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SAR EVALUATION REPORT

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

Date of Testing:
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Test Site/Location:
PCTEST Lab, Columbia, MD, USA
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FCC ID: **A3LSMS901JPN**

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

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): SC-51C, SCG13

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	0.13	0.33	0.44	N/A
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	0.32	0.86	1.45
PCE	UMTS 850	826.40 - 846.60 MHz	0.37	0.42	0.67	N/A
PCE	LTE Band 12	699.7 - 715.3 MHz	0.21	0.38	0.54	N/A
PCE	LTE Band 13	779.5 - 784.5 MHz	0.34	0.51	0.70	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.35	0.41	0.71	N/A
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.28	0.98	0.95	1.86
PCE	LTE Band 41	2498.5 - 2687.5 MHz	0.24	0.35	0.40	2.24
DTS	2.4 GHz WLAN	2412 - 2472 MHz	< 0.1	< 0.1	0.22	N/A
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	N/A	N/A
NII	U-NII-2A	5260 - 5320 MHz	0.32	< 0.1	N/A	1.00
NII	U-NII-2C	5500 - 5720 MHz	0.23	< 0.1	N/A	0.44
NII	U-NII-3	5745 - 5825 MHz	0.25	< 0.1	< 0.1	N/A
NII	U-NII-4	5845 - 5885 MHz	0.32	< 0.1	N/A	0.45
DSS/DTS	Bluetooth	2402 - 2480 MHz	0.39	< 0.1	0.15	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			1.09	1.38	1.39	3.23

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

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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
U-NII-4	Voice/Data	5845 - 5885 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC Data	Data	13.56 MHz

1.2 Time-Averaging Algorithm for RF Exposure Compliance

This device is enabled with the Qualcomm® Smart Transmit feature. This feature performs time averaging algorithm in real time to control and manage transmitting power and ensure the time-averaged RF exposure is in compliance with FCC requirements all the time. **For this device, all US Operations are limited to peak exposure mode only.**

Note that WLAN operations are not enabled with Smart Transmit.

In Peak Exposure mode, the output power of the device is limited to the lower of the Pmax and the Plimit for each characterized technology and band (see RF Exposure Part 0 Test Report, report SN could be found in Section 1.11 - Bibliography).

Below table shows Plimit EFS settings and maximum tune up output power Pmax 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.

SAR CHAR

Exposure Senario		Body-Worn	Phablet Max	Phablet Reduced	Head	Hotspot	Earjack	Maximum Tune-Up Output Power*
Averaging Volume		1g	10g	10g	1g	1g	10g	
Spacing		15 mm	11, 8, 6, 0 mm	0 mm	0 mm	10 mm	0 mm	
DSI		0	0	1	2	3	4	
Technology/Band	Antenna							Pmax
GSM 850	A	**28.6**		**28.1**	**32.7**	**29.6**	**28.1**	25.3
GSM 1900	A	**25.8**		**19.3**	**32.8**	**19.3**	**19.3**	22.1
UMTS 850	A	**28.8**		**26.5**	**29.4**	**26.7**	**26.5**	24.0
LTE Band 12	A	**29.7**		**28.5**	**32.3**	**28.2**	**28.5**	24.5
LTE Band 13	A	**28.5**		**27.0**	**30.2**	**27.0**	**27.0**	24.5
LTE Band 5 (Cell)	A	**29.4**		**26.6**	**30.1**	**27.0**	**26.6**	24.5
LTE Band 4 (AWS)	A	**24.4**		**19.0**	**30.1**	**18.5**	**19.0**	23.5
LTE Band 41 (PC3)	B	**23.5**		**19.0**	**29.2**	**19.0**	**19.0**	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 (e.g. GSM and LTE TDD).

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

The maximum time-averaged output power (dBm) for any 2G/3G/4G/5G Sub6 WWAN technology, band, and DSI = minimum of "P_{limit} EFS" and "Maximum tune up output power P_{max}" + 1dB device uncertainty. SAR values in this report were scaled to this maximum time-averaged output power to determine compliance per KDB Publication 447498 D01v06.

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

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

1.3 Power Reduction for SAR

This device used an independent fixed level power reduction mechanism for WLAN/BT during all 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 Maximum Output Power

1.4.2 2G/3G/4G Output Power

Antenna A										
GSM/GPRS/EDGE 850										
Power Level		Voice (in dBm)	Data - Burst Average GMSK (in dBm)				Data - Burst Average 8-PSK (in dBm)			
		1 TX Slot	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
Pmax	Max Allowed Power	33.0	33.0	32.5	30.5	28.5	27.5	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	29.5	27.5	26.5	25.0	23.0	22.0
DSI = 0 (Body-Worn or Phablet Max)	Max Allowed Power	33.0	33.0	32.5	30.5	28.5	27.5	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	29.5	27.5	26.5	25.0	23.0	22.0
DSI = 1 (Phablet Reduced)	Max Allowed Power	33.0	33.0	32.5	30.5	28.5	27.5	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	29.5	27.5	26.5	25.0	23.0	22.0
DSI = 2 (Head)	Max Allowed Power	33.0	33.0	32.5	30.5	28.5	27.5	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	29.5	27.5	26.5	25.0	23.0	22.0
DSI = 3 (Hotspot)	Max Allowed Power	N/A	33.0	32.5	30.5	28.5	27.5	26.0	24.0	23.0
	Nominal	N/A	32.0	31.5	29.5	27.5	26.5	25.0	23.0	22.0
DSI = 4 (Earjack)	Max Allowed Power	33.0	33.0	32.5	30.5	28.5	27.5	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	29.5	27.5	26.5	25.0	23.0	22.0
GSM/GPRS/EDGE 1900										
Power Level		Voice (in dBm)	Data - Burst Average GMSK (in dBm)				Data - Burst Average 8-PSK (in dBm)			
		1 TX Slot	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
Pmax	Max Allowed Power	30.0	30.0	29.0	27.5	25.5	26.5	25.0	23.0	22.0
	Nominal	29.0	29.0	28.0	26.5	24.5	25.5	24.0	22.0	21.0
DSI = 0 (Body-Worn or Phablet Max)	Max Allowed Power	30.0	30.0	29.0	27.5	25.5	26.5	25.0	23.0	22.0
	Nominal	29.0	29.0	28.0	26.5	24.5	25.5	24.0	22.0	21.0
DSI = 1 (Phablet Reduced)	Max Allowed Power	29.5	29.5	26.5	24.7	23.5	26.5	25.0	23.0	22.0
	Nominal	28.5	28.5	25.5	23.7	22.5	25.5	24.0	22.0	21.0
DSI = 2 (Head)	Max Allowed Power	30.0	30.0	29.0	27.5	25.5	26.5	25.0	23.0	22.0
	Nominal	29.0	29.0	28.0	26.5	24.5	25.5	24.0	22.0	21.0
DSI = 3 (Hotspot)	Max Allowed Power	N/A	29.5	26.5	24.7	23.5	26.5	25.0	23.0	22.0
	Nominal	N/A	28.5	25.5	23.7	22.5	25.5	24.0	22.0	21.0
DSI = 4 (Earjack)	Max Allowed Power	29.5	29.5	26.5	24.7	23.5	26.5	25.0	23.0	22.0
	Nominal	28.5	28.5	25.5	23.7	22.5	25.5	24.0	22.0	21.0

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

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

Mode / Band	Antenna		Modulated Average Output Power (in dBm)					
			Pmax	DSI =0 (Body-Worn or Phablet Max)	DSI =1 (Phablet Reduced)	DSI =2 (Head)	DSI =3 (Hotspot)	DSI =4 (Earjack)
LTE Band 12	A	Max Allowed Power	25.5	25.5	25.5	25.5	25.5	25.5
		Nominal	24.5	24.5	24.5	24.5	24.5	24.5
LTE Band 13	A	Max Allowed Power	25.5	25.5	25.5	25.5	25.5	25.5
		Nominal	24.5	24.5	24.5	24.5	24.5	24.5
LTE Band 5 (Cell)	A	Max Allowed Power	25.5	25.5	25.5	25.5	25.5	25.5
		Nominal	24.5	24.5	24.5	24.5	24.5	24.5
LTE Band 4 (AWS)	A	Max Allowed Power	24.5	24.5	20.0	24.5	19.5	20.0
		Nominal	23.5	23.5	19.0	23.5	18.5	19.0
LTE Band 41 (PC3)	B	Max Allowed Power	25.0	25.0	22.0	25.0	22.0	22.0
		Nominal	24.0	24.0	21.0	24.0	21.0	21.0

1.4.3 2.4 GHz Maximum SISO/MIMO WLAN Output Power

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

Mode	Band	IEEE 802.11 (in dBm)															
		SISO								MIMO							
		Antenna 1 & Antenna 2															
		b		g		n		ax (SU)		b (CDD + STBC)		g (CDD + STBC)		n (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max
2.4 GHz WIFI	2.45 GHz	16.0	17.0	16.5	17.5	17.0	18.0	17.0	18.0	19.0	20.0	19.5	20.5	20.0	21.0	20.0	21.0
						ch. 11: 15.5	16.5	ch. 11: 15.5	16.5					ch. 11: 18.5	19.5	ch. 11: 18.5	19.5
		ch. 12: 5.0	6.0	ch. 12: 5.0	6.0	ch. 12: 5.0	6.0	ch. 12: 5.0	6.0	ch. 12: 8.0	9.0	ch. 12: 8.0	9.0	ch. 12: 8.0	9.0	ch. 12: 8.0	9.0
		ch. 13: -1.0	0.0	ch. 13: -1.0	0.0	ch. 13: -1.0	0.0	ch. 13: -1.0	0.0	ch. 13: 2.0	3.0	ch. 13: 2.0	3.0	ch. 13 2.0	3.0	ch. 13: 2.0	3.0

1.4.4 2.4 GHz Reduced WLAN Output Powers

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

The below table is applicable in the following conditions:

- RCV Active
- RCV Active during simultaneous conditions with 5 GHz WLAN
- Simultaneous conditions with 5 GHz WLAN

Mode	Band	IEEE 802.11 (in dBm)															
		SISO								MIMO							
		Antenna 1															
		b		g		n		ax (SU)		b (CDD + STBC)		g (CDD + STBC)		n (CDD+STBC, SDM)		ax (SU) (CDD+STBC, SDM)	
Maximum / Nominal Power		Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max
2.4 GHz WIFI	2.45 GHz	14.0	15.0	14.0	15.0	14.0	15.0	14.0	15.0	17.0	18.0	17.0	18.0	17.0	18.0	17.0	18.0
		ch. 12: 5.0	6.0	ch. 12: 5.0	6.0	ch. 12: 5.0	6.0	ch. 12: 5.0	6.0	ch. 12: 8.0	9.0	ch. 12: 8.0	9.0	ch. 12: 8.0	9.0	ch. 8.0	9.0
		ch. 13: -1.0	0.0	ch. 12: -1.0	0.0	ch. 13: -1.0	0.0	ch. 13: -1.0	0.0	ch. 13: 2.0	3.0	ch. 13: 2.0	3.0	ch. 12: 2.0	3.0	ch. 2.0	3.0

1.4.5 5 GHz Maximum SISO/MIMO WLAN Output Power

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

Mode	Band	IEEE 802.11 (in dBm) SISO Antenna 1 & Antenna 2								IEEE 802.11 (in dBm) MIMO							
		a		n		ac		ax (SU)		a (CDD + STBC)		n (CDD + STBC, SDM)		ac (CDD + STBC, SDM)		ax (SU) (CDD + STBC, SDM)	
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
5 GHz WIFI (20MHz BW)	UNII-1	17.0	18.0	17.0 Ch. 36 16.0	18.0 Ch. 36 17.0	17.0 Ch. 36 16.0	18.0 Ch. 36 17.0	17.0 Ch. 36 16.0	18.0 Ch. 36 17.0	20.0	21.0	20.0 Ch. 36 19.0	21.0 Ch. 36 20.0	20.0 Ch. 36 19.0	21.0 Ch. 36 20.0	20.0 Ch. 36 19.0	21.0 Ch. 36 20.0
	UNII-2A	17.0	18.0	17.0	18.0	17.0	18.0	17.0	18.0	20.0	21.0	20.0	21.0	20.0	21.0	20.0	21.0
	UNII-2C	17.0	18.0	17.0	18.0	17.0	18.0	17.0	18.0	20.0	21.0	20.0	21.0	20.0	21.0	20.0	21.0
	UNII-3	17.0	18.0	17.0	18.0	17.0	18.0	17.0	18.0	20.0	21.0	20.0	21.0	20.0	21.0	20.0	21.0
	UNII-4	17.0	18.0	17.0	18.0	17.0	18.0	17.0	18.0	20.0	21.0	20.0	21.0	20.0	21.0	20.0	21.0
5 GHz WIFI (40MHz BW)	UNII-1			17.0	18.0	17.0	18.0	17.0	18.0			20.0	21.0	20.0	21.0	20.0	21.0
	UNII-2A			17.0	18.0	17.0	18.0	17.0	18.0			20.0	21.0	20.0	21.0	20.0	21.0
	UNII-2C			17.0	18.0	17.0	18.0	17.0	18.0			20.0	21.0	20.0	21.0	20.0	21.0
	UNII-3			17.0	18.0	17.0	18.0	17.0	18.0			20.0	21.0	20.0	21.0	20.0	21.0
	UNII-4			17.0	18.0	17.0	18.0	17.0	18.0			20.0	21.0	20.0	21.0	20.0	21.0
5 GHz WIFI (80MHz BW)	UNII-1					17.0 Ch. 42 16.0	18.0 Ch. 42 17.0	17.0 Ch. 42 16.0	18.0 Ch. 42 17.0					20.0 Ch. 42 19.0	21.0 Ch. 42 20.0	20.0 Ch. 42 19.0	21.0 Ch. 42 20.0
	UNII-2A					17.0	18.0	17.0	18.0					20.0	21.0	20.0	21.0
	UNII-2C					17.0	18.0	17.0	18.0					20.0	21.0	20.0	21.0
	UNII-3					17.0	18.0	17.0	18.0					20.0	21.0	20.0	21.0
	UNII-4					17.0	18.0	17.0	18.0					20.0	21.0	20.0	21.0

1.4.6 5 GHz Reduced WLAN Output Powers

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

The below table is applicable in the following conditions:

- Simultaneous conditions with 2.4 GHz WLAN

Mode	Band	IEEE 802.11 (in dBm) SISO Antenna 1 & Antenna 2								IEEE 802.11 (in dBm) MIMO							
		a		n		ac		ax (SU)		a (CDD + STBC)		n (CDD + STBC, SDM)		ac (CDD + STBC, SDM)		ax (SU) (CDD + STBC, SDM)	
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
5 GHz WIFI (20MHz BW)	UNII-1	12.0	13.0	12.0	13.0	12.0	13.0	12.0	13.0	15.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0
	UNII-2A	12.0	13.0	12.0	13.0	12.0	13.0	12.0	13.0	15.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0
	UNII-2C	12.0	13.0	12.0	13.0	12.0	13.0	12.0	13.0	15.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0
	UNII-3	12.0	13.0	12.0	13.0	12.0	13.0	12.0	13.0	15.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0
	UNII-4	12.0	13.0	12.0	13.0	12.0	13.0	12.0	13.0	15.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0
5 GHz WIFI (40MHz BW)	UNII-1			12.0	13.0	12.0	13.0	12.0	13.0			15.0	16.0	15.0	16.0	15.0	16.0
	UNII-2A			12.0	13.0	12.0	13.0	12.0	13.0			15.0	16.0	15.0	16.0	15.0	16.0
	UNII-2C			12.0	13.0	12.0	13.0	12.0	13.0			15.0	16.0	15.0	16.0	15.0	16.0
	UNII-3			12.0	13.0	12.0	13.0	12.0	13.0			15.0	16.0	15.0	16.0	15.0	16.0
	UNII-4			12.0	13.0	12.0	13.0	12.0	13.0			15.0	16.0	15.0	16.0	15.0	16.0
5 GHz WIFI (80MHz BW)	UNII-1					12.0	13.0	12.0	13.0					15.0	16.0	15.0	16.0
	UNII-2A					12.0	13.0	12.0	13.0					15.0	16.0	15.0	16.0
	UNII-2C					12.0	13.0	12.0	13.0					15.0	16.0	15.0	16.0
	UNII-3					12.0	13.0	12.0	13.0					15.0	16.0	15.0	16.0
	UNII-4					12.0	13.0	12.0	13.0					15.0	16.0	15.0	16.0

The below table is applicable in the following conditions:

- RCV Active
- RCV Active during simultaneous conditions with 2.4 GHz WLAN

Mode	Band	IEEE 802.11 (in dBm) SISO Antenna 1 & Antenna 2								IEEE 802.11 (in dBm) MIMO							
		a		n		ac		ax (SU)		a (CDD + STBC)		n (CDD + STBC, SDM)		ac (CDD + STBC, SDM)		ax (SU) (CDD + STBC, SDM)	
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
5 GHz WIFI (20MHz BW)	UNII-1	11.0	12.0	11.0	12.0	11.0	12.0	11.0	12.0	14.0	15.0	14.0	15.0	14.0	15.0	14.0	15.0
	UNII-2A	11.0	12.0	11.0	12.0	11.0	12.0	11.0	12.0	14.0	15.0	14.0	15.0	14.0	15.0	14.0	15.0
	UNII-2C	11.0	12.0	11.0	12.0	11.0	12.0	11.0	12.0	14.0	15.0	14.0	15.0	14.0	15.0	14.0	15.0
	UNII-3	11.0	12.0	11.0	12.0	11.0	12.0	11.0	12.0	14.0	15.0	14.0	15.0	14.0	15.0	14.0	15.0
	UNII-4	11.0	12.0	11.0	12.0	11.0	12.0	11.0	12.0	14.0	15.0	14.0	15.0	14.0	15.0	14.0	15.0
5 GHz WIFI (40MHz BW)	UNII-1			11.0	12.0	11.0	12.0	11.0	12.0			14.0	15.0	14.0	15.0	14.0	15.0
	UNII-2A			11.0	12.0	11.0	12.0	11.0	12.0			14.0	15.0	14.0	15.0	14.0	15.0
	UNII-2C			11.0	12.0	11.0	12.0	11.0	12.0			14.0	15.0	14.0	15.0	14.0	15.0
	UNII-3			11.0	12.0	11.0	12.0	11.0	12.0			14.0	15.0	14.0	15.0	14.0	15.0
	UNII-4			11.0	12.0	11.0	12.0	11.0	12.0			14.0	15.0	14.0	15.0	14.0	15.0
5 GHz WIFI (80MHz BW)	UNII-1					11.0	12.0	11.0	12.0					14.0	15.0	14.0	15.0
	UNII-2A					11.0	12.0	11.0	12.0					14.0	15.0	14.0	15.0
	UNII-2C					11.0	12.0	11.0	12.0					14.0	15.0	14.0	15.0
	UNII-3					11.0	12.0	11.0	12.0					14.0	15.0	14.0	15.0
	UNII-4					11.0	12.0	11.0	12.0					14.0	15.0	14.0	15.0

1.4.7 2.4 GHz Maximum Bluetooth Output Power

Mode	Single Antenna	
	Nominal	Maximum
Bluetooth (in dBm)	15.0	16.0
Bluetooth EDR (in dBm)	10.5	11.5
Bluetooth LE 1/2Mbps (in dBm)	15.0	16.0
Bluetooth LE 125/500 kbps (in dBm)	10.0	11.0

1.4.8 2.4 GHz Reduced Bluetooth Output Power

The below table is applicable in the following conditions:

- RCV active
- During simultaneous conditions with 5GHz WLAN
- RCV active during simultaneous conditions with 5 GHz WLAN

Mode	Single Antenna	
	Nominal	Maximum
Bluetooth (in dBm)	12.0	13.0
Bluetooth EDR (in dBm)	10.5	11.5
Bluetooth LE 1/2Mbps (in dBm)	12.0	13.0
Bluetooth LE 125/500 kbps (in dBm)	10.0	11.0

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 display diagonal dimension of this device is > 150 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	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	No	No	No	Yes
5 GHz WLAN MIMO	Yes	Yes	Yes	No	No	Yes
Bluetooth Ant 1	Yes	Yes	No	No	No	Yes

Note: Particular DUT edges were not required to be evaluated for wireless router SAR or phablet SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v02r01 Section III and FCC KDB Publication 648474 D04v01r03. Some edges were additionally evaluated per manufacturer’s request. 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, and UNII-4 operations are disabled.
Some edges were additionally evaluated per manufacturer’s request.

