.011	0.207	
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 11-17
DSS Body-Worn SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2480	78	Bluetooth	FHSS	16.5	16.26	0.12	15 mm	1785M	1	back	77.3	0.009	1.057	1.294	**0.012**	A32
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 11-18
GPRS/UMTS Hotspot SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
824.20	128	GSM 850	GPRS	30.0	29.06	0.02	10 mm	1775M	3	1:2.76	back	0.675	1.242	0.838	A13
836.60	190	GSM 850	GPRS	30.0	29.23	0.11	10 mm	1775M	3	1:2.76	back	0.605	1.194	0.722	
848.80	251	GSM 850	GPRS	30.0	29.05	0.06	10 mm	1775M	3	1:2.76	back	0.641	1.245	0.798	
836.60	190	GSM 850	GPRS	30.0	29.23	-0.02	10 mm	1775M	3	1:2.76	front	0.453	1.194	0.541	
836.60	190	GSM 850	GPRS	30.0	29.23	0.01	10 mm	1775M	3	1:2.76	bottom	0.308	1.194	0.368	
836.60	190	GSM 850	GPRS	30.0	29.23	0.04	10 mm	1775M	3	1:2.76	right	0.056	1.194	0.067	
836.60	190	GSM 850	GPRS	30.0	29.23	0.06	10 mm	1775M	3	1:2.76	left	0.233	1.194	0.278	
1880.00	661	GSM 1900	GPRS	23.1	21.80	0.10	10 mm	1785M	4	1:2.076	back	0.246	1.349	0.332	
1880.00	661	GSM 1900	GPRS	23.1	21.80	-0.07	10 mm	1785M	4	1:2.076	front	0.237	1.349	0.320	
1850.20	512	GSM 1900	GPRS	23.1	21.48	0.06	10 mm	1785M	4	1:2.076	bottom	0.619	1.452	0.899	
1880.00	661	GSM 1900	GPRS	23.1	21.80	-0.10	10 mm	1785M	4	1:2.076	bottom	0.760	1.349	1.025	
1909.80	810	GSM 1900	GPRS	23.1	21.26	-0.10	10 mm	1785M	4	1:2.076	bottom	0.779	1.528	1.190	A15
1880.00	661	GSM 1900	GPRS	23.1	21.80	-0.10	10 mm	1785M	4	1:2.076	right	0.047	1.349	0.063	
1880.00	661	GSM 1900	GPRS	23.1	21.80	-0.12	10 mm	1785M	4	1:2.076	left	0.035	1.349	0.047	
826.40	4132	UMTS 850	RMC	25.0	23.62	0.05	10 mm	1775M	N/A	1:1	back	0.493	1.374	0.677	A17
836.60	4183	UMTS 850	RMC	25.0	23.54	0.01	10 mm	1775M	N/A	1:1	back	0.478	1.400	0.669	
846.60	4233	UMTS 850	RMC	25.0	23.53	0.04	10 mm	1775M	N/A	1:1	back	0.476	1.403	0.668	
836.60	4183	UMTS 850	RMC	25.0	23.54	0.02	10 mm	1775M	N/A	1:1	front	0.338	1.400	0.473	
836.60	4183	UMTS 850	RMC	25.0	23.54	0.00	10 mm	1775M	N/A	1:1	bottom	0.148	1.400	0.207	
836.60	4183	UMTS 850	RMC	25.0	23.54	0.06	10 mm	1775M	N/A	1:1	right	0.045	1.400	0.063	
836.60	4183	UMTS 850	RMC	25.0	23.54	0.17	10 mm	1775M	N/A	1:1	left	0.184	1.400	0.258	
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 Band 12 Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	24.0	22.55	-0.03	0	0430M	QPSK	1	49	10 mm	back	1:1	0.323	1.396	0.451	A19
707.50	23095	Mid	LTE Band 12	10	23.0	21.70	-0.01	1	0430M	QPSK	25	12	10 mm	back	1:1	0.253	1.349	0.341	
707.50	23095	Mid	LTE Band 12	10	24.0	22.55	-0.02	0	0430M	QPSK	1	49	10 mm	front	1:1	0.274	1.396	0.383	
707.50	23095	Mid	LTE Band 12	10	23.0	21.70	0.02	1	0430M	QPSK	25	12	10 mm	front	1:1	0.215	1.349	0.290	
707.50	23095	Mid	LTE Band 12	10	24.0	22.55	-0.05	0	0430M	QPSK	1	49	10 mm	bottom	1:1	0.213	1.396	0.297	
707.50	23095	Mid	LTE Band 12	10	23.0	21.70	-0.03	1	0430M	QPSK	25	12	10 mm	bottom	1:1	0.166	1.349	0.224	
707.50	23095	Mid	LTE Band 12	10	24.0	22.55	0.01	0	0430M	QPSK	1	49	10 mm	right	1:1	0.095	1.396	0.133	
707.50	23095	Mid	LTE Band 12	10	23.0	21.70	0.04	1	0430M	QPSK	25	12	10 mm	right	1:1	0.077	1.349	0.104	
707.50	23095	Mid	LTE Band 12	10	24.0	22.55	-0.01	0	0430M	QPSK	1	49	10 mm	left	1:1	0.249	1.396	0.348	
707.50	23095	Mid	LTE Band 12	10	23.0	21.70	0.00	1	0430M	QPSK	25	12	10 mm	left	1:1	0.196	1.349	0.264	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11-20
LTE Band 13 Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	24.0	23.13	-0.04	0	1782M	QPSK	1	49	10 mm	back	1:1	0.371	1.222	0.453	A21
782.00	23230	Mid	LTE Band 13	10	23.0	22.28	-0.02	1	1782M	QPSK	25	0	10 mm	back	1:1	0.315	1.180	0.372	
782.00	23230	Mid	LTE Band 13	10	24.0	23.13	-0.03	0	1782M	QPSK	1	49	10 mm	front	1:1	0.269	1.222	0.329	
782.00	23230	Mid	LTE Band 13	10	23.0	22.28	0.00	1	1782M	QPSK	25	0	10 mm	front	1:1	0.231	1.180	0.273	
782.00	23230	Mid	LTE Band 13	10	24.0	23.13	0.06	0	1782M	QPSK	1	49	10 mm	bottom	1:1	0.211	1.222	0.258	
782.00	23230	Mid	LTE Band 13	10	23.0	22.28	-0.02	1	1782M	QPSK	25	0	10 mm	bottom	1:1	0.182	1.180	0.215	
782.00	23230	Mid	LTE Band 13	10	24.0	23.13	0.01	0	1782M	QPSK	1	49	10 mm	right	1:1	0.068	1.222	0.083	
782.00	23230	Mid	LTE Band 13	10	23.0	22.28	0.02	1	1782M	QPSK	25	0	10 mm	right	1:1	0.065	1.180	0.077	
782.00	23230	Mid	LTE Band 13	10	24.0	23.13	0.06	0	1782M	QPSK	1	49	10 mm	left	1:1	0.187	1.222	0.229	
782.00	23230	Mid	LTE Band 13	10	23.0	22.28	0.01	1	1782M	QPSK	25	0	10 mm	left	1:1	0.162	1.180	0.191	
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
LTE Band 5 (Cell) Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.54	-0.02	0	0329M	QPSK	1	0	10 mm	back	1:1	0.603	1.400	0.844	A23
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	21.61	0.01	1	0329M	QPSK	25	0	10 mm	back	1:1	0.505	1.377	0.695	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	21.58	0.02	1	0329M	QPSK	50	0	10 mm	back	1:1	0.485	1.387	0.673	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.54	-0.03	0	0329M	QPSK	1	0	10 mm	front	1:1	0.479	1.400	0.671	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	21.61	-0.10	1	0329M	QPSK	25	0	10 mm	front	1:1	0.394	1.377	0.543	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.54	-0.05	0	0329M	QPSK	1	0	10 mm	bottom	1:1	0.367	1.400	0.514	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	21.61	-0.02	1	0329M	QPSK	25	0	10 mm	bottom	1:1	0.296	1.377	0.408	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.54	0.06	0	0329M	QPSK	1	0	10 mm	right	1:1	0.072	1.400	0.101	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	21.61	-0.03	1	0329M	QPSK	25	0	10 mm	right	1:1	0.058	1.377	0.080	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.54	-0.03	0	0329M	QPSK	1	0	10 mm	left	1:1	0.230	1.400	0.322	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	21.61	-0.02	1	0329M	QPSK	25	0	10 mm	left	1:1	0.184	1.377	0.253	
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
LTE Band 4 (AWS) Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.50	0.02	0	1786M	QPSK	1	50	10 mm	back	1:1	0.282	1.259	0.355	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.53	0.06	0	1786M	QPSK	50	50	10 mm	back	1:1	0.290	1.250	0.363	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.50	-0.04	0	1786M	QPSK	1	50	10 mm	front	1:1	0.257	1.259	0.324	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.53	-0.03	0	1786M	QPSK	50	50	10 mm	front	1:1	0.262	1.250	0.328	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.50	-0.06	0	1786M	QPSK	1	50	10 mm	bottom	1:1	0.568	1.259	0.715	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.53	-0.05	0	1786M	QPSK	50	50	10 mm	bottom	1:1	0.579	1.250	0.724	A25
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.50	-0.17	0	1786M	QPSK	1	50	10 mm	right	1:1	0.049	1.259	0.062	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.53	0.02	0	1786M	QPSK	50	50	10 mm	right	1:1	0.053	1.250	0.066	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.50	0.09	0	1786M	QPSK	1	50	10 mm	left	1:1	0.038	1.259	0.048	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.53	0.12	0	1786M	QPSK	50	50	10 mm	left	1:1	0.039	1.250	0.049	
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
LTE Band 41 Hotspot SAR

