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SAR EVALUATION REPORT

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

Date of Testing:
06/21/17 - 07/19/17
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
1M1706190199-01.A3L

FCC ID: **A3LSMN9500**

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

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model: SM-N9500
Additional Models: SM-N9508

Equipment Class	Band & Mode	Tx Frequency	SAR			
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)	10 gm Phablet (W/kg)
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.12	0.33	0.77	N/A
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	0.23	0.68	N/A
PCE	UMTS 850	826.40 - 846.60 MHz	0.13	0.32	0.49	N/A
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.11	0.45	0.77	2.95
PCE	Cell. CDMA/EVDO	824.70 - 848.31 MHz	0.32	0.58	0.78	2.52
PCE	LTE Band 12	699.7 - 715.3 MHz	0.10	0.19	0.29	N/A
PCE	LTE Band 17	706.5 - 713.5 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 13	779.5 - 784.5 MHz	< 0.1	0.24	0.53	N/A
PCE	LTE Band 26 (Cell)	814.7 - 848.3 MHz	0.19	0.48	0.87	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.16	0.72	0.86	2.06
PCE	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	0.10	0.61	1.08	3.06
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 41	2498.5 - 2687.5 MHz	< 0.1	0.19	0.18	2.19
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.86	0.14	0.39	N/A
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	N/A	N/A
NII	U-NII-2A	5260 - 5320 MHz	0.65	0.24	N/A	1.68
NII	U-NII-2C	5500 - 5720 MHz	0.58	0.17	N/A	1.55
NII	U-NII-3	5745 - 5825 MHz	0.56	0.17	0.35	N/A
DSS/DTS	Bluetooth	2402 - 2480 MHz	0.93	<0.1	0.11	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			1.56	1.29	1.55	3.91

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.

Randy Ortanez
President

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

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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
Cell. CDMA/EVDO	Voice/Data	824.70 - 848.31 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 17	Voice/Data	706.5 - 713.5 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 26 (Cell)	Voice/Data	814.7 - 848.3 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 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
MST	Data	555 Hz - 8.33 kHz

1.2 Power Reduction for SAR

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

This device 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 PCE Power

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**	**31.5**	**29.8**	**27.8**	**27.0**	**25.5**	**23.5**	**22.0**
	Nominal	**32.5**	**32.5**	**31.0**	**29.3**	**27.3**	**26.5**	**25.0**	**23.0**	**21.5**
GSM/GPRS/EDGE 1900	Maximum	**30.0**	**30.0**	**28.5**	**26.5**	**25.0**	**25.7**	**24.7**	**22.7**	**21.3**
	Nominal	**29.5**	**29.5**	**28.0**	**26.0**	**24.5**	**25.2**	**24.2**	**22.2**	**20.8**

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA	*3GPP HSDPA*	*3GPP HSUPA*	*3GPP DC-HSDPA*
UMTS Band 5 (850 MHz)	Maximum	**23.5**	**23.5**	**23.0**	**23.5**
	Nominal	**23.0**	**23.0**	**22.5**	**23.0**
UMTS Band 2 (1900 MHz)	Maximum	**23.5**	**23.5**	**23.0**	**23.5**
	Nominal	**23.0**	**23.0**	**22.5**	**23.0**

Mode / Band		Modulated Average (dBm)
Cell. CDMA/EVDO	Maximum	**26.5**
	Nominal	**26.0**

Mode / Band		Modulated Average (dBm)
LTE Band 12	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 17	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 13	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 26 (Cell)	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 5 (Cell)	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 4 (AWS)	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 25 (PCS)	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 2 (PCS)	Maximum	**24.0**
	Nominal	**23.5**
LTE Band 41	Maximum	**24.5**
	Nominal	**24.0**

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1.3.2 Reduced PCE Power – Hotspot Mode Activated

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	**28.0**	**27.0**	**25.0**	**23.0**	**25.7**	**24.7**	**22.7**	**21.3**
	Nominal	**27.5**	**26.5**	**24.5**	**22.5**	**25.2**	**24.2**	**22.2**	**20.8**

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA	*3GPP HSDPA*	*3GPP HSUPA*	*3GPP DC-HSDPA*
UMTS Band 2 (1900 MHz)	Maximum	**20.5**	**20.5**	**20.5**	**20.5**
	Nominal	**20.0**	**20.0**	**20.0**	**20.0**

Mode / Band		Modulated Average (dBm)
Cell. CDMA/EVDO	Maximum	**24.5**
	Nominal	**24.0**

Mode / Band		Modulated Average (dBm)
LTE Band 4 (AWS)	Maximum	**19.0**
	Nominal	**18.5**
LTE Band 25 (PCS)	Maximum	**19.0**
	Nominal	**18.5**
LTE Band 2 (PCS)	Maximum	**19.0**
	Nominal	**18.5**
LTE Band 41	Maximum	**21.0**
	Nominal	**20.5**

1.3.3 Reduced PCE Power – Grip Sensor Activated

Mode / Band		Modulated Average (dBm)
LTE Band 4 (AWS)	Maximum	**21.0**
	Nominal	**20.5**
LTE Band 25 (PCS)	Maximum	**22.0**
	Nominal	**21.5**
LTE Band 2 (PCS)	Maximum	**22.0**
	Nominal	**21.5**
LTE Band 41	Maximum	**23.5**
	Nominal	**23.0**

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1.3.4 Maximum Bluetooth and SISO and MIMO WLAN Power

Mode / Band		Modulated Average - Single Tx Chain (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	**20.5**
	Nominal	**20.0**
IEEE 802.11g (2.4 GHz)	Maximum	**16.5**
	Nominal	**16.0**
IEEE 802.11n (2.4 GHz)	Maximum	**16.5**
	Nominal	**16.0**

Mode / Band		Modulated Average - Single Tx Chain (dBm)		
		20 MHz Bandwidth	40 MHz Bandwidth	80 MHz Bandwidth
IEEE 802.11a (5 GHz)	Maximum	**16.5**		
	Nominal	**16.0**		
IEEE 802.11n (5 GHz)	Maximum	**16.5**	**15.5 (Ch. 54-62: 14.5)**	
	Nominal	**16.0**	**15.0 (Ch. 54-62: 14.0)**	
IEEE 802.11ac (5 GHz)	Maximum	**16.5**	**15.5 (Ch. 54-62: 14.5)**	**14.5**
	Nominal	**16.0**	**15.0 (Ch. 54-62: 14.0)**	**14.0**
Mode / Band		Modulated Average - MIMO (dBm)		
		20 MHz Bandwidth	40 MHz Bandwidth	80 MHz Bandwidth
IEEE 802.11g (2.4 GHz)	Maximum	**19.5**		
	Nominal	**19.0**		
IEEE 802.11n (2.4 GHz)	Maximum	**19.5**		
	Nominal	**19.0**		
IEEE 802.11a (5 GHz)	Maximum	**19.5**		
	Nominal	**19.0**		
IEEE 802.11n (5 GHz)	Maximum	**19.5**	**18.5 (Ch. 54-62: 17.5)**	
	Nominal	**19.0**	**18.0 (Ch. 54-62: 17.0)**	
IEEE 802.11ac (5 GHz)	Maximum	**19.5**	**18.5 (Ch. 54-62: 17.5)**	**17.5**
	Nominal	**19.0**	**18.0 (Ch. 54-62: 17.0)**	**17.0**

Mode / Band		Modulated Average - Single Tx Chain (dBm)
Bluetooth	Maximum	**15.5**
	Nominal	**15.0**
Bluetooth LE (1Mbps)	Maximum	**8.5**
	Nominal	**8.0**
Bluetooth LE (2Mbps)	Maximum	**9.5**
	Nominal	**9.0**

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1.3.5 Reduced SISO and MIMO WLAN Power

Mode / Band		Modulated Average - Single Tx Chain (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	**16.5**
	Nominal	**16.0**
IEEE 802.11g (2.4 GHz)	Maximum	**13.5**
	Nominal	**13.0**
IEEE 802.11n (2.4 GHz)	Maximum	**13.5**
	Nominal	**13.0**

Mode / Band		Modulated Average - Single Tx Chain (dBm)		
		20 MHz Bandwidth	40 MHz Bandwidth	80 MHz Bandwidth
IEEE 802.11a (5 GHz)	Maximum	**13.5**		
	Nominal	**13.0**		
IEEE 802.11n (5 GHz)	Maximum	**13.5**	**13.5**	
	Nominal	**13.0**	**13.0**	
IEEE 802.11ac (5 GHz)	Maximum	**13.5**	**13.5**	**13.5**
	Nominal	**13.0**	**13.0**	**13.0**
Mode / Band		Modulated Average - MIMO (dBm)		
		20 MHz Bandwidth	40 MHz Bandwidth	80 MHz Bandwidth
IEEE 802.11g (2.4 GHz)	Maximum	**16.5**		
	Nominal	**16.0**		
IEEE 802.11n (2.4 GHz)	Maximum	**16.5**		
	Nominal	**16.0**		
IEEE 802.11a (5 GHz)	Maximum	**16.5**		
	Nominal	**16.0**		
IEEE 802.11n (5 GHz)	Maximum	**16.5**	**16.5**	
	Nominal	**16.0**	**16.0**	
IEEE 802.11ac (5 GHz)	Maximum	**16.5**	**16.5**	**16.5**
	Nominal	**16.0**	**16.0**	**16.0**

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1.3.6 Maximum Powers During Conditions with Simultaneous 2.4 GHz and 5 GHz WLAN

	# Tx	5 GHz WIFI [dBm]		2.4 GHz WIFI [dBm]		802.11 Modes
		Ant1	Ant2	Ant1	Ant2	
2.4 GHz + 5 GHz	2	A	-	-	B	2.4 GHz: b,g,n 5 GHz: a,n,ac
	2	-	A	B	-	
	2	A	-	B	-	
	2	-	A	-	B	
	3	A	A	B	-	2.4 GHz: b, g, n 5 GHz: n, ac, a (CDD + STBC only)
	3	A	A	-	B	
	3	A	-	B	B	2.4 GHz: n, g (CDD + STBC only) 5 GHz: a, n, ac
	3	-	A	B	B	
	4	A	A	B	B	2.4 GHz: n, g (CDD + STBC only) 5 GHz: n, ac, a (CDD + STBC only)

A = 13 dBm
B = 16 dBm
(Upper tolerance: target + 0.5 dB)

1.3.7 Reduced Powers During Conditions with Simultaneous 2.4 GHz and 5 GHz WLAN

	# Tx	5 GHz WIFI [dBm]		2.4 GHz WIFI [dBm]		802.11 Modes
		Ant1	Ant2	Ant1	Ant2	
2.4 GHz + 5 GHz	2	A	-	-	B	2.4 GHz: b,g,n 5 GHz: a,n,ac
	2	-	A	B	-	
	2	A	-	B	-	
	2	-	A	-	B	
	3	A	A	B	-	2.4 GHz: b, g, n 5 GHz: n, ac, a (CDD + STBC only)
	3	A	A	-	B	
	3	A	-	B	B	2.4 GHz: n, g (CDD + STBC only) 5 GHz: a, n, ac
	3	-	A	B	B	
	4	A	A	B	B	2.4 GHz: n, g (CDD + STBC only) 5 GHz: n, ac, a (CDD + STBC only)

A = 13 dBm
B = 12 dBm
(Upper tolerance: target + 0.5 dB)

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1.4 DUT Antenna Locations

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

Table 1-1
Device Edges/Sides for SAR Testing

Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 1900	Yes	Yes	No	Yes	Yes	Yes
Cell. EVDO	Yes	Yes	No	Yes	Yes	Yes
LTE Band 12	Yes	Yes	No	Yes	Yes	Yes
LTE Band 13	Yes	Yes	No	Yes	Yes	Yes
LTE Band 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	No	Yes
2.4 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
2.4 GHz WLAN Ant 2	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN Ant 2	Yes	Yes	Yes	No	No	Yes
Bluetooth	Yes	Yes	Yes	No	No	Yes

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

1.5 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.

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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. Possible transmission paths for the DUT are shown in Figure 1-1 and are color-coded to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

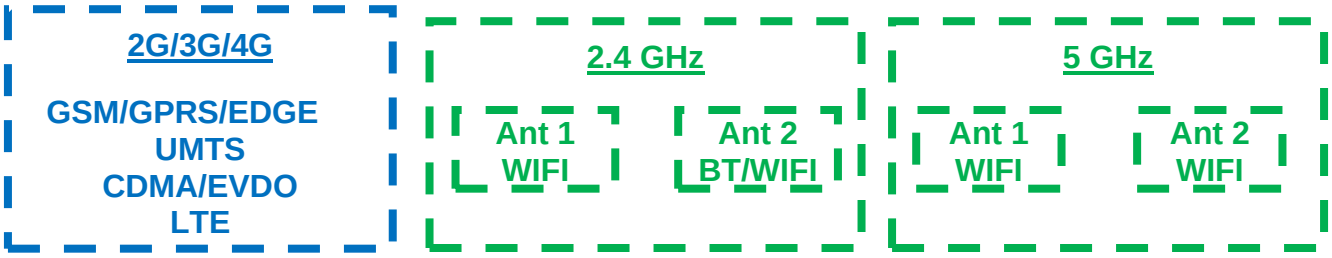

Figure 1-1
Simultaneous Transmission Paths

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

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Phablet	Notes
1	1x CDMA voice + 2.4 GHz WI-FI	Yes	Yes	N/A	Yes	
2	1x CDMA voice + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
3	1x CDMA voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^BT Tethering applications are considered.
4	1x CDMA voice + 2.4 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
5	1x CDMA voice + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
6	1x CDMA voice + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
7	1x CDMA voice + 2.4 GHz WI-FI MIMO + 5 GHz WIFI MIMO	Yes	Yes	N/A	Yes	
8	GSM voice + 2.4 GHz WI-FI	Yes	Yes	N/A	Yes	
9	GSM voice + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
10	GSM voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^BT Tethering applications are considered.
11	GSM voice + 2.4 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
12	GSM voice + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
13	GSM voice + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
14	GSM voice + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
15	UMTS + 2.4 GHz WI-FI	Yes	Yes	Yes	Yes	
16	UMTS + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
17	UMTS + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^BT Tethering applications are considered.
18	UMTS + 2.4 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
19	UMTS + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
20	UMTS + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
21	UMTS + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
22	LTE + 2.4 GHz WI-FI	Yes	Yes	Yes	Yes	
23	LTE + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
24	LTE + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^BT Tethering applications are considered.
25	LTE + 2.4 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
26	LTE + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
27	LTE + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
28	LTE + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
29	CDMA/EVDO data + 2.4 GHz WI-FI	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
30	CDMA/EVDO data + 5 GHz WI-FI	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
31	CDMA/EVDO data + 2.4 GHz Bluetooth	Yes*^	Yes*	Yes*^	Yes	*-Pre-installed VOIP applications are considered. ^BT Tethering applications are considered
32	CDMA/EVDO data + 2.4 GHz WI-FI MIMO	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
33	CDMA/EVDO data + 5 GHz WI-FI MIMO	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
34	CDMA/EVDO data + 2.4 GHz WI-FI + 5 GHz WI-FI	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
35	CDMA/EVDO data + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
36	GPRS/EDGE + 2.4 GHz WI-FI	N/A	N/A	Yes	Yes	
37	GPRS/EDGE + 5 GHz WI-FI	N/A	N/A	Yes	Yes	
38	GPRS/EDGE + 2.4 GHz Bluetooth	N/A	N/A	Yes^	Yes	^BT Tethering applications are considered.
39	GPRS/EDGE + 2.4 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	
40	GPRS/EDGE + 5 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	
41	GPRS/EDGE + 2.4 GHz WI-FI + 5 GHz WI-FI	N/A	N/A	Yes	Yes	
42	GPRS/EDGE + 2.4 GHz WI-FI MIMO + 5 GHz WI-FI MIMO	N/A	N/A	Yes	Yes	

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1. Bluetooth cannot transmit simultaneously with WLAN.
2. All licensed modes share the same antenna path and cannot transmit simultaneously.
3. When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario.
4. Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, there are no simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table.
5. 5 GHz Wireless Router is only supported for the U-NII-3 by S/W, therefore U-NII-1, U-NII2A, and U-NII2C were not evaluated for wireless router conditions.
6. This device supports 2x2 MIMO Tx for WLAN. 802.11a/g/n/ac supports CDD and STBC and 802.11n/ac additionally supports SDM.
7. This device supports BT Tethering.
8. This device supports VOLTE.
9. 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.

This device supports IEEE 802.11ac with the following features:
a) Up to 80 MHz Bandwidth only
b) No aggregate channel configurations
c) 2 Tx antenna output
d) 256 QAM is supported
e) TDWR and Band gap channels are supported

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

(B) Licensed Transmitter(s)

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

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

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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. All uplink communications are identical to Release 8 specifications. Per FCC KDB Publication 941225 D05A v01r02, SAR for downlink only LTE CA operations was not needed since the maximum average output power in downlink only LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

This device supports LTE Carrier Aggregation (CA) in the uplink for LTE Band 41 with two component carriers in the uplink. SAR Measurements and conducted powers were evaluated per FCC Guidance.

This device supports 64QAM on the downlink for LTE Operations. Conducted powers for 64QAM configurations were measured per Section 5.1 of FCC KDB Publication 941225 D05v02r05. SAR was not required for 64QAM since the highest maximum output power for 64 QAM is $\leq \frac{1}{2}$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is $\leq$ 1.45 W/kg, per Section 5.2.4 of FCC KDB Publication 941225 D05v02r05.

This device supports both LTE B12 and LTE B17. Since the supported frequency span for LTE B17 falls completely within the supported frequency span for LTE B12, both LTE bands have the same target power, and both LTE bands share the same transmission path, SAR was only assessed for LTE B12.

This device supports both LTE B26 (Cell) and LTE B5 (Cell). Since the supported frequency span for LTE B5 (Cell) falls completely within the supported frequency span for LTE B26 (Cell), both LTE bands have the same target power, and both LTE bands share the same transmission path, SAR was only assessed for LTE B26 (Cell).

This device supports both LTE B25 (PCS) and LTE B2 (PCS). Since the supported frequency span for LTE B2 (PCS) falls completely within the supported frequency span for LTE B25 (PCS), both LTE bands have the same target power, and both LTE bands share the same transmission path, SAR was only assessed for LTE B25 (PCS).

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

1.8 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r04, D05Av01r02, D06v02r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 648474 D04v01r03 (Phablet Procedures)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)

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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.

	Head Serial Number	Body-Worn Serial Number	Hotspot Serial Number	Phablet Serial Number
GSM/GPRS/EDGE 850	05EB8	05D28, 05D5F	05D28	-
GSM/GPRS/EDGE 1900	05D28	05EBA	05EBA	-
UMTS 850	05EB8	05EBA, 05D5F	05EBA	-
UMTS 1900	05B38	04E4A	04E4A	04E4A
Cell. CDMA/EVDO	1145D	05D28, 05D5F	058EC	258EC
LTE Band 12	05D28	05B38	05B38	-
LTE Band 13	05D28	05B38	05B38	-
LTE Band 26 (Cell)	05D28	05D28, 05D5F	05D28	-
LTE Band 4 (AWS)	15C0D	05D28	05D28	05D28
LTE Band 25 (PCS)	05B38	05CDB	05CDB	04E4A, 05CDB
LTE Band 41	05D28	05EE4	05EE4	05CDB, 05EE4
2.4 GHz WLAN	1145D	1144C	1144C, 1145D	-
5 GHz WLAN	15C0D	1144C	1144C	1144C
Bluetooth	1144C	1144C	1144C	-

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2 LTE INFORMATION

LTE Information					
FCC ID	**A3LSMN9500**				
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 17 (706.5 - 713.5 MHz)				
	LTE Band 13 (779.5 - 784.5 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				
	LTE Band 17: 5 MHz, 10 MHz				
	LTE Band 13: 5 MHz, 10 MHz				
	LTE Band 26 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz				
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 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 17: 5 MHz	706.5 (23755)		710 (23790)	713.5 (23825)	
LTE Band 17: 10 MHz	709 (23780)		710 (23790)	711 (23800)	
LTE Band 13: 5 MHz	779.5 (23205)		782 (23230)	784.5 (23255)	
LTE Band 13: 10 MHz	N/A		782 (23230)	N/A	
LTE Band 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	DL UE Cat 16 (QPSK, 16 QAM, 64 QAM), UL UE Cat 5 (QPSK, 16 QAM, 64 QAM)				
Modulations Supported in UL	QPSK, 16QAM, 64 QAM				
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	YES				
A-MPR (Additional MPR) disabled for SAR Testing?	YES				
LTE Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations				
LTE Additional Information	This device does not support full CA features on 3GPP Release 12. It supports uplink carrier aggregation for LTE CA_41C with a maximum of two 20 MHz component carriers. All other uplink communications are identical to the Release 8 Specifications. For downlink only intraband contiguous carrier aggregation scenarios, it supports a maximum of 2 carriers in the downlink. Uplink communications are done on the PCC. The following LTE Release 12 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, 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/m^3)
E = Total RMS electric field strength (V/m)

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

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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:

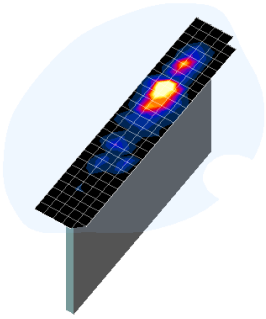

Figure 4-1
Sample SAR Area Scan

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

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

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

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

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

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

*Also compliant to IEEE 1528-2013 Table 6

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5 DEFINITION OF REFERENCE POINTS

5.1 EAR REFERENCE POINT

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

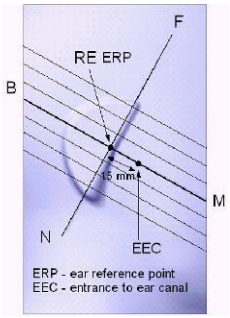

Figure 5-1
Close-Up Side view of ERP

5.2 HANDSET REFERENCE POINTS

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

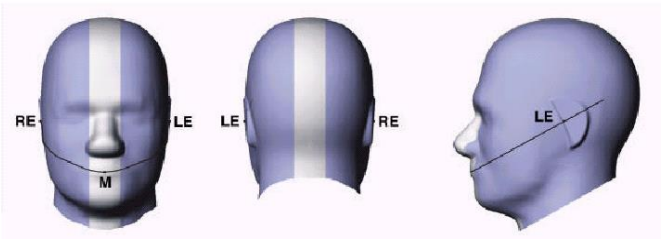

Figure 5-2
Front, back and side view of SAM Twin Phantom

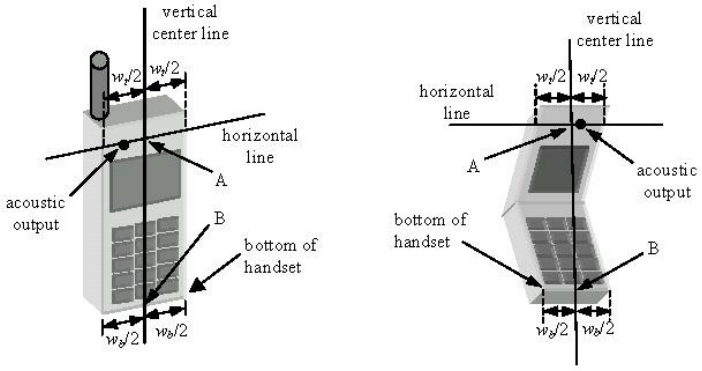

Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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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 ε = 3 and loss tangent δ = 0.02.

6.2 Positioning for Cheek

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

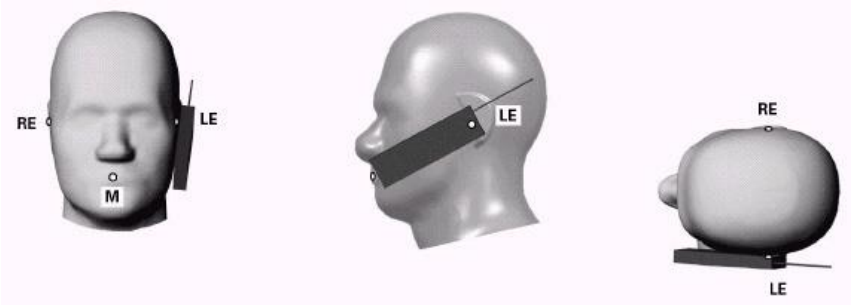

Figure 6-1 Front, Side and Top View of Cheek Position

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

6.3 Positioning for Ear / 15º Tilt

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

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

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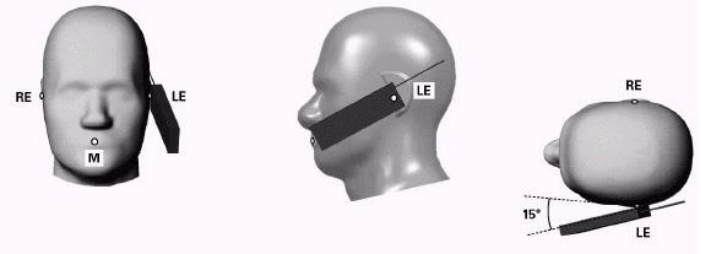

Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

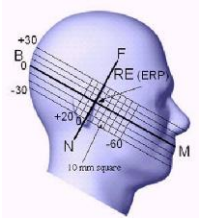

Figure 6-3
Side view w/ relevant markings

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

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

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

6.5 Body-Worn Accessory Configurations

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

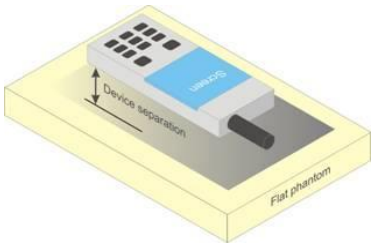

Figure 6-4
Sample Body-Worn Diagram

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

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

6.6 Extremity Exposure Configurations

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

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

6.7 Wireless Router Configurations

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

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

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6.8 Phablet Configurations

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

6.9 Additional Test Positions due to Proximity Conditions

This device uses a sensor to reduce voice and data powers in extremity (hand-held) use conditions.

When the sensor detects a user is touching the device on or near to the antenna the device reduces the maximum allowed output power However, the proximity sensor is not active when the device is moved beyond the sensor triggering distance and the maximum output power is no longer limited. Therefore, an additional exposure condition is needed in the vicinity of the triggering distance to ensure SAR is compliant when the device is allowed to operate at a non-reduced output power level.

The proximity sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the proximity sensor entirely covers the antenna. FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device at these additional test positions. Sensor triggering distance summary data is included in Appendix G.

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

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

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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 $\leq$ 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 $\leq$ 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 SCH_0 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
$\hat{I}_{or}$	dBm/1.23 MHz	-104
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

Table 8-2
Parameters for Max. Power for RC3

Parameter	Units	Value
$\hat{I}_{or}$	dBm/1.23 MHz	-86
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	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 fullrate 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+SCHn), with FCH only as the primary mode. Otherwise, SAR is required for multiple code channel configuration (FCH + SCHn), 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 Ev-Do capabilities, the 3G SAR test reduction procedure is applied to Ev-Do 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 Ev-Do 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 Ev-Do 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. The1x 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 "1's". 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.

8.5.6 SAR Measurement Conditions for DC-HSDPA

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

8.6 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.

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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.

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 ½ 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. For every supported combination of downlink only carrier aggregation, 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

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frequency band. Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for carrier aggregation configurations when the average output power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive.

8.7 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. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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

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remaining test positions is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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:

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. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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). When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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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. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.7.9 MIMO SAR considerations

Per KDB Publication 248227 D01v02r02, the simultaneous SAR provisions in KDB Publication 447498 D01v06 should be applied to determine simultaneous transmission SAR test exclusion for WIFI MIMO. If the sum of 1g single transmission chain SAR measurements is <1.6 W/kg, no additional SAR measurements for MIMO are required. Alternatively, SAR for MIMO can be measured with all antennas transmitting simultaneously at the specified maximum output power of MIMO operation. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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9 RF CONDUCTED POWERS

9.1 CDMA Conducted Powers

Table 9-1
Maximum Conducted Powers

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	1013	22H	824.7	25.77	25.78	25.64	25.77	25.78	25.97	25.85
	384	22H	836.52	25.56	25.55	25.51	25.64	25.65	25.84	25.68
	777	22H	848.31	25.55	25.53	25.48	25.40	25.43	25.95	25.64

Table 9-2
Reduced Conducted Powers- Hotspot Mode Active

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)
Cellular	1013	22H	824.7	24.21	24.18	24.19	24.06
	384	22H	836.52	24.07	24.08	23.96	23.88
	777	22H	848.31	23.83	23.73	23.72	23.56

Note:
1. RC1 is only applicable for IS-95 compatibility.