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 E.

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 WLAN MIMO	Yes	Yes	N/A	Yes	
2	GSM voice + 5 GHz WLAN Ant 1	Yes	Yes	N/A	Yes	
3	GSM voice + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
4	GSM voice + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
5	GSM voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
6	GSM voice + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
7	GSM voice + 2.4 GHz Bluetooth + 5 GHz WLAN Ant 1	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
8	GSM voice + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
9	GSM voice + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
10	GSM voice + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
11	UMTS + 2.4 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
12	UMTS + 5 GHz WLAN Ant 1	Yes	Yes	Yes	Yes	
13	UMTS + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
14	UMTS + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
15	UMTS + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
16	UMTS + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
17	UMTS + 2.4 GHz Bluetooth + 5 GHz WLAN Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
18	UMTS + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
19	UMTS + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
20	UMTS + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
21	LTE + 2.4 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
22	LTE + 5 GHz WLAN Ant 1	Yes	Yes	Yes	Yes	
23	LTE + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
24	LTE + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
25	LTE + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
26	LTE + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
27	LTE + 2.4 GHz Bluetooth + 5 GHz WLAN Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
28	LTE + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
29	LTE + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
30	LTE + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
31	GPRS/EDGE + 2.4 GHz WLAN MIMO	N/A	N/A	Yes	Yes	
32	GPRS/EDGE + 5 GHz WLAN Ant 1	N/A	N/A	Yes	Yes	
33	GPRS/EDGE + 5 GHz WLAN MIMO	N/A	N/A	Yes	Yes	
34	GPRS/EDGE + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	N/A	N/A	Yes	Yes	
35	GPRS/EDGE + 2.4 GHz Bluetooth	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
36	GPRS/EDGE + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
37	GPRS/EDGE + 2.4 GHz Bluetooth + 5 GHz WLAN Ant 1	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
38	GPRS/EDGE + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
39	GPRS/EDGE + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
40	GPRS/EDGE + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered

1. 2.4 GHz WLAN Antenna 1 and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
2. When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario.
3. Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, there are no simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table.
4. 5 GHz Wireless Router is only supported for the U-NII-3 by S/W, therefore U-NII-1, U-NII2A, U-NII2C, and U-NII4 were not evaluated for wireless router conditions.
5. This device supports 2x2 MIMO Tx for WLAN 802.11a/b/g/n/ac/ax. 802.11a/b/g/n/ac/ax supports CDD and STBC and 802.11n/ac/ax additionally supports SDM. WLAN can transmit only when operating with MIMO.
6. This device supports VoWIFI.
7. This device supports Bluetooth Tethering.
8. This device supports VoLTE.

1.8 Miscellaneous SAR Test Considerations

(A) WIFI/BT

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

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

Since Wireless Router operations are not allowed by the chipset firmware using U-NII-1, U-NII-2A, U-NII-2C, & UNII-4 WIFI, only 2.4 GHz 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 display diagonal dimension is greater than 150mm and less than 200mm. Phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg. Because wireless router operations are not supported for U-NII-1, U-NII-2A, U-NII-2C, & UNII-4 WLAN, phablet SAR tests were performed. Phablet SAR was not evaluated for 2.4 GHz and U-NII-3 WLAN operations since wireless router 1g SAR was < 1.2 W/kg.

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 I.

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is greater than 160mm" to "since the display diagonal dimension is greater than 150mm.

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.

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, Dynamic Antenna Tuning)

1.10 Device Serial Numbers

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

1.1 Bibliography

Report Type	Report Serial Number
RF Exposure Part 0 Test Report	1M2112090153-16.A3L

2 LTE INFORMATION

LTE Information					
Form Factor	Portable Handset				
	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 13 (779.5 - 784.5 MHz)				
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)				
	LTE Band 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): 1.4 MHz	1710.7 (19957)		1732.5 (20175)	1754.3 (20393)	
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)		1732.5 (20175)	1753.5 (20385)	
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)		1732.5 (20175)	1752.5 (20375)	
LTE Band 4 (AWS): 10 MHz	1715 (20000)		1732.5 (20175)	1750 (20350)	
LTE Band 4 (AWS): 15 MHz	1717.5 (20025)		1732.5 (20175)	1747.5 (20325)	
LTE Band 4 (AWS): 20 MHz	1720 (20050)		1732.5 (20175)	1745 (20300)	
LTE Band 41: 5 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 10 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 15 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 20 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
UE Category	DL UE Cat 20, UL UE Cat 13				
Modulations Supported in UL	QPSK, 16QAM, 64QAM				
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	YES				
A-MPR (Additional MPR) disabled for SAR Testing?	YES				
LTE Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations				
LTE Additional Information	This device does not support full CA features on 3GPP Release 15. It supports carrier aggregation and downlink MIMO features as shown in Section 9 and Appendix I. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. The following LTE Release 15 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

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:

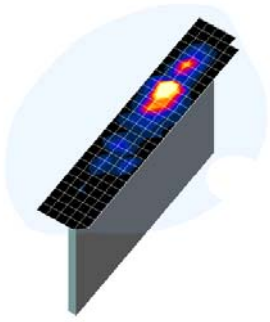

Figure 4-1
Sample SAR Area Scan

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].

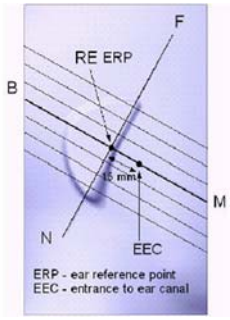

Figure 5-1
Close-Up Side view of ERP

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.

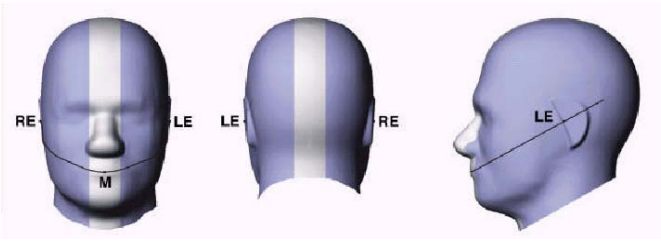

Figure 5-2
Front, back and side view of SAM Twin Phantom

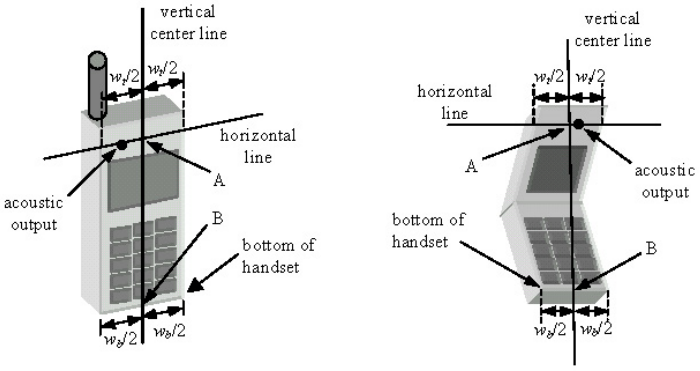

Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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.

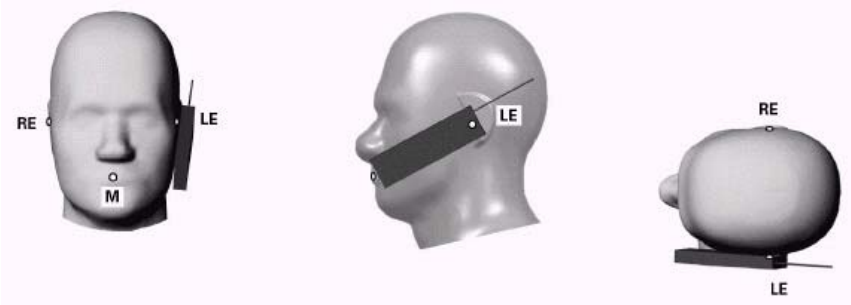

Figure 6-1 Front, Side and Top View of Cheek Position

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).

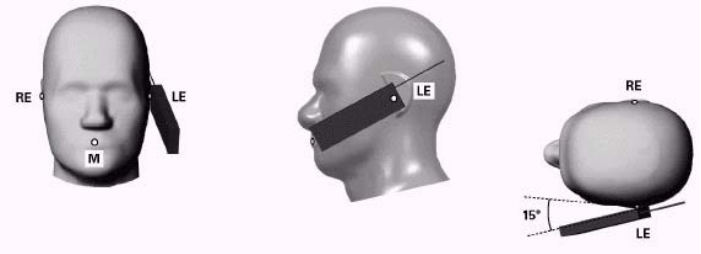

Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

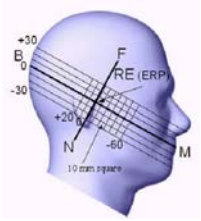

Figure 6-3
Side view w/ relevant markings

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.

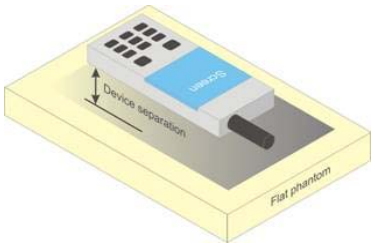

Figure 6-4
Sample Body-Worn Diagram

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 non-reduced output power level. FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device at these additional test positions. Sensor triggering distance summary data is included in Appendix G.

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

7 RF EXPOSURE LIMITS

7.1 Uncontrolled Environment

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

7.2 Controlled Environment

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

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

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

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

8 FCC MEASUREMENT PROCEDURES

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

8.1 Measured and Reported SAR

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

8.2 3G SAR Test Reduction Procedure

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

8.3 Procedures Used to Establish RF Signal for SAR

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

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

8.4 SAR Measurement Conditions for UMTS

8.4.1 Output Power Verification

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

8.4.2 Head SAR Measurements

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

8.4.3 Body SAR Measurements

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

8.4.4 SAR Measurements with Rel 5 HSDPA

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

8.4.5 SAR Measurements with Rel 6 HSUPA

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

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

8.5 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

All conducted power measurements for 2G/3G/4G WWAN technologies and bands in this section were performed by setting Reserve_power_margin (Qualcomm® Smart Transmit EFS entry) to 0dB, so that the EUT transmits continuously at minimum (Plimit, maximum tune up output power Pmax).

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	32.06	32.05	31.96	**29.52**	27.85	26.63	25.03	23.03	22.18
	190	31.94	31.92	31.95	**29.51**	27.01	26.58	24.93	22.95	22.15
	251	31.91	31.81	31.92	**29.48**	26.92	26.17	24.77	22.95	21.64
GSM 1900	512	29.02	29.11	27.99	**26.24**	24.74	25.26	24.19	22.19	21.01
	661	28.95	28.93	27.80	**25.99**	24.04	25.16	23.99	22.01	21.21
	810	29.13	29.12	28.03	**26.28**	24.05	25.48	24.31	22.34	21.46

Calculated Maximum Frame-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	22.86	22.85	25.77	**25.09**	24.67	17.43	18.84	18.60	19.00
	190	22.74	22.72	25.76	**25.08**	23.83	17.38	18.74	18.52	18.97
	251	22.71	22.61	25.73	**25.05**	23.74	16.97	18.58	18.52	18.46
GSM 1900	512	19.82	19.91	21.80	**21.81**	21.56	16.06	18.00	17.76	17.83
	661	19.75	19.73	21.61	**21.56**	20.86	15.96	17.80	17.58	18.03
	810	19.93	19.92	21.84	**21.85**	20.87	16.28	18.12	17.91	18.28

GSM 850	**Frame Avg.Targets:**	22.80	22.80	25.31	**25.07**	24.32	17.30	18.81	18.57	18.82
GSM 1900		19.80	19.80	21.81	**22.07**	21.32	16.30	17.81	17.57	17.82

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

Maximum Burst-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 1900	512	28.67	28.69	25.35	23.86	**22.30**	25.26	24.19	22.19	21.01
	661	28.51	28.59	25.42	23.20	**22.17**	25.16	23.99	22.01	21.21
	810	28.71	28.74	25.52	23.88	**22.33**	25.48	24.31	22.34	21.46

Calculated Maximum Frame-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 1900	512	19.47	19.49	19.16	19.43	**19.12**	16.06	18.00	17.76	17.83
	661	19.31	19.39	19.23	18.77	**18.99**	15.96	17.80	17.58	18.03
	810	19.51	19.54	19.33	19.45	**19.15**	16.28	18.12	17.91	18.28
GSM 1900	**Frame Avg.Targets:**	19.30	19.30	19.31	19.27	**19.32**	16.30	17.81	17.57	17.82

Note:

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

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

Figure 9-1
Power Measurement Setup

9.2 UMTS Conducted Powers

Table 9-3
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	24.29	24.20	24.17	-
99		12.2 kbps AMR	24.29	24.19	24.16	-
6	HSDPA	Subtest 1	23.19	23.12	23.08	0
6		Subtest 2	23.22	23.14	23.10	0
6		Subtest 3	22.67	22.63	22.57	0.5
6		Subtest 4	22.69	22.63	22.57	0.5
6	HSUPA	Subtest 1	23.19	23.15	23.10	0
6		Subtest 2	21.18	21.12	21.11	2
6		Subtest 3	22.18	22.15	22.09	1
6		Subtest 4	21.19	21.13	21.10	2
6		Subtest 5	23.20	23.16	23.11	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.

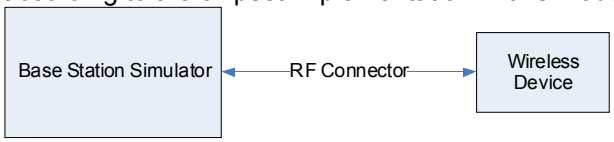

Figure 9-2
Power Measurement Setup

9.3 LTE Conducted Powers

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

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

LTE Carrier Aggregation Notes:

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

9.3.1 LTE Band 12

Table 9-4
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	24.44	0	0
	1	25	**24.51**		0
	1	49	24.43		0
	25	0	23.31	0-1	1
	25	12	23.39		1
	25	25	**23.45**		1
	50	0	23.42		1
16QAM	1	0	23.74	0-1	1
	1	25	23.42		1
	1	49	23.71		1
	25	0	22.48	0-2	2
	25	12	22.44		2
	25	25	22.41		2
	50	0	22.36		2
64QAM	1	0	22.61	0-2	2
	1	25	22.49		2
	1	49	22.79		2
	25	0	21.42	0-3	3
	25	12	21.48		3
	25	25	21.44		3
	50	0	21.48		3

9.3.2 LTE Band 13

Table 9-5
LTE Band 13 Measured P_{Max} for all DSI - 10 MHz Bandwidth

LTE Band 13 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	24.13	0	0
	1	25	**24.17**		0
	1	49	24.06		0
	25	0	23.08	0-1	1
	25	12	**23.20**		1
	25	25	23.11		1
	50	0	23.00		1
16QAM	1	0	23.69	0-1	1
	1	25	23.58		1
	1	49	23.63		1
	25	0	22.12	0-2	2
	25	12	22.15		2
	25	25	22.11		2
	50	0	22.09		2
64QAM	1	0	22.13	0-2	2
	1	25	22.35		2
	1	49	22.23		2
	25	0	21.25	0-3	3
	25	12	21.07		3
	25	25	21.12		3
	50	0	21.04		3

9.3.3 LTE Band 5

Table 9-6
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	**24.63**	0	0
	1	25	24.62		0
	1	49	24.59		0
	25	0	23.52	0-1	1
	25	12	**23.67**		1
	25	25	23.55		1
	50	0	23.52		1
16QAM	1	0	23.72	0-1	1
	1	25	23.71		1
	1	49	23.67		1
	25	0	22.55	0-2	2
	25	12	22.62		2
	25	25	22.61		2
	50	0	22.58		2
64QAM	1	0	22.60	0-2	2
	1	25	22.60		2
	1	49	22.55		2
	25	0	21.72	0-3	3
	25	12	21.67		3
	25	25	21.74		3
	50	0	21.61		3

9.3.4 LTE Band 4

Table 9-7
LTE Band 4 (AWS) Measured P_{Max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor inactive)- 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	22.57	0	0
	1	50	**23.04**		0
	1	99	22.78		0
	50	0	21.77	0-1	1
	50	25	**21.93**		1
	50	50	21.85		1
	100	0	21.82		1
16QAM	1	0	21.97	0-1	1
	1	50	22.33		1
	1	99	22.16		1
	50	0	20.78	0-2	2
	50	25	20.92		2
	50	50	20.87		2
	100	0	20.82		2
64QAM	1	0	20.68	0-2	2
	1	50	21.13		2
	1	99	20.93		2
	50	0	19.80	0-3	3
	50	25	19.93		3
	50	50	19.85		3
	100	0	19.80		3

Table 9-8
LTE Band 4 (AWS) Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 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	17.54	0	0
	1	50	**17.92**		0
	1	99	17.72		0
	50	0	17.75	0-1	0
	50	25	**17.90**		0
	50	50	17.89		0
	100	0	17.81		0
16QAM	1	0	17.91	0-1	0
	1	50	18.18		0
	1	99	18.08		0
	50	0	17.79	0-2	0
	50	25	17.93		0
	50	50	17.87		0
	100	0	17.83		0
64QAM	1	0	17.71	0-2	0
	1	50	17.97		0
	1	99	17.94		0
	50	0	17.75	0-3	0
	50	25	17.54		0
	50	50	17.84		0
	100	0	17.86		0