MEASUREMENT RESULTS																					
1 CC Uplink | 2 CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
		MHz	Ch.															(W/kg)		(W/kg)	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	21.95	0.18	0	1786M	QPSK	1	99	10 mm	back	1:1.58	0.327	1.216	0.398	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	22.02	-0.12	0	1786M	QPSK	50	0	10 mm	back	1:1.58	0.278	1.197	0.333	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	21.95	0.01	0	1786M	QPSK	1	99	10 mm	front	1:1.58	0.263	1.216	0.320	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	22.02	-0.01	0	1786M	QPSK	50	0	10 mm	front	1:1.58	0.243	1.197	0.291	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	21.95	-0.01	0	0493M	QPSK	1	99	10 mm	bottom	1:1.58	0.978	1.216	1.189	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	22.8	21.83	0.00	0	0493M	QPSK	1	0	10 mm	bottom	1:1.58	0.885	1.250	1.106	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	22.8	21.73	-0.01	0	0493M	QPSK	1	50	10 mm	bottom	1:1.58	0.758	1.279	0.969	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	22.8	21.76	-0.03	0	0493M	QPSK	1	50	10 mm	bottom	1:1.58	0.593	1.271	0.754	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.8	21.75	-0.09	0	0493M	QPSK	1	50	10 mm	bottom	1:1.58	0.696	1.274	0.887	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	22.02	-0.02	0	0493M	QPSK	50	0	10 mm	bottom	1:1.58	1.020	1.197	**1.221**	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	21.94	0.07	0	0493M	QPSK	50	50	10 mm	bottom	1:1.58	0.998	1.219	**1.217**	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	22.8	21.91	-0.03	0	0493M	QPSK	50	25	10 mm	bottom	1:1.58	0.882	1.227	1.082	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	22.8	21.84	0.00	0	0493M	QPSK	50	25	10 mm	bottom	1:1.58	0.776	1.247	0.968	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	22.8	21.91	-0.02	0	0493M	QPSK	50	25	10 mm	bottom	1:1.58	0.624	1.227	0.766	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.8	21.90	-0.02	0	0493M	QPSK	50	25	10 mm	bottom	1:1.58	0.726	1.230	0.893	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	21.94	0.03	0	0493M	QPSK	100	0	10 mm	bottom	1:1.58	0.979	1.219	1.193	
2 CC Uplink - Power Class 3	PCC	2506.00	39750	Low	LTE Band 41	20	22.8	22.30	0.04	0	0493M	QPSK	50	50	10 mm	bottom	1:1.58	1.040	1.122	1.167	A27
	SCC	2525.80	39948										50	0							
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	21.95	-0.02	0	1786M	QPSK	1	99	10 mm	right	1:1.58	0.097	1.216	0.118	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	22.02	0.04	0	1786M	QPSK	50	0	10 mm	right	1:1.58	0.095	1.197	0.114	
2 CC Uplink - Power Class 3	PCC	2506.00	39750	Low	LTE Band 41	20	22.8	22.30	-0.12	0	0493M	QPSK	50	50	10 mm	bottom	1:1.58	1.040	1.122	1.167	
	SCC	2525.80	39948										50	0							
1 CC Uplink - Power Class 3	N/A	2636.50	40155	Mid-High	LTE Band 41	20	22.8	21.76	-0.04	0	0493M	QPSK	1	50	10 mm	bottom	1:1.58	0.873	1.271	1.110	
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 11-24
WLAN Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2462	11	802.11b	DSSS	22	18.0	17.90	-0.16	10 mm	1	0329M	1	back	99.9	0.737	0.395	1.023	1.001	0.404	
2462	11	802.11b	DSSS	22	18.0	17.90	-0.13	10 mm	1	0329M	1	front	99.9	0.268	-	1.023	1.001	-	
2412	1	802.11b	DSSS	22	18.0	17.90	-0.15	10 mm	1	0329M	1	top	99.9	0.924	0.589	1.023	1.001	**0.603**	A29
2437	6	802.11b	DSSS	22	18.0	17.82	0.16	10 mm	1	0329M	1	top	99.9	0.775	0.489	1.042	1.001	0.510	
2462	11	802.11b	DSSS	22	18.0	17.90	0.14	10 mm	1	0329M	1	top	99.9	0.901	0.577	1.023	1.001	0.591	
2462	11	802.11b	DSSS	22	18.0	17.90	-0.10	10 mm	1	0329M	1	left	99.9	0.112	-	1.023	1.001	-	
2412	1	802.11b	DSSS	22	18.0	17.95	-0.16	10 mm	2	0329M	1	back	99.0	0.632	0.380	1.012	1.010	0.388	
2412	1	802.11b	DSSS	22	18.0	17.95	-0.16	10 mm	2	0329M	1	front	99.0	0.024	-	1.012	1.010	-	
2412	1	802.11b	DSSS	22	18.0	17.95	-0.16	10 mm	2	0329M	1	top	99.0	0.064	-	1.012	1.010	-	
2412	1	802.11b	DSSS	22	18.0	17.95	-0.16	10 mm	2	0329M	1	left	99.0	0.102	-	1.012	1.010	-	
5825	165	802.11a	OFDM	20	17.0	16.65	0.09	10 mm	1	1782M	6	back	99.0	0.962	0.434	1.084	1.010	**0.475**	
5825	165	802.11a	OFDM	20	17.0	16.65	0.19	10 mm	1	1782M	6	front	99.0	0.038	0.015	1.084	1.010	0.016	
5825	165	802.11a	OFDM	20	17.0	16.65	-0.12	10 mm	1	1782M	6	top	99.0	0.107	-	1.084	1.010	-	
5825	165	802.11a	OFDM	20	17.0	16.65	0.19	10 mm	1	1782M	6	left	99.0	0.289	0.121	1.084	1.010	0.132	
5745	149	802.11a	OFDM	20	17.0	16.77	-0.02	10 mm	2	1782M	6	back	98.9	0.634	0.320	1.054	1.011	0.341	
5745	149	802.11a	OFDM	20	17.0	16.77	0.12	10 mm	2	1782M	6	front	98.9	0.034	0.013	1.054	1.011	0.014	
5745	149	802.11a	OFDM	20	17.0	16.77	0.13	10 mm	2	1782M	6	top	98.9	0.172	-	1.054	1.011	-	
5745	149	802.11a	OFDM	20	17.0	16.77	0.16	10 mm	2	1782M	6	left	98.9	0.303	-	1.054	1.011	-	

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 11-25
WLAN MIMO Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY		Mode	Service	Bandwidth [MHz]	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]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															W/kg	(W/kg)			(W/kg)	
2457	10	802.11n	OFDM	20	18.0	17.93	18.0	17.28	-0.12	10 mm	MIMO	0329M	13	back	97.3	0.310	0.284	1.180	1.028	0.345	
2457	10	802.11n	OFDM	20	18.0	17.93	18.0	17.28	-0.19	10 mm	MIMO	0329M	13	front	97.3	0.160	-	1.180	1.028	-	
2457	10	802.11n	OFDM	20	18.0	17.93	18.0	17.28	-0.16	10 mm	MIMO	0329M	13	top	97.3	0.532	0.332	1.180	1.028	0.403	
2457	10	802.11n	OFDM	20	18.0	17.93	18.0	17.28	-0.14	10 mm	MIMO	0329M	13	left	97.3	0.095	-	1.180	1.028	-	
5745	149	802.11n	OFDM	20	17.0	16.83	17.0	16.26	0.15	10 mm	MIMO	1782M	13	back	97.6	2.085	1.010	1.186	1.025	1.228	A31
5785	157	802.11n	OFDM	20	17.0	16.45	17.0	16.50	0.16	10 mm	MIMO	1782M	13	back	97.6	2.018	0.998	1.135	1.025	1.161	
5825	165	802.11n	OFDM	20	17.0	16.86	17.0	16.35	0.13	10 mm	MIMO	1782M	13	back	97.6	2.100	0.911	1.161	1.025	1.084	
5825	165	802.11n	OFDM	20	17.0	16.86	17.0	16.35	0.13	10 mm	MIMO	1782M	13	front	97.6	0.158	0.055	1.161	1.025	0.065	
5825	165	802.11n	OFDM	20	17.0	16.86	17.0	16.35	0.12	10 mm	MIMO	1782M	13	top	97.6	0.347	-	1.161	1.025	-	
5825	165	802.11n	OFDM	20	17.0	16.86	17.0	16.35	0.15	10 mm	MIMO	1782M	13	left	97.6	0.715	0.321	1.161	1.025	0.382	
5745	149	802.11n	OFDM	20	17.0	16.83	17.0	16.26	0.18	10 mm	MIMO	1782M	13	back	97.6	1.908	0.858	1.186	1.025	1.043	

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

Note: To achieve the 21.0 dBm maximum allowed MIMO power shown in the documentation, for channel 10, each antenna transmits at a maximum allowed power of 18.0 dBm.
To achieve the 20.0 dBm maximum allowed MIMO power shown in the documentation, for channel 149, 157 ,165, each antenna transmits at a maximum allowed power of 17.0 dBm.
Note: Blue entry represents variability measurement.