Figure 9-1
Power Measurement Setup

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9.2 GSM Conducted Powers

Table 9-3
Maximum Conducted Powers

Maximum Burst-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 850	128	32.82	32.86	31.42	29.31	27.12	26.73	24.97	22.77	20.91
	190	32.85	32.87	31.43	29.12	27.03	26.55	24.77	22.54	20.80
	251	32.73	32.40	30.94	29.02	26.72	26.23	24.45	22.18	20.49
GSM 1900	512	29.53	29.28	28.23	25.92	23.62	24.82	23.69	21.55	19.96
	661	29.48	29.26	28.35	26.06	23.86	25.03	23.84	21.81	20.20
	810	29.04	29.11	28.23	26.04	23.79	25.12	23.80	21.68	20.22
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	23.79	23.83	25.40	25.05	24.11	17.70	18.95	18.51	17.90
	190	23.82	23.84	25.41	24.86	24.02	17.52	18.75	18.28	17.79
	251	23.70	23.37	24.92	24.76	23.71	17.20	18.43	17.92	17.48
GSM 1900	512	20.50	20.25	22.21	21.66	20.61	15.79	17.67	17.29	16.95
	661	20.45	20.23	22.33	21.80	20.85	16.00	17.82	17.55	17.19
	810	20.01	20.08	22.21	21.78	20.78	16.09	17.78	17.42	17.21
GSM 850	Frame Avg.Targets:	23.47	23.47	24.98	25.04	24.29	17.47	18.98	18.74	18.49
GSM 1900		20.47	20.47	21.98	21.74	21.49	16.17	18.18	17.94	17.79

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Table 9-4
Reduced Conducted Powers- Hotspot Mode Active

Maximum Burst-Averaged Output Power									
		GPRS/EDGE Data (GMSK)				*EDGE Data (GMSK)*			
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	26.16	26.11	**23.80**	21.69	24.82	23.69	21.55	19.96
	661	26.39	26.16	**23.98**	21.90	25.03	23.84	21.81	20.20
	810	26.30	26.16	**24.02**	21.95	25.12	23.80	21.68	20.22
Calculated Maximum Frame-Averaged Output Power									
		GPRS/EDGE Data (GMSK)				*EDGE Data (GMSK)*			
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	17.13	20.09	**19.54**	18.68	15.79	17.67	17.29	16.95
	661	17.36	20.14	**19.72**	18.89	16.00	17.82	17.55	17.19
	810	17.27	20.14	**19.76**	18.94	16.09	17.78	17.42	17.21
GSM 1900	**Frame Avg.Targets:**	18.47	20.48	**20.24**	19.49	16.17	18.18	17.94	17.79

Note:

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

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	23.39	23.29	22.97	23.07	23.02	22.93	-
99		12.2 kbps AMR	23.43	23.33	23.01	23.11	23.06	22.90	-
6	HSDPA	Subtest 1	22.24	22.06	21.76	21.99	22.02	21.90	0
6		Subtest 2	22.18	22.08	21.74	22.01	22.01	21.92	0
6		Subtest 3	21.62	21.59	21.28	21.52	21.48	21.37	0.5
6		Subtest 4	21.72	21.58	21.24	21.50	21.57	21.43	0.5
6	HSUPA	Subtest 1	22.17	22.06	21.71	21.99	21.93	21.92	0
6		Subtest 2	20.09	20.05	19.75	20.04	20.02	19.96	2
6		Subtest 3	21.10	21.06	20.76	21.00	20.96	20.93	1
6		Subtest 4	20.15	20.09	19.75	20.01	20.03	19.93	2
6		Subtest 5	21.75	21.51	21.25	21.54	21.50	21.45	0
8	DC-HSDPA	Subtest 1	22.44	22.22	21.89	21.94	22.16	21.94	0
8		Subtest 2	22.41	22.18	21.94	22.08	22.14	21.87	0
8		Subtest 3	22.00	21.77	21.49	21.63	21.73	21.43	0.5
8		Subtest 4	21.81	21.65	21.34	21.58	21.65	21.36	0.5

Table 9-6
Reduced Conducted Powers- Hotspot Mode Active

3GPP Release Version	Mode	3GPP 34.121 Subtest	PCS Band [dBm]			3GPP MPR [dB]
			9262	9400	9538	
99	WCDMA	12.2 kbps RMC	20.07	20.00	19.90	-
99		12.2 kbps AMR	20.08	20.01	19.88	-
6	HSDPA	Subtest 1	19.07	19.19	18.91	0
6		Subtest 2	19.11	19.13	18.93	0
6		Subtest 3	18.59	18.67	18.41	0.5
6		Subtest 4	18.60	18.70	18.40	0.5
6	HSUPA	Subtest 1	19.09	18.67	18.87	0
6		Subtest 2	17.10	17.19	16.91	2
6		Subtest 3	18.10	18.16	17.88	1
6		Subtest 4	17.09	17.17	16.89	2
6		Subtest 5	19.13	19.19	18.93	0
8	DC-HSDPA	Subtest 1	19.14	19.20	18.90	0
8		Subtest 2	19.11	19.19	18.87	0
8		Subtest 3	18.63	18.83	18.44	0.5
8		Subtest 4	18.59	18.70	18.39	0.5

DC-HSDPA considerations

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

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

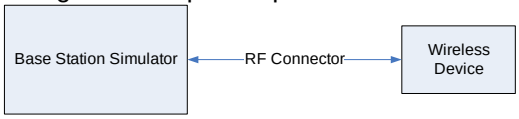

Figure 9-3
Power Measurement Setup

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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 23095 (707.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	23.54	0	0
	1	25	**23.55**		0
	1	49	23.50		0
	25	0	22.58	0-1	1
	25	12	**22.59**		1
	25	25	22.51		1
	50	0	22.57		1
16QAM	1	0	22.55	0-1	1
	1	25	22.69		1
	1	49	22.69		1
	25	0	21.55	0-2	2
	25	12	21.53		2
	25	25	21.50		2
	50	0	21.55		2
64QAM	1	0	21.71	0-2	2
	1	25	21.67		2
	1	49	21.58		2
	25	0	20.53	0-3	3
	25	12	20.54		3
	25	25	20.51		3
	50	0	20.53		3

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

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

LTE Band 12 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23035 (701.5 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23155 (713.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.39	23.44	23.28	0	0
	1	12	23.36	23.42	23.23		0
	1	24	23.40	23.39	23.21		0
	12	0	22.44	22.52	22.28	0-1	1
	12	6	22.46	22.53	22.33		1
	12	13	22.45	22.49	22.29		1
	25	0	22.42	22.47	22.29		1
16QAM	1	0	22.98	22.38	22.89	0-1	1
	1	12	23.00	22.38	22.84		1
	1	24	22.57	22.35	22.82		1
	12	0	21.48	21.51	21.32	0-2	2
	12	6	21.46	21.52	21.36		2
	12	13	21.43	21.49	21.32		2
	25	0	21.41	21.49	21.31		2
64QAM	1	0	21.41	21.67	21.40	0-2	2
	1	12	21.40	21.80	21.57		2
	1	24	21.38	21.78	21.56		2
	12	0	20.38	20.49	20.26	0-3	3
	12	6	20.40	20.52	20.30		3
	12	13	20.38	20.43	20.29		3
	25	0	20.42	20.45	20.24		3

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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 23025 (700.5 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23165 (714.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.28	23.31	23.16	0	0
	1	7	23.47	23.41	23.25		0
	1	14	23.34	23.36	23.17		0
	8	0	22.35	22.38	22.20	0-1	1
	8	4	22.39	22.45	22.24		1
	8	7	22.35	22.38	22.22		1
	15	0	22.40	22.37	22.20		1
16QAM	1	0	22.16	22.67	22.11	0-1	1
	1	7	22.27	22.53	22.20		1
	1	14	22.20	22.17	22.14		1
	8	0	21.51	21.48	21.24	0-2	2
	8	4	21.50	21.50	21.22		2
	8	7	21.46	21.48	21.23		2
	15	0	21.36	21.47	21.23		2
64QAM	1	0	21.57	21.54	21.33	0-2	2
	1	7	21.66	21.68	21.65		2
	1	14	21.54	21.58	21.52		2
	8	0	20.45	20.55	20.42	0-3	3
	8	4	20.50	20.61	20.48		3
	8	7	20.56	20.56	20.36		3
	15	0	20.44	20.48	20.23		3

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 23017 (699.7 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23173 (715.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.93	23.80	23.62	0	0
	1	2	23.96	23.85	23.65		0
	1	5	23.90	23.81	23.74		0
	3	0	23.89	23.85	23.68		0
	3	2	23.92	23.90	23.71		0
	3	3	23.87	23.83	23.67		0
	6	0	22.85	22.84	22.71	0-1	1
16QAM	1	0	22.75	22.92	22.62	0-1	1
	1	2	22.83	22.99	22.67		1
	1	5	22.77	22.93	22.57		1
	3	0	22.93	22.85	22.71		1
	3	2	22.99	22.90	22.79		1
	3	3	22.95	22.80	22.73		1
	6	0	21.81	21.92	21.89	0-2	2
64QAM	1	0	21.84	21.70	21.41	0-2	2
	1	2	21.90	21.78	21.46		2
	1	5	21.81	21.66	21.43		2
	3	0	21.87	21.75	21.66		2
	3	2	21.90	21.81	21.72		2
	3	3	21.81	21.76	21.67		2
	6	0	20.89	20.90	20.72	0-3	3

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9.4.2 LTE Band 13

Table 9-11
LTE Band 13 Conducted Powers - 10 MHz Bandwidth

LTE Band 13 10 MHzBandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**22.76**	0	0
	1	25	22.57		0
	1	49	22.46		0
	25	0	**21.69**	0-1	1
	25	12	21.68		1
	25	25	21.52		1
	50	0	21.60		1
16QAM	1	0	21.96	0-1	1
	1	25	21.65		1
	1	49	21.68		1
	25	0	20.72	0-2	2
	25	12	20.71		2
	25	25	20.63		2
	50	0	20.69		2
64QAM	1	0	20.95	0-2	2
	1	25	20.99		2
	1	49	20.79		2
	25	0	19.75	0-3	3
	25	12	19.75		3
	25	25	19.59		3
	50	0	19.82		3

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Table 9-12
LTE Band 13 Conducted Powers - 5 MHz Bandwidth

LTE Band 13 5 MHzBandwidth					
Modulation	**RB Size**	**RB Offset**	**Mid Channel** **23230** **(782.0 MHz)** **Conducted Power [dBm]**	**MPR Allowed per 3GPP [dB]**	**MPR [dB]**
QPSK	1	0	22.87	0	0
	1	12	22.88		0
	1	24	22.84		0
	12	0	21.90	0-1	1
	12	6	21.88		1
	12	13	21.83		1
	25	0	21.87		1
16QAM	1	0	22.20	0-1	1
	1	12	22.13		1
	1	24	22.13		1
	12	0	20.88	0-2	2
	12	6	20.89		2
	12	13	20.82		2
	25	0	20.83		2
64QAM	1	0	21.10	0-2	2
	1	12	21.09		2
	1	24	21.07		2
	12	0	19.95	0-3	3
	12	6	19.97		3
	12	13	19.94		3
	25	0	19.91		3

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

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9.4.3 LTE Band 26 (Cell)

Table 9-13
LTE Band 26 (Cell) Conducted Powers - 15 MHz Bandwidth

LTE Band 26 (Cell) 15 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 26865 (831.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**22.86**	0	0
	1	36	22.79		0
	1	74	22.63		0
	36	0	**21.85**	0-1	1
	36	18	**21.85**		1
	36	37	21.75		1
	75	0	21.77		1
16QAM	1	0	22.24	0-1	1
	1	36	22.20		1
	1	74	22.02		1
	36	0	20.80	0-2	2
	36	18	20.84		2
	36	37	20.74		2
	75	0	20.76		2
64QAM	1	0	21.10	0-2	2
	1	36	20.98		2
	1	74	20.99		2
	36	0	19.83	0-3	3
	36	18	19.85		3
	36	37	19.75		3
	75	0	19.80		3

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 9-14
LTE Band 26 (Cell) Conducted Powers - 10 MHz Bandwidth

LTE Band 26 (Cell) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26740 (819.0 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 26990 (844.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.98	23.05	23.04	0	0
	1	25	22.95	22.96	22.99		0
	1	49	22.88	22.93	22.91		0
	25	0	22.03	22.06	22.01	0-1	1
	25	12	22.01	22.02	22.01		1
	25	25	21.94	22.00	21.92		1
	50	0	22.02	22.01	21.97		1
16QAM	1	0	22.13	22.60	22.23	0-1	1
	1	25	22.05	22.53	22.15		1
	1	49	22.02	22.46	22.08		1
	25	0	21.10	21.05	20.97	0-2	2
	25	12	21.04	21.06	20.96		2
	25	25	21.00	21.04	20.91		2
	50	0	21.00	21.06	20.94		2
64QAM	1	0	20.87	21.35	21.18	0-2	2
	1	25	20.81	21.28	21.11		2
	1	49	20.78	21.22	21.05		2
	25	0	20.12	20.11	19.97	0-3	3
	25	12	20.13	20.09	19.97		3
	25	25	20.07	20.03	19.86		3
	50	0	20.05	20.08	19.91		3

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Table 9-15
LTE Band 26 (Cell) Conducted Powers - 5 MHz Bandwidth

LTE Band 26 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26715 (816.5 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 27015 (846.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.64	22.92	22.93	0	0
	1	12	22.59	22.87	22.88		0
	1	24	22.57	22.85	22.71		0
	12	0	21.65	21.87	21.87	0-1	1
	12	6	21.64	21.90	21.86		1
	12	13	21.61	21.81	21.83		1
	25	0	21.64	21.83	21.83		1
16QAM	1	0	21.62	22.22	21.75	0-1	1
	1	12	21.60	22.18	21.68		1
	1	24	21.55	22.12	21.63		1
	12	0	20.69	20.86	20.83	0-2	2
	12	6	20.73	20.84	20.83		2
	12	13	20.67	20.79	20.77		2
	25	0	20.60	20.81	20.81		2
64QAM	1	0	20.90	20.98	20.99	0-2	2
	1	12	20.80	20.97	20.97		2
	1	24	20.73	20.94	20.92		2
	12	0	19.71	19.80	19.81	0-3	3
	12	6	19.70	19.85	19.83		3
	12	13	19.67	19.81	19.78		3
	25	0	19.64	19.83	19.76		3

Table 9-16
LTE Band 26 (Cell) Conducted Powers - 3 MHz Bandwidth

LTE Band 26 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26705 (815.5 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 27025 (847.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.55	22.74	22.74	0	0
	1	7	22.62	22.69	22.82		0
	1	14	22.51	22.59	22.67		0
	8	0	21.58	21.70	21.77	0-1	1
	8	4	21.60	21.71	21.77		1
	8	7	21.56	21.70	21.74		1
	15	0	21.58	21.69	21.75		1
16QAM	1	0	21.88	21.56	22.42	0-1	1
	1	7	22.05	21.67	22.56		1
	1	14	21.91	21.54	22.46		1
	8	0	20.67	20.72	20.77	0-2	2
	8	4	20.70	20.73	20.77		2
	8	7	20.65	20.71	20.77		2
	15	0	20.62	20.65	20.75		2
64QAM	1	0	20.57	20.86	21.10	0-2	2
	1	7	20.69	20.98	21.19		2
	1	14	20.55	20.81	21.06		2
	8	0	19.55	19.71	19.74	0-3	3
	8	4	19.60	19.73	19.74		3
	8	7	19.79	19.71	19.68		3
	15	0	19.60	19.68	19.67		3

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Table 9-17
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 26697 (814.7 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 27033 (848.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.87	22.99	22.59	0	0
	1	2	22.95	23.07	22.66		0
	1	5	22.86	23.01	22.58		0
	3	0	22.89	23.01	22.62		0
	3	2	22.94	23.08	22.68		0
	3	3	22.89	23.01	22.61		0
	6	0	21.92	22.04	21.61	0-1	1
16QAM	1	0	22.52	22.73	22.25	0-1	1
	1	2	22.60	22.80	22.28		1
	1	5	22.50	22.71	21.96		1
	3	0	21.96	22.26	21.81		1
	3	2	22.16	22.24	21.88		1
	3	3	22.11	22.18	21.83		1
	6	0	21.12	21.17	20.82	0-2	2
64QAM	1	0	20.91	21.40	20.80	0-2	2
	1	2	21.02	21.47	21.04		2
	1	5	20.96	21.18	20.97		2
	3	0	21.17	21.18	20.93		2
	3	2	21.29	21.23	21.01		2
	3	3	21.22	21.16	20.92		2
	6	0	19.93	20.05	19.62	0-3	3

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9.4.4 LTE Band 4 (AWS)

Table 9-18
LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

LTE Band 4 (AWS) 20 MHzBandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20175 (1732.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**22.63**	0	0
	1	50	22.48		0
	1	99	22.37		0
	50	0	**21.61**	0-1	1
	50	25	21.51		1
	50	50	21.45		1
	100	0	21.53		1
16QAM	1	0	21.94	0-1	1
	1	50	21.89		1
	1	99	21.66		1
	50	0	20.59	0-2	2
	50	25	20.51		2
	50	50	20.42		2
	100	0	20.59		2
64QAM	1	0	20.70	0-2	2
	1	50	20.71		2
	1	99	20.72		2
	50	0	19.68	0-3	3
	50	25	19.58		3
	50	50	19.52		3
	100	0	19.57		3

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

Table 9-19
LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

LTE Band 4 (AWS) 15 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 20025 (1717.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20325 (1747.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.80	22.80	22.76	0	0
	1	36	22.62	22.59	22.57		0
	1	74	22.62	22.59	22.54		0
	36	0	21.75	21.75	21.72	0-1	1
	36	18	21.70	21.71	21.66		1
	36	37	21.67	21.67	21.60		1
	75	0	21.69	21.70	21.66		1
16QAM	1	0	22.03	22.01	22.01	0-1	1
	1	36	21.86	21.85	21.80		1
	1	74	21.86	21.84	21.80		1
	36	0	20.77	20.78	20.72	0-2	2
	36	18	20.73	20.73	20.67		2
	36	37	20.68	20.67	20.62		2
	75	0	20.72	20.70	20.65		2
64QAM	1	0	20.77	20.90	20.94	0-2	2
	1	36	20.61	20.71	20.50		2
	1	74	20.84	20.69	20.49		2
	36	0	19.79	19.78	19.69	0-3	3
	36	18	19.75	19.74	19.63		3
	36	37	19.69	19.61	19.58		3
	75	0	19.70	19.68	19.64		3

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Table 9-20
LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth

LTE Band 4 (AWS) 10 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 20000 (1715.0 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20350 (1750.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.36	22.67	22.30	0	0
	1	25	22.27	22.58	22.21		0
	1	49	22.25	22.54	22.19		0
	25	0	21.37	21.68	21.32	0-1	1
	25	12	21.37	21.65	21.28		1
	25	25	21.31	21.63	21.25		1
	50	0	21.35	21.64	21.29		1
16QAM	1	0	21.59	21.88	21.56	0-1	1
	1	25	21.51	21.79	21.43		1
	1	49	21.49	21.80	21.42		1
	25	0	20.38	20.69	20.34	0-2	2
	25	12	20.38	20.68	20.34		2
	25	25	20.32	20.60	20.26		2
	50	0	20.34	20.66	20.30		2
64QAM	1	0	20.60	20.73	20.55	0-2	2
	1	25	20.50	20.68	20.43		2
	1	49	20.47	20.70	20.40		2
	25	0	19.40	19.63	19.36	0-3	3
	25	12	19.41	19.62	19.34		3
	25	25	19.36	19.58	19.28		3
	50	0	19.38	19.65	19.32		3

Table 9-21
LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

LTE Band 4 (AWS) 5 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 19975 (1712.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20375 (1752.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.32	22.33	22.24	0	0
	1	12	22.26	22.22	22.19		0
	1	24	22.27	22.21	22.17		0
	12	0	21.33	21.32	21.26	0-1	1
	12	6	21.33	21.31	21.25		1
	12	13	21.31	21.26	21.24		1
	25	0	21.32	21.28	21.23		1
16QAM	1	0	21.57	21.51	21.51	0-1	1
	1	12	21.50	21.46	21.41		1
	1	24	21.47	21.46	21.42		1
	12	0	20.37	20.35	20.30	0-2	2
	12	6	20.37	20.36	20.31		2
	12	13	20.34	20.32	20.26		2
	25	0	20.33	20.29	20.27		2
64QAM	1	0	20.54	20.52	20.46	0-2	2
	1	12	20.49	20.45	20.41		2
	1	24	20.48	20.44	20.40		2
	12	0	19.33	19.31	19.28	0-3	3
	12	6	19.33	19.31	19.26		3
	12	13	19.30	19.27	19.23		3
	25	0	19.33	19.31	19.27		3

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Table 9-22
LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

LTE Band 4 (AWS) 3 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 19965 (1711.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20385 (1753.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.25	22.25	22.20	0	0
	1	7	22.34	22.30	22.31		0
	1	14	22.23	22.19	22.15		0
	8	0	21.29	21.26	21.20	0-1	1
	8	4	21.33	21.30	21.25		1
	8	7	21.30	21.26	21.19		1
	15	0	21.30	21.26	21.22		1
16QAM	1	0	21.48	21.43	21.39	0-1	1
	1	7	21.59	21.55	21.51		1
	1	14	21.46	21.45	21.40		1
	8	0	20.35	20.33	20.29	0-2	2
	8	4	20.37	20.35	20.29		2
	8	7	20.34	20.31	20.27		2
	15	0	20.30	20.25	20.23		2
64QAM	1	0	20.49	20.44	20.41	0-2	2
	1	7	20.49	20.54	20.51		2
	1	14	20.44	20.41	20.38		2
	8	0	19.38	19.36	19.31	0-3	3
	8	4	19.40	19.36	19.32		3
	8	7	19.37	19.32	19.27		3
	15	0	19.33	19.32	19.25		3

Table 9-23
LTE Band 4 (AWS) Conducted Powers -1.4 MHz Bandwidth

LTE Band 4 (AWS) 1.4 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 19957 (1710.7 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20393 (1754.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.17	22.15	22.14	0	0
	1	2	22.22	22.21	22.19		0
	1	5	22.16	22.14	22.10		0
	3	0	22.19	22.18	22.13		0
	3	2	22.24	22.21	22.18		0
	3	3	22.19	22.16	22.12		0
	6	0	21.22	21.20	21.15	0-1	1
16QAM	1	0	21.42	21.41	21.37	0-1	1
	1	2	21.49	21.46	21.42		1
	1	5	21.40	21.38	21.33		1
	3	0	21.34	21.32	21.25		1
	3	2	21.38	21.36	21.31		1
	3	3	21.32	21.32	21.26		1
	6	0	20.27	20.26	20.23	0-2	2
64QAM	1	0	20.41	20.37	20.35	0-2	2
	1	2	20.47	20.45	20.41		2
	1	5	20.39	20.38	20.32		2
	3	0	20.36	20.34	20.28		2
	3	2	20.39	20.38	20.33		2
	3	3	20.35	20.31	20.28		2
	6	0	19.28	19.26	19.22	0-3	3

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Table 9-24
Reduced LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth- Hotspot Mode Active

LTE Band 4 (AWS) 20 MHzBandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20175 (1732.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**18.52**	0	0
	1	50	18.30		0
	1	99	18.27		0
	50	0	**18.58**	0-1	0
	50	25	18.48		0
	50	50	18.41		0
	100	0	18.51		0
16QAM	1	0	18.54	0-1	0
	1	50	18.31		0
	1	99	18.58		0
	50	0	18.58	0-2	0
	50	25	18.52		0
	50	50	18.47		0
	100	0	18.49		0
64QAM	1	0	18.82	0-2	0
	1	50	18.64		0
	1	99	18.54		0
	50	0	18.61	0-3	0
	50	25	18.57		0
	50	50	18.56		0
	100	0	18.54		0

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

Table 9-25
Reduced LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth- Hotspot Mode Active

LTE Band 4 (AWS) 15 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 20025 (1717.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20325 (1747.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.52	18.55	18.72	0	0
	1	36	18.36	18.39	18.49		0
	1	74	18.40	18.38	18.46		0
	36	0	18.46	18.51	18.61	0-1	0
	36	18	18.49	18.48	18.55		0
	36	37	18.44	18.45	18.52		0
	75	0	18.43	18.45	18.55		0
16QAM	1	0	18.78	18.72	18.92	0-1	0
	1	36	18.37	18.37	18.82		0
	1	74	18.37	18.36	18.79		0
	36	0	18.49	18.54	18.68	0-2	0
	36	18	18.47	18.49	18.63		0
	36	37	18.45	18.52	18.57		0
	75	0	18.47	18.52	18.57		0
64QAM	1	0	18.60	18.57	18.90	0-2	0
	1	36	18.75	18.66	18.69		0
	1	74	18.63	18.63	18.67		0
	36	0	18.55	18.55	18.64	0-3	0
	36	18	18.51	18.48	18.59		0
	36	37	18.48	18.46	18.52		0
	75	0	18.50	18.48	18.60		0

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Table 9-26
Reduced LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth- Hotspot Mode Active

LTE Band 4 (AWS) 10 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 20000 (1715.0 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20350 (1750.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.38	18.40	18.69	0	0
	1	25	18.28	18.30	18.59		0
	1	49	18.31	18.31	18.53		0
	25	0	18.44	18.47	18.70	0-1	0
	25	12	18.43	18.44	18.63		0
	25	25	18.39	18.40	18.60		0
	50	0	18.40	18.42	18.64		0
16QAM	1	0	18.58	18.47	18.92	0-1	0
	1	25	18.52	18.57	18.80		0
	1	49	18.52	18.58	18.75		0
	25	0	18.41	18.45	18.68	0-2	0
	25	12	18.48	18.44	18.67		0
	25	25	18.46	18.47	18.62		0
	50	0	18.45	18.47	18.66		0
64QAM	1	0	18.70	18.71	18.91	0-2	0
	1	25	18.63	18.62	18.76		0
	1	49	18.62	18.60	18.58		0
	25	0	18.58	18.62	18.68	0-3	0
	25	12	18.59	18.63	18.66		0
	25	25	18.51	18.57	18.62		0
	50	0	18.49	18.52	18.68		0

Table 9-27
Reduced LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth- Hotspot Mode Active

LTE Band 4 (AWS) 5 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 19975 (1712.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20375 (1752.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.33	18.48	18.57	0	0
	1	12	18.34	18.44	18.53		0
	1	24	18.41	18.46	18.52		0
	12	0	18.41	18.42	18.61	0-1	0
	12	6	18.42	18.43	18.60		0
	12	13	18.36	18.39	18.56		0
	25	0	18.40	18.42	18.60		0
16QAM	1	0	18.42	18.79	18.95	0-1	0
	1	12	18.38	18.77	18.78		0
	1	24	18.39	18.73	18.78		0
	12	0	18.48	18.49	18.65	0-2	0
	12	6	18.49	18.49	18.65		0
	12	13	18.49	18.50	18.60		0
	25	0	18.41	18.51	18.62		0
64QAM	1	0	18.49	18.62	18.67	0-2	0
	1	12	18.63	18.58	18.59		0
	1	24	18.57	18.56	18.75		0
	12	0	18.49	18.48	18.61	0-3	0
	12	6	18.52	18.48	18.57		0
	12	13	18.45	18.41	18.57		0
	25	0	18.43	18.39	18.67		0

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Table 9-28
Reduced LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth- Hotspot Mode Active

LTE Band 4 (AWS) 3 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 19965 (1711.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20385 (1753.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.40	18.47	18.55	0	0
	1	7	18.48	18.53	18.64		0
	1	14	18.31	18.39	18.52		0
	8	0	18.39	18.39	18.55	0-1	0
	8	4	18.39	18.40	18.56		0
	8	7	18.36	18.40	18.54		0
	15	0	18.41	18.40	18.57		0
16QAM	1	0	18.20	18.34	18.83	0-1	0
	1	7	18.32	18.33	18.87		0
	1	14	18.54	18.20	18.76		0
	8	0	18.53	18.47	18.56	0-2	0
	8	4	18.53	18.47	18.56		0
	8	7	18.49	18.51	18.53		0
	15	0	18.46	18.38	18.63		0
64QAM	1	0	18.60	18.60	18.76	0-2	0
	1	7	18.71	18.69	18.88		0
	1	14	18.59	18.55	18.75		0
	8	0	18.59	18.48	18.73	0-3	0
	8	4	18.61	18.51	18.76		0
	8	7	18.57	18.46	18.61		0
	15	0	18.47	18.43	18.67		0

Table 9-29
Reduced LTE Band 4 (AWS) Conducted Powers – 1.4 MHz Bandwidth- Hotspot Mode Active

LTE Band 4 (AWS) 1.4 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 19957 (1710.7 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20393 (1754.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.29	18.35	18.47	0	0
	1	2	18.39	18.40	18.54		0
	1	5	18.31	18.35	18.48		0
	3	0	18.28	18.32	18.49		0
	3	2	18.33	18.37	18.54		0
	3	3	18.28	18.32	18.48		0
	6	0	18.31	18.34	18.50	0-1	0
16QAM	1	0	18.52	18.40	18.64	0-1	0
	1	2	18.59	18.60	18.66		0
	1	5	18.50	18.52	18.38		0
	3	0	18.42	18.71	18.59		0
	3	2	18.42	18.75	18.65		0
	3	3	18.41	18.40	18.61		0
	6	0	18.47	18.54	18.63	0-2	0
64QAM	1	0	18.50	18.38	18.72	0-2	0
	1	2	18.43	18.45	18.81		0
	1	5	18.38	18.41	18.71		0
	3	0	18.51	18.63	18.80		0
	3	2	18.56	18.73	18.81		0
	3	3	18.49	18.65	18.56		0
	6	0	18.35	18.34	18.49	0-3	0

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Table 9-30
Reduced LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth- Grip Sensor Active

LTE Band 4 (AWS) 20 MHzBandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20175 (1732.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**20.60**	0	0
	1	50	20.38		0
	1	99	20.33		0
	50	0	**20.57**	0-1	0
	50	25	20.48		0
	50	50	20.41		0
	100	0	20.46		0
16QAM	1	0	20.65	0-1	0
	1	50	20.31		0
	1	99	20.28		0
	50	0	20.54	0-2	0
	50	25	20.49		0
	50	50	20.45		0
	100	0	20.55		0
64QAM	1	0	20.86	0-2	0
	1	50	20.68		0
	1	99	20.74		0
	50	0	20.33	0-3	0
	50	25	20.24		0
	50	50	20.17		0
	100	0	20.25		0

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

Table 9-31
Reduced LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth- Grip Sensor Active

LTE Band 4 (AWS) 15 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 20025 (1717.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20325 (1747.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.56	20.57	20.70	0	0
	1	36	20.37	20.39	20.47		0
	1	74	20.43	20.39	20.45		0
	36	0	20.50	20.52	20.63	0-1	0
	36	18	20.48	20.50	20.56		0
	36	37	20.44	20.42	20.55		0
	75	0	20.45	20.47	20.59		0
16QAM	1	0	20.90	20.57	20.91	0-1	0
	1	36	20.74	20.37	20.46		0
	1	74	20.77	20.57	20.41		0
	36	0	20.52	20.53	20.60	0-2	0
	36	18	20.46	20.46	20.55		0
	36	37	20.40	20.44	20.48		0
	75	0	20.45	20.46	20.55		0
64QAM	1	0	20.93	20.70	20.78	0-2	0
	1	36	20.78	20.61	20.58		0
	1	74	20.65	20.53	20.66		0
	36	0	20.01	20.28	20.38	0-3	0
	36	18	19.96	20.22	20.31		0
	36	37	19.94	20.18	20.25		0
	75	0	19.99	20.23	20.27		0

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Table 9-32
Reduced LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth- Grip Sensor Active

LTE Band 4 (AWS) 10 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 20000 (1715.0 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20350 (1750.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.47	20.48	20.71	0	0
	1	25	20.38	20.36	20.59		0
	1	49	20.36	20.33	20.53		0
	25	0	20.45	20.47	20.70	0-1	0
	25	12	20.42	20.46	20.62		0
	25	25	20.41	20.43	20.60		0
	50	0	20.44	20.43	20.66		0
16QAM	1	0	20.64	20.70	20.50	0-1	0
	1	25	20.60	20.60	20.40		0
	1	49	20.58	20.55	20.38		0
	25	0	20.45	20.48	20.67	0-2	0
	25	12	20.42	20.46	20.56		0
	25	25	20.41	20.41	20.49		0
	50	0	20.43	20.43	20.62		0
64QAM	1	0	20.66	20.86	20.92	0-2	0
	1	25	20.58	20.78	20.75		0
	1	49	20.45	20.70	20.74		0
	25	0	19.99	20.23	20.54	0-3	0
	25	12	19.97	20.21	20.52		0
	25	25	19.94	20.16	20.42		0
	50	0	19.99	20.20	20.36		0

Table 9-33
Reduced LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth- Grip Sensor Active

LTE Band 4 (AWS) 5 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 19975 (1712.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20375 (1752.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.45	20.43	20.63	0	0
	1	12	20.39	20.36	20.55		0
	1	24	20.38	20.34	20.55		0
	12	0	20.43	20.43	20.62	0-1	0
	12	6	20.44	20.43	20.61		0
	12	13	20.37	20.45	20.59		0
	25	0	20.42	20.39	20.59		0
16QAM	1	0	20.73	20.76	20.85	0-1	0
	1	12	20.41	20.73	20.76		0
	1	24	20.17	20.69	20.74		0
	12	0	20.40	20.45	20.66	0-2	0
	12	6	20.41	20.45	20.65		0
	12	13	20.38	20.44	20.59		0
	25	0	20.36	20.44	20.59		0
64QAM	1	0	20.57	20.64	20.67	0-2	0
	1	12	20.56	20.56	20.85		0
	1	24	20.57	20.58	20.92		0
	12	0	19.96	20.15	20.30	0-3	0
	12	6	19.96	20.16	20.30		0
	12	13	19.91	20.14	20.27		0
	25	0	19.95	20.14	20.33		0

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Table 9-34
Reduced LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth- Grip Sensor Active

LTE Band 4 (AWS) 3 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 19965 (1711.5 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20385 (1753.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.35	20.41	20.55	0	0
	1	7	20.42	20.50	20.65		0
	1	14	20.27	20.36	20.47		0
	8	0	20.38	20.40	20.55	0-1	0
	8	4	20.42	20.41	20.58		0
	8	7	20.41	20.40	20.55		0
	15	0	20.43	20.39	20.58		0
16QAM	1	0	20.71	20.36	20.36	0-1	0
	1	7	20.79	20.44	20.51		0
	1	14	20.66	20.53	20.64		0
	8	0	20.55	20.43	20.65	0-2	0
	8	4	20.54	20.44	20.64		0
	8	7	20.53	20.42	20.54		0
	15	0	20.31	20.44	20.59		0
64QAM	1	0	20.56	20.59	20.72	0-2	0
	1	7	20.64	20.70	20.82		0
	1	14	20.54	20.54	20.72		0
	8	0	20.27	20.27	20.47	0-3	0
	8	4	20.26	20.28	20.49		0
	8	7	20.13	20.08	20.43		0
	15	0	20.08	20.21	20.32		0

Table 9-35
Reduced LTE Band 4 (AWS) Conducted Powers – 1.4 MHz Bandwidth- Grip Sensor Active

LTE Band 4 (AWS) 1.4 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel 19957 (1710.7 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20393 (1754.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.30	20.32	20.46	0	0
	1	2	20.35	20.38	20.51		0
	1	5	20.30	20.29	20.45		0
	3	0	20.31	20.32	20.43		0
	3	2	20.36	20.34	20.48		0
	3	3	20.31	20.31	20.42		0
	6	0	20.30	20.33	20.48	0-1	0
16QAM	1	0	20.29	20.83	20.49	0-1	0
	1	2	20.36	20.70	20.72		0
	1	5	20.31	20.61	20.63		0
	3	0	20.47	20.52	20.81		0
	3	2	20.42	20.53	20.85		0
	3	3	20.36	20.42	20.57		0
	6	0	20.29	20.31	20.60	0-2	0
64QAM	1	0	20.43	20.69	20.68	0-2	0
	1	2	20.72	20.74	20.74		0
	1	5	20.66	20.65	20.63		0
	3	0	20.63	20.36	20.65		0
	3	2	20.45	20.42	20.70		0
	3	3	20.36	20.38	20.68		0
	6	0	19.95	20.13	20.18	0-3	0

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9.4.5 LTE Band 25 (PCS)

Table 9-36
LTE Band 25 (PCS) Conducted Powers - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	**22.96**	**22.96**	22.82	0	0
	1	50	22.76	22.81	22.61		0
	1	99	22.70	22.78	22.65		0
	50	0	21.92	**21.94**	21.77	0-1	1
	50	25	21.87	21.84	21.69		1
	50	50	21.76	21.85	21.68		1
	100	0	21.86	21.83	21.79		1
16QAM	1	0	22.23	22.09	22.10	0-1	1
	1	50	22.39	22.07	21.89		1
	1	99	22.04	21.90	22.21		1
	50	0	20.92	20.96	20.77	0-2	2
	50	25	20.86	20.87	20.74		2
	50	50	20.80	20.86	20.68		2
	100	0	20.90	20.84	20.72		2
64QAM	1	0	21.31	21.25	21.15	0-2	2
	1	50	21.14	21.11	21.07		2
	1	99	21.11	21.11	21.01		2
	50	0	19.92	19.93	19.84	0-3	3
	50	25	19.91	19.90	19.75		3
	50	50	19.82	19.93	19.68		3
	100	0	19.86	19.90	19.81		3

Table 9-37
LTE Band 25 (PCS) Conducted Powers - 15 MHz Bandwidth

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26115 (1857.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26615 (1907.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.34	23.32	23.14	0	0
	1	36	23.16	23.18	22.96		0
	1	74	23.17	23.18	23.02		0
	36	0	22.30	22.34	22.11	0-1	1
	36	18	22.25	22.30	22.07		1
	36	37	22.19	22.23	22.04		1
	75	0	22.24	22.26	22.09		1
16QAM	1	0	22.64	22.62	22.39	0-1	1
	1	36	22.43	22.45	22.22		1
	1	74	22.40	22.47	22.28		1
	36	0	21.30	21.34	21.11	0-2	2
	36	18	21.26	21.27	21.09		2
	36	37	21.21	21.24	21.06		2
	75	0	21.27	21.27	21.08		2
64QAM	1	0	21.60	21.57	21.37	0-2	2
	1	36	21.42	21.42	21.20		2
	1	74	21.40	21.43	21.25		2
	36	0	20.33	20.32	20.10	0-3	3
	36	18	20.28	20.29	20.09		3
	36	37	20.22	20.24	20.04		3
	75	0	20.26	20.29	20.08		3

