



## SAR EVALUATION REPORT

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

**Date of Testing:**  
 01/12/21 – 02/19/21  
**Test Site/Location:**  
 PCTEST Lab, Columbia, MD, USA  
**Document Serial No.:**  
 1M2101040001-01.A3L (Rev1)

**FCC ID:** **A3LSMA426U**

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

**DUT Type:** Portable Handset  
**Application Type:** Certification  
**FCC Rule Part(s):** CFR §2.1093  
**Model:** SM-A426U  
**Additional Model(s):** SM-A426U1, SM-A426U1/DS, SM-S426DL

Equipment Class	Band & Mode	Tx Frequency	SAR			
			1g Head (W/kg)	1g Body-Worn (W/kg)	1g Hotspot (W/kg)	10g Phablet (W/kg)
PCE	CDMA/EVDO BC10 (896S)	817.90 - 823.10 MHz	0.30	0.52	0.78	N/A
PCE	CDMA/EVDO BC10 (829H)	824.70 - 848.31 MHz	0.31	0.49	0.83	N/A
PCE	PCS CDMA/EVDO	1851.25 - 1908.75 MHz	0.21	0.58	0.35	3.14
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.23	0.31	0.94	N/A
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	0.18	0.91	N/A
PCE	UMTS 850	828.40 - 846.60 MHz	0.25	0.39	0.54	N/A
PCE	UMTS 1755	1712.4 - 1752.6 MHz	0.28	0.92	0.83	3.03
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.14	0.27	0.56	1.59
PCE	LTE Band 71	665.5 - 695.5 MHz	0.14	0.43	0.47	N/A
PCE	LTE Band 12	699.7 - 715.3 MHz	0.20	0.34	0.41	N/A
PCE	LTE Band 13	779.5 - 784.5 MHz	0.15	0.30	0.42	N/A
PCE	LTE Band 14	790.5 - 795.5 MHz	0.24	0.34	0.65	N/A
PCE	LTE Band 26 (Cell)	414.7 - 848.3 MHz	0.26	0.36	0.58	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.12	0.20	0.39	N/A
PCE	LTE Band 66 (AWS)	1710.7 - 1779.3 MHz	0.25	0.43	0.64	2.04
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	0.14	0.43	0.38	2.78
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 30	2307.5 - 2312.5 MHz	0.57	0.62	0.72	2.77
PCE	LTE Band 7	2502.5 - 2567.5 MHz	0.58	1.25	1.06	1.44
CBE	LTE Band 48	3952.5 - 3997.5 MHz	1.64	0.35	0.89	2.66
PCE	LTE Band 41	2498.5 - 2697.5 MHz	0.66	0.59	0.52	1.30
PCE	NR Band n71	665.5 - 695.5 MHz	0.13	0.37	0.44	N/A
PCE	NR Band n5 (Cell)	828.5 - 848.5 MHz	0.22	0.26	0.81	N/A
PCE	NR Band n65 (AWS)	1712.5 - 1777.5 MHz	0.21	0.44	0.47	3.95
PCE	NR Band n25 (PCS)	1852.5 - 1912.5 MHz	0.19	0.56	0.66	2.81
PCE	NR Band n2 (PCS)	1852.5 - 1907.5 MHz	N/A	N/A	N/A	N/A
PCE	NR Band n41	2506.00 - 2679.99 MHz	0.26	0.22	0.40	0.76
PCE	NR Band n77	3750 - 3930 MHz	1.91	0.29	0.93	2.40
DTS	2.4 GHz WLAN	2412 - 2472 MHz	0.45	0.21	0.53	N/A
NI	U-NB-1	5180 - 5240 MHz	N/A	N/A	N/A	N/A
NI	U-NB-2A	5260 - 5320 MHz	0.35	0.23	N/A	1.99
NI	U-NB-2C	5500 - 5720 MHz	0.22	0.20	N/A	0.58
NI	U-NB-3	5745 - 5825 MHz	0.33	0.20	0.59	N/A
DSS/OTS	Bluetooth	2402 - 2480 MHz	0.20	< 0.1	0.15	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			1.59	1.55	1.59	3.81

Note: This revised Test Report supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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

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

Randy Ortanez  
 President





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# 1 DEVICE UNDER TEST

## 1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
CDMA/EVDO BC10 (§90S)	Voice/Data	817.90 - 823.10 MHz
CDMA/EVDO BC0 (§22H)	Voice/Data	824.70 - 848.31 MHz
PCS CDMA/EVDO	Voice/Data	1851.25 - 1908.75 MHz
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 71	Voice/Data	665.5 - 695.5 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 14	Voice/Data	790.5 - 795.5 MHz
LTE Band 26 (Cell)	Voice/Data	814.7 - 848.3 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 66 (AWS)	Voice/Data	1710.7 - 1779.3 MHz
LTE Band 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 25 (PCS)	Voice/Data	1850.7 - 1914.3 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 30	Voice/Data	2307.5 - 2312.5 MHz
LTE Band 7	Voice/Data	2502.5 - 2567.5 MHz
LTE Band 48	Voice/Data	3552.5 - 3697.5 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
NR Band n71	Data	665.5 - 695.5 MHz
NR Band n5 (Cell)	Data	826.5 - 846.5 MHz
NR Band n66 (AWS)	Data	1712.5 - 1777.5 MHz
NR Band n25 (PCS)	Data	1852.5 - 1912.5 MHz
NR Band n2 (PCS)	Data	1852.5 - 1907.5 MHz
NR Band n41	Data	2506.02 - 2679.99 MHz
NR Band n77	Data	3750 - 3930 MHz
NR Band n260	Data	37000 - 40000 MHz
NR Band n261	Data	27500 - 28350 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2472 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz

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## 1.2 Time-Averaging Algorithm for RF Exposure Compliance

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

Note that WLAN operations are not enabled with Smart Transmit.




The Smart Transmit algorithm maintains the time-averaged transmit power, in turn, time-averaged RF exposure of  $SAR_{design\_target}$  or  $PD_{design\_target}$ , below the predefined time-averaged power limit (i.e.,  $P_{limit}$  for sub-6 radio, and  $input.power.limit$  for 5G mmW NR), for each characterized technology and band (see RF Exposure Part 0 Test Report, report SN could be found in Section 1.11 - Bibliography).

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

Exposure Scenario:	Antenna	Body-Worn	Phablet	Phablet	Head	Hotspot	Earjack	Maximum Tune-up Output Power*
Averaging Volume:		1g	10g	10g	1g	1g	10g	
Spacing:		15 mm	7, 10, 6 mm	0 mm	0 mm	10 mm	0 mm	
DSI:		0	0	4, 5, 6	1	2	3	
Technology/Band	P <sub>limit</sub> corresponding to 1mW/g (SAR <sub>design_target</sub> )							P <sub>max</sub>
CDMA BC10	MAIN1	28.9		27.0	30.7	26.1	27.0	25.0
EVDO BC10	MAIN1	28.9		27.0	30.7	26.1	27.0	24.0
CDMA BC0	MAIN1	29.7		29.7	30.1	25.8	29.7	25.0
EVDO BC0	MAIN1	29.7		29.7	30.1	25.8	29.7	24.0
CDMA BC1	MAIN1	25.0		19.0	32.4	19.0	19.0	25.0
EVDO BC1	MAIN1	25.0		19.0	32.4	19.0	19.0	24.0
GSM/GPRS/EDGE 850 MHz	MAIN1	29.4		29.0	30.6	27.1	29.0	25.8
GSM/GPRS/EDGE 1900 MHz	MAIN1	25.7		24.8	33.3	24.0	24.8	22.6
UMTS B5	MAIN1	29.5		28.0	31.1	27.7	28.0	24.0
UMTS B4	MAIN1	24.2		20.0	30.5	20.0	20.0	24.0
UMTS B2	MAIN1	27.0		21.0	33.5	21.0	21.0	24.0
LTE FDD B71	MAIN1	29.1		28.5	33.8	28.5	28.5	24.5
LTE FDD B12	MAIN1	28.6		28.7	31.1	27.9	28.7	23.0
LTE FDD B13	MAIN1	29.0		26.6	32.0	26.6	26.6	23.0
LTE FDD B14	MAIN1	30.1		30.8	31.6	27.3	30.8	24.5
LTE FDD B26	MAIN1	29.4		28.0	30.9	27.4	28.0	24.0
LTE FDD B5	MAIN1	29.2		28.2	33.5	28.1	28.2	23.0
LTE FDD B66	MAIN1	25.4		21.0	30.6	21.0	21.0	23.5
LTE FDD B4	MAIN1	25.4		21.0	30.6	21.0	21.0	23.0
LTE FDD B25	MAIN1	24.0		19.0	33.0	19.0	19.0	23.5
LTE FDD B2	MAIN1	24.0		19.0	33.0	19.0	19.0	23.0
LTE FDD B30	MAIN2	25.0		18.5	18.5	18.5	18.5	22.0
LTE FDD B7	MAIN2	23.0		18.5	18.5	18.5	18.5	23.0
LTE TDD B48	SUB4	20.8		20.8	15.0	18.5	20.8	20.0
LTE TDD B41	MAIN2	26.0		18.5	18.5	18.5	18.5	21.5
LTE TDD B41 (PC2)	MAIN2	26.0		18.5	18.5	18.5	18.5	22.4
NR FDD n71	MAIN1	29.1		29.3	33.8	28.2	29.3	24.0
NR FDD n5	MAIN1	29.9		29.9	31.7	27.1	29.9	24.0
NR FDD n66	MAIN1	24.1		21.0	31.5	21.0	21.0	24.0
NR FDD n25/2	MAIN1	24.2		21.0	31.4	21.0	21.0	24.0
NR TDD n41	MAIN2	18.0		18.0	14.0	18.0	18.0	23.0
NR TDD n77	SUB4	17.5		17.5	14.5	17.5	17.5	23.0

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

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

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

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

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

### 1.3 Power Reduction for SAR

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




### 1.4 Nominal and Maximum Output Power Specifications

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




#### 1.4.1 2G/3G/4G/5G Output Power

GSM/GPRS/EDGE 850										
Power Level		Voice (in dBm)	Data - Burst Average GMSK (in dBm)				Data - Burst Average 8-PSK (in dBm)			
		1 TX Slot	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
All DSI	Max allowed power	33.5	33.5	32.5	30.5	30.0	27.5	26.5	24.0	23.5
	Nominal	32.5	32.5	31.5	29.5	29.0	26.5	25.5	23.0	22.5
GSM/GPRS/EDGE 1900										
Power Level		Voice (in dBm)	Data - Burst Average GMSK (in dBm)				Data - Burst Average 8-PSK (in dBm)			
		1 TX Slot	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
All DSI	Max allowed power	30.5	30.5	29.5	28.0	26.5	26.5	25.5	23.5	22.0
	Nominal	29.5	29.5	28.5	27.0	25.5	25.5	24.5	22.5	21.0




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

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<b>CDMA BC10 (815 MHz)</b>				
Power Level		Modulated Average Output Power (in dBm)		
		1x-RTT	EVDO Rev 0	EVDO Rev A
All DSI	Max allowed power	26.0	25.0	25.0
	Nominal	25.0	24.0	24.0
<b>CDMA BC0 (835 MHz)</b>				
Power Level		Modulated Average Output Power (in dBm)		
		1x-RTT	EVDO Rev 0	EVDO Rev A
All DSI	Max allowed power	26.0	25.0	25.0
	Nominal	25.0	24.0	24.0
<b>CDMA BC1 (1900 MHz)</b>				
Power Level		Modulated Average Output Power (in dBm)		
		1x-RTT	EVDO Rev 0	EVDO Rev A
DSI = 0 (Body-Worn or Phablet Max)	Max allowed power	26.0	25.0	25.0
	Nominal	25.0	24.0	24.0
DSI = 4, 5, or 6 (Phablet Reduced)	Max allowed power	20.0	20.0	20.0
	Nominal	19.0	19.0	19.0
DSI = 1 (Head)	Max allowed power	26.0	25.0	25.0
	Nominal	25.0	24.0	24.0
DSI = 2 (Hotspot)	Max allowed power	20.0	20.0	20.0
	Nominal	19.0	19.0	19.0
DSI = 3 (Earjack)	Max allowed power	20.0	20.0	20.0
	Nominal	19.0	19.0	19.0

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UMTS Band 5 (850 MHz)					
Power Level		Modulated Average Output Power (in dBm)			
		3GPP WCDMA	3GPP HSDPA	3GPP HSUPA	3GPP
All DSI	Max allowed power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
UMTS Band 4 (1750 MHz)					
Power Level		Modulated Average Output Power (in dBm)			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
DSI = 0 (Body-Worn or Phablet Max)	Max allowed power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
DSI = 4, 5, or 6 (Phablet Reduced)	Max allowed power	21.0	20.0	20.0	20.0
	Nominal	20.0	19.0	19.0	19.0
DSI = 1 (Head)	Max allowed power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
DSI = 2 (Hotspot)	Max allowed power	21.0	20.0	20.0	20.0
	Nominal	20.0	19.0	19.0	19.0
DSI = 3 (Earjack)	Max allowed power	21.0	20.0	20.0	20.0
	Nominal	20.0	19.0	19.0	19.0
UMTS Band 2 (1900 MHz)					
Power Level		Modulated Average Output Power (in dBm)			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
DSI = 0 (Body-Worn or Phablet Max)	Max allowed power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
DSI = 4, 5, or 6 (Phablet Reduced)	Max allowed power	22.0	21.0	21.0	21.0
	Nominal	21.0	20.0	20.0	20.0
DSI = 1 (Head)	Max allowed power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
DSI = 2 (Hotspot)	Max allowed power	22.0	21.0	21.0	21.0
	Nominal	21.0	20.0	20.0	20.0
DSI = 3 (Earjack)	Max allowed power	22.0	21.0	21.0	21.0
	Nominal	21.0	20.0	20.0	20.0




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Mode / Band		Modulated Average Output Power (in dBm)				
		DSI = 0 (Body-Worn or Phablet Max)	DSI = 4,5, or 6 (Phablet Reduced)	DSI = 1 (Head)	DSI = 2 (Hotspot)	DSI = 3 (Earjack)
LTE FDD Band 71	Max allowed	25.5	25.5	25.5	25.5	25.5
	Nominal	24.5	24.5	24.5	24.5	24.5
LTE FDD Band 12	Max allowed	24.0	24.0	24.0	24.0	24.0
	Nominal	23.0	23.0	23.0	23.0	23.0
LTE FDD Band 13	Max allowed	24.0	24.0	24.0	24.0	24.0
	Nominal	23.0	23.0	23.0	23.0	23.0
LTE FDD Band 14	Max allowed	25.5	25.5	25.5	25.5	25.5
	Nominal	24.5	24.5	24.5	24.5	24.5
LTE FDD Band 26	Max allowed	25.0	25.0	25.0	25.0	25.0
	Nominal	24.0	24.0	24.0	24.0	24.0
LTE FDD Band 5	Max allowed	24.0	24.0	24.0	24.0	24.0
	Nominal	23.0	23.0	23.0	23.0	23.0
LTE FDD Band 66	Max allowed	24.5	22.0	24.5	22.0	22.0
	Nominal	23.5	21.0	23.5	21.0	21.0
LTE FDD Band 4	Max allowed	24.0	22.0	24.0	22.0	22.0
	Nominal	23.0	21.0	23.0	21.0	21.0
LTE FDD Band 25	Max allowed	24.5	20.0	24.5	20.0	20.0
	Nominal	23.5	19.0	23.5	19.0	19.0
LTE FDD Band 2	Max allowed	24.0	20.0	24.0	20.0	20.0
	Nominal	23.0	19.0	23.0	19.0	19.0
LTE FDD Band 30	Max allowed	23.0	19.5	19.5	19.5	19.5
	Nominal	22.0	18.5	18.5	18.5	18.5
LTE FDD Band 7	Max allowed	24.0	19.5	19.5	19.5	19.5
	Nominal	23.0	18.5	18.5	18.5	18.5
LTE TDD Band 48	Max allowed	23.0	23.0	18.0	21.5	23.0
	Nominal	22.0	22.0	17.0	20.5	22.0
LTE TDD Band 41	Max allowed	24.5	21.5	21.5	21.5	21.5
	Nominal	23.5	20.5	20.5	20.5	20.5
LTE TDD Band 41 (PC2)	Max allowed	27.0	23.1	23.1	23.1	23.1
	Nominal	26.0	22.1	22.1	22.1	22.1