Table 11-26
WLAN MIMO Hotspot SAR for Conditions with 2.4 GHz and 5 GHz WLAN SAR

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	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]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															W/kg	(W/kg)			(W/kg)	
2412	1	802.11n	OFDM	22	16.0	15.95	16.0	15.69	-0.15	10 mm	MIMO	0329M	13	back	97.3	0.226	0.142	1.074	1.028	0.157	
2412	1	802.11n	OFDM	22	16.0	15.95	16.0	15.69	0.17	10 mm	MIMO	0329M	13	front	97.3	0.117	-	1.074	1.028	-	
2412	1	802.11n	OFDM	22	16.0	15.95	16.0	15.69	0.19	10 mm	MIMO	0329M	13	top	97.3	0.408	0.243	1.074	1.028	0.268	
2412	1	802.11n	OFDM	22	16.0	15.95	16.0	15.69	-0.19	10 mm	MIMO	0329M	13	left	97.3	0.101	-	1.074	1.028	-	
5775	155	802.11ac	OFDM	80	13.0	12.45	13.0	12.21	0.11	10 mm	MIMO	1782M	58.5	back	91.0	0.641	0.307	1.199	1.099	0.405	
5775	155	802.11ac	OFDM	80	13.0	12.45	13.0	12.21	0.19	10 mm	MIMO	1782M	58.5	front	91.0	0.087	0.009	1.199	1.099	0.012	
5775	155	802.11ac	OFDM	80	13.0	12.45	13.0	12.21	0.19	10 mm	MIMO	1782M	58.5	top	91.0	0.114	0.040	1.199	1.099	0.053	
5775	155	802.11ac	OFDM	80	13.0	12.45	13.0	12.21	0.03	10 mm	MIMO	1782M	58.5	left	91.0	0.247	0.109	1.199	1.099	0.144	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																Body 1.6 W/kg (mW/g) averaged over 1 gram					

DTS and NII MIMO were additionally evaluated at the maximum allowed output power during operations with Simultaneous 2.4 GHz and 5 GHz WLAN. 2.4 GHz WIFI was not transmitting during NII MIMO evaluations and 5 GHz WIFI was not transmitting during DTS MIMO evaluations.

Table 11-27
DSS Hotspot SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2480	78	Bluetooth	FHSS	16.5	16.26	0.16	10 mm	1785M	1	back	77.3	0.019	1.057	1.294	0.026	
2480	78	Bluetooth	FHSS	16.5	16.26	0.16	10 mm	1785M	1	front	77.3	0.023	1.057	1.294	0.031	
2480	78	Bluetooth	FHSS	16.5	16.26	0.06	10 mm	1785M	1	top	77.3	0.077	1.057	1.294	**0.105**	A33
2480	78	Bluetooth	FHSS	16.5	16.26	-0.14	10 mm	1785M	1	left	77.3	0.007	1.057	1.294	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								

11.4 Standalone Phablet SAR Data

Table 11-28
GPRS Phablet SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1909.80	810	GSM 1900	GPRS	29.0	28.65	-0.08	10 mm	1785M	2	1:4.15	back	0.493	1.084	0.534	
1909.80	810	GSM 1900	GPRS	29.0	28.65	-0.04	6 mm	1785M	2	1:4.15	front	0.660	1.084	0.715	
1909.80	810	GSM 1900	GPRS	29.0	28.65	-0.09	13 mm	1785M	2	1:4.15	bottom	0.689	1.084	0.747	
1909.80	810	GSM 1900	GPRS	29.0	28.65	-0.19	0 mm	1785M	2	1:4.15	right	0.322	1.084	0.349	
1909.80	810	GSM 1900	GPRS	29.0	28.65	0.02	0 mm	1785M	2	1:4.15	left	0.226	1.084	0.245	
1880.00	661	GSM 1900	GPRS	23.1	21.80	-0.14	0 mm	1785M	4	1:2.076	back	1.290	1.349	1.740	
1880.00	661	GSM 1900	GPRS	23.1	21.80	0.08	0 mm	1785M	4	1:2.076	front	1.190	1.349	1.605	
1850.20	512	GSM 1900	GPRS	23.1	21.48	-0.04	0 mm	1785M	4	1:2.076	bottom	1.420	1.452	2.062	
1880.00	661	GSM 1900	GPRS	23.1	21.80	0.05	0 mm	1785M	4	1:2.076	bottom	1.440	1.349	1.943	A34
1909.80	810	GSM 1900	GPRS	23.1	21.26	0.00	0 mm	1785M	4	1:2.076	bottom	1.440	1.528	2.200	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Phablet** **4.0 W/kg (mW/g)** averaged over 10 grams								

Table 11-29
LTE B4 Phablet SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.46	0.00	0	1786M	QPSK	1	50	10 mm	back	1:1	0.398	1.271	0.506	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.63	0.03	1	1786M	QPSK	50	50	10 mm	back	1:1	0.321	1.222	0.392	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.46	0.06	0	1786M	QPSK	1	50	6 mm	front	1:1	0.602	1.271	0.765	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.63	0.07	1	1786M	QPSK	50	50	6 mm	front	1:1	0.486	1.222	0.594	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.46	-0.07	0	1786M	QPSK	1	50	13 mm	bottom	1:1	0.509	1.271	0.647	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.63	-0.08	1	1786M	QPSK	50	50	13 mm	bottom	1:1	0.415	1.222	0.507	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.46	0.01	0	1786M	QPSK	1	50	0 mm	right	1:1	0.268	1.271	0.341	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.63	0.02	1	1786M	QPSK	50	50	0 mm	right	1:1	0.218	1.222	0.266	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	22.46	-0.08	0	1786M	QPSK	1	50	0 mm	left	1:1	0.172	1.271	0.219	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.63	0.12	1	1786M	QPSK	50	50	0 mm	left	1:1	0.145	1.222	0.177	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.50	-0.06	0	0419M	QPSK	1	50	0 mm	back	1:1	1.040	1.259	1.309	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.53	-0.05	0	0419M	QPSK	50	50	0 mm	back	1:1	1.090	1.250	1.363	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.50	-0.01	0	0419M	QPSK	1	50	0 mm	front	1:1	0.812	1.259	1.022	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.53	0.03	0	0419M	QPSK	50	50	0 mm	front	1:1	0.846	1.250	1.058	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.50	0.01	0	0419M	QPSK	1	50	0 mm	bottom	1:1	1.410	1.259	1.775	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	18.53	-0.01	0	0419M	QPSK	50	50	0 mm	bottom	1:1	1.500	1.250	1.875	A35
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 11-30
LTE B41 Phablet SAR

