



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:

07/12/18 - 07/23/18

Test Site/Location:

PCTEST Lab, Columbia, MD, USA

Document Serial No.:

1M1806280134-01-R1.A3L

FCC ID:

A3LSMA600P

APPLICANT:

SAMSUNG ELECTRONICS CO., LTD.

DUT Type:

Portable Handset

Application Type:

Certification

FCC Rule Part(s):

CFR §2.1093

Model:

SM-A600P

Equipment Class	Band & Mode	Tx Frequency	SAR		
			1g Head (W/kg)	1g Body-Worn (W/kg)	1g Hotspot (W/kg)
PCE	CDMA/EVDO BC10 (\$90S)	817.90 - 823.10 MHz	0.15	0.46	0.49
PCE	CDMA/EVDO BC0 (\$22H)	824.70 - 848.31 MHz	0.15	0.32	0.37
PCE	PCS CDMA/EVDO	1851.25 - 1908.75 MHz	0.23	1.39	1.21
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.14	0.26	0.32
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	0.51	0.42
PCE	UMTS 850	826.40 - 846.60 MHz	0.13	0.22	0.27
PCE	UMTS 1750	1712.4 - 1752.6 MHz	0.16	0.26	0.33
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.16	0.80	0.82
PCE	LTE Band 12	699.7 - 715.3 MHz	0.10	0.31	0.40
PCE	LTE Band 26 (Cell)	814.7 - 848.3 MHz	0.15	0.28	0.30
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	N/A	N/A	N/A
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.25	0.47	0.63
PCE	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	0.21	1.14	1.16
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	N/A	N/A	N/A
PCE	LTE Band 41	2498.5 - 2687.5 MHz	< 0.1	0.52	1.40
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.54	0.13	0.37
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	N/A
NII	U-NII-2A	5260 - 5320 MHz	0.80	< 0.1	N/A
NII	U-NII-2C	5500 - 5720 MHz	0.50	0.10	N/A
NII	U-NII-3	5745 - 5825 MHz	1.03	< 0.1	0.47
DSS/DTS	Bluetooth	2402 - 2480 MHz	0.11	N/A	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			1.28	1.52	1.58

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 1.8 of this report; for North American frequency bands only.

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

Note: This revised Test Report (S/N: 1M1806280134-01-R1.A3L) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.


Randy Ortanez
President



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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
CDMA/EVDO BC10 (§90S)	Voice/Data	817.90 - 823.10 MHz
CDMA/EVDO BC0 (§22H)	Voice/Data	824.70 - 848.31 MHz
PCS CDMA/EVDO	Voice/Data	1851.25 - 1908.75 MHz
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 12	Voice/Data	699.7 - 715.3 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 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 41	Voice/Data	2498.5 - 2687.5 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2462 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
ANT+	Data	2402 - 2480 MHz

1.2 Power Reduction for SAR

This device utilizes a single step power reduction mechanism for SAR compliance under portable hotspot conditions for some wireless modes and bands. All hotspot SAR evaluations for this device were performed at the maximum allowed output power when hotspot is enabled. Detailed descriptions of the power reduction mechanism are included in the operational description.

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

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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 Maximum Output Power

Mode / Band		Modulated Average (dBm)		
		CDMA	EVDO Rev. 0	EVDO Rev. A
CDMA/EVDO BC10 (\$90S)	Maximum	25.3		
	Nominal	24.3		
CDMA/EVDO BC0 (\$22H)	Maximum	25.3	24.8	24.8
	Nominal	24.3	23.8	23.8
PCS CDMA/EVDO	Maximum	25.0		
	Nominal	24.0		

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)				Burst Average 8-PSK (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
GSM/GPRS/EDGE 850	Maximum	33.0	33.0	31.0	30.0	29.0	27.5	25.5	24.5	23.0
	Nominal	32.0	32.0	30.0	29.0	28.0	26.5	24.5	23.5	22.0
GSM/GPRS/EDGE 1900	Maximum	30.0	30.0	28.0	26.0	24.5	26.5	24.5	23.0	22.5
	Nominal	29.0	29.0	27.0	25.0	23.5	25.5	23.5	22.0	21.5

Mode / Band		Modulated Average (dBm)		
		3GPP WCDMA	3GPP HSDPA	3GPP HSUPA
UMTS Band 5 (850 MHz)	Maximum	24.0	23.5	22.5
	Nominal	23.0	22.5	21.5
UMTS Band 4 (1750 MHz)	Maximum	23.0	23.0	22.0
	Nominal	22.0	22.0	21.0
UMTS Band 2 (1900 MHz)	Maximum	23.0	23.0	22.0
	Nominal	22.0	22.0	21.0

Mode / Band		Modulated Average (dBm)
LTE Band 12	Maximum	25.5
	Nominal	24.5
LTE Band 26 (Cell)	Maximum	25.5
	Nominal	24.5
LTE Band 5 (Cell)	Maximum	25.5
	Nominal	24.5
LTE Band 4 (AWS)	Maximum	24.8
	Nominal	23.8
LTE Band 25 (PCS)	Maximum	24.8
	Nominal	23.8
LTE Band 2 (PCS)	Maximum	24.5
	Nominal	23.5
LTE Band 41 PC3	Maximum	25.0
	Nominal	24.0
LTE Band 41 PC2	Maximum	28.0
	Nominal	27.0

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Mode / Band		Modulated Average - Single Tx Chain (dBm)		
Channel		1	2 - 10	11
IEEE 802.11b (2.4 GHz)	Maximum	20.0		
	Nominal	19.0		
IEEE 802.11g (2.4 GHz)	Maximum	17.0	20.0	17.0
	Nominal	16.0	19.0	16.0
IEEE 802.11n (2.4 GHz)	Maximum	17.0	20.0	17.0
	Nominal	16.0	19.0	16.0

Mode / Band		Modulated Average - Single Tx Chain (dBm)															
		20 MHz Bandwidth						40 MHz Bandwidth						80 MHz Bandwidth			
	Channel	36	40-60	64	100	104-161	165	38	46-54	62	102	110-151	159	42-106	122	138	155
IEEE 802.11a (5 GHz)	Maximum	17.0	19.0	17.0	17.0	19.0	17.0										
	Nominal	16.0	18.0	16.0	16.0	18.0	16.0										
IEEE 802.11n (5 GHz)	Maximum	17.0	19.0	17.0	17.0	19.0	17.0	15.0	17.0	15.0	15.0	17.0	15.0				
	Nominal	16.0	18.0	16.0	16.0	18.0	16.0	14.0	16.0	14.0	14.0	16.0	14.0				
IEEE 802.11ac (5 GHz)	Maximum	17.0	19.0	17.0	17.0	19.0	17.0	15.0	17.0	15.0	15.0	17.0	15.0	12.0	14.0	14.0	12.0
	Nominal	16.0	18.0	16.0	16.0	18.0	16.0	14.0	16.0	14.0	14.0	16.0	14.0	11.0	13.0	13.0	11.0

Mode/Band		Modulated Average (dBm)	
Bluetooth	Maximum	9.0	
	Nominal	8.0	
Bluetooth LE	Maximum	6.0	
	Nominal	5.0	

1.3.2

Reduced Output Power

Mode / Band		Modulated Average (dBm)
PCS CDMA/EVDO	Maximum	21.8
	Nominal	20.8

Mode / Band		Burst Average GMSK (dBm)				Burst Average 8-PSK (dBm)			
		1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
GSM/GPRS/EDGE 1900	Maximum	26.8	25.0	23.0	22.5	26.5	24.5	23.0	22.5
	Nominal	25.8	24.0	22.0	21.5	25.5	23.5	22.0	21.5

Mode / Band		Modulated Average (dBm)		
		3GPP WCDMA	3GPP HSDPA	3GPP HSUPA
UMTS Band 4 (1750 MHz)	Maximum	21.5	21.5	21.5
	Nominal	20.5	20.5	20.5
UMTS Band 2 (1900 MHz)	Maximum	19.8	19.8	19.8
	Nominal	18.8	18.8	18.8

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Mode / Band		Modulated Average (dBm)
LTE Band 4 (AWS)	Maximum	23.0
	Nominal	22.0
LTE Band 25 (PCS)	Maximum	21.3
	Nominal	20.3
LTE Band 2 (PCS)	Maximum	21.3
	Nominal	20.3
LTE Band 41 PC2	Maximum	24.5
	Nominal	23.5

Mode / Band		Modulated Average (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	16.0
	Nominal	15.0
IEEE 802.11g (2.4 GHz)	Maximum	16.0
	Nominal	15.0
IEEE 802.11n (2.4 GHz)	Maximum	16.0
	Nominal	15.0

Mode / Band		Modulated Average - Single Tx Chain (dBm)					
		20 MHz Bandwidth	40 MHz Bandwidth	80 MHz Bandwidth			
	Channel			42-106	122	138	155
IEEE 802.11a (5 GHz)	Maximum	14.0					
	Nominal	13.0					
IEEE 802.11n (5 GHz)	Maximum	14.0	14.0				
	Nominal	13.0	13.0				
IEEE 802.11ac (5 GHz)	Maximum	14.0	14.0	12.0	14.0	14.0	12.0
	Nominal	13.0	13.0	11.0	13.0	13.0	11.0

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1.4 DUT Antenna Locations

The overall dimensions of this device are > 9 x 5 cm. The overall diagonal dimension of the device is ≤160 mm and the diagonal display is ≤150 mm. A diagram showing the location of the device antennas can be found in Appendix F.

Table 1-1
Device Edges/Sides for SAR Testing

Mode	Back	Front	Top	Bottom	Right	Left
EVDO BC10 (§90S)	Yes	Yes	No	Yes	Yes	Yes
EVDO BC0 (§22H)	Yes	Yes	No	Yes	Yes	Yes
PCS EVDO	Yes	Yes	No	Yes	Yes	Yes
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 1750	Yes	Yes	No	Yes	Yes	Yes
UMTS 1900	Yes	Yes	No	Yes	Yes	Yes
LTE Band 12	Yes	Yes	No	Yes	Yes	Yes
LTE Band 26 (Cell)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 4 (AWS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 25 (PCS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 41	Yes	Yes	No	Yes	Yes	Yes
2.4 GHz WLAN	Yes	Yes	Yes	No	Yes	Yes
5 GHz WLAN	Yes	Yes	Yes	No	Yes	Yes

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

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 F.

1.6 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be transmitting 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.

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Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Notes
1	1x CDMA voice + 2.4 GHz Wi-Fi	Yes	Yes	N/A	
2	1x CDMA voice + 5 GHz Wi-Fi	Yes	Yes	N/A	
3	1x CDMA voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	^ Bluetooth Tethering is considered
4	GSM voice + 2.4 GHz Wi-Fi	Yes	Yes	N/A	
5	GSM voice + 5 GHz Wi-Fi	Yes	Yes	N/A	
6	GSM voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	^ Bluetooth Tethering is considered
7	UMTS + 2.4 GHz Wi-Fi	Yes	Yes	Yes	
8	UMTS + 5 GHz Wi-Fi	Yes	Yes	Yes	
9	UMTS + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	^ Bluetooth Tethering is considered
10	LTE + 2.4 GHz Wi-Fi	Yes	Yes	Yes	
11	LTE + 5 GHz Wi-Fi	Yes	Yes	Yes	
12	LTE + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	^ Bluetooth Tethering is considered
13	CDMA/EVDO data + 2.4 GHz Wi-Fi	Yes*	Yes*	Yes	* Pre-installed VOIP applications are considered
14	CDMA/EVDO data + 5 GHz Wi-Fi	Yes*	Yes*	Yes	* Pre-installed VOIP applications are considered
15	CDMA/EVDO data + 2.4 GHz Bluetooth	Yes*^	Yes*	Yes^	* Pre-installed VOIP applications are considered ^ Bluetooth Tethering is considered
16	GPRS/EDGE + 2.4 GHz Wi-Fi	N/A	N/A	Yes	
17	GPRS/EDGE + 5 GHz Wi-Fi	N/A	N/A	Yes	
18	GPRS/EDGE + 2.4 GHz Bluetooth	N/A	N/A	Yes^	^ Bluetooth Tethering is considered

- 2.4 GHz WLAN, 5 GHz WLAN, and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
- All licensed modes share the same antenna path and cannot transmit simultaneously.
- 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.
- 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 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.
- This device supports Bluetooth tethering.
- This device supports VOLTE.
- This device supports VoWIFI.

1.7 Miscellaneous SAR Test Considerations

(A) WIFI/BT

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

Since Wireless Router operations are not allowed by the chipset firmware using U-NII-1, U-NII-2A & 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.

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

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

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, body-worn Bluetooth SAR was not required; $[(8/15) * \sqrt{2.480}] = 0.8 < 3.0$. 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, hotspot Bluetooth SAR was not required; $[(8/10) * \sqrt{2.480}] = 1.3 < 3.0$. Per KDB Publication 447498 D01v06, the maximum power of the channel was rounded to the nearest mW before calculation.

This device supports IEEE 802.11ac with the following features:

- a) Up to 80 MHz Bandwidth only
- b) No aggregate channel configurations
- c) 1 Tx antenna output
- d) 256 QAM is supported
- e) TDWR and Band gap channels are supported

(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.

CDMA 1X Advanced technology was not required for SAR since the maximum allowed output powers for 1x Advanced was not more than 0.25 dB higher than the maximum powers for 1x and the measured SAR in any 1x mode exposure conditions was not greater than 1.2 W/kg per FCC KDB Publication 941225 D01v03r01.

This device supports LTE Carrier Aggregation (CA) in the downlink only. 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. DLCA power measurements can be found in Appendix H.

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 condition was evaluated for the highest

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configuration in Power Class 3 for each test configuration to confirm the results were scalable linearly (See Section 14.1).

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)
- 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.

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LTE INFORMATION

LTE Information					
FCC ID	A3LSMA600P				
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 26 (Cell) (814.7 - 848.3 MHz)				
	LTE Band 5 (Cell) (824.7 - 848.3 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 41 (2498.5 - 2687.5 MHz)				
Channel Bandwidths	LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 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 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 41: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
Channel Numbers and Frequencies (MHz)	Low	Low-Mid	Mid	Mid-High	High
LTE Band 12: 1.4 MHz	699.7 (23017)		707.5 (23095)		715.3 (23173)
LTE Band 12: 3 MHz	700.5 (23025)		707.5 (23095)		714.5 (23165)
LTE Band 12: 5 MHz	701.5 (23035)		707.5 (23095)		713.5 (23155)
LTE Band 12: 10 MHz	704 (23060)		707.5 (23095)		711 (23130)
LTE Band 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 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 41: 5 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 10 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 15 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 20 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
UE Category	6				
Modulations Supported in UL	QPSK, 16QAM				
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 10. It supports a maximum of 2 carriers in the downlink. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. The following LTE Release 10 Features are not supported: Relay, HetNet, Enhanced MIMO, eCIC, WIFI Offloading, MDH, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

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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/m³)
- 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]

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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:

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.

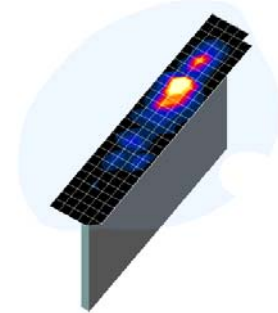


Figure 4-1
Sample SAR Area Scan

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

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

*Also compliant to IEEE 1528-2013 Table 6

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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].

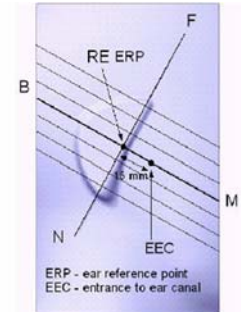


Figure 5-1
Close-Up Side view
of ERP

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 then 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

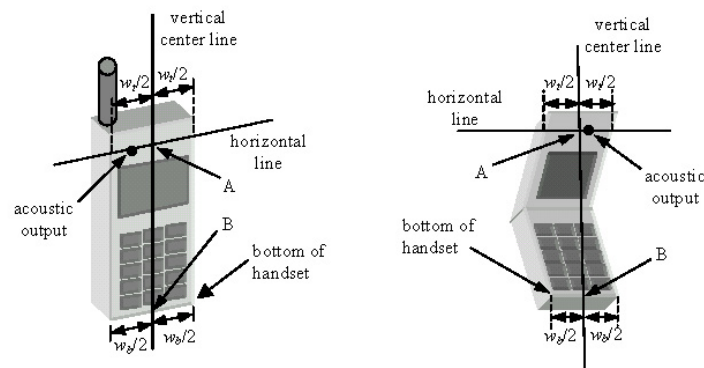


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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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 $\epsilon = 3$ and loss tangent $\delta = 0.02$.

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.

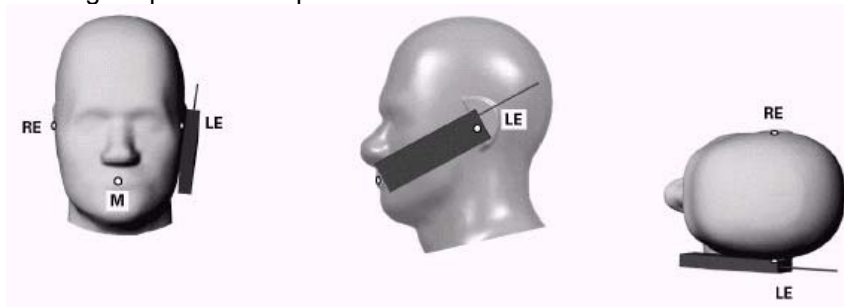


Figure 6-1 Front, Side and Top View of Cheek Position

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 with 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 / 15° 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 15 degrees.
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).

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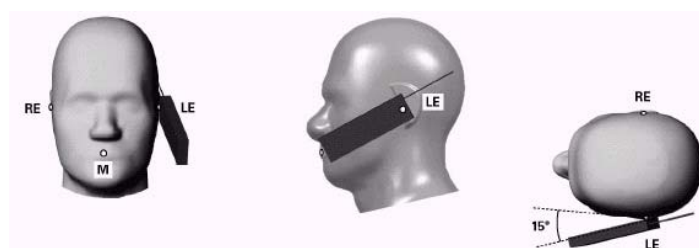


Figure 6-2 Front, Side and Top View of Ear/15° Tilt Position

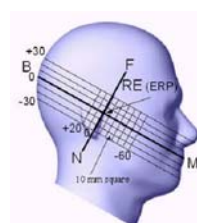


Figure 6-3 Side view w/ relevant markings

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.

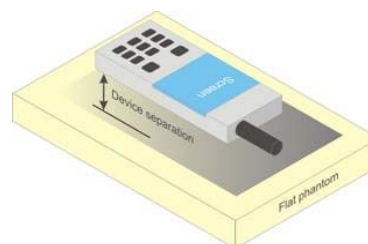


Figure 6-4 Sample Body-Worn Diagram

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

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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 ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) 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.

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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 <i>General Population</i> (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT <i>Occupational</i> (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.

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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 CDMA2000

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

8.4.1 Output Power Verification

See 3GPP2 C.S0011/TIA-98-E as recommended by FCC KDB Publication 941225 D01v03r01 “3G SAR Measurement Procedures.” Maximum output power is verified on the High, Middle and Low channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E. SO55 tests were measured with power control bits in the “All Up” condition.

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1. If the mobile station (MS) supports Reverse TCH RC 1 and Forward TCH RC 1, set up a call using Fundamental Channel Test Mode 1 (RC=1/1) with 9600 bps data rate only.
2. Under RC1, C.S0011 Table 4.4.5.2-1, Table 8-1 parameters were applied.
3. If the MS supports the RC 3 Reverse FCH, RC3 Reverse SCH₀ and demodulation of RC 3,4, or 5, set up a call using Supplemental Channel Test Mode 3 (RC 3/3) with 9600 bps Fundamental Channel and 9600 bps SCH₀ data rate.
4. Under RC3, C.S0011 Table 4.4.5.2-2, Table 8-2 was applied.

Table 8-1
Parameters for Max. Power for RC1

Parameter	Units	Value
I_{or}	dBm/1.23 MHz	-104
$\frac{Pilot E_c}{I_{or}}$	dB	-7
$\frac{Traffic E_c}{I_{or}}$	dB	-7.4

Table 8-2
Parameters for Max. Power for RC3

Parameter	Units	Value
I_{or}	dBm/1.23 MHz	-86
$\frac{Pilot E_c}{I_{or}}$	dB	-7
$\frac{Traffic E_c}{I_{or}}$	dB	-7.4

5. FCHs were configured at full rate for maximum SAR with “All Up” power control bits.

8.4.2 Head SAR Measurements

SAR for next to the ear head exposure is measured in RC3 with the handset configured to transmit at full rate in SO55. The 3G SAR test reduction procedure is applied to RC1 with RC3 as the primary mode; otherwise, SAR is required for the channel with maximum measured output in RC1 using the head exposure configuration that results in the highest reported SAR in RC3.

Head SAR is additionally evaluated using EVDO Rev. A to support compliance for VoIP operations. See Section 8.4.5 for EVDO Rev. A configuration parameters.

8.4.3 Body-worn SAR Measurements

SAR for body-worn exposure configurations is measured in RC3 with the DUT configured to transmit at full rate on FCH with all other code channels disabled using TDSO / SO32. The 3G SAR test reduction procedure is applied to the multiple code channel configuration (FCH+SCH_n), with FCH only as the primary mode. Otherwise, SAR is required for multiple code channel configuration (FCH + SCH_n), with FCH at full rate and SCH₀ enabled at 9600 bps, using the highest reported SAR configuration for FCH only. When multiple code channels are enabled, the transmitter output can shift by more than 0.5 dB and may lead to higher SAR drifts and SCH dropouts.

The 3G SAR test reduction procedure is applied to body-worn accessory SAR in RC1 with RC3 as the primary mode. Otherwise, SAR is required for RC1, with SO55 and full rate, using the highest reported SAR configuration for body-worn accessory exposure in RC3.

8.4.4 Body-worn SAR Measurements for EVDO Devices

For handsets with EVDO capabilities, the 3G SAR test reduction procedure is applied to EVDO Rev. 0 with 1x RTT RC3 as the primary mode to determine body-worn accessory test requirements. Otherwise, body-worn accessory SAR is required for Rev. 0, at 153.6 kbps, using the highest reported SAR configuration for body-worn accessory exposure in RC3.

The 3G SAR test reduction procedure is applied to Rev. A, with Rev. 0 as the primary mode to determine body-worn accessory SAR test requirements. When SAR is not required for Rev. 0, the 3G SAR test reduction is applied with 1x RTT RC3 as the primary mode.

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When SAR is required for EVDO Rev. A, SAR is measured with a Reverse Data Channel payload size of 4096 bits and a Termination Target of 16 slots defined for Subtype 2 Physical Layer configurations, using the highest reported SAR configuration for body-worn accessory exposure in Rev. 0 or 1x RTT RC3, as appropriate.

8.4.5 Body SAR Measurements for EVDO Hotspot

Hotspot Body SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0. The 3G SAR test reduction procedure is applied to Rev. A, Subtype 2 Physical layer configuration, with Rev. 0 as the primary mode; otherwise, SAR is measured for Rev. A using the highest reported SAR configuration for body-worn accessory exposure in Rev. 0. The AT is tested with a Reverse Data Channel rate of 153.6 kbps in Subtype 0/1 Physical Layer configurations; and a Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots in Subtype 2 Physical Layer configurations.

For EVDO data devices that also support 1x RTT voice and/or data operations, the 3G SAR test reduction procedure is applied to 1x RTT RC3 and RC1 with EVDO Rev. 0 and Rev. A as the respective primary modes. Otherwise, the 'Body-Worn Accessory SAR' procedures in the '3GPP2 CDMA 2000 1x Handsets' section are applied.

8.4.6 CDMA2000 1x Advanced

This device additionally supports 1x Advanced. Conducted powers are measured using SO75 with RC8 on the uplink and RC11 on the downlink per FCC KDB Publication 941225 D01v03r01. Smart blanking is disabled for all measurements. The EUT is configured with forward power control Mode 000 and reverse power control at 400 bps. Conducted powers are measured on an Agilent 8960 Series 10 Wireless Communications Test Set, Model E5515C using the CDMA2000 1x Advanced application, Option E1962B-410.

The 3G SAR test reduction procedure is applied to the 1x-Advanced transmission mode with 1x RTT RC3 as the primary mode. When SAR measurement is required, the 1x-Advanced power measurement configurations are used. The 1x Advanced SAR procedures are applied separately to head, body-worn accessory and other exposure conditions.

8.5 SAR Measurement Conditions for UMTS

8.5.1 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.

8.5.2 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 "1s". The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the

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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.

8.5.3 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.

8.5.4 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.

8.5.5 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.

8.6 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).

8.6.1 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.

8.6.2 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.

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8.6.3 A-MPR

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

8.6.4 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 $\frac{1}{2}$ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is < 1.45 W/kg.

8.6.5 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.

8.6.6 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.

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8.7 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.

8.7.1 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.

8.7.2 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.

8.7.3 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.

8.7.4 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.

8.7.5 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:

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- 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 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.

8.7.6 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. 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.

8.7.7 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 8.7.6).

8.7.8 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.

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9 RF CONDUCTED POWERS

9.1 CDMA Conducted Powers

Table 9-1
Maximum Conducted Power

Band	Channel	Rule Part	Frequency	SO55 [dBm]	SO55 [dBm]	SO75 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	RC1	RC3	RC11	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	564	90S	820.1	24.21	24.21	24.11	24.22	24.23	24.22	24.24
Cellular	1013	22H	824.7	24.29	24.28	24.18	24.30	24.27	24.29	24.30
	384	22H	836.52	24.28	24.30	24.12	24.26	24.28	24.25	24.27
	777	22H	848.31	23.81	23.69	23.59	23.85	23.80	23.81	23.86
PCS	25	24E	1851.25	23.91	23.91	23.96	23.90	23.91	23.90	23.94
	600	24E	1880	23.94	23.92	23.93	23.94	24.05	23.95	23.96
	1175	24E	1908.75	23.91	23.90	23.88	23.88	23.89	23.91	23.90

Table 9-2
Reduced Conducted Power

Band	Channel	Rule Part	Frequency	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	FCH+SCH	FCH	(RTAP)	(RETAP)
PCS	25	24E	1851.25	20.72	20.74	20.60	20.66
	600	24E	1880	20.78	20.75	20.63	20.63
	1175	24E	1908.75	20.72	20.72	20.58	20.60



Figure 9-1
Power Measurement Setup

Notes:

1. RC1 is only applicable for IS-95 compatibility.
2. For FCC Rule Part 90S, Per FCC KDB Publication 447498 D01v06 4.1.g), only one channel is required since the device operates within the transmission range of 817.90 – 823.10 MHz.
3. CDMA 1x Advanced technology was not required for SAR since the maximum allowed output powers for 1X Advanced was not more than 0.25 dB higher than the maximum powers for 1X.

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9.2 GSM Conducted Powers

Table 9-3
Maximum Conducted Power

Maximum Burst-Averaged Output Power										
		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 850	128	32.03	32.03	29.92	29.01	27.84	26.17	24.45	23.12	21.90
	190	32.04	32.22	30.20	29.32	28.13	26.38	24.73	23.36	22.16
	251	32.11	32.30	30.40	29.29	28.09	26.28	24.42	23.26	22.07
GSM 1900	512	29.22	29.36	27.26	25.07	23.86	25.93	23.68	22.37	21.41
	661	29.09	29.18	27.04	24.91	23.68	25.81	23.52	22.27	21.25
	810	28.96	29.04	26.87	24.79	23.54	25.95	23.69	22.49	21.45

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	23.00	23.00	23.90	24.75	24.83	17.14	18.43	18.86	18.89
	190	23.01	23.19	24.18	25.06	25.12	17.35	18.71	19.10	19.15
	251	23.08	23.27	24.38	25.03	25.08	17.25	18.40	19.00	19.06
GSM 1900	512	20.19	20.33	21.24	20.81	20.85	16.90	17.66	18.11	18.40
	661	20.06	20.15	21.02	20.65	20.67	16.78	17.50	18.01	18.24
	810	19.93	20.01	20.85	20.53	20.53	16.92	17.67	18.23	18.44

GSM 850	Frame	22.97	22.97	23.98	24.74	24.99	17.47	18.48	19.24	18.99
GSM 1900	Avg. Targets:	19.97	19.97	20.98	20.74	20.49	16.47	17.48	17.74	18.49

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Table 9-4
Reduced Conducted Power

Maximum Burst-Averaged Output Power									
		GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	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	26.41	24.53	22.26	20.97	26.43	24.49	22.27	21.98
	661	26.22	24.27	21.93	20.88	26.17	24.25	21.93	20.90
	810	26.03	24.15	22.12	20.52	25.99	24.11	22.10	20.49

Calculated Maximum Frame-Averaged Output Power									
		GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	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	17.38	18.51	18.00	17.96	17.40	18.47	18.01	18.97
	661	17.19	18.25	17.67	17.87	17.14	18.23	17.67	17.89
	810	17.00	18.13	17.86	17.51	16.96	18.09	17.84	17.48

GSM 1900	Frame Avg.Targets:	16.77	17.98	17.74	18.49	16.47	17.48	17.74	18.49
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Note:

- 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.
- 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.
- 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 8PSK modulation do not have an impact on output power.

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



Figure 9-2
Power Measurement Setup

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9.3 UMTS Conducted Powers

Table 9-5
Maximum Conducted Power

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	22.95	22.93	22.94	21.65	21.91	21.89	21.87	21.99	21.78	-
99		12.2 kbps AMR	22.92	22.96	22.93	21.65	21.86	21.86	21.85	21.97	21.76	-
6	HSDPA	Subtest 1	21.56	21.53	21.48	21.34	21.41	21.41	21.58	21.49	21.43	0
6		Subtest 2	21.03	21.40	20.97	20.95	20.99	20.97	21.32	21.22	21.16	0
6		Subtest 3	20.52	20.51	20.45	20.90	21.00	20.99	21.34	21.27	21.24	0.5
6		Subtest 4	20.48	20.56	20.49	20.93	21.05	20.96	21.32	21.19	21.20	0.5
6	HSPA	Subtest 1	20.45	20.45	20.42	20.44	20.42	20.41	20.71	20.59	20.57	0
6		Subtest 2	18.59	18.60	18.55	17.76	17.84	17.79	18.12	17.99	17.95	2
6		Subtest 3	20.45	20.46	20.47	20.31	20.41	20.36	20.70	20.51	20.49	1
6		Subtest 4	18.63	18.60	18.55	17.78	17.85	17.86	18.23	18.05	18.01	2
6		Subtest 5	21.58	21.57	21.51	21.39	21.45	21.41	21.76	21.63	21.54	0

Table 9-6
Reduced Conducted Power

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	20.28	20.53	20.44	18.61	18.74	18.54	-
99		12.2 kbps AMR	20.23	20.45	20.48	18.70	18.69	18.46	-
6	HSDPA	Subtest 1	19.99	20.32	20.34	18.47	18.61	18.36	0
6		Subtest 2	20.19	20.34	20.38	18.46	18.62	18.39	0
6		Subtest 3	20.15	20.32	20.46	18.60	18.65	18.45	0.5
6		Subtest 4	20.14	20.43	20.39	18.51	18.62	18.44	0.5
6	HSPA	Subtest 1	18.93	19.16	19.15	17.55	17.66	17.22	0
6		Subtest 2	17.50	17.59	17.52	17.61	17.67	17.31	2
6		Subtest 3	19.00	19.22	19.19	17.62	17.72	17.21	1
6		Subtest 4	17.51	17.58	17.52	17.59	17.70	17.35	2
6		Subtest 5	20.03	20.37	20.34	18.58	18.67	18.34	0

This device does not support DC-HSDPA.