Table 9-9
LTE Band 4 (AWS) Measured P_{Limit} for DSI = 1 (Phablet with Grip Sensor Active) 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	18.04	0	0
	1	50	**18.57**		0
	1	99	18.25		0
	50	0	18.26	0-1	0
	50	25	**18.41**		0
	50	50	18.34		0
	100	0	18.29		0
16QAM	1	0	18.35	0-1	0
	1	50	18.86		0
	1	99	18.57		0
	50	0	18.28	0-2	0
	50	25	18.45		0
	50	50	18.38		0
	100	0	18.33		0
64QAM	1	0	18.22	0-2	0
	1	50	18.72		0
	1	99	18.37		0
	50	0	18.29	0-3	0
	50	25	18.43		0
	50	50	18.35		0
	100	0	18.33		0

9.3.5 LTE Band 41

Table 9-10
LTE Band 41 Measured P_{Max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor inactive)- 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	23.98	23.95	24.20	24.12	24.18	0	0
	1	50	23.97	23.99	24.24	24.18	**24.34**		0
	1	99	23.90	24.05	24.04	24.12	24.24		0
	50	0	22.98	22.93	23.19	23.11	23.22	0-1	1
	50	25	22.99	22.97	23.32	23.25	**23.47**		1
	50	50	22.98	23.09	23.28	23.17	23.45		1
	100	0	22.91	22.87	23.24	23.14	23.28		1
16QAM	1	0	23.08	23.10	23.27	23.18	23.17	0-1	1
	1	50	23.20	23.28	23.49	23.39	23.56		1
	1	99	23.19	23.31	23.43	23.18	23.62		1
	50	0	21.99	21.96	22.26	22.20	22.25	0-2	2
	50	25	22.00	21.97	22.39	22.22	22.48		2
	50	50	21.96	22.11	22.35	22.18	22.55		2
	100	0	21.82	21.96	22.28	22.10	22.36		2
64QAM	1	0	22.04	22.65	22.13	22.18	22.25	0-2	2
	1	50	22.22	22.40	22.64	22.32	22.91		2
	1	99	22.08	22.43	22.45	22.41	22.79		2
	50	0	21.08	21.07	21.19	21.11	21.36	0-3	3
	50	25	21.05	21.15	21.36	21.24	21.53		3
	50	50	21.03	21.10	21.33	21.18	21.43		3
	100	0	20.87	20.93	21.27	21.10	21.31		3

Table 9-11
LTE Band 41 Uplink Carrier Aggregation Measured P_{Max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor inactive)- 20 MHz Bandwidth

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C	LTE B41	20	41490	2680.0	QPSK	1	0	LTE B41	20	41292	2660.2	QPSK	1	99	24.72	24.18

Table 9-12
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	20.93	21.14	20.94	21.21	21.23	0	0
	1	50	21.08	21.16	21.34	21.36	**21.57**		0
	1	99	21.10	21.23	21.10	21.03	21.49		0
	50	0	21.16	21.11	21.33	21.35	21.39	0-1	0
	50	25	21.12	21.12	21.42	21.37	**21.65**		0
	50	50	21.16	21.11	21.31	21.27	21.56		0
	100	0	21.03	21.02	21.32	21.25	21.53		0
16QAM	1	0	21.23	21.17	21.07	21.15	21.41	0-1	0
	1	50	21.26	21.37	21.32	21.35	21.57		0
	1	99	21.30	21.27	21.23	21.13	21.51		0
	50	0	21.15	21.22	21.33	21.37	21.38	0-2	0
	50	25	21.23	21.21	21.44	21.36	21.64		0
	50	50	21.18	21.23	21.41	21.39	21.65		0
	100	0	21.11	21.03	21.33	21.33	21.52		0
64QAM	1	0	21.24	21.26	21.21	21.32	21.30	0-2	0
	1	50	21.28	21.24	21.22	21.26	21.51		0
	1	99	21.26	21.38	21.27	21.10	21.43		0
	50	0	21.15	21.10	21.30	21.24	21.37	0-3	0
	50	25	21.05	21.06	21.32	21.31	21.59		0
	50	50	21.13	21.09	21.28	21.17	21.43		0
	100	0	21.02	20.98	21.22	21.21	21.38		0

Table 9-13
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

	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	41490	2680.0	QPSK	1	0	LTE B41	20	41292	2660.2	QPSK	1	99	21.28	21.23

9.4 WLAN Conducted Powers

Table 9-14
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	16.54	17.16	17.38	17.59
2437	6	16.95	17.28	17.32	17.35
2457	10			17.24	17.29
2462	11	16.68	17.30	16.32	15.89

Table 9-15
2.4 GHz WLAN Maximum Average RF Power – MIMO

2.4GHz 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2412	1	17.59	17.38	20.50
2437	6	17.94	17.32	20.65
2457	10	17.64	17.24	20.45
2462	11	16.45	16.32	19.40

Table 9-16
2.4 GHz WLAN Reduced Average RF Power with RCV Active, and/or During Conditions with 2.4 GHz and 5 GHz WLAN – 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	14.55	14.37	14.58	14.66
2437	6	14.38	14.59	14.66	14.52
2462	11	14.78	14.92	14.80	14.47

Table 9-17
2.4 GHz WLAN Reduced Average RF Power with RCV Active, and/or During Conditions with 2.4 GHz and 5 GHz WLAN – MIMO

2.4GHz 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2412	1	14.61	14.73	17.68
2437	6	14.27	14.87	17.59
2462	11	14.08	14.99	17.57

Table 9-18
5 GHz WLAN Maximum Average RF Power – Ant 1

5GHz (80MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11ac	802.11ax
		Average	Average
5210	42	16.79	16.82
5290	58	17.98	17.99
5530	106	17.77	17.84
5610	122	17.92	17.99
5690	138	17.99	17.92
5775	155	17.88	17.56
5855	171	17.81	17.77

Table 9-19
5 GHz WLAN Maximum Average RF Power – MIMO

5GHz (80MHz) 802.11ac Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
5210	42	16.79	16.58	19.70
5290	58	17.98	17.99	21.00
5530	106	17.77	17.56	20.68
5610	122	17.92	17.99	20.97
5690	138	17.99	17.54	20.78
5775	155	17.88	17.92	20.91
5855	171	17.81	17.85	20.84

Table 9-20
5 GHz WLAN Reduced Average RF Power During Conditions with 2.4 GHz and 5 GHz WLAN– Ant 1

5GHz (80MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11ac	802.11ax
		Average	Average
5210	42	12.84	12.88
5290	58	12.77	12.74
5530	106	12.92	12.84
5610	122	12.99	12.72
5690	138	12.53	12.70
5775	155	12.72	12.66
5855	171	12.69	12.54

Table 9-21
5 GHz WLAN Reduced Average RF Power During Conditions with 2.4 GHz WLAN - MIMO

5GHz (80MHz) 802.11ac Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
5210	42	12.84	12.80	15.83
5290	58	12.77	12.78	15.79
5530	106	12.92	12.83	15.89
5610	122	12.99	12.66	15.84
5690	138	12.53	12.92	15.74
5775	155	12.72	12.98	15.86
5855	171	12.69	12.33	15.52

Table 9-22
5 GHz WLAN Reduced Average RF Power During Conditions with RCV Active, or RCV Active during Conditions with 2.4 GHz WLAN – Ant 1

5GHz (80MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11ac	802.11ax
		Average	Average
5210	42	11.89	11.99
5290	58	11.74	11.82
5530	106	11.66	11.67
5610	122	11.92	11.94
5690	138	11.94	11.75
5775	155	11.62	11.66
5855	171	11.44	11.40

Table 9-23
5 GHz WLAN Reduced Average RF Power During Conditions with RCV Active, or RCV Active during Conditions with 2.4 GHz – MIMO

5GHz (80MHz) 802.11ac Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
5210	42	11.89	11.84	14.88
5290	58	11.74	11.88	14.82
5530	106	11.66	11.72	14.70
5610	122	11.92	11.38	14.67
5690	138	11.94	11.56	14.76
5775	155	11.62	11.58	14.61
5855	171	11.44	11.74	14.60

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.

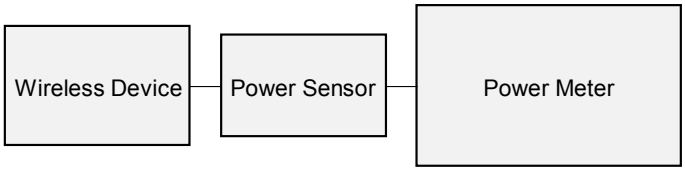

Figure 9-3
Power Measurement Setup

9.5 Bluetooth Conducted Powers

Table 9-24
Bluetooth Maximum Average RF Power

Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	1.0	GFSK	0	15.56	35.975
2441	1.0	GFSK	39	15.22	33.266
2480	1.0	GFSK	78	13.86	24.322
2402	2.0	π/4-DQPSK	0	11.23	13.274
2441	2.0	π/4-DQPSK	39	11.07	12.794
2480	2.0	π/4-DQPSK	78	9.73	9.397
2402	3.0	8DPSK	0	11.26	13.366
2441	3.0	8DPSK	39	11.08	12.823
2480	3.0	8DPSK	78	9.77	9.484

Table 9-25
Bluetooth Reduced Average RF Power (RCV Active)

Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	1.0	GFSK	0	12.34	17.140
2441	1.0	GFSK	39	12.53	17.906
2480	1.0	GFSK	78	12.05	16.032

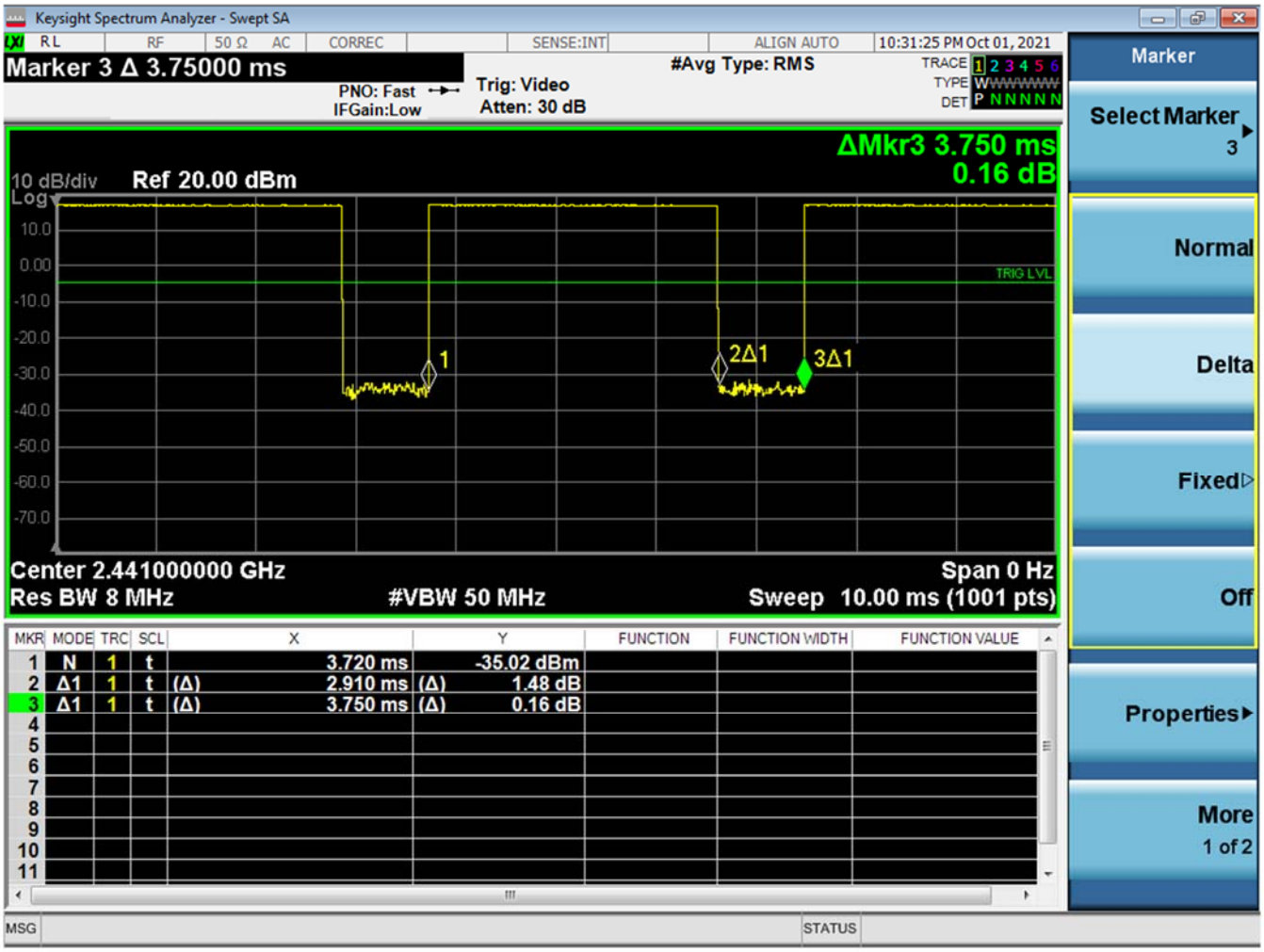

Figure 9-4
Bluetooth Transmission Plot

Equation 9-1
Bluetooth Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.91ms}{3.75ms} * 100\% = 77.6\%$$

10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured 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
12/30/2021	750 Head	20.0	680	0.880	42.902	0.888	42.305	-0.90%	1.41%
			695	0.885	42.878	0.889	42.227	-0.45%	1.54%
			700	0.887	42.864	0.889	42.201	-0.22%	1.57%
			710	0.889	42.821	0.890	42.149	-0.11%	1.59%
			725	0.893	42.742	0.891	42.071	0.22%	1.59%
			750	0.902	42.621	0.894	41.942	0.89%	1.62%
			770	0.910	42.590	0.895	41.838	1.68%	1.80%
			785	0.916	42.587	0.896	41.760	2.23%	1.98%
			800	0.922	42.571	0.897	41.682	2.79%	2.13%
01/06/2022	750 Head	22.1	680	0.888	41.918	0.888	42.305	0.00%	-0.91%
			695	0.893	41.882	0.889	42.227	0.45%	-0.82%
			700	0.895	41.867	0.889	42.201	0.67%	-0.79%
			710	0.898	41.839	0.890	42.149	0.90%	-0.74%
			725	0.903	41.794	0.891	42.071	1.35%	-0.66%
			750	0.912	41.702	0.894	41.942	2.01%	-0.57%
			770	0.919	41.639	0.895	41.838	2.68%	-0.48%
			785	0.924	41.603	0.896	41.760	3.13%	-0.38%
			800	0.929	41.569	0.897	41.682	3.57%	-0.27%
12/22/2021	835 Head	21.5	815	0.926	41.722	0.898	41.594	3.12%	0.31%
			820	0.928	41.705	0.899	41.578	3.23%	0.31%
			835	0.934	41.658	0.900	41.500	3.78%	0.38%
			850	0.940	41.617	0.916	41.500	2.62%	0.28%
12/23/2021	835 Head	20.0	815	0.920	41.374	0.898	41.594	2.45%	-0.53%
			820	0.921	41.358	0.899	41.578	2.45%	-0.53%
			835	0.927	41.304	0.900	41.500	3.00%	-0.47%
			850	0.932	41.252	0.916	41.500	1.75%	-0.60%
12/30/2021	835 Head	20.0	815	0.926	42.525	0.898	41.594	3.12%	2.24%
			820	0.928	42.504	0.899	41.578	3.23%	2.23%
			835	0.933	42.429	0.900	41.500	3.67%	2.24%
			850	0.940	42.356	0.916	41.500	2.62%	2.06%
12/21/2021	1750 Head	20.9	1710	1.386	39.538	1.348	40.142	2.82%	-1.50%
			1720	1.391	39.521	1.354	40.126	2.73%	-1.51%
			1745	1.406	39.478	1.368	40.087	2.78%	-1.52%
			1750	1.409	39.468	1.371	40.079	2.77%	-1.52%
			1770	1.419	39.430	1.383	40.047	2.60%	-1.54%
			1790	1.431	39.394	1.394	40.016	2.65%	-1.55%
12/26/2021	1900 Head	23.2	1850	1.367	38.977	1.400	40.000	-2.36%	-2.56%
			1860	1.377	38.935	1.400	40.000	-1.64%	-2.66%
			1880	1.397	38.844	1.400	40.000	-0.21%	-2.89%
			1900	1.419	38.752	1.400	40.000	1.36%	-3.12%
			1905	1.424	38.729	1.400	40.000	1.71%	-3.18%
			1910	1.429	38.705	1.400	40.000	2.07%	-3.24%
01/03/2022	2450 Head	20.2	2300	1.742	39.958	1.670	39.500	4.31%	1.16%
			2310	1.750	39.941	1.679	39.480	4.23%	1.17%
			2320	1.758	39.928	1.687	39.460	4.21%	1.19%
			2400	1.820	39.802	1.756	39.289	3.64%	1.31%
			2450	1.860	39.716	1.800	39.200	3.33%	1.32%
			2480	1.885	39.660	1.833	39.162	2.84%	1.27%
			2500	1.901	39.631	1.855	39.136	2.48%	1.26%
			2510	1.909	39.619	1.866	39.123	2.30%	1.27%
			2535	1.929	39.571	1.893	39.092	1.90%	1.23%
			2550	1.942	39.536	1.909	39.073	1.73%	1.18%
			2560	1.951	39.517	1.920	39.060	1.61%	1.17%
			2600	1.983	39.463	1.964	39.009	0.97%	1.16%
			2650	2.024	39.354	2.018	38.945	0.30%	1.05%
			2680	2.049	39.316	2.051	38.907	-0.10%	1.05%
			2700	2.062	39.283	2.073	38.882	-0.53%	1.03%
01/12/2022	2450 Head	24.9	2300	1.683	39.364	1.670	39.500	0.78%	-0.34%
			2310	1.695	39.325	1.679	39.480	0.95%	-0.39%
			2320	1.707	39.287	1.687	39.460	1.19%	-0.44%
			2400	1.798	38.968	1.756	39.289	2.39%	-0.82%
			2450	1.855	38.765	1.800	39.200	3.06%	-1.11%
			2480	1.890	38.646	1.833	39.162	3.11%	-1.32%
			2500	1.913	38.569	1.855	39.136	3.13%	-1.45%
			2510	1.925	38.533	1.866	39.123	3.16%	-1.51%
			2535	1.954	38.434	1.893	39.092	3.22%	-1.68%
			2550	1.973	38.371	1.909	39.073	3.35%	-1.80%
			2560	1.986	38.331	1.920	39.060	3.44%	-1.87%
			2600	2.033	38.178	1.964	39.009	3.51%	-2.13%
			2650	2.094	37.955	2.018	38.945	3.77%	-2.54%
			2680	2.129	37.845	2.051	38.907	3.80%	-2.73%
			2700	2.150	37.763	2.073	38.882	3.71%	-2.88%