MEASUREMENT RESULTS																						
1 CC Uplink | 2 CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
		MHz	Ch.															(W/kg)		(W/kg)	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	25.0	23.99	-0.01	0	1786M	QPSK	1	99	10 mm	back	1:1.58	0.301	1.262	0.380	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.0	23.11	-0.01	1	1786M	QPSK	50	0	10 mm	back	1:1.58	0.249	1.227	0.306	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	25.0	23.99	-0.04	0	1786M	QPSK	1	99	6 mm	front	1:1.58	0.446	1.262	0.563	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.0	23.11	-0.01	1	1786M	QPSK	50	0	6 mm	front	1:1.58	0.377	1.227	0.463	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	25.0	23.99	-0.04	0	1786M	QPSK	1	99	13 mm	bottom	1:1.58	0.452	1.262	0.570	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.0	23.11	-0.01	1	1786M	QPSK	50	0	13 mm	bottom	1:1.58	0.375	1.227	0.460	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	25.0	23.99	-0.03	0	1786M	QPSK	1	99	0 mm	right	1:1.58	0.567	1.262	0.716	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.0	23.11	-0.03	1	1786M	QPSK	50	0	0 mm	right	1:1.58	0.499	1.227	0.612	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	21.95	0.08	0	1786M	QPSK	1	99	0 mm	back	1:1.58	1.280	1.216	1.556	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	22.8	21.83	0.08	0	1786M	QPSK	1	0	0 mm	back	1:1.58	1.220	1.250	1.525	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	22.8	21.73	0.09	0	1786M	QPSK	1	50	0 mm	back	1:1.58	1.260	1.279	1.612	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	22.8	21.76	0.06	0	1786M	QPSK	1	50	0 mm	back	1:1.58	1.490	1.271	1.894	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.8	21.75	0.03	0	1786M	QPSK	1	50	0 mm	back	1:1.58	1.410	1.274	1.796	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	22.02	0.10	0	1786M	QPSK	50	0	0 mm	back	1:1.58	1.420	1.197	1.700	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	22.8	21.91	0.04	0	1786M	QPSK	50	25	0 mm	back	1:1.58	1.230	1.227	1.509	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	22.8	21.84	0.12	0	1786M	QPSK	50	25	0 mm	back	1:1.58	1.310	1.247	1.634	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	22.8	21.91	0.13	0	1786M	QPSK	50	25	0 mm	back	1:1.58	1.540	1.227	1.890	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.8	21.90	0.06	0	1786M	QPSK	50	25	0 mm	back	1:1.58	1.450	1.230	1.784	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	21.94	0.08	0	1786M	QPSK	100	0	0 mm	back	1:1.58	1.160	1.219	1.414	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	21.95	-0.10	0	1786M	QPSK	1	99	0 mm	front	1:1.58	1.020	1.216	1.240	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	22.02	-0.08	0	1786M	QPSK	50	0	0 mm	front	1:1.58	1.030	1.197	1.233	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	21.95	0.04	0	1786M	QPSK	1	99	0 mm	bottom	1:1.58	1.740	1.216	2.116	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	22.8	21.83	0.10	0	1786M	QPSK	1	0	0 mm	bottom	1:1.58	1.660	1.250	2.075	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	22.8	21.73	0.10	0	1786M	QPSK	1	50	0 mm	bottom	1:1.58	1.740	1.279	2.225	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	22.8	21.55	0.12	0	1786M	QPSK	1	0	0 mm	bottom	1:1.58	1.800	1.334	2.401	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	22.8	21.76	0.10	0	1786M	QPSK	1	50	0 mm	bottom	1:1.58	1.860	1.271	2.364	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.8	21.75	0.20	0	1786M	QPSK	1	50	0 mm	bottom	1:1.58	1.780	1.274	2.268	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	22.02	0.07	0	1786M	QPSK	50	0	0 mm	bottom	1:1.58	1.800	1.197	2.155	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	22.8	21.91	0.08	0	1786M	QPSK	50	25	0 mm	bottom	1:1.58	1.700	1.227	2.086	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	22.8	21.84	0.15	0	1786M	QPSK	50	25	0 mm	bottom	1:1.58	1.810	1.247	2.257	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	22.8	21.91	0.10	0	1786M	QPSK	50	25	0 mm	bottom	1:1.58	1.900	1.227	2.331	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.8	21.90	0.03	0	1786M	QPSK	50	25	0 mm	bottom	1:1.58	1.830	1.230	2.251	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.8	21.94	0.08	0	1786M	QPSK	100	0	0 mm	bottom	1:1.58	1.730	1.219	2.109	
2 CC Uplink - Power Class 3	PCC	2636.50	41055	Mid-High	LTE Band 41	20	22.8	21.90	-0.12	0	1786M	QPSK	1	0	0 mm	bottom	1:1.58	1.980	1.230	**2.435**	A36
	SCC	2616.70	40857										1	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 11-31
WLAN Phablet SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5320	64	802.11a	OFDM	20	17.0	16.95	-0.19	0 mm	1	1782M	6	back	99.0	2.622	0.371	1.012	1.010	0.379	
5320	64	802.11a	OFDM	20	17.0	16.95	0.00	0 mm	1	1782M	6	front	99.0	0.983	-	1.012	1.010	-	
5320	64	802.11a	OFDM	20	17.0	16.95	0.12	0 mm	1	1782M	6	top	99.0	0.615	-	1.012	1.010	-	
5320	64	802.11a	OFDM	20	17.0	16.95	0.00	0 mm	1	1782M	6	left	99.0	7.919	0.488	1.012	1.010	0.499	
5300	60	802.11a	OFDM	20	17.0	16.83	0.19	0 mm	2	1782M	6	back	98.9	10.549	0.912	1.040	1.011	**0.959**	
5300	60	802.11a	OFDM	20	17.0	16.83	0.00	0 mm	2	1782M	6	front	98.9	0.213	-	1.040	1.011	-	
5300	60	802.11a	OFDM	20	17.0	16.83	0.13	0 mm	2	1782M	6	top	98.9	0.393	-	1.040	1.011	-	
5300	60	802.11a	OFDM	20	17.0	16.83	0.00	0 mm	2	1782M	6	left	98.9	1.070	0.131	1.040	1.011	0.138	
5620	124	802.11a	OFDM	20	17.0	16.75	0.17	0 mm	1	1782M	6	back	99.0	3.871	0.544	1.059	1.010	0.582	
5620	124	802.11a	OFDM	20	17.0	16.75	0.00	0 mm	1	1782M	6	front	99.0	1.123	-	1.059	1.010	-	
5620	124	802.11a	OFDM	20	17.0	16.75	0.12	0 mm	1	1782M	6	top	99.0	1.110	-	1.059	1.010	-	
5620	124	802.11a	OFDM	20	17.0	16.75	0.13	0 mm	1	1782M	6	left	99.0	13.574	0.849	1.059	1.010	0.908	
5500	100	802.11a	OFDM	20	17.0	16.95	-0.16	0 mm	2	1782M	6	back	98.9	3.866	0.512	1.012	1.011	0.524	
5500	100	802.11a	OFDM	20	17.0	16.95	0.00	0 mm	2	1782M	6	front	98.9	0.312	-	1.012	1.011	-	
5500	100	802.11a	OFDM	20	17.0	16.95	0.17	0 mm	2	1782M	6	top	98.9	1.541	-	1.012	1.011	-	
5500	100	802.11a	OFDM	20	17.0	16.95	0.00	0 mm	2	1782M	6	left	98.9	1.301	0.119	1.012	1.011	0.122	
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 11-32
WLAN MIMO Phablet SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	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]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.															W/kg	(W/kg)			(W/kg)	
5825	165	802.11n	OFDM	20	17.0	16.86	17.0	16.35	0.00	0 mm	MIMO	1782M	13	back	97.6	8.552	1.140	1.161	1.025	1.357	A37
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**																**Phablet** **4.0 W/kg (mW/g)** averaged over 10 grams					

To achieve the 20.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 17.0 dBm.

11.5 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 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 13 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).
10. Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the 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. Additional SAR tests for phablet SAR were evaluated per KDB 616217 Section 6 (See Section 6.9 for more information).
11. This device uses Qualcomm Smart Transmit for 2G/3G/4G 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).
12. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds below.

GSM Test Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
3. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

UMTS Notes:

1. UMTS mode was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. AMR and HSPA SAR was not required per the 3G Test Reduction Procedure in KDB Publication 941225 D01v03r01.
2. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

LTE Notes:

1. LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r04. The general test procedures used for testing can be found in Section 8.5.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

4. Per FCC KDB Publication 447498 D01v06, when the reported LTE Band 41 SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for 1g evaluations, testing at the other channels was required for such test configurations.
5. TDD LTE was tested per the guidance provided in FCC KDB Publication 941225 D05v02r04. Testing was performed using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.
6. Per KDB Publication 941225 D05Av01r02, SAR for downlink only LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.
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.

WLAN Notes:

1. For held-to-ear, hotspot, and phablet operations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg for 1g evaluations, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n/ax) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 8.6.5 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg for 1g evaluations. See Section 8.6.6 for more information.
4. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D01v06 by either evaluating the sum of the 1g SAR values of each antenna transmitting independently or making a SAR measurement with both antennas transmitting simultaneously. Please see Section 12 for complete analysis.
5. When the maximum reported 1g averaged SAR is ≤0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg for 1g evaluations or all test channels were measured.
6. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated EMC test reports.
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 100% transmission duty factor to determine compliance. See Section 9.5 for the time domain plot and calculation for the duty factor of the device.
2. Head and Hotspot Bluetooth SAR were evaluated for BT BR tethering applications.

12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

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

12.2 Simultaneous Transmission Procedures

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

Per FCC KDB Publication 941225 D06v02r01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR ("-").

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

12.3 Head SAR Simultaneous Transmission Analysis

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM 850	0.107	0.595	0.017	0.702	0.124	0.719
	GSM 1900	0.057	0.595	0.017	0.652	0.074	0.669
	UMTS 850	0.199	0.595	0.017	0.794	0.216	**0.811**
	LTE Band 12	0.138	0.595	0.017	0.733	0.155	0.750
	LTE Band 13	0.141	0.595	0.017	0.736	0.158	0.753
	LTE Band 5 (Cell)	0.144	0.595	0.017	0.739	0.161	0.756
	LTE Band 4 (AWS)	0.092	0.595	0.017	0.687	0.109	0.704
	LTE Band 41	0.077	0.595	0.017	0.672	0.094	0.689

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM 850	0.107	0.042	0.007	0.149	0.114	0.156
	GSM 1900	0.057	0.042	0.007	0.099	0.064	0.106
	UMTS 850	0.199	0.042	0.007	0.241	0.206	**0.248**
	LTE Band 12	0.138	0.042	0.007	0.180	0.145	0.187
	LTE Band 13	0.141	0.042	0.007	0.183	0.148	0.190
	LTE Band 5 (Cell)	0.144	0.042	0.007	0.186	0.151	0.193
	LTE Band 4 (AWS)	0.092	0.042	0.007	0.134	0.099	0.141
	LTE Band 41	0.077	0.042	0.007	0.119	0.084	0.126

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	5	1+2+3+4+5
Head SAR	GSM 850	0.107	0.595	0.017	0.042	0.007	0.768
	GSM 1900	0.057	0.595	0.017	0.042	0.007	0.718
	UMTS 850	0.199	0.595	0.017	0.042	0.007	**0.860**
	LTE Band 12	0.138	0.595	0.017	0.042	0.007	0.799
	LTE Band 13	0.141	0.595	0.017	0.042	0.007	0.802
	LTE Band 5 (Cell)	0.144	0.595	0.017	0.042	0.007	0.805
	LTE Band 4 (AWS)	0.092	0.595	0.017	0.042	0.007	0.753
	LTE Band 41	0.077	0.595	0.017	0.042	0.007	0.738

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.107	0.336	0.443
	GSM 1900	0.057	0.336	0.393
	UMTS 850	0.199	0.336	**0.535**
	LTE Band 12	0.138	0.336	0.474
	LTE Band 13	0.141	0.336	0.477
	LTE Band 5 (Cell)	0.144	0.336	0.480
	LTE Band 4 (AWS)	0.092	0.336	0.428
	LTE Band 41	0.077	0.336	0.413