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

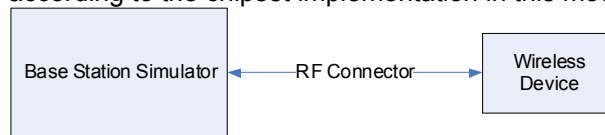


Figure 9-3
Power Measurement Setup

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9.4 LTE Conducted Powers

9.4.1 LTE Band 12

Table 9-7
LTE Band 12 Conducted Powers - 10 MHz Bandwidth

LTE Band 12 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23095 (707.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	24.73	0	0
	1	25	24.84		0
	1	49	24.56		0
	25	0	23.56	0-1	1
	25	12	23.53		1
	25	25	23.50		1
	50	0	23.53		1
16QAM	1	0	23.41	0-1	1
	1	25	23.30		1
	1	49	23.20		1
	25	0	22.56	0-2	2
	25	12	22.52		2
	25	25	22.51		2
	50	0	22.60		2

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

Table 9-8
LTE Band 12 Conducted Powers - 5 MHz Bandwidth

LTE Band 12 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23035 (701.5 MHz)	23095 (707.5 MHz)	23155 (713.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.77	24.65	25.16	0	0
	1	12	24.76	24.61	25.15		0
	1	24	24.79	24.63	24.93		0
	12	0	23.67	23.65	23.87	0-1	1
	12	6	23.63	23.66	23.87		1
	12	13	23.64	23.67	23.87		1
	25	0	23.65	23.65	23.85		1
16QAM	1	0	23.79	23.42	23.92	0-1	1
	1	12	23.69	23.46	23.86		1
	1	24	23.77	23.38	23.87		1
	12	0	22.59	22.65	22.82	0-2	2
	12	6	22.69	22.65	22.79		2
	12	13	22.59	22.63	22.79		2
	25	0	22.64	22.67	22.92		2

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Table 9-9
LTE Band 12 Conducted Powers - 3 MHz Bandwidth

LTE Band 12 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23025 (700.5 MHz)	23095 (707.5 MHz)	23165 (714.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.74	24.80	24.95	0	0
	1	7	24.72	24.77	24.96		0
	1	14	24.73	24.79	24.75		0
	8	0	23.63	23.63	23.84	0-1	1
	8	4	23.63	23.63	23.81		1
	8	7	23.62	23.61	23.82		1
	15	0	23.66	23.63	23.81		1
16QAM	1	0	23.65	23.78	23.65	0-1	1
	1	7	23.78	23.53	23.69		1
	1	14	23.69	23.60	23.75		1
	8	0	22.65	22.64	22.90	0-2	2
	8	4	22.66	22.67	22.87		2
	8	7	22.63	22.65	22.87		2
	15	0	22.67	22.69	22.86		2

Table 9-10
LTE Band 12 Conducted Powers -1.4 MHz Bandwidth

LTE Band 12 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23017 (699.7 MHz)	23095 (707.5 MHz)	23173 (715.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.78	24.76	24.99	0	0
	1	2	24.70	24.77	24.93		0
	1	5	24.78	24.82	24.83		0
	3	0	24.67	24.68	24.98		0
	3	2	24.71	24.69	24.96		0
	3	3	24.71	24.66	24.92		0
	6	0	23.66	23.65	23.88	0-1	1
16QAM	1	0	23.53	23.32	23.59	0-1	1
	1	2	23.48	23.35	23.60		1
	1	5	23.41	23.07	23.49		1
	3	0	23.61	23.60	23.75		1
	3	2	23.66	23.59	23.69		1
	3	3	23.62	23.67	23.65		1
	6	0	22.55	22.73	22.88	0-2	2

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9.4.2

LTE Band 26 (Cell)

Table 9-11
LTE Band 26 (Cell) Conducted Powers - 15 MHz Bandwidth

LTE Band 26 (Cell) 15 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26865 (831.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	24.25	0	0
	1	36	24.39		0
	1	74	24.06		0
	36	0	23.35	0-1	1
	36	18	23.27		1
	36	37	23.26		1
	75	0	23.28		1
16QAM	1	0	23.11	0-1	1
	1	36	23.09		1
	1	74	22.94		1
	36	0	22.38	0-2	2
	36	18	22.35		2
	36	37	22.33		2
	75	0	22.34		2

Note: LTE Band 26 (Cell) at 15 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-12
LTE Band 26 (Cell) Conducted Powers - 10 MHz Bandwidth

LTE Band 26 (Cell) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26740 (819.0 MHz)	26865 (831.5 MHz)	26990 (844.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.50	24.42	24.34	0	0
	1	25	24.47	24.37	24.31		0
	1	49	24.41	24.31	23.97		0
	25	0	23.49	23.50	23.21	0-1	1
	25	12	23.47	23.46	23.20		1
	25	25	23.44	23.44	23.18		1
	50	0	23.44	23.47	23.21		1
16QAM	1	0	23.35	23.26	23.02	0-1	1
	1	25	23.49	23.19	23.35		1
	1	49	23.40	23.35	23.14		1
	25	0	22.50	22.51	22.25	0-2	2
	25	12	22.47	22.48	22.27		2
	25	25	22.47	22.49	22.22		2
	50	0	22.55	22.54	22.19		2

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Table 9-13
LTE Band 26 (Cell) Conducted Powers - 5 MHz Bandwidth

LTE Band 26 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26715 (816.5 MHz)	26865 (831.5 MHz)	27015 (846.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.38	24.41	24.37	0	0
	1	12	24.39	24.42	24.42		0
	1	24	24.39	24.38	24.41		0
	12	0	23.31	23.47	23.26	0-1	1
	12	6	23.29	23.45	23.25		1
	12	13	23.30	23.46	23.23		1
	25	0	23.29	23.45	23.26		1
16QAM	1	0	23.37	23.38	23.09	0-1	1
	1	12	23.34	23.35	23.07		1
	1	24	23.29	23.34	23.17		1
	12	0	22.33	22.59	22.33	0-2	2
	12	6	22.40	22.58	22.29		2
	12	13	22.39	22.51	22.30		2
	25	0	22.38	22.55	22.27		2

Table 9-14
LTE Band 26 (Cell) Conducted Powers - 3 MHz Bandwidth

LTE Band 26 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26705 (815.5 MHz)	26865 (831.5 MHz)	27025 (847.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.50	24.44	24.29	0	0
	1	7	24.51	24.48	24.30		0
	1	14	24.46	24.47	24.27		0
	8	0	23.33	23.41	23.31	0-1	1
	8	4	23.34	23.42	23.29		1
	8	7	23.31	23.43	23.29		1
	15	0	23.36	23.43	23.30		1
16QAM	1	0	23.44	23.35	23.06	0-1	1
	1	7	23.55	23.33	23.08		1
	1	14	23.57	23.31	23.02		1
	8	0	22.42	22.53	22.34	0-2	2
	8	4	22.39	22.51	22.33		2
	8	7	22.38	22.50	22.32		2
	15	0	22.39	22.50	22.37		2

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Table 9-15
LTE Band 26 (Cell) Conducted Powers -1.4 MHz Bandwidth

LTE Band 26 (Cell) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26697 (814.7 MHz)	26865 (831.5 MHz)	27033 (848.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.51	24.57	24.37	0	0
	1	2	24.41	24.54	24.33		0
	1	5	24.49	24.56	24.39		0
	3	0	24.40	24.46	24.41		0
	3	2	24.47	24.50	24.44		0
	3	3	24.48	24.51	24.42		0
	6	0	23.46	23.42	23.41	0-1	1
16QAM	1	0	23.25	23.14	23.18	0-1	1
	1	2	23.20	22.96	23.21		1
	1	5	23.33	23.21	23.25		1
	3	0	23.39	23.53	23.27		1
	3	2	23.37	23.57	23.32		1
	3	3	23.41	23.52	23.32		1
	6	0	22.44	22.55	22.41	0-2	2

9.4.3 LTE Band 4 (AWS)

Table 9-16
LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

LTE Band 4 (AWS) 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20175 (1732.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	23.52	0	0
	1	50	23.56		0
	1	99	23.66		0
	50	0	22.69	0-1	1
	50	25	22.39		1
	50	50	22.41		1
	100	0	22.61		1
16QAM	1	0	22.34	0-1	1
	1	50	22.22		1
	1	99	22.28		1
	50	0	21.59	0-2	2
	50	25	21.36		2
	50	50	21.47		2
	100	0	21.60		2

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

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Table 9-17
LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

LTE Band 4 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20025 (1717.5 MHz)	20175 (1732.5 MHz)	20325 (1747.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.27	23.36	23.24	0	0
	1	36	23.28	23.38	23.31		0
	1	74	23.31	23.35	23.31		0
	36	0	22.32	22.27	22.29	0-1	1
	36	18	22.30	22.29	22.24		1
	36	37	22.31	22.29	22.27		1
	75	0	22.31	22.29	22.26		1
16QAM	1	0	22.35	22.49	22.18	0-1	1
	1	36	22.31	22.47	22.22		1
	1	74	22.41	22.52	22.19		1
	36	0	21.37	21.26	21.31	0-2	2
	36	18	21.38	21.33	21.25		2
	36	37	21.39	21.25	21.29		2
	75	0	21.38	21.23	21.27		2

Table 9-18
LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth

LTE Band 4 (AWS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20000 (1715.0 MHz)	20175 (1732.5 MHz)	20350 (1750.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.27	23.27	23.12	0	0
	1	25	23.29	23.30	23.14		0
	1	49	23.31	23.29	23.17		0
	25	0	22.31	22.29	22.21	0-1	1
	25	12	22.30	22.30	22.25		1
	25	25	22.33	22.30	22.24		1
	50	0	22.32	22.31	22.24		1
16QAM	1	0	22.21	22.07	22.25	0-1	1
	1	25	22.27	22.20	22.27		1
	1	49	22.18	22.21	22.20		1
	25	0	21.38	21.29	21.26	0-2	2
	25	12	21.34	21.27	21.23		2
	25	25	21.40	21.33	21.25		2
	50	0	21.33	21.24	21.23		2

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Table 9-19
LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

LTE Band 4 (AWS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19975 (1712.5 MHz)	20175 (1732.5 MHz)	20375 (1752.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.36	23.18	23.25	0	0
	1	12	23.38	23.24	23.31		0
	1	24	23.39	23.22	23.37		0
	12	0	22.35	22.30	22.24	0-1	1
	12	6	22.34	22.28	22.26		1
	12	13	22.38	22.28	22.27		1
	25	0	22.39	22.28	22.26		1
16QAM	1	0	22.37	22.08	22.32	0-1	1
	1	12	22.40	22.13	22.30		1
	1	24	22.38	22.10	22.29		1
	12	0	21.41	21.16	21.39	0-2	2
	12	6	21.35	21.27	21.33		2
	12	13	21.35	21.32	21.39		2
	25	0	21.39	21.31	21.28		2

Table 9-20
LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

LTE Band 4 (AWS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19965 (1711.5 MHz)	20175 (1732.5 MHz)	20385 (1753.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.35	23.22	23.19	0	0
	1	7	23.38	23.29	23.21		0
	1	14	23.33	23.28	23.23		0
	8	0	22.39	22.26	22.24	0-1	1
	8	4	22.41	22.24	22.25		1
	8	7	22.38	22.27	22.23		1
	15	0	22.38	22.30	22.23		1
16QAM	1	0	22.09	22.15	22.40	0-1	1
	1	7	22.21	22.15	22.37		1
	1	14	22.16	22.21	22.29		1
	8	0	21.45	21.29	21.20	0-2	2
	8	4	21.47	21.27	21.22		2
	8	7	21.48	21.30	21.21		2
	15	0	21.43	21.24	21.31		2

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Table 9-21
LTE Band 4 (AWS) Conducted Powers -1.4 MHz Bandwidth

LTE Band 4 (AWS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19957 (1710.7 MHz)	20175 (1732.5 MHz)	20393 (1754.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.42	23.41	23.30	0	0
	1	2	23.35	23.40	23.28		0
	1	5	23.42	23.42	23.34		0
	3	0	23.45	23.34	23.39		0
	3	2	23.47	23.37	23.40		0
	3	3	23.46	23.34	23.38		0
	6	0	22.44	22.29	22.33	0-1	1
16QAM	1	0	22.15	22.01	22.09	0-1	1
	1	2	22.17	21.96	22.27		1
	1	5	22.16	22.10	22.29		1
	3	0	22.39	22.14	22.33		1
	3	2	22.41	22.15	22.35		1
	3	3	22.40	22.16	22.41		1
	6	0	21.42	21.32	21.44	0-2	2

Table 9-22
LTE Band 4 (AWS) Reduced Conducted Powers - 20 MHz Bandwidth

LTE Band 4 (AWS) 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20175 (1732.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	21.77	0	0
	1	50	21.80		0
	1	99	21.81		0
	50	0	21.82	0-1	0
	50	25	21.84		0
	50	50	21.86		0
	100	0	21.80		0
16QAM	1	0	21.94	0-1	0
	1	50	21.97		0
	1	99	21.98		0
	50	0	21.33	0-2	0.5
	50	25	21.37		0.5
	50	50	21.41		0.5
	100	0	21.40		0.5

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

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Table 9-23
LTE Band 4 (AWS) Reduced Conducted Powers - 15 MHz Bandwidth

LTE Band 4 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20025 (1717.5 MHz)	20175 (1732.5 MHz)	20325 (1747.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	22.10	21.80	21.86	0	0
	1	36	22.04	21.79	21.79		0
	1	74	22.05	21.78	21.75		0
	36	0	22.19	21.95	22.03	0-1	0
	36	18	22.22	21.94	22.01		0
	36	37	22.20	21.90	21.98		0
	75	0	22.19	21.93	22.02		0
16QAM	1	0	22.05	21.91	21.93	0-1	0
	1	36	22.05	21.74	21.89		0
	1	74	21.88	21.70	21.80		0
	36	0	21.83	21.51	21.58	0-2	0.5
	36	18	21.80	21.48	21.54		0.5
	36	37	21.79	21.49	21.51		0.5
	75	0	21.78	21.46	21.50		0.5

Table 9-24
LTE Band 4 (AWS) Reduced Conducted Powers - 10 MHz Bandwidth

LTE Band 4 (AWS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20000 (1715.0 MHz)	20175 (1732.5 MHz)	20350 (1750.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	22.06	21.84	22.14	0	0
	1	25	21.99	21.80	22.10		0
	1	49	22.02	21.79	22.07		0
	25	0	22.13	21.91	22.08	0-1	0
	25	12	22.10	21.92	22.05		0
	25	25	22.11	21.90	22.06		0
	50	0	22.13	21.93	22.07		0
16QAM	1	0	22.02	22.07	21.94	0-1	0
	1	25	21.99	22.06	21.91		0
	1	49	21.95	22.11	21.90		0
	25	0	21.69	21.48	21.59	0-2	0.5
	25	12	21.67	21.47	21.56		0.5
	25	25	21.68	21.43	21.55		0.5
	50	0	21.67	21.45	21.59		0.5

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Table 9-25
LTE Band 4 (AWS) Reduced Conducted Powers - 5 MHz Bandwidth

LTE Band 4 (AWS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19975 (1712.5 MHz)	20175 (1732.5 MHz)	20375 (1752.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	22.02	21.88	22.16	0	0
	1	12	21.99	21.84	22.09		0
	1	24	22.00	21.89	22.15		0
	12	0	22.15	21.92	22.12	0-1	0
	12	6	22.14	21.94	22.11		0
	12	13	22.13	21.95	22.11		0
	25	0	22.14	21.93	22.18		0
16QAM	1	0	21.96	21.67	21.89	0-1	0
	1	12	21.92	21.61	21.89		0
	1	24	21.95	21.68	21.88		0
	12	0	21.59	21.37	21.59	0-2	0.5
	12	6	21.58	21.35	21.55		0.5
	12	13	21.60	21.37	21.60		0.5
	25	0	21.63	21.38	21.69		0.5

Table 9-26
LTE Band 4 (AWS) Reduced Conducted Powers - 3 MHz Bandwidth

LTE Band 4 (AWS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19965 (1711.5 MHz)	20175 (1732.5 MHz)	20385 (1753.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	22.14	21.84	22.07	0	0
	1	7	22.09	21.79	22.05		0
	1	14	22.11	21.82	22.08		0
	8	0	22.15	21.93	22.15	0-1	0
	8	4	22.18	21.94	22.16		0
	8	7	22.17	21.91	22.18		0
	15	0	22.20	21.95	22.19		0
16QAM	1	0	22.03	21.75	22.22	0-1	0
	1	7	22.04	21.76	22.19		0
	1	14	22.08	21.75	22.24		0
	8	0	21.69	21.37	21.61	0-2	0.5
	8	4	21.61	21.35	21.58		0.5
	8	7	21.65	21.34	21.56		0.5
	15	0	21.69	21.46	21.66		0.5

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Table 9-27
LTE Band 4 (AWS) Reduced Conducted Powers -1.4 MHz Bandwidth

LTE Band 4 (AWS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19957 (1710.7 MHz)	20175 (1732.5 MHz)	20393 (1754.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	22.13	21.95	22.11	0	0
	1	2	22.14	21.92	22.14		0
	1	5	22.09	21.93	22.09		0
	3	0	22.18	21.88	22.15		0
	3	2	22.15	21.87	22.16		0
	3	3	22.17	21.85	22.14		0
	6	0	22.19	21.88	22.10		0-1
16QAM	1	0	22.29	21.93	22.01	0-1	0
	1	2	22.24	21.95	22.08		0
	1	5	22.18	21.91	22.07		0
	3	0	22.19	22.09	22.22		0
	3	2	22.18	22.07	22.23		0
	3	3	22.16	22.09	22.27		0
	6	0	21.69	21.55	21.59		0-2

9.4.4 LTE Band 25 (PCS)

Table 9-28
LTE Band 25 (PCS) Conducted Powers - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26140 (1860.0 MHz)	26365 (1882.5 MHz)	26590 (1905.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.04	23.95	23.94	0	0
	1	50	24.03	23.95	23.90		0
	1	99	24.05	23.98	23.90		0
	50	0	22.95	22.91	22.84	0-1	1
	50	25	22.98	22.91	22.81		1
	50	50	22.94	22.86	22.81		1
	100	0	22.97	22.89	22.87		1
16QAM	1	0	22.68	22.63	22.71	0-1	1
	1	50	22.74	22.68	22.61		1
	1	99	22.78	22.68	22.59		1
	50	0	21.96	21.90	21.83	0-2	2
	50	25	21.96	21.92	21.84		2
	50	50	21.99	21.90	21.79		2
	100	0	21.91	21.80	21.80		2

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Table 9-29
LTE Band 25 (PCS) Conducted Powers - 15 MHz Bandwidth

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26115 (1857.5 MHz)	26365 (1882.5 MHz)	26615 (1907.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.00	23.85	23.81	0	0
	1	36	24.00	23.84	23.78		0
	1	74	23.99	23.80	23.74		0
	36	0	22.92	22.79	22.67	0-1	1
	36	18	22.90	22.74	22.62		1
	36	37	22.94	22.77	22.67		1
	75	0	22.87	22.72	22.63		1
16QAM	1	0	22.80	22.66	22.59	0-1	1
	1	36	22.77	22.64	22.57		1
	1	74	22.96	22.80	22.64		1
	36	0	21.98	21.77	21.60	0-2	2
	36	18	21.96	21.76	21.60		2
	36	37	21.97	21.77	21.69		2
	75	0	21.90	21.70	21.62		2

Table 9-30
LTE Band 25 (PCS) Conducted Powers - 10 MHz Bandwidth

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26090 (1855.0 MHz)	26365 (1882.5 MHz)	26640 (1910.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.11	23.87	24.10	0	0
	1	25	24.07	23.85	24.10		0
	1	49	24.04	23.86	24.08		0
	25	0	22.98	22.78	22.94	0-1	1
	25	12	22.98	22.78	22.92		1
	25	25	22.96	22.77	22.94		1
	50	0	22.95	22.77	22.95		1
16QAM	1	0	22.81	22.76	22.85	0-1	1
	1	25	22.80	22.70	22.93		1
	1	49	22.76	22.69	22.94		1
	25	0	22.01	21.82	21.95	0-2	2
	25	12	22.00	21.82	21.96		2
	25	25	21.98	21.79	21.94		2
	50	0	21.97	21.84	21.88		2

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Table 9-31
LTE Band 25 (PCS) Conducted Powers - 5 MHz Bandwidth

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26065 (1852.5 MHz)	26365 (1882.5 MHz)	26665 (1912.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.29	24.16	24.09	0	0
	1	12	24.31	24.15	24.10		0
	1	24	24.32	24.17	24.12		0
	12	0	23.18	22.90	23.03	0-1	1
	12	6	23.20	22.88	23.04		1
	12	13	23.19	22.90	23.02		1
	25	0	23.20	22.89	23.03		1
16QAM	1	0	23.22	22.86	22.90	0-1	1
	1	12	23.14	22.91	22.91		1
	1	24	23.27	22.89	22.90		1
	12	0	22.05	21.85	21.97	0-2	2
	12	6	22.07	21.88	21.95		2
	12	13	22.08	21.86	21.96		2
	25	0	22.13	21.87	21.98		2

Table 9-32
LTE Band 25 (PCS) Conducted Powers - 3 MHz Bandwidth

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26055 (1851.5 MHz)	26365 (1882.5 MHz)	26675 (1913.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.23	24.07	24.11	0	0
	1	7	24.26	24.06	24.10		0
	1	14	24.27	24.05	24.10		0
	8	0	23.21	22.93	22.96	0-1	1
	8	4	23.20	22.92	22.96		1
	8	7	23.21	22.94	22.97		1
	15	0	23.19	22.90	22.94		1
16QAM	1	0	23.28	22.80	22.97	0-1	1
	1	7	23.29	22.78	23.00		1
	1	14	23.27	22.82	22.94		1
	8	0	22.20	21.97	21.95	0-2	2
	8	4	22.21	21.99	21.95		2
	8	7	22.20	21.95	21.94		2
	15	0	22.14	21.86	21.93		2

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Table 9-33
LTE Band 25 (PCS) Conducted Powers -1.4 MHz Bandwidth

LTE Band 25 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26047 (1850.7 MHz)	26365 (1882.5 MHz)	26683 (1914.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.32	24.14	24.09	0	0
	1	2	24.26	24.08	24.10		0
	1	5	24.34	24.11	24.11		0
	3	0	24.14	23.94	23.98		0
	3	2	24.16	23.98	23.99		0
	3	3	24.18	23.95	23.96		0
	6	0	23.22	22.89	22.95	0-1	1
16QAM	1	0	23.14	22.62	22.70	0-1	1
	1	2	22.97	22.66	22.73		1
	1	5	23.13	22.71	22.67		1
	3	0	23.01	22.81	22.74		1
	3	2	23.14	22.78	22.76		1
	3	3	23.12	22.77	22.85		1
	6	0	22.13	21.81	21.83	0-2	2

Table 9-34
LTE Band 25 (PCS) Reduced Conducted Powers - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26140 (1860.0 MHz)	26365 (1882.5 MHz)	26590 (1905.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	20.47	20.45	20.23	0	0
	1	50	20.45	20.43	20.15		0
	1	99	20.44	20.40	20.16		0
	50	0	20.49	20.35	20.26	0-1	0
	50	25	20.46	20.34	20.25		0
	50	50	20.47	20.32	20.23		0
	100	0	20.46	20.31	20.25		0
16QAM	1	0	20.47	20.42	20.23	0-1	0
	1	50	20.45	20.44	20.18		0
	1	99	20.48	20.41	20.12		0
	50	0	20.49	20.35	20.24	0-2	0
	50	25	20.48	20.34	20.22		0
	50	50	20.47	20.33	20.18		0
	100	0	20.49	20.40	20.23		0

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Table 9-35
LTE Band 25 (PCS) Reduced Conducted Powers - 15 MHz Bandwidth

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26115 (1857.5 MHz)	26365 (1882.5 MHz)	26615 (1907.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	20.32	20.24	20.06	0	0
	1	36	20.26	20.16	20.02		0
	1	74	20.23	20.15	20.04		0
	36	0	20.43	20.32	20.30	0-1	0
	36	18	20.36	20.35	20.29		0
	36	37	20.37	20.30	20.26		0
	75	0	20.36	20.31	20.27		0
16QAM	1	0	20.25	20.41	20.15	0-1	0
	1	36	20.20	20.19	20.16		0
	1	74	20.10	20.14	20.10		0
	36	0	20.40	20.37	20.34	0-2	0
	36	18	20.41	20.33	20.35		0
	36	37	20.36	20.33	20.33		0
	75	0	20.38	20.31	20.26		0

Table 9-36
LTE Band 25 (PCS) Reduced Conducted Powers - 10 MHz Bandwidth

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26090 (1855.0 MHz)	26365 (1882.5 MHz)	26640 (1910.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	20.36	20.26	20.41	0	0
	1	25	20.38	20.22	20.35		0
	1	49	20.39	20.25	20.39		0
	25	0	20.47	20.32	20.37	0-1	0
	25	12	20.46	20.33	20.38		0
	25	25	20.44	20.34	20.34		0
	50	0	20.46	20.36	20.36		0
16QAM	1	0	20.32	20.44	20.31	0-1	0
	1	25	20.29	20.39	20.10		0
	1	49	20.28	20.40	20.15		0
	25	0	20.53	20.38	20.38	0-2	0
	25	12	20.50	20.35	20.37		0
	25	25	20.49	20.34	20.34		0
	50	0	20.45	20.37	20.40		0

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Table 9-37
LTE Band 25 (PCS) Reduced Conducted Powers - 5 MHz Bandwidth

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26065 (1852.5 MHz)	26365 (1882.5 MHz)	26665 (1912.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	20.42	20.29	20.55	0	0
	1	12	20.39	20.24	20.50		0
	1	24	20.43	20.28	20.53		0
	12	0	20.59	20.33	20.53	0-1	0
	12	6	20.57	20.26	20.51		0
	12	13	20.55	20.29	20.49		0
	25	0	20.60	20.31	20.57		0
16QAM	1	0	20.41	20.08	20.29	0-1	0
	1	12	20.38	20.09	20.26		0
	1	24	20.44	20.11	20.31		0
	12	0	20.55	20.25	20.42	0-2	0
	12	6	20.51	20.27	20.44		0
	12	13	20.50	20.26	20.47		0
	25	0	20.54	20.27	20.60		0

Table 9-38
LTE Band 25 (PCS) Reduced Conducted Powers - 3 MHz Bandwidth

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26055 (1851.5 MHz)	26365 (1882.5 MHz)	26675 (1913.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	20.49	20.24	20.43	0	0
	1	7	20.45	20.23	20.39		0
	1	14	20.48	20.27	20.44		0
	8	0	20.59	20.29	20.43	0-1	0
	8	4	20.55	20.30	20.46		0
	8	7	20.58	20.31	20.46		0
	15	0	20.60	20.36	20.47		0
16QAM	1	0	20.41	20.48	20.31	0-1	0
	1	7	20.37	20.46	20.28		0
	1	14	20.42	20.50	20.49		0
	8	0	20.56	20.25	20.38	0-2	0
	8	4	20.57	20.24	20.39		0
	8	7	20.53	20.26	20.41		0
	15	0	20.51	20.40	20.52		0

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Table 9-39
LTE Band 25 (PCS) Reduced Conducted Powers -1.4 MHz Bandwidth

LTE Band 25 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26047 (1850.7 MHz)	26365 (1882.5 MHz)	26683 (1914.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	20.63	20.32	20.37	0	0
	1	2	20.62	20.35	20.40		0
	1	5	20.65	20.34	20.38		0
	3	0	20.59	20.36	20.46		0
	3	2	20.62	20.33	20.47		0
	3	3	20.61	20.35	20.43		0
	6	0	20.64	20.34	20.50	0-1	0
16QAM	1	0	20.58	20.33	20.53	0-1	0
	1	2	20.67	20.31	20.49		0
	1	5	20.61	20.34	20.50		0
	3	0	20.69	20.38	20.53		0
	3	2	20.65	20.40	20.54		0
	3	3	20.77	20.37	20.52		0
	6	0	20.74	20.32	20.57	0-2	0

9.4.5 LTE Band 41 PC3

Table 9-40
LTE Band 41 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	24.23	23.94	24.32	24.46	24.20	0	0
	1	50	24.19	23.88	24.25	24.42	24.19		0
	1	99	24.13	23.85	24.21	24.39	24.18		0
	50	0	23.25	23.09	23.38	23.41	23.27	0-1	1
	50	25	23.26	23.06	23.37	23.37	23.26		1
	50	50	23.18	23.02	23.32	23.36	23.25		1
	100	0	23.23	23.08	23.33	23.36	23.25		1
16QAM	1	0	23.03	22.56	23.52	23.20	22.86	0-1	1
	1	50	23.01	22.49	23.46	23.12	22.85		1
	1	99	22.91	22.38	23.42	23.13	22.86		1
	50	0	22.32	22.05	22.39	22.46	22.32	0-2	2
	50	25	22.29	22.04	22.37	22.45	22.29		2
	50	50	22.26	22.02	22.35	22.41	22.31		2
	100	0	22.21	22.02	22.38	22.41	22.27		2

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Table 9-41
LTE Band 41 Conducted Powers - 15 MHz Bandwidth

LTE Band 41 15 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	24.14	23.96	24.44	24.42	24.35	0	0
	1	36	24.10	23.88	24.41	24.38	24.34		0
	1	74	24.04	23.84	24.38	24.36	24.32		0
	36	0	23.30	23.10	23.52	23.58	23.50	0-1	1
	36	18	23.28	23.08	23.50	23.54	23.48		1
	36	37	23.24	23.06	23.48	23.52	23.48		1
	75	0	23.28	23.14	23.52	23.56	23.50		1
16QAM	1	0	23.45	22.46	23.02	23.68	23.60	0-1	1
	1	36	23.38	22.38	22.98	23.64	23.58		1
	1	74	23.32	22.26	22.94	23.63	23.58		1
	36	0	22.32	22.16	22.54	22.50	22.52	0-2	2
	36	18	22.26	22.10	22.50	22.48	22.50		2
	36	37	22.24	22.06	22.48	22.46	22.48		2
	75	0	22.26	22.10	22.52	22.52	22.54		2

Table 9-42
LTE Band 41 Conducted Powers - 10 MHz Bandwidth

LTE Band 41 10 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	24.18	24.16	24.46	24.46	24.58	0	0
	1	25	24.15	24.14	24.44	24.44	24.54		0
	1	49	24.12	24.12	24.44	24.42	24.55		0
	25	0	23.32	23.12	23.50	23.49	23.46	0-1	1
	25	12	23.32	23.10	23.48	23.47	23.44		1
	25	25	23.30	23.10	23.46	23.50	23.44		1
	50	0	23.30	23.08	23.48	23.48	23.43		1
16QAM	1	0	23.18	22.80	23.20	23.41	23.14	0-1	1
	1	25	23.14	22.68	23.16	23.38	23.08		1
	1	49	23.08	22.58	23.14	23.36	23.02		1
	25	0	22.32	22.16	22.56	22.48	22.47	0-2	2
	25	12	22.24	22.12	22.54	22.44	22.45		2
	25	25	22.22	22.14	22.52	22.48	22.46		2
	50	0	22.24	22.10	22.53	22.46	22.42		2

Table 9-43
LTE Band 41 Conducted Powers - 5 MHz Bandwidth

LTE Band 41 5 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	24.20	24.14	24.54	24.44	24.58	0	0
	1	12	24.16	24.10	24.52	24.42	24.52		0
	1	24	24.14	24.12	24.50	24.40	24.54		0
	12	0	23.30	23.12	23.48	23.50	23.46	0-1	1
	12	6	23.32	23.10	23.46	23.48	23.44		1
	12	13	23.28	23.10	23.46	23.48	23.45		1
16QAM	25	0	23.32	23.12	23.48	23.50	23.46	0-1	1
	1	0	22.88	23.02	23.28	23.18	23.30		1
	1	12	22.86	22.98	23.26	23.14	23.36		1
	1	24	22.84	22.96	23.22	23.16	23.30	0-2	1
	12	0	22.28	22.10	22.42	22.50	22.48		2
	12	6	22.26	22.08	22.38	22.54	22.50		2
	12	13	22.28	22.10	22.38	22.48	22.46		2
	25	0	22.34	22.12	22.48	22.52	22.48		2