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Table 9-38
LTE Band 25 (PCS) Conducted Powers - 10 MHz Bandwidth

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26090 (1855.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26640 (1910.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.18	23.22	22.90	0	0
	1	25	23.08	23.15	22.84		0
	1	49	23.06	23.13	22.85		0
	25	0	22.20	22.26	21.93	0-1	1
	25	12	22.14	22.25	21.92		1
	25	25	22.12	22.20	21.91		1
	50	0	22.18	22.26	21.92		1
16QAM	1	0	22.43	22.50	22.15	0-1	1
	1	25	22.32	22.41	22.10		1
	1	49	22.32	22.44	22.13		1
	25	0	21.19	21.26	20.93	0-2	2
	25	12	21.18	21.28	20.93		2
	25	25	21.14	21.22	20.90		2
	50	0	21.14	21.24	20.92		2
64QAM	1	0	21.42	21.49	21.15	0-2	2
	1	25	21.30	21.41	21.09		2
	1	49	21.28	21.40	21.10		2
	25	0	20.21	20.30	19.96	0-3	3
	25	12	20.19	20.28	19.96		3
	25	25	20.16	20.27	19.93		3
	50	0	20.18	20.27	19.95		3

Table 9-39
LTE Band 25 (PCS) Conducted Powers - 5 MHz Bandwidth

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26065 (1852.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26665 (1912.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.14	23.17	22.87	0	0
	1	12	23.07	23.15	22.84		0
	1	24	23.06	23.15	22.86		0
	12	0	22.13	22.23	21.89	0-1	1
	12	6	22.14	22.24	21.92		1
	12	13	22.09	22.22	21.88		1
	25	0	22.15	22.20	21.88		1
16QAM	1	0	22.38	22.47	22.11	0-1	1
	1	12	22.33	22.42	22.11		1
	1	24	22.33	22.40	22.14		1
	12	0	21.18	21.25	20.93	0-2	2
	12	6	21.18	21.26	20.93		2
	12	13	21.15	21.22	20.92		2
	25	0	21.12	21.22	20.89		2
64QAM	1	0	21.24	21.44	21.12	0-2	2
	1	12	21.19	21.40	21.08		2
	1	24	21.17	21.39	21.08		2
	12	0	20.17	20.23	19.90	0-3	3
	12	6	20.18	20.24	19.90		3
	12	13	20.15	20.21	19.87		3
	25	0	20.16	20.24	19.92		3

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Table 9-40
LTE Band 25 (PCS) Conducted Powers - 3 MHz Bandwidth

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26055 (1851.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26675 (1913.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.06	23.17	22.84	0	0
	1	7	23.14	23.24	22.93		0
	1	14	23.04	23.11	22.85		0
	8	0	22.09	22.21	21.90	0-1	1
	8	4	22.13	22.22	21.88		1
	8	7	22.09	22.17	21.89		1
	15	0	22.11	22.19	21.88		1
16QAM	1	0	22.35	22.41	22.08	0-1	1
	1	7	22.44	22.52	22.22		1
	1	14	22.30	22.43	22.11		1
	8	0	21.17	21.25	20.94	0-2	2
	8	4	21.18	21.28	20.96		2
	8	7	21.15	21.25	20.94		2
	15	0	21.11	21.19	20.87		2
64QAM	1	0	21.29	21.25	21.07	0-2	2
	1	7	21.39	21.38	21.18		2
	1	14	21.25	21.25	21.04		2
	8	0	20.19	20.23	19.95	0-3	3
	8	4	20.22	20.25	19.98		3
	8	7	20.15	20.22	19.94		3
	15	0	20.16	20.23	19.91		3

Table 9-41
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 26047 (1850.7 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26683 (1914.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.01	23.07	22.78	0	0
	1	2	23.09	23.15	22.84		0
	1	5	23.04	23.09	22.77		0
	3	0	23.03	23.11	22.79		0
	3	2	23.08	23.16	22.84		0
	3	3	23.02	23.11	22.80		0
	6	0	22.07	22.13	21.81	0-1	1
16QAM	1	0	22.28	22.38	22.02	0-1	1
	1	2	22.34	22.42	22.09		1
	1	5	22.25	22.35	22.02		1
	3	0	22.17	22.25	21.94		1
	3	2	22.21	22.30	22.00		1
	3	3	22.18	22.25	21.93		1
	6	0	21.13	21.19	20.88	0-2	2
64QAM	1	0	21.25	21.35	20.99	0-2	2
	1	2	21.31	21.40	21.07		2
	1	5	21.22	21.34	21.00		2
	3	0	21.20	21.27	20.96		2
	3	2	21.25	21.32	20.99		2
	3	3	21.19	21.25	20.93		2
	6	0	20.11	20.19	19.87	0-3	3

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Table 9-42
Reduced LTE Band 25 (PCS) Conducted Powers - 20 MHz Bandwidth- Hotspot Mode Active

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	**18.00**	17.95	17.88	0	0
	1	50	17.77	17.74	17.65		0
	1	99	17.69	17.68	17.66		0
	50	0	**17.96**	17.91	17.77	0-1	0
	50	25	17.84	17.84	17.70		0
	50	50	17.82	17.85	17.68		0
	100	0	17.90	17.87	17.71		0
16QAM	1	0	18.28	18.18	17.55	0-1	0
	1	50	18.01	18.00	17.33		0
	1	99	17.79	18.01	17.34		0
	50	0	17.92	17.95	17.67	0-2	0
	50	25	17.87	17.86	17.60		0
	50	50	17.82	17.84	17.54		0
	100	0	17.91	17.85	17.64		0
64QAM	1	0	18.37	18.38	17.94	0-2	0
	1	50	18.09	18.16	17.72		0
	1	99	18.01	18.11	17.74		0
	50	0	17.98	17.96	17.70	0-3	0
	50	25	17.88	17.88	17.61		0
	50	50	17.84	17.86	17.56		0
	100	0	17.92	17.93	17.63		0

Table 9-43
Reduced LTE Band 25 (PCS) Conducted Powers – 15 MHz Bandwidth- Hotspot Mode Active

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26115 (1857.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26615 (1907.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.19	18.10	17.90	0	0
	1	36	17.99	17.90	17.67		0
	1	74	17.96	17.88	17.71		0
	36	0	18.12	18.13	17.85	0-1	0
	36	18	18.06	18.11	17.77		0
	36	37	18.06	18.05	17.73		0
	75	0	18.08	18.11	17.79		0
16QAM	1	0	18.45	18.05	18.27	0-1	0
	1	36	18.22	18.20	18.07		0
	1	74	18.25	18.21	18.12		0
	36	0	18.14	18.10	17.87	0-2	0
	36	18	18.07	18.10	17.79		0
	36	37	18.01	18.08	17.75		0
	75	0	18.08	18.11	17.80		0
64QAM	1	0	18.27	18.43	18.24	0-2	0
	1	36	18.06	18.25	17.99		0
	1	74	18.38	18.26	17.91		0
	36	0	18.14	18.16	17.78	0-3	0
	36	18	18.08	18.17	17.73		0
	36	37	18.01	18.11	17.69		0
	75	0	18.13	18.15	17.78		0

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Table 9-44
Reduced LTE Band 25 (PCS) Conducted Powers - 10 MHz Bandwidth- Hotspot Mode Active

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26090 (1855.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26640 (1910.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.11	18.12	17.75	0	0
	1	25	18.00	18.01	17.64		0
	1	49	17.98	18.11	17.68		0
	25	0	18.08	18.09	17.78	0-1	0
	25	12	18.06	18.04	17.73		0
	25	25	18.01	18.03	17.72		0
	50	0	18.03	18.06	17.76		0
16QAM	1	0	18.41	18.42	18.03	0-1	0
	1	25	18.32	18.32	17.92		0
	1	49	17.87	18.34	17.93		0
	25	0	18.08	18.11	17.76	0-2	0
	25	12	18.06	18.13	17.76		0
	25	25	17.99	18.03	17.73		0
	50	0	18.05	18.04	17.73		0
64QAM	1	0	18.35	18.28	18.15	0-2	0
	1	25	18.21	18.22	18.05		0
	1	49	18.16	18.20	18.07		0
	25	0	18.08	18.08	17.77	0-3	0
	25	12	18.07	18.07	17.79		0
	25	25	18.03	18.04	17.77		0
	50	0	18.08	18.09	17.77		0

Table 9-45
Reduced LTE Band 25 (PCS) Conducted Powers - 5 MHz Bandwidth- Hotspot Mode Active

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26065 (1852.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26665 (1912.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	17.96	17.98	17.62	0	0
	1	12	17.90	17.95	17.61		0
	1	24	17.93	18.06	17.63		0
	12	0	18.03	18.07	17.65	0-1	0
	12	6	18.05	18.09	17.68		0
	12	13	18.01	18.01	17.61		0
	25	0	18.02	18.02	17.65		0
16QAM	1	0	18.33	18.23	17.68	0-1	0
	1	12	18.23	18.38	17.58		0
	1	24	18.25	18.33	17.62		0
	12	0	18.08	18.08	17.73	0-2	0
	12	6	18.09	18.11	17.70		0
	12	13	18.03	18.06	17.71		0
	25	0	18.02	18.07	17.64		0
64QAM	1	0	18.10	18.22	17.94	0-2	0
	1	12	18.08	18.17	17.81		0
	1	24	18.37	18.17	17.82		0
	12	0	18.03	18.06	17.72	0-3	0
	12	6	18.04	18.06	17.68		0
	12	13	18.00	18.07	17.62		0
	25	0	18.07	18.04	17.65		0

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Table 9-46
Reduced LTE Band 25 (PCS) Conducted Powers - 3 MHz Bandwidth- Hotspot Mode Active

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26055 (1851.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26675 (1913.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.07	18.00	17.71	0	0
	1	7	18.13	18.21	17.76		0
	1	14	18.00	17.94	17.65		0
	8	0	18.03	18.00	17.62	0-1	0
	8	4	18.05	18.04	17.68		0
	8	7	18.02	18.03	17.65		0
	15	0	18.04	18.05	17.63		0
16QAM	1	0	17.97	17.82	17.81	0-1	0
	1	7	18.07	17.92	18.35		0
	1	14	17.92	17.84	18.20		0
	8	0	18.06	18.05	17.65	0-2	0
	8	4	18.05	18.04	17.72		0
	8	7	18.00	18.05	17.80		0
	15	0	18.06	18.00	17.66		0
64QAM	1	0	18.08	18.23	17.66	0-2	0
	1	7	18.12	18.35	17.76		0
	1	14	18.00	18.24	17.81		0
	8	0	18.04	18.19	17.59	0-3	0
	8	4	18.02	18.06	17.63		0
	8	7	18.21	18.03	17.59		0
	15	0	18.07	18.10	17.69		0

Table 9-47
Reduced LTE Band 25 (PCS) Conducted Powers – 1.4 MHz Bandwidth- Hotspot Mode Active

LTE Band 25 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26047 (1850.7 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26683 (1914.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	17.98	17.88	17.57	0	0
	1	2	18.01	17.97	17.67		0
	1	5	17.92	17.95	17.60		0
	3	0	17.96	17.95	17.52		0
	3	2	18.00	18.00	17.59		0
	3	3	17.94	17.95	17.53		0
	6	0	17.95	17.94	17.56	0-1	0
16QAM	1	0	18.12	18.10	17.75	0-1	0
	1	2	18.14	18.14	17.81		0
	1	5	17.90	17.96	17.98		0
	3	0	18.05	18.06	17.65		0
	3	2	18.11	18.09	17.66		0
	3	3	18.05	18.04	17.62		0
	6	0	18.04	18.02	17.67	0-2	0
64QAM	1	0	18.17	18.20	17.55	0-2	0
	1	2	18.24	18.27	17.64		0
	1	5	18.14	18.17	17.59		0
	3	0	18.24	18.24	17.75		0
	3	2	18.07	18.09	17.89		0
	3	3	18.02	18.00	17.88		0
	6	0	17.95	17.95	17.55	0-3	0

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Table 9-48
Reduced LTE Band 25 (PCS) Conducted Powers - 20 MHz Bandwidth- Grip Sensor Active

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	**21.12**	20.95	20.75	0	0
	1	50	20.81	20.75	20.54		0
	1	99	20.78	20.76	20.51		0
	50	0	**21.00**	20.98	20.70	0-1	0
	50	25	20.93	20.93	20.63		0
	50	50	20.84	20.85	20.60		0
	100	0	20.92	20.92	20.68		0
16QAM	1	0	21.31	20.89	21.40	0-1	0
	1	50	20.95	20.61	21.10		0
	1	99	20.97	20.65	21.21		0
	50	0	20.97	20.97	20.73	0-2	0
	50	25	20.89	20.90	20.66		0
	50	50	20.86	20.84	20.62		0
	100	0	20.93	20.88	20.68		0
64QAM	1	0	21.27	21.21	21.17	0-2	0
	1	50	21.03	21.00	20.92		0
	1	99	20.99	20.98	20.93		0
	50	0	19.98	19.99	19.96	0-3	1
	50	25	19.91	19.95	19.88		1
	50	50	19.86	19.89	19.80		1
	100	0	19.91	19.90	19.85		1

Table 9-49
Reduced LTE Band 25 (PCS) Conducted Powers – 15 MHz Bandwidth- Grip Sensor Active

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26115 (1857.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26615 (1907.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.18	21.22	20.93	0	0
	1	36	20.99	20.99	20.68		0
	1	74	21.01	21.01	20.69		0
	36	0	21.12	21.15	20.84	0-1	0
	36	18	21.09	21.08	20.79		0
	36	37	21.04	21.06	20.77		0
	75	0	21.10	21.13	20.81		0
16QAM	1	0	21.18	21.34	20.71	0-1	0
	1	36	20.99	21.19	20.66		0
	1	74	21.19	21.14	20.87		0
	36	0	21.09	21.07	20.81	0-2	0
	36	18	21.07	21.03	20.75		0
	36	37	21.04	21.01	20.70		0
	75	0	21.03	21.06	20.77		0
64QAM	1	0	21.40	21.37	21.11	0-2	0
	1	36	21.19	21.38	20.92		0
	1	74	21.20	21.24	20.98		0
	36	0	20.15	20.14	20.04	0-3	1
	36	18	20.09	20.11	20.02		1
	36	37	20.06	20.08	19.97		1
	75	0	20.04	20.10	19.99		1

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Table 9-50
Reduced LTE Band 25 (PCS) Conducted Powers - 10 MHz Bandwidth- Grip Sensor Active

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26090 (1855.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26640 (1910.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.02	21.03	20.79	0	0
	1	25	20.92	20.94	20.68		0
	1	49	20.96	20.94	20.69		0
	25	0	21.11	21.07	20.78	0-1	0
	25	12	21.08	21.08	20.79		0
	25	25	21.01	21.02	20.75		0
	50	0	21.06	21.03	20.76		0
16QAM	1	0	21.21	20.83	20.76	0-1	0
	1	25	21.11	20.79	20.66		0
	1	49	21.12	21.12	20.87		0
	25	0	21.01	21.00	20.74	0-2	0
	25	12	21.07	21.04	20.73		0
	25	25	21.02	20.94	20.70		0
	50	0	21.01	21.02	20.80		0
64QAM	1	0	21.32	21.30	21.00	0-2	0
	1	25	21.22	21.21	20.90		0
	1	49	21.21	21.19	20.88		0
	25	0	20.19	20.06	19.96	0-3	1
	25	12	20.19	20.17	19.93		1
	25	25	20.09	20.15	19.92		1
	50	0	20.07	20.14	19.97		1

Table 9-51
Reduced LTE Band 25 (PCS) Conducted Powers - 5 MHz Bandwidth- Grip Sensor Active

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26065 (1852.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26665 (1912.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.98	21.09	20.63	0	0
	1	12	20.90	21.02	20.58		0
	1	24	20.87	21.02	20.61		0
	12	0	21.02	21.04	20.61	0-1	0
	12	6	21.05	21.06	20.63		0
	12	13	21.00	21.02	20.62		0
	25	0	20.99	21.04	20.64		0
16QAM	1	0	21.23	21.62	20.88	0-1	0
	1	12	21.33	21.56	20.57		0
	1	24	21.55	21.53	20.58		0
	12	0	21.05	21.07	20.72	0-2	0
	12	6	21.03	21.11	20.72		0
	12	13	21.02	21.08	20.68		0
	25	0	20.95	21.11	20.63		0
64QAM	1	0	21.30	21.07	21.02	0-2	0
	1	12	20.99	21.32	20.87		0
	1	24	20.99	21.35	20.81		0
	12	0	19.92	20.02	19.91	0-3	1
	12	6	19.94	20.03	19.88		1
	12	13	19.96	20.05	19.79		1
	25	0	19.98	19.97	19.82		1

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Table 9-52
Reduced LTE Band 25 (PCS) Conducted Powers - 3 MHz Bandwidth- Grip Sensor Active

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26055 (1851.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26675 (1913.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	21.00	21.03	20.57	0	0
	1	7	21.07	21.12	20.66		0
	1	14	20.88	20.89	20.55		0
	8	0	21.00	20.98	20.63	0-1	0
	8	4	21.00	21.03	20.62		0
	8	7	20.98	21.00	20.61		0
	15	0	21.02	21.00	20.61		0
16QAM	1	0	21.11	20.72	20.56	0-1	0
	1	7	21.02	20.83	20.66		0
	1	14	20.86	20.70	20.58		0
	8	0	21.01	21.03	20.59	0-2	0
	8	4	21.01	21.05	20.61		0
	8	7	21.01	21.07	20.63		0
	15	0	20.90	20.96	20.63		0
64QAM	1	0	21.26	21.14	20.94	0-2	0
	1	7	21.45	21.25	21.04		0
	1	14	21.28	21.14	20.78		0
	8	0	19.99	20.03	19.93	0-3	1
	8	4	19.97	20.07	19.99		1
	8	7	19.93	20.01	19.94		1
	15	0	19.97	19.98	19.87		1

Table 9-53
Reduced LTE Band 25 (PCS) Conducted Powers – 1.4 MHz Bandwidth- Grip Sensor Active

LTE Band 25 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26047 (1850.7 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26683 (1914.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	20.90	20.85	20.43	0	0
	1	2	20.94	20.90	20.49		0
	1	5	20.89	20.87	20.43		0
	3	0	20.90	20.88	20.49		0
	3	2	20.96	20.96	20.54		0
	3	3	20.90	20.91	20.53		0
	6	0	20.89	20.89	20.58	0-1	0
16QAM	1	0	20.97	21.09	20.33	0-1	0
	1	2	21.16	21.12	20.39		0
	1	5	21.07	20.91	20.43		0
	3	0	21.25	20.96	20.57		0
	3	2	21.30	21.01	20.65		0
	3	3	21.03	20.99	20.58		0
	6	0	21.04	21.03	20.45	0-2	0
64QAM	1	0	21.11	21.27	20.70	0-2	0
	1	2	21.17	21.31	20.80		0
	1	5	21.06	21.25	20.70		0
	3	0	21.10	21.12	20.68		0
	3	2	21.15	21.14	20.77		0
	3	3	21.07	21.08	20.73		0
	6	0	19.98	20.01	19.73	0-3	1

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9.4.6 LTE Band 41

Table 9-54
LTE Band 41 Conducted Powers - 20 MHz Bandwidth

LTE Band 41 20 MHzBandwidth									
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	23.29	23.32	23.40	23.31	**23.63**	0	0
	1	50	23.09	23.17	23.15	23.07	23.47		0
	1	99	23.03	23.11	23.02	23.00	23.31		0
	50	0	22.24	22.36	22.32	22.31	**22.59**	0-1	1
	50	25	22.17	22.25	22.20	22.23	22.57		1
	50	50	22.11	22.21	22.13	22.15	22.37		1
	100	0	22.17	22.27	22.22	22.24	22.54		1
16QAM	1	0	22.52	22.59	22.66	22.56	22.87	0-1	1
	1	50	22.32	22.40	22.37	22.30	22.63		1
	1	99	22.25	22.37	22.25	22.23	22.50		1
	50	0	21.23	21.35	21.35	21.34	21.67	0-2	2
	50	25	21.21	21.27	21.26	21.26	21.60		2
	50	50	21.15	21.24	21.16	21.19	21.50		2
	100	0	21.20	21.31	21.30	21.26	21.42		2
64QAM	1	0	21.05	21.13	21.19	21.08	21.45	0-2	2
	1	50	20.85	20.93	20.90	20.81	21.18		2
	1	99	20.80	20.90	20.79	20.75	21.06		2
	50	0	20.30	20.36	20.40	20.38	20.68	0-3	3
	50	25	20.23	20.35	20.30	20.30	20.64		3
	50	50	20.14	20.26	20.20	20.23	20.52		3
	100	0	20.20	20.31	20.27	20.26	20.40		3

Table 9-55
LTE Band 41 Conducted Powers - 15 MHz Bandwidth

LTE Band 41 15 MHzBandwidth									
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	23.07	23.13	23.19	23.14	23.30	0	0
	1	36	22.94	23.07	23.05	22.95	23.19		0
	1	74	22.92	22.99	22.91	22.82	23.18		0
	36	0	22.08	22.19	22.19	22.15	22.40	0-1	1
	36	18	22.02	22.05	22.06	22.04	22.33		1
	36	37	21.93	21.97	22.04	21.92	22.24		1
	75	0	22.05	22.05	22.00	22.02	22.10		1
16QAM	1	0	22.23	22.25	22.28	22.23	22.54	0-1	1
	1	36	22.09	22.13	22.16	21.95	22.28		1
	1	74	22.03	22.05	22.04	21.95	22.19		1
	36	0	21.08	21.20	21.13	21.12	21.38	0-2	2
	36	18	21.02	21.16	21.12	21.01	21.31		2
	36	37	20.93	21.11	20.99	21.04	21.23		2
	75	0	21.02	21.09	21.04	21.00	21.19		2
64QAM	1	0	21.36	21.32	21.50	21.32	21.67	0-2	2
	1	36	21.20	21.22	21.26	21.17	21.49		2
	1	74	21.19	21.24	21.16	21.07	21.39		2
	36	0	20.11	20.12	20.12	20.11	20.39	0-3	3
	36	18	20.06	20.10	20.00	20.12	20.33		3
	36	37	20.00	20.05	19.88	20.04	20.18		3
	75	0	20.06	20.13	20.09	20.09	20.16		3

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Table 9-56
LTE Band 41 Conducted Powers - 10 MHz Bandwidth

LTE Band 41 10 MHzBandwidth									
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	23.16	23.12	23.05	23.09	23.28	0	0
	1	25	23.00	23.08	23.08	22.89	23.27		0
	1	49	22.92	22.96	22.84	22.93	23.08		0
	25	0	22.00	22.10	22.13	22.05	22.33	0-1	1
	25	12	22.00	22.07	22.10	22.03	22.31		1
	25	25	22.01	21.98	21.98	22.02	22.21		1
	50	0	21.94	22.07	22.02	22.04	22.07		1
16QAM	1	0	22.09	22.11	22.20	22.11	22.45	0-1	1
	1	25	22.01	22.14	22.13	22.03	22.34		1
	1	49	22.02	22.11	21.99	21.99	22.30		1
	25	0	20.98	21.03	21.03	21.05	21.23	0-2	2
	25	12	20.97	21.00	20.98	21.03	21.27		2
	25	25	20.94	20.96	20.98	20.84	21.17		2
	50	0	21.04	21.10	21.06	21.11	21.17		2
64QAM	1	0	21.21	21.29	21.29	21.25	21.61	0-2	2
	1	25	21.19	21.25	21.24	21.15	21.49		2
	1	49	21.15	21.20	21.14	21.11	21.42		2
	25	0	20.07	20.19	20.06	20.07	20.36	0-3	3
	25	12	20.14	20.18	20.23	20.13	20.34		3
	25	25	19.96	20.06	20.05	20.04	20.24		3
	50	0	20.06	20.10	20.14	20.12	20.13		3

Table 9-57
LTE Band 41 Conducted Powers - 5 MHz Bandwidth

LTE Band 41 5 MHzBandwidth									
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	22.62	22.66	23.19	23.02	22.90	0	0
	1	12	22.62	22.67	23.09	22.98	22.83		0
	1	24	22.52	22.60	23.06	22.97	22.98		0
	12	0	21.71	21.64	21.56	21.61	21.72	0-1	1
	12	6	21.64	21.76	21.69	21.68	21.73		1
	12	13	21.58	21.60	21.64	21.59	21.57		1
	25	0	21.67	21.58	21.65	21.63	21.74		1
16QAM	1	0	21.81	21.77	22.25	22.12	22.06	0-1	1
	1	12	21.71	21.70	22.16	22.04	22.02		1
	1	24	21.60	21.68	22.01	22.07	22.15		1
	12	0	20.70	20.66	20.75	20.70	20.69	0-2	2
	12	6	20.71	20.77	20.70	20.78	20.66		2
	12	13	20.66	20.68	20.64	20.66	20.65		2
	25	0	20.62	20.63	20.63	20.67	20.64		2
64QAM	1	0	20.81	20.81	20.97	21.26	21.27	0-2	2
	1	12	20.81	20.82	20.74	21.23	21.28		2
	1	24	20.69	20.77	20.63	21.22	21.45		2
	12	0	19.73	19.71	19.72	19.71	19.64	0-3	3
	12	6	19.67	19.76	19.76	19.73	19.72		3
	12	13	19.65	19.73	19.60	19.71	19.71		3
	25	0	19.69	19.64	19.72	19.73	19.72		3

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Table 9-58
Reduced LTE Band 41 Conducted Powers - 20 MHz Bandwidth- Hotspot Mode Active

LTE Band 41 20 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	19.90	20.13	20.21	19.80	**20.24**	0	0
	1	50	19.72	19.96	19.92	19.57	19.88		0
	1	99	19.66	19.93	19.83	19.46	19.75		0
	50	0	19.80	20.07	20.11	19.72	**20.17**	0-1	0
	50	25	19.78	20.02	20.00	19.63	19.97		0
	50	50	19.68	20.00	19.89	19.55	19.88		0
	100	0	19.75	20.07	20.03	19.64	20.05		0
16QAM	1	0	20.10	20.36	20.35	20.00	20.40	0-1	0
	1	50	19.90	20.19	20.16	19.79	20.10		0
	1	99	19.85	20.12	20.03	19.65	20.01		0
	50	0	19.83	20.18	20.12	19.75	20.11	0-2	0
	50	25	19.80	20.08	20.03	19.76	20.01		0
	50	50	19.72	20.05	19.93	19.72	19.90		0
	100	0	19.79	20.11	20.03	19.81	19.96		0
64QAM	1	0	19.60	19.85	19.95	19.62	19.89	0-2	0
	1	50	19.45	19.70	19.65	19.36	19.66		0
	1	99	19.40	19.68	19.51	19.35	19.50		0
	50	0	19.90	20.14	20.19	19.89	20.13	0-3	0
	50	25	19.80	20.08	20.09	19.80	20.03		0
	50	50	19.70	20.02	20.04	19.75	19.95		0
	100	0	19.79	20.06	20.08	19.79	20.01		0

Table 9-59
Reduced LTE Band 41 Conducted Powers - 15 MHz Bandwidth- Hotspot Mode Active

LTE Band 41 15 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	19.82	19.89	20.00	19.77	20.02	0	0
	1	36	19.57	19.81	19.77	19.56	19.85		0
	1	74	19.50	19.65	19.62	19.50	19.71		0
	36	0	19.68	19.92	19.90	19.60	19.93	0-1	0
	36	18	19.61	19.81	19.87	19.61	19.91		0
	36	37	19.55	19.79	19.73	19.53	19.85		0
	75	0	19.64	19.79	19.81	19.62	19.85		0
16QAM	1	0	19.84	19.99	20.10	19.84	20.21	0-1	0
	1	36	19.58	19.86	19.82	19.62	19.93		0
	1	74	19.58	19.82	19.70	19.52	19.83		0
	36	0	19.73	20.06	19.94	19.70	20.03	0-2	0
	36	18	19.65	19.83	19.85	19.69	19.89		0
	36	37	19.61	19.85	19.79	19.58	19.84		0
	75	0	19.60	19.90	19.88	19.61	19.90		0
64QAM	1	0	19.99	20.13	20.32	19.97	20.30	0-2	0
	1	36	19.78	19.95	20.01	19.74	20.02		0
	1	74	19.72	19.90	19.89	19.66	19.88		0
	36	0	19.71	19.91	20.00	19.71	19.98	0-3	0
	36	18	19.71	19.91	19.84	19.67	19.90		0
	36	37	19.57	19.75	19.76	19.55	19.79		0
	75	0	19.61	19.85	19.82	19.62	19.92		0

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Table 9-60
Reduced LTE Band 41 Conducted Powers - 10 MHz Bandwidth- Hotspot Mode Active

LTE Band 41 10 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	19.68	19.82	19.93	19.61	19.97	0	0
	1	25	19.54	19.79	19.83	19.57	19.82		0
	1	49	19.50	19.73	19.70	19.50	19.65		0
	25	0	19.72	19.82	19.94	19.62	19.91	0-1	0
	25	12	19.64	19.82	19.84	19.64	19.87		0
	25	25	19.55	19.74	19.81	19.52	19.85		0
	50	0	19.62	19.79	19.82	19.63	19.90		0
16QAM	1	0	19.71	19.99	20.00	19.76	20.01	0-1	0
	1	25	19.59	19.88	19.82	19.63	19.93		0
	1	49	19.58	19.78	19.73	19.57	19.88		0
	25	0	19.61	19.81	19.84	19.65	19.85	0-2	0
	25	12	19.60	19.81	19.80	19.63	19.88		0
	25	25	19.50	19.74	19.70	19.50	19.72		0
	50	0	19.70	19.84	19.77	19.63	19.96		0
64QAM	1	0	19.92	20.05	20.12	19.87	20.12	0-2	0
	1	25	19.80	19.97	19.96	19.72	20.10		0
	1	49	19.70	19.92	19.91	19.66	19.95		0
	25	0	19.71	19.91	20.03	19.74	19.96	0-3	0
	25	12	19.75	20.01	19.91	19.72	19.93		0
	25	25	19.62	19.86	19.89	19.63	19.87		0
	50	0	19.63	19.85	19.87	19.67	19.88		0

Table 9-61
Reduced LTE Band 41 Conducted Powers - 5 MHz Bandwidth- Hotspot Mode Active

LTE Band 41 5 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	19.65	19.87	19.84	19.72	19.98	0	0
	1	12	19.73	19.86	19.79	19.76	19.94		0
	1	24	19.66	19.78	19.65	19.62	19.83		0
	12	0	19.76	19.91	19.84	19.74	19.98	0-1	0
	12	6	19.74	19.95	19.92	19.78	20.00		0
	12	13	19.65	19.83	19.83	19.70	19.93		0
	25	0	19.72	19.87	19.78	19.70	19.95		0
16QAM	1	0	19.79	19.98	19.92	19.83	20.11	0-1	0
	1	12	19.73	19.96	19.91	19.84	20.01		0
	1	24	19.72	19.86	19.84	19.71	20.00		0
	12	0	19.85	19.98	19.91	19.81	19.99	0-2	0
	12	6	19.80	20.01	19.88	19.81	20.01		0
	12	13	19.88	19.95	19.83	19.75	19.94		0
	25	0	19.68	19.88	19.73	19.74	19.88		0
64QAM	1	0	19.92	20.12	20.06	19.90	20.13	0-2	0
	1	12	19.96	20.07	20.16	19.79	20.03		0
	1	24	19.80	20.02	20.01	19.72	20.02		0
	12	0	19.83	19.96	20.01	19.83	20.02	0-3	0
	12	6	19.72	19.91	20.04	19.79	20.04		0
	12	13	19.75	19.85	20.02	19.74	19.97		0
	25	0	19.76	19.89	20.07	19.78	20.04		0

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Table 9-62
Reduced LTE Band 41 Conducted Powers - 20 MHz Bandwidth- Grip Sensor Active

LTE Band 41 20 MHzBandwidth									
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	22.20	22.33	22.45	22.11	**22.54**	0	0
	1	50	21.90	22.14	22.12	21.82	22.27		0
	1	99	21.96	22.08	22.01	21.78	22.17		0
	50	0	22.01	22.33	22.33	22.08	**22.47**	0-1	0
	50	25	21.99	22.32	22.21	22.00	22.38		0
	50	50	21.92	22.13	22.13	21.91	22.28		0
	100	0	22.01	22.25	22.25	22.00	22.33		0
16QAM	1	0	22.35	22.58	22.65	22.37	22.68	0-1	0
	1	50	22.12	22.45	22.41	22.13	22.45		0
	1	99	22.24	22.38	22.27	22.08	22.33		0
	50	0	21.24	21.35	21.42	21.33	21.67	0-2	1
	50	25	21.22	21.30	21.23	21.28	21.60		1
	50	50	21.11	21.30	21.18	21.16	21.49		1
	100	0	21.24	21.29	21.25	21.28	21.47		1
64QAM	1	0	21.07	21.11	21.18	21.11	21.45	0-2	1
	1	50	20.85	20.95	20.90	20.84	21.16		1
	1	99	20.80	20.90	20.79	20.68	21.05		1
	50	0	20.26	20.39	20.28	20.39	20.65	0-3	2
	50	25	20.21	20.33	20.39	20.31	20.49		2
	50	50	20.16	20.26	20.20	20.27	20.51		2
	100	0	20.20	20.31	20.24	20.26	20.42		2

Table 9-63
Reduced LTE Band 41 Conducted Powers - 15 MHz Bandwidth- Grip Sensor Active