Mode / Band		Modulated Average Output Power (in dBm)				
		DSI = 0 (Body-Worn or Phablet Max)	DSI = 4, 5, 6 (Phablet Reduced)	DSI = 1 (Head)	DSI = 2 (Hotspot)	DSI = 3 (Earjack)
NR FDD Band 71	Max allowed	25.0	25.0	25.0	25.0	25.0
	Nominal	24.0	24.0	24.0	24.0	24.0
NR FDD Band 5	Max allowed	25.0	25.0	25.0	25.0	25.0
	Nominal	24.0	24.0	24.0	24.0	24.0
NR FDD Band 66	Max allowed	25.0	22.0	25.0	22.0	22.0
	Nominal	24.0	21.0	24.0	21.0	21.0
NR FDD Band 25	Max allowed	25.0	22.0	25.0	22.0	22.0
	Nominal	24.0	21.0	24.0	21.0	21.0
NR FDD Band 2	Max allowed	25.0	22.0	25.0	22.0	22.0
	Nominal	24.0	21.0	24.0	21.0	21.0
NR TDD Band 41	Max allowed	19.0	19.0	15.0	19.0	19.0
	Nominal	18.0	18.0	14.0	18.0	18.0
NR TDD Band 77	Max allowed	18.5	18.5	15.5	18.5	18.5
	Nominal	17.5	17.5	14.5	17.5	17.5

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

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### 1.4.2 2.4 GHz Maximum Bluetooth and WLAN Output Power

Mode	Band	IEEE 802.11 (in dBm)					
		SISO					
		b		g		n	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	21.0	20.0	21.0	20.0	20.0	19.0
		ch. 12: 16.5	15.5	ch. 11: 19.0	18.0	ch. 11: 19.0	18.0
		ch. 13: 14.0	13.0	ch. 12: 14.5	13.5	ch. 12: 14.0	13.0
				ch. 13: 11.5	10.5	ch. 13: 11.5	10.5




Mode	Band	Bluetooth							
		Bluetooth (1Mbps)		Bluetooth (EDR)		Bluetooth LE (2Mbps)		Bluetooth LE (1Mbps, 125/500kbps)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz Bluetooth	2.45 GHz	16.0	15.0	11.0	10.0	5.0	4.0	5.5	4.5

### 1.4.3 2.4 GHz Reduced WLAN and Bluetooth Output Powers

The below table is applicable in the following conditions:

- Head Conditions

Mode	Band	IEEE 802.11 (in dBm)					
		SISO					
		b		g		n	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	16.0	15.0	16.0	15.0	16.0	15.0
		ch. 13: 14.0	13.0	ch. 12: 14.5	13.5	ch. 12: 14.0	13.0
				ch. 13: 11.5	10.5	ch. 13: 11.5	10.5

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The below table is applicable for the following conditions:

- Head Conditions

Mode	Band	Bluetooth							
		Bluetooth (1Mbps)		Bluetooth (EDR)		Bluetooth LE (2Mbps)		Bluetooth LE (1Mbps, 125/500kbps)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz Bluetooth	2.45 GHz	13.5	12.5	11.0	10.0	5.0	4.0	5.5	4.5

### 1.4.4 5 GHz Maximum WLAN Output Power

Mode	Band	IEEE 802.11 (in dBm)					
		SISO					
		a		n		ac	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	5200 MHz	18.0	17.0	18.0	17.0	17.0	16.0
	5300 MHz	18.0	17.0	18.0	17.0	17.0	16.0
	5500 MHz	18.0	17.0	18.0	17.0	17.0	16.0
	5800 MHz	18.0	17.0	18.0	17.0	17.0	16.0
5 GHz WIFI (40MHz BW)	5200 MHz			18.0	17.0	16.0	15.0
	5300 MHz			18.0	17.0	16.0	15.0
	5500 MHz			18.0	17.0	16.0	15.0
	5800 MHz			18.0	17.0	16.0	15.0
5 GHz WIFI (80MHz BW)	5200 MHz					15.0	14.0
	5300 MHz					15.0	14.0
	5500 MHz					15.0	14.0
	5800 MHz					15.0	14.0

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### 1.4.5

### 5 GHz Reduced WLAN Output Powers

The below table is applicable in the following conditions:

- Head Conditions

Mode	Band	IEEE 802.11 (in dBm)					
		SISO					
		a		n		ac	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	5200 MHz	11.0	10.0	11.0	10.0	11.0	10.0
	5300 MHz	11.0	10.0	11.0	10.0	11.0	10.0
	5500 MHz	11.0	10.0	11.0	10.0	11.0	10.0
	5800 MHz	11.0	10.0	11.0	10.0	11.0	10.0
5 GHz WIFI (40MHz BW)	5200 MHz			11.0	10.0	11.0	10.0
	5300 MHz			11.0	10.0	11.0	10.0
	5500 MHz			11.0	10.0	11.0	10.0
	5800 MHz			11.0	10.0	11.0	10.0
5 GHz WIFI (80MHz BW)	5200 MHz					11.0	10.0
	5300 MHz					11.0	10.0
	5500 MHz					11.0	10.0
	5800 MHz					11.0	10.0

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## 1.5 DUT Antenna Locations

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

**Table 1-1  
Device Edges/Sides for SAR Testing**

Mode	Back	Front	Top	Bottom	Right	Left
EVDO BC10 (§90S)	Yes	Yes	No	Yes	Yes	Yes
EVDO BC0 (§22H)	Yes	Yes	No	Yes	Yes	Yes
PCS EVDO	Yes	Yes	No	Yes	Yes	Yes
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 1750	Yes	Yes	No	Yes	Yes	Yes
UMTS 1900	Yes	Yes	No	Yes	Yes	Yes
LTE Band 71	Yes	Yes	No	Yes	Yes	Yes
LTE Band 12	Yes	Yes	No	Yes	Yes	Yes
LTE Band 13	Yes	Yes	No	Yes	Yes	Yes
LTE Band 14	Yes	Yes	No	Yes	Yes	Yes
LTE Band 26 (Cell)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 5 (Cell)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 66 (AWS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 25 (PCS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 30	Yes	Yes	Yes	No	No	Yes
LTE Band 7	Yes	Yes	Yes	No	No	Yes
LTE Band 48	Yes	Yes	Yes	No	No	Yes
LTE Band 41	Yes	Yes	Yes	No	No	Yes
NR Band n71	Yes	Yes	No	Yes	Yes	Yes
NR Band n5 (Cell)	Yes	Yes	No	Yes	Yes	Yes
NR Band n66 (AWS)	Yes	Yes	No	Yes	Yes	Yes
NR Band n25 (PCS)	Yes	Yes	No	Yes	Yes	Yes
NR Band n41	Yes	Yes	Yes	No	No	Yes
NR Band n77	Yes	Yes	Yes	No	No	Yes
2.4 GHz WLAN	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN	Yes	Yes	Yes	No	No	Yes
Bluetooth	Yes	Yes	Yes	No	No	Yes

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

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## 1.6 Near Field Communications (NFC) Antenna

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

## 1.7 Simultaneous Transmission Capabilities




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

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

**Table 1-2  
Simultaneous Transmission Scenarios**

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Phablet	Notes
1	1x CDMA voice + 2.4 GHz WLAN	Yes	Yes	N/A	Yes	
2	1x CDMA voice + 5 GHz WLAN	Yes	Yes	N/A	Yes	
3	1x CDMA voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
4	1x CDMA voice + 2.4 GHz Bluetooth + 5 GHz WLAN	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
5	GSM voice + 2.4 GHz WLAN	Yes	Yes	N/A	Yes	
6	GSM voice + 5 GHz WLAN	Yes	Yes	N/A	Yes	
7	GSM voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
8	GSM voice + 2.4 GHz Bluetooth + 5 GHz WLAN	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
9	UMTS + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
10	UMTS + 5 GHz WLAN	Yes	Yes	Yes	Yes	
11	UMTS + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
12	UMTS + 2.4 GHz Bluetooth + 5 GHz WLAN	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
13	LTE + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
14	LTE + 5 GHz WLAN	Yes	Yes	Yes	Yes	
15	LTE + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
16	LTE + 2.4 GHz Bluetooth + 5 GHz WLAN	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
17	LTE + NR	Yes	Yes	N/A	Yes	
18	LTE + NR + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
19	LTE + NR + 5 GHz WLAN	Yes	Yes	Yes	Yes	
20	LTE + NR + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
21	LTE + NR + 2.4 GHz Bluetooth + 5 GHz WLAN	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
22	CDMA/EVDO data + 2.4 GHz WLAN	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered.
23	CDMA/EVDO data + 5 GHz WLAN	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered.
24	CDMA/EVDO data + 2.4 GHz Bluetooth	Yes*^	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
25	CDMA/EVDO data + 2.4 GHz Bluetooth + 5 GHz WLAN	Yes*^	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
26	GPRS/EDGE + 2.4 GHz WLAN	N/A	N/A	Yes	Yes	
27	GPRS/EDGE + 5 GHz WLAN	N/A	N/A	Yes	Yes	
28	GPRS/EDGE + 2.4 GHz Bluetooth	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
29	GPRS/EDGE + 2.4 GHz Bluetooth + 5 GHz WLAN	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered

- 2.4 GHz WLAN and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
- All licensed modes share the same antenna path and cannot transmit simultaneously.
- When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario.

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4. Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, there are no simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table.
5. 5 GHz Wireless Router is only supported for the U-NII-3 by S/W, therefore U-NII-1, U-NII2A, and U-NII2C were not evaluated for wireless router conditions.
6. This device supports VoWIFI.
7. This device supports Bluetooth Tethering.
8. This device supports VoLTE.
9. LTE + 5G NR FR1 Scenarios are limited to LTE Anchor Bands shown in the NR FR1 Checklist.
10. 5G NR FR2 n260 and n261 cannot transmit simultaneously.
11. LTE + 5G NR FR2 n260 and n261 operations are possible only with LTE Anchors shown in the Operational description.

## 1.8 Miscellaneous SAR Test Considerations

### (A) WIFI/BT

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




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

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

This device supports IEEE 802.11ac with the following features:

- a) Up to 80 MHz Bandwidth only for 5 GHz
- b) Up to 20 MHz Bandwidth only for 2.4 GHz
- c) No aggregate channel configurations
- d) 1 Tx antenna output
- e) Up to 1024 QAM is supported
- f) TDWR and Band gap channels are supported for 5 GHz
- g) MU-MIMO UL Operations are not supported

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

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## (B) Licensed Transmitter(s)

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

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

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth; and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02r04.

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

This device supports LTE Carrier Aggregation (CA) in the downlink. All uplink communications are identical to Release 8 specifications. Per FCC KDB Publication 941225 D05A v01r02, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive. The downlink carrier aggregation exclusion analysis can be found in Appendix H.

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




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

This device supports LTE capabilities with overlapping transmission frequency ranges. When the supported frequency range of an LTE Band falls completely within an LTE band with a larger transmission frequency range, both LTE bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and both LTE bands share the same transmission path and signal characteristics, SAR was only assessed for the band with the larger transmission frequency range.

This device supports both Power Class 2 (PC2) and Power Class 3 (PC3) for LTE Band 41. Per May 2017 TCB Workshop Notes, SAR tests were performed with Power Class 3 (given the specific UL/DL limitations for Power Class 2). Additionally, SAR testing for the power class 2 condition was evaluated for the highest configuration in Power Class 3 for each test configuration to confirm the results were scalable linearly (See Section 14.1).

This device supports LTE Carrier Aggregation (CA) for LTE Band 5, LTE Band 66, and LTE Band 41 with two component carriers in the uplink. SAR Measurements and conducted powers were evaluated per 2017 Fall TCB Workshop Notes.

This device supports 64QAM on the uplink and 256QAM on the downlink for LTE Operations. Conducted powers for 64QAM uplink configurations were measured per Section 5.1 of FCC KDB Publication 941225D05v02r05. SAR was not required for 64QAM since the highest maximum output power for 64QAM is

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≤ ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45W/kg, per Section 5.2.4 of FCC KDB Publication 941225 D05v02r05.

This device supports 5G NR for Bands n260, and n261. RF Exposure assessment and simultaneous transmission analysis for these bands can be found in the Near Field PD Report (report SN can be found in Section 1.11 – Bibliography).

NR implementation supports NSA mode only. In EN-DC mode, NR operates with the LTE Bands shown in the NR FR1 checklist acting as anchor bands. Per FCC guidance, SAR tests for NR Bands and LTE Anchors Bands were performed separately due to limitations in SAR probe calibration factors.

## 1.9 Guidance Applied




- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r04, D05Av01r02, D06v02r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 648474 D04v01r03 (Phablet Procedures)
- FCC KDB Publication 616217 D04v01r02 (Proximity Sensor)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)
- May 2017 TCB Workshop Notes (LTE 4x4 Downlink MIMO, LTE Band 41 Power Class 2/3)
- April 2018 TCB Workshop Notes (LTE Carrier Aggregation)

## 1.10 Device Serial Numbers

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



## 1.11 Bibliography

Report Type	Report Serial Number
PD Exposure Part 0 Test Report	1M2101040001-26.A3L
Near Field PD Report (Part 1)	1M2101040001-20.A3L
RF Exposure Part 0 Test Report	1M2101040001-23.A3L
RF Exposure Part 2 Test Report	1M2101040001-21.A3L
RF Exposure Compliance Summary Report	1M2101040001-22.A3L