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LTE Band 41 PC2

Table 9-44
LTE Band 41 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	27.08	26.86	27.26	27.16	27.15	0	0	
	1	50	27.04	26.81	27.22	26.88	27.11		0	
	1	99	26.92	26.74	27.08	26.79	27.00		0	
	50	0	26.09	25.85	26.28	25.91	26.14	0-1	1	
	50	25	26.05	25.79	26.26	25.89	26.13		1	
	50	50	26.02	25.78	26.21	25.85	26.11		1	
16QAM	100	0	26.03	25.81	26.25	25.87	26.16	0-1	1	
	1	0	25.96	25.77	26.22	25.83	26.06		0-1	1
	1	50	25.88	25.72	26.14	25.66	26.08			1
	1	99	25.76	25.64	26.10	25.72	25.99	0-2		1
	50	0	25.14	24.92	25.37	24.97	25.21		2	
	50	25	25.11	24.91	25.34	24.92	25.23		2	
	50	50	25.06	24.88	25.31	24.89	25.20		2	
	100	0	25.08	24.89	25.30	24.93	25.22		2	

Table 9-45
LTE Band 41 Conducted Powers - 15 MHz Bandwidth

LTE Band 41 15 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	27.24	26.91	27.52	27.27	27.37	0	0
	1	36	27.14	26.84	27.42	27.22	27.25		0
	1	74	27.01	26.62	27.26	27.24	27.18		0
	36	0	26.03	25.62	26.31	26.02	26.15	0-1	1
	36	18	25.99	25.72	26.33	26.08	26.31		1
	36	37	25.79	25.67	26.16	26.08	26.13		1
16QAM	75	0	25.89	25.63	26.28	26.03	26.23	0-1	1
	1	0	25.91	25.30	26.14	25.86	25.87		1
	1	36	26.01	25.30	26.21	25.99	25.76		1
	1	74	25.87	25.45	26.12	25.90	25.75	0-2	1
	36	0	25.07	24.66	25.34	25.10	25.09		2
	36	18	25.15	24.62	25.32	25.02	25.12		2
	36	37	24.96	24.72	25.26	25.06	25.05		2
	75	0	24.91	24.73	25.22	25.12	25.16		2

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Table 9-46
LTE Band 41 Conducted Powers - 10 MHz Bandwidth

LTE Band 41 10 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	27.05	26.86	27.51	27.27	27.46	0	0
	1	25	27.01	26.69	27.40	27.23	27.38		0
	1	49	26.80	26.80	27.35	27.12	27.31		0
	25	0	25.96	25.69	26.32	26.11	26.23	0-1	1
	25	12	25.92	25.66	26.29	26.10	26.20		1
	25	25	25.87	25.65	26.24	26.10	26.17		1
16QAM	50	0	25.92	25.65	26.26	26.09	26.18		1
	1	0	25.54	25.45	25.97	25.94	26.02	0-1	1
	1	25	25.58	25.45	26.04	25.79	25.91		1
	1	49	25.57	25.41	26.06	25.87	25.76		1
	25	0	24.96	24.66	25.30	25.09	25.18	0-2	2
	25	12	24.88	24.61	25.26	25.07	25.16		2
	25	25	24.85	24.59	25.23	25.06	25.12		2
	50	0	25.00	24.73	25.33	25.14	25.25		2

Table 9-47
LTE Band 41 Conducted Powers - 5 MHz Bandwidth

LTE Band 41 5 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	26.98	26.81	27.30	27.26	27.22	0	0
	1	12	26.97	26.70	27.29	27.24	27.22		0
	1	24	27.06	26.79	27.34	27.23	27.20		0
	12	0	25.95	25.65	26.29	26.07	26.22	0-1	1
	12	6	25.92	25.64	26.27	26.08	26.23		1
	12	13	25.89	25.66	26.29	26.09	26.07		1
16QAM	25	0	25.97	25.64	26.18	26.16	26.27	0-1	1
	1	0	25.76	25.46	25.99	25.70	25.88		1
	1	12	25.90	25.86	25.90	25.90	25.86		1
	1	24	25.69	25.66	26.01	25.93	25.94	0-2	2
	12	0	25.07	24.60	25.27	25.03	25.23		2
	12	6	25.01	24.68	25.43	25.17	25.15		2
	12	13	24.95	24.62	25.34	25.10	25.17		2
		25	0	24.95	24.73	25.36	25.02	24.99	

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Table 9-48
LTE Band 41 Reduced 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	23.51	23.43	23.77	23.44	23.45	0	0
	1	50	23.43	23.24	23.68	23.39	23.31		0
	1	99	23.36	23.19	23.47	23.38	23.26		0
	50	0	23.30	23.20	23.66	23.22	23.17	0-1	0
	50	25	23.28	23.09	23.61	23.20	23.11		0
	50	50	23.26	23.01	23.54	23.20	23.06		0
	100	0	23.39	23.23	23.60	23.29	23.18		0
16QAM	1	0	23.22	23.19	23.59	23.01	22.99	0-1	0
	1	50	23.39	22.86	23.46	23.10	22.82		0
	1	99	23.19	22.84	23.34	23.21	22.80		0
	50	0	23.45	23.34	23.71	23.51	23.27	0-2	0
	50	25	23.46	23.26	23.68	23.47	23.18		0
	50	50	23.48	23.10	23.61	23.26	23.26		0
	100	0	23.57	23.27	23.60	23.36	23.26		0

Table 9-49
LTE Band 41 Reduced Conducted Powers - 15 MHz Bandwidth

LTE Band 41 15 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	23.59	23.52	23.83	23.54	23.40	0	0
	1	36	23.58	23.32	23.77	23.45	23.36		0
	1	74	23.55	23.24	23.68	23.44	23.28		0
	36	0	23.35	23.25	23.62	23.30	23.22	0-1	0
	36	18	23.36	23.18	23.58	23.29	23.18		0
	36	37	23.36	23.13	23.53	23.28	23.15		0
	75	0	23.36	23.16	23.54	23.26	23.17		0
16QAM	1	0	23.22	23.05	23.29	23.03	22.93	0-1	0
	1	36	23.06	22.94	23.20	22.84	22.69		0
	1	74	22.92	22.92	23.22	22.86	22.71		0
	36	0	23.35	23.24	23.64	23.30	23.23	0-2	0
	36	18	23.34	23.16	23.59	23.25	23.19		0
	36	37	23.33	23.12	23.53	23.23	23.13		0
	75	0	23.38	23.21	23.60	23.31	23.21		0

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Table 9-50
LTE Band 41 Reduced Conducted Powers - 10 MHz Bandwidth

LTE Band 41 10 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	23.67	23.37	23.88	23.50	23.48	0	0
	1	25	23.52	23.23	23.81	23.46	23.33		0
	1	49	23.42	23.26	23.77	23.40	23.36		0
	25	0	23.41	23.24	23.63	23.32	23.24	0-1	0
	25	12	23.38	23.20	23.58	23.29	23.21		0
	25	25	23.37	23.14	23.57	23.29	23.18		0
	50	0	23.38	23.19	23.59	23.31	23.21		0
16QAM	1	0	22.75	22.70	23.20	22.89	22.89	0-1	0
	1	25	22.83	22.71	23.24	22.83	22.81		0
	1	49	22.91	22.76	23.19	23.04	22.75		0
	25	0	23.29	23.14	23.59	23.26	23.15	0-2	0
	25	12	23.29	23.12	23.56	23.25	23.10		0
	25	25	23.28	23.07	23.52	23.22	23.10		0
	50	0	23.47	23.25	23.64	23.33	23.25		0

Table 9-51
LTE Band 41 Reduced Conducted Powers - 5 MHz Bandwidth

LTE Band 41 5 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	23.54	23.38	23.83	23.41	23.42	0	0
	1	12	23.63	23.32	23.80	23.41	23.34		0
	1	24	23.50	23.41	23.77	23.43	23.37		0
	12	0	23.40	23.23	23.64	23.24	23.22	0-1	0
	12	6	23.38	23.23	23.62	23.21	23.25		0
	12	13	23.41	23.21	23.57	23.20	23.11		0
	25	0	23.39	23.15	23.62	23.40	23.25		0
16QAM	1	0	22.97	23.07	23.22	23.06	22.80	0-1	0
	1	12	23.29	23.09	23.24	23.09	22.91		0
	1	24	23.49	23.26	23.20	22.94	22.92		0
	12	0	23.46	23.18	23.79	23.29	23.39	0-2	0
	12	6	23.49	23.34	23.70	23.28	23.42		0
	12	13	23.48	23.26	23.51	23.27	23.17		0
	25	0	23.29	23.10	23.81	23.22	23.24		0

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9.5 WLAN Conducted Powers

Table 9-52
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	18.97	16.62	16.42
2417	2	N/A	18.20	18.26
2437	6	18.71	18.23	18.31
2457	10	N/A	17.92	18.06
2462	11	18.73	16.43	15.89

Table 9-53
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
5180	36	16.41	16.50	16.73
5200	40	18.17	18.05	17.93
5220	44	18.43	18.13	18.17
5240	48	18.21	18.19	18.08
5260	52	17.79	18.15	18.15
5280	56	18.30	18.24	18.14
5300	60	18.19	18.06	18.00
5320	64	16.72	16.61	16.53
5500	100	16.81	16.62	16.78
5520	104	17.91	18.06	18.13
5600	120	18.08	17.81	17.92
5620	124	18.13	17.98	18.08
5720	144	17.83	17.67	17.69
5745	149	17.78	17.79	17.56
5785	157	17.86	17.83	17.72
5805	161	17.74	17.80	17.57
5825	165	16.85	16.44	16.53

Table 9-54
2.4 GHz WLAN Reduced 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	14.58	14.84	14.44
2437	6	14.39	14.02	14.91
2462	11	14.62	14.70	14.33

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Table 9-55
5 GHz WLAN Reduced Average RF Power –

5GHz (40MHz) Conducted Power [dBm]						
Freq [MHz]	Channel	IEEE Transmission Mode		5GHz (80MHz) Conducted Power [dBm]		
		802.11n	802.11ac			
		Average	Average			
5190	38	13.81	13.98	Freq [MHz]	Channel	IEEE Transmission Mode
5230	46	13.91	13.81			802.11ac
5270	54	13.91	13.87			Average
5310	62	13.93	13.92			
5510	102	13.72	13.69	5210	42	11.74
5590	118	13.41	13.43	5290	58	11.31
5630	126	13.25	13.24	5530	106	11.24
5710	142	12.97	13.04	5610	122	12.97
5755	151	12.77	12.77	5690	138	12.74
5795	159	12.97	12.96	5775	155	11.28

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.
- The bolded data rate and channel above were tested for SAR.

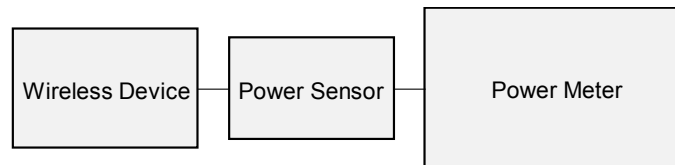


Figure 9-4
Power Measurement Setup

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9.6 Bluetooth Conducted Powers

Table 9-56
Bluetooth Average RF Power

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
			[dBm]	[mW]
2402	1.0	0	7.76	5.973
2441	1.0	39	8.25	6.687
2480	1.0	78	7.66	5.833
2402	2.0	0	6.31	4.278
2441	2.0	39	6.90	4.894
2480	2.0	78	6.12	4.088
2402	3.0	0	6.36	4.325
2441	3.0	39	6.95	4.957
2480	3.0	78	6.10	4.069

Note: The bolded data rates and channel above were tested for SAR.

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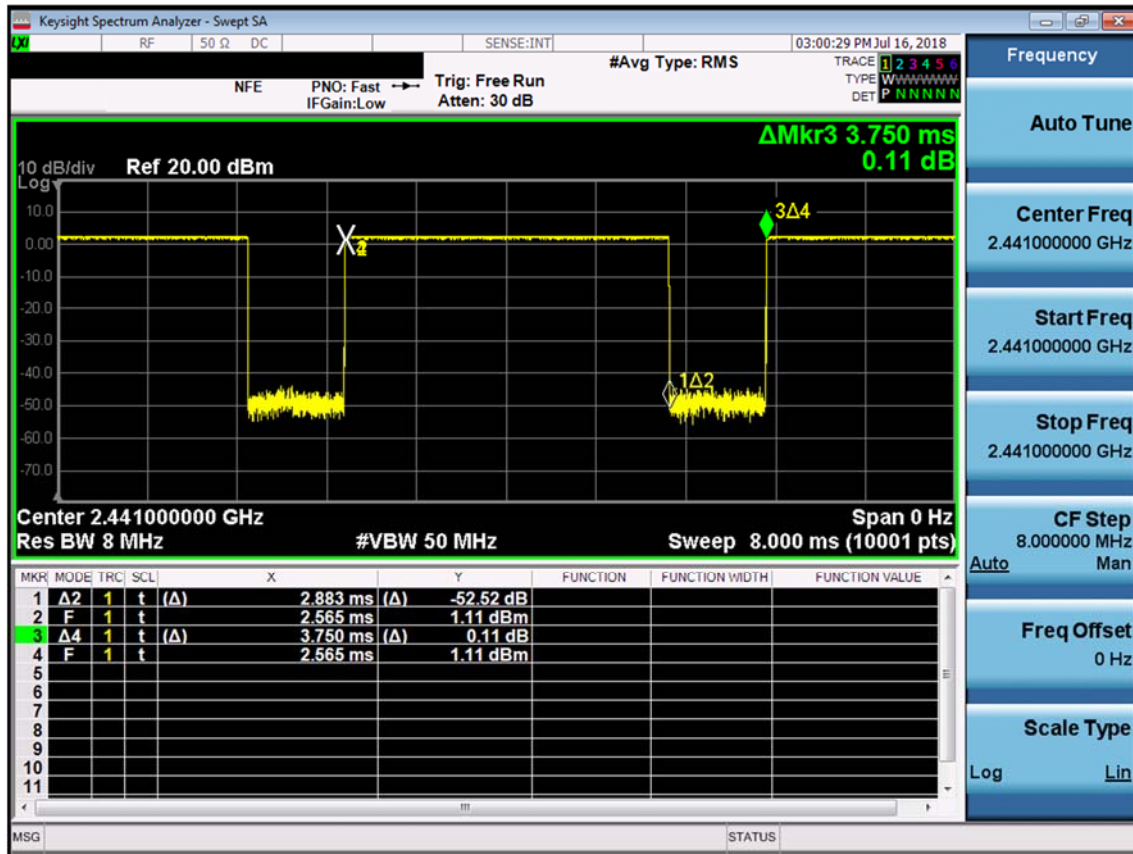


Figure 9-5
Bluetooth Transmission Plot

Equation 9-1
Bluetooth Duty Cycle Calculation

$$\text{Duty Cycle} = \frac{\text{Pulse Width}}{\text{Period}} * 100\% = \frac{2.883\text{ms}}{3.750\text{ms}} * 100\% = 76.9\%$$

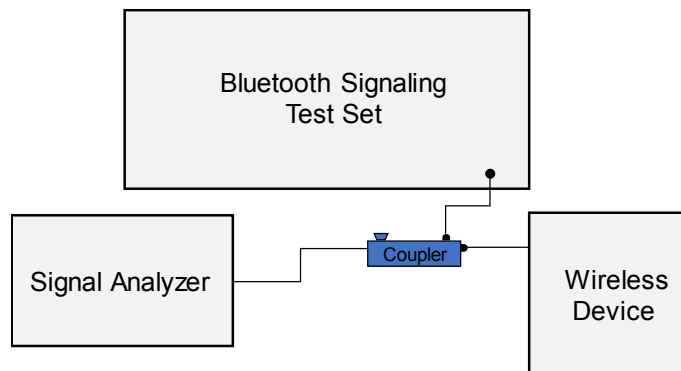


Figure 9-6
Power Measurement Setup

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10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
7/19/2018	750H	21.8	700	0.872	40.624	0.889	42.201	-1.91%	-3.74%
			710	0.877	40.601	0.890	42.149	-1.46%	-3.67%
			740	0.887	40.504	0.893	41.994	-0.67%	-3.55%
			755	0.891	40.498	0.894	41.916	-0.34%	-3.38%
7/16/2018	835H	21.2	820	0.922	41.578	0.899	41.578	2.56%	0.00%
			835	0.927	41.540	0.900	41.500	3.00%	0.10%
			850	0.932	41.497	0.916	41.500	1.75%	-0.01%
7/16/2018	1750H	20.8	1710	1.305	41.233	1.348	40.142	-3.19%	2.72%
			1750	1.331	41.186	1.371	40.079	-2.92%	2.76%
			1790	1.356	41.086	1.394	40.016	-2.73%	2.67%
7/16/2018	1900H	20.8	1850	1.390	41.014	1.400	40.000	-0.71%	2.54%
			1880	1.411	40.995	1.400	40.000	0.79%	2.49%
			1910	1.432	40.905	1.400	40.000	2.29%	2.26%
7/18/2018	1900H	23.2	1850	1.388	39.148	1.400	40.000	-0.86%	-2.13%
			1880	1.406	39.158	1.400	40.000	0.43%	-2.11%
			1910	1.422	39.158	1.400	40.000	1.57%	-2.11%
7/18/2018	2450H	22.8	2400	1.796	39.035	1.756	39.289	2.28%	-0.65%
			2450	1.853	38.837	1.800	39.200	2.94%	-0.93%
			2500	1.909	38.650	1.855	39.136	2.91%	-1.24%
7/23/2018	2450H	22.9	2400	1.753	38.468	1.756	39.289	-0.17%	-2.09%
			2450	1.806	38.267	1.800	39.200	0.33%	-2.38%
			2500	1.861	38.058	1.855	39.136	0.32%	-2.75%
			2550	1.915	37.892	1.909	39.073	0.31%	-3.02%
			2600	1.966	37.691	1.964	39.009	0.10%	-3.38%
			2650	2.020	37.515	2.018	38.945	0.10%	-3.67%
			2700	2.074	37.333	2.073	38.882	0.05%	-3.98%
07/19/2018	5200H-5800H	21.2	5240	4.565	35.819	4.696	35.940	-2.79%	-0.34%
			5260	4.580	35.710	4.717	35.917	-2.90%	-0.58%
			5300	4.620	35.639	4.758	35.871	-2.90%	-0.65%
			5320	4.647	35.577	4.778	35.849	-2.74%	-0.76%
			5600	4.982	35.117	5.065	35.529	-1.64%	-1.16%
			5620	4.960	35.069	5.086	35.506	-2.48%	-1.23%
			5745	5.140	34.864	5.214	35.363	-1.42%	-1.41%
			5765	5.136	34.827	5.234	35.340	-1.87%	-1.45%
			5785	5.174	34.781	5.255	35.317	-1.54%	-1.52%
			5800	5.184	34.766	5.270	35.300	-1.63%	-1.51%

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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
7/23/2018	750B	20.9	700	0.943	53.177	0.959	55.726	-1.67%	-4.57%
			710	0.947	53.152	0.960	55.687	-1.35%	-4.55%
			740	0.958	53.070	0.963	55.570	-0.52%	-4.50%
			755	0.963	53.039	0.964	55.512	-0.10%	-4.45%
7/17/2018	835B	20.5	820	0.997	53.226	0.969	55.258	2.89%	-3.68%
			835	1.003	53.203	0.970	55.200	3.40%	-3.62%
			850	1.009	53.159	0.988	55.154	2.13%	-3.62%
7/20/2018	835B	20.0	820	0.990	53.190	0.969	55.258	2.17%	-3.74%
			835	0.993	53.151	0.970	55.200	2.37%	-3.71%
			850	0.999	53.086	0.988	55.154	1.11%	-3.75%
7/16/2018	1750B	20.4	1710	1.461	51.712	1.463	53.537	-0.14%	-3.41%
			1750	1.490	51.674	1.488	53.432	0.13%	-3.29%
			1790	1.521	51.602	1.514	53.326	0.46%	-3.23%
7/16/2018	1900B	21.4	1850	1.509	51.758	1.520	53.300	-0.72%	-2.89%
			1880	1.541	51.653	1.520	53.300	1.38%	-3.09%
			1910	1.579	51.555	1.520	53.300	3.88%	-3.27%
7/18/2018	1900B	21.8	1850	1.516	51.167	1.520	53.300	-0.26%	-4.00%
			1880	1.549	51.164	1.520	53.300	1.91%	-4.01%
			1910	1.580	51.072	1.520	53.300	3.95%	-4.18%
7/23/2018	1900B	22.8	1850	1.507	52.393	1.520	53.300	-0.86%	-1.70%
			1880	1.542	52.278	1.520	53.300	1.45%	-1.92%
			1910	1.575	52.171	1.520	53.300	3.62%	-2.12%
7/12/2018	2450B	21.6	2400	1.961	50.922	1.902	52.767	3.10%	-3.50%
			2450	2.025	50.739	1.950	52.700	3.85%	-3.72%
			2500	2.078	50.596	2.021	52.636	2.82%	-3.88%
			2550	2.132	50.505	2.092	52.573	1.91%	-3.93%
			2600	2.190	50.319	2.163	52.509	1.25%	-4.17%
			2650	2.253	50.162	2.234	52.445	0.85%	-4.35%
7/18/2018	2450B	21.6	2700	2.305	49.992	2.305	52.382	0.00%	-4.56%
			2400	1.983	51.300	1.902	52.767	4.26%	-2.78%
			2450	2.043	51.145	1.950	52.700	4.77%	-2.95%
			2500	2.102	50.989	2.021	52.636	4.01%	-3.13%
			2550	2.158	50.861	2.092	52.573	3.15%	-3.26%
			2600	2.221	50.688	2.163	52.509	2.68%	-3.47%
7/23/2018	2450B	21.8	2650	2.284	50.561	2.234	52.445	2.24%	-3.59%
			2700	2.343	50.393	2.305	52.382	1.65%	-3.80%
			2450	2.007	50.654	1.950	52.700	2.92%	-3.88%
			2500	2.062	50.487	2.021	52.636	2.03%	-4.08%
			2550	2.121	50.333	2.092	52.573	1.39%	-4.26%
			2600	2.175	50.177	2.163	52.509	0.55%	-4.44%
07/16/2018	5200B-5800B	22.0	2650	2.233	50.018	2.234	52.445	-0.04%	-4.63%
			2700	2.292	49.876	2.305	52.382	-0.56%	-4.78%
			5240	5.434	48.261	5.346	48.960	1.65%	-1.43%
			5260	5.464	48.235	5.369	48.933	1.77%	-1.43%
			5280	5.500	48.202	5.393	48.906	1.98%	-1.44%
			5600	5.915	47.648	5.766	48.471	2.58%	-1.70%
			5620	5.960	47.602	5.790	48.444	2.94%	-1.74%
			5745	6.131	47.422	5.936	48.275	3.29%	-1.77%
			5765	6.168	47.380	5.959	48.248	3.51%	-1.80%
			5785	6.199	47.341	5.982	48.220	3.63%	-1.82%

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.

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10.2 Test System Verification

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

Table 10-2
System Verification Results

SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Source SN	Probe SN	Measured SAR _{1g} (W/kg)	1 W Target SAR _{1g} (W/kg)	1 W Normalized SAR _{1g} (W/kg)	Deviation _{1g} (%)
E	750	HEAD	07/19/2018	22.0	21.8	0.200	1161	3213	1.570	8.170	7.850	-3.92%
E	835	HEAD	07/16/2018	21.9	21.2	0.200	4047	3213	1.950	9.130	9.750	6.79%
H	1750	HEAD	07/16/2018	21.3	20.8	0.100	1148	7409	3.650	36.400	36.500	0.27%
H	1900	HEAD	07/16/2018	23.5	20.8	0.100	50080	7409	3.950	39.300	39.500	0.51%
H	1900	HEAD	07/18/2018	22.2	21.5	0.100	5d149	7409	3.940	39.600	39.400	-0.51%
G	2450	HEAD	07/18/2018	22.7	21.4	0.100	719	3332	5.460	51.900	54.600	5.20%
G	2450	HEAD	07/23/2018	22.2	21.6	0.100	719	3332	5.110	51.900	51.100	-1.54%
G	2600	HEAD	07/23/2018	22.2	21.6	0.100	1071	3332	5.570	56.300	55.700	-1.07%
H	5250	HEAD	07/19/2018	23.5	21.2	0.050	1191	7409	3.920	78.900	78.400	-0.63%
H	5600	HEAD	07/19/2018	23.5	21.2	0.050	1191	7409	3.900	83.600	78.000	-6.70%
H	5750	HEAD	07/19/2018	23.5	21.2	0.050	1191	7409	3.720	79.100	74.400	-5.94%
E	750	BODY	07/23/2018	23.9	20.9	0.200	1161	3213	1.810	8.430	9.050	7.35%
J	835	BODY	07/17/2018	20.3	20.5	0.200	4d133	3347	1.900	9.410	9.500	0.96%
J	835	BODY	07/20/2018	20.1	20.0	0.200	4d133	3347	1.940	9.410	9.700	3.08%
J	1750	BODY	07/16/2018	20.1	20.4	0.100	1008	3347	3.770	37.400	37.700	0.80%
I	1900	BODY	07/16/2018	21.3	21.3	0.100	5d080	7406	4.090	39.100	40.900	4.60%
I	1900	BODY	07/18/2018	24.8	21.9	0.100	5d149	7406	4.160	40.100	41.600	3.74%
I	1900	BODY	07/23/2018	21.8	22.0	0.100	5d141	7406	4.140	40.000	41.400	3.50%
K	2450	BODY	07/12/2018	23.3	21.6	0.100	797	3319	5.390	51.100	53.900	5.48%
K	2600	BODY	07/12/2018	23.3	21.6	0.100	1004	3319	5.580	54.800	55.800	1.82%
K	2450	BODY	07/18/2018	22.4	21.6	0.100	719	3319	5.190	50.100	51.900	3.59%
K	2600	BODY	07/18/2018	22.4	21.6	0.100	1064	3319	5.540	54.700	55.400	1.28%
K	2450	BODY	07/23/2018	22.4	21.8	0.100	797	3319	5.070	51.100	50.700	-0.78%
K	2600	BODY	07/23/2018	22.4	21.8	0.100	1071	3319	5.290	54.200	52.900	-2.40%
D	5250	BODY	07/16/2018	21.7	21.6	0.050	1237	7357	3.540	76.900	70.800	-7.93%
D	5600	BODY	07/16/2018	21.7	21.6	0.050	1237	7357	3.980	78.500	79.600	1.40%
D	5750	BODY	07/16/2018	21.7	21.6	0.050	1237	7357	3.630	77.100	72.600	-5.84%

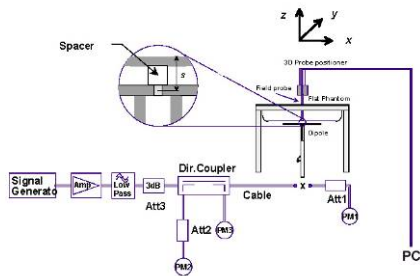


Figure 10-1
System Verification Setup Diagram



Figure 10-2
System Verification Setup Photo

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11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
CDMA BC10 (\$90S) Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
820.10	564	CDMA BC10 (\$90S)	RC3 / SO55	25.3	24.21	0.03	Right	Cheek	27920	1:1	0.113	1.285	0.145	A1
820.10	564	CDMA BC10 (\$90S)	RC3 / SO55	25.3	24.21	-0.05	Right	Tilt	27920	1:1	0.070	1.285	0.090	
820.10	564	CDMA BC10 (\$90S)	RC3 / SO55	25.3	24.21	0.06	Left	Cheek	27920	1:1	0.102	1.285	0.131	
820.10	564	CDMA BC10 (\$90S)	RC3 / SO55	25.3	24.21	0.04	Left	Tilt	27920	1:1	0.066	1.285	0.085	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. A	25.3	24.24	0.00	Right	Cheek	38117	1:1	0.097	1.276	0.124	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. A	25.3	24.24	0.19	Right	Tilt	38117	1:1	0.069	1.276	0.088	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. A	25.3	24.24	0.04	Left	Cheek	38117	1:1	0.090	1.276	0.115	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. A	25.3	24.24	0.04	Left	Tilt	38117	1:1	0.066	1.276	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
CDMA BC0 (\$22H) Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.52	384	CDMA BC0 (\$22H)	RC3 / SO55	25.3	24.30	-0.04	Right	Cheek	27920	1:1	0.118	1.259	0.149	A2
836.52	384	CDMA BC0 (\$22H)	RC3 / SO55	25.3	24.30	0.16	Right	Tilt	27920	1:1	0.072	1.259	0.091	
836.52	384	CDMA BC0 (\$22H)	RC3 / SO55	25.3	24.30	0.00	Left	Cheek	27920	1:1	0.113	1.259	0.142	
836.52	384	CDMA BC0 (\$22H)	RC3 / SO55	25.3	24.30	0.01	Left	Tilt	27920	1:1	0.077	1.259	0.097	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. A	24.8	24.27	0.03	Right	Cheek	38117	1:1	0.114	1.130	0.129	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. A	24.8	24.27	0.02	Right	Tilt	38117	1:1	0.072	1.130	0.081	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. A	24.8	24.27	0.11	Left	Cheek	38117	1:1	0.098	1.130	0.111	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. A	24.8	24.27	0.03	Left	Tilt	38117	1:1	0.070	1.130	0.079	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

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**Table 11-3
PCS CDMA Head SAR**

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	600	PCS CDMA	RC3 / SO55	25.0	23.92	-0.01	Right	Cheek	27938	1:1	0.102	1.282	0.131	
1880.00	600	PCS CDMA	RC3 / SO55	25.0	23.92	0.06	Right	Tilt	27938	1:1	0.051	1.282	0.065	
1880.00	600	PCS CDMA	RC3 / SO55	25.0	23.92	-0.09	Left	Cheek	27938	1:1	0.179	1.282	0.229	
1880.00	600	PCS CDMA	RC3 / SO55	25.0	23.92	0.19	Left	Tilt	27938	1:1	0.060	1.282	0.077	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	23.96	0.03	Right	Cheek	27938	1:1	0.117	1.271	0.149	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	23.96	0.09	Right	Tilt	27938	1:1	0.048	1.271	0.061	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	23.96	0.09	Left	Cheek	27938	1:1	0.180	1.271	0.229	A3
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	23.96	0.21	Left	Tilt	27938	1:1	0.066	1.271	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 11-4
GSM 850 Head SAR**

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.0	32.04	0.03	Right	Cheek	38117	1:8.3	0.110	1.247	0.137	A4
836.60	190	GSM 850	GSM	33.0	32.04	-0.09	Right	Tilt	38117	1:8.3	0.080	1.247	0.100	
836.60	190	GSM 850	GSM	33.0	32.04	0.00	Left	Cheek	38117	1:8.3	0.099	1.247	0.123	
836.60	190	GSM 850	GSM	33.0	32.04	-0.02	Left	Tilt	38117	1:8.3	0.077	1.247	0.096	
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
GSM 1900 Head SAR**

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	661	GSM 1900	GSM	30.0	29.09	0.21	Right	Cheek	27938	1:8.3	0.041	1.233	0.051	
1880.00	661	GSM 1900	GSM	30.0	29.09	0.16	Right	Tilt	27938	1:8.3	0.014	1.233	0.017	
1880.00	661	GSM 1900	GSM	30.0	29.09	-0.03	Left	Cheek	27938	1:8.3	0.074	1.233	0.091	A5
1880.00	661	GSM 1900	GSM	30.0	29.09	-0.06	Left	Tilt	27938	1:8.3	0.023	1.233	0.028	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