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
01/15/2022	2450 Head	21.9	2300	1.733	39.021	1.670	39.500	3.77%	-1.21%
			2310	1.740	39.007	1.679	39.480	3.63%	-1.20%
			2320	1.748	38.996	1.687	39.460	3.62%	-1.18%
			2400	1.810	38.901	1.756	39.289	3.08%	-0.99%
			2450	1.851	38.831	1.800	39.200	2.83%	-0.94%
			2480	1.875	38.794	1.833	39.162	2.29%	-0.94%
			2500	1.891	38.767	1.855	39.136	1.94%	-0.94%
			2510	1.899	38.750	1.866	39.123	1.77%	-0.95%
			2535	1.921	38.705	1.893	39.092	1.48%	-0.99%
			2550	1.935	38.682	1.909	39.073	1.36%	-1.00%
			2560	1.945	38.669	1.920	39.060	1.30%	-1.00%
			2600	1.977	38.620	1.964	39.009	0.66%	-1.00%
			2650	2.019	38.521	2.018	38.945	0.05%	-1.09%
			2680	2.046	38.471	2.051	38.907	-0.24%	-1.12%
			2700	2.062	38.441	2.073	38.882	-0.53%	-1.13%
01/03/2022	5200-5800 Head	21.2	5180	4.658	36.239	4.635	36.009	0.50%	0.64%
			5190	4.666	36.219	4.645	35.998	0.45%	0.61%
			5200	4.673	36.204	4.655	35.986	0.39%	0.61%
			5210	4.686	36.194	4.666	35.975	0.43%	0.61%
			5220	4.699	36.164	4.676	35.963	0.49%	0.56%
			5240	4.722	36.108	4.696	35.940	0.55%	0.47%
			5250	4.732	36.090	4.706	35.929	0.55%	0.45%
			5260	4.746	36.087	4.717	35.917	0.61%	0.47%
			5270	4.760	36.056	4.727	35.906	0.70%	0.42%
			5280	4.772	36.028	4.737	35.894	0.74%	0.37%
			5290	4.782	36.012	4.748	35.883	0.72%	0.36%
			5300	4.794	36.004	4.758	35.871	0.76%	0.37%
			5310	4.808	35.998	4.768	35.860	0.84%	0.38%
			5320	4.822	35.970	4.778	35.849	0.92%	0.34%
			5500	5.029	35.629	4.963	35.643	1.33%	-0.04%
			5510	5.042	35.611	4.973	35.632	1.39%	-0.06%
			5520	5.056	35.590	4.983	35.620	1.46%	-0.08%
			5530	5.070	35.574	4.994	35.609	1.52%	-0.10%
			5540	5.085	35.560	5.004	35.597	1.62%	-0.10%
			5550	5.100	35.550	5.014	35.586	1.72%	-0.10%
			5560	5.114	35.536	5.024	35.574	1.79%	-0.11%
			5580	5.133	35.499	5.045	35.551	1.74%	-0.15%
			5600	5.153	35.455	5.065	35.529	1.74%	-0.21%
			5610	5.167	35.429	5.076	35.518	1.79%	-0.25%
			5620	5.181	35.406	5.086	35.506	1.87%	-0.28%
			5640	5.207	35.366	5.106	35.483	1.98%	-0.33%
			5660	5.235	35.345	5.127	35.460	2.11%	-0.32%
			5670	5.245	35.343	5.137	35.449	2.10%	-0.30%
			5680	5.255	35.334	5.147	35.437	2.10%	-0.29%
			5690	5.266	35.316	5.158	35.426	2.09%	-0.31%
			5700	5.278	35.294	5.168	35.414	2.13%	-0.34%
			5710	5.289	35.268	5.178	35.403	2.14%	-0.38%
			5720	5.301	35.247	5.188	35.391	2.18%	-0.41%
			5745	5.334	35.187	5.214	35.363	2.30%	-0.50%
			5750	5.340	35.178	5.219	35.357	2.32%	-0.51%
			5755	5.346	35.172	5.224	35.351	2.34%	-0.51%
			5765	5.358	35.166	5.234	35.340	2.37%	-0.49%
			5775	5.368	35.162	5.245	35.329	2.35%	-0.47%
			5785	5.380	35.150	5.255	35.317	2.38%	-0.47%
			5795	5.392	35.129	5.265	35.305	2.41%	-0.50%
			5800	5.399	35.118	5.270	35.300	2.45%	-0.52%
			5805	5.403	35.104	5.275	35.294	2.43%	-0.54%
			5825	5.416	35.068	5.296	35.271	2.27%	-0.58%
			5835	5.428	35.038	5.305	35.230	2.32%	-0.54%
			5845	5.443	35.010	5.315	35.210	2.41%	-0.57%
			5855	5.458	34.990	5.325	35.197	2.50%	-0.59%
			5865	5.470	34.978	5.336	35.190	2.51%	-0.60%
			5875	5.485	34.966	5.347	35.183	2.58%	-0.62%
			5885	5.498	34.944	5.357	35.177	2.63%	-0.66%
			5905	5.520	34.916	5.379	35.163	2.62%	-0.70%

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
01/11/2022	5200-5800 Head	20.1	5180	4.714	34.895	4.635	36.009	1.70%	-3.09%
			5190	4.727	34.871	4.645	35.998	1.77%	-3.13%
			5200	4.738	34.851	4.655	35.986	1.78%	-3.15%
			5210	4.750	34.834	4.666	35.975	1.80%	-3.17%
			5220	4.762	34.822	4.676	35.963	1.84%	-3.17%
			5240	4.781	34.797	4.696	35.940	1.81%	-3.18%
			5250	4.793	34.772	4.706	35.929	1.85%	-3.22%
			5260	4.804	34.750	4.717	35.917	1.84%	-3.25%
			5270	4.815	34.728	4.727	35.906	1.86%	-3.28%
			5280	4.827	34.704	4.737	35.894	1.90%	-3.32%
			5290	4.839	34.681	4.748	35.883	1.92%	-3.35%
			5300	4.850	34.663	4.758	35.871	1.93%	-3.37%
			5310	4.862	34.651	4.768	35.860	1.97%	-3.37%
			5320	4.874	34.631	4.778	35.849	2.01%	-3.40%
			5500	5.071	34.250	4.963	35.643	2.18%	-3.91%
			5510	5.084	34.224	4.973	35.632	2.23%	-3.95%
			5520	5.097	34.201	4.983	35.620	2.29%	-3.98%
			5530	5.111	34.179	4.994	35.609	2.34%	-4.02%
			5540	5.124	34.157	5.004	35.597	2.40%	-4.05%
			5550	5.137	34.135	5.014	35.586	2.45%	-4.08%
			5560	5.151	34.112	5.024	35.574	2.53%	-4.11%
			5580	5.175	34.083	5.045	35.551	2.58%	-4.13%
			5600	5.197	34.043	5.065	35.529	2.61%	-4.18%
			5610	5.209	34.019	5.076	35.518	2.62%	-4.22%
			5620	5.221	33.996	5.086	35.506	2.65%	-4.25%
			5640	5.241	33.956	5.106	35.483	2.64%	-4.30%
			5660	5.267	33.913	5.127	35.460	2.73%	-4.36%
			5670	5.281	33.900	5.137	35.449	2.80%	-4.37%
			5680	5.294	33.890	5.147	35.437	2.86%	-4.37%
			5690	5.306	33.875	5.158	35.426	2.87%	-4.38%
			5700	5.317	33.851	5.168	35.414	2.88%	-4.41%
			5710	5.330	33.830	5.178	35.403	2.94%	-4.44%
			5720	5.341	33.813	5.188	35.391	2.95%	-4.46%
			5745	5.371	33.767	5.214	35.363	3.01%	-4.51%
			5750	5.377	33.757	5.219	35.357	3.03%	-4.53%
			5755	5.382	33.747	5.224	35.351	3.02%	-4.54%
			5765	5.391	33.728	5.234	35.340	3.00%	-4.56%
			5775	5.401	33.710	5.245	35.329	2.97%	-4.58%
			5785	5.413	33.694	5.255	35.317	3.01%	-4.60%
			5795	5.426	33.672	5.265	35.305	3.06%	-4.63%
			5800	5.432	33.663	5.270	35.300	3.07%	-4.64%
			5805	5.438	33.653	5.275	35.294	3.09%	-4.65%
			5825	5.463	33.617	5.296	35.271	3.15%	-4.69%
			5835	5.477	33.604	5.305	35.230	3.24%	-4.62%
			5845	5.490	33.589	5.315	35.210	3.29%	-4.60%
			5855	5.503	33.574	5.325	35.197	3.34%	-4.61%
			5865	5.513	33.561	5.336	35.190	3.32%	-4.63%
			5875	5.523	33.543	5.347	35.183	3.29%	-4.66%
			5885	5.531	33.522	5.357	35.177	3.25%	-4.70%
			5905	5.555	33.470	5.379	35.163	3.27%	-4.81%

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
12/30/2021	750 Body	22.5	680	0.969	54.724	0.958	55.804	1.15%	-1.94%
			695	0.975	54.703	0.959	55.745	1.67%	-1.87%
			700	0.977	54.695	0.959	55.726	1.88%	-1.85%
			710	0.980	54.672	0.960	55.687	2.08%	-1.82%
			725	0.985	54.630	0.961	55.629	2.50%	-1.80%
			750	0.994	54.560	0.964	55.531	3.11%	-1.75%
			770	1.001	54.519	0.965	55.453	3.73%	-1.68%
			785	1.007	54.500	0.966	55.395	4.24%	-1.62%
			800	1.012	54.476	0.967	55.336	4.65%	-1.55%
01/07/2022	750 Body	21.0	680	0.936	54.585	0.958	55.804	-2.30%	-2.18%
			695	0.942	54.563	0.959	55.745	-1.77%	-2.12%
			700	0.943	54.550	0.959	55.726	-1.67%	-2.11%
			710	0.946	54.526	0.960	55.687	-1.46%	-2.08%
			725	0.952	54.476	0.961	55.629	-0.94%	-2.07%
			750	0.961	54.395	0.964	55.531	-0.31%	-2.05%
			770	0.969	54.348	0.965	55.453	0.41%	-1.99%
			785	0.975	54.327	0.966	55.395	0.93%	-1.93%
			800	0.980	54.308	0.967	55.336	1.34%	-1.86%
12/21/2021	835 Body	21.2	815	0.986	55.303	0.968	55.271	1.86%	0.06%
			820	0.988	55.294	0.969	55.258	1.96%	0.07%
			835	0.994	55.263	0.970	55.200	2.47%	0.11%
			850	1.001	55.232	0.988	55.154	1.32%	0.14%
12/23/2021	835 Body	20.8	815	0.991	54.895	0.968	55.271	2.38%	-0.68%
			820	0.993	54.880	0.969	55.258	2.48%	-0.68%
			835	0.999	54.830	0.970	55.200	2.99%	-0.67%
			850	1.005	54.788	0.988	55.154	1.72%	-0.66%
01/03/2022	835 Body	19.4	815	0.957	55.527	0.968	55.271	-1.14%	0.46%
			820	0.959	55.501	0.969	55.258	-1.03%	0.44%
			835	0.965	55.436	0.970	55.200	-0.52%	0.43%
			850	0.972	55.392	0.988	55.154	-1.62%	0.43%
12/20/2021	1750 Body	21.4	1710	1.442	53.559	1.463	53.537	-1.44%	0.04%
			1720	1.449	53.553	1.469	53.511	-1.36%	0.08%
			1745	1.466	53.535	1.485	53.445	-1.28%	0.17%
			1750	1.470	53.531	1.488	53.432	-1.21%	0.19%
			1770	1.484	53.509	1.501	53.379	-1.13%	0.24%
			1790	1.499	53.490	1.514	53.326	-0.99%	0.31%
12/21/2021	1750 Body	21.8	1710	1.476	52.784	1.463	53.537	0.89%	-1.41%
			1720	1.483	52.768	1.469	53.511	0.95%	-1.39%
			1745	1.499	52.727	1.485	53.445	0.94%	-1.34%
			1750	1.502	52.717	1.488	53.432	0.94%	-1.34%
			1770	1.515	52.682	1.501	53.379	0.93%	-1.31%
			1790	1.528	52.655	1.514	53.326	0.92%	-1.26%
02/02/2022	1750 Body	22.2	1710	1.476	53.245	1.463	53.537	0.89%	-0.55%
			1720	1.483	53.209	1.469	53.511	0.95%	-0.56%
			1745	1.501	53.152	1.485	53.445	1.08%	-0.55%
			1750	1.505	53.148	1.488	53.432	1.14%	-0.53%
			1770	1.520	53.146	1.501	53.379	1.27%	-0.44%
			1790	1.533	53.137	1.514	53.326	1.25%	-0.35%
12/21/2021	1900 Body	24.4	1850	1.514	52.490	1.520	53.300	-0.39%	-1.52%
			1860	1.524	52.453	1.520	53.300	0.26%	-1.59%
			1880	1.546	52.385	1.520	53.300	1.71%	-1.72%
			1900	1.568	52.329	1.520	53.300	3.16%	-1.82%
			1905	1.573	52.316	1.520	53.300	3.49%	-1.85%
			1910	1.578	52.303	1.520	53.300	3.82%	-1.87%
01/31/2022	1900 Body	23.2	1850	1.515	54.429	1.520	53.300	-0.33%	2.12%
			1860	1.526	54.398	1.520	53.300	0.39%	2.06%
			1880	1.549	54.331	1.520	53.300	1.91%	1.93%
			1900	1.573	54.253	1.520	53.300	3.49%	1.79%
			1905	1.579	54.236	1.520	53.300	3.88%	1.76%
			1910	1.585	54.218	1.520	53.300	4.28%	1.72%
12/26/2021	2450 Body	24.5	2300	1.829	51.997	1.809	52.900	1.11%	-1.71%
			2310	1.841	51.978	1.816	52.887	1.38%	-1.72%
			2320	1.852	51.957	1.826	52.873	1.42%	-1.73%
			2400	1.942	51.783	1.902	52.767	2.10%	-1.86%
			2450	2.001	51.671	1.950	52.700	2.62%	-1.95%
			2480	2.034	51.604	1.993	52.662	2.06%	-2.01%
			2500	2.057	51.553	2.021	52.636	1.78%	-2.06%
			2510	2.069	51.526	2.035	52.623	1.67%	-2.08%
			2535	2.101	51.463	2.071	52.592	1.45%	-2.15%
			2550	2.119	51.430	2.092	52.573	1.29%	-2.17%
			2560	2.130	51.405	2.106	52.560	1.14%	-2.20%
			2600	2.176	51.295	2.163	52.509	0.60%	-2.31%
			2650	2.236	51.147	2.234	52.445	0.09%	-2.47%
			2680	2.270	51.064	2.277	52.407	-0.31%	-2.56%
			2700	2.292	51.000	2.305	52.382	-0.56%	-2.64%
01/12/2022	2450 Body	23.6	2300	1.827	51.704	1.809	52.900	1.00%	-2.26%
			2310	1.838	51.675	1.816	52.887	1.21%	-2.29%
			2320	1.849	51.649	1.826	52.873	1.26%	-2.31%
			2400	1.938	51.449	1.902	52.767	1.89%	-2.50%
			2450	1.996	51.315	1.950	52.700	2.36%	-2.63%
			2480	2.030	51.236	1.993	52.662	1.86%	-2.71%
			2500	2.053	51.181	2.021	52.636	1.58%	-2.76%
			2510	2.065	51.151	2.035	52.623	1.47%	-2.80%
			2535	2.095	51.078	2.071	52.592	1.16%	-2.88%
			2550	2.113	51.040	2.092	52.573	1.00%	-2.92%
			2560	2.125	51.016	2.106	52.560	0.90%	-2.94%
			2600	2.171	50.913	2.163	52.509	0.37%	-3.04%
			2650	2.230	50.767	2.234	52.445	-0.18%	-3.20%
			2680	2.267	50.683	2.277	52.407	-0.44%	-3.29%
			2700	2.290	50.627	2.305	52.382	-0.65%	-3.35%