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Head SAR	GSM 850	0.107	0.336	0.042	0.007	0.485	0.450	0.492
	GSM 1900	0.057	0.336	0.042	0.007	0.435	0.400	0.442
	UMTS 850	0.199	0.336	0.042	0.007	0.577	0.542	**0.584**
	LTE Band 12	0.138	0.336	0.042	0.007	0.516	0.481	0.523
	LTE Band 13	0.141	0.336	0.042	0.007	0.519	0.484	0.526
	LTE Band 5 (Cell)	0.144	0.336	0.042	0.007	0.522	0.487	0.529
	LTE Band 4 (AWS)	0.092	0.336	0.042	0.007	0.470	0.435	0.477
	LTE Band 41	0.077	0.336	0.042	0.007	0.455	0.420	0.462

12.4 Body-Worn Simultaneous Transmission Analysis

Table 12-6
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn	GSM 850	0.255	0.276	0.130	0.531	0.385	0.661
	GSM 1900	0.248	0.276	0.130	0.524	0.378	0.654
	UMTS 850	0.309	0.276	0.130	0.585	0.439	0.715
	LTE Band 12	0.336	0.276	0.130	0.612	0.466	0.742
	LTE Band 13	0.263	0.276	0.130	0.539	0.393	0.669
	LTE Band 5 (Cell)	0.409	0.276	0.130	0.685	0.539	0.815
	LTE Band 4 (AWS)	0.470	0.276	0.130	0.746	0.600	**0.876**
	LTE Band 41	0.440	0.276	0.130	0.716	0.570	0.846

Table 12-7
Simultaneous Transmission Scenario with 5 GHz WLAN (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn	GSM 850	0.255	0.327	0.210	0.582	0.465	0.792
	GSM 1900	0.248	0.327	0.210	0.575	0.458	0.785
	UMTS 850	0.309	0.327	0.210	0.636	0.519	0.846
	LTE Band 12	0.336	0.327	0.210	0.663	0.546	0.873
	LTE Band 13	0.263	0.327	0.210	0.590	0.473	0.800
	LTE Band 5 (Cell)	0.409	0.327	0.210	0.736	0.619	0.946
	LTE Band 4 (AWS)	0.470	0.327	0.210	0.797	0.680	**1.007**
	LTE Band 41	0.440	0.327	0.210	0.767	0.650	0.977

Table 12-8
Simultaneous Transmission Scenario with 2.4 GHz WLAN MIMO and 5 GHz WLAN MIMO (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	5	1+2+3+4+5
Body-Worn	GSM 850	0.255	0.276	0.130	0.327	0.210	1.198
	GSM 1900	0.248	0.276	0.130	0.327	0.210	1.191
	UMTS 850	0.309	0.276	0.130	0.327	0.210	1.252
	LTE Band 12	0.336	0.276	0.130	0.327	0.210	1.279
	LTE Band 13	0.263	0.276	0.130	0.327	0.210	1.206
	LTE Band 5 (Cell)	0.409	0.276	0.130	0.327	0.210	1.352
	LTE Band 4 (AWS)	0.470	0.276	0.130	0.327	0.210	**1.413**
	LTE Band 41	0.440	0.276	0.130	0.327	0.210	1.383

Table 12-9
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body-Worn	GSM 850	0.255	0.012	0.267
	GSM 1900	0.248	0.012	0.260
	UMTS 850	0.309	0.012	0.321
	LTE Band 12	0.336	0.012	0.348
	LTE Band 13	0.263	0.012	0.275
	LTE Band 5 (Cell)	0.409	0.012	0.421
	LTE Band 4 (AWS)	0.470	0.012	**0.482**
	LTE Band 41	0.440	0.012	0.452

Table 12-10
Simultaneous Transmission Scenario with Bluetooth and 5 GHz WLAN (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Body-Worn	GSM 850	0.255	0.012	0.327	0.210	0.594	0.477	0.804
	GSM 1900	0.248	0.012	0.327	0.210	0.587	0.470	0.797
	UMTS 850	0.309	0.012	0.327	0.210	0.648	0.531	0.858
	LTE Band 12	0.336	0.012	0.327	0.210	0.675	0.558	0.885
	LTE Band 13	0.263	0.012	0.327	0.210	0.602	0.485	0.812
	LTE Band 5 (Cell)	0.409	0.012	0.327	0.210	0.748	0.631	0.958
	LTE Band 4 (AWS)	0.470	0.012	0.327	0.210	0.809	0.692	**1.019**
	LTE Band 41	0.440	0.012	0.327	0.210	0.779	0.662	0.989

12.5 Hotspot SAR Simultaneous Transmission Analysis

Table 12-11
Simultaneous Transmission Scenario with 2.4 GHz WLAN SISO (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Hotspot SAR	GPRS 850	0.838	0.603	0.388	1.441	1.226
	GPRS 1900	1.190	0.603	0.388	See Table Below	**1.578**
	UMTS 850	0.677	0.603	0.388	1.280	1.065
	LTE Band 12	0.451	0.603	0.388	1.054	0.839
	LTE Band 13	0.453	0.603	0.388	1.056	0.841
	LTE Band 5 (Cell)	0.844	0.603	0.388	1.447	1.232
	LTE Band 4 (AWS)	0.724	0.603	0.388	1.327	1.112
	LTE Band 41	1.221	0.603	0.388	See Table Below	See Table Below

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	0.332	0.404	0.736
	Front	0.320	0.603*	0.923
	Top	-	0.603	0.603
	Bottom	1.190	-	**1.190**
	Right	0.063	-	0.063
	Left	0.047	0.603*	0.650

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Hotspot SAR	Back	0.398	0.404	0.388	0.802	0.786
	Front	0.320	0.603*	0.388*	0.923	0.708
	Top	-	0.603	0.388*	0.603	0.388
	Bottom	1.221	-	-	**1.221**	**1.221**
	Right	0.118	-	-	0.118	0.118
	Left	-	0.603*	0.388*	0.603	0.388

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.838	0.403	1.241
	GPRS 1900	1.190	0.403	**1.593**
	UMTS 850	0.677	0.403	1.080
	LTE Band 12	0.451	0.403	0.854
	LTE Band 13	0.453	0.403	0.856
	LTE Band 5 (Cell)	0.844	0.403	1.247
	LTE Band 4 (AWS)	0.724	0.403	1.127
	LTE Band 41	1.221	0.403	See Table Below

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	2.4 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	0.398	0.345	0.743
	Front	0.320	0.403*	0.723
	Top	-	0.403	0.403
	Bottom	1.221	-	**1.221**
	Right	0.118	-	0.118
	Left	-	0.403*	0.403

Table 12-13
Simultaneous Transmission Scenario with 5 GHz WLAN SISO (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Hotspot SAR	GPRS 850	0.838	0.475	0.341	1.313	1.179
	GPRS 1900	1.190	0.475	0.341	See Table Below	1.531
	UMTS 850	0.677	0.475	0.341	1.152	1.018
	LTE Band 12	0.451	0.475	0.341	0.926	0.792
	LTE Band 13	0.453	0.475	0.341	0.928	0.794
	LTE Band 5 (Cell)	0.844	0.475	0.341	1.319	1.185
	LTE Band 4 (AWS)	0.724	0.475	0.341	1.199	1.065
	LTE Band 41	1.221	0.475	0.341	See Table Below	**1.562**

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	0.332	0.475	0.807
	Front	0.320	0.016	0.336
	Top	-	0.475*	0.475
	Bottom	1.190	-	**1.190**
	Right	0.063	-	0.063
	Left	0.047	0.132	0.179

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	0.398	0.475	0.873
	Front	0.320	0.016	0.336
	Top	-	0.475*	0.475
	Bottom	1.221	-	**1.221**
	Right	0.118	-	0.118
	Left	-	0.132	0.132

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

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Hotspot SAR	Back	0.838	1.228	See Note 1	0.02
	Front	0.541	0.065	0.606	N/A
	Top	-	1.228*	**1.228**	N/A
	Bottom	0.368	-	0.368	N/A
	Right	0.067	-	0.067	N/A
	Left	0.278	0.382	0.660	N/A

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	0.332	1.228	**1.560**
	Front	0.320	0.065	0.385
	Top	-	1.228*	1.228
	Bottom	1.190	-	1.190
	Right	0.063	-	0.063
	Left	0.047	0.382	0.429

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Hotspot SAR	Back	0.677	1.228	See Note 1	0.02
	Front	0.473	0.065	0.538	N/A
	Top	-	1.228*	**1.228**	N/A
	Bottom	0.207	-	0.207	N/A
	Right	0.063	-	0.063	N/A
	Left	0.258	0.382	0.640	N/A

Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Hotspot SAR	Back	0.451	1.228	See Note 1	0.01
	Front	0.383	0.065	0.448	N/A
	Top	-	1.228*	**1.228**	N/A
	Bottom	0.297	-	0.297	N/A
	Right	0.133	-	0.133	N/A
	Left	0.348	0.382	0.730	N/A

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Hotspot SAR	Back	0.453	1.228	See Note 1	0.01
	Front	0.329	0.065	0.394	N/A
	Top	-	1.228*	**1.228**	N/A
	Bottom	0.258	-	0.258	N/A
	Right	0.083	-	0.083	N/A
	Left	0.229	0.382	0.611	N/A

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Hotspot SAR	Back	0.844	1.228	See Note 1	0.02
	Front	0.671	0.065	0.736	N/A
	Top	-	1.228*	**1.228**	N/A
	Bottom	0.514	-	0.514	N/A
	Right	0.101	-	0.101	N/A
	Left	0.322	0.382	0.704	N/A

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	0.363	1.228	**1.591**
	Front	0.328	0.065	0.393
	Top	-	1.228*	1.228
	Bottom	0.724	-	0.724
	Right	0.066	-	0.066
	Left	0.049	0.382	0.431

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Hotspot SAR	Back	0.398	1.228	See Note 1	0.01
	Front	0.320	0.065	0.385	N/A
	Top	-	1.228*	**1.228**	N/A
	Bottom	1.221	-	1.221	N/A
	Right	0.118	-	0.118	N/A
	Left	-	0.382	0.382	N/A

Note 1 - No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was not greater than 0.04 per FCC KDB 447498 D01v06. See Section 12.7 for detailed SPLS ratio analysis.