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Table 11-6
UMTS 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	24.0	22.93	0.01	Right	Cheek	38117	1:1	0.100	1.279	0.128	A6
836.60	4183	UMTS 850	RMC	24.0	22.93	0.00	Right	Tilt	38117	1:1	0.068	1.279	0.087	
836.60	4183	UMTS 850	RMC	24.0	22.93	0.08	Left	Cheek	38117	1:1	0.080	1.279	0.102	
836.60	4183	UMTS 850	RMC	24.0	22.93	0.00	Left	Tilt	38117	1:1	0.066	1.279	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 11-7
UMTS 1750 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1732.40	1412	UMTS 1750	RMC	23.0	21.91	0.18	Right	Cheek	27938	1:1	0.051	1.285	0.066	
1732.40	1412	UMTS 1750	RMC	23.0	21.91	0.12	Right	Tilt	27938	1:1	0.029	1.285	0.037	
1732.40	1412	UMTS 1750	RMC	23.0	21.91	-0.05	Left	Cheek	27938	1:1	0.124	1.285	0.159	A7
1732.40	1412	UMTS 1750	RMC	23.0	21.91	0.20	Left	Tilt	27938	1:1	0.052	1.285	0.067	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

Table 11-8
UMTS 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	9400	UMTS 1900	RMC	23.0	21.99	0.18	Right	Cheek	27938	1:1	0.069	1.262	0.087	
1880.00	9400	UMTS 1900	RMC	23.0	21.99	0.15	Right	Tilt	27938	1:1	0.026	1.262	0.033	
1880.00	9400	UMTS 1900	RMC	23.0	21.99	-0.02	Left	Cheek	27938	1:1	0.123	1.262	0.155	A8
1880.00	9400	UMTS 1900	RMC	23.0	21.99	0.17	Left	Tilt	27938	1:1	0.039	1.262	0.049	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

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Table 11-9
LTE Band 12 Head SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.														(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.5	24.84	0.19	0	Right	Cheek	QPSK	1	25	27938	1:1	0.079	1.164	0.092
707.50	23095	Mid	LTE Band 12	10	24.5	23.56	0.10	1	Right	Cheek	QPSK	25	0	27938	1:1	0.065	1.242	0.081
707.50	23095	Mid	LTE Band 12	10	25.5	24.84	0.13	0	Right	Tilt	QPSK	1	25	27938	1:1	0.051	1.164	0.059
707.50	23095	Mid	LTE Band 12	10	24.5	23.56	0.00	1	Right	Tilt	QPSK	25	0	27938	1:1	0.037	1.242	0.046
707.50	23095	Mid	LTE Band 12	10	25.5	24.84	0.01	0	Left	Cheek	QPSK	1	25	27938	1:1	0.087	1.164	0.101
707.50	23095	Mid	LTE Band 12	10	24.5	23.56	0.03	1	Left	Cheek	QPSK	25	0	27938	1:1	0.065	1.242	0.081
707.50	23095	Mid	LTE Band 12	10	25.5	24.84	0.01	0	Left	Tilt	QPSK	1	25	27938	1:1	0.056	1.164	0.065
707.50	23095	Mid	LTE Band 12	10	24.5	23.56	0.12	1	Left	Tilt	QPSK	25	0	27938	1:1	0.041	1.242	0.051
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-10
LTE Band 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	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	Mid	LTE Band 26 (Cell)	15	25.5	24.39	-0.07	0	Right	Cheek	QPSK	1	36	38117	1:1	0.112	1.291	0.145
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.35	0.09	1	Right	Cheek	QPSK	36	0	38117	1:1	0.096	1.303	0.125
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.39	0.08	0	Right	Tilt	QPSK	1	36	38117	1:1	0.072	1.291	0.093
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.35	0.10	1	Right	Tilt	QPSK	36	0	38117	1:1	0.062	1.303	0.081
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.39	0.13	0	Left	Cheek	QPSK	1	36	38117	1:1	0.095	1.291	0.123
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.35	0.20	1	Left	Cheek	QPSK	36	0	38117	1:1	0.079	1.303	0.103
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.39	-0.01	0	Left	Tilt	QPSK	1	36	38117	1:1	0.068	1.291	0.088
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.35	0.10	1	Left	Tilt	QPSK	36	0	38117	1:1	0.059	1.303	0.077
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 4 (AWS) Head SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.														(W/kg)		(W/kg)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.8	23.66	0.07	0	Right	Cheek	QPSK	1	99	28084	1:1	0.084	1.300	0.109
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.8	22.69	0.21	1	Right	Cheek	QPSK	50	0	28084	1:1	0.069	1.291	0.089
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.8	23.66	0.15	0	Right	Tilt	QPSK	1	99	28084	1:1	0.032	1.300	0.042
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.8	22.69	0.13	1	Right	Tilt	QPSK	50	0	28084	1:1	0.027	1.291	0.035
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.8	23.66	0.09	0	Left	Cheek	QPSK	1	99	28084	1:1	0.190	1.300	0.247
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.8	22.69	0.07	1	Left	Cheek	QPSK	50	0	28084	1:1	0.150	1.291	0.194
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.8	23.66	0.02	0	Left	Tilt	QPSK	1	99	28084	1:1	0.059	1.300	0.077
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.8	22.69	0.15	1	Left	Tilt	QPSK	50	0	28084	1:1	0.046	1.291	0.059
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram									

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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	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.8	24.05	0.07	0	Right	Cheek	QPSK	1	99	27938	1:1	0.087	1.189	0.103	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.8	22.98	0.01	1	Right	Cheek	QPSK	50	25	27938	1:1	0.070	1.208	0.085	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.8	24.05	0.05	0	Right	Tilt	QPSK	1	99	27938	1:1	0.032	1.189	0.038	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.8	22.98	0.05	1	Right	Tilt	QPSK	50	25	27938	1:1	0.029	1.208	0.035	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.8	24.05	-0.04	0	Left	Cheek	QPSK	1	99	27938	1:1	0.178	1.189	0.212	A12
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.8	22.98	-0.03	1	Left	Cheek	QPSK	50	25	27938	1:1	0.152	1.208	0.184	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.8	24.05	0.16	0	Left	Tilt	QPSK	1	99	27938	1:1	0.061	1.189	0.073	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.8	22.98	0.10	1	Left	Tilt	QPSK	50	25	27938	1:1	0.057	1.208	0.069	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram										

Table 11-13
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	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
	MHz	Ch.	(W/kg)														(W/kg)			
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	25.0	24.46	0.09	0	Right	Cheek	QPSK	1	0	27920	1:1.58	0.050	1.132	0.057	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	24.0	23.41	0.04	1	Right	Cheek	QPSK	50	0	27920	1:1.58	0.035	1.146	0.040	
Power Class 2	2636.50	41055	Mid-High	LTE Band 41	20	28.0	27.16	-0.12	0	Right	Cheek	QPSK	1	0	27920	1:2.31	0.062	1.213	0.075	A13
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	25.0	24.46	-0.15	0	Right	Tilt	QPSK	1	0	27920	1:1.58	0.025	1.132	0.028	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	24.0	23.41	0.12	1	Right	Tilt	QPSK	50	0	27920	1:1.58	0.021	1.146	0.024	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	25.0	24.46	0.18	0	Left	Cheek	QPSK	1	0	27920	1:1.58	0.043	1.132	0.049	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	24.0	23.41	0.09	1	Left	Cheek	QPSK	50	0	27920	1:1.58	0.031	1.146	0.036	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	25.0	24.46	0.08	0	Left	Tilt	QPSK	1	0	27920	1:1.58	0.024	1.132	0.027	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	24.0	23.41	0.20	1	Left	Tilt	QPSK	50	0	27920	1:1.58	0.020	1.146	0.023	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram										

Table 11-14
DTS Head 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	16.0	14.62	0.18	Right	Cheek	40576	1	99.7	0.328	-	1.374	1.003	-	
2462	11	802.11b	DSSS	22	16.0	14.62	0.09	Right	Tilt	40576	1	99.7	0.420	0.392	1.374	1.003	0.540	A14
2462	11	802.11b	DSSS	22	16.0	14.62	0.06	Left	Cheek	40576	1	99.7	0.348	-	1.374	1.003	-	
2462	11	802.11b	DSSS	22	16.0	14.62	0.16	Left	Tilt	40576	1	99.7	0.401	0.341	1.374	1.003	0.470	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram									

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**Table 11-15
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)	
5310	62	802.11n	OFDM	40	14.0	13.93	0.07	Right	Cheek	39735	13.5	96.3	1.638	0.731	1.016	1.038	0.771	
5310	62	802.11n	OFDM	40	14.0	13.93	0.13	Right	Tilt	39735	13.5	96.3	1.921	0.755	1.016	1.038	0.796	A15
5310	62	802.11n	OFDM	40	14.0	13.93	0.20	Left	Cheek	39735	13.5	96.3	0.977	-	1.016	1.038	-	
5310	62	802.11n	OFDM	40	14.0	13.93	0.15	Left	Tilt	39735	13.5	96.3	0.999	-	1.016	1.038	-	
5610	122	802.11ac	OFDM	80	14.0	12.97	0.18	Right	Cheek	39735	29.3	93.3	0.805	0.358	1.268	1.072	0.487	
5610	122	802.11ac	OFDM	80	14.0	12.97	0.11	Right	Tilt	39735	29.3	93.3	1.002	0.367	1.268	1.072	0.499	
5610	122	802.11ac	OFDM	80	14.0	12.97	-0.18	Left	Cheek	39735	29.3	93.3	0.522	-	1.268	1.072	-	
5610	122	802.11ac	OFDM	80	14.0	12.97	-0.17	Left	Tilt	39735	29.3	93.3	0.553	-	1.268	1.072	-	
5795	159	802.11n	OFDM	40	14.0	12.97	0.16	Right	Cheek	39735	13.5	96.3	1.691	0.635	1.268	1.038	0.836	
5755	151	802.11n	OFDM	40	14.0	12.77	-0.16	Right	Cheek	39735	13.5	96.3	1.850	0.699	1.327	1.038	0.963	
5795	159	802.11n	OFDM	40	14.0	12.97	0.13	Right	Tilt	39735	13.5	96.3	2.011	0.629	1.268	1.038	0.828	
5755	151	802.11n	OFDM	40	14.0	12.77	-0.15	Right	Tilt	39735	13.5	96.3	1.682	0.751	1.327	1.038	1.034	
5795	159	802.11n	OFDM	40	14.0	12.97	0.19	Left	Cheek	39735	13.5	96.3	1.363	0.592	1.268	1.038	0.779	
5795	159	802.11n	OFDM	40	14.0	12.97	0.15	Left	Tilt	39735	13.5	96.3	0.954	-	1.268	1.038	-	
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
DSS Head SAR**

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.											(W/kg)				
2441.00	39	Bluetooth	FHSS	9.0	8.25	0.06	Right	Cheek	40576	1	76.9	0.062	1.188	1.300	0.096	
2441.00	39	Bluetooth	FHSS	9.0	8.25	0.10	Right	Tilt	40576	1	76.9	0.070	1.188	1.300	0.108	A16
2441.00	39	Bluetooth	FHSS	9.0	8.25	0.12	Left	Cheek	40576	1	76.9	0.051	1.188	1.300	0.079	
2441.00	39	Bluetooth	FHSS	9.0	8.25	0.07	Left	Tilt	40576	1	76.9	0.066	1.188	1.300	0.102	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram							

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11.2 Standalone Body-Worn SAR Data

Table 11-17
GSM/UMTS/CDMA Body-Worn SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Accessory	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
820.10	564	CDMABC10 (\$90S)	TDSO / SO32	25.3	24.23	-0.01	15 mm	None	28084	1:1	back	0.356	1.279	0.455	A17
836.52	384	CDMABC0 (\$22H)	TDSO / SO32	25.3	24.28	-0.02	15 mm	None	28084	1:1	back	0.250	1.265	0.316	A19
1851.25	25	PCS CDMA	TDSO / SO32	25.0	23.91	-0.02	15 mm	None	27938	1:1	back	0.931	1.285	1.196	
1880.00	600	PCS CDMA	TDSO / SO32	25.0	24.05	0.01	15 mm	None	27938	1:1	back	1.080	1.245	1.345	
1908.75	1175	PCS CDMA	TDSO / SO32	25.0	23.89	0.06	15 mm	None	27938	1:1	back	0.939	1.291	1.212	
1880.00	600	PCS CDMA	TDSO / SO32	25.0	24.05	0.01	15 mm	Headphones	27938	1:1	back	0.625	1.245	0.778	
1880.00	600	PCS CDMA	TDSO / SO32	25.0	24.05	0.00	15 mm	None	27938	1:1	back	1.120	1.245	1.394	A21
836.60	190	GSM 850	GSM	33.0	32.04	-0.09	15 mm	None	38117	1:8.3	back	0.207	1.247	0.258	A23
1880.00	661	GSM 1900	GSM	30.0	29.09	-0.05	15 mm	None	39123	1:8.3	back	0.410	1.233	0.506	A25
836.60	4183	UMTS 850	RMC	24.0	22.93	0.00	15 mm	None	38117	1:1	back	0.175	1.279	0.224	A27
1732.40	1412	UMTS 1750	RMC	23.0	21.91	0.01	15 mm	None	39511	1:1	back	0.200	1.285	0.257	A29
1852.40	9262	UMTS 1900	RMC	23.0	21.87	-0.01	15 mm	None	28084	1:1	back	0.556	1.297	0.721	
1880.00	9400	UMTS 1900	RMC	23.0	21.99	-0.02	15 mm	None	28084	1:1	back	0.636	1.262	0.803	A31
1907.60	9538	UMTS 1900	RMC	23.0	21.78	0.00	15 mm	None	28084	1:1	back	0.587	1.324	0.777	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT							Body								
Spatial Peak							1.6 W/kg (mW/g)								
Uncontrolled Exposure/General Population							averaged over 1 gram								

Blue entry represents variability data.

Table 11-18
LTE FDD Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
707.50	23095	Mid	LTE Band 12	10	25.5	24.84	0.05	0	39511	QPSK	1	25	15 mm	back	1:1	0.269	1.164	0.313	A33
707.50	23095	Mid	LTE Band 12	10	24.5	23.56	-0.01	1	39511	QPSK	25	0	15 mm	back	1:1	0.211	1.242	0.262	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.39	-0.06	0	38117	QPSK	1	36	15 mm	back	1:1	0.213	1.291	0.275	A35
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.35	0.08	1	38117	QPSK	36	0	15 mm	back	1:1	0.184	1.303	0.240	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.8	23.66	0.03	0	38117	QPSK	1	99	15 mm	back	1:1	0.359	1.300	0.467	A37
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.8	22.69	0.03	1	38117	QPSK	50	0	15 mm	back	1:1	0.281	1.291	0.363	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.8	24.05	0.07	0	27938	QPSK	1	99	15 mm	back	1:1	0.936	1.189	1.113	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.8	23.98	0.01	0	27938	QPSK	1	99	15 mm	back	1:1	0.942	1.208	1.138	A39
1905.00	26590	High	LTE Band 25 (PCS)	20	24.8	23.94	0.05	0	27938	QPSK	1	0	15 mm	back	1:1	0.932	1.219	1.136	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.8	22.98	0.02	1	27938	QPSK	50	25	15 mm	back	1:1	0.717	1.208	0.866	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.8	22.91	-0.01	1	27938	QPSK	50	0	15 mm	back	1:1	0.759	1.227	0.931	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.8	22.84	-0.04	1	27938	QPSK	50	0	15 mm	back	1:1	0.716	1.247	0.893	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.8	22.97	-0.02	1	27938	QPSK	100	0	15 mm	back	1:1	0.715	1.211	0.866	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									Body										
Spatial Peak									1.6 W/kg (mW/g)										
Uncontrolled Exposure/General Population									averaged over 1 gram										

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Table 11-19
LTE TDD Body-Worn SAR

MEASUREMENT RESULTS																				
Power Class	FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
	MHz	Ch.														(W/kg)		(W/kg)		
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	25.0	24.46	0.05	0	27920	QPSK	1	0	15 mm	back	1:1.58	0.309	1.132	0.350	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	24.0	23.41	0.01	1	27920	QPSK	50	0	15 mm	back	1:1.58	0.291	1.146	0.333	
Power Class 2	2636.50	41055	Mid-High	LTE Band 41	20	28.0	27.16	-0.09	0	27920	QPSK	1	0	15 mm	back	1:2.31	0.429	1.213	0.520	A41
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									Body											
Spatial Peak									1.6 W/kg (mW/g)											
Uncontrolled Exposure/General Population									averaged over 1 gram											

Table 11-20
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)	
2412	1	802.11b	DSSS	22	20.0	18.97	0.16	15 mm	40576	1	back	99.7	0.127	0.099	1.268	1.003	0.126	A43
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									Body									
Spatial Peak									1.6 W/kg (mW/g)									
Uncontrolled Exposure/General Population									averaged over 1 gram									

Table 11-21
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	19.0	18.30	0.20	15 mm	39735	6	back	98.3	0.076	0.029	1.175	1.017	0.035	
5620	124	802.11a	OFDM	20	19.0	18.13	0.15	15 mm	39735	6	back	98.3	0.203	0.080	1.222	1.017	0.099	A45
5785	157	802.11a	OFDM	20	19.0	17.86	0.12	15 mm	39735	6	back	98.3	0.165	0.064	1.300	1.017	0.085	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body										
Spatial Peak								1.6 W/kg (mW/g)										
Uncontrolled Exposure/General Population								averaged over 1 gram										

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11.3 Standalone Hotspot SAR Data

Table 11-22
GPRS/UMTS/CDMA Hotspot SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.3	24.22	-0.01	10 mm	28084	N/A	1:1	back	0.380	1.282	0.487	A18
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.3	24.22	-0.04	10 mm	28084	N/A	1:1	front	0.269	1.282	0.345	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.3	24.22	0.13	10 mm	28084	N/A	1:1	bottom	0.096	1.282	0.123	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.3	24.22	0.04	10 mm	28084	N/A	1:1	right	0.340	1.282	0.436	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.3	24.22	-0.16	10 mm	28084	N/A	1:1	left	0.236	1.282	0.303	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	24.8	24.25	-0.01	10 mm	28084	N/A	1:1	back	0.329	1.135	0.373	A20
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	24.8	24.25	0.00	10 mm	28084	N/A	1:1	front	0.256	1.135	0.291	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	24.8	24.25	-0.06	10 mm	28084	N/A	1:1	bottom	0.111	1.135	0.126	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	24.8	24.25	-0.01	10 mm	28084	N/A	1:1	right	0.324	1.135	0.368	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	24.8	24.25	-0.10	10 mm	28084	N/A	1:1	left	0.192	1.135	0.218	
1851.25	25	PCS CDMA	EVDO Rev. 0	21.8	20.60	0.05	10 mm	27938	N/A	1:1	back	0.759	1.318	1.000	
1880.00	600	PCS CDMA	EVDO Rev. 0	21.8	20.63	0.00	10 mm	27938	N/A	1:1	back	0.921	1.309	1.206	A22
1908.75	1175	PCS CDMA	EVDO Rev. 0	21.8	20.58	0.17	10 mm	27938	N/A	1:1	back	0.902	1.324	1.194	
1880.00	600	PCS CDMA	EVDO Rev. 0	21.8	20.63	-0.20	10 mm	27938	N/A	1:1	front	0.532	1.309	0.696	
1851.25	25	PCS CDMA	EVDO Rev. 0	21.8	20.60	-0.02	10 mm	27938	N/A	1:1	bottom	0.573	1.318	0.755	
1880.00	600	PCS CDMA	EVDO Rev. 0	21.8	20.63	-0.06	10 mm	27938	N/A	1:1	bottom	0.742	1.309	0.971	
1908.75	1175	PCS CDMA	EVDO Rev. 0	21.8	20.58	0.04	10 mm	27938	N/A	1:1	bottom	0.825	1.324	1.092	
1880.00	600	PCS CDMA	EVDO Rev. 0	21.8	20.63	0.13	10 mm	27938	N/A	1:1	right	0.073	1.309	0.096	
1880.00	600	PCS CDMA	EVDO Rev. 0	21.8	20.63	0.15	10 mm	27938	N/A	1:1	left	0.111	1.309	0.145	
836.60	190	GSM 850	GPRS	29.0	28.13	-0.01	10 mm	38117	4	1:2.076	back	0.259	1.222	0.316	A24
836.60	190	GSM 850	GPRS	29.0	28.13	-0.06	10 mm	38117	4	1:2.076	front	0.162	1.222	0.198	
836.60	190	GSM 850	GPRS	29.0	28.13	0.02	10 mm	38117	4	1:2.076	bottom	0.074	1.222	0.090	
836.60	190	GSM 850	GPRS	29.0	28.13	-0.01	10 mm	38117	4	1:2.076	right	0.215	1.222	0.263	
836.60	190	GSM 850	GPRS	29.0	28.13	-0.10	10 mm	38117	4	1:2.076	left	0.145	1.222	0.177	
1880.00	661	GSM 1900	GPRS	22.5	20.88	0.07	10 mm	39123	4	1:2.076	back	0.288	1.452	0.418	A26
1880.00	661	GSM 1900	GPRS	22.5	20.88	-0.04	10 mm	39123	4	1:2.076	front	0.160	1.452	0.232	
1880.00	661	GSM 1900	GPRS	22.5	20.88	0.02	10 mm	39123	4	1:2.076	bottom	0.276	1.452	0.401	
1880.00	661	GSM 1900	GPRS	22.5	20.88	0.07	10 mm	39123	4	1:2.076	right	0.028	1.452	0.041	
1880.00	661	GSM 1900	GPRS	22.5	20.88	0.02	10 mm	39123	4	1:2.076	left	0.056	1.452	0.081	
836.60	4183	UMTS 850	RMC	24.0	22.93	-0.06	10 mm	38117	N/A	1:1	back	0.208	1.279	0.266	A28
836.60	4183	UMTS 850	RMC	24.0	22.93	0.01	10 mm	38117	N/A	1:1	front	0.121	1.279	0.155	
836.60	4183	UMTS 850	RMC	24.0	22.93	-0.03	10 mm	38117	N/A	1:1	bottom	0.061	1.279	0.078	
836.60	4183	UMTS 850	RMC	24.0	22.93	-0.10	10 mm	38117	N/A	1:1	right	0.165	1.279	0.211	
836.60	4183	UMTS 850	RMC	24.0	22.93	-0.06	10 mm	38117	N/A	1:1	left	0.099	1.279	0.127	
1732.40	1412	UMTS 1750	RMC	21.5	20.53	0.11	10 mm	39511	N/A	1:1	back	0.267	1.250	0.334	A30
1732.40	1412	UMTS 1750	RMC	21.5	20.53	-0.01	10 mm	39511	N/A	1:1	front	0.150	1.250	0.188	
1732.40	1412	UMTS 1750	RMC	21.5	20.53	0.10	10 mm	39511	N/A	1:1	bottom	0.206	1.250	0.258	
1732.40	1412	UMTS 1750	RMC	21.5	20.53	0.06	10 mm	39511	N/A	1:1	right	0.031	1.250	0.039	
1732.40	1412	UMTS 1750	RMC	21.5	20.53	0.03	10 mm	39511	N/A	1:1	left	0.066	1.250	0.083	
1852.40	9262	UMTS 1900	RMC	19.8	18.61	-0.11	10 mm	28084	N/A	1:1	back	0.526	1.315	0.692	
1880.00	9400	UMTS 1900	RMC	19.8	18.74	-0.02	10 mm	28084	N/A	1:1	back	0.614	1.276	0.783	A32
1907.60	9538	UMTS 1900	RMC	19.8	18.54	-0.05	10 mm	28084	N/A	1:1	back	0.612	1.337	0.818	
1880.00	9400	UMTS 1900	RMC	19.8	18.74	0.04	10 mm	28084	N/A	1:1	front	0.336	1.276	0.429	
1880.00	9400	UMTS 1900	RMC	19.8	18.74	-0.01	10 mm	28084	N/A	1:1	bottom	0.471	1.276	0.601	
1880.00	9400	UMTS 1900	RMC	19.8	18.74	0.10	10 mm	28084	N/A	1:1	right	0.050	1.276	0.064	
1880.00	9400	UMTS 1900	RMC	19.8	18.74	-0.01	10 mm	28084	N/A	1:1	left	0.061	1.276	0.078	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT							Body								
Spatial Peak							1.6 W/kg (mW/g)								
Uncontrolled Exposure/General Population							averaged over 1 gram								

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Table 11-23
LTE Band 12 Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
707.50	23095	Mid	LTE Band 12	10	25.5	24.84	0.01	0	39511	QPSK	1	25	10 mm	back	1:1	0.347	1.164	0.404	A34
707.50	23095	Mid	LTE Band 12	10	24.5	23.56	-0.02	1	39511	QPSK	25	0	10 mm	back	1:1	0.267	1.242	0.332	
707.50	23095	Mid	LTE Band 12	10	25.5	24.84	-0.02	0	39511	QPSK	1	25	10 mm	front	1:1	0.202	1.164	0.235	
707.50	23095	Mid	LTE Band 12	10	24.5	23.56	0.03	1	39511	QPSK	25	0	10 mm	front	1:1	0.152	1.242	0.189	
707.50	23095	Mid	LTE Band 12	10	25.5	24.84	-0.02	0	39511	QPSK	1	25	10 mm	bottom	1:1	0.061	1.164	0.071	
707.50	23095	Mid	LTE Band 12	10	24.5	23.56	-0.05	1	39511	QPSK	25	0	10 mm	bottom	1:1	0.048	1.242	0.060	
707.50	23095	Mid	LTE Band 12	10	25.5	24.84	-0.02	0	39511	QPSK	1	25	10 mm	right	1:1	0.220	1.164	0.256	
707.50	23095	Mid	LTE Band 12	10	24.5	23.56	-0.02	1	39511	QPSK	25	0	10 mm	right	1:1	0.181	1.242	0.225	
707.50	23095	Mid	LTE Band 12	10	25.5	24.84	0.02	0	39511	QPSK	1	25	10 mm	left	1:1	0.209	1.164	0.243	
707.50	23095	Mid	LTE Band 12	10	24.5	23.56	-0.01	1	39511	QPSK	25	0	10 mm	left	1:1	0.169	1.242	0.210	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body											
Spatial Peak								1.6 W/kg (mW/g)											
Uncontrolled Exposure/General Population								averaged over 1 gram											

Table 11-24
LTE Band 26 (Cell) Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.39	-0.15	0	38117	QPSK	1	36	10 mm	back	1:1	0.232	1.291	0.300	A36
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.35	0.02	1	38117	QPSK	36	0	10 mm	back	1:1	0.189	1.303	0.246	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.39	-0.03	0	38117	QPSK	1	36	10 mm	front	1:1	0.141	1.291	0.182	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.35	0.13	1	38117	QPSK	36	0	10 mm	front	1:1	0.126	1.303	0.164	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.39	-0.03	0	38117	QPSK	1	36	10 mm	bottom	1:1	0.071	1.291	0.092	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.35	0.07	1	38117	QPSK	36	0	10 mm	bottom	1:1	0.060	1.303	0.078	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.39	-0.15	0	38117	QPSK	1	36	10 mm	right	1:1	0.202	1.291	0.261	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.35	-0.06	1	38117	QPSK	36	0	10 mm	right	1:1	0.172	1.303	0.224	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.39	0.05	0	38117	QPSK	1	36	10 mm	left	1:1	0.111	1.291	0.143	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.35	0.12	1	38117	QPSK	36	0	10 mm	left	1:1	0.107	1.303	0.139	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body 1.6 W/kg (mW/g) averaged over 1 gram											
Spatial Peak																			
Uncontrolled Exposure/General Population																			

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Table 11-25
LTE Band 4 (AWS) Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.81	0.05	0	38117	QPSK	1	99	10 mm	back	1:1	0.480	1.315	0.631	A38
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.86	0.08	0	38117	QPSK	50	50	10 mm	back	1:1	0.473	1.300	0.615	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.81	-0.06	0	38117	QPSK	1	99	10 mm	front	1:1	0.248	1.315	0.326	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.86	-0.03	0	38117	QPSK	50	50	10 mm	front	1:1	0.245	1.300	0.319	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.81	-0.12	0	38117	QPSK	1	99	10 mm	bottom	1:1	0.438	1.315	0.576	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.86	0.01	0	38117	QPSK	50	50	10 mm	bottom	1:1	0.430	1.300	0.559	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.81	-0.03	0	38117	QPSK	1	99	10 mm	right	1:1	0.055	1.315	0.072	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.86	0.03	0	38117	QPSK	50	50	10 mm	right	1:1	0.051	1.300	0.066	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.81	-0.07	0	38117	QPSK	1	99	10 mm	left	1:1	0.106	1.315	0.139	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.86	0.01	0	38117	QPSK	50	50	10 mm	left	1:1	0.101	1.300	0.131	
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 25 (PCS) Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.3	20.47	0.02	0	27938	QPSK	1	0	10 mm	back	1:1	0.794	1.211	0.962	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	21.3	20.45	0.04	0	27938	QPSK	1	0	10 mm	back	1:1	0.886	1.216	1.077	
1905.00	26590	High	LTE Band 25 (PCS)	20	21.3	20.23	0.04	0	27938	QPSK	1	0	10 mm	back	1:1	0.905	1.279	1.157	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.3	20.49	0.08	0	27938	QPSK	50	0	10 mm	back	1:1	0.815	1.205	0.982	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	21.3	20.35	0.04	0	27938	QPSK	50	0	10 mm	back	1:1	0.915	1.245	1.139	A40
1905.00	26590	High	LTE Band 25 (PCS)	20	21.3	20.26	0.00	0	27938	QPSK	50	0	10 mm	back	1:1	0.906	1.271	1.152	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.3	20.46	-0.03	0	27938	QPSK	100	0	10 mm	back	1:1	0.843	1.213	1.023	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.3	20.47	0.06	0	27938	QPSK	1	0	10 mm	front	1:1	0.459	1.211	0.556	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.3	20.49	0.09	0	27938	QPSK	50	0	10 mm	front	1:1	0.475	1.205	0.572	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.3	20.47	-0.02	0	27938	QPSK	1	0	10 mm	bottom	1:1	0.629	1.211	0.762	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.3	20.49	0.02	0	27938	QPSK	50	0	10 mm	bottom	1:1	0.643	1.205	0.775	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.3	20.47	0.09	0	27938	QPSK	1	0	10 mm	right	1:1	0.080	1.211	0.097	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.3	20.49	0.08	0	27938	QPSK	50	0	10 mm	right	1:1	0.077	1.205	0.093	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.3	20.47	0.11	0	27938	QPSK	1	0	10 mm	left	1:1	0.113	1.211	0.137	
1860.00	26140	Low	LTE Band 25 (PCS)	20	21.3	20.49	0.02	0	27938	QPSK	50	0	10 mm	left	1:1	0.110	1.205	0.133	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak								Body 1.6 W/kg (mW/g) averaged over 1 gram											
Uncontrolled Exposure/General Population																			

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Table 11-27
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]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR	Plot #	
	MHz	Ch.														(W/kg)		(W/kg)		
Power Class 3	2506.00	39750	Low	LTE Band 41	20	25.0	24.23	-0.05	0	27920	QPSK	1	0	10 mm	back	1:1.58	0.899	1.194	1.073	
Power Class 3	2549.50	40185	Low-Mid	LTE Band 41	20	25.0	23.94	-0.04	0	27920	QPSK	1	0	10 mm	back	1:1.58	0.796	1.276	1.016	
Power Class 3	2593.00	40620	Mid	LTE Band 41	20	25.0	24.32	0.01	0	27920	QPSK	1	0	10 mm	back	1:1.58	0.821	1.169	0.960	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	25.0	24.46	-0.03	0	27920	QPSK	1	0	10 mm	back	1:1.58	0.742	1.132	0.840	
Power Class 3	2680.00	41490	High	LTE Band 41	20	25.0	24.20	-0.03	0	27920	QPSK	1	0	10 mm	back	1:1.58	0.739	1.202	0.888	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	24.0	23.26	-0.02	1	27920	QPSK	50	25	10 mm	back	1:1.58	0.689	1.186	0.817	
Power Class 3	2549.50	40185	Low-Mid	LTE Band 41	20	24.0	23.09	-0.05	1	27920	QPSK	50	0	10 mm	back	1:1.58	0.606	1.233	0.747	
Power Class 3	2593.00	40620	Mid	LTE Band 41	20	24.0	23.38	-0.01	1	27920	QPSK	50	0	10 mm	back	1:1.58	0.620	1.153	0.715	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	24.0	23.41	0.08	1	27920	QPSK	50	0	10 mm	back	1:1.58	0.581	1.146	0.666	
Power Class 3	2680.00	41490	High	LTE Band 41	20	24.0	23.27	-0.07	1	27920	QPSK	50	0	10 mm	back	1:1.58	0.582	1.183	0.689	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	24.0	23.36	0.02	1	27920	QPSK	100	0	10 mm	back	1:1.58	0.570	1.159	0.661	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	25.0	24.46	-0.05	0	27920	QPSK	1	0	10 mm	front	1:1.58	0.387	1.132	0.438	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	24.0	23.41	-0.03	1	27920	QPSK	50	0	10 mm	front	1:1.58	0.312	1.146	0.358	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	25.0	24.23	0.03	0	27920	QPSK	1	0	10 mm	bottom	1:1.58	1.170	1.194	1.397	A42
Power Class 3	2549.50	40185	Low-Mid	LTE Band 41	20	25.0	23.94	0.00	0	27920	QPSK	1	0	10 mm	bottom	1:1.58	0.986	1.276	1.258	
Power Class 3	2593.00	40620	Mid	LTE Band 41	20	25.0	24.32	-0.12	0	27920	QPSK	1	0	10 mm	bottom	1:1.58	1.020	1.169	1.192	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	25.0	24.46	-0.01	0	27920	QPSK	1	0	10 mm	bottom	1:1.58	0.985	1.132	1.115	
Power Class 3	2680.00	41490	High	LTE Band 41	20	25.0	24.20	0.00	0	27920	QPSK	1	0	10 mm	bottom	1:1.58	0.969	1.202	1.165	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	24.0	23.26	-0.09	1	27920	QPSK	50	25	10 mm	bottom	1:1.58	0.953	1.186	1.130	
Power Class 3	2549.50	40185	Low-Mid	LTE Band 41	20	24.0	23.09	-0.15	1	27920	QPSK	50	0	10 mm	bottom	1:1.58	0.799	1.233	0.985	
Power Class 3	2593.00	40620	Mid	LTE Band 41	20	24.0	23.38	-0.16	1	27920	QPSK	50	0	10 mm	bottom	1:1.58	0.800	1.153	0.922	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	24.0	23.41	0.00	1	27920	QPSK	50	0	10 mm	bottom	1:1.58	0.799	1.146	0.916	
Power Class 3	2680.00	41490	High	LTE Band 41	20	24.0	23.27	-0.09	1	27920	QPSK	50	0	10 mm	bottom	1:1.58	0.789	1.183	0.933	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	24.0	23.36	-0.11	1	27920	QPSK	100	0	10 mm	bottom	1:1.58	0.757	1.159	0.877	
Power Class 2	2506.00	39750	Low	LTE Band 41	20	24.5	23.51	-0.12	0	27920	QPSK	1	0	10 mm	bottom	1:2.31	0.646	1.256	0.811	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	25.0	24.46	0.11	0	27920	QPSK	1	0	10 mm	right	1:1.58	0.075	1.132	0.085	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	24.0	23.41	0.16	1	27920	QPSK	50	0	10 mm	right	1:1.58	0.058	1.146	0.066	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	25.0	24.46	0.03	0	27920	QPSK	1	0	10 mm	left	1:1.58	0.120	1.132	0.136	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	24.0	23.41	0.17	1	27920	QPSK	50	0	10 mm	left	1:1.58	0.092	1.146	0.105	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	25.0	24.23	-0.04	0	27920	QPSK	1	0	10 mm	bottom	1:1.58	1.160	1.194	1.385	
Power Class 3	2593.00	40620	Mid	LTE Band 41	20	25.0	24.32	-0.06	0	27920	QPSK	1	0	10 mm	bottom	1:1.58	1.010	1.169	1.181	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									Body											
Spatial Peak									1.6 W/kg (mW/g)											
Uncontrolled Exposure/General Population									averaged over 1 gram											

Blue entries represent variability data.