LTE Band 41 15 MHzBandwidth									
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	22.28	22.46	22.72	21.97	22.76	0	0
	1	36	22.12	22.38	22.47	21.75	22.53		0
	1	74	22.05	22.24	22.38	21.67	22.34		0
	36	0	22.29	22.43	22.72	22.03	22.60	0-1	0
	36	18	22.23	22.38	22.60	21.93	22.56		0
	36	37	22.17	22.31	22.56	21.80	22.50		0
	75	0	22.21	22.39	22.57	21.93	22.52		0
16QAM	1	0	22.46	22.55	22.84	22.16	22.74	0-1	0
	1	36	22.33	22.44	22.61	21.97	22.61		0
	1	74	22.16	22.37	22.48	21.97	22.43		0
	36	0	21.73	21.59	21.81	21.34	21.95	0-2	1
	36	18	21.65	21.58	21.71	21.25	21.93		1
	36	37	21.51	21.53	21.71	21.23	21.82		1
	75	0	21.61	21.58	21.72	21.29	21.90		1
64QAM	1	0	21.94	21.88	22.08	21.62	22.28	0-2	1
	1	36	21.74	21.75	21.88	21.46	22.01		1
	1	74	21.64	21.64	21.77	21.25	21.95		1
	36	0	20.69	20.62	20.85	20.36	21.01	0-3	2
	36	18	20.61	20.59	20.77	20.34	20.94		2
	36	37	20.55	20.49	20.64	20.17	20.83		2
	75	0	20.62	20.57	20.70	20.32	20.85		2

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Table 9-64
Reduced LTE Band 41 Conducted Powers - 10 MHz Bandwidth- Grip Sensor Active

LTE Band 41 10 MHzBandwidth									
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	22.28	22.40	22.60	22.06	22.67	0	0
	1	25	22.24	22.36	22.54	21.86	22.53		0
	1	49	22.16	22.18	22.46	21.83	22.36		0
	25	0	22.29	22.46	22.61	21.96	22.57	0-1	0
	25	12	22.20	22.44	22.57	21.92	22.55		0
	25	25	22.21	22.38	22.58	21.89	22.52		0
	50	0	22.27	22.43	22.60	21.87	22.51		0
16QAM	1	0	22.38	22.52	22.68	22.09	22.73	0-1	0
	1	25	22.27	22.46	22.62	21.99	22.57		0
	1	49	22.23	22.40	22.50	21.90	22.52		0
	25	0	21.61	21.53	21.72	21.19	21.85	0-2	1
	25	12	21.57	21.56	21.69	21.25	21.88		1
	25	25	21.41	21.50	21.58	21.20	21.76		1
	50	0	21.58	21.56	21.73	21.30	21.92		1
64QAM	1	0	21.91	21.73	22.02	21.55	22.18	0-2	1
	1	25	21.75	21.71	21.84	21.35	22.05		1
	1	49	21.71	21.60	21.74	21.24	21.93		1
	25	0	20.69	20.66	20.80	20.43	21.07	0-3	2
	25	12	20.64	20.66	20.88	20.44	20.97		2
	25	25	20.65	20.61	20.77	20.21	20.91		2
	50	0	20.67	20.68	20.82	20.27	20.93		2

Table 9-65
Reduced LTE Band 41 Conducted Powers - 5 MHz Bandwidth- Grip Sensor Active

LTE Band 41 5 MHzBandwidth									
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	22.25	22.31	22.56	21.85	22.48	0	0
	1	12	22.16	22.36	22.55	21.99	22.50		0
	1	24	22.11	22.25	22.49	21.91	22.39		0
	12	0	22.27	22.46	22.64	22.00	22.52	0-1	0
	12	6	22.24	22.40	22.67	21.93	22.53		0
	12	13	22.26	22.36	22.62	21.91	22.35		0
	25	0	22.16	22.28	22.63	21.93	22.50		0
16QAM	1	0	22.35	22.52	22.76	22.02	22.59	0-1	0
	1	12	22.34	22.46	22.65	22.03	22.51		0
	1	24	22.23	22.41	22.61	21.98	22.49		0
	12	0	21.62	21.63	21.82	21.33	21.84	0-2	1
	12	6	21.66	21.59	21.83	21.32	21.87		1
	12	13	21.56	21.56	21.72	21.30	21.69		1
	25	0	21.50	21.48	21.70	21.24	21.72		1
64QAM	1	0	21.75	21.68	21.84	21.40	21.95	0-2	1
	1	12	21.77	21.63	21.82	21.34	21.86		1
	1	24	21.66	21.57	21.79	21.33	21.85		1
	12	0	20.66	20.62	20.81	20.38	20.91	0-3	2
	12	6	20.64	20.60	20.78	20.30	20.86		2
	12	13	20.58	20.55	20.74	20.29	20.84		2
	25	0	20.62	20.57	20.72	20.35	20.83		2

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9.4.7 LTE Downlink Only Carrier Aggregation Conducted Powers

Table 9-66
LTE B41 Carrier Aggregation Conducted Powers

	PCC									SCC				Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41A-41A	LTE B41	20	41490	2680	QPSK	1	0	41490	2680	LTE B41	5	39675	2498.5	23.68	23.63
CA_41C (1)	LTE B41	20	41490	2680	QPSK	1	0	41490	2680	LTE B41	20	41292	2660.2	23.65	23.63

Table 9-67
Reduced LTE B41 Carrier Aggregation Conducted Powers- Hotspot Mode Active

	PCC									SCC				Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41A-41A	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	5	39675	2498.5	20.39	20.40
CA_41C (1)	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	20	41292	2660.2	20.38	20.40

Table 9-68
Reduced LTE B41 Carrier Aggregation Conducted Powers- Grip Sensor Active

	PCC									SCC				Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41A-41A	LTE B41	15	40620	2593	16QAM	1	0	40620	2593	LTE B41	5	39675	2498.5	22.78	22.84
CA_41C (1)	LTE B41	15	40620	2593	16QAM	1	0	40620	2593	LTE B41	20	40449	2575.9	22.80	22.84

Notes:

1. For every supported combination of downlink carrier aggregation, power measurements were performed 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.
2. All control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
3. For downlink carrier aggregation combinations, PCC uplink channel was selected based on section C)3)b)ii) of KBD 941225 D05 V01r02. The downlink PCC channel was paired with the selected PCC uplink channel according to normal configurations without carrier aggregation. For inter-band CA, the SCC downlink channels were selected near the middle of their transmission bands. For contiguous intraband CA, the downlink channel spacing between the component carriers was set to multiple of 300 kHz less than the nominal channel spacing defined in section 5.4.1A of 3GPP TS 36.521. For non-contiguous intra-band CA, the downlink channel spacing between the component carriers was set to be larger than the nominal channel spacing and provided maximum separation between the component carriers. All selected downlink channels remained fully within the downlink transmission band of the respective component carrier.

Figure 9-4
Power Measurement Setup

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9.4.8 LTE Uplink Carrier Aggregation Conducted Powers

Table 9-69
LTE Uplink Carrier Aggregation Conducted Powers

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	ULCA Tx. Power (dBm)	Single Carrier Target Power (dBm)
CA_41C	LTE B41	20	41490	2680.0	QPSK	1	0	LTE B41	20	41292	2660.2	QPSK	1	99	24.05	24.00

Table 9-70
Reduced LTE Uplink Carrier Aggregation Conducted Powers- Hotspot Mode Active

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	ULCA Tx. Power (dBm)	Single Carrier Target Power (dBm)
CA_41C	LTE B41	20	41490	2680.0	QPSK	1	0	LTE B41	20	41292	2660.2	QPSK	1	99	20.90	20.50

Table 9-71
Reduced LTE Uplink Carrier Aggregation Conducted Powers- Grip Sensor Active

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	ULCA Tx. Power (dBm)	Single Carrier Target Power (dBm)
CA_41C	LTE B41	20	39750	2506.0	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	23.00	23.00

Notes:

1. This device supports uplink carrier aggregation for LTE CA_41C with a maximum of two 20 MHz component carriers. For intraband contiguous carrier aggregation scenarios, 3GPP 36.101 Table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when non-contiguous RB allocation is implemented. The conducted powers and MPR settings in this device are permanently implemented per the above 3GPP requirements.
2. Per FCC Guidance, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.

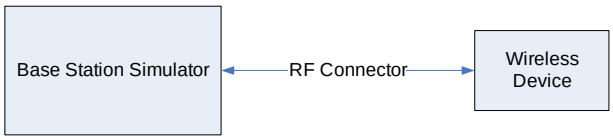

Figure 9-5
Power Measurement Setup

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9.5 WLAN Conducted Powers

Table 9-72
2.4 GHz WLAN Maximum Average RF Power – Antenna 1

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	19.72	16.35	16.23
2437	6	**19.83**	16.47	16.37
2462	11	19.50	16.22	16.16

Table 9-73
2.4 GHz WLAN Maximum Average RF Power – Antenna 2

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	19.35	15.91	16.42
2437	6	19.28	16.46	16.33
2462	11	**19.43**	16.45	16.23

Table 9-74
2.4 GHz WLAN Reduced Average RF Power – Antenna 1 (Held-to-ear)

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	16.34	12.72	12.62
2437	6	**16.49**	13.04	13.00
2462	11	16.39	12.74	12.71

Table 9-75
2.4 GHz WLAN Reduced Average RF Power – Antenna 2 (Held-to-ear)

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	**16.44**	12.78	12.73
2437	6	16.23	12.72	12.55
2462	11	16.37	12.64	12.51

Table 9-76
2.4 GHz WLAN Reduced Average RF Power – MIMO 802.11n

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]		
		ANT1	ANT2	MIMO
2412	1	12.62	12.73	15.69
2437	6	**13.00**	**12.55**	**15.79**
2462	11	12.71	12.51	15.62

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Table 9-77
5 GHz WLAN Maximum Average RF Power – Antenna 1

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5180	36	15.88	15.86	15.90
5200	40	15.86	15.77	15.82
5220	44	15.91	15.85	15.83
5240	48	15.85	15.89	15.85
5260	52	15.74	15.79	15.83
5280	56	**15.78**	15.67	15.70
5300	60	15.72	15.69	15.72
5320	64	15.74	15.78	15.69
5500	100	15.88	16.00	15.96
5600	120	16.03	16.04	16.12
5620	124	**16.12**	16.08	16.06
5720	144	16.04	15.97	16.08
5745	149	**15.98**	15.99	15.93
5785	157	15.82	15.95	15.96
5825	165	15.79	15.87	15.79

Table 9-78
5 GHz WLAN Maximum Average RF Power – Antenna 2

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5180	36	16.03	16.02	16.12
5200	40	16.02	15.99	16.04
5220	44	16.23	16.12	16.03
5240	48	16.07	16.03	16.07
5260	52	**16.13**	16.10	16.02
5280	56	16.09	16.13	16.11
5300	60	16.09	16.00	16.11
5320	64	16.11	16.13	16.11
5500	100	16.00	16.04	16.03
5600	120	16.21	16.22	16.17
5620	124	16.24	16.21	16.16
5720	144	**16.34**	16.26	16.23
5745	149	16.21	16.16	16.17
5785	157	**16.23**	16.21	16.15
5825	165	16.21	16.21	16.24

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Table 9-79
5 GHz WLAN Reduced Average RF Power – Antenna 1 (Held-to-ear)

5GHz (80MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
5210	42	13.46
5290	58	**13.31**
5530	106	12.90
5610	122	13.00
5690	138	**13.02**
5775	155	**13.31**

Table 9-80
5 GHz WLAN Reduced Average RF Power – Antenna 2 (Held-to-ear)

5GHz (80MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
5210	42	13.27
5290	58	**13.25**
5530	106	13.29
5610	122	13.36
5690	138	**13.37**
5775	155	**13.27**

Table 9-81
5 GHz WLAN Maximum Average RF Power- 802.11n MIMO

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]		
		ANT1	ANT2	MIMO
5180	36	15.86	16.02	18.95
5200	40	15.77	15.99	18.89
5220	44	15.85	16.12	19.00
5240	48	15.89	16.03	18.97
5260	52	15.79	16.10	18.96
5280	56	15.67	16.13	18.92
5300	60	15.69	16.00	18.86
5320	64	15.78	16.13	**18.97**
5500	100	16.00	16.04	19.03
5600	120	16.04	16.22	19.14
5620	124	16.08	16.21	**19.16**
5720	144	15.97	16.26	19.13
5745	149	15.99	16.16	19.09
5785	157	15.95	16.21	19.09
5825	165	15.87	16.21	19.05

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Table 9-82
Maximum Output Powers During Conditions with 2.4 GHz and 5 GHz WLAN

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]	
		ANT1	ANT2
		802.11n	
2412	1	16.23	16.42
2437	6	**16.37**	**16.33**
2462	11	16.16	16.23
Freq [MHz]	**Channel**	**5GHz (80MHz) Conducted Power [dBm]**	
		ANT1	**ANT2**
		802.11ac	
5210	42	13.46	13.27
5290	58	**13.31**	**13.25**
5530	106	12.90	13.29
5610	122	13.00	13.36
5690	138	**13.02**	**13.37**
5775	155	**13.31**	**13.27**

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.

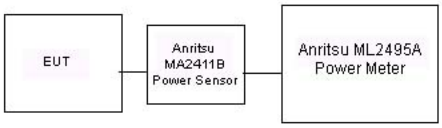

Figure 9-6
Power Measurement Setup for Bandwidths < 50 MHz

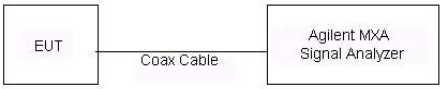

Figure 9-7
Power Measurement Setup for Bandwidths > 50 MHz

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9.6 Bluetooth Conducted Powers

Table 9-83
Bluetooth Average RF Power

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
			[dBm]	[mW]
2402	1.0	0	14.16	26.062
2441	1.0	39	**15.05**	31.969
2480	1.0	78	13.74	23.681
2402	2.0	0	4.94	3.116
2441	2.0	39	6.64	4.613
2480	2.0	78	6.34	4.303
2402	3.0	0	4.93	3.112
2441	3.0	39	6.68	4.651
2480	3.0	78	6.29	4.259

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

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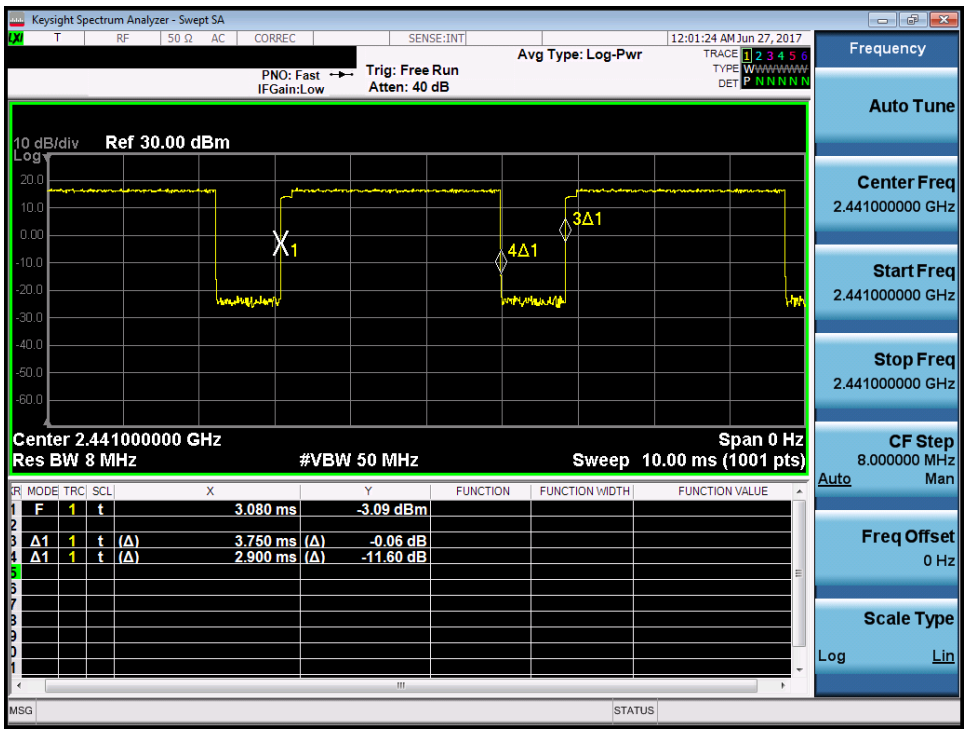

Figure 9-8
Bluetooth Transmission Plot

Equation 2
Bluetooth Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.900ms}{3.750ms} * 100\% = 77.3\%$$

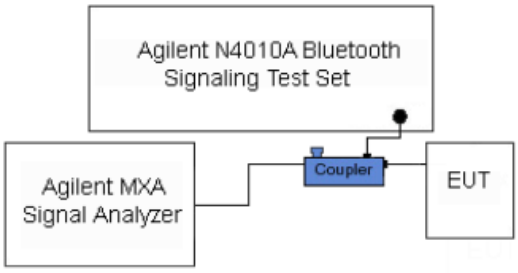

Figure 9-9
Power Measurement Setup

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10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (˚C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	%dev σ	%dev ε
6/21/2017	750H	24.5	700	0.861	42.957	0.889	42.201	-3.15%	1.79%
			710	0.870	42.792	0.890	42.149	-2.25%	1.53%
			740	0.896	42.439	0.893	41.994	0.34%	1.06%
			755	0.910	42.230	0.894	41.916	1.79%	0.75%
			770	0.922	42.097	0.895	41.838	3.02%	0.62%
			785	0.936	41.838	0.896	41.760	4.46%	0.19%
6/25/2017	835H	20.1	820	0.888	40.645	0.899	41.578	-1.22%	-2.24%
			835	0.903	40.459	0.900	41.500	0.33%	-2.51%
			850	0.918	40.272	0.916	41.500	0.22%	-2.96%
7/6/2017	835H	21.4	820	0.879	40.077	0.899	41.578	-2.22%	-3.61%
			835	0.896	39.895	0.900	41.500	-0.44%	-3.87%
			850	0.911	39.717	0.916	41.500	-0.55%	-4.30%
6/26/2017	1750H	21.0	1710	1.361	38.578	1.348	40.142	0.96%	-3.90%
			1750	1.403	38.373	1.371	40.079	2.33%	-4.26%
			1790	1.439	38.205	1.394	40.016	3.23%	-4.53%
6/28/2017	1900H	21.6	1850	1.397	39.761	1.400	40.000	-0.21%	-0.60%
			1880	1.429	39.643	1.400	40.000	2.07%	-0.89%
			1910	1.459	39.530	1.400	40.000	4.21%	-1.18%
6/26/2017	2450H	23.0	2400	1.793	39.150	1.756	39.289	2.11%	-0.35%
			2450	1.848	38.974	1.800	39.200	2.67%	-0.58%
			2500	1.904	38.783	1.855	39.136	2.64%	-0.90%
7/3/2017	2450H	22.0	2400	1.831	39.251	1.756	39.289	4.27%	-0.10%
			2450	1.888	39.091	1.800	39.200	4.89%	-0.28%
			2500	1.944	38.880	1.855	39.136	4.80%	-0.65%
6/26/2017	2600H	23.0	2600	2.014	38.417	1.964	39.009	2.55%	-1.52%
			2650	2.071	38.243	2.018	38.945	2.63%	-1.80%
			2700	2.128	38.049	2.073	38.882	2.65%	-2.14%
06/28/2017	5200H-5800H	21.0	5240	4.546	36.017	4.696	35.940	-3.19%	0.21%
			5260	4.559	36.005	4.717	35.917	-3.35%	0.25%
			5280	4.575	35.974	4.737	35.894	-3.42%	0.22%
			5300	4.596	35.931	4.758	35.871	-3.40%	0.17%
			5600	4.907	35.541	5.065	35.529	-3.12%	0.03%
			5680	4.993	35.499	5.147	35.437	-2.99%	0.17%
			5700	5.014	35.426	5.168	35.414	-2.98%	0.03%
			5745	5.053	35.359	5.214	35.363	-3.09%	-0.01%
			5765	5.077	35.384	5.234	35.340	-3.00%	0.12%
			5785	5.111	35.334	5.255	35.317	-2.74%	0.05%

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Table 10-2
Measured Body Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
6/29/2017	750B	23.1	700	0.920	55.738	0.959	55.726	-4.07%	0.02%
			710	0.927	55.661	0.960	55.687	-3.44%	-0.05%
			740	0.953	55.432	0.963	55.570	-1.04%	-0.25%
			755	0.968	55.214	0.964	55.512	0.41%	-0.54%
			770	0.981	55.136	0.965	55.453	1.66%	-0.57%
			785	0.994	54.959	0.966	55.395	2.90%	-0.79%
6/27/2017	835B	20.4	820	0.977	53.273	0.969	55.258	0.83%	-3.59%
			835	0.991	53.110	0.970	55.200	2.16%	-3.79%
			850	1.005	52.963	0.988	55.154	1.72%	-3.97%
7/3/2017	835B	18.8	820	0.977	53.780	0.969	55.258	0.83%	-2.67%
			835	0.995	53.599	0.970	55.200	2.58%	-2.90%
			850	1.008	53.427	0.988	55.154	2.02%	-3.13%
6/23/2017	1750B	25.0	1710	1.407	52.265	1.463	53.537	-3.83%	-2.38%
			1750	1.456	52.155	1.488	53.432	-2.15%	-2.39%
			1790	1.497	51.932	1.514	53.326	-1.12%	-2.61%
6/29/2017	1900B	22.5	1850	1.526	52.440	1.520	53.300	0.39%	-1.61%
			1880	1.558	52.317	1.520	53.300	2.50%	-1.84%
			1910	1.589	52.209	1.520	53.300	4.54%	-2.05%
7/3/2017	2450B	22.7	2400	1.931	51.285	1.902	52.767	1.52%	-2.81%
			2450	1.999	51.139	1.950	52.700	2.51%	-2.96%
			2500	2.068	50.934	2.021	52.636	2.33%	-3.23%
7/8/2017	2450B	22.6	2400	1.918	51.630	1.902	52.767	0.84%	-2.15%
			2450	1.989	51.439	1.950	52.700	2.00%	-2.39%
			2500	2.057	51.227	2.021	52.636	1.78%	-2.68%
7/10/2017	2450B-2600B	22.0	2450	2.020	52.076	1.950	52.700	3.59%	-1.18%
			2500	2.089	51.867	2.021	52.636	3.36%	-1.46%
			2550	2.157	51.720	2.092	52.573	3.11%	-1.62%
			2600	2.228	51.493	2.163	52.509	3.01%	-1.93%
			2650	2.290	51.285	2.234	52.445	2.51%	-2.21%
			2700	2.366	51.130	2.305	52.382	2.65%	-2.39%
7/19/2017	2450B-2600B	21.7	2450	2.033	51.829	1.950	52.700	4.26%	-1.65%
			2500	2.108	51.639	2.021	52.636	4.30%	-1.89%
			2550	2.183	51.445	2.092	52.573	4.35%	-2.15%
			2600	2.250	51.239	2.163	52.509	4.02%	-2.42%
			2650	2.326	51.061	2.234	52.445	4.12%	-2.64%
			2700	2.394	50.836	2.305	52.382	3.86%	-2.95%
06/26/2017	5200B-5800B	21.2	5240	5.383	47.508	5.346	48.960	0.69%	-2.97%
			5260	5.417	47.461	5.369	48.933	0.89%	-3.01%
			5280	5.430	47.444	5.393	48.906	0.69%	-2.99%
			5600	5.870	46.869	5.766	48.471	1.80%	-3.31%
			5620	5.896	46.848	5.790	48.444	1.83%	-3.29%
			5745	6.065	46.647	5.936	48.275	2.17%	-3.37%
			5765	6.085	46.626	5.959	48.248	2.11%	-3.36%
			5785	6.111	46.596	5.982	48.220	2.16%	-3.37%
07/03/2017	5200B-5800B	21.7	5240	5.416	47.361	5.346	48.960	1.31%	-3.27%
			5260	5.442	47.354	5.369	48.933	1.36%	-3.23%
			5280	5.459	47.299	5.393	48.906	1.22%	-3.29%
			5320	5.504	47.250	5.439	48.851	1.20%	-3.28%
			5600	5.882	46.749	5.766	48.471	2.01%	-3.55%
			5620	5.898	46.777	5.790	48.444	1.87%	-3.44%
			5700	6.024	46.673	5.883	48.336	2.40%	-3.44%
			5745	6.070	46.587	5.936	48.275	2.26%	-3.50%
			5765	6.122	46.505	5.959	48.248	2.74%	-3.61%

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 ±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 10-3
System Verification Results- 1g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Source SN	Probe SN	Measured SAR_{1g} (W/kg)	1 W Target SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	$Deviation_{1g}$ (%)
J	750	HEAD	06/21/2017	24.9	23.7	0.200	1034	3209	1.620	8.220	8.100	-1.46%
I	835	HEAD	06/25/2017	22.8	20.3	0.200	4d180	3213	1.900	9.260	9.500	2.59%
I	835	HEAD	07/06/2017	21.7	21.3	0.200	4d180	3213	1.820	9.260	9.100	-1.73%
E	1750	HEAD	06/26/2017	21.7	21.1	0.100	1148	3319	3.700	36.400	37.000	1.65%
J	1900	HEAD	06/28/2017	21.7	21.5	0.100	5d080	3209	4.010	39.300	40.100	2.04%
I	2450	HEAD	06/26/2017	22.0	21.4	0.100	981	3213	5.380	52.800	53.800	1.89%
I	2450	HEAD	07/03/2017	21.9	22.0	0.100	797	3213	5.290	52.100	52.900	1.54%
I	2600	HEAD	06/26/2017	22.0	21.4	0.100	1126	3213	5.940	56.300	59.400	5.51%
H	5250	HEAD	06/28/2017	21.7	21.0	0.050	1237	3914	3.730	79.200	74.600	-5.81%
H	5600	HEAD	06/28/2017	21.7	21.0	0.050	1237	3914	3.900	83.300	78.000	-6.36%
H	5750	HEAD	06/28/2017	21.7	21.0	0.050	1237	3914	3.920	81.500	78.400	-3.80%
E	750	BODY	06/29/2017	22.9	21.4	0.200	1161	3319	1.740	8.430	8.700	3.20%
K	835	BODY	06/27/2017	22.4	20.4	0.200	4d133	7406	2.060	9.500	10.300	8.42%
K	835	BODY	07/03/2017	20.3	19.0	0.200	4d133	7406	2.040	9.500	10.200	7.37%
J	1750	BODY	06/23/2017	24.5	24.5	0.100	1092	3209	3.710	37.000	37.100	0.27%
J	1900	BODY	06/29/2017	23.1	22.4	0.100	5d080	3209	3.940	39.100	39.400	0.77%
G	2450	BODY	07/03/2017	20.0	22.6	0.100	981	3287	5.270	50.800	52.700	3.74%
G	2450	BODY	07/08/2017	20.4	22.8	0.100	797	3287	5.370	50.700	53.700	5.92%
G	2600	BODY	07/10/2017	21.1	22.0	0.100	1071	3287	5.840	54.200	58.400	7.75%
D	5250	BODY	06/26/2017	22.1	20.4	0.050	1123	3589	3.720	75.900	74.400	-1.98%
D	5600	BODY	06/26/2017	22.1	20.4	0.050	1123	3589	4.050	78.900	81.000	2.66%
D	5750	BODY	06/26/2017	22.1	20.4	0.050	1123	3589	3.490	76.300	69.800	-8.52%

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Table 10-4
System Verification Results- 10g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Source SN	Probe SN	Measured SAR_{10g} (W/kg)	1 W Target SAR_{10g} (W/kg)	1 W Normalized SAR_{10g} (W/kg)	$Deviation_{10g}$ (%)
K	835	BODY	07/03/2017	20.3	19.0	0.200	4d133	7406	1.340	6.200	6.700	8.06%
J	1750	BODY	06/23/2017	25.0	24.5	0.100	1092	3209	2.000	19.800	20.000	1.01%
J	1900	BODY	06/29/2017	23.1	22.4	0.100	5d080	3209	2.050	20.700	20.500	-0.97%
K	2450	BODY	07/19/2017	22.9	21.7	0.100	797	7406	2.380	24.200	23.800	-1.65%
K	2600	BODY	07/19/2017	22.9	21.7	0.100	1071	7406	2.430	24.500	24.300	-0.82%
D	5250	BODY	07/03/2017	22.5	21.7	0.050	1123	3589	0.986	21.300	19.720	-7.42%
D	5600	BODY	07/03/2017	22.5	21.7	0.050	1123	3589	1.120	22.100	22.400	1.36%
D	5750	BODY	07/03/2017	22.5	21.7	0.050	1123	3589	1.020	21.300	20.400	-4.23%

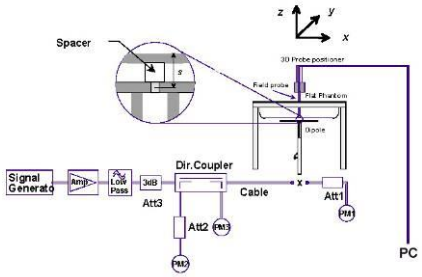

Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

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11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
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	32.85	0.16	Right	Cheek	05EB8	1:8.3	0.111	1.035	0.115	A1
836.60	190	GSM 850	GSM	33.0	32.85	0.02	Right	Tilt	05EB8	1:8.3	0.055	1.035	0.057	
836.60	190	GSM 850	GSM	33.0	32.85	0.18	Left	Cheek	05EB8	1:8.3	0.089	1.035	0.092	
836.60	190	GSM 850	GSM	33.0	32.85	-0.05	Left	Tilt	05EB8	1:8.3	0.056	1.035	0.058	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-2
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	29.48	-0.07	Right	Cheek	05D28	1:8.3	0.039	1.127	0.044	A2
1880.00	661	GSM 1900	GSM	30.0	29.48	-0.15	Right	Tilt	05D28	1:8.3	0.009	1.127	0.010	
1880.00	661	GSM 1900	GSM	30.0	29.48	0.02	Left	Cheek	05D28	1:8.3	0.023	1.127	0.026	
1880.00	661	GSM 1900	GSM	30.0	29.48	-0.10	Left	Tilt	05D28	1:8.3	0.010	1.127	0.011	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-3
UMTS 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/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	23.5	23.29	0.04	Right	Cheek	05EB8	1:1	0.120	1.050	0.126	A3
836.60	4183	UMTS 850	RMC	23.5	23.29	0.06	Right	Tilt	05EB8	1:1	0.050	1.050	0.053	
836.60	4183	UMTS 850	RMC	23.5	23.29	0.08	Left	Cheek	05EB8	1:1	0.092	1.050	0.097	
836.60	4183	UMTS 850	RMC	23.5	23.29	0.01	Left	Tilt	05EB8	1:1	0.053	1.050	0.056	
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 11-4
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	23.5	23.02	-0.02	Right	Cheek	05B38	1:1	0.094	1.117	0.105	A4
1880.00	9400	UMTS 1900	RMC	23.5	23.02	-0.01	Right	Tilt	05B38	1:1	0.022	1.117	0.025	
1880.00	9400	UMTS 1900	RMC	23.5	23.02	0.10	Left	Cheek	05B38	1:1	0.058	1.117	0.065	
1880.00	9400	UMTS 1900	RMC	23.5	23.02	0.17	Left	Tilt	05B38	1:1	0.033	1.117	0.037	

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
Cell. 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)	
836.52	384	Cell. CDMA	RC3 / SO55	26.5	25.55	0.03	Right	Cheek	1145D	1:1	0.253	1.245	**0.315**	A5
836.52	384	Cell. CDMA	RC3 / SO55	26.5	25.55	0.00	Right	Tilt	1145D	1:1	0.116	1.245	0.144	
836.52	384	Cell. CDMA	RC3 / SO55	26.5	25.55	-0.02	Left	Cheek	1145D	1:1	0.213	1.245	0.265	
836.52	384	Cell. CDMA	RC3 / SO55	26.5	25.55	-0.02	Left	Tilt	1145D	1:1	0.133	1.245	0.166	
836.52	384	Cell. CDMA	EVDO Rev. A	26.5	25.68	0.01	Right	Cheek	1145D	1:1	0.238	1.208	0.288	
836.52	384	Cell. CDMA	EVDO Rev. A	26.5	25.68	0.08	Right	Tilt	1145D	1:1	0.097	1.208	0.117	
836.52	384	Cell. CDMA	EVDO Rev. A	26.5	25.68	0.03	Left	Cheek	1145D	1:1	0.190	1.208	0.230	
836.52	384	Cell. CDMA	EVDO Rev. A	26.5	25.68	0.04	Left	Tilt	1145D	1:1	0.139	1.208	0.168	

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

Table 11-6
LTE Band 12 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	24.0	23.55	-0.04	0	Right	Cheek	QPSK	1	25	05D28	1:1	0.089	1.109	0.099	A6
707.50	23095	Mid	LTE Band 12	10	23.0	22.59	-0.03	1	Right	Cheek	QPSK	25	12	05D28	1:1	0.072	1.099	0.079	
707.50	23095	Mid	LTE Band 12	10	24.0	23.55	0.03	0	Right	Tilt	QPSK	1	25	05D28	1:1	0.051	1.109	0.057	
707.50	23095	Mid	LTE Band 12	10	23.0	22.59	0.07	1	Right	Tilt	QPSK	25	12	05D28	1:1	0.041	1.099	0.045	
707.50	23095	Mid	LTE Band 12	10	24.0	23.55	0.11	0	Left	Cheek	QPSK	1	25	05D28	1:1	0.063	1.109	0.070	
707.50	23095	Mid	LTE Band 12	10	23.0	22.59	0.12	1	Left	Cheek	QPSK	25	12	05D28	1:1	0.050	1.099	0.055	
707.50	23095	Mid	LTE Band 12	10	24.0	23.55	-0.20	0	Left	Tilt	QPSK	1	25	05D28	1:1	0.060	1.109	0.067	
707.50	23095	Mid	LTE Band 12	10	23.0	22.59	0.03	1	Left	Tilt	QPSK	25	12	05D28	1:1	0.050	1.099	0.055	