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
12/27/2021	5200-5800 Body	23.0	5180	5.305	48.283	5.276	49.041	0.55%	-1.55%
			5190	5.320	48.269	5.288	49.028	0.61%	-1.55%
			5200	5.338	48.251	5.299	49.014	0.74%	-1.56%
			5210	5.352	48.223	5.311	49.001	0.77%	-1.59%
			5220	5.366	48.206	5.323	48.987	0.81%	-1.59%
			5240	5.390	48.191	5.346	48.960	0.82%	-1.57%
			5250	5.402	48.174	5.358	48.947	0.82%	-1.58%
			5260	5.412	48.141	5.369	48.933	0.80%	-1.62%
			5270	5.423	48.106	5.381	48.919	0.78%	-1.66%
			5280	5.439	48.068	5.393	48.906	0.85%	-1.71%
			5290	5.458	48.041	5.404	48.892	1.00%	-1.74%
			5300	5.476	48.017	5.416	48.879	1.11%	-1.76%
			5310	5.488	47.996	5.428	48.865	1.11%	-1.78%
			5320	5.501	47.981	5.439	48.851	1.14%	-1.78%
			5500	5.748	47.614	5.650	48.607	1.73%	-2.04%
			5510	5.761	47.586	5.661	48.594	1.77%	-2.07%
			5520	5.779	47.555	5.673	48.580	1.87%	-2.11%
			5530	5.797	47.534	5.685	48.566	1.97%	-2.12%
			5540	5.815	47.515	5.696	48.553	2.09%	-2.14%
			5550	5.831	47.503	5.708	48.539	2.15%	-2.13%
			5560	5.847	47.493	5.720	48.526	2.22%	-2.13%
			5580	5.874	47.462	5.743	48.499	2.28%	-2.14%
			5600	5.899	47.408	5.766	48.471	2.31%	-2.19%
			5610	5.915	47.387	5.778	48.458	2.37%	-2.21%
			5620	5.931	47.364	5.790	48.444	2.44%	-2.23%
			5640	5.964	47.319	5.813	48.417	2.60%	-2.27%
			5660	6.000	47.301	5.837	48.390	2.79%	-2.25%
			5670	6.015	47.294	5.848	48.376	2.86%	-2.24%
			5680	6.026	47.277	5.860	48.363	2.83%	-2.25%
			5690	6.039	47.261	5.872	48.349	2.84%	-2.25%
			5700	6.055	47.240	5.883	48.336	2.92%	-2.27%
			5710	6.071	47.218	5.895	48.322	2.99%	-2.28%
			5720	6.085	47.200	5.907	48.309	3.01%	-2.30%
			5745	6.121	47.148	5.936	48.275	3.12%	-2.33%
			5750	6.128	47.138	5.942	48.268	3.13%	-2.34%
			5755	6.137	47.130	5.947	48.261	3.19%	-2.34%
			5765	6.152	47.118	5.959	48.248	3.24%	-2.34%
			5775	6.166	47.113	5.971	48.234	3.27%	-2.32%
			5785	6.180	47.103	5.982	48.220	3.31%	-2.32%
			5795	6.195	47.085	5.994	48.207	3.35%	-2.33%
			5800	6.203	47.079	6.000	48.200	3.38%	-2.33%
			5805	6.211	47.069	6.006	48.193	3.41%	-2.33%
			5825	6.237	47.048	6.029	48.166	3.45%	-2.32%
			5835	6.250	47.030	6.042	48.130	3.44%	-2.29%
			5845	6.268	47.001	6.054	48.110	3.53%	-2.31%
			5855	6.286	46.971	6.066	48.093	3.63%	-2.33%
			5865	6.302	46.937	6.077	48.080	3.70%	-2.38%
			5875	6.318	46.923	6.088	48.067	3.78%	-2.38%
			5885	6.332	46.918	6.100	48.053	3.80%	-2.36%
			5905	6.364	46.902	6.122	48.027	3.95%	-2.34%
01/13/2022	5200-5800 Body	23.1	5180	5.304	47.760	5.276	49.041	0.53%	-2.61%
			5190	5.313	47.753	5.288	49.028	0.47%	-2.60%
			5200	5.323	47.731	5.299	49.014	0.45%	-2.62%
			5210	5.334	47.704	5.311	49.001	0.43%	-2.65%
			5220	5.352	47.680	5.323	48.987	0.54%	-2.67%
			5240	5.391	47.613	5.346	48.960	0.84%	-2.75%
			5250	5.405	47.585	5.358	48.947	0.88%	-2.78%
			5260	5.419	47.572	5.369	48.933	0.93%	-2.78%
			5270	5.433	47.568	5.381	48.919	0.97%	-2.76%
			5280	5.448	47.557	5.393	48.906	1.02%	-2.76%
			5290	5.461	47.554	5.404	48.892	1.05%	-2.74%
			5300	5.478	47.559	5.416	48.879	1.14%	-2.70%
			5310	5.492	47.551	5.428	48.865	1.18%	-2.69%
			5320	5.508	47.532	5.439	48.851	1.27%	-2.70%
			5500	5.781	47.240	5.650	48.607	2.32%	-2.81%
			5510	5.799	47.229	5.661	48.594	2.44%	-2.81%
			5520	5.817	47.217	5.673	48.580	2.54%	-2.81%
			5530	5.832	47.206	5.685	48.566	2.59%	-2.80%
			5540	5.844	47.190	5.696	48.553	2.60%	-2.81%
			5550	5.857	47.180	5.708	48.539	2.61%	-2.80%
			5560	5.872	47.169	5.720	48.526	2.66%	-2.80%
			5580	5.902	47.130	5.743	48.499	2.77%	-2.82%
			5600	5.929	47.083	5.766	48.471	2.83%	-2.86%
			5610	5.945	47.064	5.778	48.458	2.89%	-2.88%
			5620	5.961	47.053	5.790	48.444	2.95%	-2.87%
			5640	5.988	47.031	5.813	48.417	3.01%	-2.86%
			5660	6.012	46.986	5.837	48.390	3.00%	-2.90%
			5670	6.026	46.975	5.848	48.376	3.04%	-2.90%
			5680	6.038	46.966	5.860	48.363	3.04%	-2.89%
			5690	6.051	46.949	5.872	48.349	3.05%	-2.90%
			5700	6.064	46.921	5.883	48.336	3.08%	-2.93%
			5710	6.078	46.896	5.895	48.322	3.10%	-2.95%
			5720	6.091	46.877	5.907	48.309	3.11%	-2.96%
			5745	6.131	46.834	5.936	48.275	3.29%	-2.98%
			5750	6.138	46.826	5.942	48.268	3.30%	-2.99%
			5755	6.144	46.817	5.947	48.261	3.31%	-2.99%
			5765	6.154	46.800	5.959	48.248	3.27%	-3.00%
			5775	6.163	46.780	5.971	48.234	3.22%	-3.01%
			5785	6.174	46.762	5.982	48.220	3.21%	-3.02%
			5795	6.185	46.742	5.994	48.207	3.19%	-3.04%
			5800	6.190	46.731	6.000	48.200	3.17%	-3.05%
			5805	6.195	46.720	6.006	48.193	3.15%	-3.06%
			5825	6.227	46.658	6.029	48.166	3.28%	-3.13%
			5835	6.242	46.632	6.042	48.130	3.31%	-3.11%
			5845	6.256	46.614	6.054	48.110	3.34%	-3.11%
			5855	6.270	46.590	6.066	48.093	3.36%	-3.13%
			5865	6.285	46.570	6.077	48.080	3.42%	-3.14%
			5875	6.297	46.558	6.088	48.067	3.43%	-3.14%
			5885	6.309	46.547	6.100	48.053	3.43%	-3.13%
			5905	6.331	46.477	6.122	48.027	3.41%	-3.23%

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

10.2 Test System Verification

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

Table 10-2
System Verification Results – 1g

SAR System	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp. (C)	Liquid Temp. (C)	Input Power (W)	Source SN	Probe SN	Measured SAR1g (W/kg)	1W Target SAR1g (W/kg)	1W Normalized SAR 1g (W/kg)	Deviation1g (%)
K4	750	HEAD	12/30/2021	20.4	20.0	0.20	1046	7640	1.66	8.59	1.72	-3.38%
K1	750	HEAD	01/06/2022	23.2	23.1	0.20	1034	7558	1.75	8.64	1.73	1.27%
K4	835	HEAD	12/22/2021	20.7	21.5	0.20	4d119	7640	2.04	9.64	1.93	5.81%
K2	835	HEAD	12/23/2021	20.8	20.0	0.20	4d180	7402	1.94	9.45	1.89	2.65%
K4	835	HEAD	12/30/2021	20.4	20.0	0.20	4d119	7640	2.06	9.64	1.93	6.85%
A	1750	HEAD	12/21/2021	22.3	22.1	0.10	1148	7406	3.50	35.90	3.59	-2.51%
A	1900	HEAD	12/26/2021	22.7	21.5	0.10	5d080	7406	4.21	40.50	4.05	3.95%
B	2450	HEAD	01/03/2022	20.5	20.5	0.10	719	7660	5.10	55.00	5.50	-7.27%
E	2450	HEAD	01/12/2022	24.3	22.9	0.10	797	7538	5.44	52.40	5.24	3.82%
E	2450	HEAD	01/15/2022	21.8	21.9	0.10	719	7538	5.30	55.00	5.50	-3.64%
E	2600	HEAD	01/15/2022	21.8	21.9	0.10	1004	7538	5.77	57.80	5.78	-0.17%
J	5250	HEAD	01/03/2022	20.1	21.0	0.05	1191	7668	3.78	79.60	3.98	-5.03%
J	5600	HEAD	01/03/2022	20.1	21.0	0.05	1191	7668	4.08	82.10	4.11	-0.61%
J	5750	HEAD	01/03/2022	20.1	21.0	0.05	1191	7668	3.72	78.20	3.91	-4.86%
B	5800	HEAD	01/11/2022	22.1	20.1	0.05	1191	7552	3.84	79.20	3.96	-3.03%
K1	750	BODY	12/30/2021	22.3	22.5	0.20	1034	7558	1.78	8.91	1.78	-0.11%
K2	750	BODY	01/07/2022	21.6	21.0	0.20	1034	7402	1.79	8.91	1.78	0.45%
K3	835	BODY	12/21/2021	21.8	21.6	0.20	4d119	7637	2.09	9.90	1.98	5.56%
K3	835	BODY	12/23/2021	21.2	20.9	0.20	4d119	7637	2.03	9.90	1.98	2.53%
K3	835	BODY	01/03/2022	20.1	19.4	0.20	4d119	7637	1.99	9.90	1.98	0.51%
G	1750	BODY	12/20/2021	22.8	21.4	0.10	1008	7357	3.77	37.80	3.78	-0.26%
G	1750	BODY	02/02/2022	22.6	22.2	0.10	1150	7357	4.03	37.80	3.78	6.61%
P	1900	BODY	12/21/2021	24.9	23.6	0.10	5d080	7410	4.23	40.70	4.07	3.93%
E	1900	BODY	01/31/2022	20.0	21.2	0.10	5d080	7538	3.85	40.70	4.07	-5.41%
K	2450	BODY	12/26/2021	22.0	22.5	0.10	981	3914	4.98	50.30	5.03	-0.99%
K	2450	BODY	01/12/2022	22.2	22.0	0.10	719	3914	4.98	52.00	5.20	-4.23%
K	2600	BODY	01/12/2022	22.2	22.0	0.10	1004	3914	5.48	55.40	5.54	-1.08%
J	5250	BODY	12/27/2021	20.3	21.1	0.05	1191	7668	3.43	74.10	3.71	-7.42%
J	5600	BODY	12/27/2021	20.3	21.1	0.05	1191	7668	3.80	76.90	3.85	-1.17%
J	5750	BODY	12/27/2021	20.3	21.1	0.05	1191	7668	3.48	74.40	3.72	-6.45%
B	5800	BODY	01/13/2022	23.5	21.3	0.05	1191	7552	3.71	73.50	3.68	0.95%

Table 10-3
System Verification Results – 10g

System Verification TARGET & MEASURED												
SAR System	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp. (C)	Liquid Temp. (C)	Input Power (W)	Source SN	Probe SN	Measured SAR10g (W/kg)	1W Target SAR10g (W/kg)	1W Normalized SAR10g (W/kg)	Deviation10g (%)
G	1750	BODY	12/21/2021	23.8	21.8	0.10	1148	7357	2.060	19.30	20.600	6.74%
P	1900	BODY	12/21/2021	24.9	23.6	0.10	5d080	7410	2.180	21.40	21.800	1.87%
K	2450	BODY	01/12/2022	22.2	22.0	0.10	719	3914	2.270	24.70	22.700	-8.10%
K	2600	BODY	01/12/2022	22.2	22.0	0.10	1004	3914	2.400	24.80	24.000	-3.23%
J	5250	BODY	12/27/2021	20.3	21.1	0.05	1191	7668	0.958	20.80	19.160	-7.88%
J	5600	BODY	12/27/2021	20.3	21.1	0.05	1191	7668	1.050	21.30	21.000	-1.41%
J	5750	BODY	12/27/2021	20.3	21.1	0.05	1191	7668	0.982	20.70	19.640	-5.12%
B	5800	BODY	01/13/2021	23.5	21.3	0.05	1191	7552	1.050	20.20	21.000	3.96%

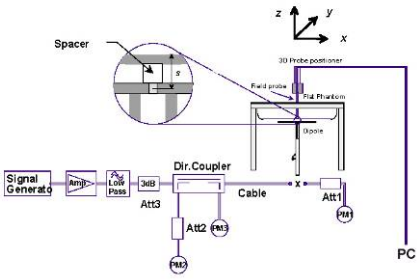

Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
GSM 850 Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
824.20	128	GSM 850	GSM	33.0	32.06	0.08	Right	Cheek	A	0026M	1:8.3	0.103	1.242	0.128	A1
824.20	128	GSM 850	GSM	33.0	32.06	0.13	Right	Tilt	A	0026M	1:8.3	0.050	1.242	0.062	
824.20	128	GSM 850	GSM	33.0	32.06	0.05	Left	Cheek	A	0026M	1:8.3	0.077	1.242	0.096	
824.20	128	GSM 850	GSM	33.0	32.06	0.18	Left	Tilt	A	0026M	1:8.3	0.051	1.242	0.063	
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	Antenna Config.	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	29.13	0.11	Right	Cheek	A	0004M	1:8.3	0.052	1.222	0.064	A2
1909.80	810	GSM 1900	GSM	30.0	29.13	0.04	Right	Tilt	A	0004M	1:8.3	0.021	1.222	0.026	
1909.80	810	GSM 1900	GSM	30.0	29.13	-0.21	Left	Cheek	A	0004M	1:8.3	0.047	1.222	0.057	
1909.80	810	GSM 1900	GSM	30.0	29.13	-0.08	Left	Tilt	A	0004M	1:8.3	0.012	1.222	0.015	
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]	Tune State	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
826.40	4132	UMTS 850	RMC	25.0	24.29	0	0.05	Right	Cheek	A	0026M	1:1	0.311	1.178	**0.366**	A3
826.40	4132	UMTS 850	RMC	25.0	24.29	0	0.00	Right	Tilt	A	0026M	1:1	0.161	1.178	0.190	
826.40	4132	UMTS 850	RMC	25.0	24.29	0	0.13	Left	Cheek	A	0026M	1:1	0.227	1.178	0.267	
826.40	4132	UMTS 850	RMC	25.0	24.29	0	0.13	Left	Tilt	A	0026M	1:1	0.141	1.178	0.166	
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]	Tune State	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.5	24.51	0	0.01	0	Right	Cheek	A	QPSK	1	25	0026M	1:1	0.166	1.256	0.208	A4
707.50	23095	Mid	LTE Band 12	10	24.5	23.45	0	0.08	1	Right	Cheek	A	QPSK	25	25	0026M	1:1	0.131	1.274	0.167	
707.50	23095	Mid	LTE Band 12	10	25.5	24.51	0	0.08	0	Right	Tilt	A	QPSK	1	25	0026M	1:1	0.092	1.256	0.116	
707.50	23095	Mid	LTE Band 12	10	24.5	23.45	0	0.09	1	Right	Tilt	A	QPSK	25	25	0026M	1:1	0.072	1.274	0.092	
707.50	23095	Mid	LTE Band 12	10	25.5	24.51	0	-0.01	0	Left	Cheek	A	QPSK	1	25	0026M	1:1	0.150	1.256	0.188	
707.50	23095	Mid	LTE Band 12	10	24.5	23.45	0	0.02	1	Left	Cheek	A	QPSK	25	25	0026M	1:1	0.118	1.274	0.150	
707.50	23095	Mid	LTE Band 12	10	25.5	24.51	0	0.09	0	Left	Tilt	A	QPSK	1	25	0026M	1:1	0.095	1.256	0.119	
707.50	23095	Mid	LTE Band 12	10	24.5	23.45	0	0.06	1	Left	Tilt	A	QPSK	25	25	0026M	1:1	0.072	1.274	0.092	
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]	Tune State	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	25.5	24.17	0	-0.03	0	Right	Cheek	A	QPSK	1	25	0031M	1:1	0.247	1.358	0.335	A5
782.00	23230	Mid	LTE Band 13	10	24.5	23.20	0	0.06	1	Right	Cheek	A	QPSK	25	12	0031M	1:1	0.194	1.349	0.262	
782.00	23230	Mid	LTE Band 13	10	25.5	24.17	0	0.09	0	Right	Tilt	A	QPSK	1	25	0031M	1:1	0.125	1.358	0.170	
782.00	23230	Mid	LTE Band 13	10	24.5	23.20	0	0.10	1	Right	Tilt	A	QPSK	25	12	0031M	1:1	0.102	1.349	0.138	
782.00	23230	Mid	LTE Band 13	10	25.5	24.17	0	0.05	0	Left	Cheek	A	QPSK	1	25	0031M	1:1	0.207	1.358	0.281	
782.00	23230	Mid	LTE Band 13	10	24.5	23.20	0	0.01	1	Left	Cheek	A	QPSK	25	12	0031M	1:1	0.167	1.349	0.225	
782.00	23230	Mid	LTE Band 13	10	25.5	24.17	0	-0.02	0	Left	Tilt	A	QPSK	1	25	0031M	1:1	0.135	1.358	0.183	
782.00	23230	Mid	LTE Band 13	10	24.5	23.20	0	0.04	1	Left	Tilt	A	QPSK	25	12	0031M	1:1	0.111	1.349	0.150	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram											

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

MEASUREMENT RESULTS																						
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	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	25.5	24.63	2	0.16	0	Right	Cheek	A	QPSK	1	0	0026M	1:1	0.284	1.222	0.347	A6
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.67	2	0.07	1	Right	Cheek	A	QPSK	25	12	0026M	1:1	0.214	1.211	0.259	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.63	2	0.13	0	Right	Tilt	A	QPSK	1	0	0026M	1:1	0.152	1.222	0.186	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.67	2	0.08	1	Right	Tilt	A	QPSK	25	12	0026M	1:1	0.111	1.211	0.134	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.63	2	0.06	0	Left	Cheek	A	QPSK	1	0	0026M	1:1	0.218	1.222	0.266	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.67	2	0.07	1	Left	Cheek	A	QPSK	25	12	0026M	1:1	0.165	1.211	0.200	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.63	2	0.01	0	Left	Tilt	A	QPSK	1	0	0026M	1:1	0.157	1.222	0.192	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.67	2	0.14	1	Left	Tilt	A	QPSK	25	12	0026M	1:1	0.116	1.211	0.140	
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]	Tune State	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	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	24.5	23.04	26	-0.16	0	Right	Cheek	A	QPSK	1	50	0004M	1:1	0.106	1.400	0.148	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	21.93	26	-0.04	1	Right	Cheek	A	QPSK	50	25	0004M	1:1	0.087	1.435	0.125	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	23.04	26	0.14	0	Right	Tilt	A	QPSK	1	50	0004M	1:1	0.071	1.400	0.099	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	21.93	26	-0.02	1	Right	Tilt	A	QPSK	50	25	0004M	1:1	0.053	1.435	0.076	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	23.04	26	0.00	0	Left	Cheek	A	QPSK	1	50	0004M	1:1	0.199	1.400	0.279	A7
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	21.93	26	0.00	1	Left	Cheek	A	QPSK	50	25	0004M	1:1	0.149	1.435	0.214	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	23.04	26	-0.15	0	Left	Tilt	A	QPSK	1	50	0004M	1:1	0.055	1.400	0.077	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	21.93	26	-0.14	1	Left	Tilt	A	QPSK	50	25	0004M	1:1	0.045	1.435	0.065	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-8
LTE Band 41 Head SAR

MEASUREMENT RESULTS																								
1 CC Uplink | 2 CC Uplink, Power Class	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	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	2680.00	41490	High	LTE Band 41	20	25.0	24.34	-0.20	0	Right	Cheek	B	QPSK	1	50	0012M	1:1.58	0.093	1.164	0.108	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	24.0	23.47	-0.18	1	Right	Cheek	B	QPSK	50	25	0012M	1:1.58	0.079	1.130	0.089	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	25.0	24.34	0.13	0	Right	Tilt	B	QPSK	1	50	0012M	1:1.58	0.070	1.164	0.081	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	24.0	23.47	0.17	1	Right	Tilt	B	QPSK	50	25	0012M	1:1.58	0.052	1.130	0.059	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	25.0	24.18	0.02	0	Left	Cheek	B	QPSK	1	0	0012M	1:1.58	0.185	1.208	0.223	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	25.0	24.34	0.07	0	Left	Cheek	B	QPSK	1	50	0012M	1:1.58	0.208	1.164	0.242	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	24.0	23.47	0.00	1	Left	Cheek	B	QPSK	50	25	0012M	1:1.58	0.167	1.130	0.189	
2 CC Uplink - Power Class 3	PCC	2680.00	41490	High	LTE Band 41	20	25.0	24.72	0.05	0	Left	Cheek	B	QPSK	1	0	0012M	1:1.58	0.214	1.067	0.228	A8
	SCC	2660.20	41292													99						
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	25.0	24.34	0.03	0	Left	Tilt	B	QPSK	1	50	0012M	1:1.58	0.096	1.164	0.112	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	24.0	23.47	0.00	1	Left	Tilt	B	QPSK	50	25	0012M	1:1.58	0.075	1.130	0.085	
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 SISO SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	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	15.0	14.78	0.00	Right	Cheek	2	0008M	1	98.9	0.062	0.046	1.052	1.011	**0.049**	
2462	11	802.11b	DSSS	22	15.0	14.78	-0.14	Right	Tilt	2	0008M	1	98.9	0.046	0.030	1.052	1.011	0.032	
2462	11	802.11b	DSSS	22	15.0	14.78	-0.06	Left	Cheek	2	0008M	1	98.9	0.022	0.016	1.052	1.011	0.017	
2462	11	802.11b	DSSS	22	15.0	14.78	0.17	Left	Tilt	2	0008M	1	98.9	0.020	0.013	1.052	1.011	0.014	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-10
DTS Head MIMO 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]	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)	
2412	1	802.11n	OFDM	20	15.0	14.61	15.0	14.73	0.18	Right	Cheek	MIMO	0008M	13	91.3	0.294	0.253	1.094	1.095	0.303	A9
2412	1	802.11n	OFDM	20	15.0	14.61	15.0	14.73	0.17	Right	Tilt	MIMO	0008M	13	91.3	0.068	-	1.094	1.095	-	
2412	1	802.11n	OFDM	20	15.0	14.61	15.0	14.73	-0.14	Left	Cheek	MIMO	0008M	13	91.3	0.240	0.221	1.094	1.095	0.265	
2412	1	802.11n	OFDM	20	15.0	14.61	15.0	14.73	0.00	Left	Tilt	MIMO	0008M	13	91.3	0.053	-	1.094	1.095	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram											

Note: To achieve the 18.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 15.0 dBm.

