PCTEST
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. +1.410.290.6652 / Fax +1.410.290.6654
http://www.pctest.com

SAR EVALUATION REPORT

Applicant Name:
Samsung Electronics Co., Ltd.
129, Samsung-ro, Maetan dong,
Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Date of Testing:
1/3/22 - 2/16/22
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
1M2112270166-01.A3L

FCC ID: **A3LSMA135U**

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

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model: SM-A135U
Additional Model(s): SM-A135U1, SM-A135U1/DS

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	0.20	0.21	0.58	N/A
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	< 0.1	0.20	1.94
PCE	UMTS 850	826.40 - 846.60 MHz	0.37	0.40	0.76	N/A
PCE	UMTS 1750	1712.4 - 1752.6 MHz	0.12	0.21	0.25	2.18
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.23	0.29	0.30	2.42
PCE	LTE Band 71	665.5 - 695.5 MHz	0.18	0.29	0.32	N/A
PCE	LTE Band 12	699.7 - 715.3 MHz	0.19	0.34	0.38	N/A
PCE	LTE Band 13	779.5 - 784.5 MHz	0.38	0.50	0.55	N/A
PCE	LTE Band 14	790.5 - 795.5 MHz	0.28	0.36	0.53	N/A
PCE	LTE Band 26 (Cell)	814.7 - 848.3 MHz	0.35	0.30	0.67	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 66 (AWS)	1710.7 - 1779.3 MHz	0.14	0.22	0.24	2.00
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	0.17	0.40	0.30	2.40
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 30	2307.5 - 2312.5 MHz	0.13	0.27	0.21	1.98
PCE	LTE Band 7	2502.5 - 2567.5 MHz	0.32	0.24	0.42	3.04
PCE	LTE Band 41	2498.5 - 2687.5 MHz	0.24	0.36	0.59	N/A
PCE	LTE Band 38	2572.5 - 2617.5 MHz	N/A	N/A	N/A	N/A
DTS	2.4 GHz WLAN	2412 - 2472 MHz	0.21	0.18	0.44	N/A
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	N/A	N/A
NII	U-NII-2A	5260 - 5320 MHz	0.10	0.46	N/A	1.90
NII	U-NII-2C	5500 - 5720 MHz	0.36	0.54	N/A	2.63
NII	U-NII-3	5745 - 5825 MHz	0.27	0.39	0.64	N/A
DSS/DTS	Bluetooth	2402 - 2480 MHz	N/A	N/A	< 0.1	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			1.07	1.15	1.42	3.53

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

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

Randy Ortanez
President

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

TABLE OF CONTENTS

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
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 71	Voice/Data	665.5 - 695.5 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 14	Voice/Data	790.5 - 795.5 MHz
LTE Band 26 (Cell)	Voice/Data	814.7 - 848.3 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 66 (AWS)	Voice/Data	1710.7 - 1779.3 MHz
LTE Band 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 25 (PCS)	Voice/Data	1850.7 - 1914.3 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 30	Voice/Data	2307.5 - 2312.5 MHz
LTE Band 7	Voice/Data	2502.5 - 2567.5 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
LTE Band 38	Voice/Data	2572.5 - 2617.5 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2472 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz

1.2 Power Reduction for SAR

This device utilizes a power reduction mechanism for some wireless modes and bands for SAR compliance under portable hotspot conditions and under some conditions when the device is being used in close proximity to the user's hand. All hotspot SAR evaluations for this device were performed at the maximum allowed output power when hotspot is enabled. FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device when being used in phablet use conditions. Detailed descriptions of the power reduction mechanism are included in the operational description.

This device used an independent fixed level power reduction mechanism for WLAN 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.

1.3 Nominal and Maximum Output Power Specifications

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

1.3.1 2G/3G/4G Output Power

GSM/GPRS/EDGE 850										
Power Level		Voice (in dBm)	Data - Burst Average GMSK (in dBm)				Data - Burst Average 8-PSK (in dBm)			
		1 TX Slot	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
Maximum	Max Allowed Power	33.5	33.5	32.0	30.0	28.0	27.5	25.5	23.5	22.5
	Nominal	32.5	32.5	31.0	29.0	27.0	26.5	24.5	22.5	21.5
Proximity Sensor Active	Max Allowed Power	33.5	33.5	32.0	30.0	28.0	27.5	25.5	23.5	22.5
	Nominal	32.5	32.5	31.0	29.0	27.0	26.5	24.5	22.5	21.5
RCV Mode Active	Max Allowed Power	33.5	33.5	32.0	30.0	28.0	27.5	25.5	23.5	22.5
	Nominal	32.5	32.5	31.0	29.0	27.0	26.5	24.5	22.5	21.5
Hotspot Mode Active	Max Allowed Power	N/A	33.5	32.0	30.0	28.0	27.5	25.5	23.5	22.5
	Nominal	N/A	32.5	31.0	29.0	27.0	26.5	24.5	22.5	21.5
Earjack Active	Max Allowed Power	33.5	33.5	32.0	30.0	28.0	27.5	25.5	23.5	22.5
	Nominal	32.5	32.5	31.0	29.0	27.0	26.5	24.5	22.5	21.5
GSM/GPRS/EDGE 1900										
Power Level		Voice (in dBm)	Data - Burst Average GMSK (in dBm)				Data - Burst Average 8-PSK (in dBm)			
		1 TX Slot	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
Maximum	Max Allowed Power	31.0	31.0	29.5	27.0	26.5	26.0	23.5	22.5	20.5
	Nominal	30.0	30.0	28.5	26.0	25.5	25.0	22.5	21.5	19.5
Proximity Sensor Active	Max Allowed Power	29.0	29.0	28.5	26.5	25.5	26.0	23.5	22.5	20.5
	Nominal	28.0	28.0	27.5	25.5	24.5	25.0	22.5	21.5	19.5
RCV Mode Active	Max Allowed Power	31.0	31.0	29.5	27.0	26.5	26.0	23.5	22.5	20.5
	Nominal	30.0	30.0	28.5	26.0	25.5	25.0	22.5	21.5	19.5
Hotspot Mode Active	Max Allowed Power	N/A	29.0	28.5	26.5	25.5	26.0	23.5	22.5	20.5
	Nominal	N/A	28.0	27.5	25.5	24.5	25.0	22.5	21.5	19.5
Earjack Active	Max Allowed Power	29.0	29.0	28.5	26.5	25.5	26.0	23.5	22.5	20.5
	Nominal	28.0	28.0	27.5	25.5	24.5	25.0	22.5	21.5	19.5

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	3GPP DC-HSDPA Rel 8
Maximum	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
Proximity Sensor Active	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
RCV Mode Active	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
Hotspot Mode Active	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
Earjack Active	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
UMTS Band 4 (1750 MHz)					
Power Level		Modulated Average Output Power			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
Maximum	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
Proximity Sensor Active	Max Allowed Power	22.5	22.1	22.1	22.1
	Nominal	21.5	21.1	21.1	21.1
RCV Mode Active	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
Hotspot Mode Active	Max Allowed Power	22.5	22.1	22.1	22.1
	Nominal	21.5	21.1	21.1	21.1
Earjack Active	Max Allowed Power	22.5	22.1	22.1	22.1
	Nominal	21.5	21.1	21.1	21.1
UMTS Band 2 (1900 MHz)					
Power Level		Modulated Average Output Power			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
Maximum	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
Proximity Sensor Active	Max Allowed Power	22.5	22.1	22.1	22.1
	Nominal	21.5	21.1	21.1	21.1
RCV Mode Active	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
Hotspot Mode Active	Max Allowed Power	22.5	22.1	22.1	22.1
	Nominal	21.5	21.1	21.1	21.1
Earjack Active	Max Allowed Power	22.5	22.1	22.1	22.1
	Nominal	21.5	21.1	21.1	21.1

Mode / Band	Antenna		Modulated Average Output Power (in dBm)				
			Maximum	Proximity Sensor Active	RCV Mode Active	Hotspot Mode Active	Earjack Active
LTE Band 71	A	Max Allowed Power	25.0	25.0	25.0	25.0	25.0
		Nominal	24.0	24.0	24.0	24.0	24.0
LTE Band 12	A	Max Allowed Power	25.5	25.5	25.5	25.5	25.5
		Nominal	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
		Nominal	24.5	24.5	24.5	24.5	24.5
LTE Band 14	A	Max Allowed Power	25.0	25.0	25.0	25.0	25.0
		Nominal	24.0	24.0	24.0	24.0	24.0
LTE Band 26 (Cell)	A	Max Allowed Power	25.0	25.0	25.0	25.0	25.0
		Nominal	24.0	24.0	24.0	24.0	24.0
LTE Band 5 (Cell)	A	Max Allowed Power	25.0	25.0	25.0	25.0	25.0
		Nominal	24.0	24.0	24.0	24.0	24.0
LTE Band 66 (AWS)	B	Max Allowed Power	25.0	21.0	25.0	21.0	21.0
		Nominal	24.0	20.0	24.0	20.0	20.0
LTE Band 4 (AWS)	B	Max Allowed Power	25.0	21.0	25.0	21.0	21.0
		Nominal	24.0	20.0	24.0	20.0	20.0
LTE Band 25 (PCS)	B	Max Allowed Power	25.0	22.0	25.0	22.0	22.0
		Nominal	24.0	21.0	24.0	21.0	21.0
LTE Band 2 (PCS)	B	Max Allowed Power	25.0	22.0	25.0	22.0	22.0
		Nominal	24.0	21.0	24.0	21.0	21.0
LTE Band 30	B	Max Allowed Power	22.5	18.5	22.5	18.5	22.0
		Nominal	21.5	17.5	21.5	17.5	21.0
LTE Band 7	B	Max Allowed Power	24.0	22.0	24.0	22.0	22.0
		Nominal	23.0	21.0	23.0	21.0	21.0
LTE Band 41(PC3)	B	Max Allowed Power	24.0	24.0	24.0	24.0	24.0
		Nominal	23.0	23.0	23.0	23.0	23.0
LTE Band 41 (PC2)	B	Max Allowed Power	27.0	24.0	27.0	24.0	26.0
		Nominal	26.0	23.0	26.0	23.0	25.0
LTE Band 38	B	Max Allowed Power	24.0	24.0	24.0	24.0	24.0
		Nominal	23.0	23.0	23.0	23.0	23.0

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

1.3.2 2.4 GHz Maximum WLAN Output Power

Mode	Band	IEEE 802.11 (in dBm)					
		b		g		n	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	20.0	19.0	19.0	18.0	19.0	18.0
		ch. 12: 8.0	7.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0
		ch. 13: 8.0	7.0	ch. 13: 6.0	5.0	ch. 13: 6.0	5.0

1.3.3 2.4 GHz Reduced WLAN Output Powers

The below table is applicable in the following conditions:

- RCV Active

Mode	Band	IEEE 802.11 (in dBm)					
		b		g		n	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	13.0	12.0	13.0	12.0	13.0	12.0
		ch. 12: 8.0	7.0	ch. 12: 6.0	5.0	ch. 12: 6.0	5.0
		ch. 13: 8.0	7.0	ch. 13: 6.0	5.0	ch. 13: 6.0	5.0

1.3.4 5 GHz Maximum WLAN Output Power

Mode	Band	IEEE 802.11 (in dBm)					
		a		n		ac	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	UNII-1	16.0 ch. 36: 13.0	15.0 12.0	16.0 ch. 36: 13.0	15.0 12.0	16.0 ch. 36: 13.0	15.0 12.0
	UNII-2A	16.0 ch. 64: 13.0	15.0 12.0	16.0 ch. 64: 13.0	15.0 12.0	16.0 ch. 64: 13.0	15.0 12.0
	UNII-2C	16.0	15.0	16.0	15.0	16.0	15.0
	UNII-3	16.0	15.0	16.0	15.0	16.0	15.0
5 GHz WIFI (40MHz BW)	UNII-1			16.0 ch. 38: 10.0	15.0 9.0	16.0 ch. 38: 10.0	15.0 9.0
	UNII-2A			ch. 54: 9.0 ch. 62: 9.5	8.0 8.5	ch. 54: 9.0 ch. 62: 9.5	8.0 8.5
	UNII-2C			16.0 ch. 102: 7.0 ch. 110: 8.0	15.0 6.0 7.0	16.0 ch. 102: 7.0 ch. 110: 8.0	15.0 6.0 7.0
	UNII-3			16.0	15.0	16.0	15.0
5 GHz WIFI (80MHz BW)	UNII-1					9.5	8.5
	UNII-2A					6.5	5.5
	UNII-2C					15.0 ch. 106: 5.5 ch. 122: 12.0	14.0 4.5 11.0
	UNII-3					15.0	14.0

1.3.5 5 GHz Reduced WLAN Output Powers

The below table is applicable in the following conditions:

- RCV Active

Mode	Band	IEEE 802.11 (in dBm)					
		a		n		ac	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	UNII-1	11.0	10.0	11.0	10.0	11.0	10.0
	UNII-2A	11.0	10.0	11.0	10.0	11.0	10.0
	UNII-2C	11.0	10.0	11.0	10.0	11.0	10.0
	UNII-3	11.0	10.0	11.0	10.0	11.0	10.0
5 GHz WIFI (40MHz BW)	UNII-1			11.0 ch. 38: 10.0	10.0 9.0	11.0 ch. 38: 10.0	10.0 9.0
	UNII-2A			ch. 54: 9.0 ch. 62: 9.5	8.0 8.5	ch. 54: 9.0 ch. 62: 9.5	8.0 8.5
	UNII-2C			11.0 ch. 102: 7.0 ch. 110: 8.0	10.0 6.0 7.0	11.0 ch. 102: 7.0 ch. 110: 8.0	10.0 6.0 7.0
	UNII-3			11.0	10.0	11.0	10.0
5 GHz WIFI (80MHz BW)	UNII-1					9.5	8.5
	UNII-2A					6.5	5.5
	UNII-2C					11.0 ch. 106: 5.5	10.0 4.5
	UNII-3					11.0	10.0

1.3.6 2.4 GHz Maximum Bluetooth Output Power

Mode	Modulated Average (dBm)	
	Maximum	Nominal
Bluetooth	9.0	8.0
Bluetooth EDR	7.5	6.5
Bluetooth LE 2Mbps	6.0	5.0
Bluetooth LE 1Mbps, 125/500 kbps	6.0	5.0

1.4 DUT Antenna Locations

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

Table 1-1
Device Edges/Sides for SAR Testing

Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	No	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 1750	Yes	Yes	No	Yes	No	Yes
UMTS 1900	Yes	Yes	No	Yes	No	Yes
LTE Band 71	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 14	Yes	Yes	No	Yes	Yes	Yes
LTE Band 26 (Cell)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 66 (AWS)	Yes	Yes	No	Yes	No	Yes
LTE Band 25 (PCS)	Yes	Yes	No	Yes	No	Yes
LTE Band 30	Yes	Yes	No	Yes	No	Yes
LTE Band 7	Yes	Yes	No	Yes	No	Yes
LTE Band 41	Yes	Yes	No	Yes	No	Yes
2.4 GHz WLAN	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN	Yes	Yes	Yes	No	No	Yes
Bluetooth	Yes	Yes	Yes	No	No	Yes

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

1.5 Near Field Communications (NFC) Antenna

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

1.6 Simultaneous Transmission Capabilities

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

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

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Phablet	Notes
1	GSM voice + 2.4 GHz WLAN	Yes	Yes	N/A	Yes	
2	GSM voice + 5 GHz WLAN	Yes	Yes	N/A	Yes	
3	GSM voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
4	GSM voice + 5 GHz WLAN + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
5	UMTS + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
6	UMTS + 5 GHz WLAN	Yes	Yes	Yes	Yes	
7	UMTS + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
8	UMTS + 5 GHz WLAN + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
9	LTE + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
10	LTE + 5 GHz WLAN	Yes	Yes	Yes	Yes	
11	LTE + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
12	LTE + 5 GHz WLAN + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
13	GPRS/EDGE + 2.4 GHz WLAN	N/A	N/A	Yes	Yes	
14	GPRS/EDGE + 5 GHz WLAN	N/A	N/A	Yes	Yes	
15	GPRS/EDGE + 2.4 GHz Bluetooth	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
16	GPRS/EDGE + 5 GHz WLAN + 2.4 GHz Bluetooth	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered

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

1.7 Miscellaneous SAR Test Considerations

(A) WIFI/BT

Per FCC KDB 447498 D01v06, the 1g SAR exclusion threshold for distances <50mm is defined by the following equation:

$$\frac{Max\ Power\ of\ Channel\ (mW)}{Test\ Separation\ Dist\ (mm)} * \sqrt{Frequency(GHz)} \leq 3.0$$

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, head Bluetooth SAR was not required; [(8/5)* √2.48] = 2.5 < 3.0. Per KDB Publication 447498 D01v06, the maximum power of the channel was rounded to the nearest mW before calculation.

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, body-worn Bluetooth SAR was not required; [(8/15)* √2.48] = 0.8 < 3.0. Per KDB

Publication 447498 D01v06, the maximum power of the channel was rounded to the nearest mW before calculation.

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, and U-NII-2C 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 802.11ac 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) Up to 1024 QAM is supported
d) TDWR and Band gap channels are supported for 5 GHz

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is greater than 160mm and less than 200mm. Phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg. Because wireless router operations are not supported for U-NII-1, U-NII-2A, and U-NII-2C WLAN, phablet SAR tests were performed Phablet SAR was not evaluated for 2.4 GHz WLAN, 2.4 GHz Bluetooth, and U-NII-3 WLAN operations since wireless router 1g SAR was < 1.2 W/kg.

(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 and less than 200mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.

This device supports LTE capabilities with overlapping transmission frequency ranges. When the supported frequency range of an LTE Band falls completely within an LTE band with a larger transmission frequency

range, both LTE bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and both LTE bands share the same transmission path and signal characteristics, SAR was only assessed for the band with the larger transmission frequency range.

This device supports both Power Class 2 (PC2) and Power Class 3 (PC3) for LTE Band 41. Per May 2017 TCB Workshop Notes, SAR tests were performed with Power Class 3 (given the specific UL/DL limitations for Power Class 2). Additionally, SAR testing for the power class 2 condition was evaluated for the highest configuration in Power Class 3 for each test configuration to confirm the results were scalable linearly (See Section 13)

1.8 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r04, D05Av01r02, D06v02r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 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 Band 41 Power Class 2/3)
- April 2018 TCB Workshop Notes (LTE Carrier Aggregation)

1.9 Device Serial Numbers

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

2 LTE INFORMATION

LTE Information					
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 71 (665.5 - 695.5 MHz)				
	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 13 (779.5 - 784.5 MHz)				
	LTE Band 14 (790.5 - 795.5 MHz)				
	LTE Band 26 (Cell) (814.7 - 848.3 MHz)				
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)				
	LTE Band 66 (AWS) (1710.7 - 1779.3 MHz)				
	LTE Band 4 (AWS) (1710.7 - 1754.3 MHz)				
	LTE Band 25 (PCS) (1850.7 - 1914.3 MHz)				
	LTE Band 2 (PCS) (1850.7 - 1909.3 MHz)				
	LTE Band 30 (2307.5 - 2312.5 MHz)				
	LTE Band 7 (2502.5 - 2567.5 MHz)				
	LTE Band 41 (2498.5 - 2687.5 MHz)				
	LTE Band 38 (2572.5 - 2617.5 MHz)				
Channel Bandwidths	LTE Band 71: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 13: 5 MHz, 10 MHz				
	LTE Band 14: 5 MHz, 10 MHz				
	LTE Band 26 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz				
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 66 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 25 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 30: 5 MHz, 10 MHz				
	LTE Band 7: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 41: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 38: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
Channel Numbers and Frequencies (MHz)	Low	Low-Mid	Mid	Mid-High	High
LTE Band 71: 5 MHz	665.5 (133147)		680.5 (133297)	695.5 (133447)	
LTE Band 71: 10 MHz	668 (133172)		680.5 (133297)	693 (133422)	
LTE Band 71: 15 MHz	670.5 (133197)		680.5 (133297)	690.5 (133397)	
LTE Band 71: 20 MHz	673 (133222)		680.5 (133297)	688 (133372)	
LTE Band 12: 1.4 MHz	699.7 (23017)		707.5 (23095)	715.3 (23173)	
LTE Band 12: 3 MHz	700.5 (23025)		707.5 (23095)	714.5 (23165)	
LTE Band 12: 5 MHz	701.5 (23035)		707.5 (23095)	713.5 (23155)	
LTE Band 12: 10 MHz	704 (23060)		707.5 (23095)	711 (23130)	
LTE Band 13: 5 MHz	779.5 (23205)		782 (23230)	784.5 (23255)	
LTE Band 13: 10 MHz	N/A		782 (23230)	N/A	
LTE Band 14: 5 MHz	790.5 (23305)		793 (23330)	795.5 (23355)	
LTE Band 14: 10 MHz	N/A		793 (23330)	N/A	
LTE Band 26 (Cell): 1.4 MHz	814.7 (26697)		831.5 (26865)	848.3 (27033)	
LTE Band 26 (Cell): 3 MHz	815.5 (26705)		831.5 (26865)	847.5 (27025)	
LTE Band 26 (Cell): 5 MHz	816.5 (26715)		831.5 (26865)	846.5 (27015)	
LTE Band 26 (Cell): 10 MHz	819 (26740)		831.5 (26865)	844 (26990)	
LTE Band 26 (Cell): 15 MHz	821.5 (26765)		831.5 (26865)	841.5 (26965)	
LTE Band 5 (Cell): 1.4 MHz	824.7 (20407)		836.5 (20525)	848.3 (20643)	
LTE Band 5 (Cell): 3 MHz	825.5 (20415)		836.5 (20525)	847.5 (20635)	
LTE Band 5 (Cell): 5 MHz	826.5 (20425)		836.5 (20525)	846.5 (20625)	
LTE Band 5 (Cell): 10 MHz	829 (20450)		836.5 (20525)	844 (20600)	
LTE Band 66 (AWS): 1.4 MHz	1710.7 (131979)		1745 (132322)	1779.3 (132665)	
LTE Band 66 (AWS): 3 MHz	1711.5 (131987)		1745 (132322)	1778.5 (132657)	
LTE Band 66 (AWS): 5 MHz	1712.5 (131997)		1745 (132322)	1777.5 (132647)	
LTE Band 66 (AWS): 10 MHz	1715 (132022)		1745 (132322)	1775 (132622)	
LTE Band 66 (AWS): 15 MHz	1717.5 (132047)		1745 (132322)	1772.5 (132597)	
LTE Band 66 (AWS): 20 MHz	1720 (132072)		1745 (132322)	1770 (132572)	
LTE Band 4 (AWS): 1.4 MHz	1710.7 (19957)		1732.5 (20175)	1754.3 (20393)	
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)		1732.5 (20175)	1753.5 (20385)	
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)		1732.5 (20175)	1752.5 (20375)	
LTE Band 4 (AWS): 10 MHz	1715 (20000)		1732.5 (20175)	1750 (20350)	
LTE Band 4 (AWS): 15 MHz	1717.5 (20025)		1732.5 (20175)	1747.5 (20325)	
LTE Band 4 (AWS): 20 MHz	1720 (20050)		1732.5 (20175)	1745 (20300)	
LTE Band 25 (PCS): 1.4 MHz	1850.7 (26047)		1882.5 (26365)	1914.3 (26683)	
LTE Band 25 (PCS): 3 MHz	1851.5 (26055)		1882.5 (26365)	1913.5 (26675)	
LTE Band 25 (PCS): 5 MHz	1852.5 (26065)		1882.5 (26365)	1912.5 (26665)	
LTE Band 25 (PCS): 10 MHz	1855 (26090)		1882.5 (26365)	1910 (26640)	
LTE Band 25 (PCS): 15 MHz	1857.5 (26115)		1882.5 (26365)	1907.5 (26615)	
LTE Band 25 (PCS): 20 MHz	1860 (26140)		1882.5 (26365)	1905 (26590)	
LTE Band 2 (PCS): 1.4 MHz	1850.7 (18607)		1880 (18900)	1909.3 (19193)	
LTE Band 2 (PCS): 3 MHz	1851.5 (18615)		1880 (18900)	1908.5 (19185)	
LTE Band 2 (PCS): 5 MHz	1852.5 (18625)		1880 (18900)	1907.5 (19175)	
LTE Band 2 (PCS): 10 MHz	1855 (18650)		1880 (18900)	1905 (19150)	
LTE Band 2 (PCS): 15 MHz	1857.5 (18675)		1880 (18900)	1902.5 (19125)	
LTE Band 2 (PCS): 20 MHz	1860 (18700)		1880 (18900)	1900 (19100)	
LTE Band 30: 5 MHz	2307.5 (27685)		2310 (27710)	2312.5 (27735)	
LTE Band 30: 10 MHz	N/A		2310 (27710)	N/A	
LTE Band 7: 5 MHz	2502.5 (20775)		2535 (21100)	2567.5 (21425)	
LTE Band 7: 10 MHz	2505 (20800)		2535 (21100)	2565 (21400)	
LTE Band 7: 15 MHz	2507.5 (20825)		2535 (21100)	2562.5 (21375)	
LTE Band 7: 20 MHz	2510 (20850)		2535 (21100)	2560 (21350)	
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)
LTE Band 38: 5 MHz	2572.5 (37775)		2595 (38000)	2617.5 (38225)	
LTE Band 38: 10 MHz	2575 (37800)		2595 (38000)	2615 (38200)	
LTE Band 38: 15 MHz	2577.5 (37825)		2595 (38000)	2612.5 (38175)	
LTE Band 38: 20 MHz	2580 (37850)		2595 (38000)	2610 (38150)	
UE Category	DL UE Cat 6, UL UE Cat 5				
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 12. It supports carrier aggregation as shown in Appendix I. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. The following LTE Release 12 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, WIFI Offloading, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