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

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Table 11-7
LTE Band 13 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	24.0	22.76	-0.02	0	Right	Cheek	QPSK	1	0	05D28	1:1	0.059	1.330	0.078	A7
782.00	23230	Mid	LTE Band 13	10	23.0	21.69	0.12	1	Right	Cheek	QPSK	25	0	05D28	1:1	0.046	1.352	0.062	
782.00	23230	Mid	LTE Band 13	10	24.0	22.76	0.14	0	Right	Tilt	QPSK	1	0	05D28	1:1	0.025	1.330	0.033	
782.00	23230	Mid	LTE Band 13	10	23.0	21.69	0.15	1	Right	Tilt	QPSK	25	0	05D28	1:1	0.020	1.352	0.027	
782.00	23230	Mid	LTE Band 13	10	24.0	22.76	0.14	0	Left	Cheek	QPSK	1	0	05D28	1:1	0.049	1.330	0.065	
782.00	23230	Mid	LTE Band 13	10	23.0	21.69	0.20	1	Left	Cheek	QPSK	25	0	05D28	1:1	0.034	1.352	0.046	
782.00	23230	Mid	LTE Band 13	10	24.0	22.76	0.16	0	Left	Tilt	QPSK	1	0	05D28	1:1	0.036	1.330	0.048	
782.00	23230	Mid	LTE Band 13	10	23.0	21.69	0.16	1	Left	Tilt	QPSK	25	0	05D28	1:1	0.025	1.352	0.034	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram										

Table 11-8
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	24.0	22.86	0.11	0	Right	Cheek	QPSK	1	0	05D28	1:1	0.145	1.300	0.189	A8
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.0	21.85	0.03	1	Right	Cheek	QPSK	36	0	05D28	1:1	0.116	1.303	0.151	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.86	0.05	0	Right	Tilt	QPSK	1	0	05D28	1:1	0.067	1.300	0.087	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.0	21.85	0.04	1	Right	Tilt	QPSK	36	0	05D28	1:1	0.057	1.303	0.074	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.86	-0.15	0	Left	Cheek	QPSK	1	0	05D28	1:1	0.107	1.300	0.139	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.0	21.85	0.12	1	Left	Cheek	QPSK	36	0	05D28	1:1	0.091	1.303	0.119	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.86	0.04	0	Left	Tilt	QPSK	1	0	05D28	1:1	0.055	1.300	0.072	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.0	21.85	0.01	1	Left	Tilt	QPSK	36	0	05D28	1:1	0.049	1.303	0.064	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram										

Table 11-9
LTE Band 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	24.0	22.63	0.00	0	Right	Cheek	QPSK	1	0	15C0D	1:1	0.084	1.371	0.115	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.61	0.00	1	Right	Cheek	QPSK	50	0	15C0D	1:1	0.066	1.377	0.091	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	22.63	0.02	0	Right	Tilt	QPSK	1	0	15C0D	1:1	0.111	1.371	0.152	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.61	0.05	1	Right	Tilt	QPSK	50	0	15C0D	1:1	0.086	1.377	0.118	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	22.63	0.01	0	Left	Cheek	QPSK	1	0	15C0D	1:1	0.096	1.371	0.132	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.61	0.13	1	Left	Cheek	QPSK	50	0	15C0D	1:1	0.027	1.377	0.037	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	22.63	0.02	0	Left	Tilt	QPSK	1	0	15C0D	1:1	0.116	1.371	0.159	A9
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.61	0.06	1	Left	Tilt	QPSK	50	0	15C0D	1:1	0.095	1.377	0.131	
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 11-10
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)	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.96	0.08	0	Right	Cheek	QPSK	1	0	05B38	1:1	0.079	1.271	0.100	A10
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.0	21.94	0.03	1	Right	Cheek	QPSK	50	0	05B38	1:1	0.073	1.276	0.093	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.96	-0.16	0	Right	Tilt	QPSK	1	0	05B38	1:1	0.031	1.271	0.039	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.0	21.94	0.08	1	Right	Tilt	QPSK	50	0	05B38	1:1	0.020	1.276	0.026	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.96	-0.06	0	Left	Cheek	QPSK	1	0	05B38	1:1	0.068	1.271	0.086	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.0	21.94	0.02	1	Left	Cheek	QPSK	50	0	05B38	1:1	0.048	1.276	0.061	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.96	0.21	0	Left	Tilt	QPSK	1	0	05B38	1:1	0.030	1.271	0.038	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.0	21.94	0.03	1	Left	Tilt	QPSK	50	0	05B38	1:1	0.027	1.276	0.034	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 11-11
LTE Band 41 Head SAR

MEASUREMENT RESULTS																					
1 CC Uplink | 2 CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
		MHz	Ch.															(W/kg)		(W/kg)	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	24.5	23.63	0.12	0	Right	Cheek	QPSK	1	0	05D28	1:1.58	0.058	1.222	0.071	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.59	0.09	1	Right	Cheek	QPSK	50	0	05D28	1:1.58	0.044	1.233	0.054	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	24.5	23.63	0.03	0	Right	Tilt	QPSK	1	0	05D28	1:1.58	0.059	1.222	0.072	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.59	0.14	1	Right	Tilt	QPSK	50	0	05D28	1:1.58	0.046	1.233	0.057	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	24.5	23.63	0.16	0	Left	Cheek	QPSK	1	0	05D28	1:1.58	0.070	1.222	0.086	A11
2 CC Uplink	PCC	2680.00	41490	High	LTE Band 41	20	24.5	24.05	-0.20	0	Left	Cheek	QPSK	1	0	05D28	1:1.58	0.061	1.109	0.068	
	SCC	2660.20	41292	High	LTE Band 41	20							QPSK	1	99						
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.59	0.17	1	Left	Cheek	QPSK	50	0	05D28	1:1.58	0.051	1.233	0.063	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	24.5	23.63	0.12	0	Left	Tilt	QPSK	1	0	05D28	1:1.58	0.040	1.222	0.049	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.59	0.13	1	Left	Tilt	QPSK	50	0	05D28	1:1.58	0.030	1.233	0.037	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																Head 1.6 W/kg (mW/g) averaged over 1 gram					

Table 11-12
DTS Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	16.5	16.49	0.19	Right	Cheek	1	1145D	1	99.0	0.558	0.461	1.002	1.010	0.467	
2437	6	802.11b	DSSS	22	16.5	16.49	0.05	Right	Tilt	1	1145D	1	99.0	0.526	0.474	1.002	1.010	0.480	
2437	6	802.11b	DSSS	22	16.5	16.49	0.14	Left	Cheek	1	1145D	1	99.0	0.272	-	1.002	1.010	-	
2437	6	802.11b	DSSS	22	16.5	16.49	0.01	Left	Tilt	1	1145D	1	99.0	0.254	-	1.002	1.010	-	
2412	1	802.11b	DSSS	22	16.5	16.44	0.12	Right	Cheek	2	1145D	1	99.0	0.888	0.783	1.014	1.010	0.802	
2462	11	802.11b	DSSS	22	16.5	16.37	0.01	Right	Cheek	2	1145D	1	99.0	1.139	0.820	1.030	1.010	0.853	
2412	1	802.11b	DSSS	22	16.5	16.44	-0.03	Right	Tilt	2	1145D	1	99.0	0.825	0.599	1.014	1.010	0.613	
2412	1	802.11b	DSSS	22	16.5	16.44	0.12	Left	Cheek	2	1145D	1	99.0	0.397	-	1.014	1.010	-	
2412	1	802.11b	DSSS	22	16.5	16.44	0.14	Left	Tilt	2	1145D	1	99.0	0.376	-	1.014	1.010	-	
2462	11	802.11b	DSSS	22	16.5	16.37	0.13	Right	Cheek	2	1145D	1	99.0	0.801	0.825	1.030	1.010	**0.858**	A12
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Head 1.6 W/kg (mW/g) averaged over 1 gram					

Note: Blue entry represents variability measurement.

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Table 11-13
DTS MIMO Head SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Ant 1 Conducted Power [dBm]	Ant 2 Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.														W/kg	(W/kg)			(W/kg)	
2437	6	802.11n	OFDM	20	13.5	13.00	12.55	0.09	Right	Cheek	MIMO	1145D	13	93.8	0.599	0.518	1.245	1.066	0.687	
2437	6	802.11n	OFDM	20	13.5	13.00	12.55	0.05	Right	Tilt	MIMO	1145D	13	93.8	0.528	0.408	1.245	1.066	0.541	
2437	6	802.11n	OFDM	20	13.5	13.00	12.55	-0.13	Left	Cheek	MIMO	1145D	13	93.8	0.182	-	1.245	1.066	-	
2437	6	802.11n	OFDM	20	13.5	13.00	12.55	0.04	Left	Tilt	MIMO	1145D	13	93.8	0.152	-	1.245	1.066	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram											

To achieve the 16.5 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 13.5 dBm.

Table 11-14
NII Head SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5290	58	802.11ac	OFDM	80	13.5	13.31	0.13	Right	Cheek	1	15C0D	29.3	94.6	0.886	0.568	1.045	1.057	0.627	
5290	58	802.11ac	OFDM	80	13.5	13.31	0.17	Right	Tilt	1	15C0D	29.3	94.6	1.159	0.585	1.045	1.057	**0.646**	A13
5290	58	802.11ac	OFDM	80	13.5	13.31	0.10	Left	Cheek	1	15C0D	29.3	94.6	0.600	-	1.045	1.057	-	
5290	58	802.11ac	OFDM	80	13.5	13.31	0.11	Left	Tilt	1	15C0D	29.3	94.6	0.448	-	1.045	1.057	-	
5290	58	802.11ac	OFDM	80	13.5	13.25	0.19	Right	Cheek	2	15C0D	29.3	94.5	0.260	0.150	1.059	1.058	0.168	
5290	58	802.11ac	OFDM	80	13.5	13.25	0.12	Right	Tilt	2	15C0D	29.3	94.5	0.195	-	1.059	1.058	-	
5290	58	802.11ac	OFDM	80	13.5	13.25	0.11	Left	Cheek	2	15C0D	29.3	94.5	0.148	-	1.059	1.058	-	
5290	58	802.11ac	OFDM	80	13.5	13.25	0.16	Left	Tilt	2	15C0D	29.3	94.5	0.129	-	1.059	1.058	-	
5690	138	802.11ac	OFDM	80	13.5	13.02	0.17	Right	Cheek	1	15C0D	29.3	94.6	0.847	0.495	1.117	1.057	0.584	
5690	138	802.11ac	OFDM	80	13.5	13.02	0.12	Right	Tilt	1	15C0D	29.3	94.6	0.668	0.348	1.117	1.057	0.411	
5690	138	802.11ac	OFDM	80	13.5	13.02	0.12	Left	Cheek	1	15C0D	29.3	94.6	0.561	-	1.117	1.057	-	
5690	138	802.11ac	OFDM	80	13.5	13.02	0.11	Left	Tilt	1	15C0D	29.3	94.6	0.315	-	1.117	1.057	-	
5690	138	802.11ac	OFDM	80	13.5	13.37	0.15	Right	Cheek	2	15C0D	29.3	94.5	0.158	0.070	1.030	1.058	0.076	
5690	138	802.11ac	OFDM	80	13.5	13.37	0.10	Right	Tilt	2	15C0D	29.3	94.5	0.103	-	1.030	1.058	-	
5690	138	802.11ac	OFDM	80	13.5	13.37	0.05	Left	Cheek	2	15C0D	29.3	94.5	0.100	-	1.030	1.058	-	
5690	138	802.11ac	OFDM	80	13.5	13.37	0.18	Left	Tilt	2	15C0D	29.3	94.5	0.073	-	1.030	1.058	-	
5775	155	802.11ac	OFDM	80	13.5	13.31	0.13	Right	Cheek	1	15C0D	29.3	94.6	0.944	0.503	1.045	1.057	0.556	
5775	155	802.11ac	OFDM	80	13.5	13.31	0.16	Right	Tilt	1	15C0D	29.3	94.6	0.771	0.393	1.045	1.057	0.434	
5775	155	802.11ac	OFDM	80	13.5	13.31	0.03	Left	Cheek	1	15C0D	29.3	94.6	0.639	-	1.045	1.057	-	
5775	155	802.11ac	OFDM	80	13.5	13.31	0.14	Left	Tilt	1	15C0D	29.3	94.6	0.388	-	1.045	1.057	-	
5775	155	802.11ac	OFDM	80	13.5	13.27	0.00	Right	Cheek	2	15C0D	29.3	94.5	0.122	0.067	1.054	1.058	0.075	
5775	155	802.11ac	OFDM	80	13.5	13.27	0.02	Right	Tilt	2	15C0D	29.3	94.5	0.101	-	1.054	1.058	-	
5775	155	802.11ac	OFDM	80	13.5	13.27	0.13	Left	Cheek	2	15C0D	29.3	94.5	0.117	-	1.054	1.058	-	
5775	155	802.11ac	OFDM	80	13.5	13.27	0.19	Left	Tilt	2	15C0D	29.3	94.5	0.117	-	1.054	1.058	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram										

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Table 11-15
NII MIMO Head SAR for Conditions with 2.4 GHz and 5 GHz WLAN SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Ant 1 Conducted Power [dBm]	Ant 2 Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.														W/kg	(W/kg)			(W/kg)	
5290	58	802.11ac	OFDM	80	13.5	13.31	13.25	-0.14	Right	Cheek	MIMO	15C0D	58.5	92.3	1.012	0.489	1.059	1.083	0.561	
5290	58	802.11ac	OFDM	80	13.5	13.31	13.25	0.14	Right	Tilt	MIMO	15C0D	58.5	92.3	1.129	0.474	1.059	1.083	0.544	
5290	58	802.11ac	OFDM	80	13.5	13.31	13.25	-0.08	Left	Cheek	MIMO	15C0D	58.5	92.3	0.498	-	1.059	1.083	-	
5290	58	802.11ac	OFDM	80	13.5	13.31	13.25	0.19	Left	Tilt	MIMO	15C0D	58.5	92.3	0.458	-	1.059	1.083	-	
5690	138	802.11ac	OFDM	80	13.5	13.02	13.37	0.17	Right	Cheek	MIMO	15C0D	58.5	92.3	0.912	0.354	1.117	1.083	0.428	
5690	138	802.11ac	OFDM	80	13.5	13.02	13.37	0.19	Right	Tilt	MIMO	15C0D	58.5	92.3	0.822	0.316	1.117	1.083	0.382	
5690	138	802.11ac	OFDM	80	13.5	13.02	13.37	0.19	Left	Cheek	MIMO	15C0D	58.5	92.3	0.637	-	1.117	1.083	-	
5690	138	802.11ac	OFDM	80	13.5	13.02	13.37	0.10	Left	Tilt	MIMO	15C0D	58.5	92.3	0.503	-	1.117	1.083	-	
5775	155	802.11ac	OFDM	80	13.5	13.31	13.27	0.19	Right	Cheek	MIMO	15C0D	58.5	92.3	0.952	0.450	1.054	1.083	0.514	
5775	155	802.11ac	OFDM	80	13.5	13.31	13.27	-0.17	Right	Tilt	MIMO	15C0D	58.5	92.3	0.763	0.266	1.054	1.083	0.304	
5775	155	802.11ac	OFDM	80	13.5	13.31	13.27	0.19	Left	Cheek	MIMO	15C0D	58.5	92.3	0.604	-	1.054	1.083	-	
5775	155	802.11ac	OFDM	80	13.5	13.31	13.27	0.15	Left	Tilt	MIMO	15C0D	58.5	92.3	0.517	-	1.054	1.083	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram											

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

Table 11-16
Bluetooth 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 (%)	Data Rate (Mbps)	SAR (1g)	Scaling Factor (Cond. Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2402.00	0	Bluetooth	FHSS	15.5	14.16	0.05	Right	Cheek	1144C	77.3	1	0.529	1.361	1.294	**0.932**	
2441.00	39	Bluetooth	FHSS	15.5	15.05	-0.02	Right	Cheek	1144C	77.3	1	0.577	1.109	1.294	0.828	A14
2480.00	78	Bluetooth	FHSS	15.5	13.74	0.07	Right	Cheek	1144C	77.3	1	0.407	1.500	1.294	0.790	
2441.00	39	Bluetooth	FHSS	15.5	15.05	-0.02	Right	Tilt	1144C	77.3	1	0.404	1.109	1.294	0.580	
2441.00	39	Bluetooth	FHSS	15.5	15.05	-0.01	Left	Cheek	1144C	77.3	1	0.234	1.109	1.294	0.336	
2441.00	39	Bluetooth	FHSS	15.5	15.05	0.03	Left	Tilt	1144C	77.3	1	0.161	1.109	1.294	0.231	
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	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.0	32.85	0.00	15 mm	N/A	05D28	1	1:8.3	back	0.315	1.035	0.326	A15
836.60	190	GSM 850	GSM	33.0	32.85	-0.01	15 mm	Headphones	05D5F	1	1:8.3	back	0.199	1.035	0.206	
1880.00	661	GSM 1900	GSM	30.0	29.48	-0.02	15 mm	N/A	05EBA	1	1:8.3	back	0.206	1.127	0.232	A17
836.60	4183	UMTS 850	RMC	23.5	23.29	0.00	15 mm	N/A	05EBA	N/A	1:1	back	0.300	1.050	0.315	A19
836.60	4183	UMTS 850	RMC	23.5	23.29	-0.01	15 mm	Headphones	05D5F	N/A	1:1	back	0.171	1.050	0.180	
1880.00	9400	UMTS 1900	RMC	23.5	23.02	0.00	15 mm	N/A	04E4A	N/A	1:1	back	0.404	1.117	0.451	A21
836.52	384	Cell. CDMA	TDSO / SO32	26.5	25.65	-0.05	15 mm	N/A	05D28	N/A	1:1	back	0.477	1.216	0.580	A23
836.52	384	Cell. CDMA	TDSO / SO32	26.5	25.65	0.00	15 mm	Headphones	05D5F	N/A	1:1	back	0.356	1.216	0.433	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-18
LTE FDD Body-Worn SAR Data

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Accessory	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	N/A	24.0	23.55	0.01	0	05B38	QPSK	1	25	15 mm	back	1:1	0.170	1.109	0.189	A25
707.50	23095	Mid	LTE Band 12	10	N/A	23.0	22.59	0.02	1	05B38	QPSK	25	12	15 mm	back	1:1	0.136	1.099	0.149	
782.00	23230	Mid	LTE Band 13	10	N/A	24.0	22.76	0.00	0	05B38	QPSK	1	0	15 mm	back	1:1	0.183	1.330	0.243	A27
782.00	23230	Mid	LTE Band 13	10	N/A	23.0	21.69	0.00	1	05B38	QPSK	25	0	15 mm	back	1:1	0.141	1.352	0.191	
831.50	26865	Mid	LTE Band 26 (Cell)	15	N/A	24.0	22.86	-0.03	0	05D28	QPSK	1	0	15 mm	back	1:1	0.367	1.300	0.477	A29
831.50	26865	Mid	LTE Band 26 (Cell)	15	N/A	23.0	21.85	-0.04	1	05D28	QPSK	36	0	15 mm	back	1:1	0.291	1.303	0.379	
831.50	26865	Mid	LTE Band 26 (Cell)	15	Headphones	24.0	22.86	-0.03	0	05D5F	QPSK	1	0	15 mm	back	1:1	0.192	1.300	0.250	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	N/A	24.0	22.63	-0.02	0	05D28	QPSK	1	0	15 mm	back	1:1	0.528	1.371	0.724	A31
1732.50	20175	Mid	LTE Band 4 (AWS)	20	N/A	23.0	21.61	0.01	1	05D28	QPSK	50	0	15 mm	back	1:1	0.418	1.377	0.576	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	N/A	24.0	22.96	-0.05	0	05CDB	QPSK	1	0	15 mm	back	1:1	0.478	1.271	0.608	A33
1882.50	26365	Mid	LTE Band 25 (PCS)	20	N/A	23.0	21.94	-0.05	1	05CDB	QPSK	50	0	15 mm	back	1:1	0.372	1.276	0.475	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-19
LTE TDD Body-Worn SAR Data

MEASUREMENT RESULTS																					
1 CC Uplink | 2 CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
		MHz	Ch.															(W/kg)		(W/kg)	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	24.5	23.63	0.09	0	05EE4	QPSK	1	0	15 mm	back	1:1.58	0.157	1.222	0.192	
2 CC Uplink	PCC	2680.00	41490	High	LTE Band 41	20	24.5	24.05	-0.04	0	05EE4	QPSK	1	0	15 mm	back	1:1.58	0.162	1.109	0.180	A35
	SCC	2660.20	41292	High								QPSK	1	99							
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.59	0.10	1	05EE4	QPSK	50	0	15 mm	back	1:1.58	0.089	1.233	0.110	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram										

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Table 11-20
DTS Body-Worn SAR Data

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	20.5	19.83	0.11	15 mm	1	1144C	1	back	99.0	0.133	0.115	1.167	1.010	**0.136**	A37
2462	11	802.11b	DSSS	22	20.5	19.43	-0.15	15 mm	2	1144C	1	back	99.0	0.116	0.099	1.279	1.010	0.128	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**								**Body** **1.6 W/kg (mW/g)** averaged over 1 gram											

Table 11-21
NII Body-Worn SAR Data

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5280	56	802.11a	OFDM	20	16.5	15.78	-0.06	15 mm	1	1144C	6	back	98.8	0.431	0.201	1.180	1.012	**0.240**	A39
5260	52	802.11a	OFDM	20	16.5	16.13	0.17	15 mm	2	1144C	6	back	98.8	0.133	0.050	1.089	1.012	0.055	
5620	124	802.11a	OFDM	20	16.5	16.12	0.12	15 mm	1	1144C	6	back	98.8	0.390	0.151	1.091	1.012	0.167	
5720	144	802.11a	OFDM	20	16.5	16.34	0.14	15 mm	2	1144C	6	back	98.8	0.152	0.057	1.038	1.012	0.060	
5745	149	802.11a	OFDM	20	16.5	15.98	0.11	15 mm	1	1144C	6	back	98.8	0.355	0.151	1.127	1.012	0.172	
5785	157	802.11a	OFDM	20	16.5	16.23	0.10	15 mm	2	1144C	6	back	98.8	0.155	0.060	1.064	1.012	0.065	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**								**Body** **1.6 W/kg (mW/g)** averaged over 1 gram											

Table 11-22
Bluetooth Body-Worn SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond. Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441	39	Bluetooth	FHSS	15.5	15.05	0.02	15 mm	1144C	1	back	77.3	0.031	1.109	1.294	**0.044**	A41
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Body** **1.6 W/kg (mW/g)** averaged over 1 gram									

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11.3 Standalone Hotspot SAR Data

Table 11-23
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)	
836.60	190	GSM 850	GPRS	29.8	29.12	0.04	10 mm	05D28	3	1:2.76	back	0.655	1.169	0.766	A16
836.60	190	GSM 850	GPRS	29.8	29.12	-0.03	10 mm	05D28	3	1:2.76	front	0.496	1.169	0.580	
836.60	190	GSM 850	GPRS	29.8	29.12	-0.09	10 mm	05D28	3	1:2.76	bottom	0.347	1.169	0.406	
836.60	190	GSM 850	GPRS	29.8	29.12	-0.02	10 mm	05D28	3	1:2.76	right	0.292	1.169	0.341	
836.60	190	GSM 850	GPRS	29.8	29.12	-0.09	10 mm	05D28	3	1:2.76	left	0.077	1.169	0.090	
1880.00	661	GSM 1900	GPRS	25.0	23.98	0.01	10 mm	05EBA	3	1:2.76	back	0.308	1.265	0.390	
1880.00	661	GSM 1900	GPRS	25.0	23.98	0.00	10 mm	05EBA	3	1:2.76	front	0.276	1.265	0.349	
1880.00	661	GSM 1900	GPRS	25.0	23.98	-0.01	10 mm	05EBA	3	1:2.76	bottom	0.534	1.265	0.676	A18
1880.00	661	GSM 1900	GPRS	25.0	23.98	0.12	10 mm	05EBA	3	1:2.76	right	0.030	1.265	0.038	
1880.00	661	GSM 1900	GPRS	25.0	23.98	-0.12	10 mm	05EBA	3	1:2.76	left	0.104	1.265	0.132	
836.60	4183	UMTS 850	RMC	23.5	23.29	0.02	10 mm	05EBA	N/A	1:1	back	0.462	1.050	0.485	A20
836.60	4183	UMTS 850	RMC	23.5	23.29	-0.05	10 mm	05EBA	N/A	1:1	front	0.353	1.050	0.371	
836.60	4183	UMTS 850	RMC	23.5	23.29	0.01	10 mm	05EBA	N/A	1:1	bottom	0.264	1.050	0.277	
836.60	4183	UMTS 850	RMC	23.5	23.29	-0.02	10 mm	05EBA	N/A	1:1	right	0.247	1.050	0.259	
836.60	4183	UMTS 850	RMC	23.5	23.29	-0.07	10 mm	05EBA	N/A	1:1	left	0.060	1.050	0.063	
1880.00	9400	UMTS 1900	RMC	20.5	20.00	-0.04	10 mm	04E4A	N/A	1:1	back	0.360	1.122	0.404	
1880.00	9400	UMTS 1900	RMC	20.5	20.00	0.03	10 mm	04E4A	N/A	1:1	front	0.333	1.122	0.374	
1880.00	9400	UMTS 1900	RMC	20.5	20.00	-0.06	10 mm	04E4A	N/A	1:1	bottom	0.686	1.122	0.770	A22
1880.00	9400	UMTS 1900	RMC	20.5	20.00	0.10	10 mm	04E4A	N/A	1:1	right	0.035	1.122	0.039	
1880.00	9400	UMTS 1900	RMC	20.5	20.00	-0.09	10 mm	04E4A	N/A	1:1	left	0.106	1.122	0.119	
836.52	384	Cell. CDMA	EVDO Rev. 0	24.5	23.96	0.01	10 mm	058EC	N/A	1:1	back	0.689	1.132	0.780	A24
836.52	384	Cell. CDMA	EVDO Rev. 0	24.5	23.96	-0.03	10 mm	058EC	N/A	1:1	front	0.540	1.132	0.611	
836.52	384	Cell. CDMA	EVDO Rev. 0	24.5	23.96	0.04	10 mm	058EC	N/A	1:1	bottom	0.374	1.132	0.423	
836.52	384	Cell. CDMA	EVDO Rev. 0	24.5	23.96	-0.12	10 mm	058EC	N/A	1:1	right	0.311	1.132	0.352	
836.52	384	Cell. CDMA	EVDO Rev. 0	24.5	23.96	0.01	10 mm	058EC	N/A	1:1	left	0.080	1.132	0.091	

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 11-24
LTE Band 12 Hotspot SAR Data

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	24.0	23.55	-0.01	0	05B38	QPSK	1	25	10 mm	back	1:1	0.250	1.109	0.277	
707.50	23095	Mid	LTE Band 12	10	23.0	22.59	-0.01	1	05B38	QPSK	25	12	10 mm	back	1:1	0.201	1.099	0.221	
707.50	23095	Mid	LTE Band 12	10	24.0	23.55	-0.01	0	05B38	QPSK	1	25	10 mm	front	1:1	0.190	1.109	0.211	
707.50	23095	Mid	LTE Band 12	10	23.0	22.59	-0.02	1	05B38	QPSK	25	12	10 mm	front	1:1	0.152	1.099	0.167	
707.50	23095	Mid	LTE Band 12	10	24.0	23.55	-0.02	0	05B38	QPSK	1	25	10 mm	bottom	1:1	0.163	1.109	0.181	
707.50	23095	Mid	LTE Band 12	10	23.0	22.59	0.12	1	05B38	QPSK	25	12	10 mm	bottom	1:1	0.131	1.099	0.144	
707.50	23095	Mid	LTE Band 12	10	24.0	23.55	-0.13	0	05B38	QPSK	1	25	10 mm	right	1:1	0.260	1.109	0.288	A26
707.50	23095	Mid	LTE Band 12	10	23.0	22.59	0.01	1	05B38	QPSK	25	12	10 mm	right	1:1	0.213	1.099	0.234	
707.50	23095	Mid	LTE Band 12	10	24.0	23.55	0.05	0	05B38	QPSK	1	25	10 mm	left	1:1	0.094	1.109	0.104	
707.50	23095	Mid	LTE Band 12	10	23.0	22.59	0.05	1	05B38	QPSK	25	12	10 mm	left	1:1	0.077	1.099	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

Table 11-25
LTE Band 13 Hotspot SAR Data

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	24.0	22.76	-0.03	0	05B38	QPSK	1	0	10 mm	back	1:1	0.397	1.330	0.528	A28
782.00	23230	Mid	LTE Band 13	10	23.0	21.69	0.01	1	05B38	QPSK	25	0	10 mm	back	1:1	0.304	1.352	0.411	
782.00	23230	Mid	LTE Band 13	10	24.0	22.76	-0.02	0	05B38	QPSK	1	0	10 mm	front	1:1	0.311	1.330	0.414	
782.00	23230	Mid	LTE Band 13	10	23.0	21.69	0.03	1	05B38	QPSK	25	0	10 mm	front	1:1	0.239	1.352	0.323	
782.00	23230	Mid	LTE Band 13	10	24.0	22.76	0.02	0	05B38	QPSK	1	0	10 mm	bottom	1:1	0.179	1.330	0.238	
782.00	23230	Mid	LTE Band 13	10	23.0	21.69	-0.05	1	05B38	QPSK	25	0	10 mm	bottom	1:1	0.143	1.352	0.193	
782.00	23230	Mid	LTE Band 13	10	24.0	22.76	0.00	0	05B38	QPSK	1	0	10 mm	right	1:1	0.171	1.330	0.227	
782.00	23230	Mid	LTE Band 13	10	23.0	21.69	0.03	1	05B38	QPSK	25	0	10 mm	right	1:1	0.131	1.352	0.177	
782.00	23230	Mid	LTE Band 13	10	24.0	22.76	0.00	0	05B38	QPSK	1	0	10 mm	left	1:1	0.052	1.330	0.069	
782.00	23230	Mid	LTE Band 13	10	23.0	21.69	0.02	1	05B38	QPSK	25	0	10 mm	left	1:1	0.042	1.352	0.057	

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 11-26
LTE Band 26 (Cell) Hotspot SAR Data

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	24.0	22.86	-0.01	0	05D28	QPSK	1	0	10 mm	back	1:1	0.667	1.300	0.867	A30
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.0	21.85	0.05	1	05D28	QPSK	36	0	10 mm	back	1:1	0.529	1.303	0.689	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.0	21.77	0.04	1	05D28	QPSK	75	0	10 mm	back	1:1	0.477	1.327	0.633	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.86	0.01	0	05D28	QPSK	1	0	10 mm	front	1:1	0.550	1.300	0.715	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.0	21.85	-0.01	1	05D28	QPSK	36	0	10 mm	front	1:1	0.435	1.303	0.567	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.86	0.01	0	05D28	QPSK	1	0	10 mm	bottom	1:1	0.398	1.300	0.517	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.0	21.85	-0.04	1	05D28	QPSK	36	0	10 mm	bottom	1:1	0.301	1.303	0.392	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.86	-0.03	0	05D28	QPSK	1	0	10 mm	right	1:1	0.310	1.300	0.403	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.0	21.85	0.02	1	05D28	QPSK	36	0	10 mm	right	1:1	0.245	1.303	0.319	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.86	0.02	0	05D28	QPSK	1	0	10 mm	left	1:1	0.084	1.300	0.109	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.0	21.85	-0.12	1	05D28	QPSK	36	0	10 mm	left	1:1	0.065	1.303	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

Table 11-27
LTE Band 4 (AWS) Hotspot SAR Data

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.0	18.52	-0.02	0	05D28	QPSK	1	0	10 mm	back	1:1	0.488	1.117	0.545	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.0	18.58	-0.01	0	05D28	QPSK	50	0	10 mm	back	1:1	0.481	1.102	0.530	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.0	18.52	0.03	0	05D28	QPSK	1	0	10 mm	front	1:1	0.442	1.117	0.494	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.0	18.58	0.02	0	05D28	QPSK	50	0	10 mm	front	1:1	0.438	1.102	0.483	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.0	18.52	-0.02	0	05D28	QPSK	1	0	10 mm	bottom	1:1	0.762	1.117	0.851	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.0	18.58	-0.03	0	05D28	QPSK	50	0	10 mm	bottom	1:1	0.776	1.102	0.855	A32
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.0	18.51	-0.03	0	05D28	QPSK	100	0	10 mm	bottom	1:1	0.771	1.119	0.863	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.0	18.52	-0.02	0	05D28	QPSK	1	0	10 mm	right	1:1	0.088	1.117	0.098	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.0	18.58	0.00	0	05D28	QPSK	50	0	10 mm	right	1:1	0.089	1.102	0.098	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.0	18.52	-0.01	0	05D28	QPSK	1	0	10 mm	left	1:1	0.163	1.117	0.182	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	19.0	18.58	0.00	0	05D28	QPSK	50	0	10 mm	left	1:1	0.156	1.102	0.172	

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 11-28
LTE Band 25 (PCS) Hotspot SAR Data

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	19.0	18.00	-0.07	0	05CDB	QPSK	1	0	10 mm	back	1:1	0.414	1.259	0.521	
1860.00	26140	Low	LTE Band 25 (PCS)	20	19.0	17.96	-0.03	0	05CDB	QPSK	50	0	10 mm	back	1:1	0.398	1.271	0.506	
1860.00	26140	Low	LTE Band 25 (PCS)	20	19.0	18.00	-0.01	0	05CDB	QPSK	1	0	10 mm	front	1:1	0.379	1.259	0.477	
1860.00	26140	Low	LTE Band 25 (PCS)	20	19.0	17.96	-0.04	0	05CDB	QPSK	50	0	10 mm	front	1:1	0.363	1.271	0.461	
1860.00	26140	Low	LTE Band 25 (PCS)	20	19.0	18.00	-0.08	0	05CDB	QPSK	1	0	10 mm	bottom	1:1	0.720	1.259	0.906	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	19.0	17.95	-0.02	0	05CDB	QPSK	1	0	10 mm	bottom	1:1	0.799	1.274	1.018	
1905.00	26590	High	LTE Band 25 (PCS)	20	19.0	17.88	-0.09	0	05CDB	QPSK	1	0	10 mm	bottom	1:1	0.832	1.294	**1.077**	A34
1860.00	26140	Low	LTE Band 25 (PCS)	20	19.0	17.96	-0.03	0	05CDB	QPSK	50	0	10 mm	bottom	1:1	0.727	1.271	0.924	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	19.0	17.91	-0.06	0	05CDB	QPSK	50	0	10 mm	bottom	1:1	0.773	1.285	0.993	
1905.00	26590	High	LTE Band 25 (PCS)	20	19.0	17.77	-0.05	0	05CDB	QPSK	50	0	10 mm	bottom	1:1	0.810	1.327	**1.075**	
1860.00	26140	Low	LTE Band 25 (PCS)	20	19.0	17.90	-0.08	0	05CDB	QPSK	100	0	10 mm	bottom	1:1	0.760	1.288	0.979	
1860.00	26140	Low	LTE Band 25 (PCS)	20	19.0	18.00	0.03	0	05CDB	QPSK	1	0	10 mm	right	1:1	0.050	1.259	0.063	
1860.00	26140	Low	LTE Band 25 (PCS)	20	19.0	17.96	0.07	0	05CDB	QPSK	50	0	10 mm	right	1:1	0.037	1.271	0.047	
1860.00	26140	Low	LTE Band 25 (PCS)	20	19.0	18.00	-0.06	0	05CDB	QPSK	1	0	10 mm	left	1:1	0.120	1.259	0.151	
1860.00	26140	Low	LTE Band 25 (PCS)	20	19.0	17.96	-0.06	0	05CDB	QPSK	50	0	10 mm	left	1:1	0.129	1.271	0.164	
1905.00	26590	High	LTE Band 25 (PCS)	20	19.0	17.88	0.01	0	05CDB	QPSK	1	0	10 mm	bottom	1:1	0.793	1.294	1.026	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram				

Note: Blue entry represents variability measurement.