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN MIMO at 18 dBm SAR (W/kg)	5 GHz WLAN MIMO at 15 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	GPRS 850	0.838	0.268	0.405	1.511
	GPRS 1900	1.190	0.268	0.405	See Table Below
	UMTS 850	0.677	0.268	0.405	1.350
	LTE Band 12	0.451	0.268	0.405	1.124
	LTE Band 13	0.453	0.268	0.405	1.126
	LTE Band 5 (Cell)	0.844	0.268	0.405	**1.517**
	LTE Band 4 (AWS)	0.724	0.268	0.405	1.397
	LTE Band 41	1.221	0.268	0.405	See Table Below

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN MIMO at 18 dBm SAR (W/kg)	5 GHz WLAN MIMO at 15 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.332	0.157	0.405	0.894
	Front	0.320	0.268*	0.012	0.600
	Top	-	0.268	0.053	0.321
	Bottom	1.190	-	-	**1.190**
	Right	0.063	-	-	0.063
	Left	0.047	0.268*	0.144	0.459

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	2.4 GHz WLAN MIMO at 18 dBm SAR (W/kg)	5 GHz WLAN MIMO at 15 dBm SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.398	0.157	0.405	0.960
	Front	0.320	0.268*	0.012	0.600
	Top	-	0.268	0.053	0.321
	Bottom	1.221	-	-	**1.221**
	Right	0.118	-	-	0.118
	Left	-	0.268*	0.144	0.412

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.838	0.105	0.943
	GPRS 1900	1.190	0.105	1.295
	UMTS 850	0.677	0.105	0.782
	LTE Band 12	0.451	0.105	0.556
	LTE Band 13	0.453	0.105	0.558
	LTE Band 5 (Cell)	0.844	0.105	0.949
	LTE Band 4 (AWS)	0.724	0.105	0.829
	LTE Band 41	1.221	0.105	**1.326**

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	4	1+2+3	1+2+4
Hotspot SAR	GPRS 850	0.838	0.105	0.475	0.341	1.418	1.284
	GPRS 1900	1.190	0.105	0.475	0.341	See Table Below	See Table Below
	UMTS 850	0.677	0.105	0.475	0.341	1.257	1.123
	LTE Band 12	0.451	0.105	0.475	0.341	1.031	0.897
	LTE Band 13	0.453	0.105	0.475	0.341	1.033	0.899
	LTE Band 5 (Cell)	0.844	0.105	0.475	0.341	**1.424**	1.290
	LTE Band 4 (AWS)	0.724	0.105	0.475	0.341	1.304	1.170
	LTE Band 41	1.221	0.105	0.475	0.341	See Table Below	See Table Below

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	4	1+2+3	1+2+4
Hotspot SAR	Back	0.332	0.026	0.475	0.341	0.833	0.699
	Front	0.320	0.031	0.016	0.014	0.367	0.365
	Top	-	0.105	0.475*	0.341*	0.580	0.446
	Bottom	1.190	-	-	-	**1.190**	**1.190**
	Right	0.063	-	-	-	0.063	0.063
	Left	0.047	0.010	0.132	0.341*	0.189	0.398

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	4	1+2+3	1+2+4
Hotspot SAR	Back	0.398	0.026	0.475	0.341	0.899	0.765
	Front	0.320	0.031	0.016	0.014	0.367	0.365
	Top	-	0.105	0.475*	0.341*	0.580	0.921
	Bottom	1.221	-	-	-	**1.221**	**1.221**
	Right	0.118	-	-	-	0.118	0.118
	Left	-	0.010	0.132	0.341*	0.142	0.483

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

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Hotspot SAR	Back	0.838	0.026	1.228	See Note 1	0.00	0.02	0.03
	Front	0.541	0.031	0.065	0.637	N/A	N/A	N/A
	Top	-	0.105	1.228*	**1.333**	N/A	N/A	N/A
	Bottom	0.368	-	-	0.368	N/A	N/A	N/A
	Right	0.067	-	-	0.067	N/A	N/A	N/A
	Left	0.278	0.010	0.382	0.670	N/A	N/A	N/A

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.332	0.026	1.228	**1.586**
	Front	0.320	0.031	0.065	0.416
	Top	-	0.105	1.228*	1.333
	Bottom	1.190	-	-	1.190
	Right	0.063	-	-	0.063
	Left	0.047	0.010	0.382	0.439

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Hotspot SAR	Back	0.677	0.026	1.228	See Note 1	0.00	0.02	0.03
	Front	0.473	0.031	0.065	0.569	N/A	N/A	N/A
	Top	-	0.105	1.228*	**1.333**	N/A	N/A	N/A
	Bottom	0.207	-	-	0.207	N/A	N/A	N/A
	Right	0.063	-	-	0.063	N/A	N/A	N/A
	Left	0.258	0.010	0.382	0.650	N/A	N/A	N/A

Simult Tx	Configuration	LTE Band 12 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Hotspot SAR	Back	0.451	0.026	1.228	See Note 1	0.00	0.01	0.03
	Front	0.383	0.031	0.065	0.479	N/A	N/A	N/A
	Top	-	0.105	1.228*	**1.333**	N/A	N/A	N/A
	Bottom	0.297	-	-	0.297	N/A	N/A	N/A
	Right	0.133	-	-	0.133	N/A	N/A	N/A
	Left	0.348	0.010	0.382	0.740	N/A	N/A	N/A

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Hotspot SAR	Back	0.453	0.026	1.228	See Note 1	0.00	0.01	0.03
	Front	0.329	0.031	0.065	0.425	N/A	N/A	N/A
	Top	-	0.105	1.228*	**1.333**	N/A	N/A	N/A
	Bottom	0.258	-	-	0.258	N/A	N/A	N/A
	Right	0.083	-	-	0.083	N/A	N/A	N/A
	Left	0.229	0.010	0.382	0.621	N/A	N/A	N/A

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Hotspot SAR	Back	0.844	0.026	1.228	See Note 1	0.01	0.02	0.03
	Front	0.671	0.031	0.065	0.767	N/A	N/A	N/A
	Top	-	0.105	1.228*	**1.333**	N/A	N/A	N/A
	Bottom	0.514	-	-	0.514	N/A	N/A	N/A
	Right	0.101	-	-	0.101	N/A	N/A	N/A
	Left	0.322	0.010	0.382	0.714	N/A	N/A	N/A

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Hotspot SAR	Back	0.363	0.026	1.228	See Note 1	0.00	0.01	0.03
	Front	0.328	0.031	0.065	0.424	N/A	N/A	N/A
	Top	-	0.105	1.228*	1.333	N/A	N/A	N/A
	Bottom	0.724	-	-	0.724	N/A	N/A	N/A
	Right	0.066	-	-	0.066	N/A	N/A	N/A
	Left	0.049	0.010	0.382	0.441	N/A	N/A	N/A

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Hotspot SAR	Back	0.398	0.026	1.228	See Note 1	0.00	0.01	0.03
	Front	0.320	0.031	0.065	0.416	N/A	N/A	N/A
	Top	-	0.105	1.228*	**1.333**	N/A	N/A	N/A
	Bottom	1.221	-	-	1.221	N/A	N/A	N/A
	Right	0.118	-	-	0.118	N/A	N/A	N/A
	Left	-	0.010	0.382	0.392	N/A	N/A	N/A

Note 1 - No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was not greater than 0.04 per FCC KDB 447498 D01v06. See Section 12.7 for detailed SPLS ratio analysis.

12.6 Phablet Simultaneous Transmission Analysis

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

For SAR summation, the highest reported SAR across all test distances was used as the most conservative evaluation for simultaneous transmission analysis for each device edge.