3 INTRODUCTION

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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

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

where:

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

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

4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

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

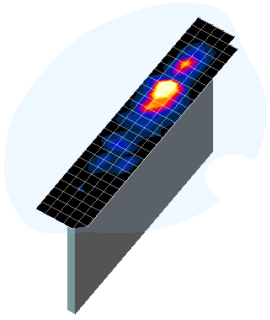

Figure 4-1
Sample SAR Area Scan

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

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

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

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

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

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

*Also compliant to IEEE 1528-2013 Table 6

5 DEFINITION OF REFERENCE POINTS

5.1 EAR REFERENCE POINT

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

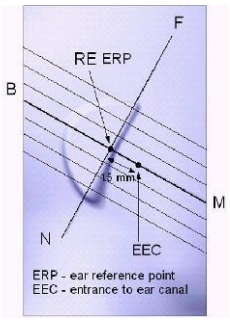

Figure 5-1
Close-Up Side view of ERP

5.2 HANDSET REFERENCE POINTS

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

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

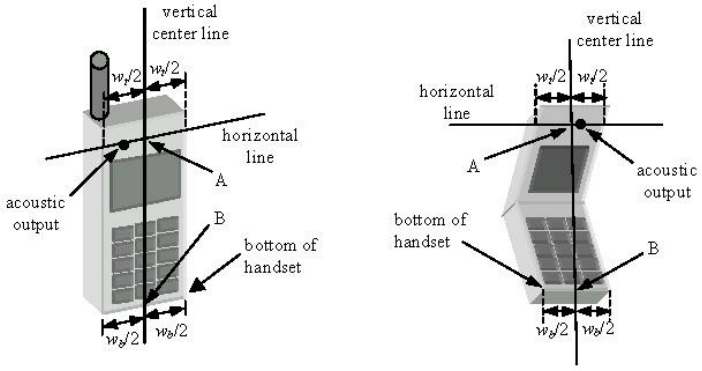

Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

6 TEST CONFIGURATION POSITIONS

6.1 Device Holder

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

6.2 Positioning for Cheek

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

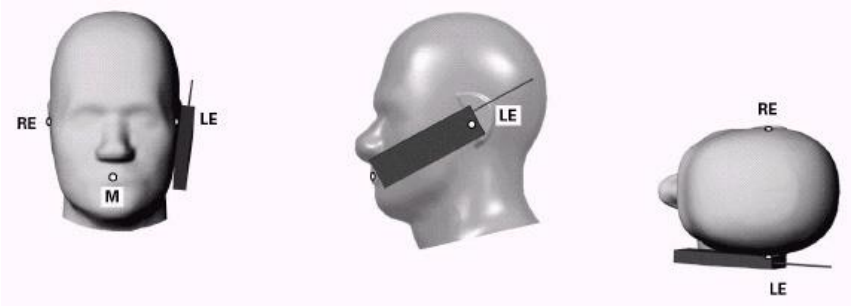

Figure 6-1 Front, Side and Top View of Cheek Position

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

6.3 Positioning for Ear / 15º Tilt

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

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

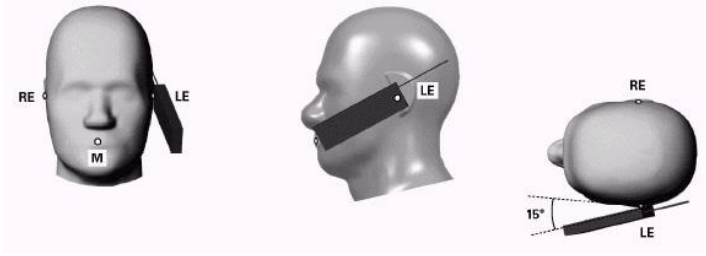

Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

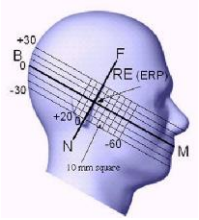

Figure 6-3
Side view w/ relevant markings

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

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

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

6.5 Body-Worn Accessory Configurations

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

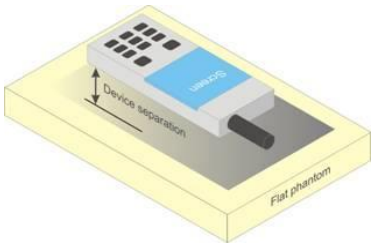

Figure 6-4
Sample Body-Worn Diagram

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

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

6.6 Extremity Exposure Configurations

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

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

6.7 Wireless Router Configurations

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

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

6.8 Phablet Configurations

For smart phones with a display diagonal dimension > 150 mm or an overall diagonal dimension > 160 mm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the phablets procedures outlined in KDB Publication 648474 D04v01r03 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worn accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna <=25 mm from that surface or edge, in direct contact with the phantom, for 10g SAR. The UMPC mini-tablet 1g SAR at 5 mm is not required. When hotspot mode applies, 10g SAR is required only for the surfaces and edges with hotspot mode 1g SAR > 1.2 W/kg.

6.9 Proximity Sensor Considerations

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

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

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

7 RF EXPOSURE LIMITS

7.1 Uncontrolled Environment

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

7.2 Controlled Environment

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

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

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

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

8 FCC MEASUREMENT PROCEDURES

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

8.1 Measured and Reported SAR

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

8.2 3G SAR Test Reduction Procedure

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

8.3 Procedures Used to Establish RF Signal for SAR

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

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

8.4 SAR Measurement Conditions for UMTS

8.4.1 Output Power Verification

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

8.4.2 Head SAR Measurements

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

8.4.3 Body SAR Measurements

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

8.4.4 SAR Measurements with Rel 5 HSDPA

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

8.4.5 SAR Measurements with Rel 6 HSUPA

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

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

8.4.6 SAR Measurement Conditions for DC-HSDPA

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

8.5 SAR Measurement Conditions for LTE

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

8.5.1 Spectrum Plots for RB Configurations

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

8.5.2 MPR

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

8.5.3 A-MPR

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

8.5.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r04:

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

8.5.5 TDD

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

8.5.6 Downlink Only Carrier Aggregation

Conducted power measurements with LTE Carrier Aggregation (CA) (downlink only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data

connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to specifications when downlink carrier aggregation is inactive on the PCC. Additional conducted output powers are measured with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band. Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for downlink only carrier aggregation configurations when the average output power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive.

8.6 SAR Testing with 802.11 Transmitters

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

8.6.1 General Device Setup

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

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

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

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

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

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

8.6.4 Initial Test Position Procedure

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

8.6.5 2.4 GHz SAR Test Requirements

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

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

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

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

8.6.6 OFDM Transmission Mode and SAR Test Channel Selection

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

8.6.7 Initial Test Configuration Procedure

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

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

8.6.8 Subsequent Test Configuration Procedures

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

9 RF CONDUCTED POWERS

9.1 GSM Conducted Powers

Table 9-1
Maximum Conducted Powers

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	33.01	32.77	30.80	**29.51**	27.88	26.53	24.52	23.01	21.81
	190	33.23	33.25	31.11	**29.74**	27.92	26.82	24.59	23.28	21.89
	251	33.49	33.50	31.37	**29.88**	28.00	27.03	25.00	23.45	22.03
GSM 1900	512	30.47	30.53	28.06	25.92	**25.01**	24.81	22.88	21.11	19.37
	661	30.26	30.20	27.74	25.65	**25.23**	24.74	22.57	21.17	19.56
	810	30.17	30.11	27.74	25.86	**25.65**	24.56	22.53	20.99	19.70

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	23.81	23.57	24.61	**25.08**	24.70	17.33	18.33	18.58	18.63
	190	24.03	24.05	24.92	**25.31**	24.74	17.62	18.40	18.85	18.71
	251	24.29	24.30	25.18	**25.45**	24.82	17.83	18.81	19.02	18.85
GSM 1900	512	21.27	21.33	21.87	21.49	**21.83**	15.61	16.69	16.68	16.19
	661	21.06	21.00	21.55	21.22	**22.05**	15.54	16.38	16.74	16.38
	810	20.97	20.91	21.55	21.43	**22.47**	15.36	16.34	16.56	16.52

GSM 850	**Frame Avg.Targets:**	23.30	23.30	24.81	**24.57**	23.82	17.30	18.31	18.07	18.32
GSM 1900		20.80	20.80	22.31	21.57	**22.32**	15.80	16.31	17.07	16.32

Table 9-2
Reduced Conducted Powers -Phablet with grip sensor active, Hotspot mode active, and/or 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	28.42	28.36	26.96	25.00	**23.92**	24.81	22.88	21.11	19.37
	661	28.59	28.71	26.87	24.78	**24.02**	24.74	22.57	21.17	19.56
	810	28.81	28.67	28.12	26.05	**24.93**	24.56	22.53	20.99	19.70

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	19.22	19.16	20.77	20.57	**20.74**	15.61	16.69	16.68	16.19
	661	19.39	19.51	20.68	20.35	**20.84**	15.54	16.38	16.74	16.38
	810	19.61	19.47	21.93	21.62	**21.75**	15.36	16.34	16.56	16.52
GSM 1900	**Frame Avg.Targets:**	18.80	18.80	21.31	21.07	**21.32**	15.80	16.31	17.07	16.32

Note:

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

GSM Class: B
GPRS Multislot class: 12 (Max 4 Tx uplink slots)
EDGE Multislot class: 12 (Max 4 Tx uplink slots)
DTM Multislot Class: N/A

Figure 9-1
Power Measurement Setup

9.2 UMTS Conducted Powers

Table 9-3
Maximum Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	24.20	24.01	24.30	24.31	24.05	24.11	24.25	24.34	24.30	-
99		12.2 kbps AMR	24.16	23.97	24.29	24.28	24.00	24.11	24.21	24.32	24.25	-
6	HSDPA	Subtest 1	22.51	22.25	22.60	22.36	22.60	22.42	22.66	23.11	22.18	0
6		Subtest 2	22.62	22.28	22.67	22.41	22.36	22.38	22.52	23.13	22.53	0
6		Subtest 3	21.85	21.50	21.60	21.50	21.51	21.54	22.05	22.13	21.93	0.5
6		Subtest 4	22.02	21.66	21.99	21.66	21.87	21.78	22.26	22.38	22.24	0.5
6	HSUPA	Subtest 1	22.15	21.98	22.13	21.50	21.51	21.51	22.05	22.13	21.92	0
6		Subtest 2	20.08	20.97	20.16	19.50	19.50	19.51	20.01	20.12	19.90	2
6		Subtest 3	21.21	20.99	21.24	20.76	21.04	21.03	21.08	21.15	20.99	1
6		Subtest 4	20.12	19.99	20.17	19.50	19.55	19.51	20.04	20.11	19.95	2
6		Subtest 5	22.12	21.96	22.15	21.76	22.01	22.02	22.03	22.15	21.89	0
8	DC-HSDPA	Subtest 1	22.54	22.54	22.52	22.13	22.20	22.18	22.89	23.16	22.48	0
8		Subtest 2	22.71	22.45	22.55	22.74	22.49	22.61	22.93	23.35	22.53	0
8		Subtest 3	21.95	21.34	21.59	21.30	21.35	21.18	22.00	22.31	21.20	0.5
8		Subtest 4	21.51	21.60	21.88	21.26	21.47	21.33	22.27	22.09	21.87	0.5

Table 9-4
Reduced Conducted Powers - Phablet with grip sensor active, Hotspot mode active, and/or Earjack active

3GPP Release Version	Mode	3GPP 34.121 Subtest	AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	21.30	21.31	21.07	21.37	21.42	21.40	-
99		12.2 kbps AMR	21.28	21.30	21.02	21.37	21.40	21.40	-
6	HSDPA	Subtest 1	21.07	20.84	20.63	21.17	21.27	20.74	0
6		Subtest 2	21.20	20.80	20.71	21.21	21.24	20.75	0
6		Subtest 3	21.18	20.81	20.44	21.19	21.13	20.69	0.5
6		Subtest 4	21.30	21.01	20.89	21.27	21.53	20.96	0.5
6	HSUPA	Subtest 1	20.08	19.78	19.63	20.11	20.20	19.65	0
6		Subtest 2	19.15	19.40	19.33	19.86	19.97	19.72	2
6		Subtest 3	20.08	19.83	19.72	20.23	20.32	19.70	1
6		Subtest 4	19.27	19.41	19.36	19.87	19.97	19.75	2
6		Subtest 5	21.23	20.85	20.74	21.21	21.30	20.75	0
8	DC-HSDPA	Subtest 1	21.17	21.15	20.32	21.12	21.52	20.86	0
8		Subtest 2	21.26	20.71	20.21	21.11	21.49	20.82	0
8		Subtest 3	20.85	20.78	20.41	21.10	21.57	20.42	0.5
8		Subtest 4	20.71	20.73	20.38	21.12	21.55	20.90	0.5

DC-HSDPA considerations

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

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

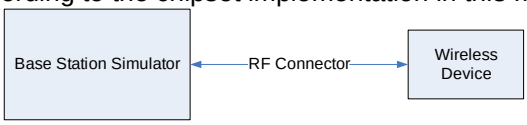

Figure 9-2
Power Measurement Setup

9.3 LTE Conducted Powers

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

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.

9.3.1 LTE Band 71

Table 9-5
LTE Band 71 Maximum Conducted Powers - 20 MHz Bandwidth

LTE Band 71 20 MHz Bandwidth					
Modulation	**RB Size**	**RB Offset**	**Mid Channel** **133297** **(680.5 MHz)** **Conducted Power [dBm]**	**MPR Allowed per 3GPP [dB]**	**MPR [dB]**
QPSK	1	0	**24.37**	0	0
	1	50	24.29		0
	1	99	24.11		0
	50	0	**23.20**	0-1	1
	50	25	23.17		1
	50	50	23.07		1
	100	0	23.18		1
16QAM	1	0	23.33	0-1	1
	1	50	23.30		1
	1	99	23.10		1
	50	0	22.21	0-2	2
	50	25	22.17		2
	50	50	22.04		2
	100	0	22.11		2
64QAM	1	0	22.15	0-2	2
	1	50	22.14		2
	1	99	21.93		2
	50	0	21.07	0-3	3
	50	25	21.11		3
	50	50	20.88		3
	100	0	21.00		3

9.3.2 LTE Band 12

Table 9-6
LTE Band 12 Maximum Conducted Powers - 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	**24.45**	0	0
	1	25	24.34		0
	1	49	24.20		0
	25	0	**23.24**	0-1	1
	25	12	23.23		1
	25	25	23.13		1
	50	0	23.23		1
16QAM	1	0	23.33	0-1	1
	1	25	23.47		1
	1	49	23.29		1
	25	0	22.26	0-2	2
	25	12	22.15		2
	25	25	22.14		2
	50	0	22.21		2
64QAM	1	0	22.26	0-2	2
	1	25	22.28		2
	1	49	21.97		2
	25	0	21.21	0-3	3
	25	12	21.12		3
	25	25	21.07		3
	50	0	21.09		3

9.3.3 LTE Band 13

Table 9-7
LTE Band 13 Maximum Conducted Powers - 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	24.04	0	0
	1	25	**24.15**		0
	1	49	23.99		0
	25	0	22.96	0-1	1
	25	12	**23.00**		1
	25	25	22.94		1
	50	0	22.97		1
16QAM	1	0	22.81	0-1	1
	1	25	22.85		1
	1	49	22.53		1
	25	0	21.75	0-2	2
	25	12	21.88		2
	25	25	21.76		2
	50	0	21.75		2
64QAM	1	0	21.79	0-2	2
	1	25	21.80		2
	1	49	21.59		2
	25	0	20.83	0-3	3
	25	12	20.89		3
	25	25	20.79		3
	50	0	20.76		3

9.3.4 LTE Band 14

Table 9-8
LTE Band 14 Maximum Conducted Powers - 10 MHz Bandwidth

LTE Band 14 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23330 (793.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	24.06	0	0
	1	25	**24.12**		0
	1	49	23.79		0
	25	0	**23.00**	0-1	1
	25	12	22.96		1
	25	25	22.86		1
	50	0	22.87		1
16QAM	1	0	22.90	0-1	1
	1	25	22.74		1
	1	49	22.47		1
	25	0	21.86	0-2	2
	25	12	21.75		2
	25	25	21.77		2
	50	0	21.74		2
64QAM	1	0	21.67	0-2	2
	1	25	21.70		2
	1	49	21.53		2
	25	0	20.83	0-3	3
	25	12	20.80		3
	25	25	20.75		3
	50	0	20.75		3

9.3.5 LTE Band 26

Table 9-9
TE Band 26 (Cell) Maximum Conducted Powers- 15 MHz Bandwidth

LTE Band 26 (Cell) 15 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 26865 (831.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**24.28**	0	0
	1	36	24.07		0
	1	74	23.97		0
	36	0	23.13	0-1	1
	36	18	**23.30**		1
	36	37	23.04		1
	75	0	23.00		1
16QAM	1	0	22.93	0-1	1
	1	36	22.91		1
	1	74	22.64		1
	36	0	22.03	0-2	2
	36	18	21.90		2
	36	37	21.84		2
	75	0	21.91		2
64QAM	1	0	21.79	0-2	2
	1	36	21.84		2
	1	74	21.55		2
	36	0	21.07	0-3	3
	36	18	21.00		3
	36	37	20.91		3
	75	0	20.94		3

9.3.6 LTE Band 66

Table 9-10
LTE Band 66 (AWS) Maximum Conducted Powers – 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	**24.34**	24.17	24.05	0	0
	1	50	24.29	24.12	24.12		0
	1	99	24.25	24.12	23.88		0
	50	0	**23.25**	23.16	23.05	0-1	1
	50	25	23.22	23.06	22.98		1
	50	50	23.22	23.08	22.91		1
	100	0	23.23	23.21	23.04		1
16QAM	1	0	23.14	22.96	22.80	0-1	1
	1	50	23.04	22.92	22.79		1
	1	99	22.98	22.81	22.67		1
	50	0	22.35	22.19	22.02	0-2	2
	50	25	22.30	22.07	22.00		2
	50	50	22.29	22.08	21.94		2
	100	0	22.26	22.13	22.03		2
64QAM	1	0	22.36	22.03	22.02	0-2	2
	1	50	22.18	22.00	22.15		2
	1	99	22.32	21.93	21.99		2
	50	0	21.39	21.17	21.12	0-3	3
	50	25	21.23	21.09	21.00		3
	50	50	21.34	21.07	20.96		3
	100	0	21.32	21.20	21.05		3

Table 9-11
LTE Band 66 (AWS) Reduced Conducted Powers - Phablet with grip sensor active, Hotspot mode active, and/or Earjack active - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.76	**20.78**	20.53	0	0
	1	50	20.77	20.64	20.72		0
	1	99	20.76	20.54	20.56		0
	50	0	20.74	**20.94**	20.93	0-1	0
	50	25	20.63	20.56	20.47		0
	50	50	20.70	20.57	20.48		0
	100	0	20.74	20.75	20.56		0
16QAM	1	0	20.60	20.48	20.26	0-1	0
	1	50	20.38	20.49	20.44		0
	1	99	20.33	20.35	20.16		0
	50	0	20.54	20.74	20.85	0-2	0
	50	25	20.71	20.56	20.43		0
	50	50	20.81	20.61	20.43		0
	100	0	20.70	20.69	20.62		0
64QAM	1	0	20.70	20.49	20.28	0-2	0
	1	50	20.62	20.46	20.39		0
	1	99	20.53	20.46	20.20		0
	50	0	20.72	20.72	20.75	0-3	0
	50	25	20.73	20.55	20.45		0
	50	50	20.79	20.53	20.35		0
	100	0	20.77	20.73	20.54		0