Table 11-11
NII SISO 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	12.0	11.74	0.10	Right	Cheek	1	0005M	29.3	92.4	0.340	0.280	1.062	1.082	0.322	
5290	58	802.11ac	OFDM	80	12.0	11.74	-0.04	Right	Tilt	1	0005M	29.3	92.4	0.019	-	1.062	1.082	-	
5290	58	802.11ac	OFDM	80	12.0	11.74	0.06	Left	Cheek	1	0005M	29.3	92.4	0.164	-	1.062	1.082	-	
5290	58	802.11ac	OFDM	80	12.0	11.74	-0.19	Left	Tilt	1	0005M	29.3	92.4	0.017	-	1.062	1.082	-	
5690	138	802.11ac	OFDM	80	12.0	11.94	-0.14	Right	Cheek	1	0005M	29.3	92.4	0.286	0.213	1.014	1.082	0.234	
5690	138	802.11ac	OFDM	80	12.0	11.94	0.19	Right	Tilt	1	0005M	29.3	92.4	0.018	-	1.014	1.082	-	
5690	138	802.11ac	OFDM	80	12.0	11.94	0.11	Left	Cheek	1	0005M	29.3	92.4	0.097	-	1.014	1.082	-	
5690	138	802.11ac	OFDM	80	12.0	11.94	0.17	Left	Tilt	1	0005M	29.3	92.4	0.007	-	1.014	1.082	-	
5775	155	802.11ac	OFDM	80	12.0	11.62	-0.15	Right	Cheek	1	0005M	29.3	92.4	0.294	0.211	1.091	1.082	0.249	
5775	155	802.11ac	OFDM	80	12.0	11.62	0.00	Right	Tilt	1	0005M	29.3	92.4	0.007	-	1.091	1.082	-	
5775	155	802.11ac	OFDM	80	12.0	11.62	-0.04	Left	Cheek	1	0005M	29.3	92.4	0.098	-	1.091	1.082	-	
5775	155	802.11ac	OFDM	80	12.0	11.62	-0.14	Left	Tilt	1	0005M	29.3	92.4	0.015	-	1.091	1.082	-	
5855	171	802.11ac	OFDM	80	12.0	11.44	0.11	Right	Cheek	1	0005M	29.3	92.4	0.357	0.262	1.138	1.082	**0.323**	
5855	171	802.11ac	OFDM	80	12.0	11.44	0.19	Right	Tilt	1	0005M	29.3	92.4	0.138	-	1.138	1.082	-	
5855	171	802.11ac	OFDM	80	12.0	11.44	0.08	Left	Cheek	1	0005M	29.3	92.4	0.159	-	1.138	1.082	-	
5855	171	802.11ac	OFDM	80	12.0	11.44	0.17	Left	Tilt	1	0005M	29.3	92.4	0.264	-	1.138	1.082	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-12
NII MIMO Head 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]	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	12.0	11.74	12.0	11.88	-0.17	Right	Cheek	MIMO	0005M	58.5	91.7	0.361	0.280	1.062	1.091	**0.324**	A10
5290	58	802.11ac	OFDM	80	12.0	11.74	12.0	11.88	0.10	Right	Tilt	MIMO	0005M	58.5	91.7	0.048	-	1.062	1.091	-	
5290	58	802.11ac	OFDM	80	12.0	11.74	12.0	11.88	-0.11	Left	Cheek	MIMO	0005M	58.5	91.7	0.132	-	1.062	1.091	-	
5290	58	802.11ac	OFDM	80	12.0	11.74	12.0	11.88	-0.18	Left	Tilt	MIMO	0005M	58.5	91.7	0.011	-	1.062	1.091	-	
5690	138	802.11ac	OFDM	80	12.0	11.94	12.0	11.56	0.08	Right	Cheek	MIMO	0005M	58.5	91.7	0.426	0.262	1.107	1.091	0.316	
5690	138	802.11ac	OFDM	80	12.0	11.94	12.0	11.56	0.17	Right	Tilt	MIMO	0005M	58.5	91.7	0.013	-	1.107	1.091	-	
5690	138	802.11ac	OFDM	80	12.0	11.94	12.0	11.56	-0.18	Left	Cheek	MIMO	0005M	58.5	91.7	0.070	-	1.107	1.091	-	
5690	138	802.11ac	OFDM	80	12.0	11.94	12.0	11.56	0.14	Left	Tilt	MIMO	0005M	58.5	91.7	0.011	-	1.107	1.091	-	
5775	155	802.11ac	OFDM	80	12.0	11.62	12.0	11.58	-0.05	Right	Cheek	MIMO	0005M	58.5	91.7	0.353	0.217	1.102	1.091	0.261	
5775	155	802.11ac	OFDM	80	12.0	11.62	12.0	11.58	-0.13	Right	Tilt	MIMO	0005M	58.5	91.7	0.009	-	1.102	1.091	-	
5775	155	802.11ac	OFDM	80	12.0	11.62	12.0	11.58	-0.12	Left	Cheek	MIMO	0005M	58.5	91.7	0.065	-	1.102	1.091	-	
5775	155	802.11ac	OFDM	80	12.0	11.62	12.0	11.58	-0.10	Left	Tilt	MIMO	0005M	58.5	91.7	0.004	-	1.102	1.091	-	
5855	171	802.11ac	OFDM	80	12.0	11.44	12.0	11.74	0.17	Right	Cheek	MIMO	0005M	58.5	91.7	0.281	0.231	1.138	1.091	0.287	
5855	171	802.11ac	OFDM	80	12.0	11.44	12.0	11.74	0.11	Right	Tilt	MIMO	0005M	58.5	91.7	0.061	-	1.138	1.091	-	
5855	171	802.11ac	OFDM	80	12.0	11.44	12.0	11.74	0.00	Left	Cheek	MIMO	0005M	58.5	91.7	0.126	-	1.138	1.091	-	
5855	171	802.11ac	OFDM	80	12.0	11.44	12.0	11.74	0.00	Left	Tilt	MIMO	0005M	58.5	91.7	0.000	-	1.138	1.091	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram											

Note: To achieve the 15.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 12.0 dBm.

Table 11-13
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)	
2441.00	39	Bluetooth	FHSS	13.0	12.53	0.08	Right	Cheek	0008M	1	77.60	0.242	1.114	1.289	0.347	
2441.00	39	Bluetooth	FHSS	13.0	12.53	-0.18	Right	Tilt	0008M	1	77.60	0.051	1.114	1.289	0.073	
2441.00	39	Bluetooth	FHSS	13.0	12.53	-0.10	Left	Cheek	0008M	1	77.60	0.268	1.114	1.289	**0.385**	A11
2441.00	39	Bluetooth	FHSS	13.0	12.53	-0.18	Left	Tilt	0008M	1	77.60	0.032	1.114	1.289	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						

11.1 Standalone Body-Worn SAR Data

Table 11-14
GSM/UMTS Body-Worn SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
824.20	128	GSM 850	GSM	33.0	32.06	N/A	0.01	15 mm	A	0031M	1:8.3	back	0.268	1.242	0.333	A12
1909.80	810	GSM 1900	GSM	30.0	29.13	N/A	-0.06	15 mm	A	0004M	1:8.3	back	0.260	1.222	0.318	A14
826.40	4132	UMTS 850	RMC	25.0	24.29	2	0.00	15 mm	A	0031M	1:1	back	0.353	1.178	0.416	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 11-15
LTE Body-Worn SAR

MEASUREMENT RESULTS																						
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.5	24.51	0	-0.06	0	A	0026M	QPSK	1	25	15 mm	back	1:1	0.305	1.256	0.383	A18
707.50	23095	Mid	LTE Band 12	10	24.5	23.45	0	0.00	1	A	0026M	QPSK	25	25	15 mm	back	1:1	0.227	1.274	0.289	
782.00	23230	Mid	LTE Band 13	10	25.5	24.17	0	0.00	0	A	0026M	QPSK	1	25	15 mm	back	1:1	0.372	1.358	0.505	A20
782.00	23230	Mid	LTE Band 13	10	24.5	23.20	0	-0.01	1	A	0026M	QPSK	25	12	15 mm	back	1:1	0.295	1.349	0.398	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.63	1	-0.02	0	A	0031M	QPSK	1	0	15 mm	back	1:1	0.334	1.222	0.408	A22
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.67	1	-0.02	1	A	0031M	QPSK	25	12	15 mm	back	1:1	0.262	1.211	0.317	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	23.04	26	-0.19	0	A	0007M	QPSK	1	50	15 mm	back	1:1	0.701	1.400	0.981	A24
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	21.93	26	-0.10	1	A	0007M	QPSK	50	25	15 mm	back	1:1	0.568	1.435	0.815	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	21.82	26	-0.01	1	A	0007M	QPSK	100	0	15 mm	back	1:1	0.554	1.472	0.815	
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
LTE Band 41 Body-Worn SAR

MEASUREMENT RESULTS																						
1 CC Uplink | 2 CC Uplink, Power Class	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
		MHz	Ch.																(W/kg)		(W/kg)	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	25.0	24.18	0.07	0	B	0012M	QPSK	1	0	15 mm	back	1:1.58	0.270	1.208	0.326	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	25.0	24.34	-0.08	0	B	0012M	QPSK	1	50	15 mm	back	1:1.58	0.303	1.164	0.353	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	24.0	23.47	-0.03	1	B	0012M	QPSK	50	25	15 mm	back	1:1.58	0.239	1.130	0.270	
2 CC Uplink - Power Class 3	PCC	2680.00	41490	High	LTE Band 41	20	25.0	24.72	0.03	0	B	0012M	QPSK	1	0	15 mm	back	1:1.58	0.304	1.067	0.324	A26
	SCC	2660.20	41292												99							
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
DTS SISO Body-Worn SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	17.0	16.95	-0.02	15 mm	2	0008M	1	back	98.9	0.104	0.085	1.012	1.011	0.087	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-18
DTS MIMO Body-Worn 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)	
2437	6	802.11n	OFDM	20	18.0	17.94	18.0	17.32	-0.12	15 mm	MIMO	0008M	13	back	91.3	0.230	0.179	1.169	1.095	0.229	A28
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Body 1.6 W/kg (mW/g) averaged over 1 gram									

Note: To achieve the 21 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 18 dBm.

Table 11-19
NII SISO 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)	
5290	58	802.11ac	OFDM	80	18.0	17.98	-0.12	15 mm	1	0005M	29.3	back	92.4	0.112	0.076	1.005	1.082	**0.083**	
5690	138	802.11ac	OFDM	80	18.0	17.99	0.19	15 mm	1	0005M	29.3	back	92.4	0.097	0.064	1.002	1.082	0.069	
5775	155	802.11ac	OFDM	80	18.0	17.88	-0.20	15 mm	1	0005M	29.3	back	92.4	0.043	0.036	1.028	1.082	0.040	
5855	171	802.11ac	OFDM	80	18.0	17.81	-0.17	15 mm	1	0005M	29.3	back	92.4	0.050	0.043	1.045	1.082	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 11-20
NII MIMO Body-Worn 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)	
5290	58	802.11ac	OFDM	80	18.0	17.98	18.0	17.99	0.16	15 mm	MIMO	0005M	58.5	back	91.7	0.133	0.098	1.005	1.091	0.107	
5610	122	802.11ac	OFDM	80	18.0	17.92	18.0	17.99	-0.17	15 mm	MIMO	0005M	58.5	back	91.7	0.108	0.084	1.019	1.091	0.093	
5775	155	802.11ac	OFDM	80	18.0	17.88	18.0	17.92	-0.15	15 mm	MIMO	0005M	58.5	back	91.7	0.156	0.118	1.028	1.091	0.132	
5855	171	802.11ac	OFDM	80	18.0	17.81	18.0	17.85	-0.09	15 mm	MIMO	0005M	58.5	back	91.7	0.190	0.148	1.045	1.091	0.169	A30
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**										**Body** **1.6 W/kg (mW/g)** averaged over 1 gram											

Note: To achieve the 21 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 18 dBm.

Table 11-21
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)	
2402	0	Bluetooth	FHSS	16.0	15.56	0.10	15 mm	0008M	1	back	77.6	0.037	1.107	1.289	**0.053**	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									

11.2 Standalone Hotspot SAR Data

Table 11-22
GPRS/UMTS Hotspot SAR Data

MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	Spacing	Antenna Config.	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	30.5	29.52	N/A	-0.11	10 mm	A	0031M	3	1:2.76	back	0.354	1.253	0.444	A13
824.20	128	GSM 850	GPRS	30.5	29.52	N/A	-0.02	10 mm	A	0031M	3	1:2.76	front	0.280	1.253	0.351	
824.20	128	GSM 850	GPRS	30.5	29.52	N/A	0.13	10 mm	A	0031M	3	1:2.76	bottom	0.055	1.253	0.069	
824.20	128	GSM 850	GPRS	30.5	29.52	N/A	0.03	10 mm	A	0031M	3	1:2.76	right	0.287	1.253	0.360	
824.20	128	GSM 850	GPRS	30.5	29.52	N/A	-0.21	10 mm	A	0031M	3	1:2.76	left	0.186	1.253	0.233	
1909.80	810	GSM 1900	GPRS	23.5	22.33	N/A	-0.01	10 mm	A	0004M	4	1:2.076	back	0.563	1.309	0.737	
1909.80	810	GSM 1900	GPRS	23.5	22.33	N/A	-0.05	10 mm	A	0004M	4	1:2.076	front	0.458	1.309	0.600	
1850.20	512	GSM 1900	GPRS	23.5	22.30	N/A	0.00	10 mm	A	0004M	4	1:2.076	bottom	0.625	1.318	0.824	
1880.00	661	GSM 1900	GPRS	23.5	22.17	N/A	0.05	10 mm	A	0004M	4	1:2.076	bottom	0.612	1.358	0.831	
1909.80	810	GSM 1900	GPRS	23.5	22.33	N/A	-0.04	10 mm	A	0004M	4	1:2.076	bottom	0.659	1.309	0.863	A15
1909.80	810	GSM 1900	GPRS	23.5	22.33	N/A	-0.18	10 mm	A	0004M	4	1:2.076	right	0.017	1.309	0.022	
1909.80	810	GSM 1900	GPRS	23.5	22.33	N/A	0.04	10 mm	A	0004M	4	1:2.076	left	0.062	1.309	0.081	
826.40	4132	UMTS 850	RMC	25.0	24.29	2	0.02	10 mm	A	0031M	N/A	1:1	back	0.515	1.178	0.607	
836.60	4183	UMTS 850	RMC	25.0	24.20	2	0.01	10 mm	A	0031M	N/A	1:1	back	0.522	1.202	0.627	
846.60	4233	UMTS 850	RMC	25.0	24.17	2	-0.01	10 mm	A	0031M	N/A	1:1	back	0.555	1.211	0.672	A17
826.40	4132	UMTS 850	RMC	25.0	24.29	2	0.01	10 mm	A	0031M	N/A	1:1	front	0.425	1.178	0.501	
826.40	4132	UMTS 850	RMC	25.0	24.29	2	0.03	10 mm	A	0031M	N/A	1:1	bottom	0.173	1.178	0.204	
826.40	4132	UMTS 850	RMC	25.0	24.29	2	0.03	10 mm	A	0031M	N/A	1:1	right	0.451	1.178	0.531	
826.40	4132	UMTS 850	RMC	25.0	24.29	2	0.02	10 mm	A	0031M	N/A	1:1	left	0.302	1.178	0.356	
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 12 Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.5	24.51	0	-0.01	0	A	0026M	QPSK	1	25	10 mm	back	1:1	0.427	1.256	0.536	A19
707.50	23095	Mid	LTE Band 12	10	24.5	23.45	0	0.00	1	A	0026M	QPSK	25	25	10 mm	back	1:1	0.326	1.274	0.415	
707.50	23095	Mid	LTE Band 12	10	25.5	24.51	0	-0.02	0	A	0026M	QPSK	1	25	10 mm	front	1:1	0.327	1.256	0.411	
707.50	23095	Mid	LTE Band 12	10	24.5	23.45	0	-0.02	1	A	0026M	QPSK	25	25	10 mm	front	1:1	0.251	1.274	0.320	
707.50	23095	Mid	LTE Band 12	10	25.5	24.51	0	0.08	0	A	0026M	QPSK	1	25	10 mm	bottom	1:1	0.139	1.256	0.175	
707.50	23095	Mid	LTE Band 12	10	24.5	23.45	0	0.01	1	A	0026M	QPSK	25	25	10 mm	bottom	1:1	0.106	1.274	0.135	
707.50	23095	Mid	LTE Band 12	10	25.5	24.51	0	0.03	0	A	0026M	QPSK	1	25	10 mm	right	1:1	0.253	1.256	0.318	
707.50	23095	Mid	LTE Band 12	10	24.5	23.45	0	0.06	1	A	0026M	QPSK	25	25	10 mm	right	1:1	0.204	1.274	0.260	
707.50	23095	Mid	LTE Band 12	10	25.5	24.51	0	-0.04	0	A	0026M	QPSK	1	25	10 mm	left	1:1	0.213	1.256	0.268	
707.50	23095	Mid	LTE Band 12	10	24.5	23.45	0	-0.12	1	A	0026M	QPSK	25	25	10 mm	left	1:1	0.172	1.274	0.219	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Body 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-24
LTE Band 13 Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	25.5	24.17	0	0.02	0	A	0026M	QPSK	1	25	10 mm	back	1:1	0.516	1.358	0.701	A21
782.00	23230	Mid	LTE Band 13	10	24.5	23.20	0	0.06	1	A	0026M	QPSK	25	12	10 mm	back	1:1	0.409	1.349	0.552	
782.00	23230	Mid	LTE Band 13	10	25.5	24.17	0	-0.04	0	A	0026M	QPSK	1	25	10 mm	front	1:1	0.417	1.358	0.566	
782.00	23230	Mid	LTE Band 13	10	24.5	23.20	0	-0.02	1	A	0026M	QPSK	25	12	10 mm	front	1:1	0.332	1.349	0.448	
782.00	23230	Mid	LTE Band 13	10	25.5	24.17	0	0.01	0	A	0026M	QPSK	1	25	10 mm	bottom	1:1	0.206	1.358	0.280	
782.00	23230	Mid	LTE Band 13	10	24.5	23.20	0	0.01	1	A	0026M	QPSK	25	12	10 mm	bottom	1:1	0.161	1.349	0.217	
782.00	23230	Mid	LTE Band 13	10	25.5	24.17	0	0.02	0	A	0026M	QPSK	1	25	10 mm	right	1:1	0.469	1.358	0.637	
782.00	23230	Mid	LTE Band 13	10	24.5	23.20	0	-0.07	1	A	0026M	QPSK	25	12	10 mm	right	1:1	0.367	1.349	0.495	
782.00	23230	Mid	LTE Band 13	10	25.5	24.17	0	0.06	0	A	0026M	QPSK	1	25	10 mm	left	1:1	0.311	1.358	0.422	
782.00	23230	Mid	LTE Band 13	10	24.5	23.20	0	-0.08	1	A	0026M	QPSK	25	12	10 mm	left	1:1	0.247	1.349	0.333	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11-25
LTE Band 5 (Cell) Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.63	1	0.00	0	A	0031M	QPSK	1	0	10 mm	back	1:1	0.581	1.222	0.710	A23
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.67	1	0.00	1	A	0031M	QPSK	25	12	10 mm	back	1:1	0.468	1.211	0.567	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.63	1	0.01	0	A	0031M	QPSK	1	0	10 mm	front	1:1	0.426	1.222	0.521	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.67	1	0.02	1	A	0031M	QPSK	25	12	10 mm	front	1:1	0.339	1.211	0.411	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.63	1	0.01	0	A	0031M	QPSK	1	0	10 mm	bottom	1:1	0.267	1.222	0.326	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.67	1	0.00	1	A	0031M	QPSK	25	12	10 mm	bottom	1:1	0.215	1.211	0.260	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.63	1	0.00	0	A	0031M	QPSK	1	0	10 mm	right	1:1	0.453	1.222	0.554	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.67	1	0.03	1	A	0031M	QPSK	25	12	10 mm	right	1:1	0.342	1.211	0.414	
836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.63	1	0.09	0	A	0031M	QPSK	1	0	10 mm	left	1:1	0.166	1.222	0.203	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	23.67	1	0.03	1	A	0031M	QPSK	25	12	10 mm	left	1:1	0.128	1.211	0.155	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11-26
LTE Band 4 (AWS) Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	17.92	26	0.04	0	A	0007M	QPSK	1	50	10 mm	back	1:1	0.420	1.439	0.604	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	17.90	26	-0.17	0	A	0007M	QPSK	50	25	10 mm	back	1:1	0.419	1.445	0.605	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	17.92	26	0.02	0	A	0007M	QPSK	1	50	10 mm	front	1:1	0.275	1.439	0.396	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	17.90	26	0.06	0	A	0007M	QPSK	50	25	10 mm	front	1:1	0.279	1.445	0.403	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	17.92	26	0.03	0	A	0007M	QPSK	1	50	10 mm	bottom	1:1	0.640	1.439	0.921	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	17.90	26	0.01	0	A	0007M	QPSK	50	25	10 mm	bottom	1:1	0.655	1.445	0.946	A25
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	17.81	26	0.00	0	A	0007M	QPSK	100	0	10 mm	bottom	1:1	0.646	1.476	**0.953**	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	17.92	26	0.11	0	A	0007M	QPSK	1	50	10 mm	right	1:1	0.058	1.439	0.083	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	17.90	26	0.14	0	A	0007M	QPSK	50	25	10 mm	right	1:1	0.056	1.445	0.081	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	17.92	26	0.03	0	A	0007M	QPSK	1	50	10 mm	left	1:1	0.107	1.439	0.154	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.5	17.90	26	0.17	0	A	0007M	QPSK	50	25	10 mm	left	1:1	0.108	1.445	0.156	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11-27
LTE Band 41 Hotspot SAR