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LTE Information					
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 71 (665.5 - 695.5 MHz) LTE Band 12 (699.7 - 715.3 MHz) LTE Band 13 (728.5 - 794.5 MHz) LTE Band 14 (750.5 - 795.5 MHz) LTE Band 26 (Cell) (814.7 - 848.3 MHz) LTE Band 5 (Cell) (824.7 - 848.3 MHz) LTE Band 66 (AWS) (1710.7 - 1779.3 MHz) LTE Band 4 (AWS) (1710.7 - 1754.3 MHz) LTE Band 25 (PCS) (1850.7 - 1914.3 MHz) LTE Band 2 (PCS) (1850.7 - 1909.3 MHz) LTE Band 30 (2307.5 - 2312.5 MHz) LTE Band 7 (2502.5 - 2567.5 MHz) LTE Band 48 (3552.5 - 3697.5 MHz) LTE Band 41 (2498.5 - 2687.5 MHz)				
Channel Bandwidths	LTE Band 71: 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz LTE Band 13: 5 MHz, 10 MHz LTE Band 14: 5 MHz, 10 MHz LTE Band 26 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz LTE Band 66 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 25 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 30: 5 MHz, 10 MHz LTE Band 7: 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 48: 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 71: 5 MHz	665.5 (133147)		690.5 (133297)		695.5 (133447)
LTE Band 71: 10 MHz	666 (133172)		690.5 (133297)		693 (133422)
LTE Band 71: 15 MHz	670.5 (133197)		690.5 (133297)		690.5 (133297)
LTE Band 71: 20 MHz	673 (133222)		690.5 (133297)		688 (133372)
LTE Band 12: 1.4 MHz	699.7 (23017)		707.5 (23095)		715.3 (23173)
LTE Band 12: 3 MHz	700.5 (23025)		707.5 (23095)		714.5 (23165)
LTE Band 12: 5 MHz	701.5 (23035)		707.5 (23095)		713.5 (23155)
LTE Band 12: 10 MHz	704 (23060)		707.5 (23095)		711 (23130)
LTE Band 13: 5 MHz	779.5 (23205)		782 (23230)		784.5 (23255)
LTE Band 13: 10 MHz	N/A		782 (23230)		N/A
LTE Band 14: 5 MHz	790.5 (23305)		793 (23330)		795.5 (23355)
LTE Band 14: 10 MHz	N/A		793 (23330)		N/A
LTE Band 26 (Cell): 1.4 MHz	814.7 (26697)		831.5 (26865)		848.3 (27033)
LTE Band 26 (Cell): 3 MHz	815.5 (26705)		831.5 (26865)		847.5 (27025)
LTE Band 26 (Cell): 5 MHz	816.5 (26715)		831.5 (26865)		846.5 (27015)
LTE Band 26 (Cell): 10 MHz	819 (26740)		831.5 (26865)		844 (26990)
LTE Band 26 (Cell): 15 MHz	821.5 (26765)		831.5 (26865)		841.5 (26965)
LTE Band 5 (Cell): 1.4 MHz	824.7 (20407)		836.5 (20525)		848.3 (20643)
LTE Band 5 (Cell): 3 MHz	825.5 (20415)		836.5 (20525)		847.5 (20635)
LTE Band 5 (Cell): 5 MHz	826.5 (20425)		836.5 (20525)		846.5 (20625)
LTE Band 5 (Cell): 10 MHz	829 (20450)		836.5 (20525)		844 (20600)
LTE Band 66 (AWS): 1.4 MHz	1710.7 (131979)		1745 (132322)		1779.3 (132665)
LTE Band 66 (AWS): 3 MHz	1711.5 (131987)		1745 (132322)		1778.5 (132657)
LTE Band 66 (AWS): 5 MHz	1712.5 (131997)		1745 (132322)		1777.5 (132647)
LTE Band 66 (AWS): 10 MHz	1715 (132022)		1745 (132322)		1775 (132622)
LTE Band 66 (AWS): 15 MHz	1717.5 (132047)		1745 (132322)		1772.5 (132597)
LTE Band 66 (AWS): 20 MHz	1720 (132072)		1745 (132322)		1770 (132572)
LTE Band 4 (AWS): 1.4 MHz	1710.7 (19957)		1732.5 (20175)		1754.3 (20393)
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)		1732.5 (20175)		1753.5 (20385)
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)		1732.5 (20175)		1752.5 (20375)
LTE Band 4 (AWS): 10 MHz	1715 (20000)		1732.5 (20175)		1750 (20350)
LTE Band 4 (AWS): 15 MHz	1717.5 (20025)		1732.5 (20175)		1747.5 (20325)
LTE Band 4 (AWS): 20 MHz	1720 (20050)		1732.5 (20175)		1745 (20300)
LTE Band 25 (PCS): 1.4 MHz	1850.7 (26047)		1882.5 (26365)		1914.3 (26683)
LTE Band 25 (PCS): 3 MHz	1851.5 (26055)		1882.5 (26365)		1913.5 (26675)
LTE Band 25 (PCS): 5 MHz	1852.5 (26065)		1882.5 (26365)		1912.5 (26665)
LTE Band 25 (PCS): 10 MHz	1855 (26090)		1882.5 (26365)		1910 (26640)
LTE Band 25 (PCS): 15 MHz	1857.5 (26115)		1882.5 (26365)		1907.5 (26615)
LTE Band 25 (PCS): 20 MHz	1860 (26140)		1882.5 (26365)		1905 (26590)
LTE Band 2 (PCS): 1.4 MHz	1850.7 (18607)		1880 (18900)		1909.3 (19193)
LTE Band 2 (PCS): 3 MHz	1851.5 (18615)		1880 (18900)		1908.5 (19185)
LTE Band 2 (PCS): 5 MHz	1852.5 (18625)		1880 (18900)		1907.5 (19175)
LTE Band 2 (PCS): 10 MHz	1855 (18650)		1880 (18900)		1905 (19150)
LTE Band 2 (PCS): 15 MHz	1857.5 (18675)		1880 (18900)		1902.5 (19125)
LTE Band 2 (PCS): 20 MHz	1860 (18700)		1880 (18900)		1900 (19100)
LTE Band 30: 5 MHz	2307.5 (27685)		2310 (27710)		2312.5 (27735)
LTE Band 30: 10 MHz	N/A		2310 (27710)		N/A
LTE Band 7: 5 MHz	2502.5 (20775)		2535 (21100)		2567.5 (21425)
LTE Band 7: 10 MHz	2505 (20800)		2535 (21100)		2565 (21400)
LTE Band 7: 15 MHz	2507.5 (20825)		2535 (21100)		2562.5 (21375)
LTE Band 7: 20 MHz	2510 (20850)		2535 (21100)		2560 (21350)
LTE Band 48: 5 MHz	3552.5 (55265)	3600.8 (55748)	N/A	3649.2 (56232)	3697.5 (56715)
LTE Band 48: 10 MHz	3555 (55290)	3601.7 (55757)	N/A	3648.3 (56223)	3695 (56690)
LTE Band 48: 15 MHz	3557.5 (55315)	3602.5 (55765)	N/A	3647.5 (56215)	3692.5 (56665)
LTE Band 48: 20 MHz	3560 (55340)	3603.3 (55773)	N/A	3646.7 (56207)	3690 (56640)
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 18, UL UE Cat 15				
Modulations Supported in UL	QPSK, 16QAM, 64QAM				
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3-6.2.5? (manufacturer attestation to be provided)	YES				
A-MPR (Additional MPR) disabled for SAR Testing?	YES				
LTE Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations				
LTE Additional Information	This device does not support full CA features on 3GPP Release 15. It supports carrier aggregation, downlink MIMO, LAA features as shown in Section 9 and Appendix H. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. The following LTE Release 15 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

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NR Information				
Form Factor	Portable Handset			
Frequency Range of each NR transmission band	NR Band n71 (665.5 - 695.5 MHz)			
	NR Band n5 (Cell) (826.5 - 846.5 MHz)			
	NR Band n66 (AWS) (1712.5 - 1777.5 MHz)			
	NR Band n25 (PCS) (1852.5 - 1912.5 MHz)			
	NR Band n2 (PCS) (1852.5 - 1907.5 MHz)			
	NR Band n41 (2506.02 - 2679.99 MHz)			
	NR Band n77 (3750 - 3930 MHz)			
Channel Bandwidths	NR Band n71: 5 MHz, 10 MHz, 15 MHz, 20 MHz			
	NR Band n5 (Cell): 5 MHz, 10 MHz, 15 MHz, 20 MHz			
	NR Band n66 (AWS): 5 MHz, 10 MHz, 15 MHz, 20 MHz			
	NR Band n25 (PCS): 5 MHz, 10 MHz, 15 MHz, 20 MHz			
	NR Band n2 (PCS): 5 MHz, 10 MHz, 15 MHz, 20 MHz			
	NR Band n41: 20 MHz, 40 MHz, 60 MHz, 80 MHz, 100 MHz			
NR Band n77: 100 MHz				
Channel Numbers and Frequencies (MHz)				
NR Band n71: 5 MHz	665.5 (133147)		680.5 (136100)	695.5 (133447)
NR Band n71: 10 MHz	668 (133600)		680.5 (136100)	693 (138600)
NR Band n71: 15 MHz	670.5 (134100)		680.5 (136100)	690.5 (138100)
NR Band n71: 20 MHz	673 (134600)		680.5 (136100)	688 (137600)
NR Band n5 (Cell): 5 MHz	826.5 (165300)		836.5 (167300)	846.5 (169300)
NR Band n5 (Cell): 10 MHz	829 (165800)		836.5 (167300)	844 (168800)
NR Band n5 (Cell): 15 MHz	831.5 (166300)		836.5 (167300)	841.5 (168300)
NR Band n5 (Cell): 20 MHz	834 (166800)		836.5 (167300)	839 (167800)
NR Band n66 (AWS): 5 MHz	1712.5 (342500)		1745 (349000)	1777.5 (355500)
NR Band n66 (AWS): 10 MHz	1715 (343000)		1745 (349000)	1775 (355000)
NR Band n66 (AWS): 15 MHz	1717.5 (343500)		1745 (349000)	1772.5 (354500)
NR Band n66 (AWS): 20 MHz	1720 (344000)		1745 (349000)	1770 (354000)
NR Band n25 (PCS): 5 MHz	1852.5 (370500)		1882.5 (376500)	1912.5 (382500)
NR Band n25 (PCS): 10 MHz	1855 (371000)		1882.5 (376500)	1910 (382000)
NR Band n25 (PCS): 15 MHz	1857.5 (371500)		1882.5 (376500)	1907.5 (381500)
NR Band n25 (PCS): 20 MHz	1860 (372000)		1882.5 (376500)	1905 (381000)
NR Band n2 (PCS): 5 MHz	1852.5 (370500)		1880 (376000)	1907.5 (381500)
NR Band n2 (PCS): 10 MHz	1855 (371000)		1880 (376000)	1905 (381000)
NR Band n2 (PCS): 15 MHz	1857.5 (371500)		1880 (376000)	1902.5 (380500)
NR Band n2 (PCS): 20 MHz	1860 (372000)		1880 (376000)	1900 (380000)
NR Band n41: 20 MHz	2506.02 (501204)	2549.49 (509898)	2592.99 (518598)	2636.49 (527298) 2679.99 (535998)
NR Band n41: 40 MHz	2516.01 (503202)	2567.34 (513468)	N/A	2618.67 (523734) 2670 (534000)
NR Band n41: 60 MHz	2526 (505200)		2592.99 (518598)	2659.98 (531996)
NR Band n41: 80 MHz	2536.02 (507204)		N/A	2649.99 (529998)
NR Band n41: 100 MHz	2546.01 (509202)		2592.99 (518598)	2640 (528000)
NR Band n77: 100 MHz	3750 (650000)	N/A	N/A	N/A 3930 (662000)
SCS for NR Band n71/n5/n66/n25/n2	15 kHz			
SCS for NR Band n41/n77	30 kHz			
Modulations Supported in UL	DFT-s-OFDM: 11/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM			
A-MPR (Additional MPR) disabled for SAR Testing?	YES			
EN-DC Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations			
LTE Anchor Bands for NR Band n71	LTE Band 66/2			
LTE Anchor Bands for NR Band n5 (Cell)	LTE Band 66/2/30/48			
LTE Anchor Bands for NR Band n66 (AWS)	LTE Band 12/13/14/5/48			
LTE Anchor Bands for NR Band n25 (PCS)	LTE Band 12			
LTE Anchor Bands for NR Band n2 (PCS)	LTE Band 12/13/14/5			
LTE Anchor Bands for NR Band n41	LTE Band 12/66/2			
LTE Anchor Bands for NR Band n77	LTE Band 12/13/14/5/66/2/30/7			

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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<sup>3</sup>)
- E = Total RMS electric field strength (V/m)

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

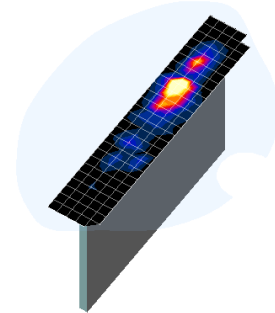
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## 4 DOSIMETRIC ASSESSMENT

### 4.1 Measurement Procedure

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

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013.
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):
  - a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 4-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).
  - b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.
  - c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.






**Figure 4-1**  
Sample SAR Area Scan

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

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

\*Also compliant to IEEE 1528-2013 Table 6

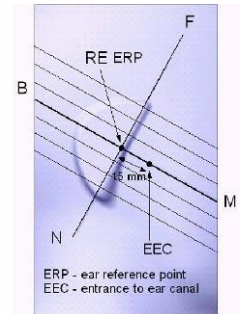
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# 5

## 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].



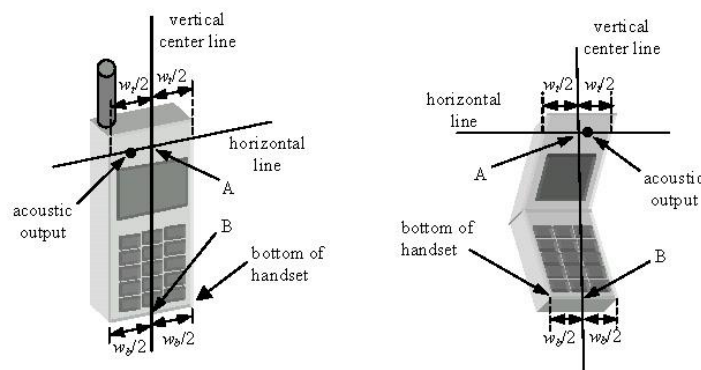
**Figure 5-1**  
Close-Up Side view of ERP

### 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 then located at the same level as the center of the ear reference point. The test device was positioned so that the “vertical centerline” was bisecting the front surface of the handset at its top and bottom edges, positioning the “ear reference point” on the outer surface of the both the left and right head phantoms on the ear reference point.



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



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

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## 6 TEST CONFIGURATION POSITIONS

### 6.1 Device Holder

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

### 6.2 Positioning for Cheek

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

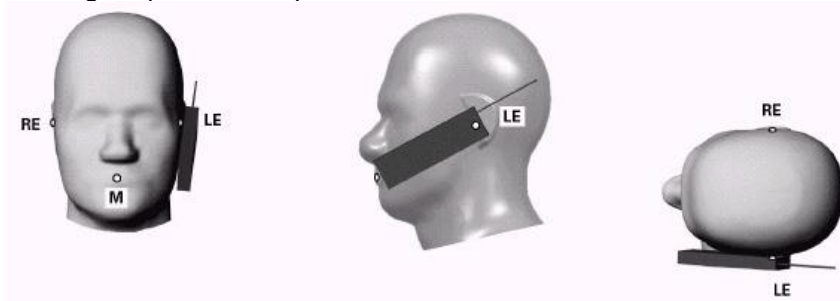





Figure 6-1 Front, Side and Top View of Cheek Position

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

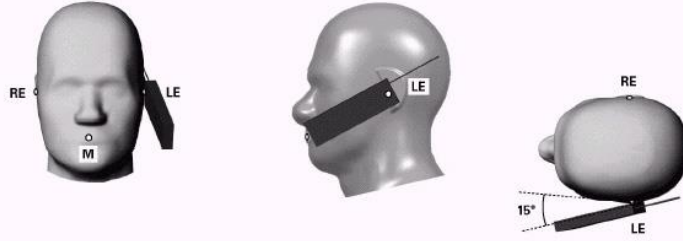
### 6.3 Positioning for Ear / 15° Tilt

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

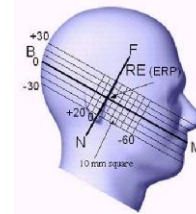
1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15 degrees.
2. The phone was then rotated around the horizontal line by 15 degrees.
3. While maintaining the orientation of the phone, the phone was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

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



**Figure 6-3 Side view w/ relevant markings**

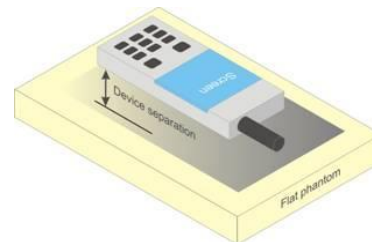
### 6.4 SAR Evaluations near the Mouth/Jaw Regions of the SAM Phantom

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

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

### 6.5 Body-Worn Accessory Configurations

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



**Figure 6-4 Sample Body-Worn Diagram**

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

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

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

## 6.6 Extremity Exposure Configurations

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

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




## 6.7 Wireless Router Configurations

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

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

## 6.8 Phablet Configurations

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

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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  $\leq 25$  mm from that surface or edge, in direct contact with the phantom, for 10g SAR. The UMPC mini-tablet 1g SAR at 5 mm is not required. When hotspot mode applies, 10g SAR is required only for the surfaces and edges with hotspot mode 1g SAR  $> 1.2$  W/kg.

## 6.9 Proximity Sensor Considerations

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

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

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

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# 7 RF EXPOSURE LIMITS

## 7.1 Uncontrolled Environment

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



## 7.2 Controlled Environment

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

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

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT <i>General Population</i> (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT <i>Occupational</i> (W/kg) or (mW/g)
<b>Peak Spatial Average SAR</b> Head	1.6	8.0
<b>Whole Body SAR</b>	0.08	0.4
<b>Peak Spatial Average SAR</b> 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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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<sub>0</sub> 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 SCH<sub>0</sub> 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
$\frac{I_{or}}{I_{or}}$	dBm/1.23 MHz	-104
$\frac{Pilot E_c}{I_{or}}$	dB	-7
$\frac{Traffic E_c}{I_{or}}$	dB	-7.4

**Table 8-2**  
**Parameters for Max. Power for RC3**

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

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

## 8.4.2 Head SAR Measurements

SAR for next to the ear head exposure is measured in RC3 with the handset configured to transmit at 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+SCH<sub>n</sub>), with FCH only as the primary mode. Otherwise, SAR is required for multiple code channel configuration (FCH + SCH<sub>n</sub>), with FCH at full rate and SCH<sub>0</sub> enabled at 9600 bps, using the highest reported SAR configuration for FCH only. When multiple code channels are enabled, the transmitter output can shift by more than 0.5 dB and may lead to higher SAR drifts and SCH dropouts.