9.3.7 LTE Band 25

Table 9-12
LTE Band 25 (PCS) Maximum Conducted Powers - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.85	24.07	23.91	0	0
	1	50	23.72	**24.17**	23.77		0
	1	99	23.81	24.10	23.80		0
	50	0	22.95	**23.18**	23.05	0-1	1
	50	25	22.68	23.12	22.74		1
	50	50	22.72	23.08	22.76		1
	100	0	22.91	23.08	22.94		1
16QAM	1	0	22.78	22.91	22.74	0-1	1
	1	50	22.50	22.86	22.60		1
	1	99	22.58	22.84	22.49		1
	50	0	21.99	22.10	22.02	0-2	2
	50	25	21.77	22.13	21.75		2
	50	50	21.88	22.11	21.82		2
	100	0	21.76	22.00	21.92		2
64QAM	1	0	21.92	22.00	21.77	0-2	2
	1	50	21.78	21.96	21.74		2
	1	99	21.70	22.00	21.65		2
	50	0	21.08	21.14	20.95	0-3	3
	50	25	20.87	21.14	20.82		3
	50	50	20.82	21.16	20.87		3
	100	0	21.01	21.08	20.94		3

Table 9-13
LTE Band 25 (PCS) Reduced Conducted Powers - Phablet with grip sensor active, Hotspot mode active, and/or Earjack active - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.43	21.47	21.23	0	0
	1	50	21.40	**21.57**	21.04		0
	1	99	21.31	21.47	21.09		0
	50	0	21.37	21.24	21.24	0-1	0
	50	25	21.31	21.34	21.08		0
	50	50	21.23	**21.55**	21.10		0
	100	0	21.35	21.32	21.24		0
16QAM	1	0	21.13	21.28	21.36	0-1	0
	1	50	21.14	21.34	21.02		0
	1	99	21.08	21.39	21.14		0
	50	0	21.42	21.29	21.30	0-2	0
	50	25	21.27	21.36	21.13		0
	50	50	21.23	21.34	21.03		0
	100	0	21.32	21.22	21.33		0
64QAM	1	0	21.21	21.41	21.06	0-2	0
	1	50	21.26	21.39	20.89		0
	1	99	21.08	21.39	20.84		0
	50	0	21.36	21.36	21.34	0-3	0
	50	25	21.27	21.41	21.07		0
	50	50	21.21	21.40	21.08		0
	100	0	21.34	21.23	21.16		0

9.3.8 LTE Band 30

Table 9-14
LTE Band 30 Maximum Conducted Powers - 10 MHz Bandwidth

LTE Band 30 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 27710 (2310.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	21.66	0	0
	1	25	21.75		0
	1	49	**21.76**		0
	25	0	**20.62**	0-1	1
	25	12	20.61		1
	25	25	20.56		1
	50	0	20.57		1
16QAM	1	0	20.39	0-1	1
	1	25	20.44		1
	1	49	20.29		1
	25	0	19.65	0-2	2
	25	12	19.67		2
	25	25	19.68		2
	50	0	19.72		2
64QAM	1	0	19.37	0-2	2
	1	25	19.61		2
	1	49	19.43		2
	25	0	18.75	0-3	3
	25	12	18.84		3
	25	25	18.80		3
	50	0	18.78		3

Table 9-15
LTE Band 30 Reduced Conducted Powers - Phablet with grip sensor active and Hotspot mode active - 10 MHz Bandwidth

LTE Band 30 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 27710 (2310.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	17.78	0	0
	1	25	17.89		0
	1	49	**17.90**		0
	25	0	**17.79**	0-1	0
	25	12	17.76		0
	25	25	17.78		0
	50	0	17.71		0
16QAM	1	0	17.38	0-1	0
	1	25	17.57		0
	1	49	17.46		0
	25	0	17.71	0-2	0
	25	12	17.82		0
	25	25	17.82		0
	50	0	17.76		0
64QAM	1	0	17.55	0-2	0
	1	25	17.73		0
	1	49	17.57		0
	25	0	17.68	0-3	0
	25	12	17.82		0
	25	25	17.80		0
	50	0	17.83		0

9.3.9 LTE Band 7

Table 9-16
LTE Band 7 Maximum Conducted Powers - 20 MHz Bandwidth

LTE Band 7 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20850 (2510.0 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21350 (2560.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.41	**23.83**	23.12	0	0
	1	50	23.52	23.78	23.13		0
	1	99	23.41	23.59	23.10		0
	50	0	22.40	**22.63**	22.11	0-1	1
	50	25	22.47	22.57	22.08		1
	50	50	22.39	22.51	22.09		1
	100	0	22.33	22.57	22.14		1
16QAM	1	0	22.33	22.66	21.94	0-1	1
	1	50	22.31	22.57	22.02		1
	1	99	22.14	22.43	21.93		1
	50	0	21.44	21.63	21.16	0-2	2
	50	25	21.39	21.58	21.13		2
	50	50	21.42	21.56	21.14		2
	100	0	21.39	21.57	21.17		2
64QAM	1	0	21.45	21.52	21.09	0-2	2
	1	50	21.35	21.50	21.00		2
	1	99	21.34	21.43	21.04		2
	50	0	20.44	20.68	20.20	0-3	3
	50	25	20.50	20.64	20.19		3
	50	50	20.49	20.59	20.20		3
	100	0	20.45	20.67	20.24		3

Table 9-17
LTE Band 7 Reduced Conducted Powers - Phablet with grip sensor active and Hotspot mode active - 20 MHz Bandwidth

LTE Band 7 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20850 (2510.0 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21350 (2560.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.42	21.63	21.15	0	0
	1	50	21.47	**21.66**	21.13		0
	1	99	21.46	21.45	21.14		0
	50	0	21.40	**21.74**	21.29	0-1	0
	50	25	21.48	21.62	21.14		0
	50	50	21.41	21.56	21.13		0
	100	0	21.39	21.65	21.16		0
16QAM	1	0	21.26	21.42	20.88	0-1	0
	1	50	21.14	21.45	20.91		0
	1	99	21.13	21.19	20.84		0
	50	0	21.36	21.54	21.19	0-2	0
	50	25	21.47	21.57	21.13		0
	50	50	21.49	21.44	21.16		0
	100	0	21.36	21.60	21.25		0
64QAM	1	0	21.01	21.51	21.02	0-2	0
	1	50	21.24	21.49	21.05		0
	1	99	21.37	21.40	21.07		0
	50	0	20.37	20.74	20.30	0-3	1
	50	25	20.55	20.62	20.19		1
	50	50	20.49	20.59	20.19		1
	100	0	20.46	20.72	20.27		1

9.3.10 LTE Band 41

Table 9-18
LTE Band 41 PC3 Maximum Conducted Powers– 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	23.55	23.59	23.37	23.08	23.05	0	0
	1	50	23.67	23.43	23.43	23.05	23.14		0
	1	99	**23.81**	23.31	23.32	23.07	23.05		0
	50	0	22.71	22.54	22.43	22.00	22.07	0-1	1
	50	25	22.78	22.49	22.36	22.01	22.13		1
	50	50	**22.82**	22.40	22.33	22.06	22.11		1
	100	0	22.76	22.49	22.36	22.10	22.13		1
16QAM	1	0	22.60	22.61	22.50	22.10	22.13	0-1	1
	1	50	22.67	22.40	22.41	21.97	22.09		1
	1	99	22.76	22.26	22.37	22.00	22.04		1
	50	0	21.82	21.63	21.52	21.13	21.12	0-2	2
	50	25	21.85	21.56	21.50	21.12	21.27		2
	50	50	21.96	21.51	21.47	21.08	21.22		2
	100	0	21.86	21.59	21.46	21.13	21.22		2
64QAM	1	0	21.34	21.31	21.17	20.84	20.90	0-2	2
	1	50	21.41	21.16	21.13	20.76	20.97		2
	1	99	21.52	21.07	21.00	20.68	20.90		2
	50	0	20.76	20.61	20.50	20.06	20.13	0-3	3
	50	25	20.82	20.53	20.55	20.05	20.20		3
	50	50	20.90	20.48	20.41	20.04	20.19		3
	100	0	20.85	20.56	20.41	20.13	20.21		3

Table 9-19
LTE Band 41 PC2 Maximum Conducted Powers– 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	25.91	26.05	25.87	25.69	25.45	0	0
	1	50	26.13	25.85	25.89	25.52	25.51		0
	1	99	**26.20**	25.69	25.83	25.39	25.45		0
	50	0	25.03	24.90	24.77	24.40	24.41	0-1	1
	50	25	25.10	24.85	24.76	24.39	24.47		1
	50	50	**25.19**	24.77	24.73	24.35	24.49		1
	100	0	25.05	24.88	24.76	24.41	24.47		1

Table 9-20
LTE Band 41 PC2 Reduced Conducted Powers - Phablet with grip sensor active and/or Hotspot mode 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	23.23	23.32	23.14	22.77	22.76	0	0
	1	50	23.39	23.15	23.10	22.67	22.81		0
	1	99	**23.49**	23.01	22.95	22.57	22.64		0
	50	0	23.15	23.05	22.89	22.50	22.59	0-1	0
	50	25	23.26	22.98	22.80	22.46	22.60		0
	50	50	**23.31**	22.89	22.82	22.33	22.61		0
	100	0	23.22	22.96	22.86	22.50	22.58		0

Figure 9-3
Power Measurement Setup

9.4 WLAN Conducted Powers

Table 9-21
2.4 GHz WLAN Maximum Average RF Power

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
		Average	Average	Average
2412	1	18.12	17.26	17.13
2437	6	18.90	17.74	17.44
2462	11	18.96	17.81	17.57

Table 9-22
2.4 GHz WLAN Reduced Average RF Power with RCV Active

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
		Average	Average	Average
2412	1	12.47	12.13	12.69
2437	6	12.35	12.33	12.13
2462	11	12.49	12.08	12.28

Table 9-23
5 GHz WLAN Maximum Average RF Power

5GHz (20MHz) Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
		Average	Average	Average
5260	52	15.79	15.96	15.98
5280	56	15.91	15.97	15.95
5300	60	15.85	15.62	15.72
5320	64	12.81	12.93	12.78

5GHz (40MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11n	802.11ac
		Average	Average
5190	38	9.68	9.97
5230	46	15.77	15.96
5510	102	6.78	6.57
5550	110	7.56	7.98
5590	118	15.32	15.22
5630	126	15.22	15.40
5710	142	15.53	15.68
5755	151	15.89	15.96
5795	159	15.13	15.18

Table 9-24
5 GHz WLAN Reduced Average RF Power with RCV Active

5GHz (40MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11n	802.11ac
		Average	Average
5190	38	9.68	9.97
5230	46	10.91	10.99

5GHz (20MHz) Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
		Average	Average	Average
5260	52	10.73	10.92	10.86
5280	56	10.81	10.81	10.68
5300	60	10.26	10.60	10.44
5320	64	10.93	10.99	10.98

5GHz (80MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
		Average
5530	106	5.48
5610	122	10.23
5690	138	10.33
5775	155	10.37

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

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

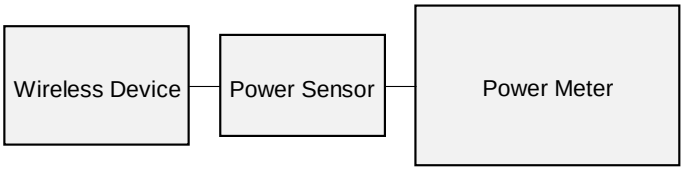

Figure 9-4
Power Measurement Setup

9.5 Bluetooth Conducted Powers

Table 9-25
Bluetooth Maximum Average RF Power

Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Peak Conducted Power		Avg Conducted Power	
				[dBm]	[mW]	[dBm]	[mW]
2402	1.0	GFSK	0	8.28	6.730	7.80	6.023
2441	1.0	GFSK	39	8.94	7.832	8.43	6.961
2480	1.0	GFSK	78	9.14	8.198	8.68	7.371
2402	2.0	π/4-DQPSK	0	8.59	7.229	6.51	4.476
2441	2.0	π/4-DQPSK	39	9.12	8.171	7.14	5.170
2480	2.0	π/4-DQPSK	78	9.46	8.825	7.37	5.453
2402	3.0	8DPSK	0	9.12	8.171	6.49	4.460
2441	3.0	8DPSK	39	9.43	8.776	7.13	5.163
2480	3.0	8DPSK	78	9.96	9.908	7.37	5.453

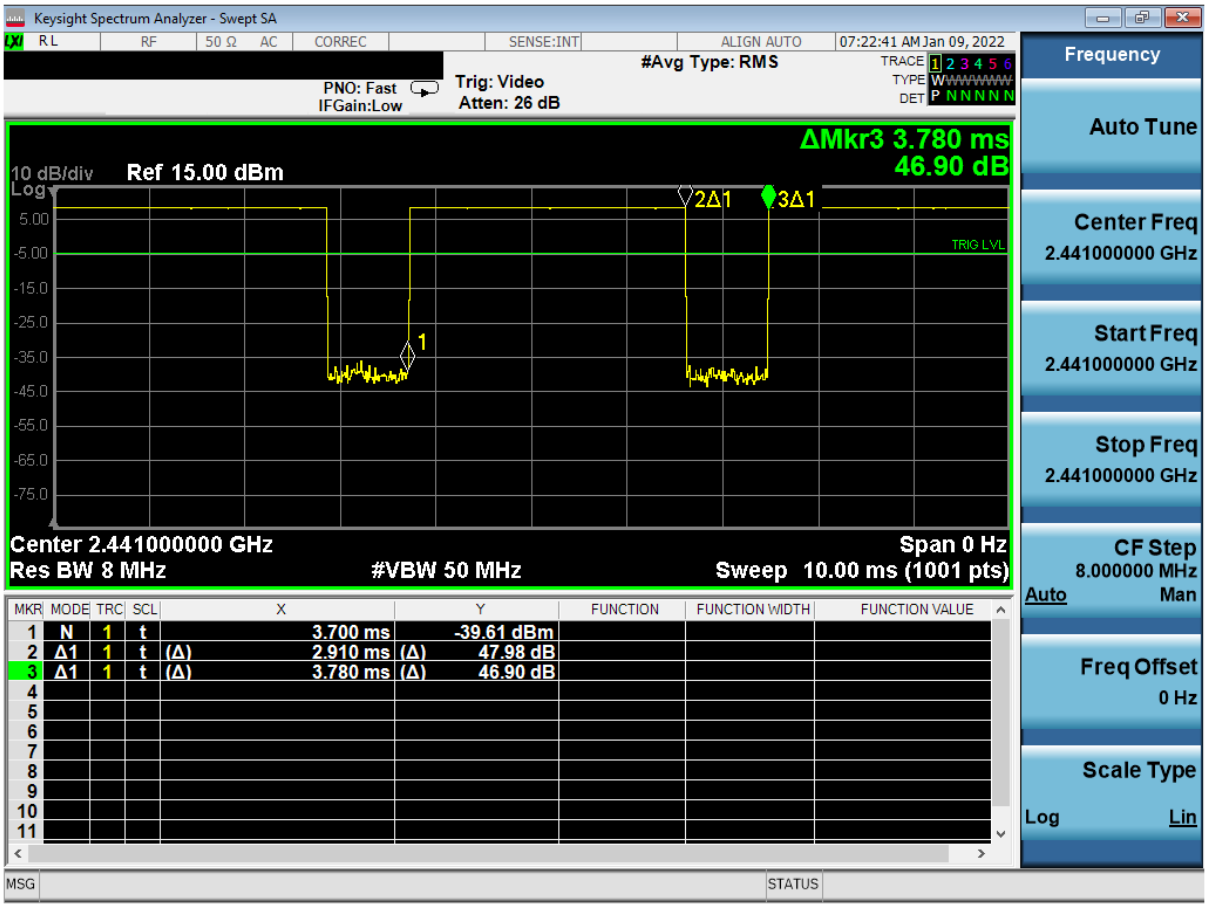

Figure 9-5
Bluetooth Transmission Plot

Equation 9-1
Bluetooth Antenna 1 Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.91ms}{3.78ms} * 100\% = 77.0\%$$

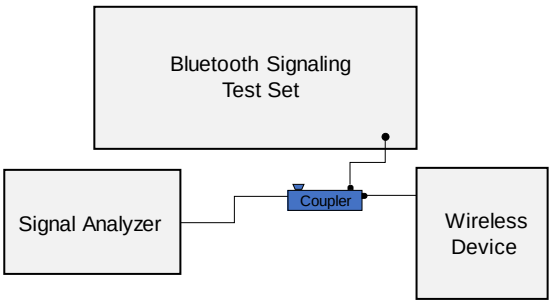

Figure 9-6
Power Measurement Setup

10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
01/03/2022	750 Head	18.9	680	0.865	43.338	0.888	42.305	-2.59%	2.44%
			695	0.870	43.290	0.889	42.227	-2.14%	2.52%
			700	0.872	43.269	0.889	42.201	-1.91%	2.53%
			710	0.875	43.225	0.890	42.149	-1.69%	2.55%
			725	0.879	43.156	0.891	42.071	-1.35%	2.58%
			750	0.888	43.059	0.894	41.942	-0.67%	2.66%
			770	0.896	43.010	0.895	41.838	0.11%	2.80%
			785	0.902	42.981	0.896	41.760	0.67%	2.92%
			800	0.908	42.940	0.897	41.682	1.23%	3.02%
01/05/2022	750 Head	20.2	680	0.888	42.349	0.888	42.305	0.00%	0.10%
			695	0.893	42.303	0.889	42.227	0.45%	0.18%
			700	0.895	42.283	0.889	42.201	0.67%	0.19%
			710	0.898	42.239	0.890	42.149	0.90%	0.21%
			725	0.903	42.167	0.891	42.071	1.35%	0.23%
			750	0.913	42.073	0.894	41.942	2.13%	0.31%
			770	0.920	42.026	0.895	41.838	2.79%	0.45%
			785	0.926	41.999	0.896	41.760	3.35%	0.57%
			800	0.931	41.961	0.897	41.682	3.79%	0.67%
01/06/2022	835 Head	22.1	815	0.934	41.523	0.898	41.594	4.01%	-0.17%
			820	0.936	41.506	0.899	41.578	4.12%	-0.17%
			835	0.942	41.457	0.900	41.500	4.67%	-0.10%
			850	0.948	41.404	0.916	41.500	3.49%	-0.23%
01/10/2022	835 Head	20.7	815	0.934	41.492	0.898	41.594	4.01%	-0.25%
			820	0.935	41.477	0.899	41.578	4.00%	-0.24%
			835	0.941	41.428	0.900	41.500	4.56%	-0.17%
			850	0.948	41.386	0.916	41.500	3.49%	-0.27%
01/04/2022	1750 Head	21.4	1710	1.354	41.888	1.348	40.142	0.45%	4.35%
			1720	1.360	41.875	1.354	40.126	0.44%	4.36%
			1745	1.376	41.836	1.368	40.087	0.58%	4.36%
			1750	1.379	41.827	1.371	40.079	0.58%	4.36%
			1770	1.392	41.789	1.383	40.047	0.65%	4.35%
			1790	1.404	41.754	1.394	40.016	0.72%	4.34%
01/09/2022	1900 Head	22.1	1850	1.397	40.247	1.400	40.000	-0.21%	0.62%
			1860	1.407	40.201	1.400	40.000	0.50%	0.50%
			1880	1.429	40.109	1.400	40.000	2.07%	0.27%
			1900	1.450	40.018	1.400	40.000	3.57%	0.05%
			1905	1.455	39.994	1.400	40.000	3.93%	-0.02%
			1910	1.460	39.971	1.400	40.000	4.29%	-0.07%
01/05/2022	2450 Head	22.0	2300	1.730	39.134	1.670	39.500	3.59%	-0.93%
			2310	1.738	39.120	1.679	39.480	3.51%	-0.91%
			2320	1.746	39.107	1.687	39.460	3.50%	-0.89%
			2400	1.808	38.994	1.756	39.289	2.96%	-0.75%
			2450	1.847	38.921	1.800	39.200	2.61%	-0.71%
			2480	1.870	38.876	1.833	39.162	2.02%	-0.73%
			2500	1.885	38.839	1.855	39.136	1.62%	-0.76%
			2510	1.893	38.821	1.866	39.123	1.46%	-0.77%
			2535	1.914	38.780	1.893	39.092	1.11%	-0.80%
			2550	1.927	38.761	1.909	39.073	0.94%	-0.80%
			2560	1.935	38.747	1.920	39.060	0.78%	-0.80%
			2600	1.966	38.685	1.964	39.009	0.10%	-0.83%
			2650	2.006	38.599	2.018	38.945	-0.59%	-0.89%
			2680	2.030	38.561	2.051	38.907	-1.02%	-0.89%
			2700	2.045	38.537	2.073	38.882	-1.35%	-0.89%
01/25/2022	2450 Head	22.3	2300	1.750	39.544	1.670	39.500	4.79%	0.11%
			2310	1.757	39.530	1.679	39.480	4.65%	0.13%
			2320	1.764	39.520	1.687	39.460	4.56%	0.15%
			2400	1.823	39.423	1.756	39.289	3.82%	0.34%
			2450	1.859	39.356	1.800	39.200	3.28%	0.40%
			2480	1.882	39.314	1.833	39.162	2.67%	0.39%
			2500	1.897	39.291	1.855	39.136	2.26%	0.40%
			2510	1.905	39.282	1.866	39.123	2.09%	0.41%
			2535	1.924	39.246	1.893	39.092	1.64%	0.39%
			2550	1.936	39.222	1.909	39.073	1.41%	0.38%
			2560	1.944	39.207	1.920	39.060	1.25%	0.38%
			2600	1.974	39.156	1.964	39.009	0.51%	0.38%
			2650	2.013	39.063	2.018	38.945	-0.25%	0.30%
			2680	2.036	39.024	2.051	38.907	-0.73%	0.30%
			2700	2.049	38.990	2.073	38.882	-1.16%	0.28%
02/10/2022	5200-5800 Head	21.3	5180	4.638	36.097	4.635	36.009	0.06%	0.24%
			5190	4.648	36.077	4.645	35.998	0.06%	0.22%
			5200	4.660	36.048	4.655	35.986	0.11%	0.17%
			5210	4.674	36.030	4.666	35.975	0.17%	0.15%
			5220	4.686	36.015	4.676	35.963	0.21%	0.14%
			5240	4.712	35.974	4.696	35.940	0.34%	0.09%
			5250	4.724	35.951	4.706	35.929	0.38%	0.06%
			5260	4.738	35.937	4.717	35.917	0.45%	0.06%
			5270	4.750	35.917	4.727	35.906	0.49%	0.03%
			5280	4.762	35.894	4.737	35.894	0.53%	0.00%
			5290	4.776	35.882	4.748	35.883	0.59%	0.00%
			5300	4.784	35.872	4.758	35.871	0.55%	0.00%
			5310	4.793	35.851	4.768	35.860	0.52%	-0.03%
			5320	4.801	35.826	4.778	35.849	0.48%	-0.06%
			5500	5.029	35.528	4.963	35.643	1.33%	-0.32%
			5510	5.043	35.519	4.973	35.632	1.41%	-0.32%
			5520	5.056	35.518	4.983	35.620	1.46%	-0.29%
			5530	5.063	35.513	4.994	35.609	1.38%	-0.27%
			5540	5.070	35.501	5.004	35.597	1.32%	-0.27%
			5550	5.080	35.475	5.014	35.586	1.32%	-0.31%
			5560	5.089	35.444	5.024	35.574	1.29%	-0.37%
			5580	5.117	35.390	5.045	35.551	1.43%	-0.45%
			5600	5.151	35.367	5.065	35.529	1.70%	-0.46%
			5610	5.163	35.365	5.076	35.518	1.71%	-0.43%
			5620	5.174	35.370	5.086	35.506	1.73%	-0.38%
			5640	5.188	35.351	5.106	35.483	1.61%	-0.37%
			5660	5.199	35.308	5.127	35.460	1.40%	-0.43%
			5670	5.209	35.269	5.137	35.449	1.40%	-0.51%
			5680	5.223	35.230	5.147	35.437	1.48%	-0.58%
			5690	5.239	35.202	5.158	35.426	1.57%	-0.63%
			5700	5.251	35.195	5.168	35.414	1.61%	-0.62%
			5710	5.263	35.195	5.178	35.403	1.64%	-0.59%
			5720	5.275	35.182	5.188	35.391	1.68%	-0.59%
			5745	5.299	35.146	5.214	35.363	1.63%	-0.61%
			5750	5.302	35.140	5.219	35.357	1.59%	-0.61%
			5755	5.304	35.132	5.224	35.351	1.53%	-0.62%
			5765	5.313	35.108	5.234	35.340	1.51%	-0.66%
			5775	5.326	35.083	5.245	35.329	1.54%	-0.70%
			5785	5.339	35.047	5.255	35.317	1.60%	-0.76%
			5795	5.351	35.012	5.265	35.305	1.63%	-0.83%
			5805	5.363	34.997	5.275	35.294	1.67%	-0.84%
			5825	5.387	34.964	5.296	35.271	1.72%	-0.87%
			5835	5.399	34.951	5.305	35.230	1.77%	-0.79%
			5845	5.410	34.938	5.315	35.210	1.79%	-0.77%
			5855	5.420	34.920	5.325	35.197	1.78%	-0.79%
			5875	5.437	34.865	5.347	35.183	1.68%	-0.90%
			5885	5.448	34.835	5.357	35.177	1.70%	-0.97%
			5905	5.470	34.796	5.379	35.163	1.69%	-1.04%