MEASUREMENT RESULTS																							
1 CC Uplink | 2 CC Uplink, Power Class	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
		MHz	Ch.																(W/kg)		(W/kg)	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.57	0.04	0	B	0012M	QPSK	1	50	10 mm	back	1:1.58	0.256	1.104	0.283	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.65	-0.02	0	B	0012M	QPSK	50	25	10 mm	back	1:1.58	0.234	1.084	0.254	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.57	0.03	0	B	0012M	QPSK	1	50	10 mm	front	1:1.58	0.171	1.104	0.189	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.65	-0.02	0	B	0012M	QPSK	50	25	10 mm	front	1:1.58	0.163	1.084	0.177	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.57	0.01	0	B	0012M	QPSK	1	50	10 mm	bottom	1:1.58	0.284	1.104	0.314	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.65	0.01	0	B	0012M	QPSK	50	25	10 mm	bottom	1:1.58	0.277	1.084	0.300	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.23	0.08	0	B	0012M	QPSK	1	0	10 mm	left	1:1.58	0.304	1.194	0.363	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.57	-0.03	0	B	0012M	QPSK	1	50	10 mm	left	1:1.58	0.362	1.104	0.400	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.65	-0.03	0	B	0012M	QPSK	50	25	10 mm	left	1:1.58	0.363	1.084	0.393	A27
2 CC Uplink - Power Class 3	PCC	2680.00	41490	High	LTE Band 41	20	22.0	21.28	-0.11	0	B	0012M	QPSK	1	0	10 mm	left	1:1.58	0.318	1.180	0.375	
	SCC	2660.20	41292												99							
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram												

Table 11-28
SISO WLAN Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	17.0	16.95	-0.02	10 mm	2	0008M	1	back	98.9	0.285	0.212	1.012	1.011	**0.217**	
2437	6	802.11b	DSSS	22	17.0	16.95	-0.12	10 mm	2	0008M	1	front	98.9	0.020	0.014	1.012	1.011	0.014	
2437	6	802.11b	DSSS	22	17.0	16.95	-0.03	10 mm	2	0008M	1	top	98.9	0.034	0.029	1.012	1.011	0.030	
2437	6	802.11b	DSSS	22	17.0	16.95	-0.18	10 mm	2	0008M	1	left	98.9	0.009	0.006	1.012	1.011	0.006	
5775	155	802.11ac	OFDM	80	18.0	17.88	0.01	10 mm	1	0005M	29.3	back	92.4	0.086	0.057	1.028	1.082	0.063	
5775	155	802.11ac	OFDM	80	18.0	17.88	-0.12	10 mm	1	0005M	29.3	front	92.4	0.076	0.051	1.028	1.082	0.057	
5775	155	802.11ac	OFDM	80	18.0	17.88	-0.02	10 mm	1	0005M	29.3	left	92.4	0.109	0.079	1.028	1.082	**0.088**	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-29
MIMO WLAN 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)	
2437	6	802.11n	OFDM	20	18.0	17.94	18.0	17.32	-0.12	10 mm	MIMO	0008M	13	back	91.3	0.400	0.371	1.169	1.095	0.475	A29
2437	6	802.11n	OFDM	20	18.0	17.94	18.0	17.32	0.14	10 mm	MIMO	0008M	13	front	91.3	0.178	0.147	1.169	1.095	0.188	
2437	6	802.11n	OFDM	20	18.0	17.94	18.0	17.32	0.12	10 mm	MIMO	0008M	13	top	91.3	0.067	0.051	1.169	1.095	0.065	
2437	6	802.11n	OFDM	20	18.0	17.94	18.0	17.32	0.07	10 mm	MIMO	0008M	13	left	91.3	0.302	0.238	1.169	1.095	0.305	
5775	155	802.11ac	OFDM	80	18.0	17.88	18.0	17.92	-0.19	10 mm	MIMO	0005M	58.5	back	91.7	0.187	0.154	1.028	1.091	0.173	A31
5775	155	802.11ac	OFDM	80	18.0	17.88	18.0	17.92	0.10	10 mm	MIMO	0005M	58.5	front	91.7	0.047	-	1.028	1.091	-	
5775	155	802.11ac	OFDM	80	18.0	17.88	18.0	17.92	0.15	10 mm	MIMO	0005M	58.5	top	91.7	0.019	-	1.028	1.091	-	
5775	155	802.11ac	OFDM	80	18.0	17.88	18.0	17.92	-0.13	10 mm	MIMO	0005M	58.5	left	91.7	0.080	0.057	1.028	1.091	0.064	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram										

Note:
1)For 2.4 GHz WLAN, to achieve the 21 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 18 dBm.
2)For 5 GHz WLAN, to achieve the 21 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 18 dBm.

Table 11-30
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)	
2402	0	Bluetooth	FHSS	16.0	15.56	0.04	10 mm	0008M	1	back	77.60	0.075	1.107	1.289	0.107	
2402	0	Bluetooth	FHSS	16.0	15.56	-0.09	10 mm	0008M	1	front	77.60	0.069	1.107	1.289	0.098	
2402	0	Bluetooth	FHSS	16.0	15.56	-0.20	10 mm	0008M	1	top	77.60	0.010	1.107	1.289	0.014	
2402	0	Bluetooth	FHSS	16.0	15.56	-0.03	10 mm	0008M	1	left	77.60	0.108	1.107	1.289	**0.154**	A33
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 Phablet SAR Data

Table 11-31
GPRS Phablet SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	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	27.5	26.28	-0.06	8 mm	A	0004M	3	1:2.76	back	0.715	1.324	0.947	
1909.80	810	GSM 1900	GPRS	27.5	26.28	-0.07	6 mm	A	0004M	3	1:2.76	front	0.704	1.324	0.932	
1909.80	810	GSM 1900	GPRS	27.5	26.28	0.01	11 mm	A	0004M	3	1:2.76	bottom	0.728	1.324	0.964	
1909.80	810	GSM 1900	GPRS	27.5	26.28	-0.05	0 mm	A	0004M	3	1:2.76	right	0.231	1.324	0.306	
1909.80	810	GSM 1900	GPRS	27.5	26.28	-0.02	0 mm	A	0004M	3	1:2.76	left	0.563	1.324	0.745	
1909.80	810	GSM 1900	GPRS	23.5	22.33	-0.03	0 mm	A	0004M	4	1:2.076	back	1.110	1.309	1.453	A34
1909.80	810	GSM 1900	GPRS	23.5	22.33	0.00	0 mm	A	0004M	4	1:2.076	front	0.858	1.309	1.123	
1909.80	810	GSM 1900	GPRS	23.5	22.33	-0.12	0 mm	A	0004M	4	1:2.076	bottom	0.740	1.309	0.969	
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
LTE Band 4 (AWS) Phablet SAR

MEASUREMENT RESULTS																						
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	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	24.5	23.04	26	0.03	0	A	0007M	QPSK	1	50	8 mm	back	1:1	0.952	1.400	1.333	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	21.93	26	0.03	1	A	0007M	QPSK	50	25	8 mm	back	1:1	0.774	1.435	1.111	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	23.04	26	0.03	0	A	0007M	QPSK	1	50	6 mm	front	1:1	1.090	1.400	1.526	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	21.93	26	0.02	1	A	0007M	QPSK	50	25	6 mm	front	1:1	0.883	1.435	1.267	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	23.04	26	0.00	0	A	0007M	QPSK	1	50	11 mm	bottom	1:1	1.050	1.400	1.470	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	21.93	26	-0.05	1	A	0007M	QPSK	50	25	11 mm	bottom	1:1	0.838	1.435	1.203	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	23.04	26	-0.01	0	A	0007M	QPSK	1	50	0 mm	right	1:1	0.352	1.400	0.493	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	21.93	26	0.02	1	A	0007M	QPSK	50	25	0 mm	right	1:1	0.274	1.435	0.393	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.5	23.04	26	-0.03	0	A	0007M	QPSK	1	50	0 mm	left	1:1	0.910	1.400	1.274	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	21.93	26	-0.03	1	A	0007M	QPSK	50	25	0 mm	left	1:1	0.713	1.435	1.023	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.0	18.57	26	-0.04	0	A	0007M	QPSK	1	50	0 mm	back	1:1	1.290	1.390	1.793	A35
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.0	18.41	26	-0.01	0	A	0007M	QPSK	50	25	0 mm	back	1:1	1.290	1.442	1.860	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.0	18.57	26	-0.08	0	A	0007M	QPSK	1	50	0 mm	front	1:1	1.190	1.390	1.654	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.0	18.41	26	0.01	0	A	0007M	QPSK	50	25	0 mm	front	1:1	1.200	1.442	1.730	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.0	18.57	26	-0.01	0	A	0007M	QPSK	1	50	0 mm	bottom	1:1	1.260	1.390	1.751	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.0	18.41	26	0.00	0	A	0007M	QPSK	50	25	0 mm	bottom	1:1	1.280	1.442	1.846	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Phablet
Spatial PeAK	4.0 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 10 grams

Table 11-33
LTE Band 41 Phablet SAR

MEASUREMENT RESULTS																						
1 CC Uplink | 2 CC Uplink, Power Class	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	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	2680.00	41490	High	LTE Band 41	20	25.0	24.34	-0.11	0	B	0012M	QPSK	1	50	8 mm	back	1:1.58	0.236	1.164	0.275	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	24.0	23.47	0.00	1	B	0012M	QPSK	50	25	8 mm	back	1:1.58	0.162	1.130	0.183	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	25.0	24.34	-0.02	0	B	0012M	QPSK	1	50	6 mm	front	1:1.58	0.292	1.164	0.340	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	24.0	23.47	0.00	1	B	0012M	QPSK	50	25	6 mm	front	1:1.58	0.226	1.130	0.255	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	25.0	24.34	-0.19	0	B	0012M	QPSK	1	50	11 mm	bottom	1:1.58	0.222	1.164	0.258	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	24.0	23.47	-0.06	1	B	0012M	QPSK	50	25	11 mm	bottom	1:1.58	0.147	1.130	0.166	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	25.0	23.98	-0.15	0	B	0012M	QPSK	1	0	0 mm	left	1:1.58	1.160	1.265	1.467	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	25.0	24.05	0.01	0	B	0012M	QPSK	1	99	0 mm	left	1:1.58	1.340	1.245	1.668	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	25.0	24.24	-0.06	0	B	0012M	QPSK	1	50	0 mm	left	1:1.58	1.520	1.191	1.810	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	25.0	24.18	-0.01	0	B	0012M	QPSK	1	50	0 mm	left	1:1.58	1.700	1.208	2.054	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	25.0	24.18	0.06	0	B	0012M	QPSK	1	0	0 mm	left	1:1.58	1.650	1.208	1.993	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	25.0	24.34	0.06	0	B	0012M	QPSK	1	50	0 mm	left	1:1.58	1.920	1.164	**2.235**	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	24.0	22.99	-0.02	1	B	0012M	QPSK	50	25	0 mm	left	1:1.58	0.866	1.262	1.093	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	24.0	23.09	0.01	1	B	0012M	QPSK	50	50	0 mm	left	1:1.58	0.971	1.233	1.197	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	24.0	23.32	0.01	1	B	0012M	QPSK	50	25	0 mm	left	1:1.58	1.290	1.169	1.508	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	24.0	23.25	0.03	1	B	0012M	QPSK	50	25	0 mm	left	1:1.58	1.340	1.189	1.593	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	24.0	23.47	0.01	1	B	0012M	QPSK	50	25	0 mm	left	1:1.58	1.480	1.130	1.672	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	24.0	23.28	0.02	1	B	0012M	QPSK	100	0	0 mm	left	1:1.58	1.420	1.180	1.676	
2 CC Uplink - Power Class 3	PCC	2680.00	41490	High	LTE Band 41	20	25.0	24.72	-0.02	0	B	0012M	QPSK	1	0	0 mm	left	1:1.58	1.950	1.067	2.081	A36
	SCC	2660.20	41292												99							
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	22.0	21.10	0.05	0	B	0012M	QPSK	1	99	0 mm	back	1:1.58	0.869	1.230	1.069	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	22.0	21.23	-0.09	0	B	0012M	QPSK	1	99	0 mm	back	1:1.58	0.976	1.194	1.165	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	22.0	21.34	-0.02	0	B	0012M	QPSK	1	50	0 mm	back	1:1.58	1.170	1.164	1.362	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	22.0	21.36	-0.15	0	B	0012M	QPSK	1	50	0 mm	back	1:1.58	1.210	1.159	1.402	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.57	0.00	0	B	0012M	QPSK	1	50	0 mm	back	1:1.58	1.450	1.104	1.601	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.65	-0.05	0	B	0012M	QPSK	50	25	0 mm	back	1:1.58	1.260	1.084	1.366	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.53	0.03	0	B	0012M	QPSK	100	0	0 mm	back	1:1.58	1.570	1.114	1.749	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.57	-0.02	0	B	0012M	QPSK	1	50	0 mm	front	1:1.58	1.120	1.104	1.236	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.65	0.01	0	B	0012M	QPSK	50	25	0 mm	front	1:1.58	0.996	1.084	1.080	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.57	-0.09	0	B	0012M	QPSK	1	50	0 mm	bottom	1:1.58	1.350	1.104	1.490	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	22.0	21.65	0.11	0	B	0012M	QPSK	50	25	0 mm	bottom	1:1.58	1.260	1.084	1.366	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Phablet
Spatial Peak	4.0 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 10 grams