Table 11-29
LTE Band 41 Hotspot SAR Data

MEASUREMENT RESULTS																					
1 CC Uplink | 2 CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
		MHz	Ch.															(W/kg)		(W/kg)	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	21.0	20.24	0.08	0	05EE4	QPSK	1	0	10 mm	back	1:1.58	0.145	1.191	0.173	
2 CC Uplink	PCC	2680.00	41490	High	LTE Band 41	20	21.0	20.90	0.06	0	05EE4	QPSK	1	0	10 mm	back	1:1.58	0.171	1.023	0.175	A36
	SCC	2660.20	41292	High								QPSK	1	99							
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	21.0	20.17	0.09	0	05EE4	QPSK	50	0	10 mm	back	1:1.58	0.141	1.211	0.171	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	21.0	20.24	0.05	0	05EE4	QPSK	1	0	10 mm	front	1:1.58	0.095	1.191	0.113	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	21.0	20.17	-0.02	0	05EE4	QPSK	50	0	10 mm	front	1:1.58	0.092	1.211	0.111	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	21.0	20.24	0.07	0	05EE4	QPSK	1	0	10 mm	bottom	1:1.58	0.090	1.191	0.107	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	21.0	20.17	0.04	0	05EE4	QPSK	50	0	10 mm	bottom	1:1.58	0.089	1.211	0.108	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	21.0	20.24	-0.06	0	05EE4	QPSK	1	0	10 mm	left	1:1.58	0.050	1.191	0.060	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	21.0	20.17	-0.07	0	05EE4	QPSK	50	0	10 mm	left	1:1.58	0.049	1.211	0.059	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																Body 1.6 W/kg (mW/g) averaged over 1 gram					

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Table 11-30
WLAN Hotspot SAR Data

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	20.5	19.83	0.20	10 mm	1	1144C	1	back	99.0	0.325	-	1.167	1.010	-	
2437	6	802.11b	DSSS	22	20.5	19.83	-0.17	10 mm	1	1144C	1	front	99.0	0.247	-	1.167	1.010	-	
2437	6	802.11b	DSSS	22	20.5	19.83	0.18	10 mm	1	1144C	1	top	99.0	0.421	0.333	1.167	1.010	**0.392**	A38
2437	6	802.11b	DSSS	22	20.5	19.83	0.03	10 mm	1	1144C	1	left	99.0	0.244	-	1.167	1.010	-	
2462	11	802.11b	DSSS	22	20.5	19.43	0.04	10 mm	2	1144C	1	back	99.0	0.255	0.226	1.279	1.010	0.292	
2462	11	802.11b	DSSS	22	20.5	19.43	0.13	10 mm	2	1144C	1	front	99.0	0.245	-	1.279	1.010	-	
2462	11	802.11b	DSSS	22	20.5	19.43	0.03	10 mm	2	1144C	1	top	99.0	0.147	-	1.279	1.010	-	
2462	11	802.11b	DSSS	22	20.5	19.43	0.11	10 mm	2	1144C	1	left	99.0	0.135	-	1.279	1.010	-	
5745	149	802.11a	OFDM	20	16.5	15.98	0.10	10 mm	1	1144C	6	back	98.8	0.574	0.304	1.127	1.012	**0.347**	A40
5745	149	802.11a	OFDM	20	16.5	15.98	0.12	10 mm	1	1144C	6	front	98.8	0.164	-	1.127	1.012	-	
5745	149	802.11a	OFDM	20	16.5	15.98	0.13	10 mm	1	1144C	6	top	98.8	0.240	-	1.127	1.012	-	
5745	149	802.11a	OFDM	20	16.5	15.98	0.00	10 mm	1	1144C	6	left	98.8	0.019	-	1.127	1.012	-	
5785	157	802.11a	OFDM	20	16.5	16.23	-0.02	10 mm	2	1144C	6	back	98.8	0.237	0.097	1.064	1.012	0.104	
5785	157	802.11a	OFDM	20	16.5	16.23	0.00	10 mm	2	1144C	6	front	98.8	0.036	-	1.064	1.012	-	
5785	157	802.11a	OFDM	20	16.5	16.23	0.13	10 mm	2	1144C	6	top	98.8	0.073	-	1.064	1.012	-	
5785	157	802.11a	OFDM	20	16.5	16.23	0.14	10 mm	2	1144C	6	left	98.8	0.025	-	1.064	1.012	-	

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 11-31
WLAN MIMO Hotspot SAR for Conditions with 2.4 GHz and 5 GHz WLAN SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Ant 1 Conducted Power [dBm]	Ant 2 Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.														W/kg	(W/kg)			(W/kg)	
2437	6	802.11n	OFDM	20	16.5	16.37	16.33	-0.17	10 mm	MIMO	1145D	13	back	93.8	0.221	0.190	1.040	1.066	0.211	
2437	6	802.11n	OFDM	20	16.5	16.37	16.33	-0.03	10 mm	MIMO	1145D	13	front	93.8	0.169	-	1.040	1.066	-	
2437	6	802.11n	OFDM	20	16.5	16.37	16.33	0.11	10 mm	MIMO	1145D	13	top	93.8	0.012	-	1.040	1.066	-	
2437	6	802.11n	OFDM	20	16.5	16.37	16.33	-0.04	10 mm	MIMO	1145D	13	left	93.8	0.152	-	1.040	1.066	-	
5775	155	802.11ac	OFDM	80	13.5	13.31	13.27	-0.05	10 mm	MIMO	1144C	58.5	back	92.3	0.358	0.178	1.054	1.083	0.203	
5775	155	802.11ac	OFDM	80	13.5	13.31	13.27	0.00	10 mm	MIMO	1144C	58.5	front	92.3	0.095	-	1.054	1.083	-	
5775	155	802.11ac	OFDM	80	13.5	13.31	13.27	0.18	10 mm	MIMO	1144C	58.5	top	92.3	0.124	-	1.054	1.083	-	
5775	155	802.11ac	OFDM	80	13.5	13.31	13.27	0.00	10 mm	MIMO	1144C	58.5	left	92.3	0.019	-	1.054	1.083	-	

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

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

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Table 11-32
Bluetooth Hotspot SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond. Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441	39	Bluetooth	FHSS	15.5	15.05	0.00	10 mm	1144C	1	back	77.3	0.076	1.109	1.294	**0.109**	A42
2441	39	Bluetooth	FHSS	15.5	15.05	0.04	10 mm	1144C	1	front	77.3	0.066	1.109	1.294	0.095	
2441	39	Bluetooth	FHSS	15.5	15.05	-0.05	10 mm	1144C	1	top	77.3	0.036	1.109	1.294	0.052	
2441	39	Bluetooth	FHSS	15.5	15.05	0.07	10 mm	1144C	1	left	77.3	0.031	1.109	1.294	0.044	

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

11.4 Standalone Phablet SAR Data

Table 11-33
UMTS/CDMA Phablet SAR Data

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Duty Cycle	Side	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1852.40	9262	UMTS 1900	RMC	23.5	23.07	-0.07	0 mm	04E4A	1:1	bottom	2.670	1.104	2.948	A43
1880.00	9400	UMTS 1900	RMC	23.5	23.02	-0.05	0 mm	04E4A	1:1	bottom	2.510	1.117	2.804	
1907.60	9538	UMTS 1900	RMC	23.5	22.93	-0.08	0 mm	04E4A	1:1	bottom	2.400	1.140	2.736	
1852.40	9262	UMTS 1900	RMC	23.5	23.07	-0.06	0 mm	04E4A	1:1	bottom	2.670	1.104	2.948	
824.70	1013	Cell. CDMA	EVDO Rev. 0	26.5	25.97	-0.05	0 mm	258EC	1:1	back	2.220	1.130	2.509	A44
836.52	384	Cell. CDMA	EVDO Rev. 0	26.5	25.84	-0.17	0 mm	258EC	1:1	back	1.880	1.164	2.188	
848.31	777	Cell. CDMA	EVDO Rev. 0	26.5	25.95	-0.09	0 mm	258EC	1:1	back	2.220	1.135	2.520	
824.70	1013	Cell. CDMA	EVDO Rev. 0	26.5	25.97	0.08	0 mm	258EC	1:1	back	2.140	1.130	2.418	

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

Note: Blue entry represents variability measurement.

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Table 11-34
LTE FDD Phablet SAR Data

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 (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	22.63	-0.06	0	05D28	QPSK	1	0	6 mm	back	1:1	0.745	1.371	1.021	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.61	0.06	1	05D28	QPSK	50	0	6 mm	back	1:1	0.600	1.377	0.826	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	22.63	0.04	0	05D28	QPSK	1	0	4 mm	front	1:1	0.832	1.371	1.141	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.61	0.07	1	05D28	QPSK	50	0	4 mm	front	1:1	0.667	1.377	0.918	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	22.63	-0.01	0	05D28	QPSK	1	0	8 mm	bottom	1:1	0.813	1.371	1.115	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.61	0.01	1	05D28	QPSK	50	0	8 mm	bottom	1:1	0.659	1.377	0.907	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	22.63	-0.13	0	05D28	QPSK	1	0	0 mm	right	1:1	0.244	1.371	0.335	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.61	0.16	1	05D28	QPSK	50	0	0 mm	right	1:1	0.198	1.377	0.273	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	22.63	-0.15	0	05D28	QPSK	1	0	0 mm	left	1:1	0.631	1.371	0.865	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.61	-0.08	1	05D28	QPSK	50	0	0 mm	left	1:1	0.508	1.377	0.700	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.60	-0.11	0	05D28	QPSK	1	0	0 mm	back	1:1	1.670	1.096	1.830	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.57	-0.11	0	05D28	QPSK	50	0	0 mm	back	1:1	1.670	1.104	1.844	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.60	0.06	0	05D28	QPSK	1	0	0 mm	front	1:1	1.390	1.096	1.523	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.57	0.05	0	05D28	QPSK	50	0	0 mm	front	1:1	1.390	1.104	1.535	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.60	-0.03	0	05D28	QPSK	1	0	0 mm	bottom	1:1	1.860	1.096	2.039	A45
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.57	0.00	0	05D28	QPSK	50	0	0 mm	bottom	1:1	1.850	1.104	2.042	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.46	-0.01	0	05D28	QPSK	100	0	0 mm	bottom	1:1	1.820	1.132	2.060	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.96	-0.04	0	04E4A	QPSK	1	0	6 mm	back	1:1	0.882	1.271	1.121	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.0	21.94	-0.06	1	04E4A	QPSK	50	0	6 mm	back	1:1	0.700	1.276	0.893	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.96	0.04	0	04E4A	QPSK	1	0	4 mm	front	1:1	0.947	1.271	1.204	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.0	21.94	0.02	1	04E4A	QPSK	50	0	4 mm	front	1:1	0.746	1.276	0.952	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.96	-0.07	0	04E4A	QPSK	1	0	8 mm	bottom	1:1	0.889	1.271	1.130	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.0	21.94	-0.08	1	04E4A	QPSK	50	0	8 mm	bottom	1:1	0.711	1.276	0.907	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.96	0.09	0	04E4A	QPSK	1	0	0 mm	right	1:1	0.177	1.271	0.225	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.0	21.94	0.03	1	04E4A	QPSK	50	0	0 mm	right	1:1	0.140	1.276	0.179	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.96	-0.15	0	04E4A	QPSK	1	0	0 mm	left	1:1	0.759	1.271	0.965	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.0	21.94	-0.12	1	04E4A	QPSK	50	0	0 mm	left	1:1	0.617	1.276	0.787	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.12	-0.13	0	05CDB	QPSK	1	0	0 mm	back	1:1	2.000	1.225	2.450	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	20.95	-0.16	0	05CDB	QPSK	1	0	0 mm	back	1:1	1.960	1.274	2.497	
1905.00	26590	High	LTE Band 25 (PCS)	20	22.0	20.75	-0.21	0	05CDB	QPSK	1	0	0 mm	back	1:1	1.840	1.334	2.455	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.00	-0.14	0	05CDB	QPSK	50	0	0 mm	back	1:1	2.000	1.259	2.518	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	20.98	-0.12	0	05CDB	QPSK	50	0	0 mm	back	1:1	1.960	1.265	2.479	
1905.00	26590	High	LTE Band 25 (PCS)	20	22.0	20.70	-0.18	0	05CDB	QPSK	50	0	0 mm	back	1:1	1.980	1.349	2.671	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	20.92	-0.21	0	05CDB	QPSK	100	0	0 mm	back	1:1	1.860	1.282	2.385	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.12	-0.10	0	05CDB	QPSK	1	0	0 mm	front	1:1	1.780	1.225	2.181	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	20.95	-0.15	0	05CDB	QPSK	1	0	0 mm	front	1:1	1.770	1.274	2.255	
1905.00	26590	High	LTE Band 25 (PCS)	20	22.0	20.75	-0.15	0	05CDB	QPSK	1	0	0 mm	front	1:1	1.820	1.334	2.428	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.00	-0.16	0	05CDB	QPSK	50	0	0 mm	front	1:1	1.780	1.259	2.241	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	20.98	-0.18	0	05CDB	QPSK	50	0	0 mm	front	1:1	1.800	1.265	2.277	
1905.00	26590	High	LTE Band 25 (PCS)	20	22.0	20.70	-0.17	0	05CDB	QPSK	50	0	0 mm	front	1:1	1.790	1.349	2.415	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	20.92	-0.15	0	05CDB	QPSK	100	0	0 mm	front	1:1	1.680	1.282	2.154	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.12	-0.05	0	05CDB	QPSK	1	0	0 mm	bottom	1:1	2.330	1.225	2.854	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	20.95	-0.06	0	05CDB	QPSK	1	0	0 mm	bottom	1:1	2.260	1.274	2.879	
1905.00	26590	High	LTE Band 25 (PCS)	20	22.0	20.75	-0.08	0	05CDB	QPSK	1	0	0 mm	bottom	1:1	2.290	1.334	3.055	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.00	-0.05	0	05CDB	QPSK	50	0	0 mm	bottom	1:1	2.370	1.259	2.984	A46
1882.50	26365	Mid	LTE Band 25 (PCS)	20	22.0	20.98	-0.07	0	05CDB	QPSK	50	0	0 mm	bottom	1:1	2.270	1.265	2.872	
1905.00	26590	High	LTE Band 25 (PCS)	20	22.0	20.70	-0.06	0	05CDB	QPSK	50	0	0 mm	bottom	1:1	2.250	1.349	3.035	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	20.92	-0.07	0	05CDB	QPSK	100	0	0 mm	bottom	1:1	2.120	1.282	2.718	

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

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Table 11-35
LTE TDD Phablet SAR Data

MEASUREMENT RESULTS																						
1 CC Uplink | 2 CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
		MHz	Ch.															(W/kg)		(W/kg)	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	24.5	23.63	0.05	0	05CDB	QPSK	1	0	6 mm	back	1:1.58	0.689	1.222	0.842	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.59	-0.05	1	05CDB	QPSK	50	0	6 mm	back	1:1.58	0.526	1.233	0.649	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	24.5	23.63	-0.02	0	05CDB	QPSK	1	0	4 mm	front	1:1.58	0.654	1.222	0.799	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.59	0.03	1	05CDB	QPSK	50	0	4 mm	front	1:1.58	0.506	1.233	0.624	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	24.5	23.63	0.00	0	05CDB	QPSK	1	0	8 mm	bottom	1:1.58	0.550	1.222	0.672	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.59	-0.01	1	05CDB	QPSK	50	0	8 mm	bottom	1:1.58	0.423	1.233	0.522	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	24.5	23.63	-0.02	0	05CDB	QPSK	1	0	0 mm	left	1:1.58	0.814	1.222	0.995	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.59	-0.04	1	05CDB	QPSK	50	0	0 mm	left	1:1.58	0.656	1.233	0.809	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.5	22.20	-0.07	0	05EE4	QPSK	1	0	0 mm	back	1:1.58	1.620	1.349	2.185	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.5	21.96	-0.01	0	05EE4	QPSK	1	99	0 mm	back	1:1.58	1.350	1.426	1.925	
2 CC Uplink	PCC	2506.00	39750	Low	LTE Band 41	20	23.5	23.00	0.03	0	05CDB	QPSK	1	99	0 mm	back	1:1.58	1.790	1.122	2.008	A47
	SCC	2525.80	39948	Low								QPSK	1	0							
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.33	-0.02	0	05EE4	QPSK	1	0	0 mm	back	1:1.58	1.520	1.309	1.990	
1 CC Uplink	N/A	2593.00	40620	Mid	LTE Band 41	20	23.5	22.45	-0.08	0	05EE4	QPSK	1	0	0 mm	back	1:1.58	1.300	1.274	1.656	
1 CC Uplink	N/A	2636.50	41055	Mid-High	LTE Band 41	20	23.5	22.11	-0.03	0	05EE4	QPSK	1	0	0 mm	back	1:1.58	1.120	1.377	1.542	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.54	0.00	0	05EE4	QPSK	1	0	0 mm	back	1:1.58	1.040	1.247	1.297	
1 CC Uplink	N/A	2506.00	39750	Low	LTE Band 41	20	23.5	22.01	0.01	0	05EE4	QPSK	50	0	0 mm	back	1:1.58	1.440	1.409	2.029	
1 CC Uplink	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.33	-0.01	0	05EE4	QPSK	50	0	0 mm	back	1:1.58	1.490	1.309	1.950	
1 CC Uplink	N/A	2593.00	40620	Mid	LTE Band 41	20	23.5	22.33	-0.04	0	05EE4	QPSK	50	0	0 mm	back	1:1.58	1.290	1.309	1.689	
1 CC Uplink	N/A	2636.50	41055	Mid-High	LTE Band 41	20	23.5	22.08	-0.02	0	05EE4	QPSK	50	0	0 mm	back	1:1.58	1.080	1.387	1.498	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.47	0.00	0	05EE4	QPSK	50	0	0 mm	back	1:1.58	1.030	1.268	1.306	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.33	-0.02	0	05EE4	QPSK	100	0	0 mm	back	1:1.58	0.989	1.309	1.295	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.54	-0.03	0	05EE4	QPSK	1	0	0 mm	front	1:1.58	0.797	1.247	0.994	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.47	0.00	0	05EE4	QPSK	50	0	0 mm	front	1:1.58	0.778	1.268	0.987	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.54	-0.12	0	05EE4	QPSK	1	0	0 mm	bottom	1:1.58	0.782	1.247	0.975	
1 CC Uplink	N/A	2680.00	41490	High	LTE Band 41	20	23.5	22.47	-0.17	0	05EE4	QPSK	50	0	0 mm	bottom	1:1.58	0.775	1.268	0.983	

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

Note: LTE B41 single carrier, Back side, low channel, 1RB, 99 RB offset, at 0mm was additionally evaluated to correlate with ULCA test data.

Table 11-36
WLAN Phablet SAR Data

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5280	56	802.11a	OFDM	20	16.5	15.78	-0.10	0 mm	1	1144C	6	back	98.8	12.984	1.410	1.180	1.012	**1.684**	
5280	56	802.11a	OFDM	20	16.5	15.78	-0.17	0 mm	1	1144C	6	front	98.8	5.471	0.637	1.180	1.012	0.761	
5280	56	802.11a	OFDM	20	16.5	15.78	0.00	0 mm	1	1144C	6	top	98.8	7.072	0.739	1.180	1.012	0.882	
5280	56	802.11a	OFDM	20	16.5	15.78	0.20	0 mm	1	1144C	6	left	98.8	0.652	-	1.180	1.012	-	
5260	52	802.11a	OFDM	20	16.5	16.13	0.01	0 mm	2	1144C	6	back	98.8	3.143	0.432	1.089	1.012	0.476	
5260	52	802.11a	OFDM	20	16.5	16.13	0.15	0 mm	2	1144C	6	front	98.8	1.862	0.119	1.089	1.012	0.131	
5260	52	802.11a	OFDM	20	16.5	16.13	0.18	0 mm	2	1144C	6	top	98.8	0.841	-	1.089	1.012	-	
5260	52	802.11a	OFDM	20	16.5	16.13	0.00	0 mm	2	1144C	6	left	98.8	0.308	-	1.089	1.012	-	
5620	124	802.11a	OFDM	20	16.5	16.12	0.02	0 mm	1	1144C	6	back	98.8	11.740	1.400	1.091	1.012	1.546	
5620	124	802.11a	OFDM	20	16.5	16.12	0.04	0 mm	1	1144C	6	front	98.8	5.437	0.787	1.091	1.012	0.869	
5620	124	802.11a	OFDM	20	16.5	16.12	0.00	0 mm	1	1144C	6	top	98.8	5.798	0.489	1.091	1.012	0.540	
5620	124	802.11a	OFDM	20	16.5	16.12	0.12	0 mm	1	1144C	6	left	98.8	0.402	-	1.091	1.012	-	
5720	144	802.11a	OFDM	20	16.5	16.34	0.02	0 mm	2	1144C	6	back	98.8	2.606	-	1.038	1.012	-	
5720	144	802.11a	OFDM	20	16.5	16.34	0.14	0 mm	2	1144C	6	front	98.8	1.325	0.095	1.038	1.012	0.100	
5720	144	802.11a	OFDM	20	16.5	16.34	0.14	0 mm	2	1144C	6	top	98.8	5.920	0.441	1.038	1.012	0.463	
5720	144	802.11a	OFDM	20	16.5	16.34	0.00	0 mm	2	1144C	6	left	98.8	0.186	-	1.038	1.012	-	

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

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Table 11-37
WLAN MIMO Phablet SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Ant 1 Conducted Power [dBm]	Ant 2 Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.														W/kg	(W/kg)			(W/kg)	
5320	64	802.11n	OFDM	20	16.5	15.78	16.13	-0.14	0 mm	MIMO	1144C	13	back	97.8	12.951	1.530	1.180	1.022	1.845	
5320	64	802.11n	OFDM	20	16.5	15.78	16.13	-0.12	0 mm	MIMO	1144C	13	front	97.8	4.989	0.643	1.180	1.022	0.775	
5320	64	802.11n	OFDM	20	16.5	15.78	16.13	-0.05	0 mm	MIMO	1144C	13	top	97.8	5.526	0.606	1.180	1.022	0.731	
5320	64	802.11n	OFDM	20	16.5	15.78	16.13	0.07	0 mm	MIMO	1144C	13	left	97.8	0.823	-	1.180	1.022	-	
5600	120	802.11n	OFDM	20	16.5	16.04	16.22	0.05	0 mm	MIMO	1144C	13	back	97.8	7.179	1.730	1.112	1.022	1.966	
5620	124	802.11n	OFDM	20	16.5	16.08	16.21	0.03	0 mm	MIMO	1144C	13	back	97.8	16.834	1.830	1.102	1.022	2.061	A48
5620	124	802.11n	OFDM	20	16.5	16.08	16.21	0.06	0 mm	MIMO	1144C	13	front	97.8	4.843	0.863	1.102	1.022	0.972	
5620	124	802.11n	OFDM	20	16.5	16.08	16.21	0.13	0 mm	MIMO	1144C	13	top	97.8	7.833	0.642	1.102	1.022	0.723	
5620	124	802.11n	OFDM	20	16.5	16.08	16.21	0.17	0 mm	MIMO	1144C	13	left	97.8	0.514	-	1.102	1.022	-	

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

To achieve the 19.5 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 16.5 dBm.

11.5 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB 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 for 1g and 2.0 W/kg for 10g. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 13 for variability analysis.
8. 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).
9. Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is > 160 mm and < 200 mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.
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.
11. Additional SAR tests for phablet SAR were evaluated per KDB 616217 Section 6 (See Section 6.9 for more information).
12. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required. Body-worn SAR for some modes was additionally evaluated with headphones to evaluate a static antenna tuning configuration. The antenna tuning and operating parameters are implemented using a fixed table look-up mechanism and remains

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unchanged for the same device operating configurations. The operational description contains more information about the static tuning mechanism.

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 then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

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.
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 or ≤ 2.0 W/kg for 10g then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.
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 or ≤ 2.0 W/kg for 10g then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

LTE Notes:

1. LTE 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.

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2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
4. Per FCC KDB Publication 447498 D01v06, when the reported (scaled) for LTE Band 41 SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for 1g or > 1.5 W/kg for 10g, 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 downlink only LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.
7. For LTE Band 41, per FCC guidance, SAR was first measured with only a single carrier active in the uplink (carrier aggregation not active). For each exposure condition, the uplink CA scenario with two component carriers was additionally tested for the configuration with the highest SAR when carrier aggregation was not active. The SCC was configured with the closest available contiguous channel. The two component carriers were configured so the resource blocks are physically allocated side by side to achieve the maximum output power.

WLAN Notes:

1. For held-to-ear 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, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 8.7.5 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg. See Section 8.7.6 for more information.
4. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D01v06 by either evaluating the sum of the 1g SAR values of each antenna transmitting independently or making a SAR measurement with both antennas transmitting simultaneously. Please see Section 12 for complete analysis.
5. When the maximum reported 1g averaged SAR is ≤0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg or all test channels were measured.
6. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.
7. 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.

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Bluetooth Notes:

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

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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 1-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤1.6 W/kg. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1-g or 10-g SAR.

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12.3 Head SAR Simultaneous Transmission Analysis

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Head SAR	GSM 850	0.115	0.480	0.858	0.595	0.973
	GSM 1900	0.044	0.480	0.858	0.524	0.902
	UMTS 850	0.126	0.480	0.858	0.606	0.984
	UMTS 1900	0.105	0.480	0.858	0.585	0.963
	Cell. CDMA/EVDO	0.315	0.480	0.858	0.795	**1.173**
	LTE Band 12	0.099	0.480	0.858	0.579	0.957
	LTE Band 13	0.078	0.480	0.858	0.558	0.936
	LTE Band 26 (Cell)	0.189	0.480	0.858	0.669	1.047
	LTE Band 4 (AWS)	0.159	0.480	0.858	0.639	1.017
	LTE Band 25 (PCS)	0.100	0.480	0.858	0.580	0.958
	LTE Band 41	0.086	0.480	0.858	0.566	0.944

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.115	0.687	0.802
	GSM 1900	0.044	0.687	0.731
	UMTS 850	0.126	0.687	0.813
	UMTS 1900	0.105	0.687	0.792
	Cell. CDMA/EVDO	0.315	0.687	**1.002**
	LTE Band 12	0.099	0.687	0.786
	LTE Band 13	0.078	0.687	0.765
	LTE Band 26 (Cell)	0.189	0.687	0.876
	LTE Band 4 (AWS)	0.159	0.687	0.846
	LTE Band 25 (PCS)	0.100	0.687	0.787
	LTE Band 41	0.086	0.687	0.773

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM 850	0.115	0.646	0.168	0.761	0.283	0.929
	GSM 1900	0.044	0.646	0.168	0.690	0.212	0.858
	UMTS 850	0.126	0.646	0.168	0.772	0.294	0.940
	UMTS 1900	0.105	0.646	0.168	0.751	0.273	0.919
	Cell. CDMA/EVDO	0.315	0.646	0.168	0.961	0.483	**1.129**
	LTE Band 12	0.099	0.646	0.168	0.745	0.267	0.913
	LTE Band 13	0.078	0.646	0.168	0.724	0.246	0.892
	LTE Band 26 (Cell)	0.189	0.646	0.168	0.835	0.357	1.003
	LTE Band 4 (AWS)	0.159	0.646	0.168	0.805	0.327	0.973
	LTE Band 25 (PCS)	0.100	0.646	0.168	0.746	0.268	0.914
	LTE Band 41	0.086	0.646	0.168	0.732	0.254	0.900

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN MIMO SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	GSM 850	0.115	0.687	0.561	1.363
	GSM 1900	0.044	0.687	0.561	1.292
	UMTS 850	0.126	0.687	0.561	1.374
	UMTS 1900	0.105	0.687	0.561	1.353
	Cell. CDMA/EVDO	0.315	0.687	0.561	**1.563**
	LTE Band 12	0.099	0.687	0.561	1.347
	LTE Band 13	0.078	0.687	0.561	1.326
	LTE Band 26 (Cell)	0.189	0.687	0.561	1.437
	LTE Band 4 (AWS)	0.159	0.687	0.561	1.407
	LTE Band 25 (PCS)	0.100	0.687	0.561	1.348
	LTE Band 41	0.086	0.687	0.561	1.334

Note: 2.4 GHz WLAN MIMO SAR value, with target 13 dBm, is used for this sum as the results are more conservative.

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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	GSM 850	0.115	0.932	1.047
	GSM 1900	0.044	0.932	0.976
	UMTS 850	0.126	0.932	1.058
	UMTS 1900	0.105	0.932	1.037
	Cell. CDMA/EVDO	0.315	0.932	**1.247**
	LTE Band 12	0.099	0.932	1.031
	LTE Band 13	0.078	0.932	1.010
	LTE Band 26 (Cell)	0.189	0.932	1.121
	LTE Band 4 (AWS)	0.159	0.932	1.091
	LTE Band 25 (PCS)	0.100	0.932	1.032
	LTE Band 41	0.086	0.932	1.018

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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 Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn	GSM 850	0.326	0.136	0.128	0.462	0.454	0.590
	GSM 1900	0.232	0.136	0.128	0.368	0.360	0.496
	UMTS 850	0.315	0.136	0.128	0.451	0.443	0.579
	UMTS 1900	0.451	0.136	0.128	0.587	0.579	0.715
	Cell. CDMA	0.580	0.136	0.128	0.716	0.708	0.844
	LTE Band 12	0.189	0.136	0.128	0.325	0.317	0.453
	LTE Band 13	0.243	0.136	0.128	0.379	0.371	0.507
	LTE Band 26 (Cell)	0.477	0.136	0.128	0.613	0.605	0.741
	LTE Band 4 (AWS)	0.724	0.136	0.128	0.860	0.852	**0.988**
	LTE Band 25 (PCS)	0.608	0.136	0.128	0.744	0.736	0.872
	LTE Band 41	0.192	0.136	0.128	0.328	0.320	0.456

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 Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn	GSM 850	0.326	0.240	0.065	0.566	0.391	0.631
	GSM 1900	0.232	0.240	0.065	0.472	0.297	0.537
	UMTS 850	0.315	0.240	0.065	0.555	0.380	0.620
	UMTS 1900	0.451	0.240	0.065	0.691	0.516	0.756
	Cell. CDMA	0.580	0.240	0.065	0.820	0.645	0.885
	LTE Band 12	0.189	0.240	0.065	0.429	0.254	0.494
	LTE Band 13	0.243	0.240	0.065	0.483	0.308	0.548
	LTE Band 26 (Cell)	0.477	0.240	0.065	0.717	0.542	0.782
	LTE Band 4 (AWS)	0.724	0.240	0.065	0.964	0.789	**1.029**
	LTE Band 25 (PCS)	0.608	0.240	0.065	0.848	0.673	0.913
	LTE Band 41	0.192	0.240	0.065	0.432	0.257	0.497

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Table 12-7
Simultaneous Transmission Scenario with 2.4 GHz MIMO and 5 GHz MIMO WLAN (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	5	1+2+3+4+5
Body-Worn	GSM 850	0.326	0.136	0.128	0.240	0.065	0.895
	GSM 1900	0.232	0.136	0.128	0.240	0.065	0.801
	UMTS 850	0.315	0.136	0.128	0.240	0.065	0.884
	UMTS 1900	0.451	0.136	0.128	0.240	0.065	1.020
	Cell. CDMA	0.580	0.136	0.128	0.240	0.065	1.149
	LTE Band 12	0.189	0.136	0.128	0.240	0.065	0.758
	LTE Band 13	0.243	0.136	0.128	0.240	0.065	0.812
	LTE Band 26 (Cell)	0.477	0.136	0.128	0.240	0.065	1.046
	LTE Band 4 (AWS)	0.724	0.136	0.128	0.240	0.065	**1.293**
	LTE Band 25 (PCS)	0.608	0.136	0.128	0.240	0.065	1.177
	LTE Band 41	0.192	0.136	0.128	0.240	0.065	0.761

Table 12-8
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.5 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body-Worn	GSM 850	0.326	0.044	0.370
	GSM 1900	0.232	0.044	0.276
	UMTS 850	0.315	0.044	0.359
	UMTS 1900	0.451	0.044	0.495
	Cell. CDMA	0.580	0.044	0.624
	LTE Band 12	0.189	0.044	0.233
	LTE Band 13	0.243	0.044	0.287
	LTE Band 26 (Cell)	0.477	0.044	0.521
	LTE Band 4 (AWS)	0.724	0.044	**0.768**
	LTE Band 25 (PCS)	0.608	0.044	0.652
	LTE Band 41	0.192	0.044	0.236

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12.5 Hotspot SAR Simultaneous Transmission Analysis

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

Per FCC KDB Publication 648474 D04 Handset SAR v01r01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR ("-").