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

## 8.4.4 Body-worn SAR Measurements for EVDO Devices

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

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

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

### 8.4.5 Body SAR Measurements for EVDO Hotspot

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

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

### 8.4.6 CDMA2000 1x Advanced

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

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




## 8.5 SAR Measurement Conditions for UMTS

### 8.5.1 Output Power Verification

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

### 8.5.2 Head SAR Measurements

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

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### 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<sub>n</sub> 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<sub>n</sub>, 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  $\leq 0.8$  W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
  - iii. When the reported SAR for a required test channel is  $> 1.45$  W/kg, SAR is required for all RB offset configurations for that channel.
- b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.
- c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is  $< 0.8$  W/kg.
- d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sections 5.2.1 through 5.2.3 is less than or equal to  $\frac{1}{2}$  dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is  $< 1.45$  W/kg.

## 8.6.5 TDD

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

## 8.6.6 Downlink Only Carrier Aggregation

Conducted power measurements with LTE Carrier Aggregation (CA) (downlink only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to specifications when downlink carrier aggregation is inactive on the PCC. Additional conducted output powers are measured with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band. Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for downlink only carrier aggregation configurations when the average output

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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 10g 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  $\leq 0.4$  W/kg, no additional testing for the remaining test positions is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR

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positions until the reported SAR result is  $\leq 0.8$  W/kg or all test positions are measured. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

### 8.7.5 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  $\leq 0.8$  W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 2) When the reported SAR is  $> 0.8$  W/kg, SAR is required for that position using the next highest measured output power channel. When any reported SAR is  $> 1.2$  W/kg, SAR is required for the third channel; i.e., all channels require testing.

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




### 8.7.6 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. Per April 2019 TCB Workshop guidance, 802.11ax was considered the highest order 802.11 mode. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

### 8.7.7 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  $\leq 0.8$  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  $\leq 1.2$  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 10g 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  $\leq 1.2$  W/kg, no additional SAR tests for the subsequent test configurations are required. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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## 9 RF CONDUCTED POWERS

All conducted power measurements for 2G/3G/4G/5G Sub6 WWAN technologies and bands in this section were performed by setting *Reserve\_power\_margin* (Qualcomm® Smart Transmit EFS entry) to 0dB, so that the EUT transmits continuously at minimum ( $P_{limit}$ , maximum tune up output power  $P_{max}$ ).

### 9.1 CDMA Conducted Powers

**Table 9-1**  
**Measured  $P_{max}$**




Band	Channel	Rule Part	Frequency	SO55 [dBm]	SO55 [dBm]	SO75 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	RC1	RC3	RC11	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	564	90S	820.1	24.88	24.82	24.25	24.78	24.76	23.81	23.79
Cellular	1013	22H	824.7	24.97	24.91	24.37	24.87	24.86	23.92	23.92
	384	22H	836.52	24.96	24.89	24.49	24.87	24.88	23.98	23.87
	777	22H	848.31	24.67	24.63	24.30	24.61	24.62	23.65	23.62
PCS	25	24E	1851.25	25.23	25.11	24.93	25.11	25.12	24.03	24.06
	600	24E	1880	25.15	25.11	24.51	25.08	25.03	23.83	24.05
	1175	24E	1908.75	24.96	24.98	24.34	24.92	24.91	23.92	23.93

**Table 9-2**

**Measured  $P_{limit}$  for DSI = 2 (Hotspot Mode), DSI = 4,5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active)**

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)
PCS	25	24E	1851.25	19.38	19.44	19.77	19.39	19.35	19.46	19.35
	600	24E	1880	19.35	19.35	19.36	19.38	19.38	19.35	19.41
	1175	24E	1908.75	19.35	19.40	19.20	19.35	19.34	19.45	19.35

Note: RC1 is only applicable for IS-95 compatibility. For FCC Rule Part 90S, Per FCC KDB Publication 447498 D01v06 4.1.g), only one channel is required since the device operates within the transmission range of 817.90 – 823.10 MHz.

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**Figure 9-1**  
**Power Measurement Setup**

## 9.2 GSM Conducted Powers

**Table 9-3**  
**Measured  $P_{max}$**

Maximum Burst-Averaged Output Power										
Band	Channel	Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
		GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 850	128	33.01	33.21	32.05	29.79	<b>28.81</b>	27.12	25.27	23.11	22.26
	190	33.07	33.25	32.34	30.00	<b>29.27</b>	27.42	25.64	23.38	22.37
	251	32.68	32.93	31.62	29.77	<b>28.71</b>	27.05	25.22	23.06	22.49
GSM 1900	512	30.50	30.49	29.50	<b>27.34</b>	25.71	26.20	25.33	23.16	22.00
	661	30.08	30.22	29.43	<b>27.39</b>	25.68	26.36	25.45	23.14	21.89
	810	30.18	30.41	29.15	<b>27.03</b>	25.44	25.75	25.07	22.80	21.65

Calculated Maximum Frame-Averaged Output Power										
Band	Channel	Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
		GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 850	128	23.81	24.01	25.86	25.36	<b>25.63</b>	17.92	19.08	18.68	19.08
	190	23.87	24.05	26.15	25.57	<b>26.09</b>	18.22	19.45	18.95	19.19
	251	23.48	23.73	25.43	25.34	<b>25.53</b>	17.85	19.03	18.63	19.31
GSM 1900	512	21.30	21.29	23.31	<b>22.91</b>	22.53	17.00	19.14	18.73	18.82
	661	20.88	21.02	23.24	<b>22.96</b>	22.50	17.16	19.26	18.71	18.71
	810	20.98	21.21	22.96	<b>22.60</b>	22.26	16.55	18.88	18.37	18.47

<b>GSM 850</b>	<b>Frame Avg. Targets:</b>	23.30	23.30	25.31	25.07	<b>25.82</b>	17.30	19.31	18.57	19.32
<b>GSM 1900</b>		20.30	20.30	22.31	<b>22.57</b>	22.32	16.30	18.31	18.07	17.82

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Note:

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

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



**Figure 9-2**  
**Power Measurement Setup**

### 9.3 UMTS Conducted Powers

**Table 9-4**  
**Measured  $P_{max}$**

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	23.48	23.63	23.28	23.35	23.45	23.48	24.23	24.22	24.21	-
99		12.2 kbps AMR	23.45	23.71	23.32	23.43	23.59	23.47	24.21	24.29	24.13	-
6	HSDPA	Subtest 1	22.48	22.45	22.12	21.45	21.95	22.15	21.66	21.76	21.51	0
6		Subtest 2	22.50	22.47	22.14	21.46	21.95	22.19	21.62	21.72	21.46	0
6		Subtest 3	22.00	21.96	21.65	21.99	22.41	22.64	22.11	22.22	21.98	0.5
6		Subtest 4	22.00	21.97	21.63	21.99	22.42	22.60	22.12	22.21	21.98	0.5
6	HSUPA	Subtest 1	22.50	22.44	22.13	21.45	21.96	22.15	21.60	21.73	21.48	0
6		Subtest 2	20.50	20.45	20.14	19.42	19.93	20.16	19.60	19.70	19.44	2
6		Subtest 3	21.50	21.42	21.10	20.43	20.95	21.15	20.60	20.69	20.45	1
6		Subtest 4	20.49	20.44	20.12	19.41	19.94	20.15	19.60	19.72	19.47	2
6		Subtest 5	22.50	22.45	22.13	21.44	21.95	22.17	21.61	21.72	21.48	0
8	DC-HSDPA	Subtest 1	22.50	22.43	22.09	21.47	21.96	22.20	21.69	21.80	21.52	0
8		Subtest 2	22.50	22.45	22.12	21.47	21.95	22.21	21.65	21.74	21.49	0
8		Subtest 3	22.00	21.96	21.64	22.00	22.45	22.67	22.14	22.23	22.00	0.5
8		Subtest 4	22.00	21.96	21.63	22.00	22.43	22.68	22.17	22.25	22.00	0.5

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**Table 9-5**  
**Measured  $P_{limit}$  for DSI = 2 (Hotspot Mode), DSI = 4,5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active)**

3GPP Release Version	Mode	3GPP 34.121 Subtest	AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	20.39	20.88	21.00	20.40	20.46	20.45	-
99		12.2 kbps AMR	20.32	20.89	21.00	20.63	20.51	20.39	-
6	HSDPA	Subtest 1	18.34	18.86	19.04	18.34	18.41	18.25	0
6		Subtest 2	18.33	18.85	19.01	18.37	18.44	18.30	0
6		Subtest 3	18.85	19.40	19.55	18.86	18.95	18.75	0.5
6		Subtest 4	18.83	19.41	19.55	18.82	18.94	18.79	0.5
6	HSUPA	Subtest 1	18.35	18.87	19.00	18.35	18.47	18.26	0
6		Subtest 2	16.35	16.90	17.01	16.30	16.44	16.25	2
6		Subtest 3	17.30	17.83	18.00	17.31	17.43	17.22	1
6		Subtest 4	16.32	16.84	17.00	16.30	16.42	16.21	2
6		Subtest 5	18.34	18.86	19.00	18.30	18.41	18.24	0
8	DC-HSDPA	Subtest 1	18.35	18.89	19.00	18.40	18.48	18.28	0
8		Subtest 2	18.30	18.89	18.99	18.37	18.50	18.24	0
8		Subtest 3	18.90	19.40	19.58	18.91	18.99	18.82	0.5
8		Subtest 4	18.85	19.39	19.56	18.89	18.99	18.87	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 1 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




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

### 9.4.1 LTE Band 71

**Table 9-6**  
**LTE Band 71 Measured P<sub>max</sub> for all DSI - 20 MHz Bandwidth**

LTE Band 71 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			133297 (680.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	<b>24.85</b>	0	0
	1	50	24.79		0
	1	99	24.49		0
	50	0	<b>24.04</b>	0-1	1
	50	25	23.96		1
	50	50	23.74		1
	100	0	23.88		1
16QAM	1	0	24.36	0-1	1
	1	50	24.40		1
	1	99	23.96		1
	50	0	23.04	0-2	2
	50	25	22.99		2
	50	50	22.80		2
	100	0	22.87		2
64QAM	1	0	23.08	0-2	2
	1	50	23.05		2
	1	99	22.70		2
	50	0	22.03	0-3	3
	50	25	21.97		3
	50	50	21.81		3
	100	0	21.93		3

Note: LTE Band 71 at 20 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

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9.4.2

LTE Band 12

Table 9-7  
 LTE Band 12 Measured P<sub>max</sub> for all DSI - 10 MHz Bandwidth

LTE Band 12 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23095 (707.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	22.60	0	0
	1	25	22.53		0
	1	49	22.48		0
	25	0	21.65	0-1	1
	25	12	21.62		1
	25	25	21.56		1
	50	0	21.60		1
16QAM	1	0	22.15	0-1	1
	1	25	22.06		1
	1	49	21.94		1
	25	0	20.64	0-2	2
	25	12	20.57		2
	25	25	20.45		2
	50	0	20.60		2
64QAM	1	0	20.99	0-2	2
	1	25	20.85		2
	1	49	20.61		2
	25	0	19.71	0-3	3
	25	12	19.70		3
	25	25	19.66		3
	50	0	19.68		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.

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9.4.3

LTE Band 13

Table 9-8  
 LTE Band 13 Measured P<sub>max</sub> for all DSI - 10 MHz Bandwidth

LTE Band 13 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23230 (782.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	23.05	0	0
	1	25	23.07		0
	1	49	<b>23.14</b>		0
	25	0	22.01	0-1	1
	25	12	22.09		1
	25	25	<b>22.13</b>		1
	50	0	22.06		1
16QAM	1	0	22.60	0-1	1
	1	25	22.62		1
	1	49	22.76		1
	25	0	21.17	0-2	2
	25	12	21.12		2
	25	25	21.21		2
	50	0	21.04		2
64QAM	1	0	21.51	0-2	2
	1	25	21.57		2
	1	49	21.66		2
	25	0	20.17	0-3	3
	25	12	20.13		3
	25	25	20.19		3
	50	0	20.05		3




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9.4.4

LTE Band 14

Table 9-9  
 LTE Band 14 Measured P<sub>max</sub> for all DSI - 10 MHz Bandwidth

LTE Band 14 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23330 (793.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	24.52	0	0
	1	25	24.27		0
	1	49	24.16		0
	25	0	23.42	0-1	1
	25	12	23.54		1
	25	25	23.45		1
	50	0	23.42		1
16QAM	1	0	23.71	0-1	1
	1	25	23.69		1
	1	49	23.62		1
	25	0	22.46	0-2	2
	25	12	22.58		2
	25	25	22.48		2
	50	0	22.50		2
64QAM	1	0	22.54	0-2	2
	1	25	22.70		2
	1	49	22.74		2
	25	0	21.51	0-3	3
	25	12	21.56		3
	25	25	21.55		3
	50	0	21.48		3

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LTE Band 26 (Cell)

Table 9-10  
 LTE Band 26 (Cell) Measured P<sub>max</sub> for all DSI - 15 MHz Bandwidth

LTE Band 26 (Cell) 15 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26865 (831.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	23.85	0	0
	1	36	23.87		0
	1	74	<b>23.97</b>		0
	36	0	22.95	0-1	1
	36	18	22.96		1
	36	37	<b>23.05</b>		1
	75	0	22.89		1
16QAM	1	0	23.46	0-1	1
	1	36	23.33		1
	1	74	23.41		1
	36	0	21.93	0-2	2
	36	18	22.01		2
	36	37	22.04		2
	75	0	21.96		2
64QAM	1	0	22.19	0-2	2
	1	36	22.17		2
	1	74	22.35		2
	36	0	20.98	0-3	3
	36	18	21.03		3
	36	37	21.03		3
	75	0	21.01		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.