Table 11-28
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 W/kg	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																	
2412	1	802.11b	DSSS	22	20.0	18.97	0.12	10 mm	40576	1	back	99.7	0.241	-	1.268	1.003	-	
2412	1	802.11b	DSSS	22	20.0	18.97	-0.19	10 mm	40576	1	front	99.7	0.174	-	1.268	1.003	-	
2412	1	802.11b	DSSS	22	20.0	18.97	0.12	10 mm	40576	1	top	99.7	0.320	0.290	1.268	1.003	0.369	A44
2412	1	802.11b	DSSS	22	20.0	18.97	0.12	10 mm	40576	1	right	99.7	0.024	-	1.268	1.003	-	
2412	1	802.11b	DSSS	22	20.0	18.97	0.19	10 mm	40576	1	left	99.7	0.041	-	1.268	1.003	-	
5785	157	802.11a	OFDM	20	19.0	17.86	0.12	10 mm	39735	6	back	98.3	0.327	0.123	1.300	1.017	0.163	
5785	157	802.11a	OFDM	20	19.0	17.86	-0.20	10 mm	39735	6	front	98.3	0.841	0.353	1.300	1.017	0.467	A46
5785	157	802.11a	OFDM	20	19.0	17.86	-0.14	10 mm	39735	6	top	98.3	0.758	0.309	1.300	1.017	0.409	
5785	157	802.11a	OFDM	20	19.0	17.86	0.19	10 mm	39735	6	right	98.3	0.076	-	1.300	1.017	-	
5785	157	802.11a	OFDM	20	19.0	17.86	0.20	10 mm	39735	6	left	98.3	0.099	-	1.300	1.017	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									Body									
Spatial Peak									1.6 W/kg (mW/g)									
Uncontrolled Exposure/General Population									averaged over 1 gram									

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11.4 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Body-worn SAR was additionally evaluated using a headset cable when the standalone report body-worn SAR was ≥ 1.2 W/kg.
8. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 13 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).
10. This device utilizes power reduction for some wireless modes and technologies, as outlined in Section 1.3. The maximum output power allowed for each transmitter and exposure condition was evaluated for SAR compliance based on expected use conditions and simultaneous transmission scenarios.

GSM Test Notes:

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

CDMA Notes:

1. Head SAR for CDMA2000 mode was tested under RC3/SO55 per FCC KDB Publication 941225 D01v03r01.
2. Body-Worn SAR was tested with 1x RTT with TDSO / SO32 FCH Only. EVDO Rev0 and RevA and TDSO / SO32 FCH+SCH SAR tests were not required per the 3G SAR Test Reduction Procedure in FCC KDB Publication 941225 D01v03r01.
3. CDMA Wireless Router SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0 according to KDB 941225 D01v03r01 procedures for data devices. Wireless Router SAR tests for Subtype 2 of Rev.A and 1x RTT configurations were not required per the 3G SAR Test Reduction Policy in KDB Publication 941225 D01v03r01.

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4. Head SAR was additionally evaluated using EVDO Rev. A to determine compliance for VoIP operations.
5. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel was used.
6. CDMA 1X Advanced technology was not required for SAR since the maximum allowed output powers for 1X Advanced was not more than 0.25 dB higher than the maximum powers for 1X.

UMTS Notes:

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

LTE Notes:

1. LTE Considerations: 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 8.6.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 and MCC=001 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
4. Per FCC KDB Publication 447498 D01v06, when the reported LTE Band 41 SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for 1g evaluations, testing at the other channels was required for such test configurations.
5. TDD LTE was tested per the guidance provided in FCC KDB Publication 941225 D05v02r04. Testing was performed using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.
6. Per KDB Publication 941225 D05Av01r02, SAR for downlink only LTE CA operations was not needed since the maximum average output power in LTE CA mode was not > 0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.
7. 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 14 for linearity results.

WLAN Notes:

1. For held-to-ear and hotspot 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

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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 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 8.7.5 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 8.7.6 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.

Bluetooth Notes

1. Bluetooth SAR was measured with the device connected to a call box with hopping disabled with DH5 operation and Tx Tests test mode type. Per October 2016 TCB Workshop Notes, the reported SAR was scaled to the 100% transmission duty factor to determine compliance. See Section 9.6 for the time domain plot and calculation for the duty factor of the device.

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12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

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

12.2 Simultaneous Transmission Procedures

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

When standalone SAR is not required to be measured, per FCC KDB 447498 D01v06 4.3.2 b), the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

$$\text{Estimated SAR} = \frac{\sqrt{f(\text{GHz})}}{7.5} * \frac{(\text{Max Power of channel, mW})}{\text{Min. Separation Distance, mm}}$$

Table 12-1
Estimated SAR

Mode	Frequency	Maximum Allowed Power	Separation Distance (Body Worn)	Estimated SAR (Body Worn)	Separation Distance (Hotspot)	Estimated SAR (Hotspot)
	[MHz]	[dBm]	[mm]	[W/kg]	[mm]	[W/kg]
Bluetooth	2480	9.00	15	0.112	10	0.168

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

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12.3 Head SAR Simultaneous Transmission Analysis

Table 12-2
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	CDMA/EVDO BC10 (§90S)	0.145	0.540	0.685
	CDMA/EVDO BC0 (§22H)	0.149	0.540	0.689
	PCS CDMA/EVDO	0.229	0.540	0.769
	GSM 850	0.137	0.540	0.677
	GSM 1900	0.091	0.540	0.631
	UMTS 850	0.128	0.540	0.668
	UMTS 1750	0.159	0.540	0.699
	UMTS 1900	0.155	0.540	0.695
	LTE Band 12	0.101	0.540	0.641
	LTE Band 26 (Cell)	0.145	0.540	0.685
	LTE Band 4 (AWS)	0.247	0.540	0.787
	LTE Band 25 (PCS)	0.212	0.540	0.752
	LTE Band 41	0.075	0.540	0.615

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	CDMA/EVDO BC10 (§90S)	0.145	1.034	1.179
	CDMA/EVDO BC0 (§22H)	0.149	1.034	1.183
	PCS CDMA/EVDO	0.229	1.034	1.263
	GSM 850	0.137	1.034	1.171
	GSM 1900	0.091	1.034	1.125
	UMTS 850	0.128	1.034	1.162
	UMTS 1750	0.159	1.034	1.193
	UMTS 1900	0.155	1.034	1.189
	LTE Band 12	0.101	1.034	1.135
	LTE Band 26 (Cell)	0.145	1.034	1.179
	LTE Band 4 (AWS)	0.247	1.034	1.281
	LTE Band 25 (PCS)	0.212	1.034	1.246
	LTE Band 41	0.075	1.034	1.109

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	CDMA/EVDO BC10 (§90S)	0.145	0.108	0.253
	CDMA/EVDO BC0 (§22H)	0.149	0.108	0.257
	PCS CDMA/EVDO	0.229	0.108	0.337
	GSM 850	0.137	0.108	0.245
	GSM 1900	0.091	0.108	0.199
	UMTS 850	0.128	0.108	0.236
	UMTS 1750	0.159	0.108	0.267
	UMTS 1900	0.155	0.108	0.263
	LTE Band 12	0.101	0.108	0.209
	LTE Band 26 (Cell)	0.145	0.108	0.253
	LTE Band 4 (AWS)	0.247	0.108	0.355
	LTE Band 25 (PCS)	0.212	0.108	0.320
	LTE Band 41	0.075	0.108	0.183

12.4 Body-Worn Simultaneous Transmission Analysis

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body-Worn	CDMA BC10 (§90S)	0.455	0.126	0.581
	CDMA BC0 (§22H)	0.316	0.126	0.442
	PCS CDMA	1.394	0.126	1.520
	GSM 850	0.258	0.126	0.384
	GSM 1900	0.506	0.126	0.632
	UMTS 850	0.224	0.126	0.350
	UMTS 1750	0.257	0.126	0.383
	UMTS 1900	0.803	0.126	0.929
	LTE Band 12	0.313	0.126	0.439
	LTE Band 26 (Cell)	0.275	0.126	0.401
	LTE Band 4 (AWS)	0.467	0.126	0.593
	LTE Band 25 (PCS)	1.138	0.126	1.264
	LTE Band 41	0.520	0.126	0.646

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Table 12-6
Simultaneous Transmission Scenario with 5 GHz WLAN (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body-Worn	CDMA BC10 (§90S)	0.455	0.099	0.554
	CDMA BC0 (§22H)	0.316	0.099	0.415
	PCS CDMA	1.394	0.099	1.493
	GSM 850	0.258	0.099	0.357
	GSM 1900	0.506	0.099	0.605
	UMTS 850	0.224	0.099	0.323
	UMTS 1750	0.257	0.099	0.356
	UMTS 1900	0.803	0.099	0.902
	LTE Band 12	0.313	0.099	0.412
	LTE Band 26 (Cell)	0.275	0.099	0.374
	LTE Band 4 (AWS)	0.467	0.099	0.566
	LTE Band 25 (PCS)	1.138	0.099	1.237
	LTE Band 41	0.520	0.099	0.619

Table 12-7
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body-Worn	CDMA BC10 (§90S)	0.455	0.112	0.567
	CDMA BC0 (§22H)	0.316	0.112	0.428
	PCS CDMA	1.394	0.112	1.506
	GSM 850	0.258	0.112	0.370
	GSM 1900	0.506	0.112	0.618
	UMTS 850	0.224	0.112	0.336
	UMTS 1750	0.257	0.112	0.369
	UMTS 1900	0.803	0.112	0.915
	LTE Band 12	0.313	0.112	0.425
	LTE Band 26 (Cell)	0.275	0.112	0.387
	LTE Band 4 (AWS)	0.467	0.112	0.579
	LTE Band 25 (PCS)	1.138	0.112	1.250
	LTE Band 41	0.520	0.112	0.632

Note: Bluetooth SAR was not required to be measured per FCC KDB Publication 447498 D01v06. Estimated SAR results were used in the above table to determine simultaneous transmission SAR test exclusion.

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12.5 Hotspot SAR Simultaneous Transmission Analysis

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

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

Table 12-8
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	EVDO BC10 (§90S)	0.487	0.369	0.856
	EVDO BC0 (§22H)	0.373	0.369	0.742
	PCS EVDO	1.206	0.369	1.575
	GPRS 850	0.316	0.369	0.685
	GPRS 1900	0.418	0.369	0.787
	UMTS 850	0.266	0.369	0.635
	UMTS 1750	0.334	0.369	0.703
	UMTS 1900	0.818	0.369	1.187
	LTE Band 12	0.404	0.369	0.773
	LTE Band 26 (Cell)	0.300	0.369	0.669
	LTE Band 4 (AWS)	0.631	0.369	1.000
	LTE Band 25 (PCS)	1.157	0.369	1.526
	LTE Band 41	1.397	0.369	See Table Below

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	1.073	0.369*	1.442
	Front	0.438	0.369*	0.807
	Top	-	0.369	0.369
	Bottom	1.397	-	1.397
	Right	0.085	0.369*	0.454
	Left	0.136	0.369*	0.505

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Table 12-9
Simultaneous Transmission Scenario with 5 GHz WLAN (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	EVDO BC10 (§90S)	0.487	0.467	0.954
	EVDO BC0 (§22H)	0.373	0.467	0.840
	PCS EVDO	1.206	0.467	See Table Below
	GPRS 850	0.316	0.467	0.783
	GPRS 1900	0.418	0.467	0.885
	UMTS 850	0.266	0.467	0.733
	UMTS 1750	0.334	0.467	0.801
	UMTS 1900	0.818	0.467	1.285
	LTE Band 12	0.404	0.467	0.871
	LTE Band 26 (Cell)	0.300	0.467	0.767
	LTE Band 4 (AWS)	0.631	0.467	1.098
	LTE Band 25 (PCS)	1.157	0.467	See Table Below
	LTE Band 41	1.397	0.467	See Table Below

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2			1	2	1+2
Hotspot SAR	Back	1.206	0.163	1.369	Hotspot SAR	Back	1.157	0.163	1.320
	Front	0.696	0.467	1.163		Front	0.572	0.467	1.039
	Top	-	0.409	0.409		Top	-	0.409	0.409
	Bottom	1.092	-	1.092		Bottom	0.775	-	0.775
	Right	0.096	0.467*	0.563		Right	0.097	0.467*	0.564
	Left	0.145	0.467*	0.612		Left	0.137	0.467*	0.604

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	1.073	0.163	1.236
	Front	0.438	0.467	0.905
	Top	-	0.409	0.409
	Bottom	1.397	-	1.397
	Right	0.085	0.467*	0.552
	Left	0.136	0.467*	0.603

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	EVDO BC10 (§90S)	0.487	0.168	0.655
	EVDO BC0 (§22H)	0.373	0.168	0.541
	PCS EVDO	1.206	0.168	1.374
	GPRS 850	0.316	0.168	0.484
	GPRS 1900	0.418	0.168	0.586
	UMTS 850	0.266	0.168	0.434
	UMTS 1750	0.334	0.168	0.502
	UMTS 1900	0.818	0.168	0.986
	LTE Band 12	0.404	0.168	0.572
	LTE Band 26 (Cell)	0.300	0.168	0.468
	LTE Band 4 (AWS)	0.631	0.168	0.799
	LTE Band 25 (PCS)	1.157	0.168	1.325
	LTE Band 41	1.397	0.168	1.565

12.6 Simultaneous Transmission Conclusion

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

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13 SAR MEASUREMENT VARIABILITY

13.1 Measurement Variability

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

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

- 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
- 2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ 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

Table 13-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS												
Band	FREQUENCY		Mode	Service	Side	Spacing	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)
	MHz	Ch.					(W/kg)	(W/kg)		(W/kg)		(W/kg)
1900	1880.00	600	PCS CDMA	TDSO / SO32	back	15 mm	1.080	1.120	1.04	N/A	N/A	N/A
2450	2506.00	39750	LTE Band 41, 20 MHz Bandwidth	QPSK, 1 RB, 0 RB Offset	bottom	10 mm	1.170	1.160	1.01	N/A	N/A	N/A
2600	2593.00	40620	LTE Band 41, 20 MHz Bandwidth	QPSK, 1 RB, 0 RB Offset	bottom	10 mm	1.020	1.010	1.01	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT							Body					
Spatial Peak							1.6 W/kg (mW/g)					
Uncontrolled Exposure/General Population							averaged over 1 gram					

13.2 Measurement Uncertainty

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

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14 ADDITIONAL TESTING PER FCC GUIDANCE

14.1 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 as < 10% and all reported SAR values were < 1.4 W/kg for 1g and < 3.5 W/kg for 10g.

LTE Band 41 SAR testing 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.

Table 14-1
LTE Band 41 Head Linearity Data

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	25	28
Measured Output Power (dBm)	24.46	27.16
Measured SAR (W/kg)	0.05	0.062
Measured Power (mW)	279.25	520.00
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	176.77	225.16
% deviation from expected linearity		-2.65%

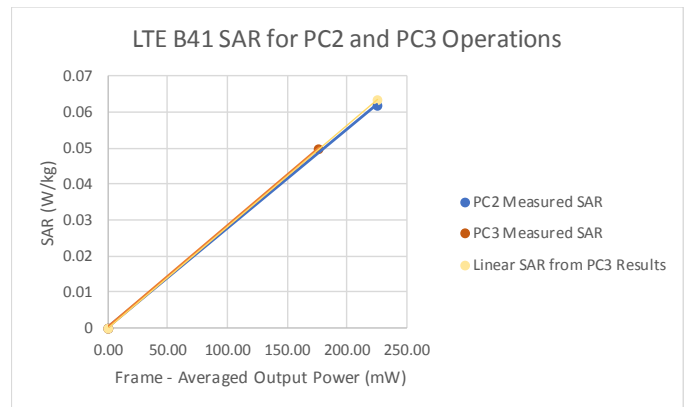


Figure 14-1
LTE Band 41 Head Linearity

Table 14-2
LTE Band 41 Body-Worn Linearity Data

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	25	28
Measured Output Power (dBm)	24.46	27.16
Measured SAR (W/kg)	0.309	0.429
Measured Power (mW)	279.25	520.00
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	176.77	225.16
% deviation from expected linearity		9.00%

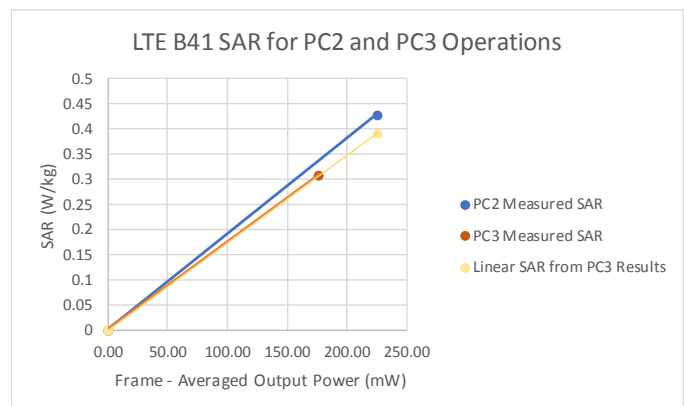


Figure 14-2
LTE Band 41 Body-Worn Linearity

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Table 14-3
LTE Band 41 Hotspot Linearity Data

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	25	24.5
Measured Output Power (dBm)	24.23	23.51
Measured SAR (W/kg)	1.17	0.646
Measured Power (mW)	264.85	224.39
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	167.65	97.16
% deviation from expected linearity		-4.73%

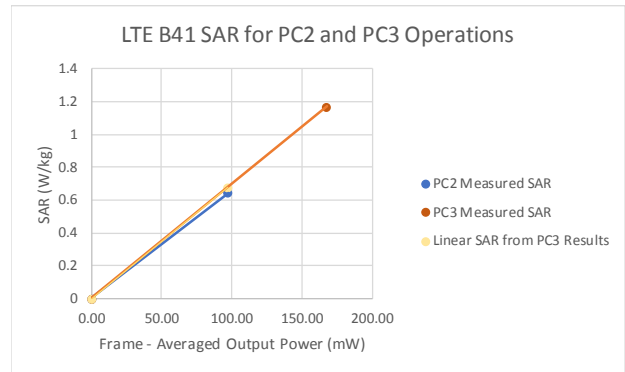


Figure 14-3
LTE Band 41 Hotspot Linearity

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15 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	Network Analyzer	2/21/2018	Annual	2/21/2019	MY40001472
Agilent	8753ES	S-Parameter Vector Network Analyzer	8/17/2017	Annual	8/17/2018	MY40003841
Agilent	E4432B	ESG-D Series Signal Generator	4/19/2018	Annual	4/19/2019	US40053896
Agilent	E4438C	ESG Vector Signal Generator	4/18/2018	Annual	4/18/2019	MY45091346
Agilent	E5515C	Wireless Communications Test Set	2/28/2018	Biennial	2/28/2020	GB41450275
Agilent	E5515C	8960 Series 10 Wireless Communications Test Set	11/15/2017	Annual	11/15/2018	GB42230325
Agilent	E5515C	Wireless Communications Test Set	1/24/2018	Annual	1/24/2019	GB44400860
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Agilent	N5182A	MXG Vector Signal Generator	11/1/2017	Annual	11/1/2018	MY47420603
Agilent	N5182A-506	MXG Vector Signal	6/19/2018	Annual	6/19/2019	MY48180366
Agilent	N9020A	MXA Signal Analyzer	1/24/2018	Annual	1/24/2019	US46470561
Amplifier Research	150A100C	Amplifier	CBT	N/A	CBT	350132
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	343971
Anritsu	MA24106A	USB Power Sensor	6/5/2018	Annual	6/5/2019	1231535
Anritsu	MA24106A	USB Power Sensor	6/5/2018	Annual	6/5/2019	1231538
Anritsu	MA24106A	USB Power Sensor	6/21/2018	Annual	6/21/2019	1244512
Anritsu	MA24106A	USB Power Sensor	6/5/2018	Annual	6/5/2019	1244515
Anritsu	MA2411B	Pulse Power Sensor	3/2/2018	Annual	3/2/2019	1207364
Anritsu	MA2411B	Pulse Power Sensor	11/15/2017	Annual	11/15/2018	1339007
Anritsu	MA2411B	Pulse Power Sensor	3/2/2018	Annual	3/2/2019	1339018
Anritsu	ML2495A	Power Meter	11/28/2017	Annual	11/28/2018	1039008
Anritsu	ML2496A	Power Meter	10/9/2017	Annual	10/9/2018	1138001
Anritsu	MT8820C	Radio Communication Analyzer	3/20/2018	Annual	3/20/2019	6201144419
Anritsu	MT8820C	Radio Communication Analyzer	6/27/2018	Annual	6/27/2019	6201240328
Anritsu	MT8862A	Wireless Connectivity Test Set	7/3/2018	Annual	7/3/2019	6261782395
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	4040	Therm./ Clock/ Humidity Monitor	1/8/2018	Annual	1/8/2019	160473909
Control Company	4352	Ultra Low Stem Thermometer	1/8/2018	Annual	1/8/2019	160508097
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/4/2018	Annual	6/4/2019	MY53401181
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mitutoyo	CD-6°CSX	Digital Caliper	4/18/2018	Biennial	4/18/2020	13264165
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-53W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	NC-100	Torque Wrench	4/18/2018	Annual	4/18/2019	1445
Pasternack	NC-100	Torque Wrench	4/18/2018	Annual	4/18/2019	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE5011-1	Torque Wrench	7/19/2017	Biennial	7/19/2019	N/A
Rohde & Schwarz	CMW500	Radio Communication Tester	11/3/2017	Annual	11/3/2018	100976
Rohde & Schwarz	CMW500	Radio Communication Tester	10/13/2017	Annual	10/13/2018	102060
Seekonk	NC-100	Torque Wrench (8" lb)	5/10/2018	Biennial	5/10/2020	21053
SPEAG	D1750V2	1750 MHz SAR Dipole	5/9/2017	Biennial	5/9/2019	1148
SPEAG	D1765V2	1765 MHz SAR Dipole	5/23/2018	Annual	5/23/2019	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	7/8/2016	Triennial	7/8/2019	54080
SPEAG	D1900V2	1900 MHz SAR Dipole	4/12/2018	Annual	4/12/2019	56141
SPEAG	D1900V2	1900 MHz SAR Dipole	7/11/2017	Biennial	7/11/2019	56149
SPEAG	D2450V2	2450 MHz SAR Dipole	8/17/2017	Biennial	8/17/2019	719
SPEAG	D2450V2	2450 MHz SAR Dipole	9/11/2017	Annual	9/11/2018	797
SPEAG	D2600V2	2600 MHz SAR Dipole	4/11/2018	Annual	4/11/2019	1004
SPEAG	D2600V2	2600 MHz SAR Dipole	6/7/2017	Biennial	6/7/2019	1064
SPEAG	D2600V2	2600 MHz SAR Dipole	9/13/2016	Biennial	9/13/2018	1071
SPEAG	D5GHzV2	5 GHz SAR Dipole	9/21/2016	Biennial	9/21/2018	1191
SPEAG	D5GHzV2	5 GHz SAR Dipole	8/15/2017	Annual	8/15/2018	1237
SPEAG	D750V3	750 MHz SAR Dipole	7/13/2016	Triennial	7/13/2019	1161
SPEAG	D835V2	835 MHz SAR Dipole	7/13/2016	Triennial	7/13/2019	44047
SPEAG	D835V2	835 MHz SAR Dipole	7/11/2017	Biennial	7/11/2019	44133
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/22/2018	Annual	5/22/2019	859
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2018	Annual	2/9/2019	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/9/2017	Annual	8/9/2018	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/18/2018	Annual	6/18/2019	1334
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/7/2018	Annual	3/7/2019	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/11/2018	Annual	4/11/2019	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/9/2017	Annual	11/9/2018	1450
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/15/2018	Annual	5/15/2019	1070
SPEAG	DAK-3.5	Dielectric Assessment Kit	9/12/2017	Annual	9/12/2018	1091
SPEAG	DAKS-3.5	Portable DAK	9/5/2017	Annual	9/5/2018	1045
SPEAG	ES3DV3	SAR Probe	2/13/2018	Annual	2/13/2019	3213
SPEAG	ES3DV3	SAR Probe	3/13/2018	Annual	3/13/2019	3319
SPEAG	ES3DV3	SAR Probe	8/14/2017	Annual	8/14/2018	3332
SPEAG	ES3DV3	SAR Probe	3/27/2018	Annual	3/27/2019	3347
SPEAG	EX3DV4	SAR Probe	4/18/2018	Annual	4/18/2019	7357
SPEAG	EX3DV4	SAR Probe	5/22/2018	Annual	5/22/2019	7406
SPEAG	EX3DV4	SAR Probe	6/25/2018	Annual	6/25/2019	7409

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.