Table 12-9
Simultaneous Transmission Scenario (2.4 GHz Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	0.766	0.392	0.292	1.158	1.058	1.450
	GPRS 1900	0.676	0.392	0.292	1.068	0.968	1.360
	UMTS 850	0.485	0.392	0.292	0.877	0.777	1.169
	UMTS 1900	0.770	0.392	0.292	1.162	1.062	1.454
	Cell. EVDO	0.780	0.392	0.292	1.172	1.072	1.464
	LTE Band 12	0.288	0.392	0.292	0.680	0.580	0.972
	LTE Band 13	0.528	0.392	0.292	0.920	0.820	1.212
	LTE Band 26 (Cell)	0.867	0.392	0.292	1.259	1.159	**1.551**
	LTE Band 4 (AWS)	0.863	0.392	0.292	1.255	1.155	1.547
	LTE Band 25 (PCS)	1.077	0.392	0.292	1.469	1.369	See Table Below
	LTE Band 41	0.175	0.392	0.292	0.567	0.467	0.859

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.521	0.392*	0.292	**1.205**
	Front	0.477	0.392*	0.292*	1.161
	Top	-	0.392	0.292*	0.684
	Bottom	1.077	-	-	1.077
	Right	0.063	-	-	0.063
	Left	0.164	0.392*	0.292*	0.848

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Table 12-10
Simultaneous Transmission Scenario with 5 GHz WLAN (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	0.766	0.347	0.104	1.113	0.870	1.217
	GPRS 1900	0.676	0.347	0.104	1.023	0.780	1.127
	UMTS 850	0.485	0.347	0.104	0.832	0.589	0.936
	UMTS 1900	0.770	0.347	0.104	1.117	0.874	1.221
	Cell. EVDO	0.780	0.347	0.104	1.127	0.884	1.231
	LTE Band 12	0.288	0.347	0.104	0.635	0.392	0.739
	LTE Band 13	0.528	0.347	0.104	0.875	0.632	0.979
	LTE Band 26 (Cell)	0.867	0.347	0.104	1.214	0.971	1.318
	LTE Band 4 (AWS)	0.863	0.347	0.104	1.210	0.967	1.314
	LTE Band 25 (PCS)	1.077	0.347	0.104	1.424	1.181	**1.528**
	LTE Band 41	0.175	0.347	0.104	0.522	0.279	0.626

Table 12-11
Simultaneous Transmission Scenario with 2.4 GHz MIMO and 5 GHz MIMO WLAN (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN MIMO SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	GPRS 850	0.766	0.211	0.203	1.180
	GPRS 1900	0.676	0.211	0.203	1.090
	UMTS 850	0.485	0.211	0.203	0.899
	UMTS 1900	0.770	0.211	0.203	1.184
	Cell. EVDO	0.780	0.211	0.203	1.194
	LTE Band 12	0.288	0.211	0.203	0.702
	LTE Band 13	0.528	0.211	0.203	0.942
	LTE Band 26 (Cell)	0.867	0.211	0.203	1.281
	LTE Band 4 (AWS)	0.863	0.211	0.203	1.277
	LTE Band 25 (PCS)	1.077	0.211	0.203	**1.491**
	LTE Band 41	0.175	0.211	0.203	0.589

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

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.766	0.109	0.875
	GPRS 1900	0.676	0.109	0.785
	UMTS 850	0.485	0.109	0.594
	UMTS 1900	0.770	0.109	0.879
	Cell. EVDO	0.780	0.109	0.889
	LTE Band 12	0.288	0.109	0.397
	LTE Band 13	0.528	0.109	0.637
	LTE Band 26 (Cell)	0.867	0.109	0.976
	LTE Band 4 (AWS)	0.863	0.109	0.972
	LTE Band 25 (PCS)	1.077	0.109	**1.186**
	LTE Band 41	0.175	0.109	0.284

12.6 Phablet SAR Simultaneous Transmission Analysis

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

Table 12-13
Simultaneous Transmission Scenario – 5 GHz WLAN MIMO (Phablet)

Exposure Condition	Mode	3G/4G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Phablet SAR	UMTS 1900	2.948	1.684	0.476	See Table Below	3.424	See Table Below
	Cell. CDMA	2.520	1.684	0.476	See Table Below	2.996	See Table Below
	LTE Band 4 (AWS)	2.060	1.684	0.476	**3.744**	2.536	See Table Below
	LTE Band 25 (PCS)	3.055	1.684	0.476	See Table Below	3.531	See Table Below
	LTE Band 41	2.185	1.684	0.476	See Table Below	2.661	See Table Below

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Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Phablet SAR	Back	-	1.684	0.476	1.684	2.160
	Front	-	0.869	0.131	0.869	1.000
	Top	-	0.882	0.463	0.882	1.345
	Bottom	2.948	-	-	**2.948**	**2.948**
	Right	-	-	-	-	-
	Left	-	1.684*	0.476*	1.684	2.160

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Phablet SAR	Back	2.520	1.684	See Note 1	0.06
	Front	-	0.869	0.869	N/A
	Top	-	0.882	0.882	N/A
	Bottom	-	-	0.000	N/A
	Right	-	-	0.000	N/A
	Left	-	1.684*	1.684	N/A

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Phablet SAR	Back	2.520	2.061	See Note 1	0.07
	Front	-	0.972	0.972	N/A
	Top	-	0.731	0.731	N/A
	Bottom	-	-	0.000	N/A
	Right	-	-	0.000	N/A
	Left	-	2.061*	2.061	N/A

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Phablet SAR	Back	1.844	2.061	**3.905**
	Front	1.535	0.972	2.507
	Top	-	0.731	0.731
	Bottom	2.060	-	2.060
	Right	0.335	-	0.335
	Left	0.865	2.061*	2.926

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Phablet SAR	Back	2.671	1.684	See Note 1	0.06
	Front	2.428	0.869	3.297	N/A
	Top	-	0.882	0.882	N/A
	Bottom	3.055	-	3.055	N/A
	Right	0.225	-	0.225	N/A
	Left	0.965	1.684*	2.649	N/A

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Phablet SAR	Back	2.671	2.061	See Note 1	0.07
	Front	2.428	0.972	3.400	N/A
	Top	-	0.731	0.731	N/A
	Bottom	3.055	-	3.055	N/A
	Right	0.225	-	0.225	N/A
	Left	0.965	2.061*	3.026	N/A

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Phablet SAR	Back	2.185	1.684	**3.869**
	Front	0.994	0.869	1.863
	Top	-	0.882	0.882
	Bottom	0.983	-	0.983
	Right	-	-	0.000
	Left	0.995	1.684*	2.679

Simult Tx	Configuration	LTE Band 41 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Phablet SAR	Back	2.185	2.061	See Note 1	0.06
	Front	0.994	0.972	1.966	N/A
	Top	-	0.731	0.731	N/A
	Bottom	0.983	-	0.983	N/A
	Right	-	-	0.000	N/A
	Left	0.995	2.061*	3.056	N/A

Notes:

1. No evaluation was performed to determine the aggregate 10g SAR for these configurations as the SPLS ratio between the antenna pairs was not greater than 0.10 per FCC KDB 447498 D01v06. See Section 12.7 for detailed SPLS ratio analysis.
2. For SAR summation, the highest reported SAR across all test distances was used as the most conservative evaluation for simultaneous transmission analysis for each device edge.

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12.7 SPLSR Evaluation and Analysis

Per FCC KDB Publication 447498 D01v06, when the sum of the standalone transmitters is more than 4 W/kg for 10g, the SAR sum to peak locations can be analyzed to determine SAR distribution overlaps. When the SAR peak to location ratio (shown below) for each pair of antennas is ≤0.10 for 10g, simultaneous SAR evaluation is not required. The distance between the transmitters was calculated using the following formula.

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

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

12.7.1 Back Side SPLSR Evaluation and Analysis

Table 12-14
Peak SAR Locations for Phablet Back Side

Mode/Band	x (mm)	y (mm)	Reported SAR (W/kg)
5 GHz WLAN Ant 1	-5.00	69.00	1.684
5 GHz WLAN MIMO	-2.60	67.40	2.061
Cell. CDMA	-9.00	-83.00	2.52
LTE Band 25 (PCS)	-2.00	-75.00	2.671
LTE Band 41	5.70	-80.60	2.185

Table 12-15
Back Side SAR to Peak Location Separation Ratio Calculations

Antenna Pair		Standalone 10g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio	Plot Number
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$	
5 GHz WLAN Ant 1	Cell. CDMA	1.684	2.52	4.204	152.05	0.06	1
5 GHz WLAN MIMO	Cell. CDMA	2.061	2.52	4.581	150.54	0.07	2
5 GHz WLAN Ant 1	LTE Band 25 (PCS)	1.684	2.671	4.355	144.03	0.06	3
5 GHz WLAN MIMO	LTE Band 25 (PCS)	2.061	2.671	4.732	142.40	0.07	4
5 GHz WLAN MIMO	LTE Band 41	2.061	2.185	4.246	148.23	0.06	5

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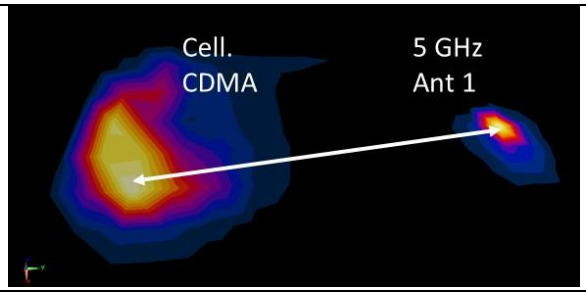
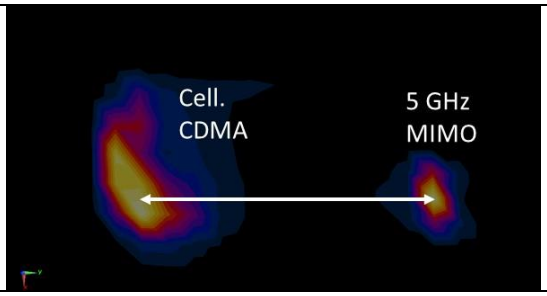
Table 12-16
Back Side SAR to Peak Location Separation Ratio Plots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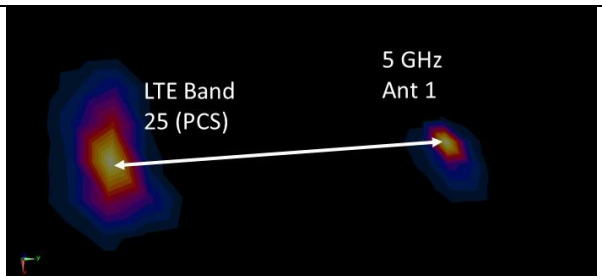
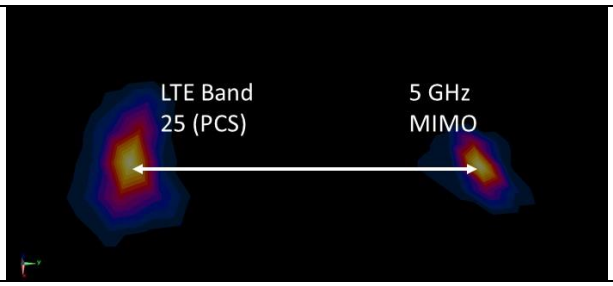
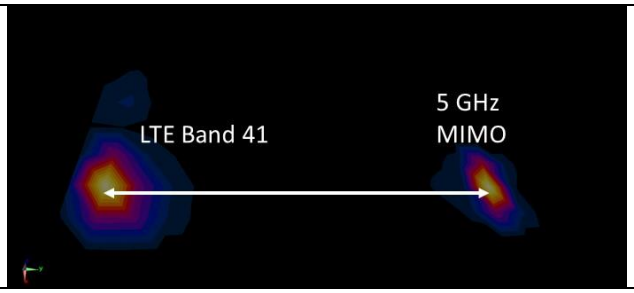
	
3	4
	
5	

12.8 Simultaneous Transmission Conclusion

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

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

Table 13-1
Head SAR Measurement Variability Results

HEAD VARIABILITY RESULTS															
Band	FREQUENCY		Mode/Band	Service	Side	Test Position	Data Rate (Mbps)	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
2450	2462.00	11	802.11b, 22 MHz Bandwidth	DSSS , ANT 2	Right	Cheek	1	0.820	0.825	1.01	N/A	N/A	N/A	N/A
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 13-2
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)	Ratio
	MHz	Ch.					(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1900	1905.00	26590	LTE Band 25 (PCS), 20 MHz Bandwidth	QPSK, 1 RB, 0 RB Offset	bottom	10 mm	0.832	0.793	1.05	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population					Body 1.6 W/kg (mW/g) averaged over 1 gram								

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Table 13-3
Phablet SAR Measurement Variability Results

PHABLET VARIABILITY RESULTS													
Band	FREQUENCY		Mode	Service	Side	Spacing	Measured SAR (10g)	1st Repeated SAR (10g)	Ratio	2nd Repeated SAR (10g)	Ratio	3rd Repeated SAR (10g)	Ratio
	MHz	Ch.					(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1900	1852.40	9262	UMTS 1900	RMC	bottom	0 mm	2.670	2.670	1.00	N/A	N/A	N/A	N/A
835	824.70	1013	Cell. CDMA	EVDO Rev. 0	back	0 mm	2.220	2.140	1.04	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Phablet 4.0 W/kg (mW/g) averaged over 10 grams						

13.2 Measurement Uncertainty

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

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14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Agilent	8753ES	S-Parameter Vector Network Analyzer	8/19/2016	Annual	8/19/2017	MY40003841
Agilent	E4432B	ESG-D Series Signal Generator	3/24/2017	Annual	3/24/2018	US40053896
Agilent	E4438C	ESG Vector Signal Generator	3/23/2017	Annual	3/23/2018	MY47270002
Agilent	E5515C	8960 Series 10 Wireless Communications Test Set	10/5/2016	Annual	10/5/2017	GB42230325
Agilent	E5515C	Wireless Communications Test Set	10/23/2015	Biennial	10/23/2017	GB43193563
Agilent	E8257D	(250kHz-20GHz) Signal Generator	3/22/2017	Annual	3/22/2018	MY45470194
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Agilent	N5182A	MXG Vector Signal Generator	10/27/2016	Annual	10/27/2017	MY47420603
Agilent	N9020A	MXA Signal Analyzer	10/28/2016	Annual	10/28/2017	US46470561
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Anritsu	MA24106A	USB Power Sensor	10/27/2016	Annual	10/27/2017	1344545
Anritsu	MA24106A	USB Power Sensor	10/27/2016	Annual	10/27/2017	1344559
Anritsu	MA2411B	Pulse Power Sensor	8/18/2016	Annual	8/18/2017	1126066
Anritsu	MA2411B	Pulse Power Sensor	8/18/2016	Annual	8/18/2017	1207470
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Anritsu	MT8820C	Radio Communication Analyzer	9/13/2016	Annual	9/13/2017	6201144419
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
Control Company	4352	Ultra Long Stem Thermometer	5/2/2017	Biennial	5/2/2019	170330156
Control Company	4040	Therm./ Clock/ Humidity Monitor	3/1/2017	Biennial	3/1/2019	170152021
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	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	3/2/2016	Biennial	3/2/2018	13264162
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
Pasternack	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	12/12/2016	Annual	12/12/2017	833855/0010
Rohde & Schwarz	CMW500	Radio Communication Tester	10/20/2016	Annual	10/20/2017	100976
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/2/2016	Biennial	3/2/2018	N/A
Seekonk	NC-100	Torque Wrench (8" lb)	8/30/2016	Biennial	8/30/2018	N/A
SPEAG	DAK-3.5	Dielectric Assessment Kit	9/13/2016	Annual	9/13/2017	1091
SPEAG	D750V3	750 MHz SAR Dipole	5/11/2017	Annual	5/11/2018	1034
SPEAG	D835V2	850 MHz SAR Dipole	5/11/2017	Annual	5/11/2018	4d180
SPEAG	D1750V2	1750 MHz SAR Dipole	5/9/2017	Annual	5/9/2018	1148
SPEAG	D1900V2	1900 MHz SAR Dipole	7/8/2016	Annual	7/8/2017	5d080
SPEAG	D2450V2	2450 MHz SAR Dipole	7/25/2016	Annual	7/25/2017	981
SPEAG	D2450V2	2450 MHz SAR Dipole	9/13/2016	Annual	9/13/2017	797
SPEAG	D2600V2	2600 MHz SAR Dipole	7/25/2016	Annual	7/25/2017	1126
SPEAG	D5GHzV2	5 GHz SAR Dipole	8/2/2016	Annual	8/2/2017	1237
SPEAG	D750V3	750 MHz SAR Dipole	7/13/2016	Annual	7/13/2017	1161
SPEAG	D835V2	835 MHz SAR Dipole	7/14/2016	Annual	7/14/2017	4d133
SPEAG	D1750V2	1750 MHz SAR Dipole	5/9/2017	Annual	5/9/2018	1092
SPEAG	D2600V2	2600 MHz SAR Dipole	9/13/2016	Annual	9/13/2017	1071
SPEAG	D5GHzV2	5 GHz SAR Dipole	3/9/2017	Annual	3/9/2018	1123
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3209
SPEAG	ES3DV3	SAR Probe	2/10/2017	Annual	2/10/2018	3213
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3319
SPEAG	EX3DV4	SAR Probe	2/13/2017	Annual	2/13/2018	3914
SPEAG	EX3DV4	SAR Probe	4/18/2017	Annual	4/18/2018	7406
SPEAG	ES3DV3	SAR Probe	9/19/2016	Annual	9/19/2017	3287
SPEAG	EX3DV4	SAR Probe	1/13/2017	Annual	1/13/2018	3589
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/13/2017	Annual	3/13/2018	1415
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2017	Annual	2/9/2018	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2017	Annual	3/8/2018	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2017	Annual	2/9/2018	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/11/2017	Annual	4/11/2018	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/14/2016	Annual	9/14/2017	1408
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/16/2017	Annual	1/16/2018	1466

Note:

1. 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.
2. All equipment was used solely within its calibration period.

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15 MEASUREMENT UNCERTAINTIES

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

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16 CONCLUSION

16.1 Measurement Conclusion

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

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

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APPENDIX A: SAR TEST DATA

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PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMN9500; Type: Portable Handset; Serial: 05EB8

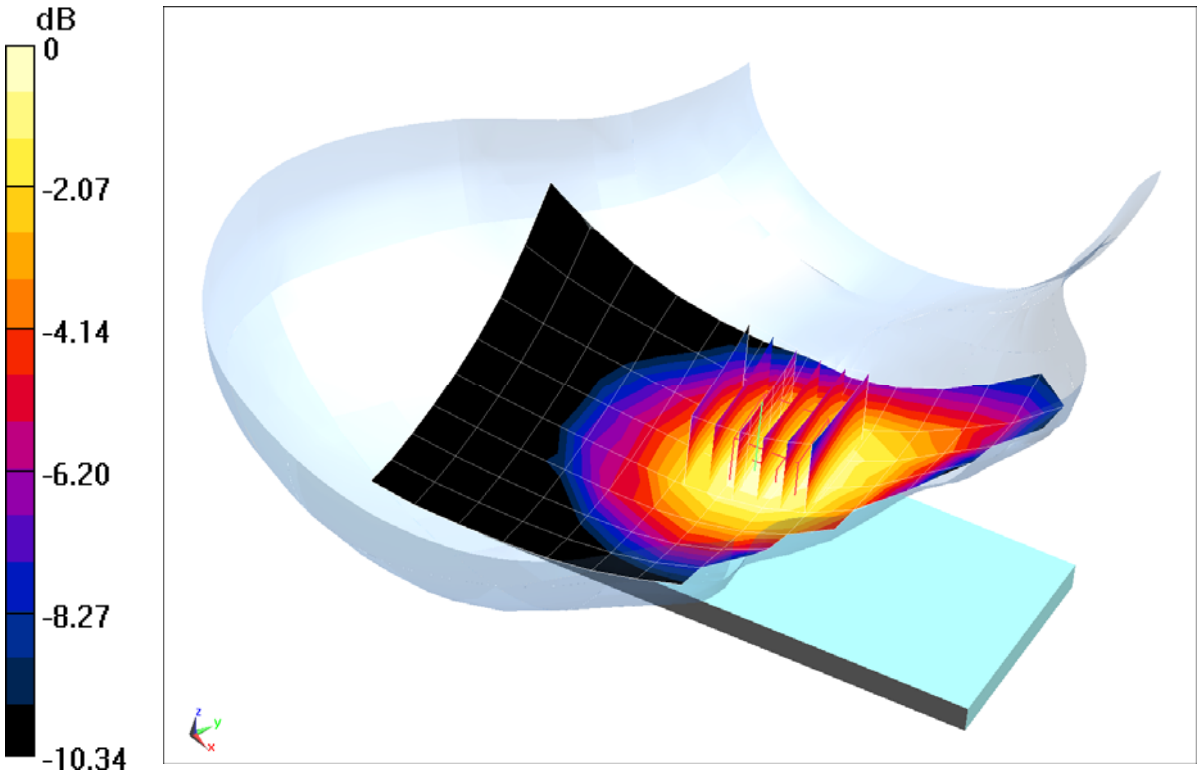
Communication System: UID 0, GSM; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.905 S/m; ε_r = 40.439; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-25-2017; Ambient Temp: 22.8°C; Tissue Temp: 20.3°C

Probe: ES3DV3 - SN3213; ConvF(6.49, 6.49, 6.49); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
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 (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.49 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.144 W/kg
SAR(1 g) = 0.111 W/kg



0 dB = 0.123 W/kg = -9.10 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMN9500; Type: Portable Handset; Serial: 05D28

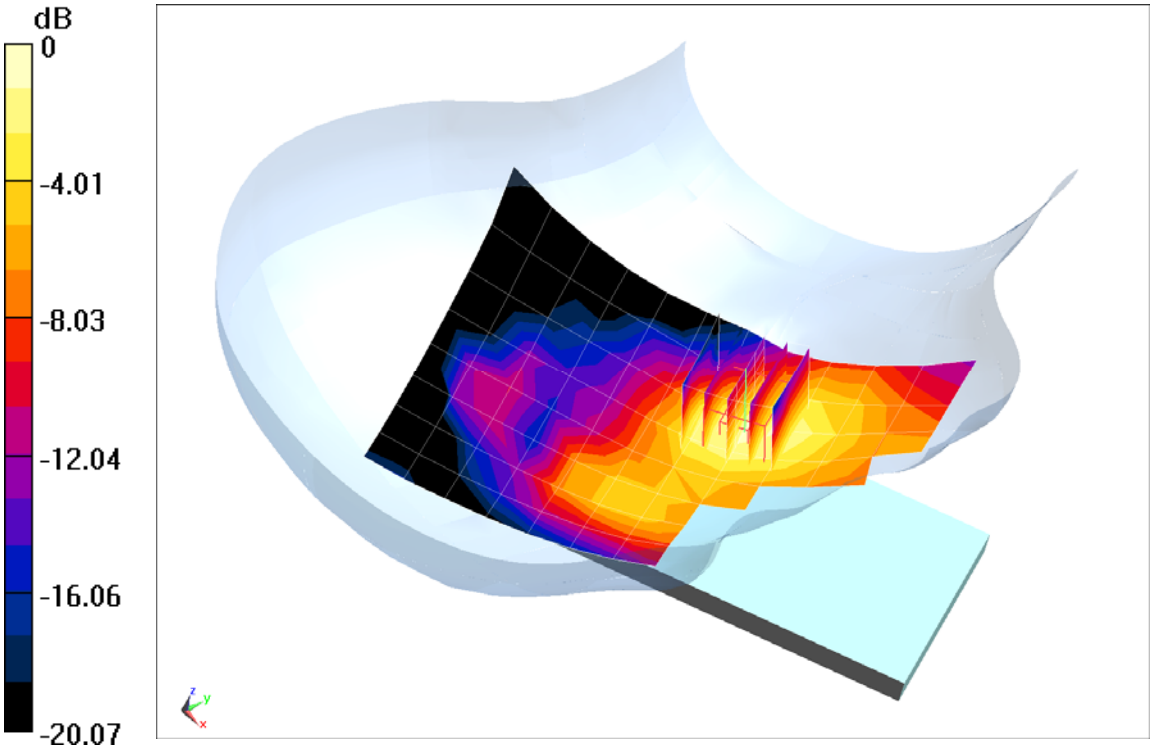
Communication System: UID 0, GSM; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.429 S/m; ε_r = 39.643; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-28-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3209; ConvF(5.31, 5.31, 5.31); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: GSM 1900, 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 = 5.611 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.0630 W/kg
SAR(1 g) = 0.039 W/kg



0 dB = 0.0472 W/kg = -13.26 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMN9500; Type: Portable Handset; Serial: 05EB8

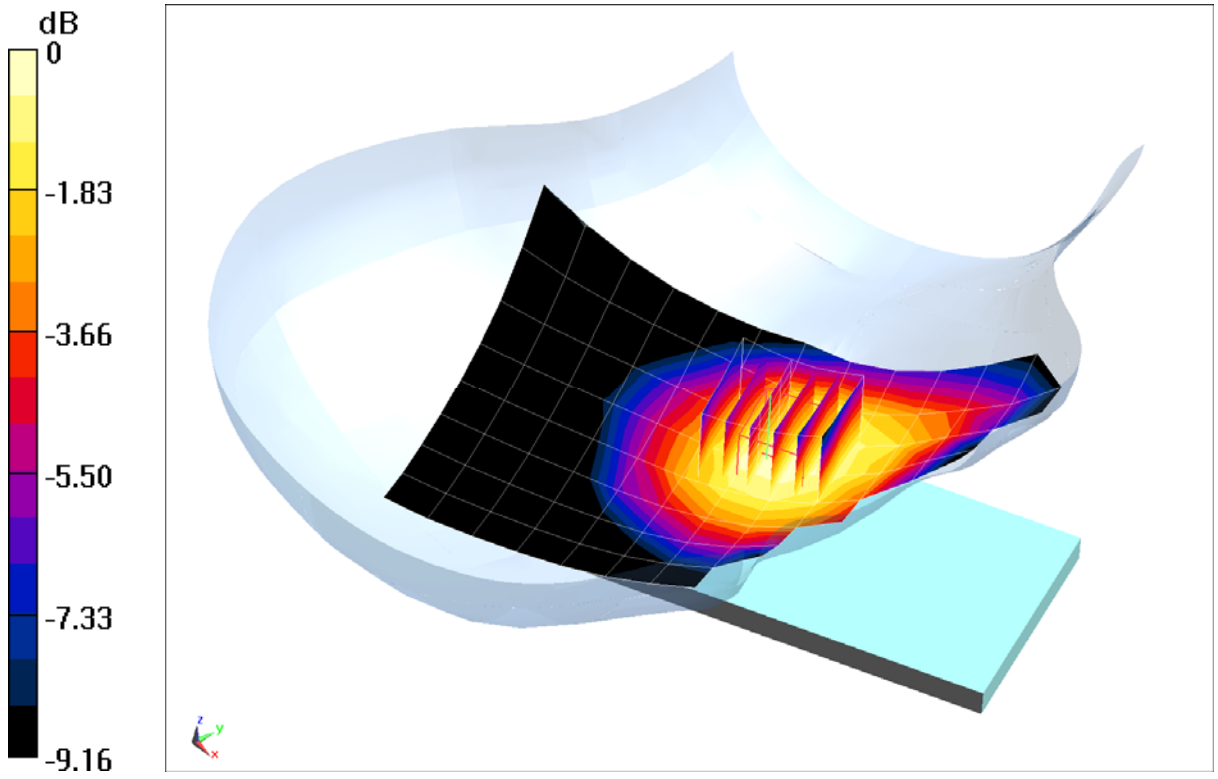
Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.905 S/m; ε_r = 40.439; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-25-2017; Ambient Temp: 22.8°C; Tissue Temp: 20.3°C

Probe: ES3DV3 - SN3213; ConvF(6.49, 6.49, 6.49); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
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=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.96 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.152 W/kg
SAR(1 g) = 0.120 W/kg



0 dB = 0.133 W/kg = -8.76 dBW/kg

DUT: A3LSMN9500; Type: Portable Handset; Serial: 05B38

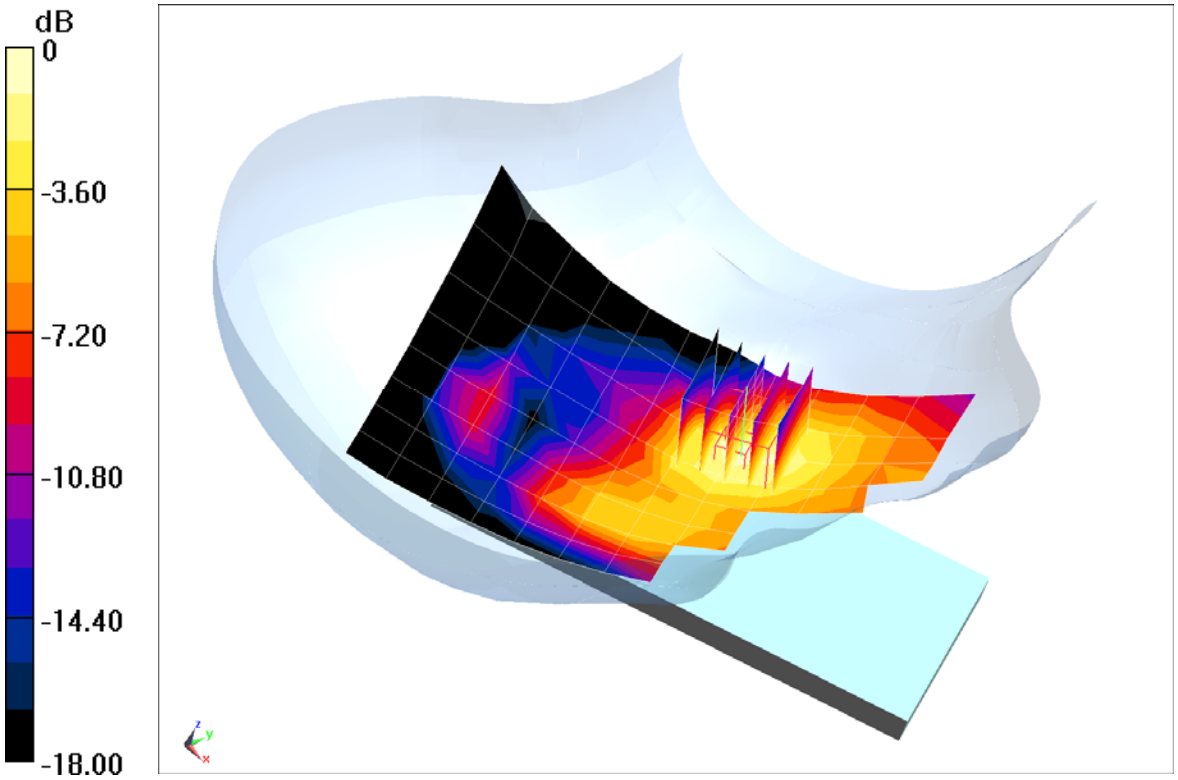
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1880 MHz; σ = 1.429 S/m; ε_r = 39.643; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-28-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3209; ConvF(5.31, 5.31, 5.31); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 1900, 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 = 8.594 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.155 W/kg
SAR(1 g) = 0.094 W/kg