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LTE Band 5 (Cell)

Table 9-11  
 LTE Band 5 (Cell) Measured P<sub>max</sub> for all DSI - 10 MHz Bandwidth

LTE Band 5 (Cell) 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20525 (836.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	22.87	0	0
	1	25	23.07		0
	1	49	<b>23.14</b>		0
	25	0	22.25	0-1	1
	25	12	<b>22.26</b>		1
	25	25	22.13		1
	50	0	22.12		1
16QAM	1	0	22.38	0-1	1
	1	25	22.36		1
	1	49	22.31		1
	25	0	21.34	0-2	2
	25	12	21.36		2
	25	25	21.13		2
	50	0	21.20		2
64QAM	1	0	21.54	0-2	2
	1	25	21.43		2
	1	49	21.27		2
	25	0	20.41	0-3	3
	25	12	20.31		3
	25	25	20.14		3
	50	0	20.12		3

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

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9.4.7

LTE Band 66 (AWS)

Table 9-12




LTE Band 66 (AWS) Measured P<sub>max</sub> for DSI = 1 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor inactive) - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth								
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]	
			132072 (1720.0 MHz)	132322 (1745.0 MHz)	132572 (1770.0 MHz)			
			Conducted Power [dBm]					
QPSK	1	0	23.01	22.50	23.15	0	0	
	1	50	23.30	22.73	23.22		0	
	1	99	23.07	22.78	23.34		0	
	50	0	22.29	21.90	22.20	0-1	1	
	50	25	22.30	22.00	22.44		1	
	50	50	22.27	21.92	22.33		1	
16QAM	100	0	22.27	21.97	22.35	0-1	1	
	1	0	22.32	21.99	22.48		0-1	1
	1	50	22.65	22.30	22.63			1
	1	99	22.47	22.10	22.66	0-2		1
	50	0	21.32	21.07	21.27		2	
	50	25	21.49	21.10	21.34		2	
64QAM	50	50	21.28	21.01	21.32	0-2	2	
	100	0	21.34	21.00	21.20		2	
	1	0	21.22	20.83	21.34		0-2	2
	1	50	21.45	21.16	21.52	0-3		2
	1	99	21.22	21.06	21.62			2
	50	0	20.38	20.08	20.32		0-3	3
50	25	20.41	20.16	20.37	3			
50	50	20.26	20.06	20.33	3			
100	0	20.29	20.03	20.27		3		

Table 9-13

LTE Band 66 (AWS) Measured P<sub>max</sub> for DSI = 1 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor inactive) - 10 MHz Bandwidth

LTE Band 66 (AWS) 10 MHz Bandwidth								
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]	
			132022 (1715.0 MHz)	132322 (1745.0 MHz)	132622 (1775.0 MHz)			
			Conducted Power [dBm]					
QPSK	1	0	22.98	22.60	22.89	0	0	
	1	25	23.29	22.62	23.10		0	
	1	49	22.91	22.69	22.88		0	
	25	0	22.26	21.81	22.07	0-1	1	
	25	12	22.23	21.90	22.24		1	
	25	25	22.10	21.84	22.20		1	
16QAM	50	0	22.27	21.91	22.14	0-1	1	
	1	0	22.24	21.77	22.25		0-1	1
	1	25	22.31	21.90	22.38			0-2
	1	49	22.16	21.92	22.25	0-2		
	25	0	21.30	20.95	21.30		2	
	25	12	21.38	21.02	21.32		2	
64QAM	25	25	21.12	20.91	21.32	0-2	2	
	50	0	21.27	20.88	21.21		0-3	2
	1	0	21.21	20.79	21.18			0-2
	1	25	21.39	21.03	21.19	0-3		
	1	49	21.01	20.89	21.34		0-3	
	25	0	20.30	19.96	20.24			3
25	12	20.41	19.97	20.24	3			
25	25	20.13	19.96	20.33	3			
50	0	20.28	19.83	20.13		3		




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**Table 9-14**  
**LTE Band 66 (AWS) Measured  $P_{limit}$  for DSI = 2 (Hotspot Mode), DSI = 4,5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active) - 20 MHz Bandwidth**

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			132072 (1720.0 MHz)	132322 (1745.0 MHz)	132572 (1770.0 MHz)		
Conducted Power [dBm]							
QPSK	1	0	20.56	20.45	20.83	0	0
	1	50	20.85	20.63	20.98		0
	1	99	20.62	20.60	21.06		0
	50	0	20.91	20.65	20.88	0-1	0
	50	25	21.02	20.78	20.96		0
	50	50	20.84	20.77	21.07		0
100	0	20.94	20.80	20.97	0	0	
16QAM	1	0	20.95	20.70	21.14	0-1	0
	1	50	21.13	20.91	21.28		0
	1	99	21.02	20.87	21.45		0
	50	0	20.91	20.67	20.92	0-2	0
	50	25	21.07	20.75	21.05		0
	50	50	20.89	20.73	21.07		0
100	0	21.01	20.74	20.89	0	0	
64QAM	1	0	20.89	20.75	21.00	0-2	0
	1	50	21.12	20.86	21.13		0
	1	99	20.93	20.80	21.34		0
	50	0	19.92	19.71	20.00	0-3	0.5
	50	25	20.05	19.82	20.08		0.5
	50	50	19.92	19.78	20.05		0.5
100	0	19.97	19.79	19.96	0.5	0.5	

**Table 9-15**  
**LTE Band 66 (AWS) Measured  $P_{limit}$  for DSI = 2 (Hotspot Mode), DSI = 4,5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active) - 10 MHz Bandwidth**

LTE Band 66 (AWS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			132022 (1715.0 MHz)	132322 (1745.0 MHz)	132622 (1775.0 MHz)		
Conducted Power [dBm]							
QPSK	1	0	20.92	20.48	20.79	0	0
	1	25	21.08	20.75	21.14		0
	1	49	20.98	20.52	21.00		0
	25	0	21.13	20.78	21.08	0-1	0
	25	12	21.18	20.99	21.18		0
	25	25	21.11	20.84	21.13		0
50	0	21.12	20.87	21.14	0	0	
16QAM	1	0	21.14	20.84	21.00	0-1	0
	1	25	21.36	21.09	21.23		0
	1	49	21.16	20.87	21.15		0
	25	0	21.28	20.92	21.07	0-2	0
	25	12	21.31	20.98	21.14		0
	25	25	21.08	20.84	21.11		0
50	0	21.20	20.88	21.07	0	0	
64QAM	1	0	21.25	20.79	20.97	0-2	0
	1	25	21.42	21.04	21.23		0
	1	49	21.09	20.83	21.12		0
	25	0	20.27	19.90	20.08	0-3	0.5
	25	12	20.30	19.97	20.15		0.5
	25	25	20.11	19.90	20.11		0.5
50	0	20.18	19.87	20.04	0.5	0.5	

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LTE Band 25 (PCS)

Table 9-16




LTE Band 25 (PCS) Measured  $P_{max}$  for DSI = 1 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor inactive) - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26140 (1860.0 MHz)	26365 (1882.5 MHz)	26590 (1905.0 MHz)		
Conducted Power [dBm]							
QPSK	1	0	23.33	23.81	23.48	0	0
	1	50	23.39	23.85	23.36		0
	1	99	23.46	23.71	23.37		0
	50	0	22.65	22.72	22.55	0-1	1
	50	25	22.74	22.75	22.49		1
	50	50	22.73	22.72	22.39		1
16QAM	100	0	22.62	22.63	22.42	0-1	1
	1	0	22.99	22.98	22.95		1
	1	50	22.98	23.00	22.81		1
	1	99	23.00	22.99	22.82	0-2	1
	50	0	21.65	21.74	21.47		2
	50	25	21.77	21.74	21.45		2
64QAM	50	50	21.76	21.70	21.37	0-2	2
	100	0	21.63	21.66	21.42		2
	1	0	21.79	21.84	21.54		0-2
	1	50	21.91	21.90	21.46	2	
	1	99	21.97	21.80	21.36	2	
	64QAM	50	0	20.63	20.79	20.54	0-3
50		25	20.72	20.82	20.52	3	
50		50	20.73	20.78	20.41	3	
100		0	20.59	20.70	20.43	3	

Table 9-17

LTE Band 25 (PCS) Measured  $P_{limit}$  for DSI = 2 (Hotspot Mode), DSI = 4,5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active) - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26140 (1860.0 MHz)	26365 (1882.5 MHz)	26590 (1905.0 MHz)		
Conducted Power [dBm]							
QPSK	1	0	19.54	19.63	19.44	0	0
	1	50	19.52	19.67	19.37		0
	1	99	19.63	19.66	19.40		0
	50	0	19.55	19.71	19.46	0-1	0
	50	25	19.74	19.77	19.50		0
	50	50	19.72	19.71	19.33		0
16QAM	100	0	19.61	19.64	19.38	0-1	0
	1	0	19.86	19.98	19.76		0
	1	50	19.81	19.99	19.59		0
	1	99	19.85	19.95	19.63	0-2	0
	50	0	19.66	19.74	19.54		0
	50	25	19.74	19.71	19.47		0
64QAM	50	50	19.71	19.74	19.38	0-2	0
	100	0	19.65	19.86	19.35		0
	1	0	19.82	19.84	19.72		0-2
	1	50	19.84	19.93	19.62	0	
	1	99	19.88	19.84	19.49	0	
	64QAM	50	0	19.67	19.66	19.56	0-3
50		25	19.78	19.74	19.55	0	
50		50	19.71	19.72	19.40	0	
100		0	19.64	19.61	19.48	0	

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LTE Band 30




Table 9-18  
 LTE Band 30 Measured  $P_{max}$  for DSI = 0 (Body-worn, or Phablet with grip sensor inactive) - 10 MHz Bandwidth

LTE Band 30 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			27710 (2310.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	22.68	0	0
	1	25	22.70		0
	1	49	<b>22.75</b>		0
	25	0	21.77	0-1	1
	25	12	<b>21.80</b>		1
	25	25	21.71		1
	50	0	21.68		1
16QAM	1	0	21.84	0-1	1
	1	25	21.89		1
	1	49	21.88		1
	25	0	20.88	0-2	2
	25	12	20.91		2
	25	25	20.89		2
	50	0	20.73		2
64QAM	1	0	20.74	0-2	2
	1	25	20.69		2
	1	49	20.79		2
	25	0	19.89	0-3	3
	25	12	19.85		3
	25	25	19.64		3
	50	0	19.72		3

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**Table 9-19**  
**LTE Band 30 Measured  $P_{limit}$  for DSI =1 (Head), DSI = 2 (Hotspot Mode), DSI = 4,5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active) - 10 MHz Bandwidth**

LTE Band 30 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			27710 (2310.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	18.75	0	0
	1	25	18.66		0
	1	49	18.60		0
	25	0	18.71	0-1	0
	25	12	18.66		0
	25	25	18.70		0
	50	0	18.67		0
16QAM	1	0	18.75	0-1	0
	1	25	18.96		0
	1	49	19.04		0
	25	0	18.84	0-2	0
	25	12	18.86		0
	25	25	18.74		0
	50	0	18.70		0
64QAM	1	0	19.07	0-2	0
	1	25	18.89		0
	1	49	18.96		0
	25	0	18.77	0-3	0
	25	12	18.73		0
	25	25	18.75		0
	50	0	18.78		0

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LTE Band 7

Table 9-20  
 LTE Band 7 Measured  $P_{max}$  for DSI = 0 (Body-worn, or Phablet with grip sensor inactive) - 20 MHz Bandwidth

LTE Band 7 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20850 (2510.0 MHz)	21100 (2535.0 MHz)	21350 (2560.0 MHz)		
Conducted Power [dBm]							
QPSK	1	0	23.55	23.29	22.68	0	0
	1	50	23.47	23.09	22.58		0
	1	99	23.32	23.06	22.52		0
	50	0	22.63	22.12	21.91	0-1	1
	50	25	22.54	22.11	21.90		1
	50	50	22.43	22.00	21.81		1
16QAM	100	0	22.43	22.02	21.83	0-1	1
	1	0	22.88	22.45	22.11		1
	1	50	22.86	22.36	22.07		1
	1	99	22.74	22.35	22.05	0-2	1
	50	0	21.58	21.11	20.96		2
	50	25	21.52	21.09	20.92		2
64QAM	50	50	21.44	21.01	20.81	0-2	2
	100	0	21.44	21.02	20.83		2
	1	0	21.66	21.28	21.14		0-2
	1	50	21.55	21.11	21.04	2	
	1	99	21.50	21.04	20.99	0-3	
	50	0	20.65	20.17	19.90		3
50	25	20.55	20.14	19.90	3		
64QAM	50	50	20.51	20.05	19.83	0-3	3
	100	0	20.49	20.06	19.81		3

Table 9-21  
 LTE Band 7 Measured  $P_{limit}$  for DSI = 1 (Head), DSI = 2 (Hotspot Mode), DSI = 4, 5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active) - 20 MHz Bandwidth

LTE Band 7 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20850 (2510.0 MHz)	21100 (2535.0 MHz)	21350 (2560.0 MHz)		
Conducted Power [dBm]							
QPSK	1	0	18.65	18.79	19.01	0	0
	1	50	18.52	18.94	18.93		0
	1	99	18.71	19.08	18.80		0
	50	0	18.56	18.85	18.97	0-1	0
	50	25	18.64	18.93	19.04		0
	50	50	18.65	19.05	18.96		0
16QAM	100	0	18.62	18.90	18.91	0-1	0
	1	0	18.91	19.06	19.22		0
	1	50	18.74	19.13	19.18		0
	1	99	18.87	19.15	19.14	0-2	0
	50	0	18.46	18.84	19.02		0
	50	25	18.63	18.87	19.07		0
64QAM	50	50	18.74	19.00	19.01	0-2	0
	100	0	18.58	18.85	18.97		0
	1	0	18.72	19.03	19.14		0-2
	1	50	18.81	19.11	18.94	0	
	1	99	19.02	19.14	19.14	0-3	
	50	0	18.52	18.91	19.05		0
50	25	18.73	19.01	19.13	0		
64QAM	50	50	18.72	19.06	19.05	0-3	0
	100	0	18.58	18.88	18.93		0

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LTE Band 48

Table 9-22

LTE Band 48 Measured  $P_{max}$  for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), DSI = 4,5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active) - 20 MHz Bandwidth

LTE Band 48 20 MHz Bandwidth								
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			55340 (3560.0 MHz)	55773 (3603.3 MHz)	56207 (3646.7 MHz)	56640 (3690.0 MHz)		
			Conducted Power [dBm]					
QPSK	1	0	22.20	21.40	21.48	22.07	0	0
	1	50	22.11	21.21	21.62	22.28		0
	1	99	21.98	21.15	21.86	22.37		0
	50	0	21.20	20.39	20.48	21.32	0-1	1
	50	25	21.25	20.34	20.71	21.44		1
	50	50	20.82	20.21	20.73	21.31		1
	100	0	21.12	20.25	20.65	21.27		1
16QAM	1	0	21.38	20.60	20.68	21.43	0-1	1
	1	50	21.32	20.48	20.85	21.52		1
	1	99	21.29	20.38	21.00	21.61		1
	50	0	20.25	19.42	19.56	20.30	0-2	2
	50	25	20.38	19.37	19.75	20.36		2
	50	50	20.24	19.26	19.73	20.41		2
	100	0	20.15	19.31	19.62	20.27		2
64QAM	1	0	19.95	19.10	19.15	19.88	0-2	2
	1	50	19.88	19.04	19.42	20.07		2
	1	99	19.64	18.84	19.67	20.15		2
	50	0	19.25	18.45	18.59	19.27	0-3	3
	50	25	19.43	18.41	18.79	19.42		3
	50	50	19.13	18.25	18.83	19.39		3
	100	0	19.18	18.23	18.58	19.30		3




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**Table 9-23**  
**LTE Band 48 Measured  $P_{limit}$  for DSI = 2 (Hotspot Mode) - 20 MHz Bandwidth**

LTE Band 48 20 MHz Bandwidth								
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			55340 (3560.0 MHz)	55773 (3603.3 MHz)	56207 (3646.7 MHz)	56640 (3690.0 MHz)		
			Conducted Power [dBm]					
QPSK	1	0	20.70	20.21	20.15	20.92	0	0
	1	50	20.63	20.07	20.21	20.84		0
	1	99	20.49	20.13	20.19	<b>20.93</b>		0
	50	0	20.71	20.18	20.16	20.96	0-1	0
	50	25	20.77	20.01	20.33	<b>21.00</b>		0
	50	50	20.62	20.04	20.21	20.88		0
	100	0	20.75	20.16	20.09	20.90		0
16QAM	1	0	20.84	20.31	20.15	21.06	0-1	0
	1	50	20.85	20.22	20.22	21.07		0
	1	99	20.71	20.19	20.19	21.11		0
	50	0	19.96	19.33	19.40	20.00	0-2	0.5
	50	25	20.04	19.39	19.32	20.00		0.5
	50	50	20.05	19.28	19.16	20.02		0.5
	100	0	19.92	19.14	19.21	20.11		0.5
64QAM	1	0	19.77	19.36	19.45	20.06	0-2	0.5
	1	50	19.68	19.27	19.44	19.99		0.5
	1	99	19.51	19.25	19.38	20.05		0.5
	50	0	18.79	18.33	18.42	19.12	0-3	1.5
	50	25	18.81	18.24	18.36	19.10		1.5
	50	50	18.87	18.18	18.40	19.04		1.5
	100	0	18.85	18.27	18.39	19.02		1.5

**Table 9-24**  
**LTE Band 48 Measured  $P_{limit}$  for DSI =1 (Head) - 20 MHz Bandwidth**

LTE Band 48 20 MHz Bandwidth								
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			55340 (3560.0 MHz)	55773 (3603.3 MHz)	56207 (3646.7 MHz)	56640 (3690.0 MHz)		
			Conducted Power [dBm]					
QPSK	1	0	17.66	16.90	16.72	17.56	0	0
	1	50	17.57	16.74	16.92	17.75		0
	1	99	17.44	16.69	17.10	<b>17.87</b>		0
	50	0	17.68	16.91	16.76	17.70	0-1	0
	50	25	17.77	16.88	16.96	17.86		0
	50	50	17.56	16.73	17.03	<b>17.88</b>		0
	100	0	17.58	16.77	16.87	17.77		0
16QAM	1	0	17.95	17.25	16.82	17.95	0-1	0
	1	50	17.97	17.14	17.03	17.97		0
	1	99	17.95	17.01	17.21	17.99		0
	50	0	17.75	16.86	16.77	17.73	0-2	0
	50	25	17.82	16.80	17.01	17.88		0
	50	50	17.62	16.69	17.06	17.91		0
	100	0	17.62	16.78	16.88	17.78		0
64QAM	1	0	17.44	17.22	16.78	17.26	0-2	0
	1	50	17.35	17.10	16.99	17.48		0
	1	99	17.18	16.97	17.21	17.61		0
	50	0	17.77	16.94	17.21	17.79	0-3	0
	50	25	17.87	16.92	17.05	17.90		0
	50	50	17.64	16.77	17.11	17.95		0
	100	0	17.69	16.81	16.92	17.84		0