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16 MEASUREMENT UNCERTAINTIES

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

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17 CONCLUSION

17.1 Measurement Conclusion

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

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

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APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 27920

Communication System: UID 0, Cellular CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used (interpolated):

$f = 820.1$ MHz; $\sigma = 0.922$ S/m; $\epsilon_r = 41.578$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Test Date: 07-16-2018; Ambient Temp: 21.9°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(6.42, 6.42, 6.42); Calibrated: 2/13/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2018

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: Cell. CDMA, Rule Part 90S, Right Head, Cheek, Mid.ch

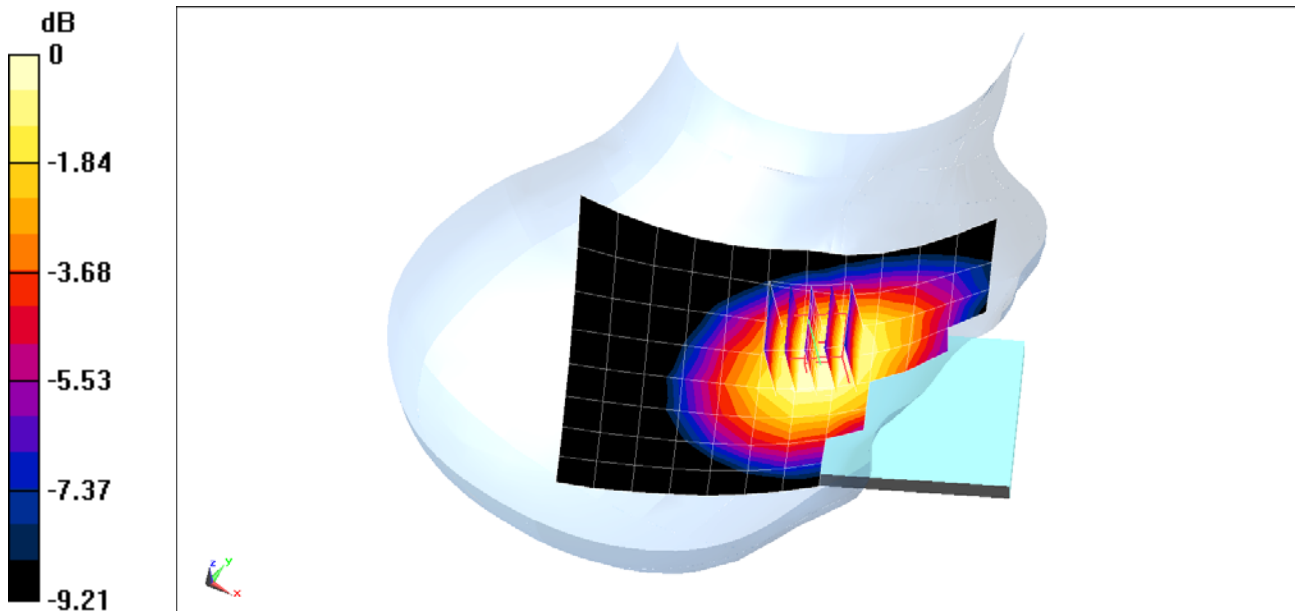
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.54 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.142 W/kg

SAR(1 g) = 0.113 W/kg



0 dB = 0.124 W/kg = -9.07 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 27920

Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.52 \text{ MHz}$; $\sigma = 0.928 \text{ S/m}$; $\epsilon_r = 41.536$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 07-16-2018; Ambient Temp: 21.9°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(6.42, 6.42, 6.42); Calibrated: 2/13/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2018

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: Cell. CDMA, Rule Part 22H, Right Head, Cheek, Mid.ch

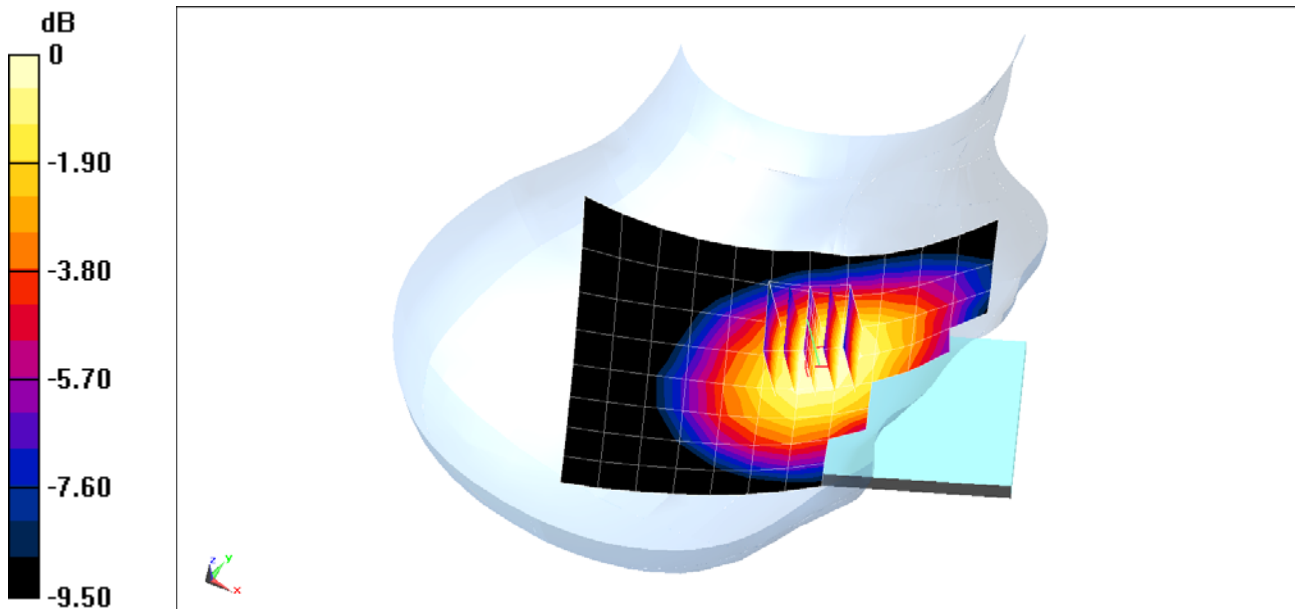
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 11.76 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.149 W/kg

SAR(1 g) = 0.118 W/kg



0 dB = 0.129 W/kg = -8.89 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 27938

Communication System: UID 0, PCS CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.406 \text{ S/m}$; $\epsilon_r = 39.158$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 07-18-2018; Ambient Temp: 22.2°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7409; ConvF(8.05, 8.05, 8.05); Calibrated: 6/25/2018;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2018

Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: PCS EVDO Rev A, Left Head, Cheek, Mid.ch

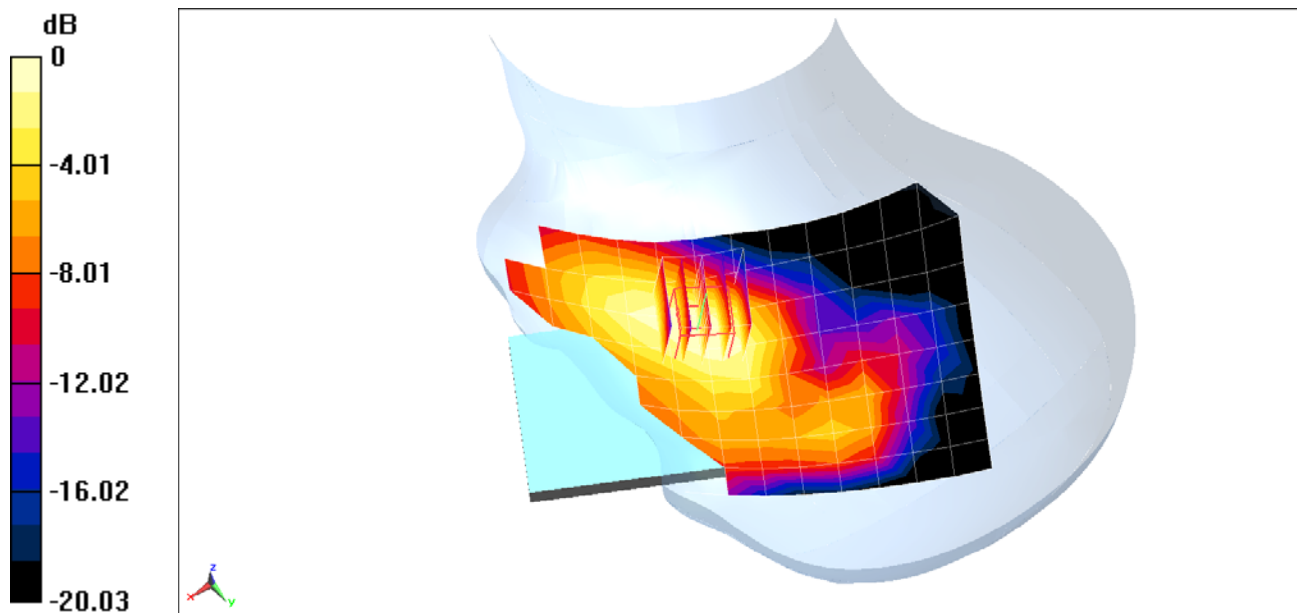
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 11.80 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.288 W/kg

SAR(1 g) = 0.180 W/kg



0 dB = 0.246 W/kg = -6.09 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 38117

Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6$ MHz; $\sigma = 0.928$ S/m; $\epsilon_r = 41.535$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Test Date: 07-16-2018; Ambient Temp: 21.9°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(6.42, 6.42, 6.42); Calibrated: 2/13/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2018

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: GSM 850, Right Head, Cheek, Mid.ch

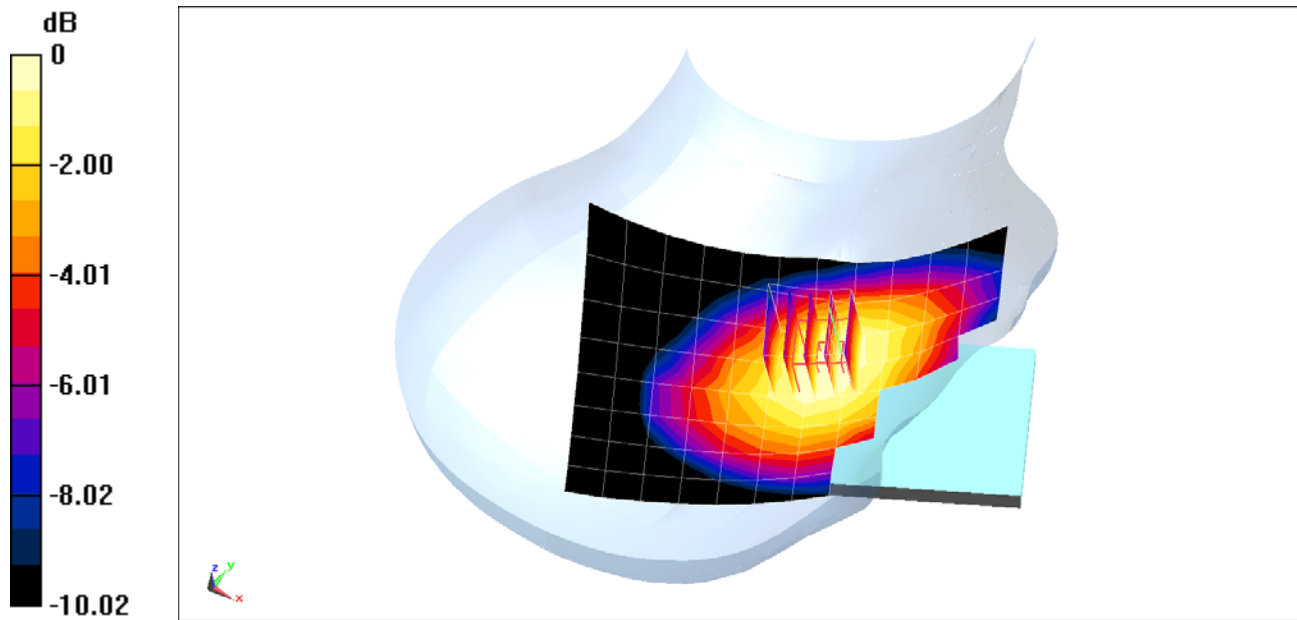
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.23 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.140 W/kg

SAR(1 g) = 0.110 W/kg



0 dB = 0.119 W/kg = -9.24 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 27938

Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.406 \text{ S/m}$; $\epsilon_r = 39.158$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 07-18-2018; Ambient Temp: 22.2°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7409; ConvF(8.05, 8.05, 8.05); Calibrated: 6/25/2018;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2018

Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: GSM 1900, Left Head, Cheek, Mid.ch

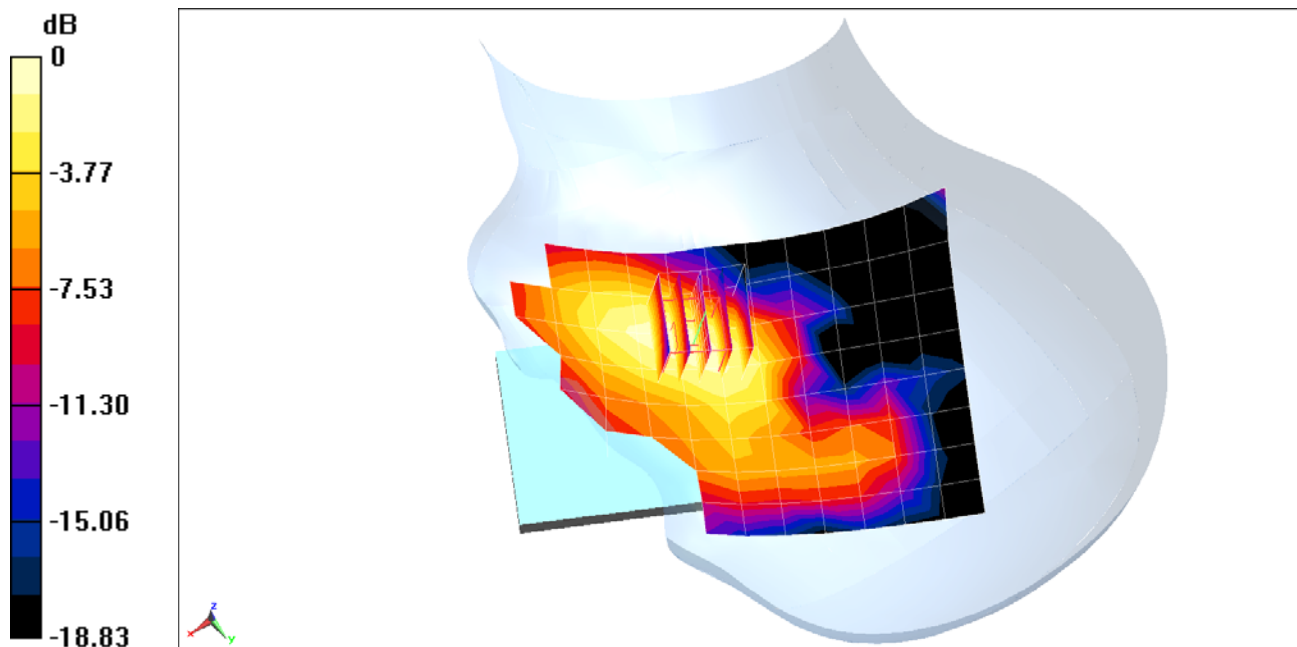
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 7.620 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.120 W/kg

SAR(1 g) = 0.074 W/kg



0 dB = 0.102 W/kg = -9.91 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 38117

Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.928 \text{ S/m}$; $\epsilon_r = 41.535$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 07-16-2018; Ambient Temp: 21.9°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(6.42, 6.42, 6.42); Calibrated: 2/13/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2018

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 850, Right Head, Cheek, Mid.ch

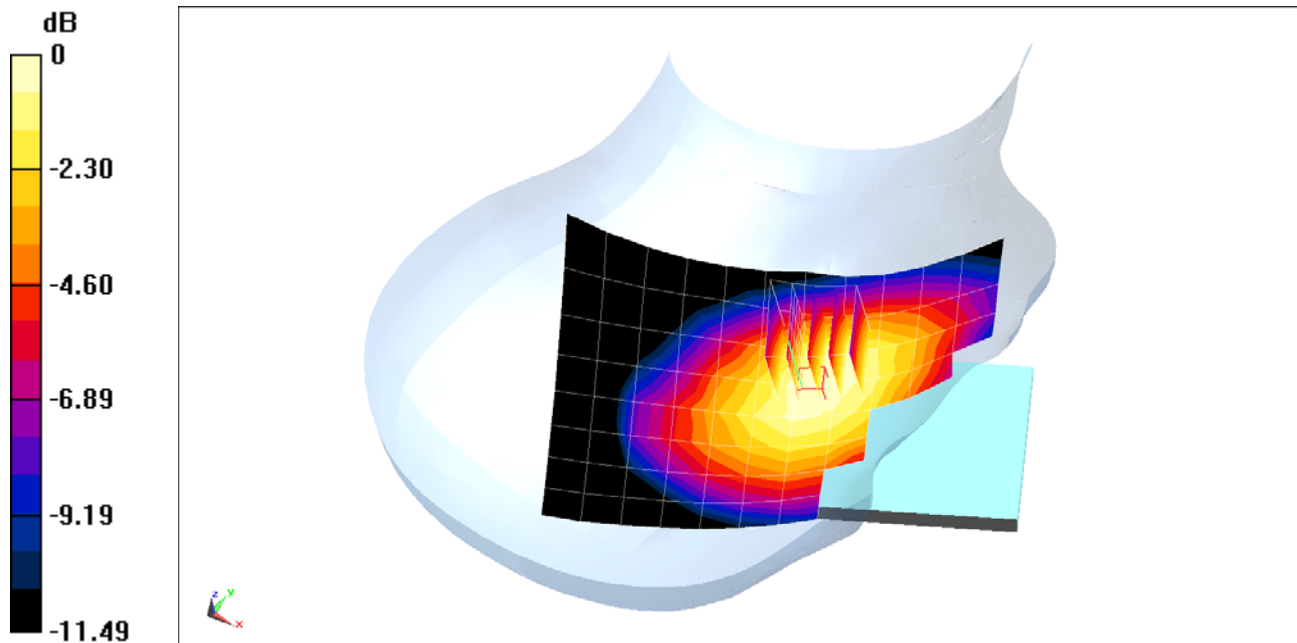
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.54 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.128 W/kg

SAR(1 g) = 0.100 W/kg



0 dB = 0.110 W/kg = -9.59 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 27938

Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: 1750 Head Medium parameters used (interpolated):

$f = 1732.4 \text{ MHz}$; $\sigma = 1.32 \text{ S/m}$; $\epsilon_r = 41.207$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 07-16-2018; Ambient Temp: 21.3°C; Tissue Temp: 20.8°C

Probe: EX3DV4 - SN7409; ConvF(8.43, 8.43, 8.43); Calibrated: 6/25/2018;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2018

Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 1750, Left Head, Cheek, Mid.ch

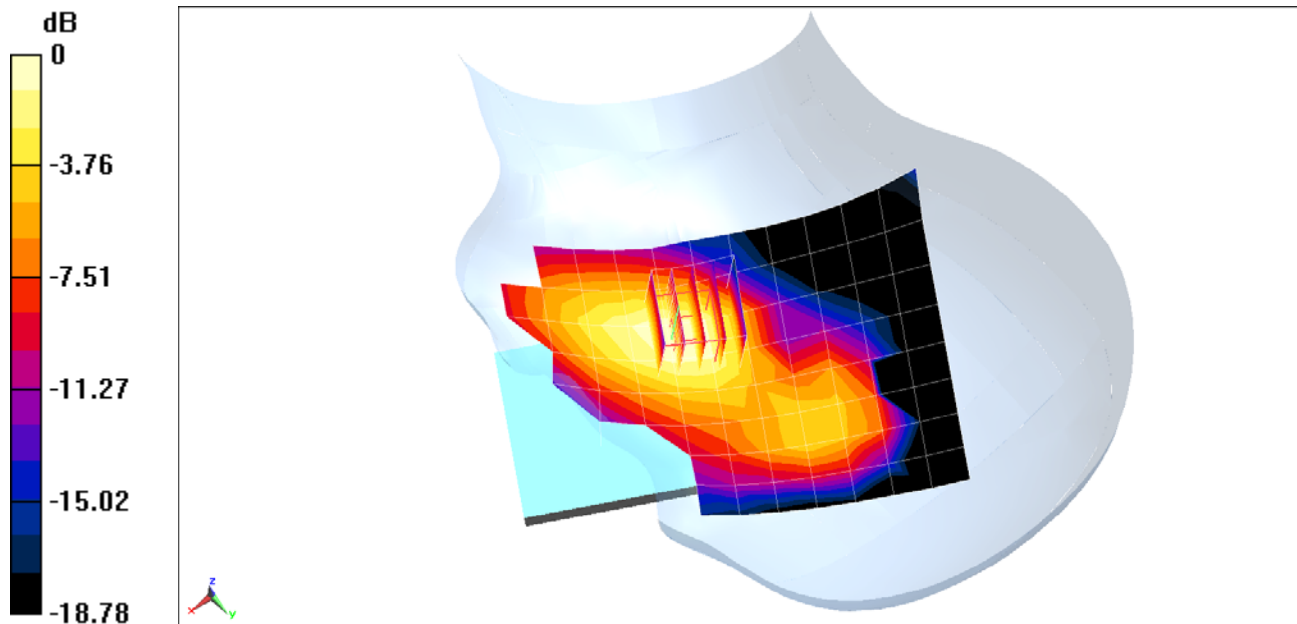
Area Scan (9x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.13 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.192 W/kg

SAR(1 g) = 0.124 W/kg



0 dB = 0.165 W/kg = -7.83 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 27938

Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.411 \text{ S/m}$; $\epsilon_r = 40.995$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 07-16-2018; Ambient Temp: 23.5°C; Tissue Temp: 20.8°C

Probe: EX3DV4 - SN7409; ConvF(8.05, 8.05, 8.05); Calibrated: 6/25/2018;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2018

Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 1900, Left Head, Cheek, Mid.ch

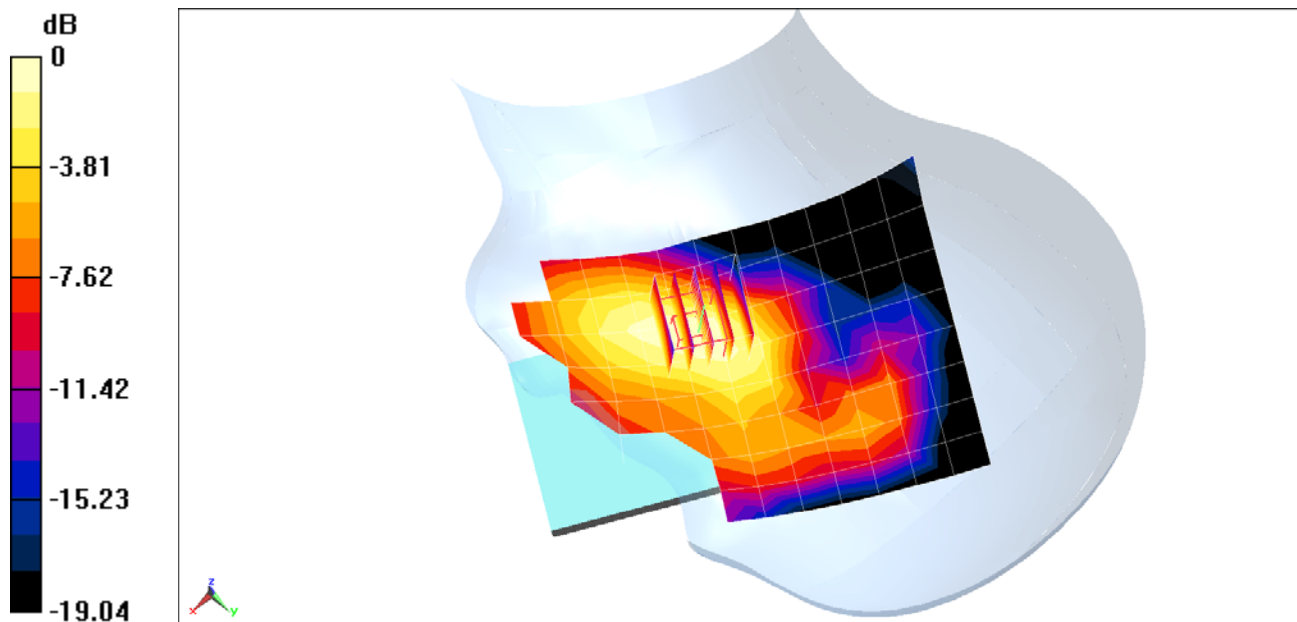
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 9.736 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.196 W/kg

SAR(1 g) = 0.123 W/kg



0 dB = 0.167 W/kg = -7.77 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 27938

Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1

Medium: 750 Head Medium parameters used (interpolated):

$f = 707.5$ MHz; $\sigma = 0.876$ S/m; $\epsilon_r = 40.607$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Test Date: 07-19-2018; Ambient Temp: 22.0°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3213; ConvF(6.75, 6.75, 6.75); Calibrated: 2/13/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2018

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 12, Left Head, Cheek, Mid.ch

QPSK, 10 MHz Bandwidth, 1 RB, 25 RB Offset

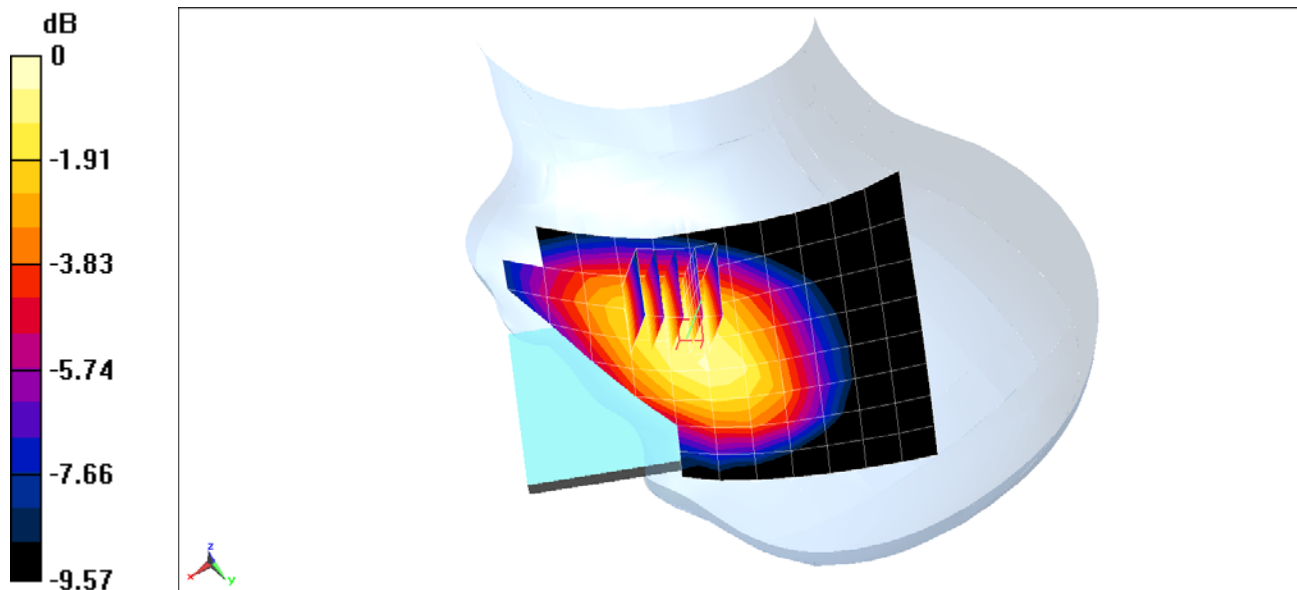
Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.54 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.111 W/kg

SAR(1 g) = 0.087 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 38117

Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1

Medium: 835 Head Medium parameters used (interpolated):

$f = 831.5$ MHz; $\sigma = 0.926$ S/m; $\epsilon_r = 41.549$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Test Date: 07-16-2018; Ambient Temp: 21.9°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(6.42, 6.42, 6.42); Calibrated: 2/13/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/9/2018

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 26 (Cell.), Right Head, Cheek, Mid.ch
15 MHz Bandwidth, QPSK, 1 RB, 36 RB Offset

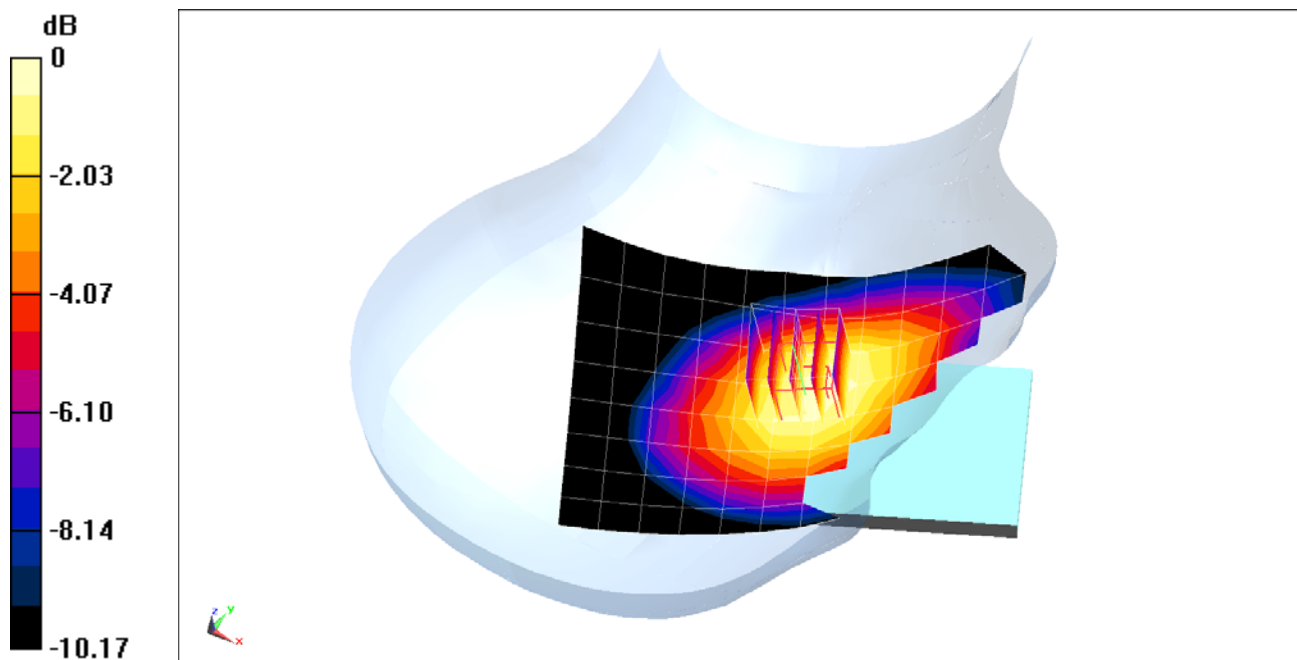
Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.99 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.142 W/kg

SAR(1 g) = 0.112 W/kg



0 dB = 0.122 W/kg = -9.14 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 28084

Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium: 1750 Head Medium parameters used (interpolated):

$f = 1732.5$ MHz; $\sigma = 1.32$ S/m; $\epsilon_r = 41.207$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Test Date: 07-16-2018; Ambient Temp: 21.3°C; Tissue Temp: 20.8°C

Probe: EX3DV4 - SN7409; ConvF(8.43, 8.43, 8.43); Calibrated: 6/25/2018;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2018

Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 4 (AWS), Left Head, Cheek, Mid.ch
20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset

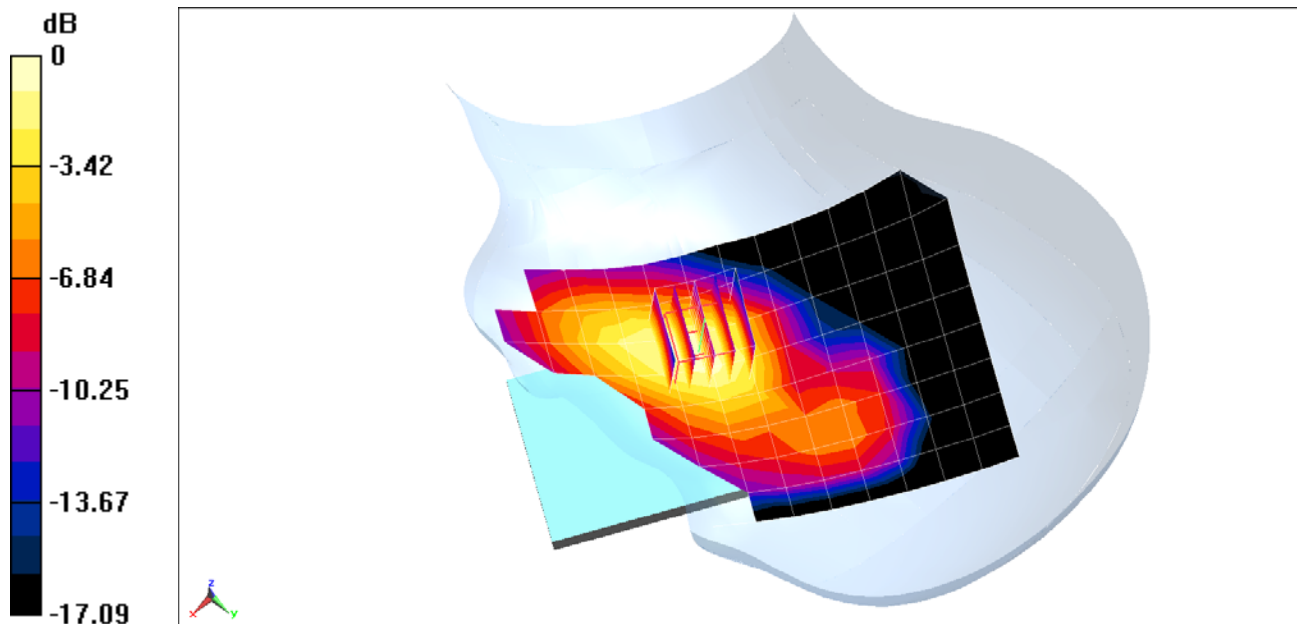
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.02 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.300 W/kg

SAR(1 g) = 0.190 W/kg



0 dB = 0.260 W/kg = -5.85 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 27938

Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1

Medium: 1900 Head Medium parameters used (interpolated):

$f = 1860 \text{ MHz}$; $\sigma = 1.397 \text{ S/m}$; $\epsilon_r = 41.008$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 07-16-2018; Ambient Temp: 23.5°C; Tissue Temp: 20.8°C

Probe: EX3DV4 - SN7409; ConvF(8.05, 8.05, 8.05); Calibrated: 6/25/2018;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2018

Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 25 (PCS), Left Head, Cheek, Low.ch
20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset

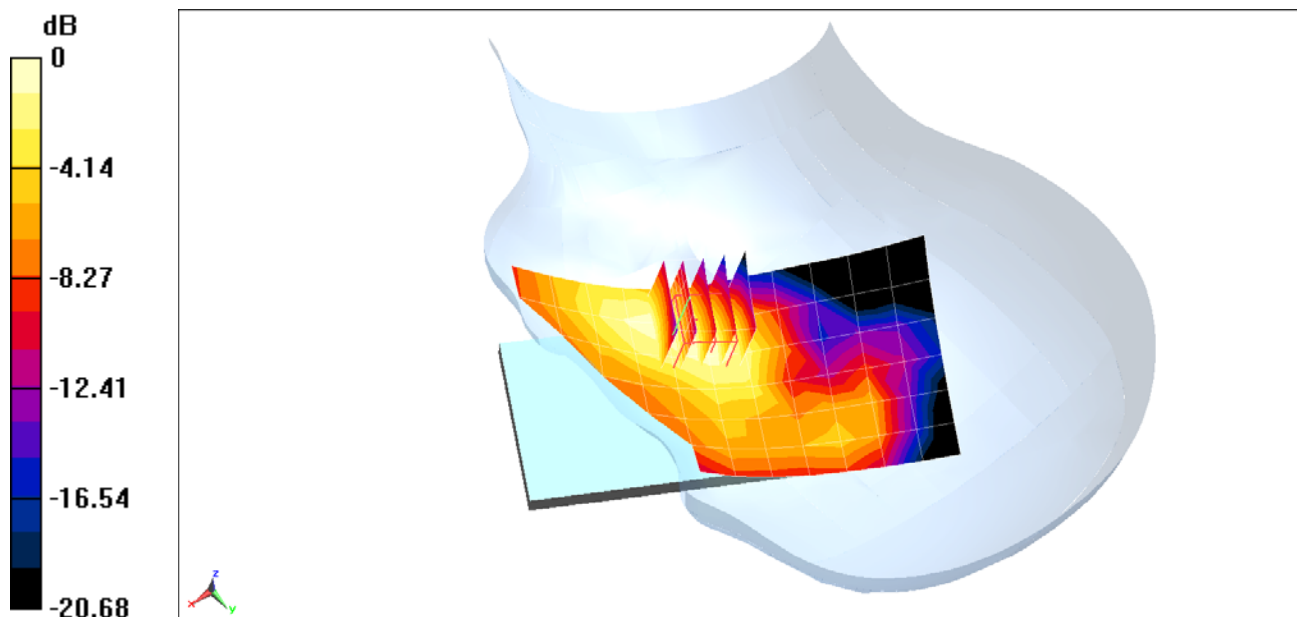
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.25 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.284 W/kg

SAR(1 g) = 0.178 W/kg



0 dB = 0.243 W/kg = -6.14 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 27920

Communication System: UID 0, _LTE Band 41 (Class 2); Frequency: 2636.5 MHz; Duty Cycle: 1:2.31

Medium: 2450 Head Medium parameters used (interpolated):

$f = 2636.5$ MHz; $\sigma = 2.005$ S/m; $\epsilon_r = 37.563$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Test Date: 07-23-2018; Ambient Temp: 22.2°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3332; ConvF(4.56, 4.56, 4.56); Calibrated: 8/14/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 8/9/2017

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 41, PC2, Right Head, Cheek, Mid-High.ch
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

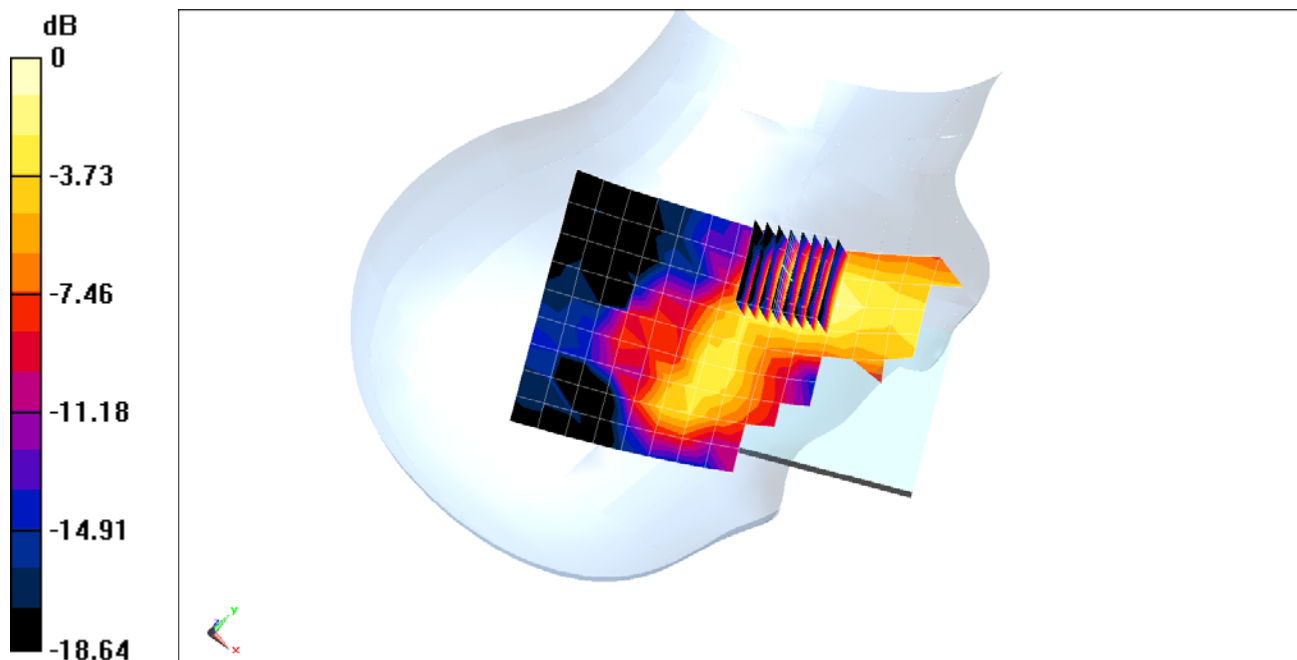
Area Scan (10x17x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.252 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.128 W/kg

SAR(1 g) = 0.062 W/kg



0 dB = 0.0826 W/kg = -10.83 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 40576

Communication System: UID 0, _IEEE 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used (interpolated):

$f = 2462 \text{ MHz}$; $\sigma = 1.866 \text{ S/m}$; $\epsilon_r = 38.792$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 07-18-2018; Ambient Temp: 22.7°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3332; ConvF(4.68, 4.68, 4.68); Calibrated: 8/14/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 8/9/2017

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: IEEE 802.11b, 22 MHz Bandwidth, Right Head, Tilt, Ch 11, 1 Mbps

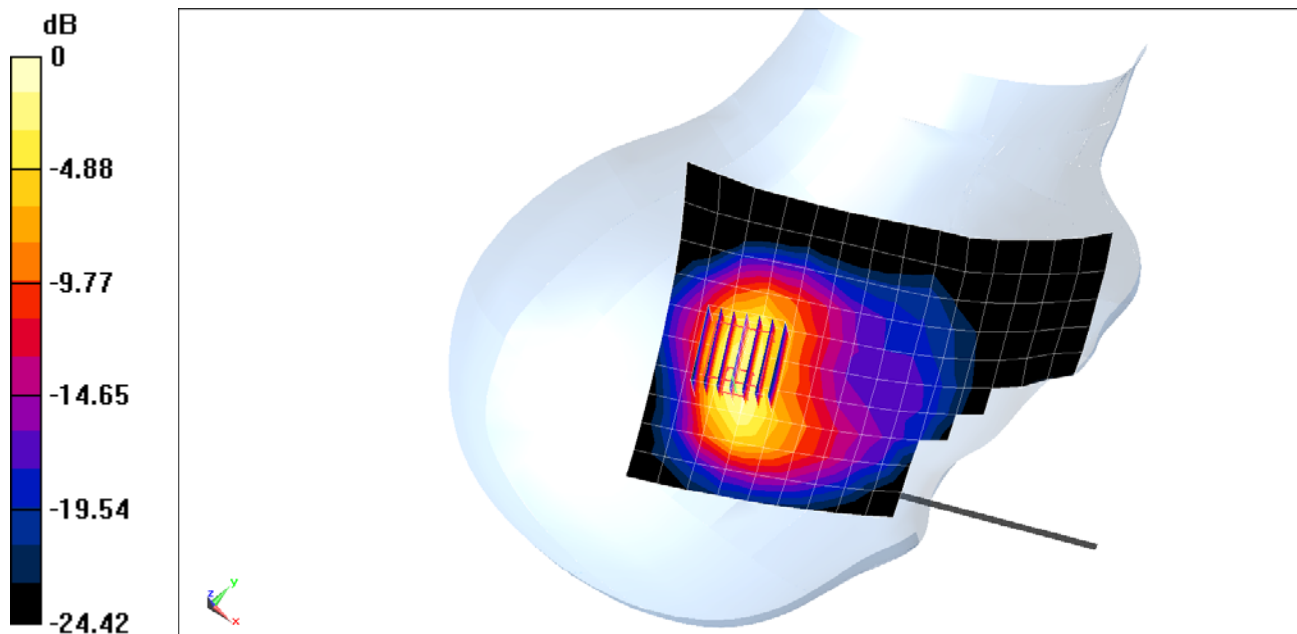
Area Scan (11x18x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.39 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.987 W/kg

SAR(1 g) = 0.392 W/kg



0 dB = 0.575 W/kg = -2.40 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 39735

Communication System: UID 0, 802.11n 5.2-5.8 GHz Band; Frequency: 5310 MHz; Duty Cycle: 1:1

Medium: 5GHz Head Medium parameters used (interpolated):

$f = 5310 \text{ MHz}$; $\sigma = 4.634 \text{ S/m}$; $\epsilon_r = 35.608$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 07-19-2018; Ambient Temp: 23.5°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN7409; ConvF(5.2, 5.2, 5.2); Calibrated: 6/25/2018;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2018

Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: IEEE 802.11n, U-NII-2A, 40 MHz Bandwidth, Right Head, Tilt, Ch 62, 13.5 Mbps

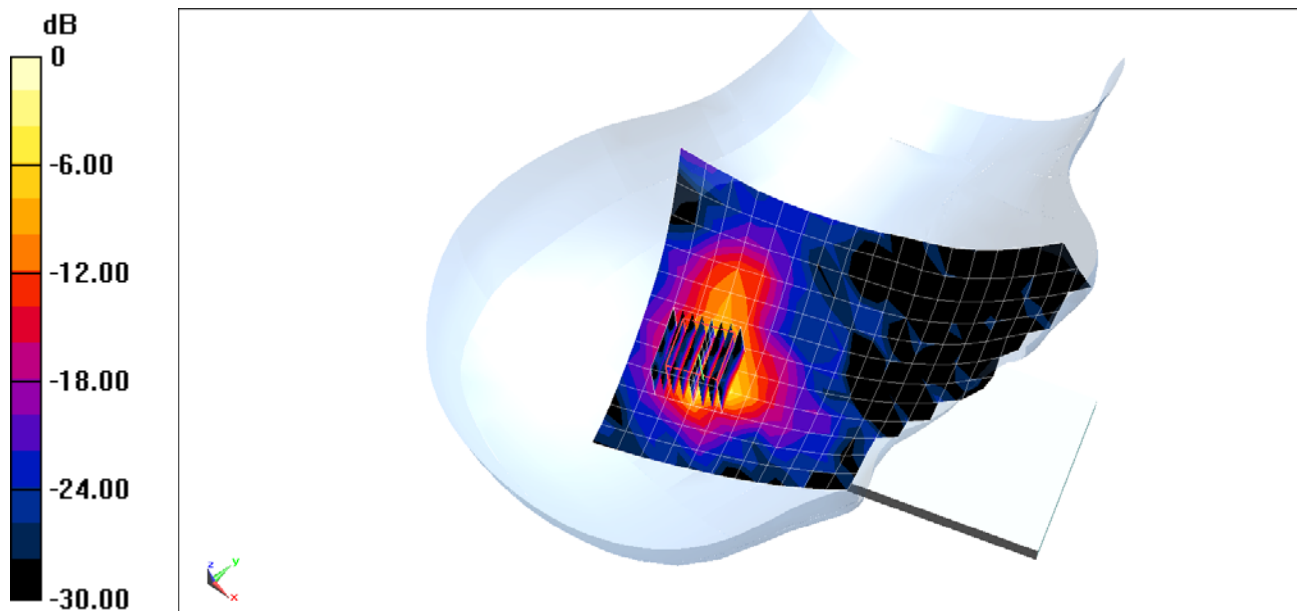
Area Scan (13x22x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Zoom Scan (8x8x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Reference Value = 5.960 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 3.45 W/kg

SAR(1 g) = 0.755 W/kg



0 dB = 1.92 W/kg = 2.83 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 40576

Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.300

Medium: 2450 Head Medium parameters used (interpolated):

$f = 2441$ MHz; $\sigma = 1.843$ S/m; $\epsilon_r = 38.873$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Test Date: 07-18-2018; Ambient Temp: 22.7°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3332; ConvF(4.68, 4.68, 4.68); Calibrated: 8/14/2017;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 8/9/2017

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: Bluetooth, Right Head, Tilt, Ch 39, 1 Mbps

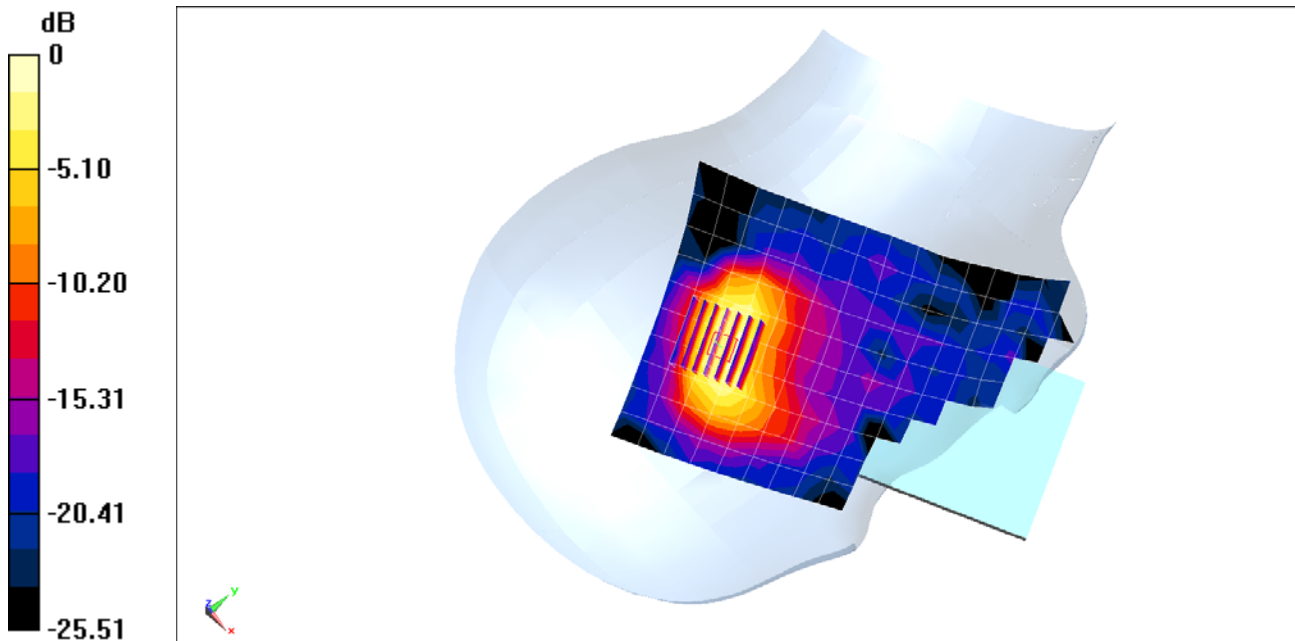
Area Scan (11x19x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.821 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.160 W/kg

SAR(1 g) = 0.070 W/kg



0 dB = 0.0958 W/kg = -10.19 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 28084

Communication System: UID 0, CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 820.1 \text{ MHz}$; $\sigma = 0.997 \text{ S/m}$; $\epsilon_r = 53.226$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-17-2018; Ambient Temp: 20.3°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3347; ConvF(6.37, 6.37, 6.37); Calibrated: 3/27/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1450; Calibrated: 11/9/2017

Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: Cell. CDMA BC10, Body SAR, Back side, Mid.ch

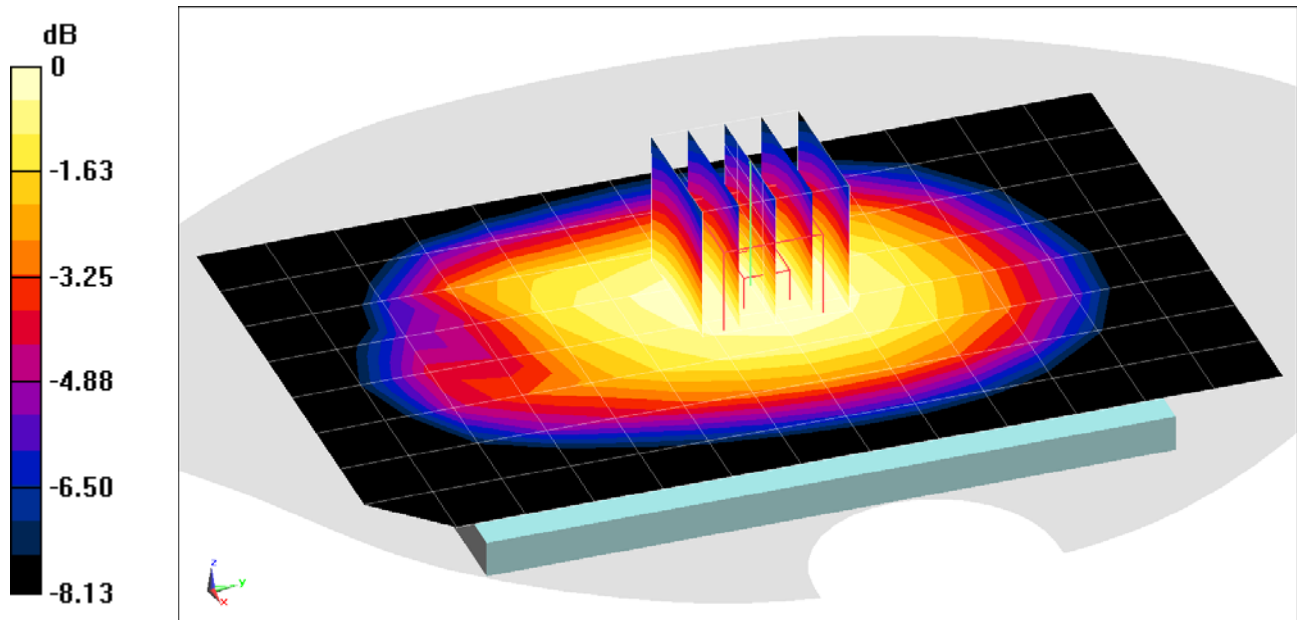
Area Scan (9x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.38 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.449 W/kg

SAR(1 g) = 0.356 W/kg



0 dB = 0.391 W/kg = -4.08 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 28084

Communication System: UID 0, CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 820.1$ MHz; $\sigma = 0.997$ S/m; $\epsilon_r = 53.226$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-17-2018; Ambient Temp: 20.3°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3347; ConvF(6.37, 6.37, 6.37); Calibrated: 3/27/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1450; Calibrated: 11/9/2017

Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: Cell. EVDO Rev. 0 BC10, Body SAR, Back side, Mid.ch

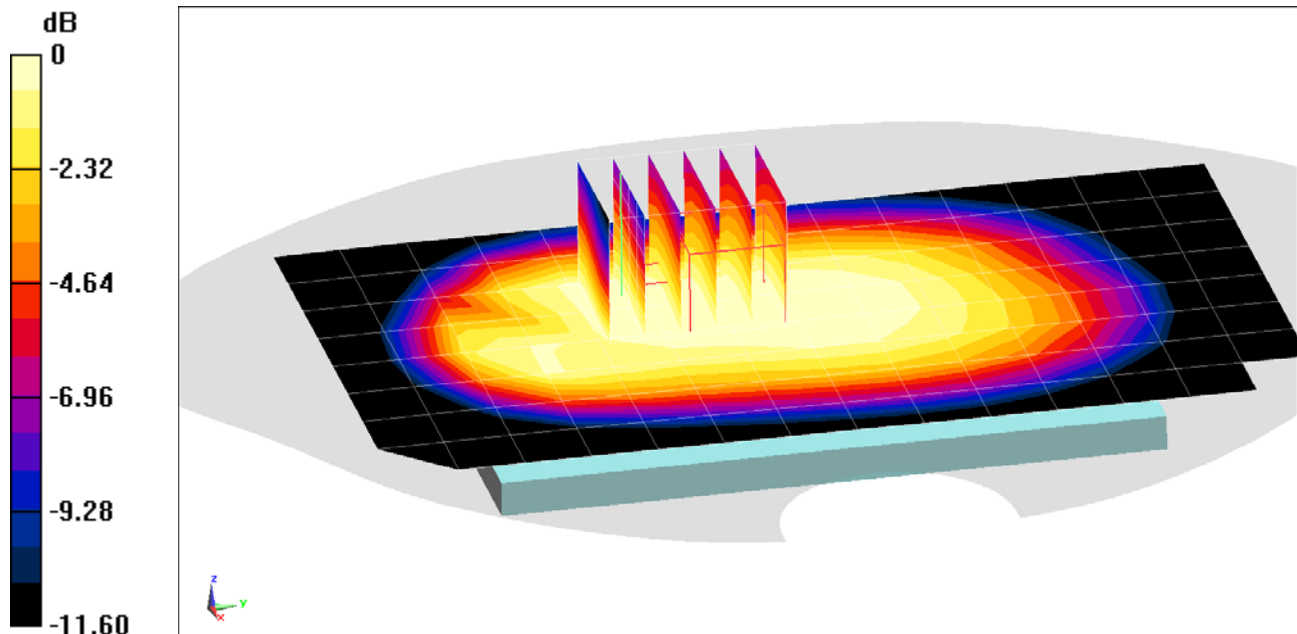
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 20.26 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.498 W/kg

SAR(1 g) = 0.380 W/kg



0 dB = 0.417 W/kg = -3.80 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 28084

Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.52$ MHz; $\sigma = 1.004$ S/m; $\epsilon_r = 53.199$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-17-2018; Ambient Temp: 20.3°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3347; ConvF(6.37, 6.37, 6.37); Calibrated: 3/27/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1450; Calibrated: 11/9/2017

Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: Cell. CDMA, Body SAR, Back side, Mid.ch

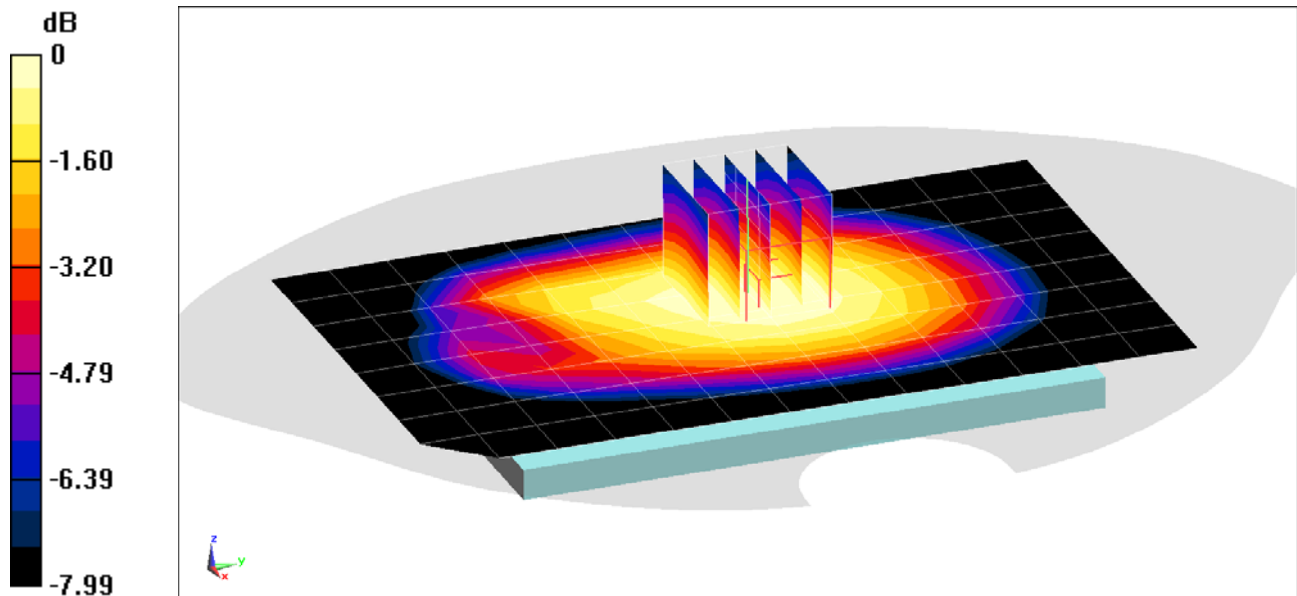
Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.88 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.313 W/kg

SAR(1 g) = 0.250 W/kg



0 dB = 0.368 W/kg = -4.34 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 28084

Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.52 \text{ MHz}$; $\sigma = 1.004 \text{ S/m}$; $\epsilon_r = 53.199$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-17-2018; Ambient Temp: 20.3°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3347; ConvF(6.37, 6.37, 6.37); Calibrated: 3/27/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1450; Calibrated: 11/9/2017

Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: Cell. EVDO Rev. 0, Body SAR, Back side, Mid.ch

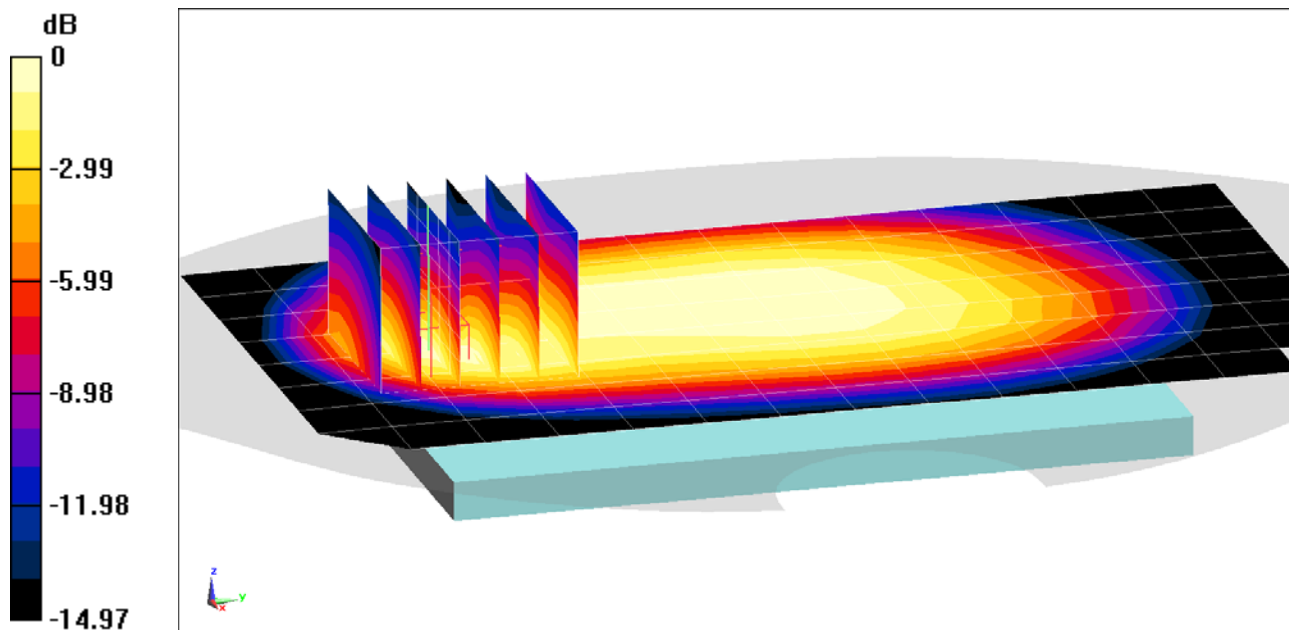
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.20 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.599 W/kg

SAR(1 g) = 0.329 W/kg



0 dB = 0.412 W/kg = -3.85 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 27938

Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.542 \text{ S/m}$; $\epsilon_r = 52.278$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-23-2018; Ambient Temp: 21.8°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7406; ConvF(7.74, 7.74, 7.74); Calibrated: 5/22/2018;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/22/2018

Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1167

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: PCS CDMA, Body SAR, Back side, Mid.ch

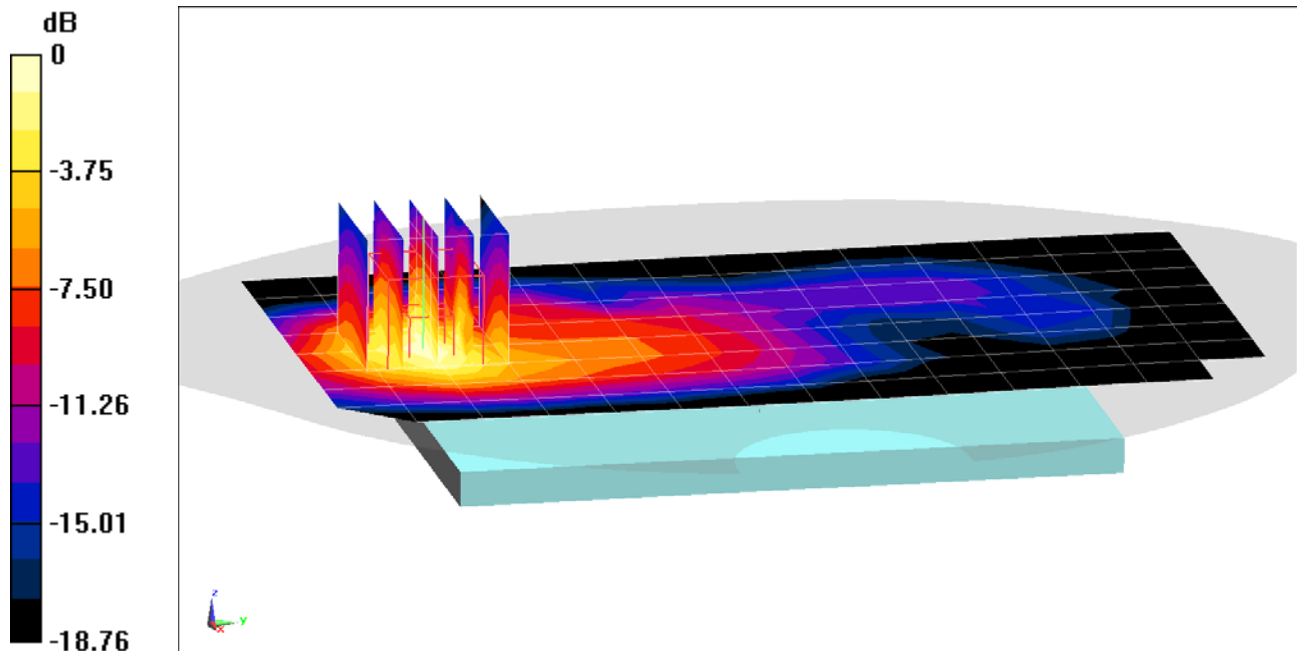
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 29.32 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 2.11 W/kg