Table 10-2
Measured Body Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
01/05/2022	750 Body	21.2	680	0.955	54.874	0.958	55.804	-0.31%	-1.67%
			695	0.961	54.829	0.959	55.745	0.21%	-1.64%
			700	0.962	54.813	0.959	55.726	0.31%	-1.64%
			710	0.966	54.775	0.960	55.687	0.63%	-1.64%
			725	0.971	54.725	0.961	55.629	1.04%	-1.63%
			750	0.980	54.666	0.964	55.531	1.66%	-1.56%
			770	0.989	54.628	0.965	55.453	2.49%	-1.49%
			785	0.995	54.597	0.966	55.395	3.00%	-1.44%
			800	1.001	54.553	0.967	55.336	3.52%	-1.41%
01/05/2022	750 Body	20.0	680	0.931	55.880	0.958	55.804	-2.82%	0.14%
			695	0.936	55.836	0.959	55.745	-2.40%	0.16%
			700	0.938	55.821	0.959	55.726	-2.19%	0.17%
			710	0.942	55.791	0.960	55.687	-1.88%	0.19%
			725	0.947	55.736	0.961	55.629	-1.46%	0.19%
			750	0.957	55.670	0.964	55.531	-0.73%	0.25%
			770	0.966	55.633	0.965	55.453	0.10%	0.32%
			785	0.972	55.606	0.966	55.395	0.62%	0.38%
			800	0.979	55.569	0.967	55.336	1.24%	0.42%
01/03/2022	835 Body	21.5	815	0.999	54.945	0.968	55.271	3.20%	-0.59%
			820	1.001	54.924	0.969	55.258	3.30%	-0.60%
			835	1.006	54.862	0.970	55.200	3.71%	-0.61%
			850	1.011	54.817	0.988	55.154	2.33%	-0.61%
01/05/2022	835 Body	20.0	815	0.984	55.525	0.968	55.271	1.65%	0.46%
			820	0.986	55.509	0.969	55.258	1.75%	0.45%
			835	0.993	55.455	0.970	55.200	2.37%	0.46%
			850	0.999	55.412	0.988	55.154	1.11%	0.47%
01/10/2022	1750 Body	20.7	1710	1.452	53.316	1.463	53.537	-0.75%	-0.41%
			1720	1.458	53.306	1.469	53.511	-0.75%	-0.38%
			1745	1.474	53.273	1.485	53.445	-0.74%	-0.32%
			1750	1.477	53.263	1.488	53.432	-0.74%	-0.32%
			1770	1.491	53.227	1.501	53.379	-0.67%	-0.28%
			1790	1.506	53.198	1.514	53.326	-0.53%	-0.24%
01/10/2022	1900 Body	24.6	1850	1.487	53.272	1.520	53.300	-2.17%	-0.05%
			1860	1.499	53.239	1.520	53.300	-1.38%	-0.11%
			1880	1.523	53.189	1.520	53.300	0.20%	-0.21%
			1900	1.545	53.143	1.520	53.300	1.64%	-0.29%
			1905	1.550	53.130	1.520	53.300	1.97%	-0.32%
			1910	1.555	53.115	1.520	53.300	2.30%	-0.35%
01/10/2022	1900 Body	23.9	1850	1.512	51.941	1.520	53.300	-0.53%	-2.55%
			1860	1.522	51.902	1.520	53.300	0.13%	-2.62%
			1880	1.546	51.821	1.520	53.300	1.71%	-2.77%
			1900	1.569	51.757	1.520	53.300	3.22%	-2.89%
			1905	1.575	51.743	1.520	53.300	3.62%	-2.92%
			1910	1.581	51.728	1.520	53.300	4.01%	-2.95%
01/20/2022	1900 Body	24.8	1850	1.491	51.834	1.520	53.300	-1.91%	-2.75%
			1860	1.502	51.798	1.520	53.300	-1.18%	-2.82%
			1880	1.524	51.739	1.520	53.300	0.26%	-2.93%
			1900	1.547	51.678	1.520	53.300	1.78%	-3.04%
			1905	1.552	51.661	1.520	53.300	2.11%	-3.08%
			1910	1.558	51.644	1.520	53.300	2.50%	-3.11%
01/09/2022	2450 Body	21.9	2300	1.826	51.529	1.809	52.900	0.94%	-2.59%
			2310	1.837	51.500	1.816	52.887	1.16%	-2.62%
			2320	1.847	51.473	1.826	52.873	1.15%	-2.65%
			2400	1.934	51.247	1.902	52.767	1.68%	-2.88%
			2450	1.990	51.111	1.950	52.700	2.05%	-3.02%
			2480	2.023	51.029	1.993	52.662	1.51%	-3.10%
			2500	2.045	50.967	2.021	52.636	1.19%	-3.17%
			2510	2.056	50.936	2.035	52.623	1.03%	-3.21%
			2535	2.085	50.861	2.071	52.592	0.68%	-3.29%
			2550	2.103	50.820	2.092	52.573	0.53%	-3.33%
			2560	2.115	50.792	2.106	52.560	0.43%	-3.36%
			2600	2.162	50.676	2.163	52.509	-0.05%	-3.49%
			2650	2.220	50.535	2.234	52.445	-0.63%	-3.64%
			2680	2.257	50.450	2.277	52.407	-0.88%	-3.73%
			2700	2.281	50.391	2.305	52.382	-1.04%	-3.80%
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%

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

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
01/26/2022	2450 Body	25.0	2300	1.897	51.352	1.809	52.900	4.86%	-2.93%
			2310	1.906	51.340	1.816	52.887	4.96%	-2.93%
			2320	1.915	51.330	1.826	52.873	4.87%	-2.92%
			2400	1.985	51.232	1.902	52.767	4.36%	-2.91%
			2450	2.029	51.166	1.950	52.700	4.05%	-2.91%
			2480	2.055	51.127	1.993	52.662	3.11%	-2.91%
			2500	2.072	51.099	2.021	52.636	2.52%	-2.92%
			2510	2.082	51.082	2.035	52.623	2.31%	-2.93%
			2535	2.105	51.040	2.071	52.592	1.64%	-2.95%
			2550	2.119	51.017	2.092	52.573	1.29%	-2.96%
			2560	2.128	51.006	2.106	52.560	1.04%	-2.96%
			2600	2.163	50.954	2.163	52.509	0.00%	-2.96%
			2650	2.208	50.868	2.234	52.445	-1.16%	-3.01%
			2680	2.235	50.826	2.277	52.407	-1.84%	-3.02%
			2700	2.253	50.801	2.305	52.382	-2.26%	-3.02%
01/31/2022	2450 Body	22.3	2300	1.860	51.026	1.809	52.900	2.82%	-3.54%
			2310	1.872	50.998	1.816	52.887	3.08%	-3.57%
			2320	1.883	50.971	1.826	52.873	3.12%	-3.60%
			2400	1.978	50.754	1.902	52.767	4.00%	-3.81%
			2450	2.039	50.607	1.950	52.700	4.56%	-3.97%
			2480	2.074	50.517	1.993	52.662	4.06%	-4.07%
			2500	2.097	50.453	2.021	52.636	3.76%	-4.15%
			2510	2.109	50.422	2.035	52.623	3.64%	-4.18%
			2535	2.137	50.345	2.071	52.592	3.19%	-4.27%
			2550	2.155	50.302	2.092	52.573	3.01%	-4.32%
			2560	2.167	50.275	2.106	52.560	2.90%	-4.35%
			2600	2.213	50.160	2.163	52.509	2.31%	-4.47%
			2650	2.272	50.010	2.234	52.445	1.70%	-4.64%
			2680	2.306	49.928	2.277	52.407	1.27%	-4.73%
			2700	2.328	49.864	2.305	52.382	1.00%	-4.81%
02/16/2022	2450 Body	25.0	2300	1.897	53.373	1.809	52.900	4.86%	0.89%
			2310	1.906	53.357	1.816	52.887	4.96%	0.89%
			2320	1.915	53.344	1.826	52.873	4.87%	0.89%
			2400	1.987	53.224	1.902	52.767	4.47%	0.87%
			2450	2.033	53.149	1.950	52.700	4.26%	0.85%
			2480	2.059	53.099	1.993	52.662	3.31%	0.83%
			2500	2.077	53.061	2.021	52.636	2.77%	0.81%
			2510	2.086	53.042	2.035	52.623	2.51%	0.80%
			2535	2.109	53.005	2.071	52.592	1.83%	0.79%
			2550	2.123	52.986	2.092	52.573	1.48%	0.79%
			2560	2.132	52.974	2.106	52.560	1.23%	0.79%
			2600	2.168	52.920	2.163	52.509	0.23%	0.78%
			2650	2.214	52.831	2.234	52.445	-0.90%	0.74%
			2680	2.242	52.798	2.277	52.407	-1.54%	0.75%
			2700	2.258	52.769	2.305	52.382	-2.04%	0.74%

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

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
01/25/2022	5200-5800 Body	23.6	5180	5.324	48.210	5.276	49.041	0.91%	-1.69%
			5190	5.336	48.195	5.288	49.028	0.91%	-1.70%
			5200	5.349	48.173	5.299	49.014	0.94%	-1.72%
			5210	5.363	48.154	5.311	49.001	0.98%	-1.73%
			5220	5.379	48.136	5.323	48.987	1.05%	-1.74%
			5240	5.405	48.097	5.346	48.960	1.10%	-1.76%
			5250	5.422	48.073	5.358	48.947	1.19%	-1.79%
			5260	5.438	48.058	5.369	48.933	1.29%	-1.79%
			5270	5.453	48.045	5.381	48.919	1.34%	-1.79%
			5280	5.464	48.025	5.393	48.906	1.32%	-1.80%
			5290	5.477	48.002	5.404	48.892	1.35%	-1.82%
			5300	5.490	47.982	5.416	48.879	1.37%	-1.84%
			5310	5.505	47.967	5.428	48.865	1.42%	-1.84%
			5320	5.520	47.945	5.439	48.851	1.49%	-1.85%
			5500	5.773	47.584	5.650	48.607	2.18%	-2.10%
			5510	5.788	47.560	5.661	48.594	2.24%	-2.13%
			5520	5.804	47.539	5.673	48.580	2.31%	-2.14%
			5530	5.821	47.522	5.685	48.566	2.39%	-2.15%
			5540	5.837	47.507	5.696	48.553	2.48%	-2.15%
			5550	5.854	47.488	5.708	48.539	2.56%	-2.17%
			5560	5.869	47.467	5.720	48.526	2.60%	-2.18%
			5580	5.899	47.427	5.743	48.499	2.72%	-2.21%
			5600	5.929	47.388	5.766	48.471	2.83%	-2.23%
			5610	5.943	47.365	5.778	48.458	2.86%	-2.26%
			5620	5.957	47.346	5.790	48.444	2.88%	-2.27%
			5640	5.984	47.314	5.813	48.417	2.94%	-2.28%
			5660	6.014	47.280	5.837	48.390	3.03%	-2.29%
			5670	6.029	47.262	5.848	48.376	3.10%	-2.30%
			5680	6.043	47.249	5.860	48.363	3.12%	-2.30%
			5690	6.058	47.235	5.872	48.349	3.17%	-2.30%
			5700	6.074	47.214	5.883	48.336	3.25%	-2.32%
			5710	6.090	47.190	5.895	48.322	3.31%	-2.34%
			5720	6.106	47.166	5.907	48.309	3.37%	-2.37%
			5745	6.144	47.128	5.936	48.275	3.50%	-2.38%
			5750	6.150	47.121	5.942	48.268	3.50%	-2.38%
			5755	6.155	47.114	5.947	48.261	3.50%	-2.38%
			5765	6.167	47.098	5.959	48.248	3.49%	-2.38%
			5775	6.181	47.077	5.971	48.234	3.52%	-2.40%
			5785	6.194	47.054	5.982	48.220	3.54%	-2.42%
			5795	6.209	47.036	5.994	48.207	3.59%	-2.43%
			5800	6.215	47.027	6.000	48.200	3.58%	-2.43%
			5805	6.224	47.021	6.006	48.193	3.63%	-2.43%
			5825	6.259	46.985	6.029	48.166	3.81%	-2.45%
			5835	6.276	46.978	6.042	48.130	3.87%	-2.39%
			5845	6.292	46.970	6.054	48.110	3.93%	-2.37%
			5855	6.305	46.953	6.066	48.093	3.94%	-2.37%
			5865	6.319	46.918	6.077	48.080	3.98%	-2.42%
			5875	6.333	46.889	6.088	48.067	4.02%	-2.45%
			5885	6.346	46.865	6.100	48.053	4.03%	-2.47%
			5905	6.375	46.819	6.122	48.027	4.13%	-2.52%
01/31/2022	5200-5800 Body	21.5	5180	5.356	47.456	5.276	49.041	1.52%	-3.23%
			5190	5.372	47.431	5.288	49.028	1.59%	-3.26%
			5200	5.389	47.401	5.299	49.014	1.70%	-3.29%
			5210	5.403	47.364	5.311	49.001	1.73%	-3.34%
			5220	5.417	47.344	5.323	48.987	1.77%	-3.35%
			5240	5.444	47.292	5.346	48.960	1.83%	-3.41%
			5250	5.460	47.273	5.358	48.947	1.90%	-3.42%
			5260	5.474	47.257	5.369	48.933	1.96%	-3.43%
			5270	5.489	47.261	5.381	48.919	2.01%	-3.39%
			5280	5.504	47.256	5.393	48.906	2.06%	-3.37%
			5290	5.521	47.242	5.404	48.892	2.17%	-3.37%
			5300	5.534	47.211	5.416	48.879	2.18%	-3.41%
			5310	5.547	47.174	5.428	48.865	2.19%	-3.46%
			5320	5.560	47.149	5.439	48.851	2.22%	-3.48%
			5500	5.828	46.805	5.650	48.607	3.15%	-3.71%
			5510	5.844	46.799	5.661	48.594	3.23%	-3.69%
			5520	5.857	46.791	5.673	48.580	3.24%	-3.68%
			5530	5.869	46.781	5.685	48.566	3.24%	-3.68%
			5540	5.879	46.759	5.696	48.553	3.21%	-3.69%
			5550	5.890	46.738	5.708	48.539	3.19%	-3.71%
			5560	5.902	46.708	5.720	48.526	3.18%	-3.75%
			5580	5.935	46.668	5.743	48.499	3.34%	-3.78%
			5600	5.973	46.632	5.766	48.471	3.59%	-3.79%
			5610	5.991	46.618	5.778	48.458	3.69%	-3.80%
			5620	6.007	46.609	5.790	48.444	3.75%	-3.79%
			5640	6.029	46.590	5.813	48.417	3.72%	-3.77%
			5660	6.046	46.551	5.837	48.390	3.58%	-3.80%
			5670	6.059	46.524	5.848	48.376	3.61%	-3.83%
			5680	6.075	46.492	5.860	48.363	3.67%	-3.87%
			5690	6.091	46.457	5.872	48.349	3.73%	-3.91%
			5700	6.107	46.434	5.883	48.336	3.81%	-3.93%
			5710	6.124	46.420	5.895	48.322	3.88%	-3.94%
			5720	6.140	46.417	5.907	48.309	3.94%	-3.92%
			5745	6.177	46.391	5.936	48.275	4.06%	-3.90%
			5750	6.181	46.383	5.942	48.268	4.02%	-3.91%
			5755	6.186	46.375	5.947	48.261	4.02%	-3.91%
			5765	6.198	46.355	5.959	48.248	4.01%	-3.92%
			5775	6.212	46.323	5.971	48.234	4.04%	-3.96%
			5785	6.232	46.293	5.982	48.220	4.18%	-4.00%
			5795	6.250	46.252	5.994	48.207	4.27%	-4.06%
			5800	6.258	46.242	6.000	48.200	4.30%	-4.06%
			5805	6.266	46.235	6.006	48.193	4.33%	-4.06%
			5825	6.299	46.202	6.029	48.166	4.48%	-4.08%
			5835	6.313	46.183	6.042	48.130	4.49%	-4.05%
			5845	6.323	46.165	6.054	48.110	4.44%	-4.04%
			5855	6.331	46.152	6.066	48.093	4.37%	-4.04%
			5865	6.344	46.132	6.077	48.080	4.39%	-4.05%
			5875	6.361	46.100	6.088	48.067	4.48%	-4.09%
			5885	6.376	46.080	6.100	48.053	4.52%	-4.11%
			5905	6.404	46.047	6.122	48.027	4.61%	-4.12%

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 F.