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LTE Band 41

**Table 9-25**  
**LTE Band 41 PC3 Measured  $P_{max}$  for DSI = 0 (Body-worn, or Phablet with grip sensor inactive) - 20 MHz Bandwidth**

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	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	23.48	23.58	23.33	23.03	22.82	0	0
	1	50	23.42	23.48	23.75	23.23	23.22		0
	1	99	23.45	23.42	23.37	22.69	23.19		0
	50	0	22.47	22.55	22.60	22.34	22.19	0-1	1
	50	25	22.56	22.62	22.76	22.40	22.43		1
	50	50	22.53	22.58	22.70	22.14	22.40		1
16QAM	100	0	22.48	22.57	22.60	22.29	22.32	0-1	1
	1	0	22.78	22.90	22.63	22.42	22.15		1
	1	50	22.75	22.85	23.03	22.58	22.57		1
	1	99	22.79	22.80	22.65	22.08	22.52	0-2	2
	50	0	21.50	21.60	21.64	21.37	21.28		2
	50	25	21.62	21.69	21.82	21.45	21.44		2
64QAM	50	50	21.60	21.64	21.70	21.14	21.45	0-2	2
	100	0	21.50	21.58	21.68	21.33	21.33		2
	1	0	21.45	21.59	21.25	21.10	20.85		0-3
	1	50	21.50	21.70	21.76	21.27	21.29	2	
	1	99	21.52	21.54	21.30	20.72	21.25	2	
	50	0	20.47	20.61	20.64	20.37	20.26	3	
50	25	20.61	20.70	20.82	20.44	20.45	3		
50	50	20.61	20.64	20.74	20.20	20.44	3		
100	0	20.52	20.59	20.66	20.33	20.35	3		

**Table 9-26**  
**LTE Band 41 PC2 Measured  $P_{max}$  for DSI = 0 (Body-worn, or Phablet with grip sensor inactive) - 20 MHz Bandwidth**

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	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)		
QPSK	1	0	25.54	26.10	26.27	25.61	25.54	0	0
	1	50	25.45	25.99	26.20	25.32	25.14		0
	1	99	25.48	25.85	25.90	25.28	25.02		0
	50	0	24.70	25.30	25.28	24.75	24.50	0-1	1
	50	25	24.75	25.14	25.34	24.66	24.38		1
	50	50	24.74	25.28	25.03	24.61	24.38		1
100	0	24.82	25.12	25.20	24.73	24.52	1		

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**Table 9-27**




**LTE Band 41 PC3 Measured  $P_{limit}$  for DSI = 1 (Head), DSI = 2 (Hotspot Mode), DSI = 4,5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active) - 20 MHz Bandwidth**

LTE Band 41 20 MHz Bandwidth										
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]	
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)			
			Conducted Power [dBm]							
QPSK	1	0	20.43	20.62	20.35	20.21	20.04	0	0	
	1	50	20.44	20.61	20.76	20.33	20.26		0	
	1	99	20.49	20.58	20.40	20.08	20.23		0	
	16QAM	50	0	20.44	20.60	20.62	20.40	20.21	0-1	0
		50	25	20.57	20.71	20.77	20.45	20.40		0
		50	50	20.58	20.64	20.73	20.18	20.42		0
		64QAM	100	0	20.49	20.59	20.65	20.34	20.33	0-1
1			0	20.59	20.86	20.51	20.30	20.02	0	
1			50	20.60	20.75	20.91	20.44	20.46	0	
16QAM	1		99	20.64	20.74	20.53	19.97	20.45	0-2	0
	50		0	20.52	20.68	20.68	20.43	20.27		0
	50		25	20.61	20.74	20.81	20.46	20.52		0
	64QAM		50	50	20.62	20.69	20.78	20.22	20.51	0-2
		100	0	20.53	20.63	20.71	20.38	20.38	0	
		1	0	20.08	20.24	19.94	20.00	19.92	0	
16QAM		1	50	20.12	20.27	20.42	19.99	19.98	0-2	0
		1	99	20.17	20.20	20.00	19.81	19.96		0
		50	0	20.49	20.66	20.68	20.41	20.26		0-3
		50	25	20.65	20.74	20.85	20.47	20.48	0	
	50	50	20.59	20.68	20.76	20.24	20.46	0		
	100	0	20.50	20.60	20.70	20.33	20.33	0		

**Table 9-28**

**LTE Band 41 PC2 Measured  $P_{limit}$  for DSI = 1 (Head), DSI = 2 (Hotspot Mode), DSI = 4,5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active) - 20 MHz Bandwidth**

LTE Band 41 20 MHz Bandwidth										
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]	
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)			
			Conducted Power [dBm]							
QPSK	1	0	22.04	22.20	21.93	21.74	21.53	0	0	
	1	50	22.09	22.15	22.33	21.94	21.94		0	
	1	99	22.14	22.12	22.03	21.46	21.90		0	
	16QAM	50	0	22.06	22.21	22.18	22.00	21.83	0-1	0
		50	25	22.17	22.30	22.36	22.05	22.04		0
		50	50	22.16	22.22	22.29	21.79	22.03		0
		64QAM	100	0	22.10	22.17	22.27	21.96	21.97	0

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## 9.4.13 LTE Uplink Carrier Aggregation Conducted Powers

Table 9-29  
LTE Band 5 Uplink Carrier Aggregation Measured  $P_{max}$  for all DSI

Combination	PCC									SCC									Power	
	PCC Band	PCC Bandwidth [MHz]	PCC UL Channel	PCC UL Frequency [MHz]	PCC DL Channel	PCC DL Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC UL Channel	SCC UL Frequency [MHz]	SCC DL Channel	SCC DL Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_5B	LTE B5	10	20525	836.5	2525	881.5	QPSK	1	49	LTE B5	5	20597	843.7	2597	888.7	QPSK	1	0	23.45	23.14

Table 9-30  
LTE Band 66 Uplink Carrier Aggregation Measured  $P_{max}$  for DSI = 1 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor inactive)

Combination	PCC									SCC									Power	
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	PCC DL Channel	PCC DL Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_66C	LTE B66	20	132572	1770.0	67036	2170.0	QPSK	1	0	LTE B66	20	132374	1750.2	66838	2150.2	QPSK	1	99	24.24	23.15
CA_66B	LTE B66	10	132622	1775.0	67086	2175.0	QPSK	1	0	LTE B66	10	132523	1765.1	66987	2165.1	QPSK	1	49	24.03	22.89

Table 9-31  
LTE Band 66 Uplink Carrier Aggregation Measured  $P_{limit}$  for DSI = 2 (Hotspot Mode), DSI = 4, 5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active)

Combination	PCC									SCC									Power	
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	PCC DL Channel	PCC DL Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_66C	LTE B66	20	132572	1770.0	67036	2170.0	QPSK	50	0	LTE B66	20	132374	1750.2	66838	2150.2	QPSK	50	50	21.15	20.88
CA_66B	LTE B66	10	132622	1775.0	67086	2175.0	QPSK	25	0	LTE B66	10	132523	1765.1	66987	2165.1	QPSK	25	25	21.17	21.08

Table 9-32  
LTE Band 41 PC3 Uplink Carrier Aggregation Measured  $P_{max}$  for DSI = 0 (Body-worn, or Phablet with grip sensor inactive)



Combination	PCC									SCC									Power	
	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)				
CA_41C	LTE B41	20	40620	2593.0	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	0	24.07	23.37				

Table 9-33  
LTE Band 41 PC2 Uplink Carrier Aggregation Measured  $P_{max}$  for DSI = 0 (Body-worn, or Phablet with grip sensor inactive)

Combination	PCC									SCC									Power	
	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)				
CA_41C	LTE B41 PC2	20	40620	2593.0	QPSK	1	99	LTE B41 PC2	20	40818	2612.8	QPSK	1	0	26.19	25.90				

Table 9-34  
LTE Band 41 PC3 Uplink Carrier Aggregation Measured  $P_{limit}$  for DSI = 1 (Head), DSI = 2 (Hotspot Mode), DSI = 4, 5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active)

Combination	PCC									SCC									Power	
	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)				
CA_41C	LTE B41	20	40620	2593.0	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	0	20.76	20.40				
CA_41C	LTE B41	20	40620	2593.0	QPSK	50	50	LTE B41	20	40818	2612.8	QPSK	50	0	21.00	20.73				

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**Table 9-35**

**LTE Band 41 PC2 Uplink Carrier Aggregation Measured  $P_{limit}$  for DSI =1 (Head), DSI = 2 (Hotspot Mode), DSI = 4, 5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active)**

Combination	PCC							SCC						Power		
	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA 41C	LTE B41 PC2	20	40620	2593.0	QPSK	1	99	LTE B41 PC2	20	40818	2612.8	QPSK	1	0	22.39	22.03
CA 41C	LTE B41 PC2	20	40620	2593.0	QPSK	50	50	LTE B41 PC2	20	40818	2612.8	QPSK	50	0	22.52	22.29

**Notes:**

1. This device supports uplink carrier aggregation for LTE CA\_5B, LTE CA\_66B, LTE CA\_66C, and LTE CA\_41C with a maximum of two component carriers. For intraband contiguous carrier aggregation scenarios, 3GPP 36.101 Table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when non-contiguous RB allocation is implemented. The conducted powers and MPR settings in this device are permanently implemented per the above 3GPP requirements.
2. Per FCC Guidance, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.



**Figure 9-4  
Power Measurement Setup**

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## 9.5 NR Conducted Powers




Note: Per October 2020 TCB Workshop Guidance, NR FR1 SAR evaluations are being generally based on adapting the existing LTE SAR procedures (FCC KDB Publication 941225 D05v02r05). Therefore, NR SAR for the lower bandwidths was not required for testing based on the measured output power and the reported NR SAR for the highest bandwidth. Lower bandwidth conducted powers for all NR bands can be found in appendix F.

### 9.5.1 NR Band n71

Table 9-36  
NR Band n71 Measured P<sub>max</sub> for all DSI - 20 MHz Bandwidth

NR Band n71 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			136100 (680.5 MHz) Conducted Power [dBm]		
DFT-s-OFDM $\pi/2$ BPSK	1	1	23.26	0	0.0
	1	53	23.22		0.0
	1	104	23.11		0.0
	50	0	22.89	0-0.5	0.5
	50	28	23.34	0	0.0
	50	56	22.69	0-0.5	0.5
	100	0	22.80		0.5
DFT-s-OFDM QPSK	1	1	23.39	0	0.0
	1	53	<b>23.40</b>		0.0
	1	104	23.22		0.0
	50	0	22.33	0-1	1.0
	50	28	<b>23.35</b>	0	0.0
	50	56	22.25	0-1	1.0
	100	0	22.35		1.0
DFT-s-OFDM 16QAM	1	1	22.10	0-1	1.0
CP-OFDM QPSK	1	1	21.81	0-1.5	1.5

Note: NR Band n71 at 20 MHz bandwidth does not support non-overlapping channels. Per FCC Guidance, 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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9.5.2

NR Band n5

Table 9-37  
NR Band n5 Measured P<sub>max</sub> for all DSI - 20 MHz Bandwidth

NR Band n5 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			167300 (836.5 MHz)		
			Conducted Power [dBm]		
DFT-s-OFDM $\pi/2$ BPSK	1	1	23.43	0	0.0
	1	53	23.55		0.0
	1	104	23.30		0.0
	50	0	23.08	0-0.5	0.5
	50	28	23.55	0	0.0
	50	56	22.95	0-0.5	0.5
	100	0	23.00		0.5
DFT-s-OFDM QPSK	1	1	23.58	0	0.0
	1	53	<b>23.62</b>		0.0
	1	104	23.40		0.0
	50	0	22.45	0-1	1.0
	50	28	<b>23.43</b>	0	0.0
	50	56	22.27	0-1	1.0
	100	0	22.42		1.0
DFT-s-OFDM 16QAM	1	1	22.24	0-1	1.0
CP-OFDM QPSK	1	1	22.15	0-1.5	1.5

Note: NR Band n5 (Cell) at 20 MHz bandwidth does not support non-overlapping channels. Per FCC Guidance, 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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9.5.3

NR Band n66




Table 9-38  
NR Band n66 Measured  $P_{max}$  for DSI = 1 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor inactive) - 20 MHz Bandwidth

NR Band n66 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
			344000 (1720 MHz)	349000 (1745 MHz)	354000 (1770 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	23.86	24.05	24.05	0	0.0
	1	53	23.92	24.04	24.14		0.0
	1	104	24.10	24.23	24.30		0.0
	50	0	23.63	23.82	23.77	0-0.5	0.5
	50	28	24.15	24.32	24.37	0	0.0
	50	56	23.76	23.80	23.94	0-0.5	0.5
	100	0	23.78	23.79	23.93		0.5
DFT-s-OFDM QPSK	1	1	24.36	24.40	24.49	0	0.0
	1	53	24.26	24.45	24.52		0.0
	1	104	24.43	<b>24.60</b>	24.59		0.0
	50	0	23.24	23.35	23.40	0-1	1.0
	50	28	24.20	<b>24.40</b>	24.39	0	0.0
	50	56	23.32	23.33	23.51	0-1	1.0
	100	0	23.34	23.35	23.34		1.0
DFT-s-OFDM 16QAM	1	1	23.37	23.32	23.51	0-1	1.0
CP-OFDM QPSK	1	1	22.66	22.85	22.84	0-1.5	1.5

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**Table 9-39**  
**NR Band n66 Measured  $P_{limit}$  for DSI = 2 (Hotspot Mode), DSI = 4,5, or 6 (Phablet with grip sensor active)**  
**and/or DSI = 3 (Earjack active) - 20 MHz Bandwidth**

NR Band n66 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
			344000 (1720 MHz)	349000 (1745 MHz)	354000 (1770 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	21.51	21.52	21.35	0	0.0
	1	53	21.38	21.45	21.33		0.0
	1	104	21.62	21.60	21.37		0.0
	50	0	21.48	21.60	21.40	0-0.5	0.0
	50	28	21.48	21.52	21.47	0	0.0
	50	56	21.50	21.49	21.38	0-0.5	0.0
	100	0	21.47	21.55	21.44		0.0
DFT-s-OFDM QPSK	1	1	21.46	21.53	21.31	0	0.0
	1	53	21.34	21.50	21.37		0.0
	1	104	21.56	<b>21.58</b>	21.44		0.0
	50	0	21.43	<b>21.61</b>	21.45	0-1	0.0
	50	28	21.34	21.52	21.40	0	0.0
	50	56	21.45	21.47	21.46	0-1	0.0
	100	0	21.48	21.53	21.48		0.0
DFT-s-OFDM 16QAM	1	1	21.78	21.79	21.61	0-1	0.0
CP-OFDM QPSK	1	1	21.33	21.55	21.51	0-1.5	0.0

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9.5.4

NR Band n25 (PCS)

Table 9-40  
NR Band n25 Measured  $P_{max}$  for DSI = 1 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor inactive) - 20 MHz Bandwidth