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

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Phablet SAR	Back	1.740	0.582	0.959	2.322	2.699	3.281
	Front	1.605	0.908*	0.959*	2.513	2.564	**3.472**
	Top	-	0.908*	0.959*	0.908	0.959	1.867
	Bottom	2.200	-	-	2.200	2.200	2.200
	Right	0.349	-	-	0.349	0.349	0.349
	Left	0.245	0.908	0.138	1.153	0.383	1.291

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Phablet SAR	Back	1.363	0.582	0.959	1.945	2.322	2.904
	Front	1.058	0.908*	0.959*	1.966	2.017	**2.925**
	Top	-	0.908*	0.959*	0.908	0.959	1.867
	Bottom	1.875	-	-	1.875	1.875	1.875
	Right	0.341	-	-	0.341	0.341	0.341
	Left	0.219	0.908	0.138	1.127	0.357	1.265

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Phablet SAR	Back	1.894	0.582	0.959	2.476	2.853	**3.435**
	Front	1.240	0.908*	0.959*	2.148	2.199	3.107
	Top	-	0.908*	0.959*	0.908	0.959	1.867
	Bottom	2.435	-	-	2.435	2.435	2.435
	Right	0.716	-	-	0.716	0.716	0.716
	Left	-	0.908	0.138	0.908	0.138	1.046

12.7 SPLSR Evaluation and Analysis

Per FCC KDB Publication 447498 D01v06, when the sum of the standalone transmitters is more than 1.6 W/kg for 1g and 4 W/kg for 10g, the SAR sum to peak locations can be analyzed to determine SAR distribution overlaps. When the SAR peak to location ratio (shown below) for each pair of antennas is ≤ 0.04 for 1g, simultaneous SAR evaluation is not required. The distance between the transmitters was calculated using the following formula.

$$\text{Distance}_{Tx1-Tx2} = R_i = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2} \text{ (Hotspot)}$$

$$\text{SPLS Ratio} = \frac{(SAR_1 + SAR_2)^{1.5}}{R_i}$$

12.7.1 Hotspot Back Side SPLSR Evaluation and Analysis

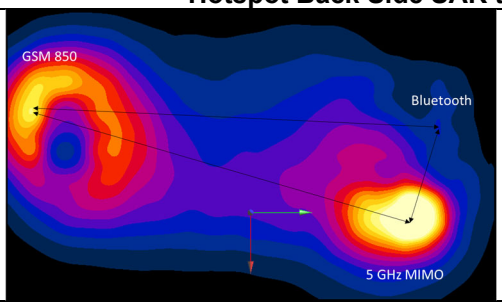
Table 12-20
Peak SAR Locations for Hotspot Back Side

Mode/Band	x (mm)	y (mm)
5 GHz WLAN MIMO	2.00	66.00
Bluetooth	-37.00	76.80
GPRS 850	-41.50	-88.50
UMTS 850	-40.00	-80.00
LTE Band 12	-44.00	-80.00
LTE Band 13	-41.00	-81.50
LTE Band 5 (Cell)	-40.00	-77.00
LTE Band 4 (AWS)	-23.50	-85.50
LTE Band 41	-14.20	-76.80

Table 12-21
Hotspot Back Side SAR to Peak Location Separation Ratio Calculations

Antenna Pair		Standalone SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio	Plot Number
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$	
GPRS 850	Bluetooth	0.838	0.026	0.864	165.36	0.00	1
GPRS 850	5 GHz WLAN MIMO	0.838	1.228	2.066	160.51	0.02	
Bluetooth	5 GHz WLAN MIMO	0.026	1.228	1.254	40.47	0.03	
UMTS 850	Bluetooth	0.677	0.026	0.703	156.83	0.00	2
UMTS 850	5 GHz WLAN MIMO	0.677	1.228	1.905	151.92	0.02	
Bluetooth	5 GHz WLAN MIMO	0.026	1.228	1.254	40.47	0.03	
LTE Band 12	Bluetooth	0.451	0.026	0.477	156.96	0.00	3
LTE Band 12	5 GHz WLAN MIMO	0.451	1.228	1.679	153.08	0.01	
Bluetooth	5 GHz WLAN MIMO	0.026	1.228	1.254	40.47	0.03	
LTE Band 13	Bluetooth	0.453	0.026	0.479	158.35	0.00	4
LTE Band 13	5 GHz WLAN MIMO	0.453	1.228	1.681	153.64	0.01	
Bluetooth	5 GHz WLAN MIMO	0.026	1.228	1.254	40.47	0.03	
LTE Band 5 (Cell)	Bluetooth	0.844	0.026	0.87	153.83	0.01	5
LTE Band 5 (Cell)	5 GHz WLAN MIMO	0.844	1.228	2.072	149.04	0.02	
Bluetooth	5 GHz WLAN MIMO	0.026	1.228	1.254	40.47	0.03	
LTE Band 4 (AWS)	Bluetooth	0.363	0.026	0.389	162.86	0.00	6
LTE Band 4 (AWS)	5 GHz WLAN MIMO	0.363	1.228	1.591	153.63	0.01	
Bluetooth	5 GHz WLAN MIMO	0.026	1.228	1.254	40.47	0.03	
LTE Band 41	Bluetooth	0.398	0.026	0.424	155.28	0.00	7
LTE Band 41	5 GHz WLAN MIMO	0.398	1.228	1.626	143.72	0.01	
Bluetooth	5 GHz WLAN MIMO	0.026	1.228	1.254	40.47	0.03	

Table 12-22
Hotspot Back Side SAR to Peak Location Separation Ratio Plots



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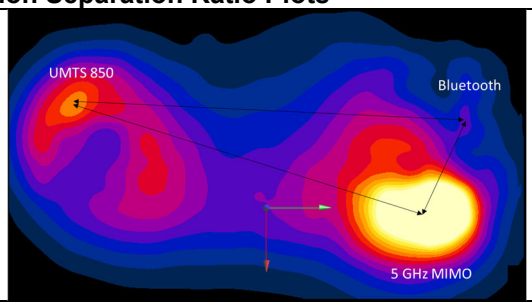
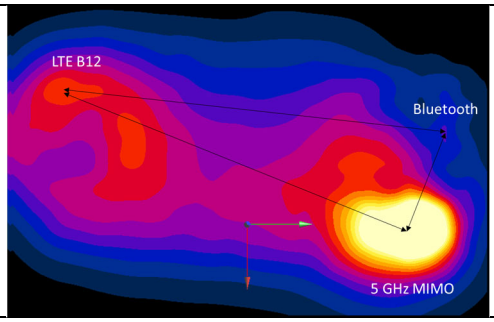


2



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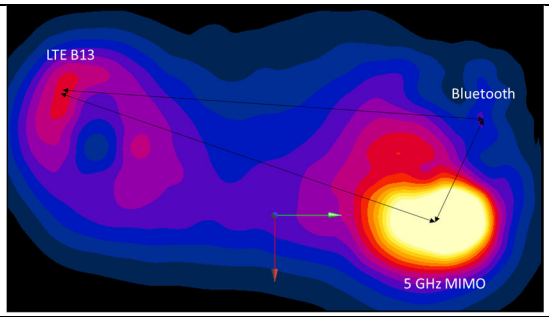

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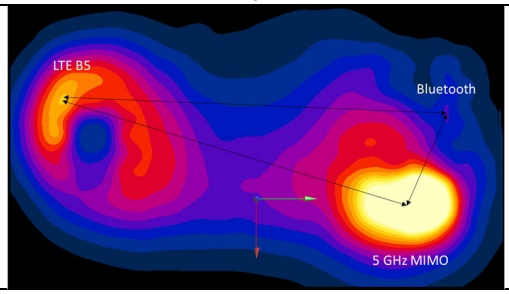

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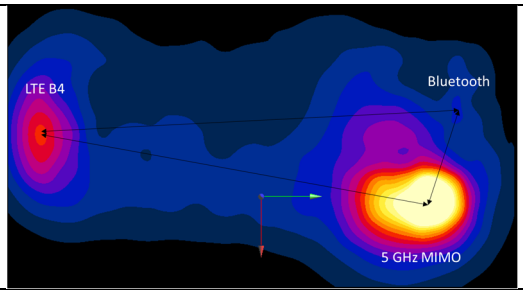

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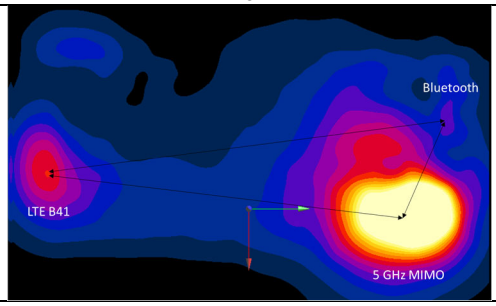

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12.8 Simultaneous Transmission Conclusion

The above numerical summed SAR results and SPLSR analysis are sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06 and IEEE 1528- 2013 Section 6.3.4.1.

13 SAR MEASUREMENT VARIABILITY

13.1 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 13-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS														
Band	FREQUENCY		Mode	Service	Data Rate (Mbps)	Side	Spacing	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)	
2450	PCC: 2506.00 SCC: 2525.80	PCC: 39750 SCC: 39948	LTE Band 41, 20 MHz Bandwidth, ULCA	PCC: QPSK, 50 RB, 50 RB Offset SCC: QPSK, 50 RB, 0 RB Offset	N/A	bottom	10 mm	1.040	1.040	1.00	N/A	N/A	N/A	N/A
2600	2636.50	40155	LTE Band 41, 20 MHz Bandwidth	QPSK, 1 RB, 50 RB Offset	N/A	bottom	10 mm	0.938	0.873	1.07	N/A	N/A	N/A	N/A
5750	5745.00	149	802.11n, 20 MHz Bandwidth	OFDM , MIMO	13	back	10 mm	1.010	0.858	1.18	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						