Table 10-5
System Verification Results – 1g

System Verification TARGET & MEASURED												
SAR System	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp. (C)	Liquid Temp. (C)	Input Power (W)	Source SN	Probe SN	Measured SAR1g (W/kg)	1W Target SAR1g (W/kg)	1W Normalized SAR 1g (W/kg)	Deviation1g (%)
K4	750	HEAD	01/03/2022	19.2	18.9	0.20	1046	7640	1.650	8.59	1.718	-3.96%
K4	750	HEAD	01/05/2022	20.6	20.2	0.20	1046	7565	1.740	8.59	1.718	1.28%
K1	835	HEAD	01/06/2022	23.2	23.1	0.20	4d180	7558	2.040	9.45	1.890	7.94%
K1	835	HEAD	01/10/2022	22.5	22.4	0.20	4d180	7558	2.010	9.45	1.890	6.35%
A	1750	HEAD	01/04/2022	23.3	21.4	0.10	1148	7406	3.890	35.90	3.590	8.36%
B	1900	HEAD	01/09/2022	21.5	21.8	0.10	5d080	7660	4.010	40.50	4.050	-0.99%
S	2300	HEAD	01/25/2022	20.5	21.3	0.10	1116	7552	5.180	49.60	4.960	4.44%
B	2450	HEAD	01/05/2022	22.8	22.0	0.10	719	7660	5.130	55.00	5.500	-6.73%
S	2450	HEAD	01/25/2022	20.5	21.3	0.10	797	7552	5.360	52.40	5.240	2.29%
B	2600	HEAD	01/05/2022	22.8	22.0	0.10	1004	7660	5.460	57.80	5.780	-5.54%
G	5250	HEAD	02/10/2022	23.0	21.3	0.05	1191	7357	3.850	79.60	3.980	-3.27%
G	5600	HEAD	02/10/2022	23.0	21.3	0.05	1191	7357	4.220	82.10	4.105	2.80%
G	5750	HEAD	02/10/2022	23.0	21.3	0.05	1191	7357	4.040	78.20	3.910	3.32%
K3	750	BODY	01/05/2022	19.7	19.9	0.20	1046	7637	1.810	8.79	1.758	2.96%
K2	750	BODY	01/05/2022	21.6	21.2	0.20	1034	7402	1.750	8.91	1.782	-1.80%
K2	835	BODY	01/03/2022	21.8	21.5	0.20	4d180	7402	2.000	9.67	1.934	3.41%
K3	835	BODY	01/05/2022	19.7	19.9	0.20	4d119	7637	2.040	9.90	1.980	3.03%
L	1750	BODY	01/10/2022	23.5	21.2	0.10	1008	7670	3.820	37.80	3.780	1.06%
P	1900	BODY	01/10/2022	24.7	22.4	0.10	5d148	7410	4.020	39.10	3.910	2.81%
A	1900	BODY	01/10/2022	21.6	23.6	0.10	5d080	7406	4.180	40.70	4.070	2.70%
H	2300	BODY	01/26/2022	21.8	23.0	0.10	1073	7409	4.740	48.40	4.840	-2.07%
K	2450	BODY	01/09/2022	21.9	21.9	0.10	719	3914	5.090	52.00	5.200	-2.12%
K	2450	BODY	01/12/2022	22.2	22.0	0.10	719	3914	4.980	52.00	5.200	-4.23%
H	2450	BODY	01/26/2022	21.8	23.0	0.10	719	7409	5.330	52.00	5.200	2.50%
K	2450	BODY	01/31/2022	22.1	22.3	0.10	719	3914	5.130	52.00	5.200	-1.35%
K	2600	BODY	01/09/2022	21.9	21.9	0.10	1004	3914	5.320	55.40	5.540	-3.97%
K	2600	BODY	01/12/2022	22.2	22.0	0.10	1004	3914	5.480	55.40	5.540	-1.08%
G	5250	BODY	01/25/2022	23.4	22.0	0.05	1191	7357	3.740	74.10	3.705	0.94%
G	5600	BODY	01/25/2022	23.4	22.0	0.05	1191	7357	3.850	76.90	3.845	0.13%
G	5750	BODY	01/25/2022	23.4	22.0	0.05	1191	7357	3.680	74.40	3.720	-1.08%

Table 10-6
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 (%)
L	1750	BODY	01/10/2022	23.5	21.2	0.10	1008	7670	2.030	19.90	20.300	2.01%
A	1900	BODY	01/10/2022	21.6	23.6	0.10	5d080	7406	2.160	21.40	21.600	0.93%
A	1900	BODY	02/09/2022	24.7	21.6	0.10	5d149	7406	2.280	21.10	22.800	8.06%
H	2300	BODY	02/16/2022	20.9	23.0	0.10	1116	7409	2.350	23.70	23.500	-0.84%
K	2450	BODY	01/09/2022	21.9	21.9	0.10	719	3914	2.320	24.70	23.200	-6.07%
K	2600	BODY	01/09/2022	21.9	21.9	0.10	1004	3914	2.350	24.80	23.500	-5.24%
G	5250	BODY	02/09/2022	23.4	22.0	0.05	1191	7357	1.110	20.80	22.200	6.73%
G	5600	BODY	02/09/2022	23.4	22.0	0.05	1191	7357	1.160	21.30	23.200	8.92%
G	5750	BODY	02/09/2022	23.4	22.0	0.05	1191	7357	1.110	20.70	22.200	7.25%

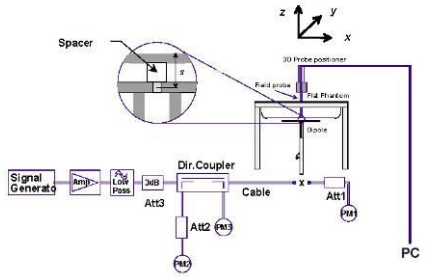

Figure 10-1
System Verification Setup Diagram

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)	
848.80	251	GSM 850	GSM	33.5	33.49	0.06	Right	Cheek	A	15811	1:8.3	0.199	1.002	0.199	A1
848.80	251	GSM 850	GSM	33.5	33.49	0.11	Right	Tilt	A	15811	1:8.3	0.118	1.002	0.118	
848.80	251	GSM 850	GSM	33.5	33.49	0.05	Left	Cheek	A	15811	1:8.3	0.165	1.002	0.165	
848.80	251	GSM 850	GSM	33.5	33.49	0.07	Left	Tilt	A	15811	1:8.3	0.084	1.002	0.084	
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)	
1850.20	512	GSM 1900	GSM	31.0	30.47	0.04	Right	Cheek	B	12305	1:8.3	0.034	1.130	0.038	
1850.20	512	GSM 1900	GSM	31.0	30.47	-0.01	Right	Tilt	B	12305	1:8.3	0.025	1.130	0.028	
1850.20	512	GSM 1900	GSM	31.0	30.47	0.05	Left	Cheek	B	12305	1:8.3	0.043	1.130	0.049	A2
1850.20	512	GSM 1900	GSM	31.0	30.47	-0.04	Left	Tilt	B	12305	1:8.3	0.031	1.130	0.035	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-3
UMTS 850 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
846.60	4233	UMTS 850	RMC	25.0	24.30	0.01	Right	Cheek	A	15829	1:1	0.317	1.175	0.372	A3
846.60	4233	UMTS 850	RMC	25.0	24.30	0.12	Right	Tilt	A	15829	1:1	0.167	1.175	0.196	
846.60	4233	UMTS 850	RMC	25.0	24.30	-0.06	Left	Cheek	A	15829	1:1	0.277	1.175	0.325	
846.60	4233	UMTS 850	RMC	25.0	24.30	0.00	Left	Tilt	A	15829	1:1	0.143	1.175	0.168	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-4
UMTS 1750 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.														
1712.40	1312	UMTS 1750	RMC	25.0	24.31	-0.01	Right	Cheek	B	12511	1:1	0.099	1.172	0.116	A4
1712.40	1312	UMTS 1750	RMC	25.0	24.31	-0.06	Right	Tilt	B	12511	1:1	0.054	1.172	0.063	
1712.40	1312	UMTS 1750	RMC	25.0	24.31	0.01	Left	Cheek	B	12511	1:1	0.081	1.172	0.095	
1712.40	1312	UMTS 1750	RMC	25.0	24.31	0.05	Left	Tilt	B	12511	1:1	0.060	1.172	0.070	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-5
UMTS 1900 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.														
1880.00	9400	UMTS 1900	RMC	25.0	24.34	0.05	Right	Cheek	B	12305	1:1	0.121	1.164	0.141	
1880.00	9400	UMTS 1900	RMC	25.0	24.34	0.02	Right	Tilt	B	12305	1:1	0.135	1.164	0.157	
1880.00	9400	UMTS 1900	RMC	25.0	24.34	0.06	Left	Cheek	B	12305	1:1	0.193	1.164	0.225	A5
1880.00	9400	UMTS 1900	RMC	25.0	24.34	0.06	Left	Tilt	B	12305	1:1	0.162	1.164	0.189	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-6
LTE Band 71 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
680.50	133297	Mid	LTE Band 71	20	25.0	24.37	-0.05	0	Right	Cheek	A	QPSK	1	0	15811	1:1	0.151	1.156	0.175	A6
680.50	133297	Mid	LTE Band 71	20	24.0	23.20	0.03	1	Right	Cheek	A	QPSK	50	0	15811	1:1	0.108	1.202	0.130	
680.50	133297	Mid	LTE Band 71	20	25.0	24.37	0.19	0	Right	Tilt	A	QPSK	1	0	15811	1:1	0.069	1.156	0.080	
680.50	133297	Mid	LTE Band 71	20	24.0	23.20	0.07	1	Right	Tilt	A	QPSK	50	0	15811	1:1	0.052	1.202	0.063	
680.50	133297	Mid	LTE Band 71	20	25.0	24.37	0.04	0	Left	Cheek	A	QPSK	1	0	15811	1:1	0.118	1.156	0.136	
680.50	133297	Mid	LTE Band 71	20	24.0	23.20	0.09	1	Left	Cheek	A	QPSK	50	0	15811	1:1	0.080	1.202	0.096	
680.50	133297	Mid	LTE Band 71	20	25.0	24.37	0.07	0	Left	Tilt	A	QPSK	1	0	15811	1:1	0.074	1.156	0.086	
680.50	133297	Mid	LTE Band 71	20	24.0	23.20	0.08	1	Left	Tilt	A	QPSK	50	0	15811	1:1	0.048	1.202	0.058	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-7
LTE Band 12 Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	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	24.45	0.00	0	Right	Cheek	A	QPSK	1	0	15811	1:1	0.150	1.274	0.191	A7
707.50	23095	Mid	LTE Band 12	10	24.5	23.24	0.13	1	Right	Cheek	A	QPSK	25	0	15811	1:1	0.126	1.337	0.168	
707.50	23095	Mid	LTE Band 12	10	25.5	24.45	0.07	0	Right	Tilt	A	QPSK	1	0	15811	1:1	0.075	1.274	0.096	
707.50	23095	Mid	LTE Band 12	10	24.5	23.24	0.14	1	Right	Tilt	A	QPSK	25	0	15811	1:1	0.059	1.337	0.079	
707.50	23095	Mid	LTE Band 12	10	25.5	24.45	0.05	0	Left	Cheek	A	QPSK	1	0	15811	1:1	0.117	1.274	0.149	
707.50	23095	Mid	LTE Band 12	10	24.5	23.24	0.13	1	Left	Cheek	A	QPSK	25	0	15811	1:1	0.092	1.337	0.123	
707.50	23095	Mid	LTE Band 12	10	25.5	24.45	0.11	0	Left	Tilt	A	QPSK	1	0	15811	1:1	0.055	1.274	0.070	
707.50	23095	Mid	LTE Band 12	10	24.5	23.24	0.17	1	Left	Tilt	A	QPSK	25	0	15811	1:1	0.045	1.337	0.060	

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

Table 11-8
LTE Band 13 Head SAR

MEASUREMENT RESULTS																					
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)	
782.00	23230	Mid	LTE Band 13	10	25.5	24.15	0.03	0	Right	Cheek	A	QPSK	1	25	15829	1:1	0.277	1.365	0.378	A8
782.00	23230	Mid	LTE Band 13	10	24.5	23.00	0.06	1	Right	Cheek	A	QPSK	25	12	15829	1:1	0.209	1.413	0.295	
782.00	23230	Mid	LTE Band 13	10	25.5	24.15	0.01	0	Right	Tilt	A	QPSK	1	25	15829	1:1	0.137	1.365	0.187	
782.00	23230	Mid	LTE Band 13	10	24.5	23.00	0.02	1	Right	Tilt	A	QPSK	25	12	15829	1:1	0.105	1.413	0.148	
782.00	23230	Mid	LTE Band 13	10	25.5	24.15	0.01	0	Left	Cheek	A	QPSK	1	25	15829	1:1	0.220	1.365	0.300	
782.00	23230	Mid	LTE Band 13	10	24.5	23.00	0.03	1	Left	Cheek	A	QPSK	25	12	15829	1:1	0.167	1.413	0.236	
782.00	23230	Mid	LTE Band 13	10	25.5	24.15	0.09	0	Left	Tilt	A	QPSK	1	25	15829	1:1	0.123	1.365	0.168	
782.00	23230	Mid	LTE Band 13	10	24.5	23.00	0.07	1	Left	Tilt	A	QPSK	25	12	15829	1:1	0.094	1.413	0.133	

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

Table 11-9
LTE Band 14 Head SAR

MEASUREMENT RESULTS																					
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)	
793.00	23330	Mid	LTE Band 14	10	25.0	24.12	0.02	0	Right	Cheek	A	QPSK	1	25	15829	1:1	0.228	1.225	0.279	A9
793.00	23330	Mid	LTE Band 14	10	24.0	23.00	0.05	1	Right	Cheek	A	QPSK	25	0	15829	1:1	0.171	1.259	0.215	
793.00	23330	Mid	LTE Band 14	10	25.0	24.12	0.03	0	Right	Tilt	A	QPSK	1	25	15829	1:1	0.126	1.225	0.154	
793.00	23330	Mid	LTE Band 14	10	24.0	23.00	0.02	1	Right	Tilt	A	QPSK	25	0	15829	1:1	0.093	1.259	0.117	
793.00	23330	Mid	LTE Band 14	10	25.0	24.12	0.02	0	Left	Cheek	A	QPSK	1	25	15829	1:1	0.193	1.225	0.236	
793.00	23330	Mid	LTE Band 14	10	24.0	23.00	-0.02	1	Left	Cheek	A	QPSK	25	0	15829	1:1	0.155	1.259	0.195	
793.00	23330	Mid	LTE Band 14	10	25.0	24.12	0.04	0	Left	Tilt	A	QPSK	1	25	15829	1:1	0.097	1.225	0.119	
793.00	23330	Mid	LTE Band 14	10	24.0	23.00	0.04	1	Left	Tilt	A	QPSK	25	0	15829	1:1	0.077	1.259	0.097	

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

Table 11-10
LTE Band 26 (Cell) Head SAR

MEASUREMENT RESULTS																					
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)	
831.50	26865	Md	LTE Band 26 (Cell)	15	25.0	24.28	0.00	0	Right	Cheek	A	QPSK	1	0	15829	1:1	0.294	1.180	0.347	A10
831.50	26865	Md	LTE Band 26 (Cell)	15	24.0	23.30	0.04	1	Right	Cheek	A	QPSK	36	18	15829	1:1	0.245	1.175	0.288	
831.50	26865	Md	LTE Band 26 (Cell)	15	25.0	24.28	-0.04	0	Right	Tilt	A	QPSK	1	0	15829	1:1	0.166	1.180	0.196	
831.50	26865	Md	LTE Band 26 (Cell)	15	24.0	23.30	0.03	1	Right	Tilt	A	QPSK	36	18	15829	1:1	0.133	1.175	0.156	
831.50	26865	Md	LTE Band 26 (Cell)	15	25.0	24.28	0.02	0	Left	Cheek	A	QPSK	1	0	15829	1:1	0.240	1.180	0.283	
831.50	26865	Md	LTE Band 26 (Cell)	15	24.0	23.30	0.07	1	Left	Cheek	A	QPSK	36	18	15829	1:1	0.195	1.175	0.229	
831.50	26865	Md	LTE Band 26 (Cell)	15	25.0	24.28	-0.08	0	Left	Tilt	A	QPSK	1	0	15829	1:1	0.153	1.180	0.181	
831.50	26865	Md	LTE Band 26 (Cell)	15	24.0	23.30	0.04	1	Left	Tilt	A	QPSK	36	18	15829	1:1	0.121	1.175	0.142	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram											

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

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	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)	
1720.00	132072	Low	LTE Band 66 (AWS)	20	25.0	24.34	-0.06	0	Right	Cheek	B	QPSK	1	0	12511	1:1	0.123	1.164	0.143	A11
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.25	-0.05	1	Right	Cheek	B	QPSK	50	0	12511	1:1	0.091	1.189	0.108	
1720.00	132072	Low	LTE Band 66 (AWS)	20	25.0	24.34	-0.08	0	Right	Tilt	B	QPSK	1	0	12511	1:1	0.080	1.164	0.093	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.25	0.16	1	Right	Tilt	B	QPSK	50	0	12511	1:1	0.060	1.189	0.071	
1720.00	132072	Low	LTE Band 66 (AWS)	20	25.0	24.34	-0.01	0	Left	Cheek	B	QPSK	1	0	12511	1:1	0.091	1.164	0.106	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.25	0.01	1	Left	Cheek	B	QPSK	50	0	12511	1:1	0.077	1.189	0.092	
1720.00	132072	Low	LTE Band 66 (AWS)	20	25.0	24.34	0.11	0	Left	Tilt	B	QPSK	1	0	12511	1:1	0.066	1.164	0.077	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.25	-0.06	1	Left	Tilt	B	QPSK	50	0	12511	1:1	0.052	1.189	0.062	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-12
LTE Band 25 (PCS) Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	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)	
1882.50	26365	Md	LTE Band 25 (PCS)	20	25.0	24.17	0.12	0	Right	Cheek	B	QPSK	1	50	12305	1:1	0.111	1.211	0.134	
1882.50	26365	Md	LTE Band 25 (PCS)	20	24.0	23.18	0.01	1	Right	Cheek	B	QPSK	50	0	12305	1:1	0.085	1.208	0.103	
1882.50	26365	Md	LTE Band 25 (PCS)	20	25.0	24.17	0.12	0	Right	Tilt	B	QPSK	1	50	12305	1:1	0.078	1.211	0.094	
1882.50	26365	Md	LTE Band 25 (PCS)	20	24.0	23.18	0.02	1	Right	Tilt	B	QPSK	50	0	12305	1:1	0.063	1.208	0.076	
1882.50	26365	Md	LTE Band 25 (PCS)	20	25.0	24.17	-0.01	0	Left	Cheek	B	QPSK	1	50	12305	1:1	0.138	1.211	0.167	A12
1882.50	26365	Md	LTE Band 25 (PCS)	20	24.0	23.18	0.03	1	Left	Cheek	B	QPSK	50	0	12305	1:1	0.112	1.208	0.135	
1882.50	26365	Md	LTE Band 25 (PCS)	20	25.0	24.17	-0.02	0	Left	Tilt	B	QPSK	1	50	12305	1:1	0.096	1.211	0.116	
1882.50	26365	Md	LTE Band 25 (PCS)	20	24.0	23.18	-0.09	1	Left	Tilt	B	QPSK	50	0	12305	1:1	0.083	1.208	0.100	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-13
LTE Band 30 Head SAR

MEASUREMENT RESULTS																					
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) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
2310.00	27710	Mid	LTE Band 30	10	22.5	21.76	-0.05	0	Right	Cheek	B	QPSK	1	49	21181	1:1	0.110	1.186	0.130	A13
2310.00	27710	Mid	LTE Band 30	10	21.5	20.62	-0.10	1	Right	Cheek	B	QPSK	25	0	21181	1:1	0.079	1.225	0.097	
2310.00	27710	Mid	LTE Band 30	10	22.5	21.76	-0.14	0	Right	Tilt	B	QPSK	1	49	21181	1:1	0.099	1.186	0.117	
2310.00	27710	Mid	LTE Band 30	10	21.5	20.62	-0.04	1	Right	Tilt	B	QPSK	25	0	21181	1:1	0.079	1.225	0.097	
2310.00	27710	Mid	LTE Band 30	10	22.5	21.76	0.13	0	Left	Cheek	B	QPSK	1	49	21181	1:1	0.080	1.186	0.095	
2310.00	27710	Mid	LTE Band 30	10	21.5	20.62	0.18	1	Left	Cheek	B	QPSK	25	0	21181	1:1	0.061	1.225	0.075	
2310.00	27710	Mid	LTE Band 30	10	22.5	21.76	0.13	0	Left	Tilt	B	QPSK	1	49	21181	1:1	0.059	1.186	0.070	
2310.00	27710	Mid	LTE Band 30	10	21.5	20.62	0.12	1	Left	Tilt	B	QPSK	25	0	21181	1:1	0.054	1.225	0.066	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-14
LTE Band 7 Head SAR

MEASUREMENT RESULTS																				
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) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																			
2535.00	21100	Mid	LTE Band 7	20	24.0	23.83	-0.01	0	Right	Cheek	B	QPSK	1	0	14848	1:1	0.227	1.040	0.236	
2535.00	21100	Mid	LTE Band 7	20	23.0	22.63	-0.02	1	Right	Cheek	B	QPSK	50	0	14848	1:1	0.164	1.089	0.179	
2535.00	21100	Mid	LTE Band 7	20	24.0	23.83	0.06	0	Right	Tilt	B	QPSK	1	0	14848	1:1	0.209	1.040	0.217	
2535.00	21100	Mid	LTE Band 7	20	23.0	22.63	0.00	1	Right	Tilt	B	QPSK	50	0	14848	1:1	0.148	1.089	0.161	
2535.00	21100	Mid	LTE Band 7	20	24.0	23.83	0.10	0	Left	Cheek	B	QPSK	1	0	14848	1:1	0.304	1.040	0.316	A14
2535.00	21100	Mid	LTE Band 7	20	23.0	22.63	0.04	1	Left	Cheek	B	QPSK	50	0	14848	1:1	0.248	1.089	0.270	
2535.00	21100	Mid	LTE Band 7	20	24.0	23.83	-0.04	0	Left	Tilt	B	QPSK	1	0	14848	1:1	0.146	1.040	0.152	
2535.00	21100	Mid	LTE Band 7	20	23.0	22.63	0.02	1	Left	Tilt	B	QPSK	50	0	14848	1:1	0.108	1.089	0.118	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram										

Table 11-15
LTE Band 41 Head SAR

MEASUREMENT RESULTS																						
Power Class	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) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
	MHz	Ch.																			
Power Class 3	2506.00	39750	Low	LTE Band 41	20	24.0	23.81	0.13	0	Right	Cheek	B	QPSK	1	99	14848	1:1.58	0.135	1.045	0.141	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.0	22.82	0.05	1	Right	Cheek	B	QPSK	50	50	14848	1:1.58	0.116	1.042	0.121	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	24.0	23.81	-0.01	0	Right	Tilt	B	QPSK	1	99	14848	1:1.58	0.130	1.045	0.136	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.0	22.82	-0.01	1	Right	Tilt	B	QPSK	50	50	14848	1:1.58	0.093	1.042	0.097	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	24.0	23.81	-0.03	0	Left	Cheek	B	QPSK	1	99	14848	1:1.58	0.188	1.045	0.196	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.0	22.82	0.03	1	Left	Cheek	B	QPSK	50	50	14848	1:1.58	0.149	1.042	0.155	
Power Class 2	2506.00	39750	Low	LTE Band 41	20	27.0	26.20	0.01	0	Left	Cheek	B	QPSK	1	99	14848	1:2.31	0.201	1.202	0.242	A15
Power Class 3	2506.00	39750	Low	LTE Band 41	20	24.0	23.81	-0.16	0	Left	Tilt	B	QPSK	1	99	14848	1:1.58	0.085	1.045	0.089	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.0	22.82	0.10	1	Left	Tilt	B	QPSK	50	50	14848	1:1.58	0.062	1.042	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 11-16
DTS Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	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	13.0	12.49	0.05	Right	Cheek	21181	1	99.7	0.231	0.185	1.125	1.003	**0.209**	A16
2462	11	802.11b	DSSS	22	13.0	12.49	-0.15	Right	Tilt	21181	1	99.7	0.155	-	1.125	1.003	-	
2462	11	802.11b	DSSS	22	13.0	12.49	0.13	Left	Cheek	21181	1	99.7	0.095	-	1.125	1.003	-	
2462	11	802.11b	DSSS	22	13.0	12.49	0.08	Left	Tilt	21181	1	99.7	0.094	-	1.125	1.003	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**								**Head** **1.6 W/kg (mW/g)** averaged over 1 gram										