NR Band n25 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
			372000 (1860 MHz)	376500 (1882.5 MHz)	381000 (1905 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	24.60	24.37	24.51	0	0.0
	1	53	24.78	24.42	24.50		0.0
	1	104	24.63	24.46	24.18		0.0
	50	0	24.19	24.05	24.07	0-0.5	0.5
	50	28	24.69	24.62	24.61	0	0.0
	50	56	24.12	24.09	24.00	0-0.5	0.5
	100	0	24.09	24.01	23.94		0.5
DFT-s-OFDM QPSK	1	1	24.55	24.33	24.24	0	0.0
	1	53	<b>24.78</b>	24.24	24.33		0.0
	1	104	24.59	24.23	24.02		0.0
	50	0	23.73	23.63	23.61	0-1	1.0
	50	28	<b>24.66</b>	24.64	24.65	0	0.0
	50	56	23.50	23.58	23.48	0-1	1.0
	100	0	23.60	23.58	23.59		1.0
DFT-s-OFDM 16QAM	1	1	23.66	23.67	23.57	0-1	1.0
CP-OFDM QPSK	1	1	22.58	22.51	22.57	0-1.5	1.5







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Table 9-41

NR Band n25 Measured  $P_{limit}$  for DSI = 2 (Hotspot Mode), DSI = 4, 5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active) - 20 MHz Bandwidth

NR Band n25 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
			372000 (1860 MHz)	376500 (1882.5 MHz)	381000 (1905 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	21.08	20.89	21.04	0	0.0
	1	53	21.24	20.74	20.92		0.0
	1	104	21.24	20.75	20.84		0.0
	50	0	21.33	20.85	21.01	0-0.5	0.0
	50	28	21.35	20.81	21.08	0	0.0
	50	56	21.28	20.82	21.09	0-0.5	0.0
	100	0	21.32	20.80	21.04		0.0
DFT-s-OFDM QPSK	1	1	21.26	20.84	21.17	0	0.0
	1	53	21.24	20.66	21.01		0.0
	1	104	<b>21.33</b>	20.66	20.91		0.0
	50	0	21.36	20.85	21.11	0-1	0.0
	50	28	<b>21.38</b>	21.17	21.08	0	0.0
	50	56	21.36	21.22	21.10	0-1	0.0
	100	0	21.30	21.16	21.14		0.0
DFT-s-OFDM 16QAM	1	1	21.07	20.80	20.74	0-1	0.0
CP-OFDM QPSK	1	1	21.23	21.09	21.03	0-1.5	0.0

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9.5.1




NR Band n41

Table 9-42

NR Band n41 Measured P<sub>limit</sub> for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), DSI = 2 (Hotspot Mode), DSI = 4, 5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active) - 100 MHz Bandwidth

NR Band n41 100 MHz Bandwidth					
Modulation	RB Size	RB Offset	Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			518598 (2592.99 MHz)  Conducted Power [dBm]		
DFT-s-OFDM $\pi/2$ BPSK	1	1	18.00	0	0.0
	1	137	17.95		0.0
	1	271	17.81		0.0
	135	0	18.09	0-0.5	0.0
	135	69	17.97	0	0.0
	135	138	17.87	0-0.5	0.0
	270	0	17.99		0.0
DFT-s-OFDM QPSK	1	1	<b>18.05</b>	0	0.0
	1	137	17.98		0.0
	1	271	17.90		0.0
	135	0	<b>18.13</b>	0-1	0.0
	135	69	18.03	0	0.0
	135	138	17.93	0-1	0.0
	270	0	17.99		0.0
DFT-s-OFDM 16QAM	1	1	18.23	0-1	0.0
CP-OFDM QPSK	1	1	18.00	0-1.5	0.0




Note: NR Band n41 at 100 MHz bandwidth does not support non-overlapping channels. Per FCC Guidance, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

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**Table 9-43  
NR Band n41 Measured P<sub>limit</sub> for DSI = 1 (Head)- 100 MHz Bandwidth**

NR Band n41 100 MHz Bandwidth					
Modulation	RB Size	RB Offset	Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			518598 (2592.99 MHz)		
			Conducted Power [dBm]		
DFT-s-OFDM $\pi/2$ BPSK	1	1	14.25	0	0.0
	1	137	14.14		0.0
	1	271	14.02		0.0
	135	0	14.30	0-0.5	0.0
	135	69	14.14	0	0.0
	135	138	14.10	0-0.5	0.0
	270	0	14.12		0.0
DFT-s-OFDM QPSK	1	1	<b>14.12</b>	0	0.0
	1	137	14.07		0.0
	1	271	14.06		0.0
	135	0	<b>14.25</b>	0-1	0.0
	135	69	14.15	0	0.0
	135	138	14.10	0-1	0.0
	270	0	14.11		0.0
DFT-s-OFDM 16QAM	1	1	14.30	0-1	0.0
CP-OFDM QPSK	1	1	14.04	0-1.5	0.0

Note: NR Band n41 at 100 MHz bandwidth does not support non-overlapping channels. Per FCC Guidance, 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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### 9.5.1

### NR Band n77

Table 9-44

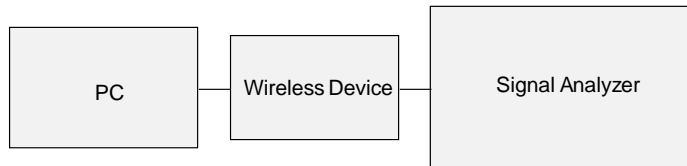
NR Band n77 Measured  $P_{limit}$  for DSI = 0 (Body-worn, or Phablet with grip sensor not triggered), DSI = 2 (Hotspot Mode), DSI = 4, 5, or 6 (Phablet with grip sensor active) and/or DSI = 3 (Earjack active) - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth						
Modulation	RB Size	RB Offset	Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
			650000 (3750 MHz)	662000 (3930 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM $\pi/2$ BPSK	1	1	17.47	17.50	0	0.0
	1	137	17.34	17.14		0.0
	1	271	16.88	16.63		0.0
	135	0	17.32	17.32	0-0.5	0.0
	135	69	17.49	17.09	0	0.0
	135	138	16.83	16.94	0-0.5	0.0
	270	0	17.18	17.04		0.0
DFT-s-OFDM QPSK	1	1	<b>17.40</b>	17.39	0	0.0
	1	137	17.04	17.09		0.0
	1	271	16.54	16.50		0.0
	135	0	<b>17.41</b>	17.25	0-1	0.0
	135	69	17.10	17.19	0	0.0
	135	138	16.90	16.61	0-1	0.0
	270	0	17.25	17.04		0.0
DFT-s-OFDM 16QAM	1	1	17.34	17.24	0-1	0.0
CP-OFDM QPSK	1	1	17.22	17.17	0-1.5	0.0

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**Table 9-45  
NR Band n77 Measured P<sub>limit</sub> for DSI = 1 (Head)- 100 MHz Bandwidth**

NR Band n77 100 MHz Bandwidth						
Modulation	RB Size	RB Offset	Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
			650000 (3750 MHz)	662000 (3930 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.31	15.05	0	0.0
	1	137	14.93	14.74		0.0
	1	271	14.46	14.15		0.0
	135	0	15.33	15.08	0-0.5	0.0
	135	69	15.02	14.77	0	0.0
	135	138	14.72	14.37	0-0.5	0.0
	270	0	15.06	14.85		0.0
DFT-s-OFDM QPSK	1	1	<b>15.29</b>	14.82	0	0.0
	1	137	14.77	14.36		0.0
	1	271	14.33	14.09		0.0
	135	0	14.83	14.85	0-1	0.0
	135	69	<b>14.93</b>	14.53	0	0.0
	135	138	14.43	14.35	0-1	0.0
	270	0	14.58	14.55		0.0
DFT-s-OFDM 16QAM	1	1	14.85	14.78	0-1	0.0
CP-OFDM QPSK	1	1	14.79	14.47	0-1.5	0.0



**Figure 9-5  
Power Measurement Setup**

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## 9.6 WLAN Conducted Powers

**Table 9-46**  
2.4 GHz WLAN Maximum Average RF Power

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
		Average	Average	Average
2412	1	20.49	20.54	18.79
2417	2	N/A	20.86	19.72
2437	6	20.76	20.81	19.64
2457	10	N/A	20.62	19.79
2462	11	20.95	18.96	18.69

**Table 9-47**  
5 GHz WLAN Maximum Average RF Power

5GHz (40MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11n	802.11ac
		Average	Average
5190	38	17.71	15.89
5230	46	17.98	15.88
5270	54	17.48	15.38
5310	62	17.47	15.59
5510	102	17.48	15.79
5590	118	17.51	15.91
5630	126	17.76	15.98
5710	142	17.98	15.56
5755	151	17.26	15.47
5795	159	17.89	15.79

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**Table 9-48  
2.4 GHz WLAN Reduced Average RF Power**

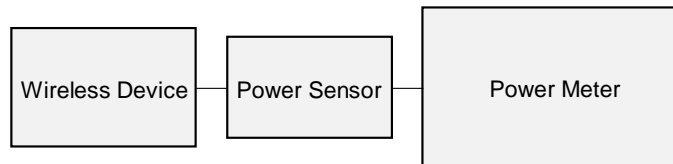
2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
		Average	Average	Average
2412	1	15.79	15.92	15.73
2437	6	15.92	15.66	15.48
2462	11	15.68	15.70	15.62

**Table 9-49  
5 GHz WLAN RCV Reduced Average RF Power**




5GHz (80MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
		Average
5210	42	10.47
5290	58	10.72
5530	106	10.61
5610	122	10.99
5690	138	10.84
5775	155	10.42

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

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



**Figure 9-6  
Power Measurement Setup**




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## 9.7 Bluetooth Conducted Powers




Table 9-50  
Bluetooth Average RF Power - Maximum

Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	1.0	GFSK	0	14.42	27.638
2441	1.0	GFSK	39	15.91	38.958
2480	1.0	GFSK	78	15.26	33.566
2402	2.0	$\pi/4$ -DQPSK	0	9.19	8.292
2441	2.0	$\pi/4$ -DQPSK	39	10.56	11.384
2480	2.0	$\pi/4$ -DQPSK	78	9.76	9.456
2402	3.0	8DPSK	0	9.20	8.322
2441	3.0	8DPSK	39	10.70	11.741
2480	3.0	8DPSK	78	9.85	9.659

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**Table 9-51  
Bluetooth Average RF Power - Reduced**

Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	1.0	GFSK	0	11.43	13.912
2441	1.0	GFSK	39	13.29	21.316
2480	1.0	GFSK	78	12.34	17.140
2402	2.0	$\pi/4$ -DQPSK	0	9.19	8.292
2441	2.0	$\pi/4$ -DQPSK	39	10.56	11.384
2480	2.0	$\pi/4$ -DQPSK	78	9.76	9.456
2402	3.0	8DPSK	0	9.20	8.322
2441	3.0	8DPSK	39	10.70	11.741
2480	3.0	8DPSK	78	9.85	9.659

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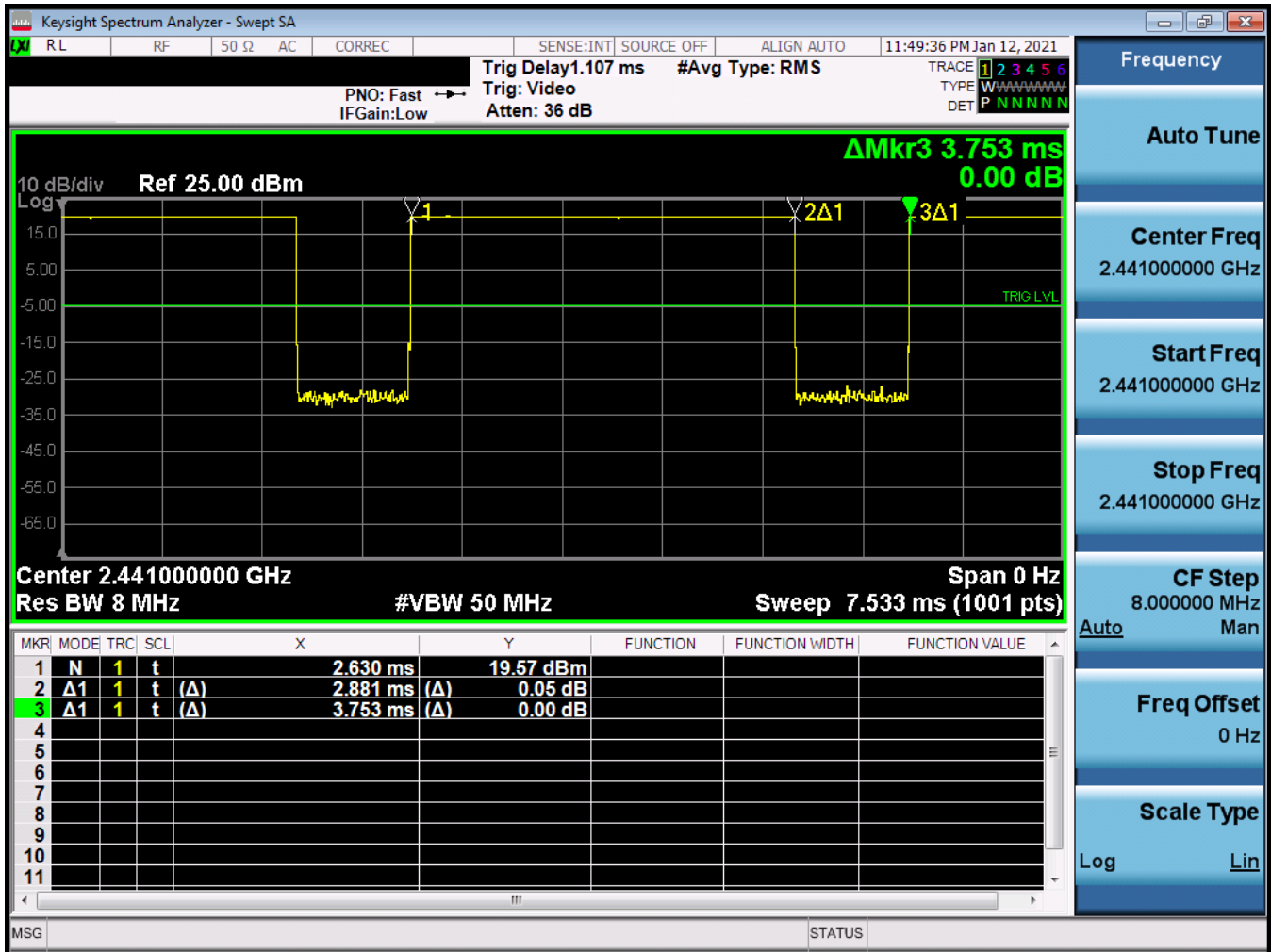
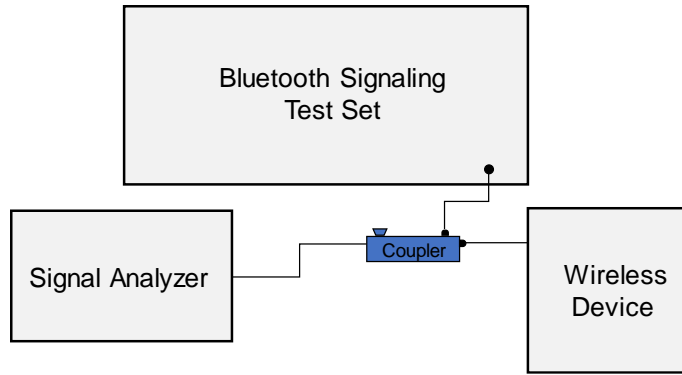


Figure 9-7  
Bluetooth Transmission Plot




Equation 9-1  
Bluetooth Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.881ms}{3.753ms} * 100\% = 76.8\%$$