13.2 Measurement Uncertainty

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

14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	Network Analyzer	3/5/2020	Annual	3/5/2021	MY40001472
Agilent	85033E	3.5mm Standard Calibration Kit	6/6/2020	Annual	6/6/2021	MY53402352
Agilent	E5515C	8960 Series 10 Wireless Communications Test Set	2/10/2020	Annual	2/10/2021	GB42230325
Agilent	E4438C	ESG Vector Signal Generator	9/30/2019	Annual	9/30/2020	US41460739
Agilent	E4432B	ESG-D Series Signal Generator	7/14/2019	Annual	7/14/2020	US40053896
Agilent	N5182A	MXG Vector Signal Generator	5/13/2020	Annual	5/13/2021	MY47420603
Agilent	8753ES	Network Analyzer	3/5/2020	Annual	3/5/2021	MY40001472
Agilent	8753ES	S-Parameter Network Analyzer	8/26/2019	Annual	8/26/2020	MY40000670
Agilent	8753ES	S-Parameter Vector Network Analyzer	9/19/2019	Annual	9/19/2020	MY40003841
Agilent	E5515C	Wireless Communications Test Set	9/25/2019	Annual	9/25/2020	GB43304278
Agilent	E5515C	Wireless Communications Test Set	1/14/2020	Triennial	1/14/2023	GB43304447
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB44450273
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Amplifier Research	150A100C	Amplifier	CBT	N/A	CBT	350132
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	343971
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433978
Anritsu	ML2495A	Power Meter	12/17/2019	Annual	12/17/2020	941001
Anritsu	ML2496A	Power Meter	3/23/2020	Annual	3/23/2021	1351001
Anritsu	MA2411B	Pulse Power Sensor	12/4/2019	Annual	12/4/2020	1126066
Anritsu	MT8821C	Radio Communication Analyzer	11/22/2019	Annual	11/22/2020	6262044715
Anritsu	MT8821C	Radio Communication Analyzer	7/6/2020	Annual	7/6/2021	6262150000
Anritsu	MT8821C	Radio Communication Analyzer	7/3/2020	Annual	7/3/2021	6262150047
Anritsu	MT8821C	Radio Communication Analyzer	5/21/2020	Annual	5/21/2021	6201144419
Anritsu	MA24106A	USB Power Sensor	8/27/2019	Annual	8/27/2020	1827533
Anritsu	MA24106A	USB Power Sensor	6/3/2020	Annual	6/3/2021	2018527
Anritsu	MT8862A	Wireless Connectivity Test Set	8/8/2019	Annual	8/8/2020	6261782395
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
Control Company	4352	Long Stem Thermometer	5/16/2020	Biennial	5/16/2022	200294567
Control Company	4352	Long Stem Thermometer	5/16/2020	Biennial	5/16/2022	200294604
Control Company	4040	Therm./Clock/Humidity Monitor	6/29/2019	Biennial	6/29/2021	192291463
Control Company	4040	Therm./Clock/Humidity Monitor	6/29/2019	Biennial	6/29/2021	192291470
Control Company	4352	Ultra Long Stem Thermometer	11/29/2018	Biennial	11/29/2020	181766816
Control Company	4352	Ultra Long Stem Thermometer	11/29/2018	Biennial	11/29/2020	181766817
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	N9020A	MXA Signal Analyzer	12/19/2019	Annual	12/19/2020	MY48010233
KEYSIGHT	E4438C	VECTOR SIGNAL GENERATOR	6/22/2020	Annual	6/22/2021	MY45092078
eysight Technologie	N6705B	DC Power Analyzer	4/27/2019	Biennial	4/27/2021	MY53004059
eysight Technologie	AT/N6705B	DC Power Supply	N/A	N/A	N/A	MY53001315
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
MiniCircuits	VLF-6000+	Low Pass Filter	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
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	ZNLE6	Vector Network Analyzer	10/11/2019	Annual	10/11/2020	101307
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	2/4/2020	Annual	2/4/2021	162125
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	11/14/2019	Annual	11/14/2020	164948
SPEAG	D750V3	750 MHz SAR Dipole	3/16/2020	Annual	3/16/2021	1003
SPEAG	D750V3	750 MHz SAR Dipole	3/11/2020	Annual	3/11/2021	1054
SPEAG	D750V3	750 MHz SAR Dipole	10/19/2018	Biennial	10/19/2020	1161
SPEAG	D835V2	835 MHz SAR Dipole	3/13/2019	Biennial	3/13/2021	4d047
SPEAG	D835V2	835 MHz SAR Dipole	1/13/2020	Annual	1/13/2021	4d132
SPEAG	D1750V2	1750 MHz SAR Dipole	5/12/2020	Annual	5/12/2021	1148
SPEAG	D1765V2	1765 MHz SAR Dipole	5/23/2018	Triennial	5/23/2021	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	10/23/2018	Biennial	10/23/2020	5d080
SPEAG	D1900V2	1900 MHz SAR Dipole	2/21/2019	Biennial	2/21/2021	5d148
SPEAG	D2450V2	2450 MHz SAR Dipole	8/14/2019	Annual	8/14/2020	719
SPEAG	D2450V2	2450 MHz SAR Dipole	9/11/2017	Triennial	9/11/2020	797
SPEAG	D2600V2	2600 MHz SAR Dipole	4/11/2018	Triennial	4/11/2021	1004
SPEAG	D2600V2	2600 MHz SAR Dipole	6/14/2019	Biennial	6/14/2021	1064
SPEAG	D5GHzV2	5 GHz SAR Dipole	1/16/2018	Triennial	1/16/2021	1057
SPEAG	D5GHzV2	5 GHz SAR Dipole	8/10/2018	Biennial	8/10/2020	1237
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/17/2019	Annual	9/17/2020	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/18/2020	Annual	6/18/2021	1334
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/12/2020	Annual	3/12/2021	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/15/2020	Annual	4/15/2021	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/12/2019	Annual	9/12/2020	1449
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/13/2020	Annual	1/13/2021	1530
SPEAG	DAE4	Dasy Data Acquisition Electronics	12/5/2019	Annual	12/5/2020	1533
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/13/2020	Annual	1/13/2021	1558
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/15/2020	Annual	7/15/2021	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/14/2020	Annual	5/14/2021	1583
SPEAG	EX3DV4	SAR Probe	1/21/2020	Annual	1/21/2021	3589
SPEAG	EX3DV4	SAR Probe	4/21/2020	Annual	4/21/2021	7357
SPEAG	EX3DV4	SAR Probe	6/23/2020	Annual	6/23/2021	7406
SPEAG	EX3DV4	SAR Probe	6/23/2020	Annual	6/23/2021	7409
SPEAG	EX3DV4	SAR Probe	1/21/2020	Annual	1/21/2021	7488
SPEAG	EX3DV4	SAR Probe	5/18/2020	Annual	5/18/2021	7538
SPEAG	EX3DV4	SAR Probe	9/19/2019	Annual	9/19/2020	7551
SPEAG	EX3DV4	SAR Probe	9/19/2019	Annual	9/19/2020	7552
SPEAG	EX3DV4	SAR Probe	12/11/2019	Annual	12/11/2020	7570
SPEAG	EX3DV4	SAR Probe	12/11/2019	Annual	12/11/2020	7571
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/12/2020	Annual	5/12/2021	1070

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

15 MEASUREMENT UNCERTAINTIES

a	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	**Tol. (± %)**	**Prob. Dist.**	**Div.**	**c_i 1gm**	**c_i 10 gms**	**1gm u_i (± %)**	**10gms u_i (± %)**	**v_i**
Measurement System								
Probe Calibration	6.55	N	1	1.0	1.0	6.6	6.6	∞
Axial Isotropy	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	1.3	N	1	0.7	0.7	0.9	0.9	∞
Boundary Effect	2.0	R	1.73	1.0	1.0	1.2	1.2	∞
Linearity	0.3	N	1	1.0	1.0	0.3	0.3	∞
System Detection Limits	0.25	R	1.73	1.0	1.0	0.1	0.1	∞
Readout Electronics	0.3	N	1	1.0	1.0	0.3	0.3	∞
Response Time	0.8	R	1.73	1.0	1.0	0.5	0.5	∞
Integration Time	2.6	R	1.73	1.0	1.0	1.5	1.5	∞
RF Ambient Conditions - Noise	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
RF Ambient Conditions - Reflections	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	R	1.73	1.0	1.0	0.2	0.2	∞
Probe Positioning w/ respect to Phantom	6.7	R	1.73	1.0	1.0	3.9	3.9	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	4.0	R	1.73	1.0	1.0	2.3	2.3	∞
Test Sample Related								
Test Sample Positioning	2.7	N	1	1.0	1.0	2.7	2.7	35
Device Holder Uncertainty	1.67	N	1	1.0	1.0	1.7	1.7	5
Output Power Variation - SAR drift measurement	5.0	R	1.73	1.0	1.0	2.9	2.9	∞
SAR Scaling	0.0	R	1.73	1.0	1.0	0.0	0.0	∞
Phantom & Tissue Parameters								
Phantom Uncertainty (Shape & Thickness tolerances)	7.6	R	1.73	1.0	1.0	4.4	4.4	∞
Liquid Conductivity - measurement uncertainty	4.2	N	1	0.78	0.71	3.3	3.0	10
Liquid Permittivity - measurement uncertainty	4.1	N	1	0.23	0.26	1.0	1.1	10
Liquid Conductivity - Temperature Uncertainty	3.4	R	1.73	0.78	0.71	1.5	1.4	∞
Liquid Permittivity - Temperature Unceritainty	0.6	R	1.73	0.23	0.26	0.1	0.1	∞
Liquid Conductivity - deviation from target values	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Permittivity - deviation from target values	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Combined Standard Uncertainty (k=1)		RSS				11.5	11.3	60
Expanded Uncertainty (95% CONFIDENCE LEVEL)		k=2				23.0	22.6	

16 CONCLUSION

16.1 Measurement Conclusion

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

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

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