Table 11-17
NII Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	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)	
5320	64	802.11a	OFDM	20	11.0	10.93	-0.19	Right	Cheek	21181	6	97.7	0.129	-	1.016	1.024	-	
5320	64	802.11a	OFDM	20	11.0	10.93	0.12	Right	Tilt	21181	6	97.7	0.145	-	1.016	1.024	-	
5320	64	802.11a	OFDM	20	11.0	10.93	0.20	Left	Cheek	21181	6	97.7	0.150	-	1.016	1.024	-	
5320	64	802.11a	OFDM	20	11.0	10.93	-0.15	Left	Tilt	21181	6	97.7	0.155	0.094	1.016	1.024	0.098	
5690	138	802.11ac	OFDM	80	11.0	10.33	-0.07	Right	Tilt	21181	29.3	91.4	0.236	-	1.167	1.094	-	
5690	138	802.11ac	OFDM	80	11.0	10.33	-0.16	Right	Tilt	21181	29.3	91.4	0.338	-	1.167	1.094	-	
5690	138	802.11ac	OFDM	80	11.0	10.33	-0.13	Left	Cheek	21181	29.3	91.4	0.336	-	1.167	1.094	-	
5690	138	802.11ac	OFDM	80	11.0	10.33	0.00	Left	Tilt	21181	29.3	91.4	0.402	0.279	1.167	1.094	**0.356**	A17
5775	155	802.11ac	OFDM	80	11.0	10.37	0.02	Right	Cheek	21181	29.3	91.4	0.192	-	1.156	1.094	-	
5775	155	802.11ac	OFDM	80	11.0	10.37	0.15	Right	Tilt	21181	29.3	91.4	0.244	-	1.156	1.094	-	
5775	155	802.11ac	OFDM	80	11.0	10.37	0.13	Left	Cheek	21181	29.3	91.4	0.232	-	1.156	1.094	-	
5775	155	802.11ac	OFDM	80	11.0	10.37	0.08	Left	Tilt	21181	29.3	91.4	0.315	0.210	1.156	1.094	0.266	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**								**Head** **1.6 W/kg (mW/g)** averaged over 1 gram										

11.2 Standalone Body-Worn SAR Data

Table 11-18
GSM/UMTS Body-Worn SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	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)	
848.80	251	GSM 850	GSM	33.5	33.49	-0.10	15 mm	A	15829	1:8.3	back	0.210	1.002	0.210	A18
1850.20	512	GSM 1900	GSM	31.0	30.47	0.10	15 mm	B	14848	1:8.3	back	0.054	1.130	0.061	A20
846.60	4233	UMTS 850	RMC	25.0	24.30	0.11	15 mm	A	15829	1:1	back	0.343	1.175	0.403	A22
1712.40	1312	UMTS 1750	RMC	25.0	24.31	0.02	15 mm	B	14830	1:1	back	0.177	1.172	0.207	A24
1880.00	9400	UMTS 1900	RMC	25.0	24.34	-0.02	15 mm	B	12305	1:1	back	0.252	1.164	0.293	A26
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Body** **1.6 W/kg (mW/g)** averaged over 1 gram								

Table 11-19
LTE Body-Worn SAR

MEASUREMENT RESULTS																						
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)	
680.50	133297	Mid	LTE Band 71	20	25.0	24.37	0.04	0	A	15811	QPSK	1	0	15 mm	back	1:1	0.247	1.156	0.286	A28
680.50	133297	Mid	LTE Band 71	20	24.0	23.20	-0.02	1	A	15811	QPSK	50	0	15 mm	back	1:1	0.187	1.202	0.225	
707.50	23095	Mid	LTE Band 12	10	25.5	24.45	0.01	0	A	15811	QPSK	1	0	15 mm	back	1:1	0.264	1.274	0.336	A30
707.50	23095	Mid	LTE Band 12	10	24.5	23.24	0.00	1	A	15811	QPSK	25	0	15 mm	back	1:1	0.211	1.337	0.282	
782.00	23230	Mid	LTE Band 13	10	25.5	24.15	-0.01	0	A	15829	QPSK	1	25	15 mm	back	1:1	0.364	1.365	**0.497**	A32
782.00	23230	Mid	LTE Band 13	10	24.5	23.00	-0.02	1	A	15829	QPSK	25	12	15 mm	back	1:1	0.278	1.413	0.393	
793.00	23330	Mid	LTE Band 14	10	25.0	24.12	0.02	0	A	15829	QPSK	1	25	15 mm	back	1:1	0.293	1.225	0.359	A34
793.00	23330	Mid	LTE Band 14	10	24.0	23.00	-0.02	1	A	15829	QPSK	25	0	15 mm	back	1:1	0.230	1.259	0.290	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.28	0.02	0	A	15811	QPSK	1	0	15 mm	back	1:1	0.254	1.180	0.300	A36
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.30	0.02	1	A	15811	QPSK	36	18	15 mm	back	1:1	0.223	1.175	0.262	
1720.00	132072	Low	LTE Band 66 (AWS)	20	25.0	24.34	-0.03	0	B	14830	QPSK	1	0	15 mm	back	1:1	0.188	1.164	0.219	A38
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.25	-0.04	1	B	14830	QPSK	50	0	15 mm	back	1:1	0.148	1.189	0.176	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	25.0	24.17	-0.07	0	B	12305	QPSK	1	50	15 mm	back	1:1	0.328	1.211	0.397	A40
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	23.18	-0.03	1	B	12305	QPSK	50	0	15 mm	back	1:1	0.250	1.208	0.302	
2310.00	27710	Mid	LTE Band 30	10	22.5	21.76	-0.17	0	B	20704	QPSK	1	49	15 mm	back	1:1	0.228	1.186	0.270	A42
2310.00	27710	Mid	LTE Band 30	10	21.5	20.62	-0.16	1	B	20704	QPSK	25	0	15 mm	back	1:1	0.189	1.225	0.232	
2535.00	21100	Mid	LTE Band 7	20	24.0	23.83	-0.04	0	B	13766	QPSK	1	0	15 mm	back	1:1	0.226	1.040	0.235	A44
2535.00	21100	Mid	LTE Band 7	20	23.0	22.63	-0.02	1	B	13766	QPSK	50	0	15 mm	back	1:1	0.193	1.089	0.210	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-20
LTE Band 41 Body-Worn SAR

MEASUREMENT RESULTS																					
Power Class	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)	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	24.0	23.81	0.01	0	B	13766	QPSK	1	99	15 mm	back	1:1.58	0.245	1.045	0.256	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.0	22.82	0.05	1	B	13766	QPSK	50	50	15 mm	back	1:1.58	0.192	1.042	0.200	
Power Class 2	2506.00	39750	Low	LTE Band 41	20	27.0	26.20	-0.04	0	B	13766	QPSK	1	99	15 mm	back	1:2.31	0.295	1.202	0.355	A46
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11-21
DTS Body-Worn SAR

MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
2462	11	802.11b	DSSS	22	20.0	18.96	0.01	15 mm	11042	1	back	99.7	0.195	0.138	1.271	1.003	**0.176**	A48
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram					

Table 11-22
NII Body-Worn SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	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)	
5280	56	802.11a	OFDM	20	16.0	15.91	0.07	15 mm	21181	6	back	97.7	0.658	0.435	1.021	1.024	0.455	
5710	142	802.11n	OFDM	40	16.0	15.53	-0.06	15 mm	21181	13.5	back	98.4	0.690	0.480	1.114	1.016	**0.543**	A50
5755	151	802.11n	OFDM	40	16.0	15.89	0.02	15 mm	21181	13.5	back	98.4	0.528	0.375	1.026	1.016	0.391	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**													**Body** **1.6 W/kg (mW/g)** averaged over 1 gram					

11.3 Standalone Hotspot SAR Data

Table 11-23
GPRS/UMTS Hotspot 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 (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
848.80	251	GSM 850	GPRS	30.0	29.88	-0.06	10 mm	A	15829	3	1:2.76	back	0.561	1.028	0.577	A19
848.80	251	GSM 850	GPRS	30.0	29.88	0.12	10 mm	A	15829	3	1:2.76	front	0.185	1.028	0.190	
848.80	251	GSM 850	GPRS	30.0	29.88	0.00	10 mm	A	15829	3	1:2.76	bottom	0.355	1.028	0.365	
848.80	251	GSM 850	GPRS	30.0	29.88	0.08	10 mm	A	15829	3	1:2.76	right	0.202	1.028	0.208	
848.80	251	GSM 850	GPRS	30.0	29.88	0.07	10 mm	A	15829	3	1:2.76	left	0.105	1.028	0.108	
1909.80	810	GSM 1900	GPRS	25.5	24.93	-0.14	10 mm	B	14848	4	1:2.076	back	0.172	1.140	0.196	
1909.80	810	GSM 1900	GPRS	25.5	24.93	-0.06	10 mm	B	14848	4	1:2.076	front	0.103	1.140	0.117	
1909.80	810	GSM 1900	GPRS	25.5	24.93	-0.11	10 mm	B	14848	4	1:2.076	bottom	0.179	1.140	0.204	A21
1909.80	810	GSM 1900	GPRS	25.5	24.93	-0.04	10 mm	B	14848	4	1:2.076	left	0.093	1.140	0.106	
826.40	4132	UMTS 850	RMC	25.0	24.20	0.06	10 mm	A	15829	N/A	1:1	back	0.507	1.202	0.609	
836.60	4183	UMTS 850	RMC	25.0	24.01	0.01	10 mm	A	15829	N/A	1:1	back	0.601	1.256	**0.755**	
846.60	4233	UMTS 850	RMC	25.0	24.30	-0.01	10 mm	A	15829	N/A	1:1	back	0.629	1.175	0.739	A23
846.60	4233	UMTS 850	RMC	25.0	24.30	0.00	10 mm	A	15829	N/A	1:1	front	0.225	1.175	0.264	
846.60	4233	UMTS 850	RMC	25.0	24.30	-0.02	10 mm	A	15829	N/A	1:1	bottom	0.414	1.175	0.486	
846.60	4233	UMTS 850	RMC	25.0	24.30	-0.01	10 mm	A	15829	N/A	1:1	right	0.290	1.175	0.341	
846.60	4233	UMTS 850	RMC	25.0	24.30	0.05	10 mm	A	15829	N/A	1:1	left	0.151	1.175	0.177	
1732.40	1412	UMTS 1750	RMC	22.5	21.31	0.02	10 mm	B	14830	N/A	1:1	back	0.188	1.315	0.247	
1732.40	1412	UMTS 1750	RMC	22.5	21.31	0.01	10 mm	B	14830	N/A	1:1	front	0.156	1.315	0.205	
1732.40	1412	UMTS 1750	RMC	22.5	21.31	0.01	10 mm	B	14830	N/A	1:1	bottom	0.193	1.315	0.254	A25
1732.40	1412	UMTS 1750	RMC	22.5	21.31	-0.10	10 mm	B	14830	N/A	1:1	left	0.087	1.315	0.114	
1880.00	9400	UMTS 1900	RMC	22.5	21.42	0.01	10 mm	B	12305	N/A	1:1	back	0.231	1.282	0.296	A27
1880.00	9400	UMTS 1900	RMC	22.5	21.42	0.01	10 mm	B	12305	N/A	1:1	front	0.149	1.282	0.191	
1880.00	9400	UMTS 1900	RMC	22.5	21.42	-0.06	10 mm	B	12305	N/A	1:1	bottom	0.218	1.282	0.279	
1880.00	9400	UMTS 1900	RMC	22.5	21.42	0.03	10 mm	B	12305	N/A	1:1	left	0.129	1.282	0.165	
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 71 Hotspot SAR

MEASUREMENT RESULTS																						
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)	
680.50	133297	Mid	LTE Band 71	20	25.0	24.37	-0.02	0	A	15811	QPSK	1	0	10 mm	back	1:1	0.274	1.156	0.317	A29
680.50	133297	Mid	LTE Band 71	20	24.0	23.20	0.04	1	A	15811	QPSK	50	0	10 mm	back	1:1	0.218	1.202	0.262	
680.50	133297	Mid	LTE Band 71	20	25.0	24.37	-0.05	0	A	15811	QPSK	1	0	10 mm	front	1:1	0.164	1.156	0.190	
680.50	133297	Mid	LTE Band 71	20	24.0	23.20	-0.01	1	A	15811	QPSK	50	0	10 mm	front	1:1	0.130	1.202	0.156	
680.50	133297	Mid	LTE Band 71	20	25.0	24.37	0.09	0	A	15811	QPSK	1	0	10 mm	bottom	1:1	0.131	1.156	0.151	
680.50	133297	Mid	LTE Band 71	20	24.0	23.20	0.03	1	A	15811	QPSK	50	0	10 mm	bottom	1:1	0.108	1.202	0.130	
680.50	133297	Mid	LTE Band 71	20	25.0	24.37	0.06	0	A	15811	QPSK	1	0	10 mm	right	1:1	0.266	1.156	0.307	
680.50	133297	Mid	LTE Band 71	20	24.0	23.20	-0.02	1	A	15811	QPSK	50	0	10 mm	right	1:1	0.220	1.202	0.264	
680.50	133297	Mid	LTE Band 71	20	25.0	24.37	0.00	0	A	15811	QPSK	1	0	10 mm	left	1:1	0.160	1.156	0.185	
680.50	133297	Mid	LTE Band 71	20	24.0	23.20	0.13	1	A	15811	QPSK	50	0	10 mm	left	1:1	0.132	1.202	0.159	
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 12 Hotspot SAR

MEASUREMENT RESULTS																						
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)	
707.50	23095	Mid	LTE Band 12	10	25.5	24.45	-0.01	0	A	15811	QPSK	1	0	10 mm	back	1:1	0.297	1.274	0.378	A31
707.50	23095	Mid	LTE Band 12	10	24.5	23.24	-0.04	1	A	15811	QPSK	25	0	10 mm	back	1:1	0.237	1.337	0.317	
707.50	23095	Mid	LTE Band 12	10	25.5	24.45	-0.01	0	A	15811	QPSK	1	0	10 mm	front	1:1	0.186	1.274	0.237	
707.50	23095	Mid	LTE Band 12	10	24.5	23.24	0.03	1	A	15811	QPSK	25	0	10 mm	front	1:1	0.149	1.337	0.199	
707.50	23095	Mid	LTE Band 12	10	25.5	24.45	-0.02	0	A	15811	QPSK	1	0	10 mm	bottom	1:1	0.132	1.274	0.168	
707.50	23095	Mid	LTE Band 12	10	24.5	23.24	0.02	1	A	15811	QPSK	25	0	10 mm	bottom	1:1	0.103	1.337	0.138	
707.50	23095	Mid	LTE Band 12	10	25.5	24.45	0.02	0	A	15811	QPSK	1	0	10 mm	right	1:1	0.292	1.274	0.372	
707.50	23095	Mid	LTE Band 12	10	24.5	23.24	0.03	1	A	15811	QPSK	25	0	10 mm	right	1:1	0.235	1.337	0.314	
707.50	23095	Mid	LTE Band 12	10	25.5	24.45	-0.06	0	A	15811	QPSK	1	0	10 mm	left	1:1	0.167	1.274	0.213	
707.50	23095	Mid	LTE Band 12	10	24.5	23.24	0.03	1	A	15811	QPSK	25	0	10 mm	left	1:1	0.134	1.337	0.179	
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 13 Hotspot SAR

MEASUREMENT RESULTS																						
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)	
782.00	23230	Mid	LTE Band 13	10	25.5	24.15	-0.01	0	A	15829	QPSK	1	25	10 mm	back	1:1	0.405	1.365	0.553	A33
782.00	23230	Mid	LTE Band 13	10	24.5	23.00	0.05	1	A	15829	QPSK	25	12	10 mm	back	1:1	0.287	1.413	0.406	
782.00	23230	Mid	LTE Band 13	10	25.5	24.15	0.00	0	A	15829	QPSK	1	25	10 mm	front	1:1	0.270	1.365	0.369	
782.00	23230	Mid	LTE Band 13	10	24.5	23.00	-0.03	1	A	15829	QPSK	25	12	10 mm	front	1:1	0.206	1.413	0.291	
782.00	23230	Mid	LTE Band 13	10	25.5	24.15	0.07	0	A	15829	QPSK	1	25	10 mm	bottom	1:1	0.266	1.365	0.363	
782.00	23230	Mid	LTE Band 13	10	24.5	23.00	-0.01	1	A	15829	QPSK	25	12	10 mm	bottom	1:1	0.203	1.413	0.287	
782.00	23230	Mid	LTE Band 13	10	25.5	24.15	-0.02	0	A	15829	QPSK	1	25	10 mm	right	1:1	0.379	1.365	0.517	
782.00	23230	Mid	LTE Band 13	10	24.5	23.00	0.05	1	A	15829	QPSK	25	12	10 mm	right	1:1	0.290	1.413	0.410	
782.00	23230	Mid	LTE Band 13	10	25.5	24.15	0.00	0	A	15829	QPSK	1	25	10 mm	left	1:1	0.217	1.365	0.296	
782.00	23230	Mid	LTE Band 13	10	24.5	23.00	-0.03	1	A	15829	QPSK	25	12	10 mm	left	1:1	0.165	1.413	0.233	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram												

Table 11-27
LTE Band 14 Hotspot SAR

MEASUREMENT RESULTS																						
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)	
793.00	23330	Mid	LTE Band 14	10	25.0	24.12	-0.03	0	A	15829	QPSK	1	25	10 mm	back	1:1	0.434	1.225	0.532	A35
793.00	23330	Mid	LTE Band 14	10	24.0	23.00	0.01	1	A	15829	QPSK	25	0	10 mm	back	1:1	0.334	1.259	0.421	
793.00	23330	Mid	LTE Band 14	10	25.0	24.12	-0.01	0	A	15829	QPSK	1	25	10 mm	front	1:1	0.218	1.225	0.267	
793.00	23330	Mid	LTE Band 14	10	24.0	23.00	0.03	1	A	15829	QPSK	25	0	10 mm	front	1:1	0.170	1.259	0.214	
793.00	23330	Mid	LTE Band 14	10	25.0	24.12	0.01	0	A	15829	QPSK	1	25	10 mm	bottom	1:1	0.208	1.225	0.255	
793.00	23330	Mid	LTE Band 14	10	24.0	23.00	-0.02	1	A	15829	QPSK	25	0	10 mm	bottom	1:1	0.156	1.259	0.196	
793.00	23330	Mid	LTE Band 14	10	25.0	24.12	0.00	0	A	15829	QPSK	1	25	10 mm	right	1:1	0.286	1.225	0.350	
793.00	23330	Mid	LTE Band 14	10	24.0	23.00	0.02	1	A	15829	QPSK	25	0	10 mm	right	1:1	0.222	1.259	0.279	
793.00	23330	Mid	LTE Band 14	10	25.0	24.12	0.03	0	A	15829	QPSK	1	25	10 mm	left	1:1	0.162	1.225	0.198	
793.00	23330	Mid	LTE Band 14	10	24.0	23.00	0.03	1	A	15829	QPSK	25	0	10 mm	left	1:1	0.123	1.259	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 11-28
LTE Band 26 (Cell) Hotspot SAR

MEASUREMENT RESULTS																						
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)	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.28	0.02	0	A	15811	QPSK	1	0	10 mm	back	1:1	0.566	1.180	0.668	A37
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.30	-0.01	1	A	15811	QPSK	36	18	10 mm	back	1:1	0.477	1.175	0.560	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.28	-0.05	0	A	15811	QPSK	1	0	10 mm	front	1:1	0.261	1.180	0.308	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.30	0.03	1	A	15811	QPSK	36	18	10 mm	front	1:1	0.200	1.175	0.235	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.28	0.03	0	A	15811	QPSK	1	0	10 mm	bottom	1:1	0.317	1.180	0.374	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.30	0.00	1	A	15811	QPSK	36	18	10 mm	bottom	1:1	0.275	1.175	0.323	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.28	0.01	0	A	15811	QPSK	1	0	10 mm	right	1:1	0.302	1.180	0.356	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.30	0.03	1	A	15811	QPSK	36	18	10 mm	right	1:1	0.236	1.175	0.277	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	24.28	0.01	0	A	15811	QPSK	1	0	10 mm	left	1:1	0.172	1.180	0.203	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.30	-0.04	1	A	15811	QPSK	36	18	10 mm	left	1:1	0.131	1.175	0.154	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram												

Table 11-29
LTE Band 66 (AWS) Hotspot SAR

MEASUREMENT RESULTS																						
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)	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.78	-0.05	0	B	14830	QPSK	1	0	10 mm	back	1:1	0.225	1.052	0.237	A39
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.94	0.01	0	B	14830	QPSK	50	0	10 mm	back	1:1	0.220	1.014	0.223	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.78	0.06	0	B	14830	QPSK	1	0	10 mm	front	1:1	0.198	1.052	0.208	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.94	0.03	0	B	14830	QPSK	50	0	10 mm	front	1:1	0.190	1.014	0.193	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.78	0.00	0	B	14830	QPSK	1	0	10 mm	bottom	1:1	0.219	1.052	0.230	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.94	-0.04	0	B	14830	QPSK	50	0	10 mm	bottom	1:1	0.210	1.014	0.213	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.78	-0.01	0	B	14830	QPSK	1	0	10 mm	left	1:1	0.108	1.052	0.114	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.94	0.04	0	B	14830	QPSK	50	0	10 mm	left	1:1	0.107	1.014	0.108	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram												

Table 11-30
LTE Band 25 (PCS) Hotspot SAR

MEASUREMENT RESULTS																					
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)	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.57	-0.02	0	B	12305	QPSK	1	50	10 mm	back	1:1	0.273	1.104	0.301	A41
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.55	0.03	0	B	12305	QPSK	50	50	10 mm	back	1:1	0.260	1.109	0.288	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.57	-0.04	0	B	12305	QPSK	1	50	10 mm	front	1:1	0.132	1.104	0.146	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.55	0.02	0	B	12305	QPSK	50	50	10 mm	front	1:1	0.135	1.109	0.150	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.57	0.00	0	B	12305	QPSK	1	50	10 mm	bottom	1:1	0.250	1.104	0.276	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.55	0.03	0	B	12305	QPSK	50	50	10 mm	bottom	1:1	0.260	1.109	0.288	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.57	0.14	0	B	12305	QPSK	1	50	10 mm	left	1:1	0.159	1.104	0.176	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.55	0.02	0	B	12305	QPSK	50	50	10 mm	left	1:1	0.159	1.109	0.176	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Body 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11-31
LTE Band 30 Hotspot SAR