SAR(1 g) = 1.12 W/kg



0 dB = 0.835 W/kg = -0.78 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 27938

Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.549 \text{ S/m}$; $\epsilon_r = 51.164$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-18-2018; Ambient Temp: 24.8°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7406; ConvF(7.74, 7.74, 7.74); Calibrated: 5/22/2018;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/22/2018

Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1167

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: PCS EVDO Rev. 0, Body SAR, Back side, Mid.ch

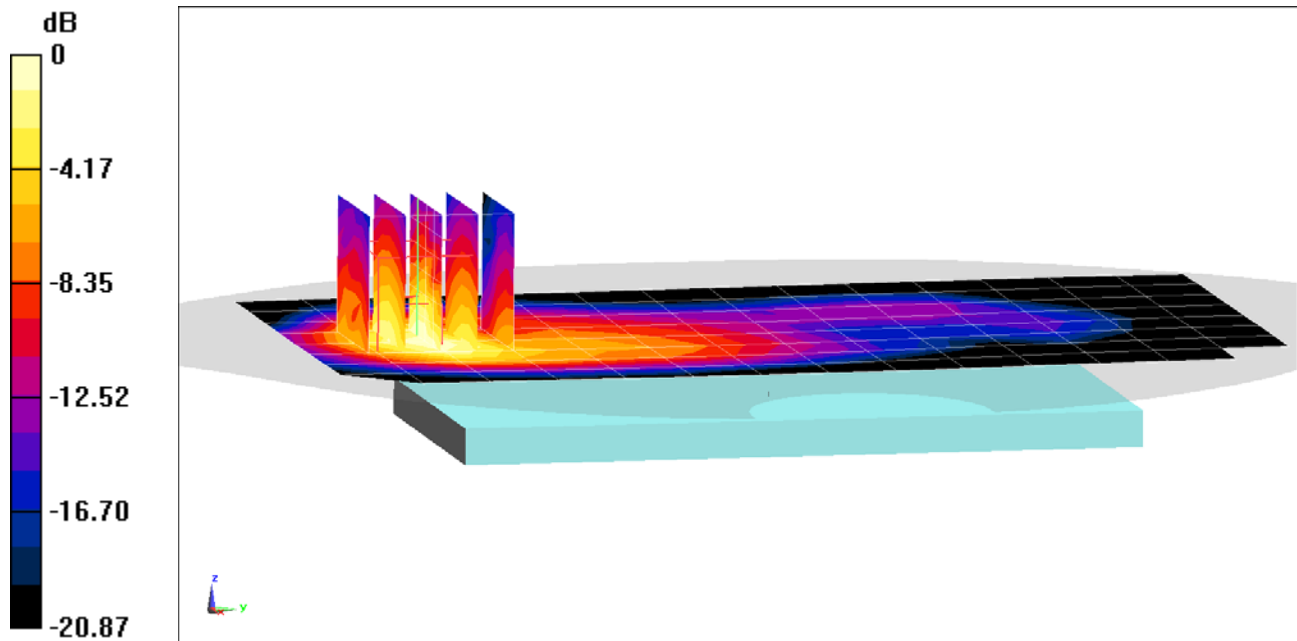
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 26.32 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 1.49 W/kg

SAR(1 g) = 0.921 W/kg



0 dB = 1.28 W/kg = 1.07 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 38117

Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.994 \text{ S/m}$; $\epsilon_r = 53.144$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-20-2018; Ambient Temp: 20.1°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3347; ConvF(6.37, 6.37, 6.37); Calibrated: 3/27/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1450; Calibrated: 11/9/2017

Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: GSM 850, Body SAR, Back side, Mid.ch

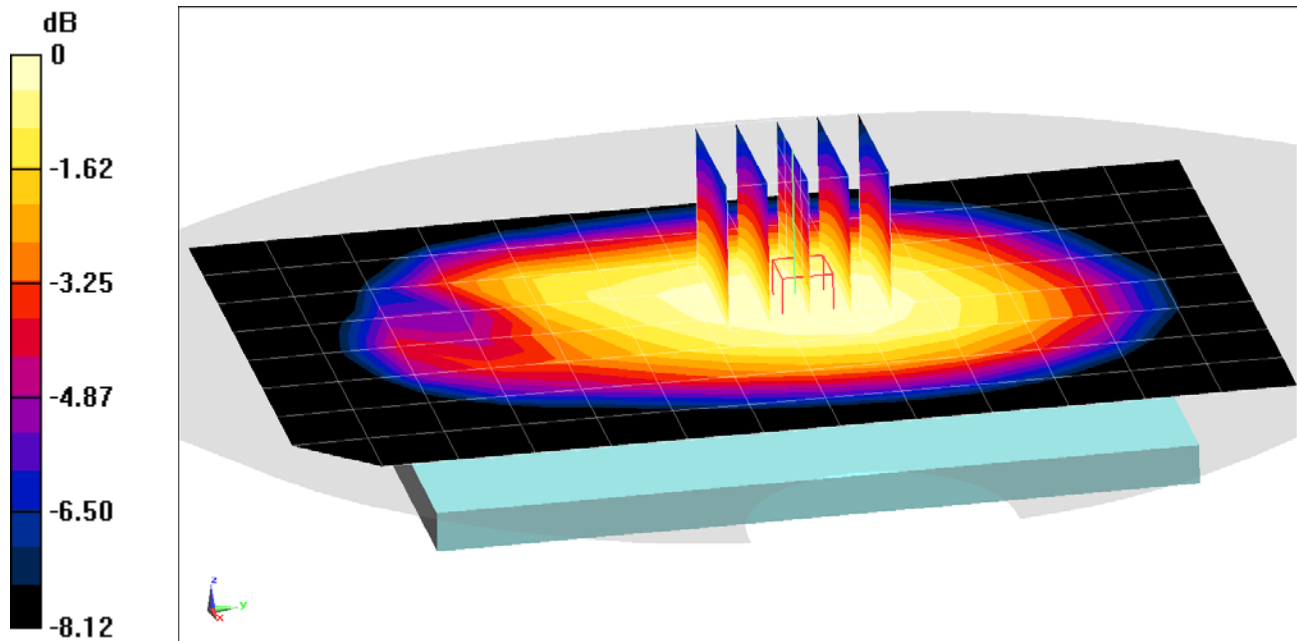
Area Scan (9x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.90 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.262 W/kg

SAR(1 g) = 0.207 W/kg



0 dB = 0.227 W/kg = -6.44 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 38117

Communication System: UID 0, GSM GPRS; 4 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:2.076

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.994 \text{ S/m}$; $\epsilon_r = 53.144$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-20-2018; Ambient Temp: 20.1°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3347; ConvF(6.37, 6.37, 6.37); Calibrated: 3/27/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1450; Calibrated: 11/9/2017

Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: GPRS 850, Body SAR, Back side, Mid.ch, 4 Tx Slots

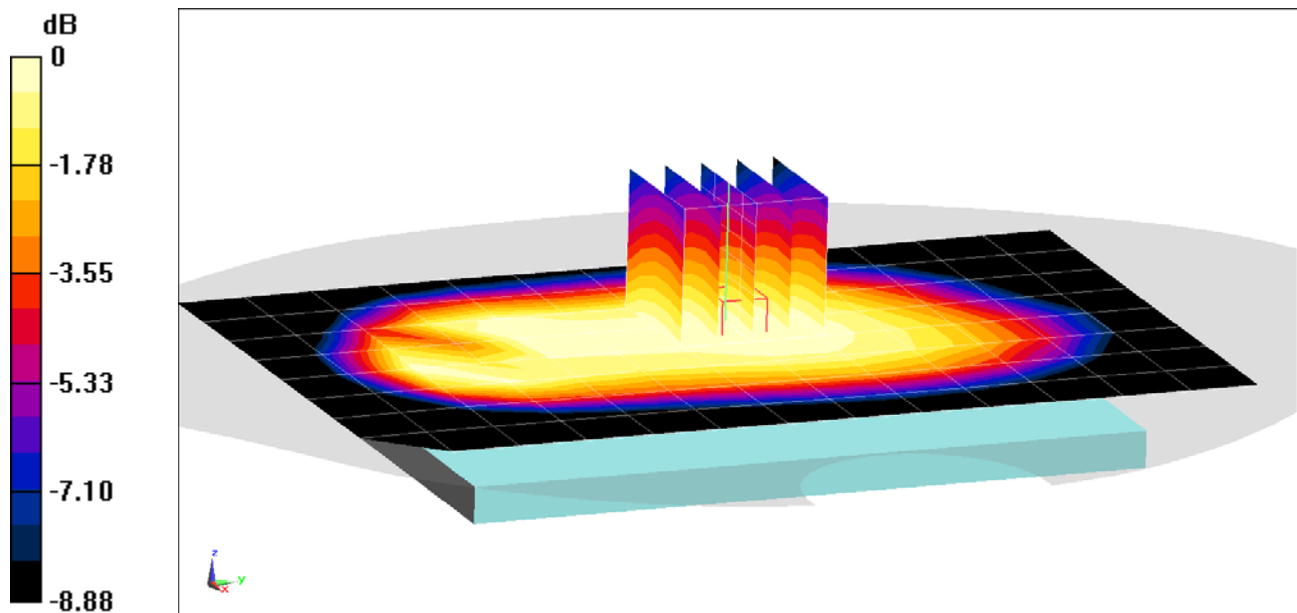
Area Scan (9x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 16.26 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.328 W/kg

SAR(1 g) = 0.259 W/kg



0 dB = 0.298 W/kg = -5.26 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 39123

Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.541 \text{ S/m}$; $\epsilon_r = 51.653$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-16-2018; Ambient Temp: 21.3°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN7406; ConvF(7.74, 7.74, 7.74); Calibrated: 5/22/2018;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/22/2018

Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1167

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: GSM 1900, Body SAR, Back side, Mid.ch

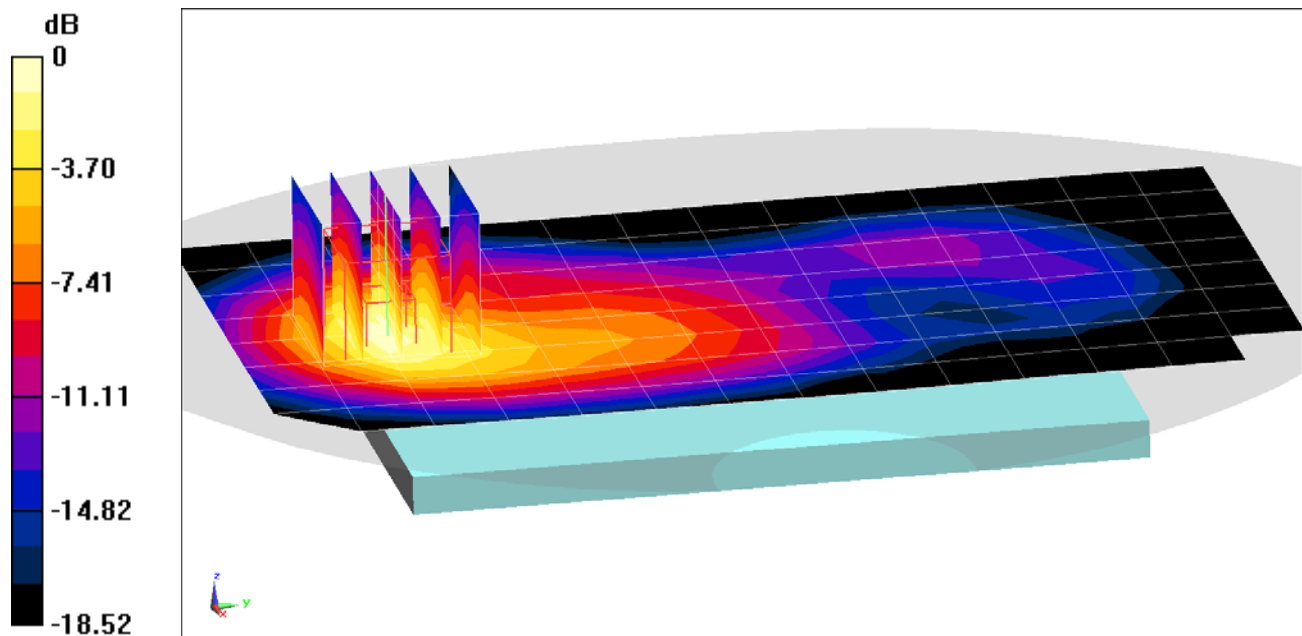
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 17.27 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.676 W/kg

SAR(1 g) = 0.410 W/kg



0 dB = 0.586 W/kg = -2.32 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 39123

Communication System: UID 0, _GSM GPRS; 4 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:2.076

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.541 \text{ S/m}$; $\epsilon_r = 51.653$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-16-2018; Ambient Temp: 21.3°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN7406; ConvF(7.74, 7.74, 7.74); Calibrated: 5/22/2018;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/22/2018

Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1167

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: GPRS 1900, Body SAR, Back side, Mid.ch, 4 Tx Slots

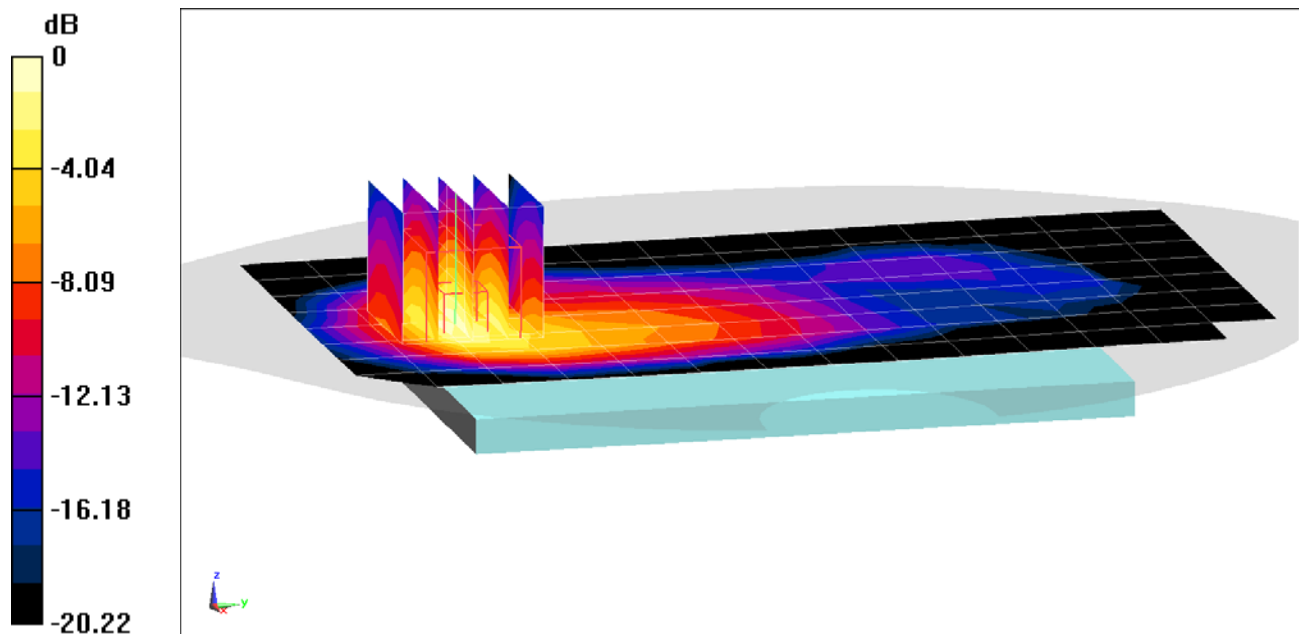
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.53 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.499 W/kg

SAR(1 g) = 0.288 W/kg



0 dB = 0.428 W/kg = -3.69 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 38117

Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.994 \text{ S/m}$; $\epsilon_r = 53.144$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-20-2018; Ambient Temp: 20.1°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3347; ConvF(6.37, 6.37, 6.37); Calibrated: 3/27/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1450; Calibrated: 11/9/2017

Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 850, Body SAR, Back side, Mid.ch

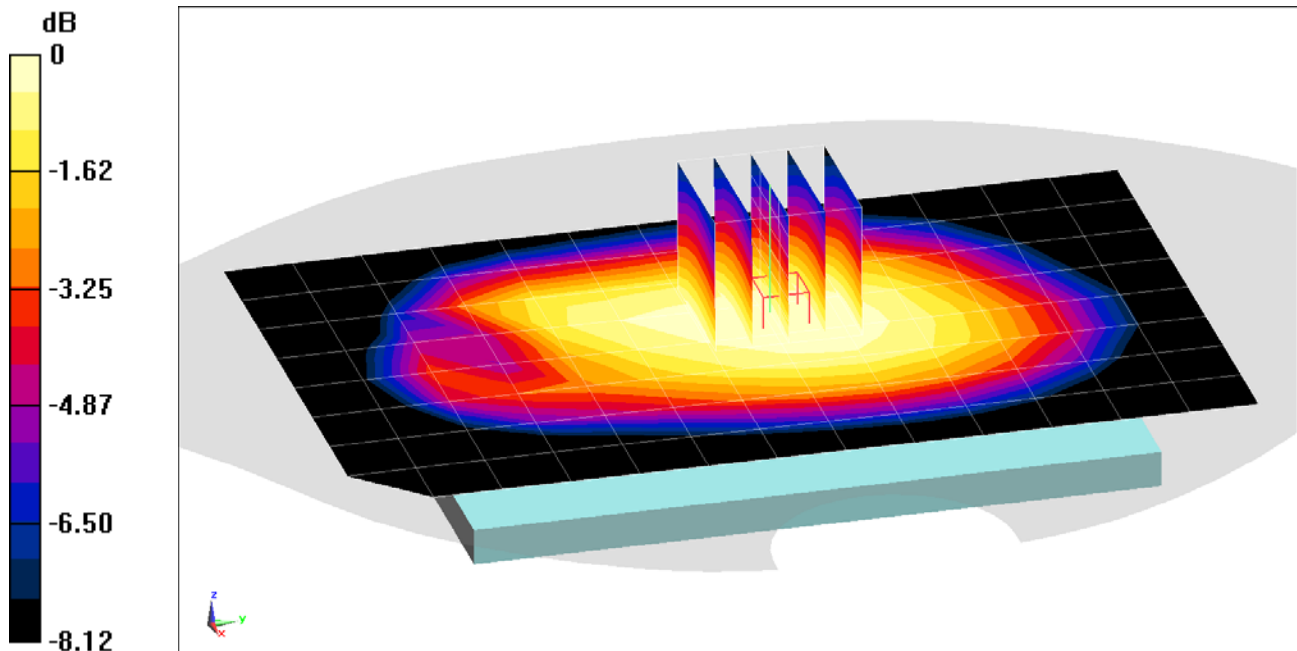
Area Scan (9x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 13.71 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.221 W/kg

SAR(1 g) = 0.175 W/kg



0 dB = 0.192 W/kg = -7.17 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 38117

Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Body Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.994 \text{ S/m}$; $\epsilon_r = 53.144$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-20-2018; Ambient Temp: 20.1°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3347; ConvF(6.37, 6.37, 6.37); Calibrated: 3/27/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1450; Calibrated: 11/9/2017

Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 850, Body SAR, Back side, Mid.ch

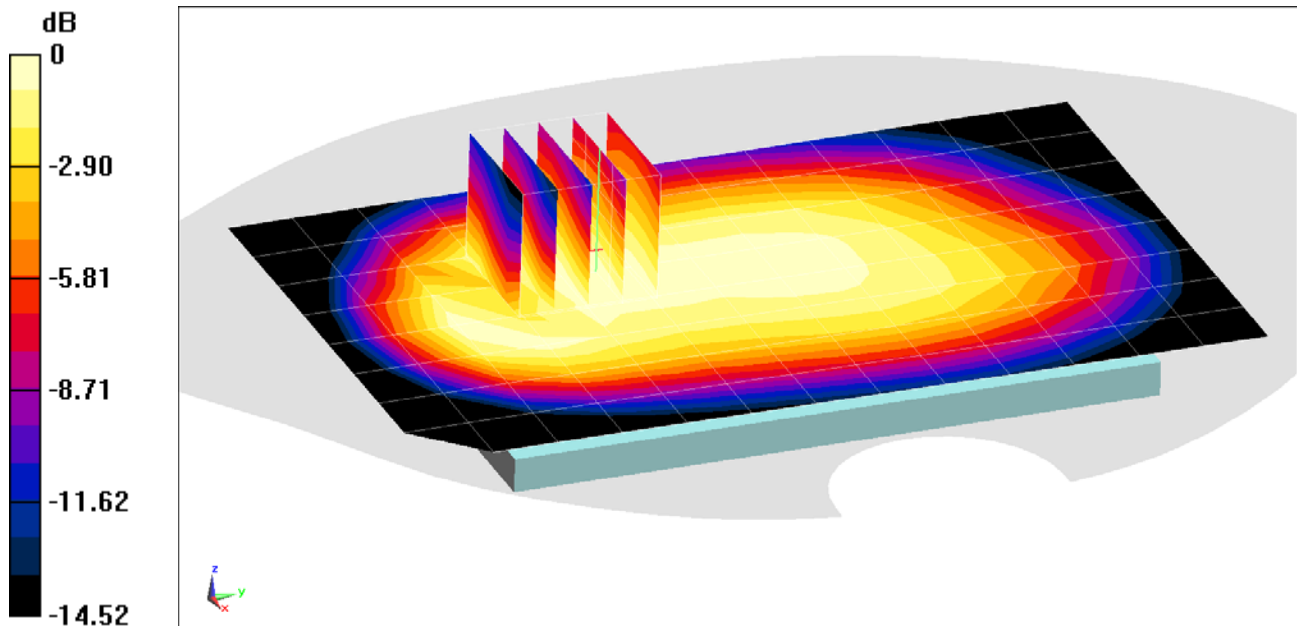
Area Scan (9x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.60 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.283 W/kg

SAR(1 g) = 0.208 W/kg



0 dB = 0.229 W/kg = -6.40 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 39511

Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: 1750 Body Medium parameters used (interpolated):

$f = 1732.4$ MHz; $\sigma = 1.477$ S/m; $\epsilon_r = 51.691$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-16-2018; Ambient Temp: 20.1°C; Tissue Temp: 20.4°C

Probe: ES3DV3 - SN3347; ConvF(5.17, 5.17, 5.17); Calibrated: 3/27/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1450; Calibrated: 11/9/2017

Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 1750, Body SAR, Back side, Mid.ch

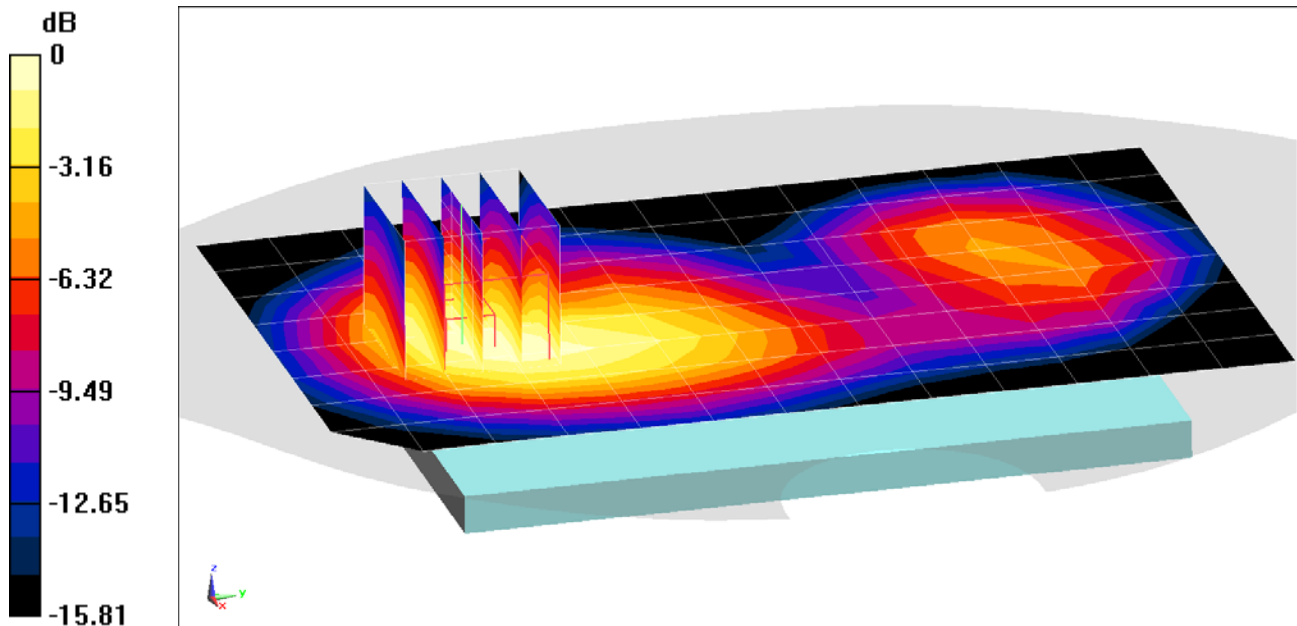
Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.44 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.306 W/kg

SAR(1 g) = 0.200 W/kg



0 dB = 0.237 W/kg = -6.25 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 39511

Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: 1750 Body Medium parameters used (interpolated):

$f = 1732.4 \text{ MHz}$; $\sigma = 1.477 \text{ S/m}$; $\epsilon_r = 51.691$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-16-2018; Ambient Temp: 20.1°C; Tissue Temp: 20.4°C

Probe: ES3DV3 - SN3347; ConvF(5.17, 5.17, 5.17); Calibrated: 3/27/2018;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1450; Calibrated: 11/9/2017

Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 1750, Body SAR, Back side, Mid.ch

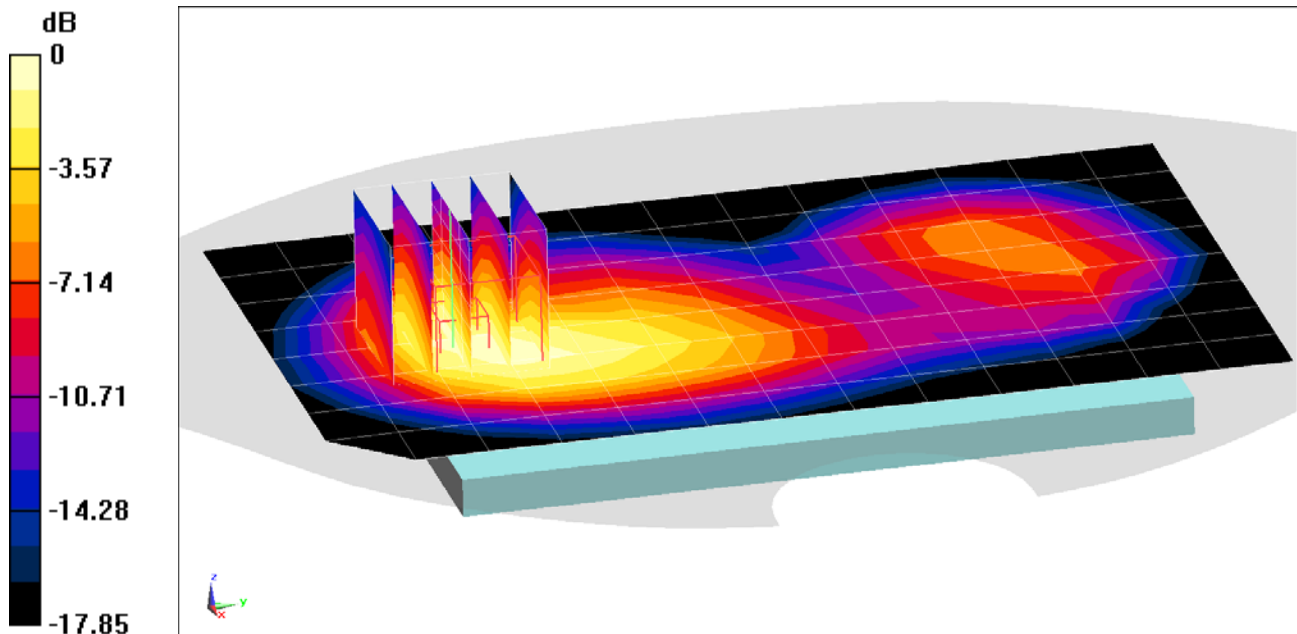
Area Scan (9x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.28 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.419 W/kg

SAR(1 g) = 0.267 W/kg



0 dB = 0.316 W/kg = -5.00 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMA600P; Type: Portable Handset; Serial: 28084

Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.541 \text{ S/m}$; $\epsilon_r = 51.653$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-16-2018; Ambient Temp: 21.3°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN7406; ConvF(7.74, 7.74, 7.74); Calibrated: 5/22/2018;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/22/2018

Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1167

Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 1900, Body SAR, Back side, Mid.ch

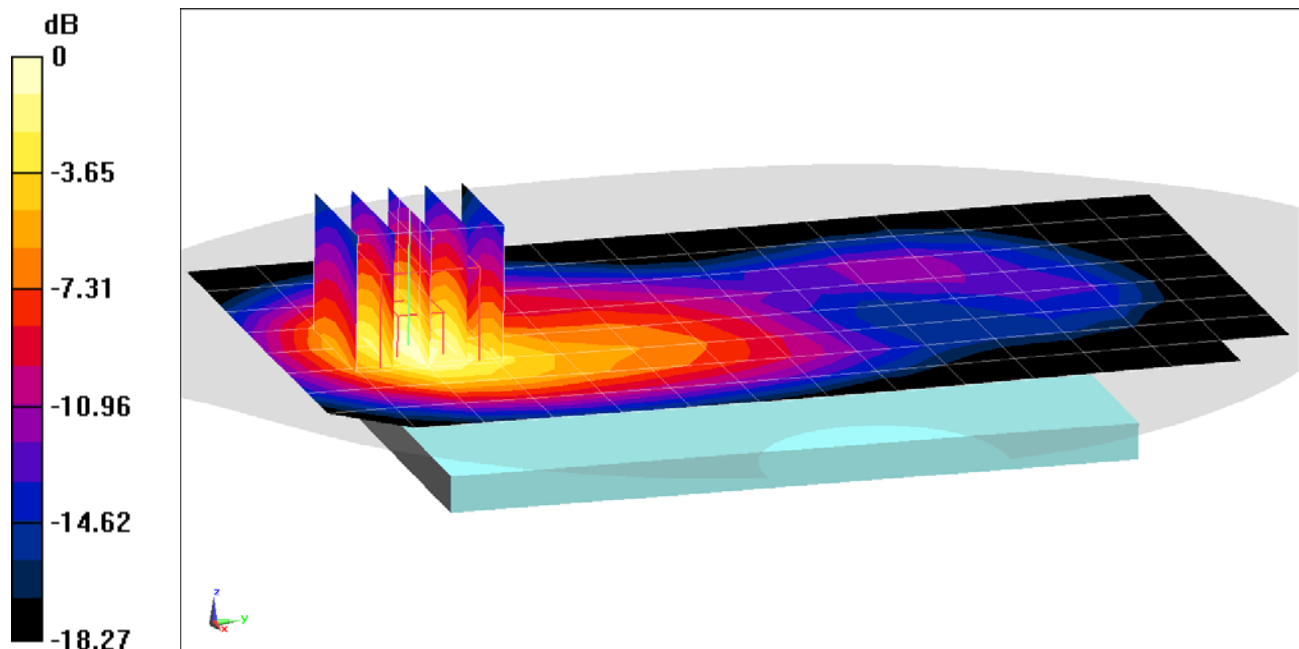
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 21.34 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.636 W/kg



0 dB = 0.907 W/kg = -0.42 dBW/kg