0 dB = 0.112 W/kg = -9.51 dBW/kg

DUT: A3LSMN9500; Type: Portable Handset; Serial: 1145D

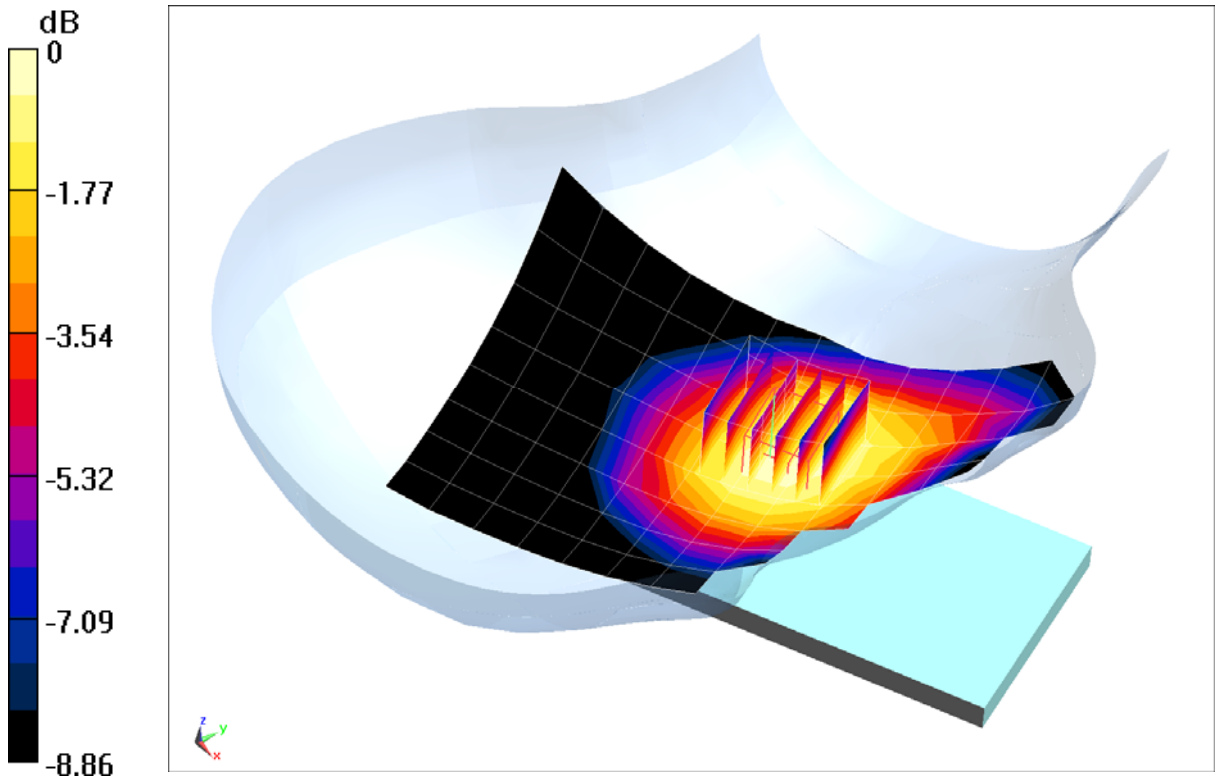
Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 836.52 MHz; σ = 0.898 S/m; ε_r = 39.877; ρ = 1000 kg/m^3
Phantom section: Right Section;

Test Date: 07-06-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3213; ConvF(6.49, 6.49, 6.49); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: Cell. CDMA, Right Head, Cheek, 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 = 17.37 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.314 W/kg
SAR(1 g) = 0.253 W/kg



0 dB = 0.277 W/kg = -5.58 dBW/kg

DUT: A3LSMN9500; Type: Portable Handset; Serial: 05D28

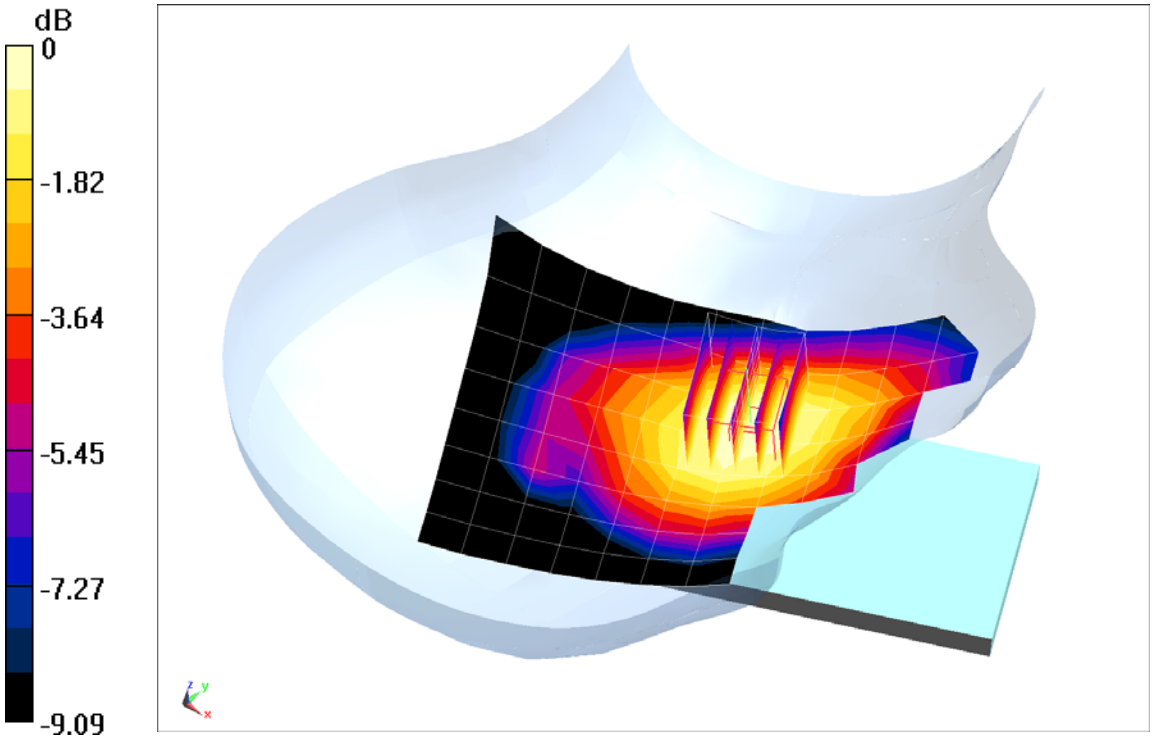
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.868 S/m; ε_r = 42.833; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-21-2017; Ambient Temp: 24.9°C; Tissue Temp: 23.7°C

Probe: ES3DV3 - SN3209; ConvF(6.76, 6.76, 6.76); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 12, Right Head, Cheek, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 25 RB Offset

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.90 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.111 W/kg
SAR(1 g) = 0.089 W/kg



0 dB = 0.0964 W/kg = -10.16 dBW/kg

DUT: A3LSMN9500; Type: Portable Handset; Serial: 05D28

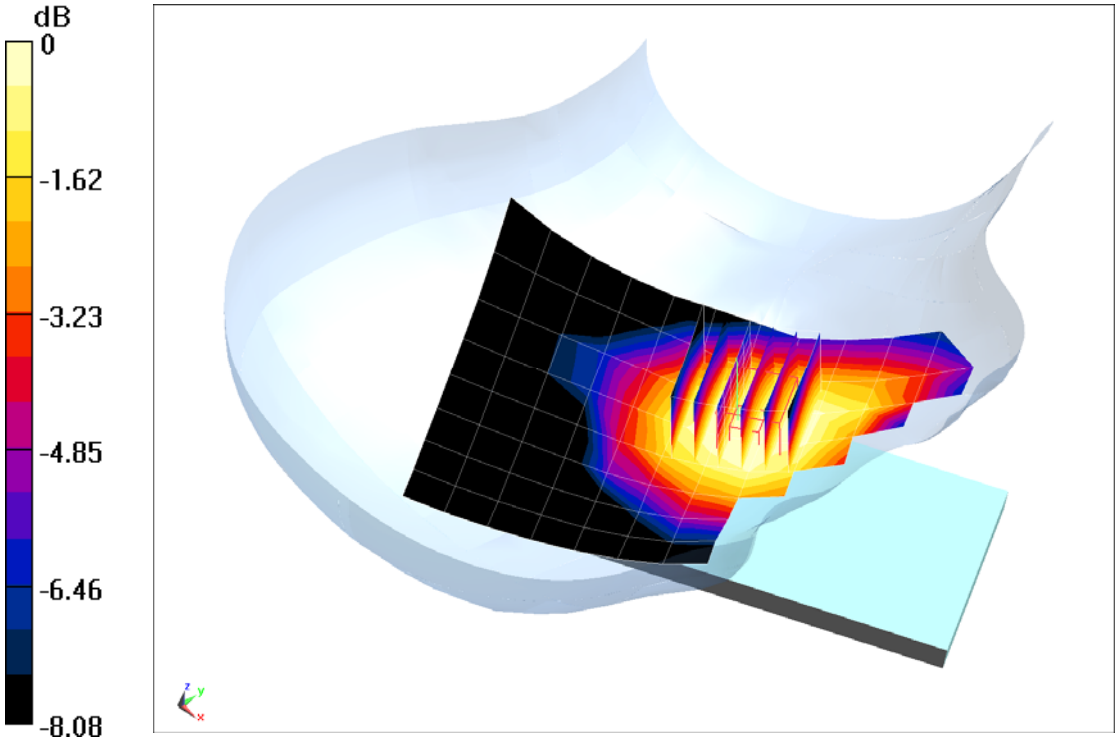
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 782 MHz; σ = 0.933 S/m; ε_r = 41.890; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-21-2017; Ambient Temp: 24.9°C; Tissue Temp: 23.7°C

Probe: ES3DV3 - SN3209; ConvF(6.76, 6.76, 6.76); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 13, Right Head, Cheek, Mid.ch,
10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.516 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.0740 W/kg
SAR(1 g) = 0.059 W/kg



0 dB = 0.0637 W/kg = -11.96 dBW/kg

DUT: A3LSMN9500; Type: Portable Handset; Serial: 05D28

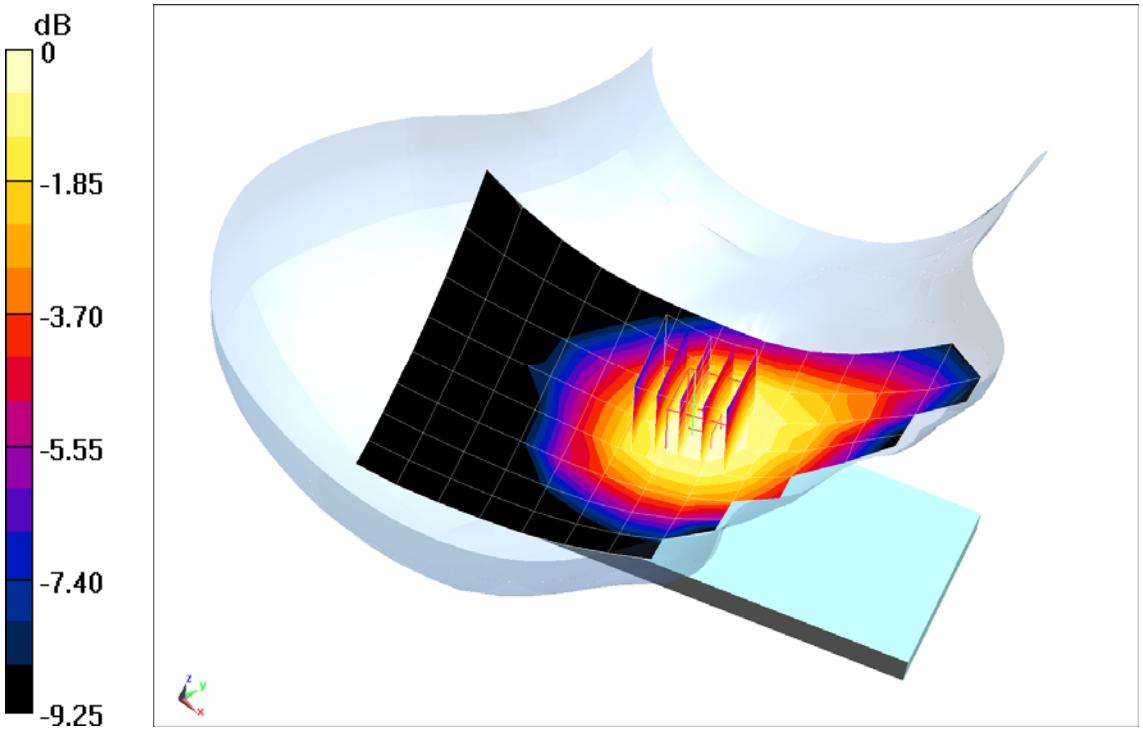
Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used (interpolated):
f = 831.5 MHz; σ = 0.899 S/m; ε_r = 40.502; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-25-2017; Ambient Temp: 22.8°C; Tissue Temp: 20.3°C

Probe: ES3DV3 - SN3213; ConvF(6.49, 6.49, 6.49); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
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, 0 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 = 13.57 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.176 W/kg
SAR(1 g) = 0.145 W/kg



0 dB = 0.156 W/kg = -8.07 dBW/kg

DUT: A3LSMN9500; Type: Portable Handset; Serial: 15C0D

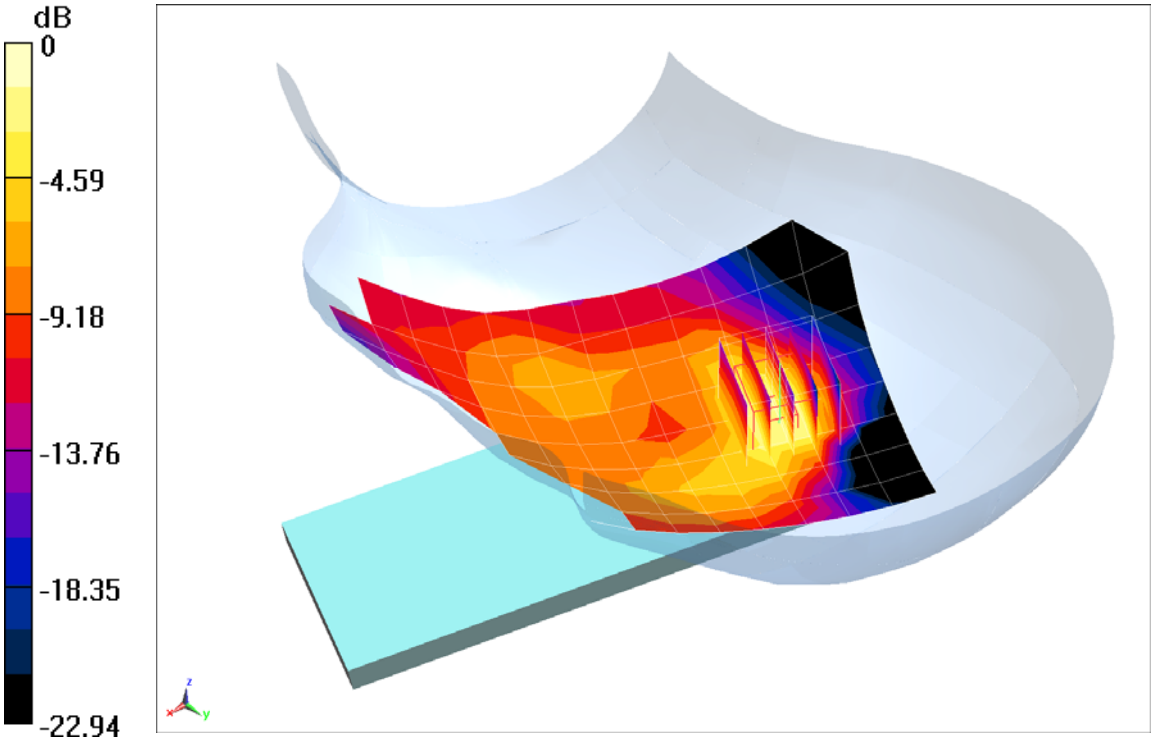
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used (interpolated):
f = 1732.5 MHz; σ = 1.385 S/m; ε_r = 38.463; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-26-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.1°C

Probe: ES3DV3 - SN3319; ConvF(5.38, 5.38, 5.38); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 3/8/2017
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 4 (AWS), Left Head, Tilt, Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 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 = 10.64 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.200 W/kg
SAR(1 g) = 0.116 W/kg



0 dB = 0.147 W/kg = -8.33 dBW/kg

DUT: A3LSMN9500; Type: Portable Handset; Serial: 05B38

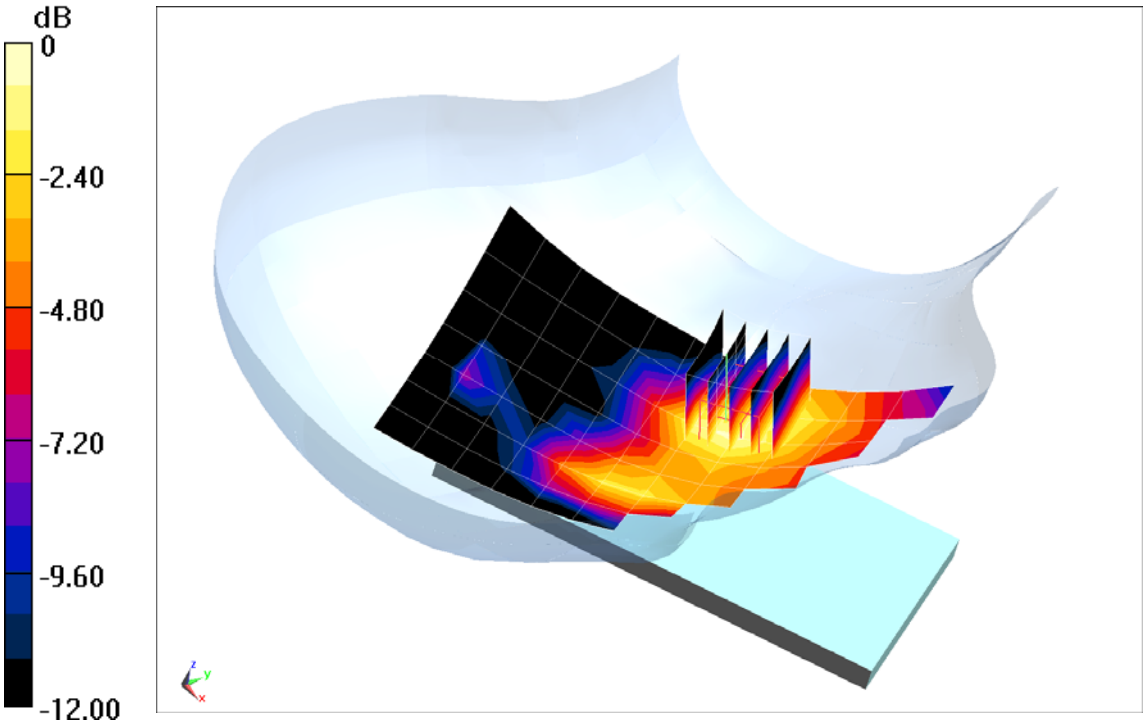
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1882.5 MHz; σ = 1.431 S/m; ε_r = 39.634; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-28-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.5°C

Probe: ES3DV3 - SN3209; ConvF(5.31, 5.31, 5.31); Calibrated: 3/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1415; Calibrated: 3/13/2017
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 25 (PCS), Right Head, Cheek, Mid.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.197 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.128 W/kg
SAR(1 g) = 0.079 W/kg



0 dB = 0.0936 W/kg = -10.29 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMN9500; Type: Portable Handset; Serial: 05D28

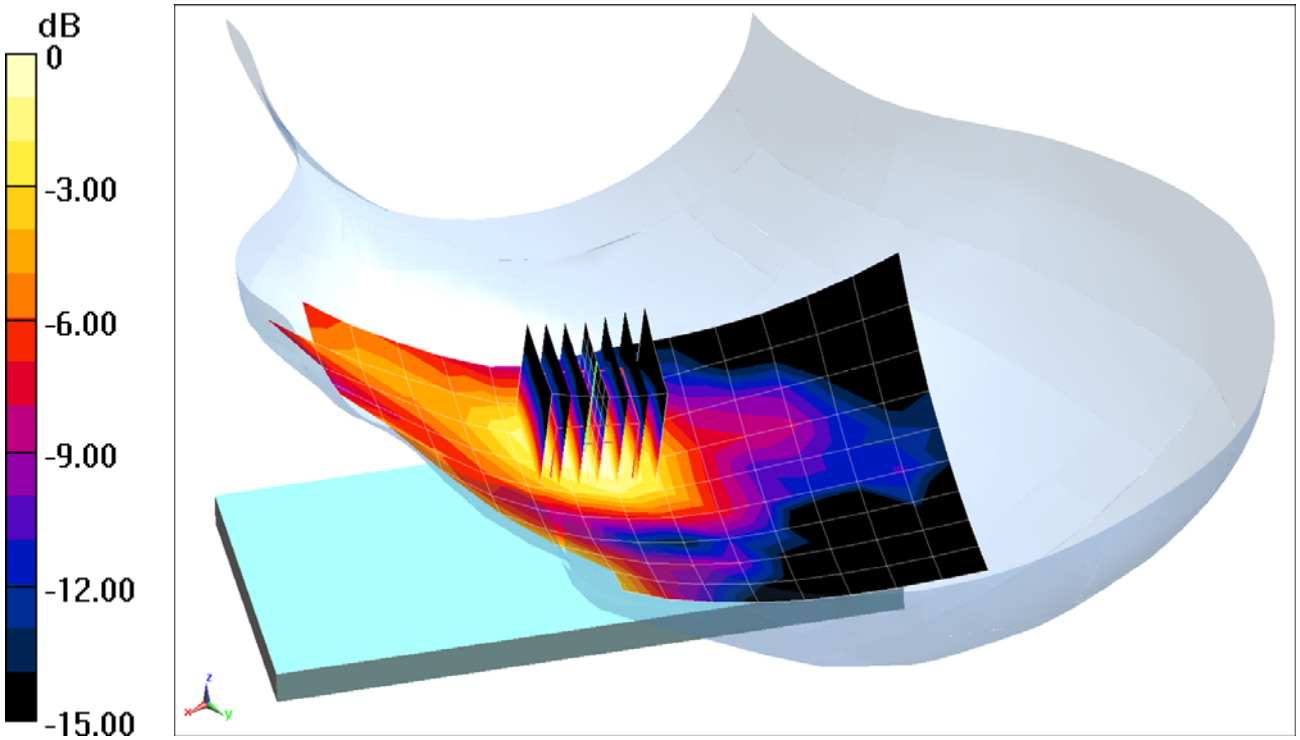
Communication System: UID 0, LTE Band 41; Frequency: 2680 MHz; Duty Cycle: 1:1.58
Medium: 2600 Head Medium parameters used (interpolated):
f = 2680 MHz; σ = 2.105 S/m; ε_r = 38.127; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-26-2017; Ambient Temp: 22.0°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3213; ConvF(4.52, 4.52, 4.52); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Right; Type: SAM; Serial: 1757
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 41, Left Head, Cheek, High.ch,
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (10x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.556 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.130 W/kg
SAR(1 g) = 0.070 W/kg



0 dB = 0.0850 W/kg = -10.71 dBW/kg

DUT: A3LSMN9500; Type: Portable Handset; Serial: 1145D

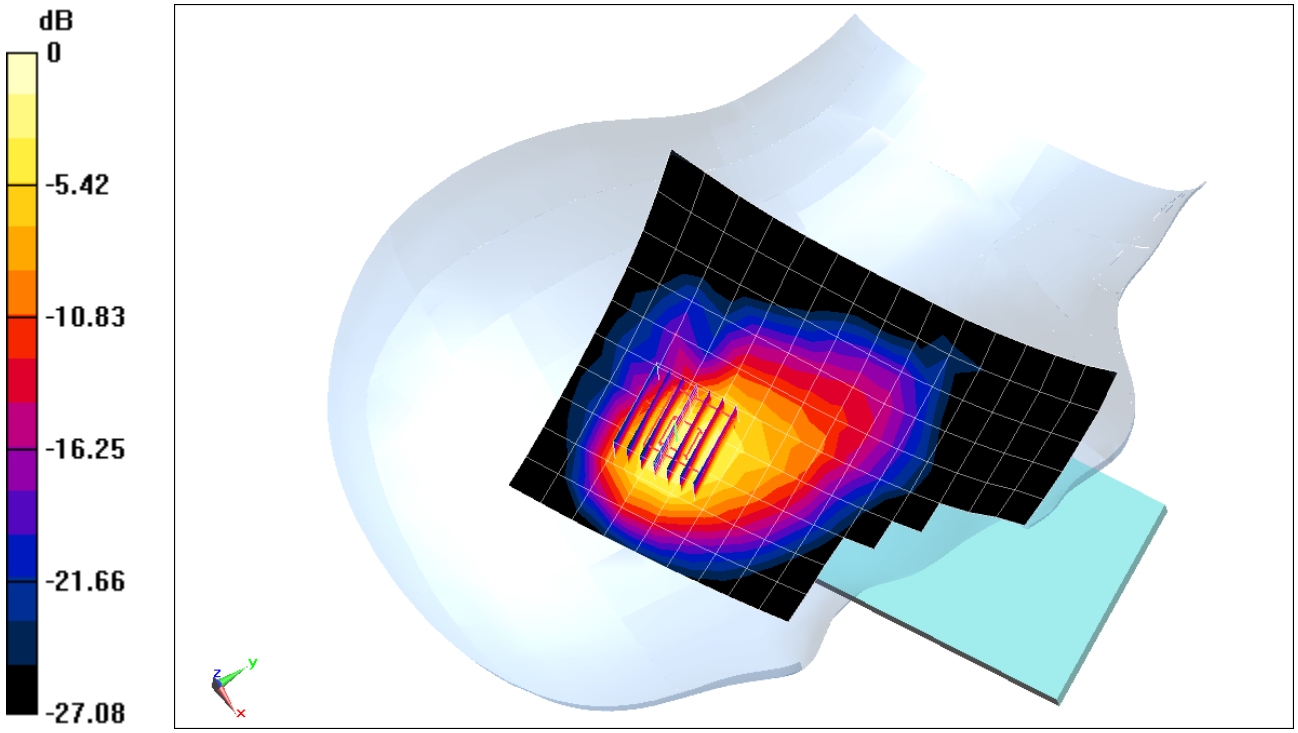
Communication System: UID 0, 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used (interpolated):
$f = 2462$ MHz; $\sigma = 1.901$ S/m; $\varepsilon_r = 39.04$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 07-03-2017; Ambient Temp: 21.9°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3213; ConvF(4.7, 4.7, 4.7); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Right; Type: SAM; Serial: 1757
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: IEEE 802.11b, 22 MHz Bandwidth, Right Head, Cheek, Ch 11, 1 Mbps, Antenna 2

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.281 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 1.76 W/kg
SAR(1 g) = 0.825 W/kg



0 dB = 1.12 W/kg = 0.49 dBW/kg

DUT: A3LSMN9500; Type: Portable Handset; Serial: 15C0D

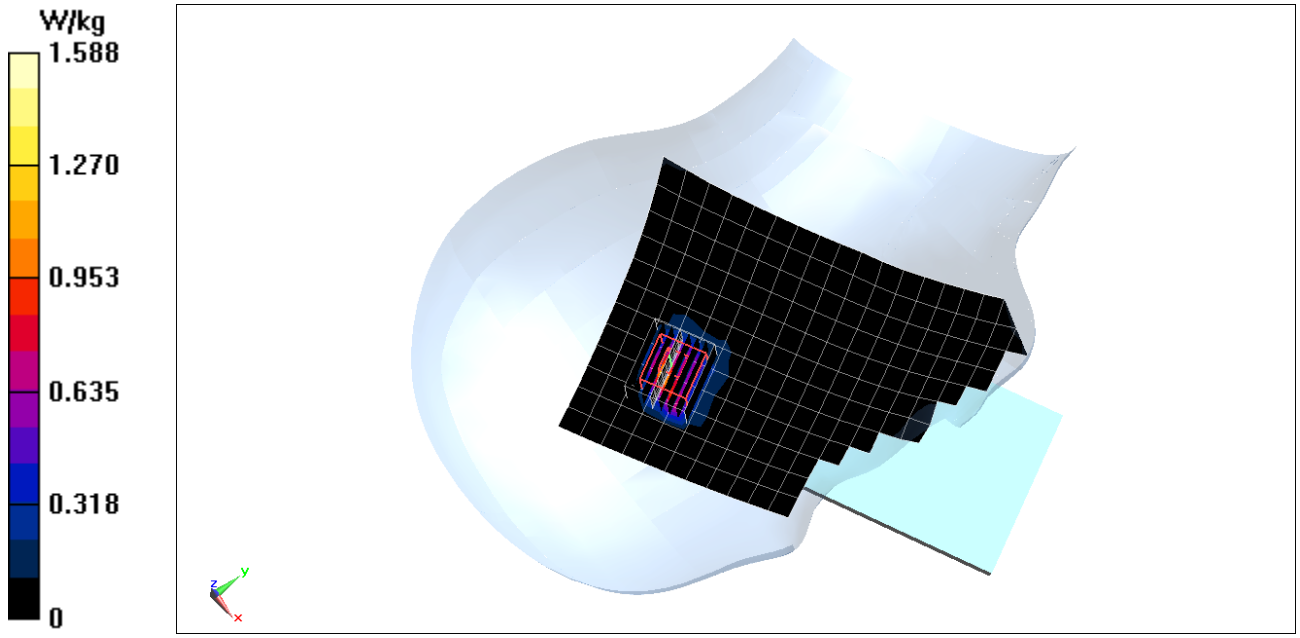
Communication System: UID 0, 802.11ac 5.2-5.8 GHz Band; Frequency: 5290 MHz; Duty Cycle: 1:1
Medium: 5GHz Head Medium parameters used (interpolated):
$f = 5290$ MHz; $\sigma = 4.586$ S/m; $\varepsilon_r = 35.953$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 06-28-2017; Ambient Temp: 21.7°C; Tissue Temp: 21.0°C

Probe: EX3DV4 - SN3914; ConvF(5.49, 5.49, 5.49); Calibrated: 2/13/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/9/2017
Phantom: SAM with CRP (Left); Type: SAM; Serial: 1715
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: IEEE 802.11ac, U-NII-2A, 80 MHz Bandwidth,
Right Head, Tilt, Ch 58, 29.3 Mbps, Antenna 1

Area Scan (13x22x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 3.051 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 2.72 W/kg
SAR(1 g) = 0.585 W/kg



DUT: A3LSMN9500; Type: Portable Handset; Serial: 1144C

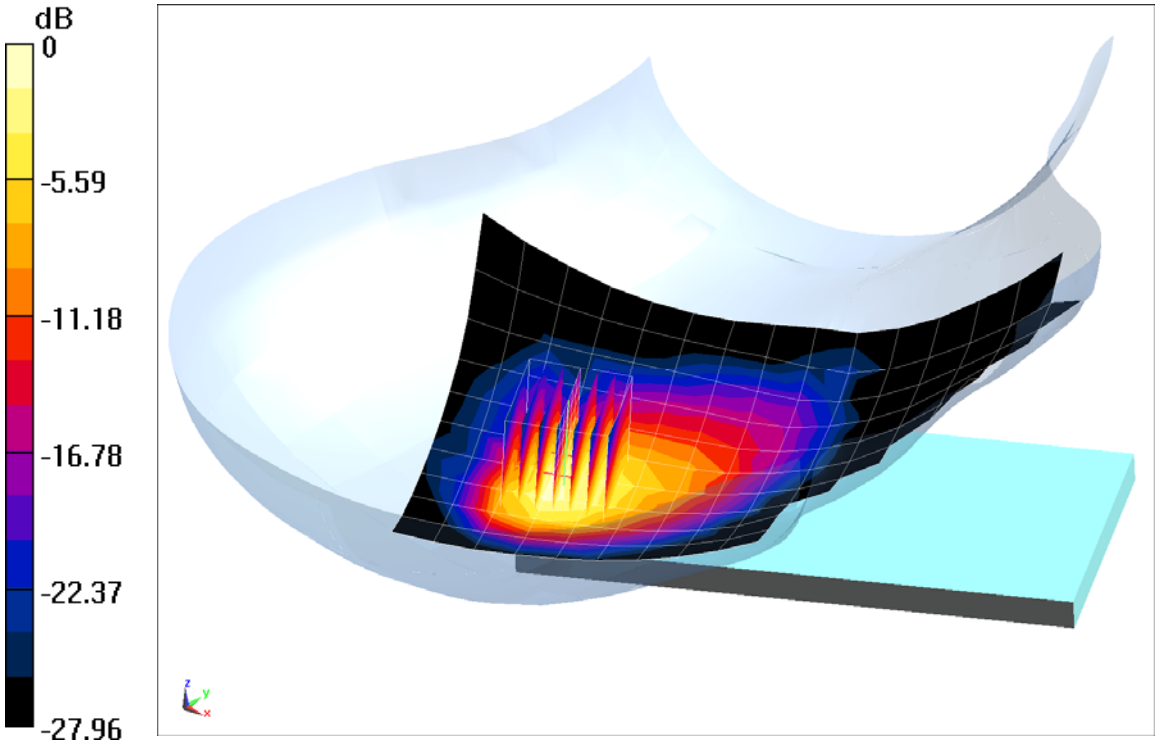
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.294
Medium: 2450 Head Medium parameters used (interpolated):
$f = 2441$ MHz; $\sigma = 1.878$ S/m; $\varepsilon_r = 39.12$; $\rho = 1000$ kg/m^3
Phantom section: Right Section

Test Date: 07-03-2017; Ambient Temp: 21.9°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3213; ConvF(4.7, 4.7, 4.7); Calibrated: 2/10/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2017
Phantom: SAM Right; Type: SAM; Serial: 1757
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

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

Area Scan (11x19x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.55 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.27 W/kg
SAR(1 g) = 0.577 W/kg



0 dB = 0.778 W/kg = -1.09 dBW/kg