MEASUREMENT RESULTS																					
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)	
2310.00	27710	Mid	LTE Band 30	10	18.5	17.90	0.12	0	B	20704	QPSK	1	49	10 mm	back	1:1	0.160	1.148	0.184	
2310.00	27710	Mid	LTE Band 30	10	18.5	17.79	0.00	0	B	20704	QPSK	25	0	10 mm	back	1:1	0.157	1.178	0.185	
2310.00	27710	Mid	LTE Band 30	10	18.5	17.90	0.03	0	B	20704	QPSK	1	49	10 mm	front	1:1	0.102	1.148	0.117	
2310.00	27710	Mid	LTE Band 30	10	18.5	17.79	-0.07	0	B	20704	QPSK	25	0	10 mm	front	1:1	0.103	1.178	0.121	
2310.00	27710	Mid	LTE Band 30	10	18.5	17.90	0.00	0	B	20704	QPSK	1	49	10 mm	bottom	1:1	0.180	1.148	0.207	A43
2310.00	27710	Mid	LTE Band 30	10	18.5	17.79	0.05	0	B	20704	QPSK	25	0	10 mm	bottom	1:1	0.171	1.178	0.201	
2310.00	27710	Mid	LTE Band 30	10	18.5	17.90	-0.09	0	B	20704	QPSK	1	49	10 mm	left	1:1	0.076	1.148	0.087	
2310.00	27710	Mid	LTE Band 30	10	18.5	17.79	-0.11	0	B	20704	QPSK	25	0	10 mm	left	1:1	0.073	1.178	0.086	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Body 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11-32
LTE Band 7 Hotspot SAR

MEASUREMENT RESULTS																					
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)	
2535.00	21100	Mid	LTE Band 7	20	22.0	21.66	0.01	0	B	13766	QPSK	1	50	10 mm	back	1:1	0.389	1.081	0.421	
2535.00	21100	Mid	LTE Band 7	20	22.0	21.74	0.01	0	B	13766	QPSK	50	0	10 mm	back	1:1	0.395	1.062	0.419	A45
2535.00	21100	Mid	LTE Band 7	20	22.0	21.66	-0.01	0	B	13766	QPSK	1	50	10 mm	front	1:1	0.272	1.081	0.294	
2535.00	21100	Mid	LTE Band 7	20	22.0	21.74	0.01	0	B	13766	QPSK	50	0	10 mm	front	1:1	0.271	1.062	0.288	
2535.00	21100	Mid	LTE Band 7	20	22.0	21.66	-0.04	0	B	13766	QPSK	1	50	10 mm	bottom	1:1	0.265	1.081	0.286	
2535.00	21100	Mid	LTE Band 7	20	22.0	21.74	-0.05	0	B	13766	QPSK	50	0	10 mm	bottom	1:1	0.268	1.062	0.285	
2535.00	21100	Mid	LTE Band 7	20	22.0	21.66	0.00	0	B	13766	QPSK	1	50	10 mm	left	1:1	0.231	1.081	0.250	
2535.00	21100	Mid	LTE Band 7	20	22.0	21.74	0.01	0	B	13766	QPSK	50	0	10 mm	left	1:1	0.238	1.062	0.253	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Body 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11-33
LTE Band 41 Hotspot SAR

MEASUREMENT RESULTS																						
Power Class	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)	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	24.0	23.81	0.02	0	B	13766	QPSK	1	99	10 mm	back	1:1.58	0.563	1.045	0.588	A47
Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.0	22.82	-0.01	1	B	13766	QPSK	50	50	10 mm	back	1:1.58	0.445	1.042	0.464	
Power Class 2	2506.00	39750	Low	LTE Band 41	20	24.0	23.49	-0.01	0	B	13766	QPSK	1	99	10 mm	back	1:2.31	0.373	1.125	0.420	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	24.0	23.81	0.06	0	B	13766	QPSK	1	99	10 mm	front	1:1.58	0.280	1.045	0.293	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.0	22.82	-0.02	1	B	13766	QPSK	50	50	10 mm	front	1:1.58	0.231	1.042	0.241	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	24.0	23.81	-0.08	0	B	13766	QPSK	1	99	10 mm	bottom	1:1.58	0.260	1.045	0.272	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.0	22.82	-0.01	1	B	13766	QPSK	50	50	10 mm	bottom	1:1.58	0.213	1.042	0.222	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	24.0	23.81	0.00	0	B	13766	QPSK	1	99	10 mm	left	1:1.58	0.289	1.045	0.302	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.0	22.82	-0.01	1	B	13766	QPSK	50	50	10 mm	left	1:1.58	0.241	1.042	0.251	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram												

Table 11-34
WLAN Hotspot SAR

MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
2462	11	802.11b	DSSS	22	20.0	18.96	-0.04	10 mm	11042	1	back	99.7	0.451	0.348	1.271	1.003	**0.444**	A49
2462	11	802.11b	DSSS	22	20.0	18.96	-0.06	10 mm	11042	1	front	99.7	0.121	-	1.271	1.003	-	
2462	11	802.11b	DSSS	22	20.0	18.96	0.18	10 mm	11042	1	top	99.7	0.102	-	1.271	1.003	-	
2462	11	802.11b	DSSS	22	20.0	18.96	0.10	10 mm	11042	1	left	99.7	0.198	0.151	1.271	1.003	0.192	
5755	151	802.11n	OFDM	40	16.0	15.89	0.01	10 mm	21181	13.5	back	98.4	0.842	0.613	1.026	1.016	**0.639**	A51
5795	159	802.11n	OFDM	40	16.0	15.13	0.02	10 mm	21181	13.5	back	98.4	0.695	0.479	1.222	1.016	0.595	
5755	151	802.11n	OFDM	40	16.0	15.89	0.16	10 mm	21181	13.5	front	98.4	0.122	-	1.026	1.016	-	
5755	151	802.11n	OFDM	40	16.0	15.89	0.10	10 mm	21181	13.5	top	98.4	0.674	0.514	1.026	1.016	0.536	
5755	151	802.11n	OFDM	40	16.0	15.89	0.10	10 mm	21181	13.5	left	98.4	0.269	-	1.026	1.016	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-35
DSS Hotspot SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2480	78	Bluetooth	FHSS	9.0	8.68	0.04	10 mm	20704	1	back	77.00	0.018	1.076	1.299	**0.025**	A52
2480	78	Bluetooth	FHSS	9.0	8.68	0.20	10 mm	20704	1	front	77.00	0.004	1.076	1.299	0.006	
2480	78	Bluetooth	FHSS	9.0	8.68	-0.12	10 mm	20704	1	top	77.00	0.004	1.076	1.299	0.006	
2480	78	Bluetooth	FHSS	9.0	8.68	0.12	10 mm	20704	1	left	77.00	0.013	1.076	1.299	0.018	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram							

11.4 Standalone Phablet SAR Data

Table 11-36
GPRS/UMTS 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	26.5	25.65	-0.17	15 mm	B	14848	4	1:2.076	back	0.074	1.216	0.090	
1909.80	810	GSM 1900	GPRS	26.5	25.65	0.10	0 mm	B	14848	4	1:2.076	front	0.770	1.216	0.936	
1909.80	810	GSM 1900	GPRS	26.5	25.65	-0.12	11 mm	B	14848	4	1:2.076	bottom	0.132	1.216	0.161	
1909.80	810	GSM 1900	GPRS	26.5	25.65	-0.03	6 mm	B	14848	4	1:2.076	left	0.119	1.216	0.145	
1850.20	512	GSM 1900	GPRS	25.5	23.92	0.05	0 mm	B	14848	4	1:2.076	back	1.170	1.439	1.684	
1880.00	661	GSM 1900	GPRS	25.5	24.02	-0.08	0 mm	B	14848	4	1:2.076	back	1.380	1.406	1.940	
1909.80	810	GSM 1900	GPRS	25.5	24.93	0.03	0 mm	B	14848	4	1:2.076	back	1.660	1.140	1.892	A53
1909.80	810	GSM 1900	GPRS	25.5	24.93	-0.05	0 mm	B	14848	4	1:2.076	bottom	0.540	1.140	0.616	
1909.80	810	GSM 1900	GPRS	25.5	24.93	-0.14	0 mm	B	14848	4	1:2.076	left	0.600	1.140	0.684	
1712.40	1312	UMTS 1750	RMC	25.0	24.31	0.02	15 mm	B	14830	N/A	1:1	back	0.120	1.172	0.141	
1712.40	1312	UMTS 1750	RMC	25.0	24.31	0.03	0 mm	B	14830	N/A	1:1	front	1.330	1.172	1.559	
1712.40	1312	UMTS 1750	RMC	25.0	24.31	-0.03	11 mm	B	14830	N/A	1:1	bottom	0.209	1.172	0.245	
1712.40	1312	UMTS 1750	RMC	25.0	24.31	-0.03	6 mm	B	14830	N/A	1:1	left	0.162	1.172	0.190	
1712.40	1312	UMTS 1750	RMC	22.5	21.30	0.00	0 mm	B	14830	N/A	1:1	back	1.560	1.318	2.056	
1732.40	1412	UMTS 1750	RMC	22.5	21.31	0.03	0 mm	B	14830	N/A	1:1	back	1.540	1.315	2.025	
1752.60	1513	UMTS 1750	RMC	22.5	21.07	-0.03	0 mm	B	14830	N/A	1:1	back	1.570	1.390	2.182	A54
1732.40	1412	UMTS 1750	RMC	22.5	21.31	-0.07	0 mm	B	14830	N/A	1:1	bottom	0.621	1.315	0.817	
1732.40	1412	UMTS 1750	RMC	22.5	21.31	-0.02	0 mm	B	14830	N/A	1:1	left	0.515	1.315	0.677	
1880.00	9400	UMTS 1900	RMC	25.0	24.34	-0.02	15 mm	B	12305	N/A	1:1	back	0.146	1.164	0.170	
1880.00	9400	UMTS 1900	RMC	25.0	24.34	-0.01	0 mm	B	12305	N/A	1:1	front	0.815	1.164	0.949	
1880.00	9400	UMTS 1900	RMC	25.0	24.34	0.04	11 mm	B	12305	N/A	1:1	bottom	0.112	1.164	0.130	
1880.00	9400	UMTS 1900	RMC	25.0	24.34	0.01	6 mm	B	12305	N/A	1:1	left	0.116	1.164	0.135	
1852.40	9262	UMTS 1900	RMC	22.5	21.37	0.00	0 mm	B	12305	N/A	1:1	back	1.660	1.297	2.153	
1880.00	9400	UMTS 1900	RMC	22.5	21.42	0.00	0 mm	B	12305	N/A	1:1	back	1.840	1.282	2.359	
1907.60	9538	UMTS 1900	RMC	22.5	21.40	0.02	0 mm	B	12305	N/A	1:1	back	1.880	1.288	2.421	A55
1880.00	9400	UMTS 1900	RMC	22.5	21.42	0.02	0 mm	B	12305	N/A	1:1	bottom	0.770	1.282	0.987	
1880.00	9400	UMTS 1900	RMC	22.5	21.42	-0.03	0 mm	B	12305	N/A	1:1	left	0.572	1.282	0.733	
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 11-37
LTE Band 66 (AWS) Phablet SAR

MEASUREMENT RESULTS																					
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) (W/kg)	Scaling Factor	Reported SAR (10g) (W/kg)	Plot #
MHz	Ch.																			
1720.00	132072	Low	LTE Band 66 (AWS)	20	25.0	24.34	-0.03	0	B	14830	QPSK	1	0	15 mm	back	1:1	0.127	1.164	0.148	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.25	-0.04	1	B	14830	QPSK	50	0	15 mm	back	1:1	0.100	1.189	0.119	
1720.00	132072	Low	LTE Band 66 (AWS)	20	25.0	24.34	0.02	0	B	14830	QPSK	1	0	0 mm	front	1:1	1.480	1.164	1.723	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.25	0.04	1	B	14830	QPSK	50	0	0 mm	front	1:1	1.160	1.189	1.379	
1720.00	132072	Low	LTE Band 66 (AWS)	20	25.0	24.34	0.03	0	B	14830	QPSK	1	0	11 mm	bottom	1:1	0.223	1.164	0.260	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.25	0.02	1	B	14830	QPSK	50	0	11 mm	bottom	1:1	0.171	1.189	0.203	
1720.00	132072	Low	LTE Band 66 (AWS)	20	25.0	24.34	0.02	0	B	14830	QPSK	1	0	6 mm	left	1:1	0.187	1.164	0.218	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.25	-0.01	1	B	14830	QPSK	50	0	6 mm	left	1:1	0.150	1.189	0.178	
1720.00	132072	Low	LTE Band 66 (AWS)	20	21.0	20.77	0.03	0	B	14830	QPSK	1	50	0 mm	back	1:1	1.680	1.054	1.771	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.78	-0.02	0	B	14830	QPSK	1	0	0 mm	back	1:1	1.830	1.052	1.925	
1770.00	132572	High	LTE Band 66 (AWS)	20	21.0	20.72	0.02	0	B	14830	QPSK	1	50	0 mm	back	1:1	1.870	1.067	1.995	A56
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.94	0.01	0	B	14830	QPSK	50	0	0 mm	back	1:1	1.790	1.014	1.815	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.75	-0.01	0	B	14830	QPSK	100	0	0 mm	back	1:1	1.780	1.059	1.885	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.78	0.06	0	B	14830	QPSK	1	0	0 mm	bottom	1:1	0.698	1.052	0.734	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.94	0.01	0	B	14830	QPSK	50	0	0 mm	bottom	1:1	0.713	1.014	0.723	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.78	0.01	0	B	14830	QPSK	1	0	0 mm	left	1:1	0.584	1.052	0.614	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	21.0	20.94	-0.01	0	B	14830	QPSK	50	0	0 mm	left	1:1	0.574	1.014	0.582	
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 11-38
LTE Band 25 (PCS) Phablet SAR

MEASUREMENT RESULTS																					
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) (W/kg)	Scaling Factor	Reported SAR (10g) (W/kg)	Plot #
MHz	Ch.																			
1882.50	26365	Mid	LTE Band 25 (PCS)	20	25.0	24.17	-0.07	0	B	12305	QPSK	1	50	15 mm	back	1:1	0.193	1.211	0.234	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	23.18	-0.03	1	B	12305	QPSK	50	0	15 mm	back	1:1	0.146	1.208	0.176	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	25.0	24.17	0.01	0	B	12305	QPSK	1	50	0 mm	front	1:1	1.160	1.211	1.405	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	23.18	0.00	1	B	12305	QPSK	50	0	0 mm	front	1:1	0.907	1.208	1.096	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	25.0	24.17	0.00	0	B	12305	QPSK	1	50	11 mm	bottom	1:1	0.264	1.211	0.320	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	23.18	-0.05	1	B	12305	QPSK	50	0	11 mm	bottom	1:1	0.199	1.208	0.240	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	25.0	24.17	-0.08	0	B	12305	QPSK	1	50	6 mm	left	1:1	0.267	1.211	0.323	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	23.18	0.00	1	B	12305	QPSK	50	0	6 mm	left	1:1	0.205	1.208	0.248	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.43	0.08	0	B	12305	QPSK	1	0	0 mm	back	1:1	1.630	1.140	1.858	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.57	-0.01	0	B	12305	QPSK	1	50	0 mm	back	1:1	1.900	1.104	2.098	
1905.00	26590	High	LTE Band 25 (PCS)	20	22.0	21.23	0.01	0	B	12305	QPSK	1	0	0 mm	back	1:1	2.010	1.194	2.400	A57
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.37	0.03	0	B	12305	QPSK	50	0	0 mm	back	1:1	1.660	1.156	1.919	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.55	0.01	0	B	12305	QPSK	50	50	0 mm	back	1:1	1.850	1.109	2.052	
1905.00	26590	High	LTE Band 25 (PCS)	20	22.0	21.24	-0.02	0	B	12305	QPSK	50	0	0 mm	back	1:1	2.000	1.191	2.382	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.35	0.02	0	B	12305	QPSK	100	0	0 mm	back	1:1	1.680	1.161	1.950	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.57	-0.02	0	B	12305	QPSK	1	50	0 mm	bottom	1:1	0.795	1.104	0.878	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.55	0.04	0	B	12305	QPSK	50	50	0 mm	bottom	1:1	0.767	1.109	0.851	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.57	0.03	0	B	12305	QPSK	1	50	0 mm	left	1:1	0.641	1.104	0.708	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	21.55	0.01	0	B	12305	QPSK	50	50	0 mm	left	1:1	0.658	1.109	0.730	
1905.00	26590	High	LTE Band 25 (PCS)	20	22.0	21.23	-0.02	0	B	12305	QPSK	1	0	0 mm	back	1:1	2.000	1.194	2.388	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Phablet 4.0 W/kg (mW/g) averaged over 10 grams							

Note: Blue entry represents variability measurement

Table 11-39
LTE Band 30 Phablet SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Accessory	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)	
2310.00	27710	Mid	LTE Band 30	10	N/A	22.5	21.76	-0.17	0	B	20704	QPSK	1	49	15 mm	back	1:1	0.132	1.186	0.157	
2310.00	27710	Mid	LTE Band 30	10	N/A	21.5	20.62	-0.16	1	B	20704	QPSK	25	0	15 mm	back	1:1	0.110	1.225	0.135	
2310.00	27710	Mid	LTE Band 30	10	Headphones	22.0	21.76	-0.01	0	B	20704	QPSK	1	49	0 mm	back	1:1	1.870	1.057	1.977	A58
2310.00	27710	Mid	LTE Band 30	10	N/A	22.5	21.76	0.00	0	B	20704	QPSK	1	49	0 mm	front	1:1	1.220	1.186	1.447	
2310.00	27710	Mid	LTE Band 30	10	N/A	21.5	20.62	0.03	1	B	20704	QPSK	25	0	0 mm	front	1:1	0.930	1.225	1.139	
2310.00	27710	Mid	LTE Band 30	10	N/A	22.5	21.76	-0.12	0	B	20704	QPSK	1	49	11 mm	bottom	1:1	0.209	1.186	0.248	
2310.00	27710	Mid	LTE Band 30	10	N/A	21.5	20.62	-0.05	1	B	20704	QPSK	25	0	11 mm	bottom	1:1	0.174	1.225	0.213	
2310.00	27710	Mid	LTE Band 30	10	N/A	22.5	21.76	-0.18	0	B	20704	QPSK	1	49	6 mm	left	1:1	0.162	1.186	0.192	
2310.00	27710	Mid	LTE Band 30	10	N/A	21.5	20.62	-0.01	1	B	20704	QPSK	25	0	6 mm	left	1:1	0.138	1.225	0.169	
2310.00	27710	Mid	LTE Band 30	10	N/A	18.5	17.90	0.00	0	B	20704	QPSK	1	49	0 mm	back	1:1	0.841	1.148	0.965	
2310.00	27710	Mid	LTE Band 30	10	N/A	18.5	17.79	-0.01	0	B	20704	QPSK	25	0	0 mm	back	1:1	0.809	1.178	0.953	
2310.00	27710	Mid	LTE Band 30	10	N/A	18.5	17.90	-0.04	0	B	20704	QPSK	1	49	0 mm	bottom	1:1	0.370	1.148	0.425	
2310.00	27710	Mid	LTE Band 30	10	N/A	18.5	17.79	0.00	0	B	20704	QPSK	25	0	0 mm	bottom	1:1	0.348	1.178	0.410	
2310.00	27710	Mid	LTE Band 30	10	N/A	18.5	17.90	0.01	0	B	20704	QPSK	1	49	0 mm	left	1:1	0.154	1.148	0.177	
2310.00	27710	Mid	LTE Band 30	10	N/A	18.5	17.79	0.03	0	B	20704	QPSK	25	0	0 mm	left	1:1	0.140	1.178	0.165	
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 11-40
LTE Band 7 Phablet SAR

MEASUREMENT RESULTS																				
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)	
2535.00	21100	Mid	LTE Band 7	20	24.0	23.83	-0.04	0	B	13766	QPSK	1	0	15 mm	back	1:1	0.115	1.040	0.120	
2535.00	21100	Mid	LTE Band 7	20	23.0	22.63	-0.02	1	B	13766	QPSK	50	0	15 mm	back	1:1	0.097	1.089	0.106	
2510.00	20850	Low	LTE Band 7	20	24.0	23.52	0.04	0	B	13766	QPSK	1	50	0 mm	front	1:1	2.240	1.117	2.502	
2535.00	21100	Mid	LTE Band 7	20	24.0	23.83	0.00	0	B	13766	QPSK	1	0	0 mm	front	1:1	2.400	1.040	2.496	
2560.00	21350	High	LTE Band 7	20	24.0	23.13	0.02	0	B	13766	QPSK	1	50	0 mm	front	1:1	2.490	1.222	**3.043**	A59
2510.00	20850	Low	LTE Band 7	20	23.0	22.47	-0.01	1	B	13766	QPSK	50	25	0 mm	front	1:1	1.800	1.130	2.034	
2535.00	21100	Mid	LTE Band 7	20	23.0	22.63	0.05	1	B	13766	QPSK	50	0	0 mm	front	1:1	1.940	1.089	2.113	
2560.00	21350	High	LTE Band 7	20	23.0	22.11	-0.02	1	B	13766	QPSK	50	0	0 mm	front	1:1	1.770	1.227	2.172	
2535.00	21100	Mid	LTE Band 7	20	23.0	22.57	0.01	1	B	13766	QPSK	100	0	0 mm	front	1:1	1.950	1.104	2.153	
2535.00	21100	Mid	LTE Band 7	20	24.0	23.83	-0.05	0	B	13766	QPSK	1	0	11 mm	bottom	1:1	0.232	1.040	0.241	
2535.00	21100	Mid	LTE Band 7	20	23.0	22.63	-0.01	1	B	13766	QPSK	50	0	11 mm	bottom	1:1	0.190	1.089	0.207	
2535.00	21100	Mid	LTE Band 7	20	24.0	23.83	-0.02	0	B	13766	QPSK	1	0	6 mm	left	1:1	0.389	1.040	0.405	
2535.00	21100	Mid	LTE Band 7	20	23.0	22.63	-0.01	1	B	13766	QPSK	50	0	6 mm	left	1:1	0.314	1.089	0.342	
2510.00	20850	Low	LTE Band 7	20	22.0	21.47	0.00	0	B	13766	QPSK	1	50	0 mm	back	1:1	2.350	1.130	2.656	
2535.00	21100	Mid	LTE Band 7	20	22.0	21.66	0.01	0	B	13766	QPSK	1	50	0 mm	back	1:1	1.990	1.081	2.151	
2560.00	21350	High	LTE Band 7	20	22.0	21.15	0.02	0	B	13766	QPSK	1	0	0 mm	back	1:1	1.920	1.216	2.335	
2510.00	20850	Low	LTE Band 7	20	22.0	21.48	0.03	0	B	13766	QPSK	50	25	0 mm	back	1:1	2.270	1.128	2.561	
2535.00	21100	Mid	LTE Band 7	20	22.0	21.74	0.00	0	B	13766	QPSK	50	0	0 mm	back	1:1	1.930	1.062	2.050	
2560.00	21350	High	LTE Band 7	20	22.0	21.29	0.00	0	B	13766	QPSK	50	0	0 mm	back	1:1	1.860	1.178	2.191	
2535.00	21100	Mid	LTE Band 7	20	22.0	21.65	0.00	0	B	13766	QPSK	100	0	0 mm	back	1:1	1.890	1.083	2.047	
2535.00	21100	Mid	LTE Band 7	20	22.0	21.66	-0.02	0	B	13766	QPSK	1	50	0 mm	bottom	1:1	1.140	1.081	1.232	
2535.00	21100	Mid	LTE Band 7	20	22.0	21.74	-0.02	0	B	13766	QPSK	50	0	0 mm	bottom	1:1	1.130	1.062	1.200	
2535.00	21100	Mid	LTE Band 7	20	22.0	21.66	0.04	0	B	13766	QPSK	1	50	0 mm	left	1:1	0.836	1.081	0.904	
2535.00	21100	Mid	LTE Band 7	20	22.0	21.74	0.01	0	B	13766	QPSK	50	0	0 mm	left	1:1	0.833	1.062	0.885	
2510.00	20850	Low	LTE Band 7	20	22.0	21.47	0.01	0	B	13766	QPSK	1	50	0 mm	back	1:1	2.280	1.130	2.576	
2560.00	21350	High	LTE Band 7	20	24.0	23.13	0.00	0	B	13766	QPSK	1	50	0 mm	front	1:1	2.490	1.222	**3.043**	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**																	**Phablet** **4.0 W/kg (mW/g)** averaged over 10 grams			