Table 11-34
NII SISO 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)	
5290	58	802.11ac	OFDM	80	18.0	17.98	-0.09	0 mm	1	0005M	29.3	back	92.4	4.170	0.558	1.005	1.082	0.607	
5290	58	802.11ac	OFDM	80	18.0	17.98	-0.05	0 mm	1	0005M	29.3	front	92.4	4.170	-	1.005	1.082	-	
5290	58	802.11ac	OFDM	80	18.0	17.98	-0.08	0 mm	1	0005M	29.3	left	92.4	8.110	0.919	1.005	1.082	0.999	A37
5690	138	802.11ac	OFDM	80	18.0	17.99	-0.02	0 mm	1	0005M	29.3	back	92.4	2.390	0.388	1.002	1.082	0.421	
5690	138	802.11ac	OFDM	80	18.0	17.99	-0.11	0 mm	1	0005M	29.3	front	92.4	1.580	-	1.002	1.082	-	
5690	138	802.11ac	OFDM	80	18.0	17.99	-0.07	0 mm	1	0005M	29.3	left	92.4	2.030	0.402	1.002	1.082	0.436	
5855	171	802.11ac	OFDM	80	18.0	17.81	-0.08	0 mm	1	0005M	29.3	back	92.4	1.540	0.242	1.045	1.082	0.274	
5855	171	802.11ac	OFDM	80	18.0	17.81	-0.03	0 mm	1	0005M	29.3	front	92.4	1.930	-	1.045	1.082	-	
5855	171	802.11ac	OFDM	80	18.0	17.81	-0.02	0 mm	1	0005M	29.3	left	92.4	2.050	0.398	1.045	1.082	0.450	
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 11-35
NII MIMO WLAN 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)	
5290	58	802.11ac	OFDM	80	18.0	17.98	18.0	17.99	0.13	0 mm	MIMO	0005M	58.5	back	91.7	3.180	0.591	1.005	1.091	0.648	
5290	58	802.11ac	OFDM	80	18.0	17.98	18.0	17.99	-0.14	0 mm	MIMO	0005M	58.5	front	91.7	4.030	0.746	1.005	1.091	0.818	
5290	58	802.11ac	OFDM	80	18.0	17.98	18.0	17.99	0.12	0 mm	MIMO	0005M	58.5	top	91.7	0.387	0.059	1.005	1.091	0.065	
5290	58	802.11ac	OFDM	80	18.0	17.98	18.0	17.99	-0.03	0 mm	MIMO	0005M	58.5	left	91.7	5.660	0.828	1.005	1.091	0.908	
5610	122	802.11ac	OFDM	80	18.0	17.92	18.0	17.99	-0.03	0 mm	MIMO	0005M	58.5	back	91.7	3.420	0.466	1.019	1.091	0.518	
5610	122	802.11ac	OFDM	80	18.0	17.92	18.0	17.99	-0.02	0 mm	MIMO	0005M	58.5	front	91.7	3.740	0.695	1.019	1.091	0.773	
5610	122	802.11ac	OFDM	80	18.0	17.92	18.0	17.99	-0.13	0 mm	MIMO	0005M	58.5	top	91.7	0.253	0.145	1.019	1.091	0.161	
5610	122	802.11ac	OFDM	80	18.0	17.92	18.0	17.99	0.18	0 mm	MIMO	0005M	58.5	left	91.7	5.270	0.646	1.019	1.091	0.718	
5855	171	802.11ac	OFDM	80	18.0	17.81	18.0	17.85	-0.03	0 mm	MIMO	0005M	58.5	back	91.7	1.350	0.290	1.045	1.091	0.331	
5855	171	802.11ac	OFDM	80	18.0	17.81	18.0	17.85	-0.11	0 mm	MIMO	0005M	58.5	front	91.7	1.890	0.292	1.045	1.091	0.333	
5855	171	802.11ac	OFDM	80	18.0	17.81	18.0	17.85	-0.14	0 mm	MIMO	0005M	58.5	top	91.7	0.191	0.049	1.045	1.091	0.056	
5855	171	802.11ac	OFDM	80	18.0	17.81	18.0	17.85	0.01	0 mm	MIMO	0005M	58.5	left	91.7	1.930	0.366	1.045	1.091	0.417	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Phablet 4.0 W/kg (mW/g) averaged over 10 grams						

Note: To achieve the 21 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 18 dBm.

11.4 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 not performed because the measured SAR results for a frequency band were less than 0.8 W/kg. Please see Section 12 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).
10. Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the display diagonal dimension is > 150 mm and < 200 mm.. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.
11. This device supports dynamic antenna tuning for some bands. Per FCC Guidance, SAR was measured according to the normally required SAR measurement configurations with tuner active. The auto-tune state determined by the device was verified before and after each SAR measurement and is listed in tables above. Please see Section 13 for supplemental data.
12. Additional SAR tests for phablet SAR were evaluated per KDB 616217 Section 6 (See Section 6.9 for more information).
13. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the 1g thresholds for the equivalent test cases.
14. This device uses Qualcomm Smart Transmit for 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).

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 highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s).

UMTS Notes:

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

LTE Notes:

1. LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r04. The general test procedures used for testing can be found in Section 8.5.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 and MCC=001 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
4. 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.
5. 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.
6. Per FCC KDB Publication 447498 D01v06, when the reported 1g SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for LTE B41, and, testing at the other channels was required for such test configurations.
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, and hotspot, and phablet operations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg for 1g evaluations, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n/ax) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 8.6.5 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg for 1g evaluations. See Section 8.6.6 for more information.

4. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 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 Appendix K 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 9.6 for the time domain plot and calculation for the duty factor of the device.
2. Head and Hotspot Bluetooth SAR were evaluated for BT BR tethering applications.

12 SAR MEASUREMENT VARIABILITY

12.1 Measurement Variability

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

12.2 Measurement Uncertainty

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

13 ADDITIONAL TESTING PER FCC GUIDANCE

13.1 Tuner Testing

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

To evaluate all the tuner states, the 120 tuner states were divided among the aggregate band, mode and exposure combinations. Single point time-sweep measurements were performed at the peak SAR location determined by the zoom scan of the configuration with the highest reported SAR for each combination. The tuner state was able to be established remotely so that the device was not moved for the entire series of single point SAR for the tuner states in each combination. The SAR probe remained stationary at the same position throughout the entire series of single point measurements for each combination. When the single point SAR or 1g SAR was > 1.2 W/kg for a particular band/mode/exposure condition, point SAR measurements were made for all 120 states.

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

Table 13-1
Supplemental Head SAR Data

Supplemental Head SAR Data									
UMTS B5		LTE B12		LTE B13		LTE B5		LTE B4	
RMC		QPSK, 10 MHz Bandwidth, 1 RB, 25 RB Offset		QPSK, 10 MHz Bandwidth, 1 RB, 25 RB Offset		QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offset		QPSK, 20 MHz Bandwidth, 1 RB, 50 RB Offset	
Test Position	Right Cheek	Test Position	Right Cheek	Test Position	Right Cheek	Test Position	Left Cheek	Test Position	Left Cheek
Frequency (MHz)	826.40	Frequency (MHz)	707.50	Frequency (MHz)	782.00	Frequency (MHz)	836.50	Frequency (MHz)	1732.50
Channel	4132	Channel	23095	Channel	23230	Channel	20525	Channel	20175
Measured 1g SAR (W/kg)	0.311	Measured 1g SAR (W/kg)	0.166	Measured 1g SAR (W/kg)	0.247	Measured 1g SAR (W/kg)	0.284	Measured 1g SAR (W/kg)	0.199
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 0)	0.397	Auto-tune (State 0)	0.206	Auto-tune (State 0)	0.299	Auto-tune (State 2)	0.352	Auto-tune (State 26)	0.213
Default (State 0)	0.398	Default (State 0)	0.210	Default (State 0)	0.289	Default (State 0)	0.416	Default (State 0)	0.178
State 0	0.398	State 0	0.210	State 0	0.289	State 2	0.384	State 8	0.112
State 7	0.244	State 17	0.090	State 10	0.048	State 13	0.307	State 14	0.185
State 11	0.078	State 22	0.014	State 19	0.112	State 15	0.339	State 18	0.185
State 33	0.197	State 29	0.174	State 28	0.287	State 20	0.176	State 26	0.227
State 52	0.116	State 37	0.017	State 31	0.282	State 30	0.297	State 43	0.063
State 55	0.224	State 41	0.105	State 38	0.030	State 42	0.286	State 47	0.042
State 64	0.008	State 46	0.038	State 45	0.109	State 59	0.254	State 53	0.227
State 77	0.010	State 65	0.198	State 57	0.242	State 61	0.075	State 68	0.080
State 88	0.099	State 71	0.030	State 66	0.234	State 75	0.030	State 76	0.026
State 101	0.055	State 79	0.180	State 73	0.032	State 84	0.307	State 95	0.137
State 107	0.337	State 90	0.013	State 94	0.216	State 93	0.270	State 99	0.112
State 115	0.338	State 106	0.124	State 96	0.220	State 110	0.324	State 105	0.176
State 117	0.330	State 116	0.055	State 104	0.294	State 118	0.325	State 113	0.177

Table 13-2
Supplemental Body SAR Data

Supplemental Body SAR Data									
UMTS B5		LTE B12		LTE B13		LTE B5		LTE B4	
RMC		QPSK, 10 MHz Bandwidth, 1 RB, 25 RB Offset		QPSK, 10 MHz Bandwidth, 1 RB, 25 RB Offset		QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offset		QPSK, 20 MHz Bandwidth, 50 RB, 25 RB Offset	
Test Position	Back	Test Position	Back	Test Position	Back	Test Position	Back	Test Position	Bottom
Spacing	10 mm	Spacing	10 mm	Spacing	10 mm	Spacing	10 mm	Spacing	10 mm
Frequency (MHz)	846.60	Frequency (MHz)	707.50	Frequency (MHz)	782.00	Frequency (MHz)	836.50	Frequency (MHz)	1732.50
Channel	4233	Channel	23095	Channel	23230	Channel	20525	Channel	20175
Measured 1g SAR (W/kg)	0.555	Measured 1g SAR (W/kg)	0.427	Measured 1g SAR (W/kg)	0.516	Measured 1g SAR (W/kg)	0.581	Measured 1g SAR (W/kg)	0.655
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 2)	0.893	Auto-tune (State 0)	0.653	Auto-tune (State 0)	0.816	Auto-tune (State 1)	0.924	Auto-tune (State 26)	1.168
Default (State 0)	0.878	Default (State 0)	0.694	Default (State 0)	0.850	Default (State 0)	0.972	Default (State 0)	1.056
State 0	0.878	State 0	0.694	State 0	0.850	State 1	0.953	State 4	1.056
State 1	0.845	State 12	0.044	State 3	0.687	State 6	0.767	State 5	1.054
State 2	0.832	State 16	0.364	State 34	0.441	State 9	0.415	State 7	1.052
State 21	0.304	State 25	0.013	State 40	0.602	State 23	0.156	State 26	1.168
State 24	0.073	State 36	0.119	State 58	0.603	State 27	0.619	State 35	1.055
State 32	0.574	State 48	0.074	State 69	0.537	State 39	0.871	State 49	1.134
State 54	0.610	State 51	0.023	State 78	0.800	State 44	0.665	State 60	1.169
State 63	0.054	State 56	0.473	State 86	0.451	State 50	0.156	State 62	1.164
State 67	0.820	State 70	0.194	State 88	0.236	State 72	0.325	State 82	1.163
State 83	0.717	State 74	0.030	State 92	0.669	State 80	0.736	State 89	1.165
State 85	0.536	State 81	0.623	State 100	0.150	State 91	0.332	State 102	1.167
State 97	0.691	State 87	0.235	State 103	0.036	State 98	0.581	State 111	1.166
State 119	0.429	State 112	0.689	State 109	0.740	State 108	0.267	State 114	1.168

14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	85033E	3.5mm Standard Calibration Kit	7/7/2021	Annual	7/7/2022	MY53402352
Agilent	8753ES	S-Parameter Vector Network Analyzer	2/2/2021	Annual	2/2/2022	US39170122
Agilent	8753ES	S-Parameter Vector Network Analyzer	4/14/2021	Annual	4/14/2022	US39170118
Agilent	E4438C	ESG Vector Signal Generator	12/14/2020	Biennial	12/14/2022	MY42082385
Agilent	E4438C	ESG Vector Signal Generator	11/21/2021	Annual	11/21/2022	MY47270002
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Agilent	N5182A	MXG Vector Signal Generator	11/17/2021	Annual	11/17/2022	US46240505
Agilent	N5182A	MXG Vector Signal Generator	6/15/2021	Annual	6/15/2022	MY47420800
Amplifier Research	150A100C	Amplifier	CBT	N/A	CBT	350132
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Anritsu	MA24106A	USB Power Sensor	8/10/2021	Annual	8/10/2022	1231538
Anritsu	MA24106A	USB Power Sensor	8/10/2021	Annual	8/10/2022	1231535
Anritsu	MA24106A	USB Power Sensor	3/2/2021	Annual	3/2/2022	1244524
Anritsu	MA24106A	USB Power Sensor	9/21/2021	Annual	9/21/2022	1244515
Anritsu	MA2411B	Pulse Power Sensor	8/10/2021	Annual	8/10/2022	1207364
Anritsu	MA2411B	Pulse Power Sensor	9/21/2021	Annual	9/21/2022	1315051
Anritsu	ML2496A	Power Meter	2/19/2021	Annual	2/19/2022	1138001
Anritsu	MS2028C	Vector Network Analyzer	2/26/2021	Annual	2/26/2022	1204153
Anritsu	MT8820C	Radio Communication Analyzer	10/23/2021	Annual	10/23/2022	6201300731
Anritsu	MT8821C	Radio Communication Analyzer	4/16/2021	Annual	4/16/2022	6200901190
Anritsu	MT8821C	Radio Communication Analyzer	3/23/2021	Annual	3/23/2022	6201144418
Anritsu	MT8862A	Wireless Connectivity Test Set	10/27/2021	Annual	10/27/2022	6261782395
Control Company	4040	Therm./ Clock/ Humidity Monitor	2/23/2021	Annual	2/23/2022	160574418
Control Company	4352	Ultra Long Stem Thermometer	3/2/2021	Annual	3/2/2022	160508097
Control Company	4352	Ultra Long Stem Thermometer	3/2/2021	Annual	3/2/2022	160508122
Fairview Microwave	FM2CP1122-10	2.92mm Directional Coupler	7/7/2021	Annual	7/7/2022	1946
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	9/27/2021	Annual	9/27/2022	MY53401181
Keysight Technologies	E4438C	VECTOR SIGNAL GENERATOR	10/15/2021	Annual	10/15/2022	MY45092078
Keysight Technologies	N6705B	DC Power Analyzer	5/5/2021	Triennial	5/5/2024	MY53004059
Keysight Technologies	N9020A	MXA Signal Analyzer	2/24/2021	Annual	2/24/2022	MY48010233
MCL	BW-N10W5+	Attenuator	7/6/2021	Annual	7/6/2022	1507
MCL	BW-N3W5+	Attenuator	7/6/2021	Annual	7/6/2022	1608
Mini-Circuits	BW-N10W5+	Attenuator	CBT	N/A	CBT	1350
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	7/6/2021	Annual	7/6/2022	UU19201507
Mini-Circuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
Mini-Circuits	VLF-6000+	Low Pass Filter	7/6/2021	Annual	7/6/2022	31634
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	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-6	Dual Directional Coupler	7/6/2021	Annual	7/6/2022	N/A
Rohde & Schwarz	CMW500	Radio Communication Tester	12/30/2021	Annual	12/30/2022	106578
Rohde & Schwarz	CMW500	Radio Communication Tester	7/19/2021	Annual	7/19/2022	128635
Rohde & Schwarz	CMW500	Radio Communication Tester	3/22/2021	Annual	3/22/2022	167283
Seekonk	TSF-100	Torque Wrench 5/16", 8" lbs	7/8/2021	Annual	7/8/2022	47639-1256
Seekonk	TSF-100	Torque Wrench	7/8/2021	Annual	7/8/2022	47639-29
SPEAG	D1750V2	1750 MHz SAR Dipole	5/12/2020	Biennial	5/12/2022	1148
SPEAG	D1750V2	1750 MHz SAR Dipole	10/22/2021	Annual	10/22/2022	1150
SPEAG	D1765V2	1765 MHz SAR Dipole	5/14/2021	Annual	5/14/2022	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	10/22/2021	Annual	10/22/2022	5d080
SPEAG	D2450V2	2450 MHz SAR Dipole	8/18/2021	Annual	8/18/2022	719
SPEAG	D2450V2	2450 MHz SAR Dipole	9/20/2020	Biennial	9/20/2022	797
SPEAG	D2450V2	2450 MHz SAR Dipole	11/25/2021	Annual	11/25/2022	981
SPEAG	D2600V2	2600 MHz SAR Dipole	4/14/2021	Annual	4/14/2022	1004
SPEAG	D5GHzV2	5 GHz SAR Dipole	9/15/2021	Annual	9/15/2022	1191
SPEAG	D750V3	750 MHz SAR Dipole	5/11/2021	Annual	5/11/2022	1034
SPEAG	D750V3	750 MHz SAR Dipole	2/17/2021	Annual	2/17/2022	1046
SPEAG	D835V2	835 MHz SAR Dipole	4/15/2021	Annual	4/15/2022	4d119
SPEAG	D835V2	835 MHz SAR Dipole	5/11/2021	Annual	5/11/2022	4d180
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/13/2021	Annual	9/13/2022	1364
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/11/2021	Annual	5/11/2022	728
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/13/2021	Annual	7/13/2022	1583
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/10/2021	Annual	11/10/2022	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/9/2021	Annual	4/9/2022	1502
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/22/2021	Annual	6/22/2022	1677
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/21/2021	Annual	6/21/2022	1676
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/18/2021	Annual	3/18/2022	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/7/2021	Annual	4/7/2022	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/1/2021	Annual	3/1/2022	1652
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/11/2021	Annual	1/11/2022	1645
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/12/2021	Annual	5/12/2022	1070
SPEAG	DAK-3.5	Dielectric Assessment Kit	10/20/2021	Annual	10/20/2022	1091
SPEAG	EX3DV4	SAR Probe	5/18/2021	Annual	5/18/2022	3914
SPEAG	EX3DV4	SAR Probe	11/16/2021	Annual	11/16/2022	7538
SPEAG	EX3DV4	SAR Probe	10/7/2021	Annual	10/7/2022	7558
SPEAG	EX3DV4	SAR Probe	4/16/2021	Annual	4/16/2022	7402
SPEAG	EX3DV4	SAR Probe	9/20/2021	Annual	9/20/2022	7552
SPEAG	EX3DV4	SAR Probe	3/3/2021	Annual	3/3/2022	7637
SPEAG	EX3DV4	SAR Probe	6/28/2021	Annual	6/28/2022	7660
SPEAG	EX3DV4	SAR Probe	7/20/2021	Annual	7/20/2022	7406
SPEAG	EX3DV4	SAR Probe	7/20/2021	Annual	7/20/2022	7410
SPEAG	EX3DV4	SAR Probe	8/4/2021	Annual	8/4/2022	7668
SPEAG	EX3DV4	SAR PROBE	3/2/2021	Annual	3/2/2022	7640
SPEAG	EX3DV4	SAR Probe	4/19/2021	Annual	4/19/2022	7357
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1237
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1243
Staubli	TX60	Dasy Robot	N/A	N/A	N/A	F20/0022014/A/001
Staubli	TX90	Dasy Robot	N/A	N/A	N/A	F11/5JK9A1/A/01
Testo	Saveris2-H1	Thermo-hygrometer	7/16/2021	Annual	7/16/2022	54629639

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.
Each equipment item was used solely within its respective calibration period.

15 MEASUREMENT UNCERTAINTIES

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

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

16 CONCLUSION

16.1 Measurement Conclusion

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

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

17 REFERENCES

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

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

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

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