Note: Blue entries represent variability measurement

Table 11-41
WLAN Phablet SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	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)	
5280	56	802.11a	OFDM	20	16.0	15.91	-0.05	0 mm	21181	6	back	97.7	11.400	1.740	1.021	1.024	1.819	
5300	60	802.11a	OFDM	20	16.0	15.85	0.01	0 mm	21181	6	back	97.7	8.180	1.790	1.035	1.024	1.897	
5280	56	802.11a	OFDM	20	16.0	15.91	-0.05	0 mm	21181	6	front	97.7	0.711	0.170	1.021	1.024	0.178	
5280	56	802.11a	OFDM	20	16.0	15.91	-0.01	0 mm	21181	6	top	97.7	5.570	0.747	1.021	1.024	0.781	
5280	56	802.11a	OFDM	20	16.0	15.91	-0.04	0 mm	21181	6	left	97.7	2.680	-	1.021	1.024	-	
5590	118	802.11n	OFDM	40	16.0	15.32	0.05	0 mm	21181	13.5	back	98.4	9.100	1.610	1.169	1.016	1.912	
5630	126	802.11n	OFDM	40	16.0	15.22	0.05	0 mm	21181	13.5	back	98.4	9.810	2.160	1.197	1.016	**2.627**	A60
5710	142	802.11n	OFDM	40	16.0	15.53	0.15	0 mm	21181	13.5	back	98.4	11.600	2.110	1.114	1.016	2.388	
5710	142	802.11n	OFDM	40	16.0	15.53	0.20	0 mm	21181	13.5	front	98.4	0.729	0.208	1.114	1.016	0.235	
5710	142	802.11n	OFDM	40	16.0	15.53	0.03	0 mm	21181	13.5	top	98.4	6.010	0.893	1.114	1.016	1.011	
5710	142	802.11n	OFDM	40	16.0	15.53	-0.04	0 mm	21181	13.5	left	98.4	2.290	-	1.114	1.016	-	
5630	126	802.11n	OFDM	40	16.0	15.22	0.01	0 mm	21181	13.5	back	98.4	9.810	2.160	1.197	1.016	2.627	
5710	142	802.11n	OFDM	40	16.0	15.53	0.05	0 mm	21181	13.5	back	98.4	9.810	1.970	1.114	1.016	2.230	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Phablet 4.0 W/kg (mW/g) averaged over 10 grams					

Note: Blue entry represents variability measurement

11.5 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.
8. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 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 diagonal dimension is > 160 mm and < 200 mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.
11. Additional SAR tests for phablet SAR were evaluated per KDB 616217 Section 6 (See Section 6.9 for more information).

12. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the 1g thresholds for the equivalent test cases.
13. LTE B30 Phablet SAR was additionally evaluated at the earjack power level to demonstrate compliance.

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. 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.
5. TDD LTE was tested per the guidance provided in FCC KDB Publication 941225 D05v02r04. Testing was performed using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.
6. Per KDB Publication 941225 D05Av01r02, SAR for downlink only LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.
7. This device supports Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operations is 43.3 % using UL-DL configuration 1. Per FCC Guidance, all SAR tests were performed using Power Class 3. SAR with power class 2 at the available duty factor was additionally performed for the power class 3 configuration with the highest SAR configuration for each exposure conditions. Please see Section 13 for linearity results.

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) 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. 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.
5. 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.
6. 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 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, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

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

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

Table 12-1
Phablet SAR Measurement Variability Results

PHABLET VARIABILITY RESULTS													
Band	FREQUENCY		Mode	Service	Side	Spacing	Measured SAR (10g)	1st Repeated SAR (10g)	Ratio	2nd Repeated SAR (10g)	Ratio	3rd Repeated SAR (10g)	Ratio
	MHz	Ch.					(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1900	1905.00	26590	LTE Band 25 (PCS), 20 MHz Bandwidth	QPSK, 1 RB, 0 RB Offset	back	0 mm	2.010	2.000	1.01	N/A	N/A	N/A	N/A
2450	2510.00	20850	LTE Band 7, 20 MHz Bandwidth	QPSK, 1 RB, 50 RB Offset	back	0 mm	2.350	2.280	1.03	N/A	N/A	N/A	N/A
2600	2560.00	21350	LTE Band 7, 20 MHz Bandwidth	QPSK, 1 RB, 50 RB Offset	front	0 mm	2.490	2.490	1.00	N/A	N/A	N/A	N/A
5600	5630.00	126	802.11n, 40 MHz Bandwidth	OFDM	back	0 mm	2.160	2.160	1.00	N/A	N/A	N/A	N/A
5750	5710.00	142	802.11n, 40 MHz Bandwidth	OFDM	back	0 mm	2.110	1.970	1.07	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Phablet 4.0 W/kg (mW/g) averaged over 10 grams						

12.2 Measurement Uncertainty

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

13 ADDITIONAL TESTING PER FCC GUIDANCE

13.1 LTE Band 41 Power Class 2 and Power Class 3 Linearity

This device supports Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operations is 43.3 % using UL-DL configuration 1. Per May 2017 TCB Workshop Notes based on the device behavior, all SAR tests were performed using Power Class 3. SAR with Power Class 2 at the highest power and available duty factor was additionally performed for the Power Class 3 configuration with the highest SAR for each exposure condition. The linearity between the Power Class 2 and Power Class 3 SAR results and the respective frame averaged powers was calculated to determine that the results were linear.
Per May 2017 TCB Workshop, no additional SAR measurements were required since the linearity between power classes was < 10% and all reported SAR values were < 1.4 W/kg for 1g and < 3.5 W/kg for 10g.

Table 13-1
LTE Band 41 Head Linearity Data

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	24.00	27.00
Measured Output Power (dBm)	23.81	26.20
Measured SAR (W/kg)	0.188	0.201
Measured Power (mW)	240.44	416.87
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	152.20	180.50
% deviation from expected linearity		-9.85%

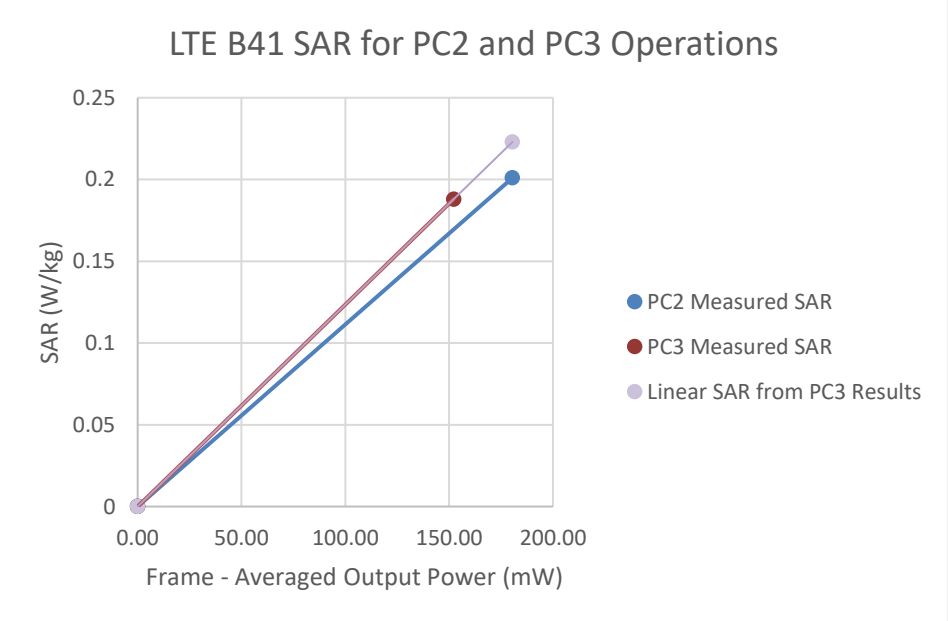

Figure 13-1
LTE Band 41 Head Linearity

Table 13-2
LTE Band 41 Body-Worn Linearity Data

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	24.0	27.0
Measured Output Power (dBm)	23.81	26.20
Measured SAR (W/kg)	0.245	0.295
Measured Power (mW)	240.44	416.87
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	152.20	180.50
% deviation from expected linearity		1.52%

Figure 13-2
LTE Band 41 Body-Worn Linearity

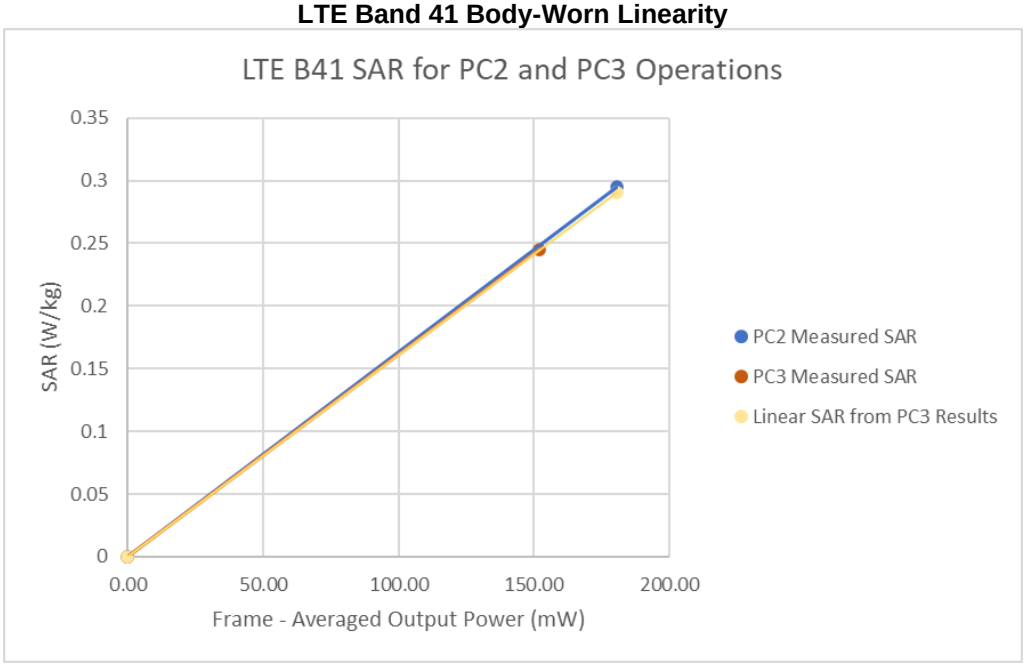

Table 13-3
LTE Band 41 Hotspot Linearity Data

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	24.0	24.0
Measured Output Power (dBm)	23.81	23.49
Measured SAR (W/kg)	0.563	0.373
Measured Power (mW)	240.44	223.36
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	152.20	96.71
% deviation from expected linearity		4.26%

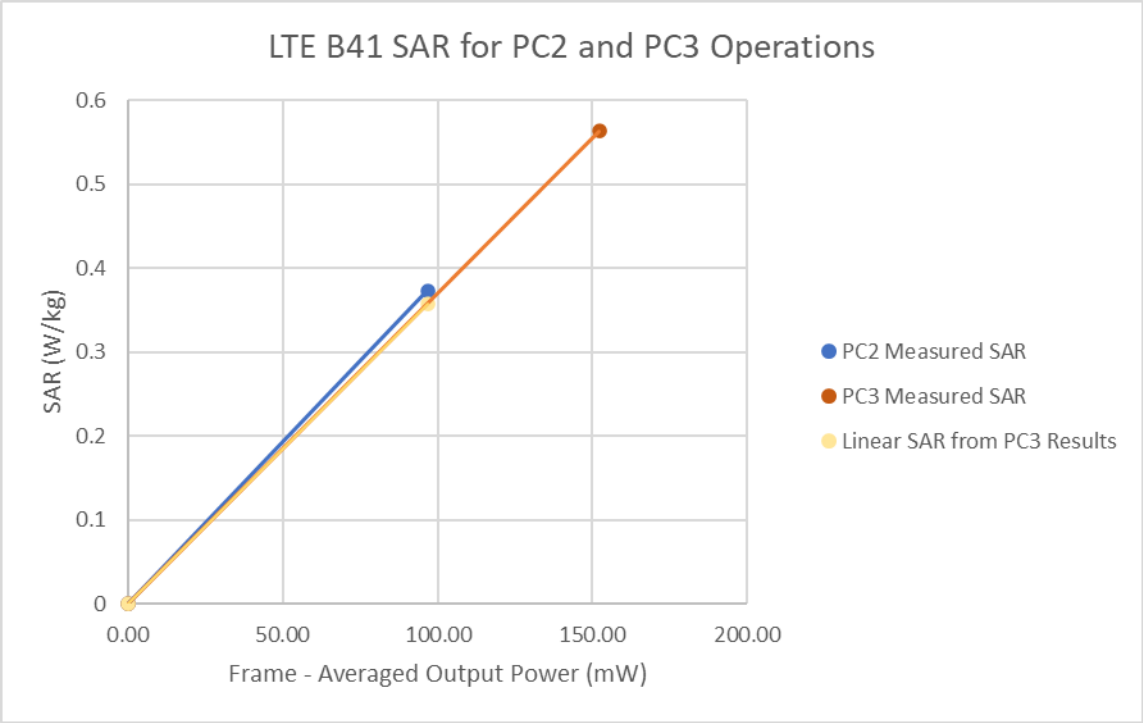

Figure 13-3
LTE Band 41 Hotspot Linearity

14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	CBT	N/A	CBT	3051A00187
Agilent	85033E	3.5mm Standard Calibration Kit	7/7/2021	Annual	7/7/2022	MY53402352
Agilent	E4438C	ESG Vector Signal Generator	12/14/2020	Biennial	12/14/2022	MY42082385
Agilent	E4438C	ESG Vector Signal Generator	5/6/2021	Annual	5/6/2022	MY42082659
Agilent	N5182A	MXG Vector Signal Generator	6/21/2021	Annual	6/21/2022	MY47420603
Agilent	N5182A	MXG Vector Signal Generator	6/15/2021	Annual	6/15/2022	MY47420800
Agilent	8753ES	S-Parameter Vector Network Analyzer	2/19/2021	Annual	2/19/2022	MY40001472
Agilent	E5515C	Wireless Communications Test Set	5/4/2021	Biennial	5/4/2023	GB43193563
Agilent	E5515C	Wireless Communications Test Set	5/18/2020	Biennial	5/18/2022	GB43193591
Agilent	E5515C	Wireless Communications Test Set	5/6/2021	Annual	5/6/2022	GB44400860
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB44450273
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	353317
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	353468
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	353469
Anritsu	ML2496A	Power Meter	3/3/2021	Annual	3/3/2022	1306009
Anritsu	ML2496A	Power Meter	4/21/2021	Annual	4/21/2022	1351001
Anritsu	MA2411B	Pulse Power Sensor	3/8/2021	Annual	3/8/2022	1339007
Anritsu	MA2411B	Pulse Power Sensor	3/9/2021	Annual	3/9/2022	1207470
Anritsu	MT8821C	Radio Communication Analyzer	4/16/2021	Annual	4/16/2022	6200901190
Anritsu	MT8821C	Radio Communication Analyzer	3/23/2021	Annual	3/23/2022	6201144418
Anritsu	MT8821C	Radio Communication Analyzer	4/14/2021	Annual	4/14/2022	6261895213
Anritsu	MT8821C	Radio Communication Analyzer	3/2/2021	Annual	3/2/2022	6262044715
Anritsu	MT8821C	Radio Communication Analyzer	7/18/2021	Annual	7/18/2022	6262150047
Anritsu	MA24106A	USB Power Sensor	3/2/2021	Annual	3/2/2022	1244524
Anritsu	MA24106A	USB Power Sensor	3/3/2021	Annual	3/3/2022	1344556
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M15SA00-009
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
Control Company	4353	Long Stem Thermometer	10/28/2020	Biennial	10/28/2022	200670653
Control Company	4352	Long Stem Thermometer	5/16/2020	Biennial	5/16/2022	200294436
Control Company	4352	Long Stem Thermometer	5/16/2020	Biennial	5/16/2022	200294567
Control Company	4040	Therm./ Clock/ Humidity Monitor	2/17/2020	Biennial	2/17/2022	200113269
Control Company	4040	Therm./ Clock/ Humidity Monitor	2/17/2020	Biennial	2/17/2022	200113274
Control Company	4040	Therm./ Clock/ Humidity Monitor	3/6/2020	Biennial	3/6/2022	200170289
Insize	1108-150	Digital Caliper	1/17/2020	Biennial	1/17/2022	409193536
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
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-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mini-Circuits	TVA-11-422	RF Power Amp	CBT	N/A	CBT	QA1303002
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	NC-100	Torque Wrench	8/4/2020	Biennial	8/4/2022	N/A
Pasternack	NC-100	Torque Wrench	8/4/2020	Biennial	8/4/2022	N/A
Pasternack	NC-100	Torque Wrench	8/4/2020	Biennial	8/4/2022	N/A
Pasternack	NC-100	Torque Wrench (8in-lbs)	8/5/2020	Biennial	8/5/2022	47639-47
Rohde & Schwarz	CMW500	Radio Communication Tester	2/18/2021	Annual	2/18/2022	101767
Rohde & Schwarz	CMW500	Radio Communication Tester	3/19/2021	Annual	3/19/2022	128633
Rohde & Schwarz	CMW500	Radio Communication Tester	5/11/2021	Annual	5/11/2022	128636
Rohde & Schwarz	CMW500	Radio Communication Tester	3/22/2021	Annual	3/22/2022	167283
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	2/10/2021	Annual	2/10/2022	161662
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	3/22/2021	Annual	3/22/2022	162125
SPEAG	D1750V2	1750 MHz SAR Dipole	5/12/2020	Biennial	5/12/2022	1148
SPEAG	D1765V2	1750 MHz SAR Dipole	5/14/2021	Annual	5/14/2022	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	2/21/2019	Triennial	2/21/2022	5d148
SPEAG	D1900V2	1900 MHz SAR Dipole	9/21/2021	Annual	9/21/2022	5d149
SPEAG	D1900V2	1900 MHz SAR Dipole	10/22/2021	Annual	10/22/2022	5d080
SPEAG	D2300V2	2300 MHz SAR Dipole	8/18/2021	Annual	8/18/2022	1073
SPEAG	D2300V2	2300 MHz SAR Dipole	6/3/2021	Annual	6/3/2022	1116
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	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	2/17/2021	Annual	2/17/2022	1046
SPEAG	D750V3	750 MHz SAR Dipole	5/11/2021	Annual	5/11/2022	1034
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	3/1/2021	Annual	3/1/2022	1652
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/7/2021	Annual	4/7/2022	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/11/2021	Annual	5/11/2022	728
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/15/2021	Annual	6/15/2022	1334
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/21/2021	Annual	6/21/2022	1676
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/22/2021	Annual	6/22/2022	1677
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/13/2021	Annual	7/13/2022	1583
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/4/2021	Annual	8/4/2022	1680
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/13/2021	Annual	9/13/2022	1364
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/11/2021	Annual	11/11/2022	1466
SPEAG	DAE3	Dasy Data Acquisition Electronics	8/3/2021	Annual	8/3/2022	1681
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/11/2021	Annual	1/11/2022	1645
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/9/2021	Annual	4/9/2022	1502
SPEAG	EX3DV4	SAR Probe	8/5/2021	Annual	8/5/2022	7670
SPEAG	EX3DV4	SAR Probe	3/2/2021	Annual	3/2/2022	7640
SPEAG	EX3DV4	SAR Probe	3/3/2021	Annual	3/3/2022	7637
SPEAG	EX3DV4	SAR Probe	4/16/2021	Annual	4/16/2022	7402
SPEAG	EX3DV4	SAR Probe	4/19/2021	Annual	4/19/2022	7357
SPEAG	EX3DV4	SAR Probe	5/18/2021	Annual	5/18/2022	3914
SPEAG	EX3DV4	SAR Probe	6/21/2021	Annual	6/21/2022	7409
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	9/20/2021	Annual	9/20/2022	7552
SPEAG	EX3DV4	SAR Probe	10/7/2021	Annual	10/7/2022	7558
SPEAG	EX3DV4	SAR Probe	11/15/2021	Annual	11/15/2022	7565
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/12/2021	Annual	5/12/2022	1070
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1237

Note: all equipment was used solely within its respective calibration period.
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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

[28] FCC General RF Exposure Guidance and SAR Procedures for Dongles, KDB Publication 447498, D01-D02

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

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