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**Figure 9-8**  
**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, $\sigma$ (S/m)	Measured Dielectric Constant, $\epsilon$	TARGET Conductivity, $\sigma$ (S/m)	TARGET Dielectric Constant, $\epsilon$	% dev $\sigma$	% dev $\epsilon$
01/26/2021	750 Head	20.5	680	0.873	41.973	0.888	42.305	-1.69%	-0.78%
			695	0.878	41.924	0.889	42.227	-1.24%	-0.72%
			700	0.879	41.907	0.889	42.201	-1.12%	-0.70%
			710	0.883	41.868	0.890	42.149	-0.79%	-0.67%
			725	0.888	41.818	0.891	42.071	-0.34%	-0.60%
			750	0.897	41.749	0.894	41.942	0.34%	-0.46%
			770	0.904	41.693	0.895	41.838	1.01%	-0.35%
			785	0.910	41.639	0.896	41.760	1.56%	-0.29%
02/02/2021	750 Head	20.2	680	0.848	41.295	0.888	42.305	-4.50%	-2.39%
			695	0.853	41.259	0.889	42.227	-4.05%	-2.29%
			750	0.872	41.079	0.894	41.942	-2.46%	-2.06%
			785	0.885	40.989	0.896	41.760	-1.23%	-1.85%
			800	0.890	40.934	0.897	41.682	-0.78%	-1.79%
1/12/2021	835 Head	19.9	820	0.867	40.043	0.899	41.578	-3.56%	-3.69%
			835	0.882	39.836	0.900	41.500	-2.00%	-4.01%
			850	0.897	39.636	0.916	41.500	-2.07%	-4.49%
1/26/2021	835 Head	20.0	820	0.868	40.063	0.899	41.578	-3.45%	-3.64%
			835	0.883	39.862	0.900	41.500	-1.89%	-3.95%
			850	0.898	39.672	0.916	41.500	-1.97%	-4.40%
2/3/2021	835 Head	22.4	820	0.893	42.797	0.899	41.578	-0.67%	2.93%
			835	0.908	42.625	0.900	41.500	0.89%	2.71%
			850	0.923	42.449	0.916	41.500	0.76%	2.29%
01/25/2021	1750 Head	21.0	1710	1.349	40.480	1.348	40.142	0.07%	0.84%
			1720	1.356	40.464	1.354	40.126	0.15%	0.84%
			1745	1.372	40.436	1.368	40.087	0.29%	0.87%
			1750	1.375	40.430	1.371	40.079	0.29%	0.88%
			1770	1.388	40.398	1.383	40.047	0.36%	0.88%
1/12/2021	1900 Head	24.2	1790	1.400	40.353	1.394	40.016	0.43%	0.84%
			1850	1.355	39.166	1.400	40.000	-3.21%	-2.09%
			1860	1.365	39.127	1.400	40.000	-2.50%	-2.18%
			1880	1.385	39.060	1.400	40.000	-1.07%	-2.35%
			1900	1.403	38.980	1.400	40.000	0.21%	-2.55%
			1905	1.408	38.959	1.400	40.000	0.57%	-2.60%
			1910	1.412	38.937	1.400	40.000	0.86%	-2.66%
1/21/2021	1900 Head	25.0	1950	1.454	38.753	1.400	40.000	3.86%	-3.12%
			1850	1.353	40.596	1.400	40.000	-3.36%	1.49%
			1860	1.364	40.539	1.400	40.000	-2.57%	1.35%
			1880	1.385	40.438	1.400	40.000	-1.07%	1.10%
			1900	1.406	40.359	1.400	40.000	0.43%	0.90%
			1905	1.411	40.342	1.400	40.000	0.79%	0.85%
			1910	1.415	40.325	1.400	40.000	1.07%	0.81%
01/27/2021	1900 Head	24.0	1950	1.458	40.184	1.400	40.000	4.14%	0.46%
			1850	1.354	40.415	1.400	40.000	-3.29%	1.04%
			1860	1.365	40.370	1.400	40.000	-2.50%	0.92%
			1880	1.386	40.285	1.400	40.000	-1.00%	0.71%
			1900	1.406	40.212	1.400	40.000	0.43%	0.53%
			1905	1.411	40.196	1.400	40.000	0.79%	0.49%
			1910	1.415	40.179	1.400	40.000	1.07%	0.45%
02/04/2021	2450 Head	24.7	1950	1.457	40.056	1.400	40.000	4.07%	0.14%
			2300	1.749	38.472	1.670	39.500	4.73%	-2.60%
			2310	1.755	38.465	1.679	39.480	4.53%	-2.57%
			2320	1.762	38.455	1.687	39.460	4.45%	-2.55%
			2400	1.822	38.307	1.756	39.289	3.76%	-2.50%
			2450	1.857	38.244	1.800	39.200	3.17%	-2.44%
			2480	1.878	38.185	1.833	39.162	2.45%	-2.49%
			2500	1.895	38.155	1.855	39.136	2.16%	-2.51%
			2510	1.904	38.141	1.866	39.123	2.04%	-2.51%
			2535	1.924	38.107	1.893	39.092	1.64%	-2.52%
			2550	1.935	38.089	1.909	39.073	1.36%	-2.52%
			2560	1.942	38.073	1.920	39.060	1.15%	-2.53%
			2600	1.973	37.984	1.964	39.009	0.46%	-2.63%
2650	2.015	37.911	2.018	38.945	-0.15%	-2.66%			
2680	2.035	37.860	2.051	38.907	-0.78%	-2.69%			
2700	2.051	37.804	2.073	38.882	-1.06%	-2.77%			

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**Table 10-2  
Measured Head Tissue Properties - Continued**

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, $\sigma$ (S/m)	Measured Dielectric Constant, $\epsilon$	TARGET Conductivity, $\sigma$ (S/m)	TARGET Dielectric Constant, $\epsilon$	% dev $\sigma$	% dev $\epsilon$
02/09/2021	2450 Head	24.0	2400	1.750	41.132	1.756	39.289	-0.34%	4.69%
			2450	1.809	40.939	1.800	39.200	0.50%	4.44%
			2480	1.843	40.831	1.833	39.162	0.55%	4.26%
02/13/2021	2450 Head	21.6	2400	1.756	38.755	1.756	39.289	0.00%	-1.36%
			2450	1.795	38.678	1.800	39.200	-0.28%	-1.33%
			2480	1.818	38.642	1.833	39.162	-0.82%	-1.33%
02/19/2021	3600 Head	18.0	3300	2.699	39.385	2.708	38.157	-0.33%	3.22%
			3350	2.748	39.290	2.759	38.100	-0.40%	3.12%
			3450	2.846	39.103	2.861	37.986	-0.52%	2.94%
			3500	2.893	39.014	2.913	37.929	-0.69%	2.86%
			3550	2.944	38.912	2.964	37.871	-0.67%	2.75%
			3560	2.957	38.883	2.974	37.860	-0.57%	2.70%
			3600	2.998	38.850	3.015	37.814	-0.56%	2.74%
			3650	3.050	38.722	3.066	37.757	-0.52%	2.56%
			3690	3.095	38.665	3.107	37.711	-0.39%	2.53%
			3700	3.101	38.664	3.117	37.700	-0.51%	2.56%
			3750	3.150	38.549	3.169	37.643	-0.60%	2.41%
			3900	3.322	38.306	3.323	37.471	-0.03%	2.23%
			3930	3.337	38.245	3.353	37.437	-0.48%	2.16%
			02/09/2021	5200-5800 Head	21.5	5180	4.534	35.375	4.635
5190	4.545	35.361				4.645	35.998	-2.15%	-1.77%
5200	4.557	35.340				4.655	35.986	-2.11%	-1.80%
5210	4.568	35.319				4.666	35.975	-2.10%	-1.82%
5220	4.578	35.310				4.676	35.963	-2.10%	-1.82%
5240	4.598	35.286				4.696	35.940	-2.09%	-1.82%
5250	4.609	35.258				4.706	35.929	-2.06%	-1.87%
5260	4.618	35.231				4.717	35.917	-2.10%	-1.91%
5270	4.628	35.206				4.727	35.906	-2.09%	-1.95%
5280	4.639	35.183				4.737	35.894	-2.07%	-1.98%
5290	4.653	35.159				4.748	35.883	-2.00%	-2.02%
5300	4.667	35.141				4.758	35.871	-1.91%	-2.04%
5310	4.678	35.128				4.768	35.860	-1.89%	-2.04%
5320	4.689	35.115				4.778	35.849	-1.88%	-2.05%
5500	4.886	34.777				4.963	35.643	-1.55%	-2.43%
5510	4.899	34.755				4.973	35.632	-1.49%	-2.46%
5520	4.912	34.733				4.983	35.620	-1.42%	-2.49%
5530	4.926	34.714				4.994	35.609	-1.36%	-2.51%
5540	4.939	34.693				5.004	35.597	-1.30%	-2.54%
5550	4.952	34.675				5.014	35.586	-1.24%	-2.56%
5560	4.966	34.659				5.024	35.574	-1.15%	-2.57%
5580	4.989	34.631				5.045	35.551	-1.11%	-2.59%
5600	5.010	34.590				5.065	35.529	-1.09%	-2.64%
5610	5.023	34.571				5.076	35.518	-1.04%	-2.67%
5620	5.034	34.556				5.086	35.506	-1.02%	-2.68%
5640	5.055	34.517				5.106	35.483	-1.00%	-2.72%
5660	5.082	34.480				5.127	35.460	-0.88%	-2.76%
5670	5.094	34.467				5.137	35.449	-0.84%	-2.77%
5680	5.104	34.456				5.147	35.437	-0.84%	-2.77%
5690	5.115	34.441				5.158	35.426	-0.83%	-2.78%
5700	5.126	34.422				5.168	35.414	-0.81%	-2.80%
5710	5.138	34.403				5.178	35.403	-0.77%	-2.82%
5720	5.149	34.383				5.188	35.391	-0.75%	-2.85%
5745	5.176	34.340				5.214	35.363	-0.73%	-2.89%
5750	5.182	34.333	5.219	35.357	-0.71%	-2.90%			
5755	5.187	34.326	5.224	35.351	-0.71%	-2.90%			
5765	5.197	34.313	5.234	35.340	-0.71%	-2.91%			
5775	5.207	34.302	5.245	35.329	-0.72%	-2.91%			
5785	5.218	34.288	5.255	35.317	-0.70%	-2.91%			
5795	5.229	34.266	5.265	35.305	-0.68%	-2.94%			
5805	5.241	34.241	5.275	35.294	-0.64%	-2.98%			
5825	5.262	34.204	5.296	35.271	-0.64%	-3.03%			

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**Table 10-3  
Measured Body Tissue Properties**

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, $\sigma$ (S/m)	Measured Dielectric Constant, $\epsilon$	TARGET Conductivity, $\sigma$ (S/m)	TARGET Dielectric Constant, $\epsilon$	% dev $\sigma$	% dev $\epsilon$
01/25/2021	750 Body	22.6	680	0.919	55.987	0.958	55.804	-4.07%	0.33%
			695	0.924	55.936	0.959	55.745	-3.65%	0.34%
			700	0.925	55.921	0.959	55.726	-3.55%	0.35%
			710	0.929	55.892	0.960	55.687	-3.23%	0.37%
			750	0.943	55.828	0.964	55.531	-2.18%	0.53%
			770	0.950	55.789	0.965	55.453	-1.55%	0.61%
02/02/2021	750 Body	21.1	785	0.956	55.739	0.966	55.395	-1.04%	0.62%
			750	0.928	56.169	0.964	55.531	-3.73%	1.15%
			770	0.936	56.128	0.965	55.453	-3.01%	1.22%
			800	0.942	56.088	0.966	55.395	-2.48%	1.25%
			800	0.948	56.039	0.967	55.336	-1.96%	1.27%
			680	0.915	55.990	0.958	55.804	-4.49%	0.33%
02/12/2021	750 Body	21.8	695	0.920	55.963	0.959	55.745	-4.07%	0.39%
			750	0.941	55.853	0.964	55.531	-2.39%	0.58%
			820	0.943	53.733	0.969	55.258	-2.68%	-2.76%
01/20/2021	835 Body	22.3	835	0.959	53.583	0.970	55.200	-1.13%	-2.93%
			850	0.975	53.420	0.988	55.154	-1.32%	-3.14%
			820	0.944	53.812	0.969	55.258	-2.58%	-2.62%
1/23/2021	835 Body	21.5	835	0.960	53.663	0.970	55.200	-1.03%	-2.78%
			850	0.975	53.518	0.988	55.154	-1.32%	-2.97%
			820	0.944	54.354	0.969	55.258	-2.58%	-1.64%
1/25/2021	835 Body	21.6	835	0.960	54.218	0.970	55.200	-1.03%	-1.78%
			850	0.976	54.077	0.988	55.154	-1.21%	-1.95%
			820	0.975	55.280	0.969	55.258	0.62%	0.04%
02/02/2021	835 Body	20.2	835	0.991	55.129	0.970	55.200	2.16%	-0.13%
			850	1.006	54.989	0.988	55.154	1.82%	-0.30%
			1710	1.484	51.117	1.463	53.537	1.44%	-4.52%
			1720	1.495	51.059	1.469	53.511	1.77%	-4.58%
01/26/2021	1750 Body	21.1	1745	1.525	50.925	1.485	53.445	2.69%	-4.72%
			1750	1.531	50.902	1.488	53.432	2.89%	-4.73%
			1770	1.556	50.837	1.501	53.379	3.66%	-4.76%
			1790	1.578	50.782	1.514	53.326	4.23%	-4.77%
			1710	1.489	51.693	1.463	53.537	1.78%	-3.44%
01/28/2021	1750 Body	21.1	1720	1.500	51.630	1.469	53.511	2.11%	-3.52%
			1745	1.531	51.499	1.485	53.445	3.10%	-3.64%
			1750	1.537	51.476	1.488	53.432	3.29%	-3.66%
			1770	1.564	51.408	1.501	53.379	4.20%	-3.69%
			1790	1.587	51.345	1.514	53.326	4.82%	-3.71%
01/30/2021	1750 Body	23.3	1710	1.434	51.781	1.463	53.537	-1.98%	-3.28%
			1720	1.444	51.751	1.469	53.511	-1.70%	-3.29%
			1745	1.472	51.671	1.485	53.445	-0.88%	-3.32%
			1750	1.477	51.654	1.488	53.432	-0.74%	-3.33%
			1770	1.498	51.582	1.501	53.379	-0.20%	-3.37%
02/03/2021	1750 Body	21.4	1790	1.520	51.509	1.514	53.326	0.40%	-3.41%
			1710	1.473	51.236	1.463	53.537	0.68%	-4.30%
			1720	1.484	51.178	1.469	53.511	1.02%	-4.36%
			1745	1.513	51.048	1.485	53.445	1.89%	-4.48%
			1750	1.520	51.025	1.488	53.432	2.15%	-4.50%
01/24/2021	1900 Body	24.4	1770	1.546	50.948	1.501	53.379	3.00%	-4.55%
			1790	1.569	50.882	1.514	53.326	3.63%	-4.58%
			1850	1.485	53.166	1.520	53.300	-2.30%	-0.25%
			1860	1.496	53.137	1.520	53.300	-1.58%	-0.31%
			1880	1.516	53.076	1.520	53.300	-0.26%	-0.42%
			1900	1.538	53.024	1.520	53.300	1.18%	-0.52%
01/27/2021	1900 Body	24.2	1905	1.544	53.012	1.520	53.300	1.58%	-0.54%
			1910	1.550	53.000	1.520	53.300	1.97%	-0.56%
			1950	1.595	52.889	1.520	53.300	4.93%	-0.77%
			1850	1.464	52.337	1.520	53.300	-3.68%	-1.81%
			1860	1.473	52.288	1.520	53.300	-3.09%	-1.90%
			1880	1.494	52.226	1.520	53.300	-1.71%	-2.02%
1/28/2021	1900 Body	24.6	1900	1.513	52.155	1.520	53.300	-0.46%	-2.15%
			1905	1.518	52.135	1.520	53.300	-0.13%	-2.19%
			1910	1.525	52.124	1.520	53.300	0.33%	-2.21%
			1950	1.566	51.944	1.520	53.300	3.03%	-2.54%
			1850	1.484	52.147	1.520	53.300	-2.37%	-2.16%
			1860	1.495	52.106	1.520	53.300	-1.64%	-2.24%
1/30/2021	1900 Body	24.4	1880	1.517	52.040	1.520	53.300	-0.20%	-2.36%
			1900	1.537	51.984	1.520	53.300	1.12%	-2.47%
			1905	1.542	51.971	1.520	53.300	1.45%	-2.49%
			1910	1.547	51.956	1.520	53.300	1.78%	-2.52%
			1950	1.590	51.839	1.520	53.300	4.61%	-2.74%
			1850	1.484	51.508	1.520	53.300	-2.37%	-3.36%
02/02/2021	1900 Body	24.8	1860	1.494	51.476	1.520	53.300	-1.71%	-3.42%
			1880	1.514	51.416	1.520	53.300	-0.39%	-3.53%
			1900	1.535	51.355	1.520	53.300	0.99%	-3.65%
			1905	1.540	51.338	1.520	53.300	1.32%	-3.68%
			1910	1.545	51.321	1.520	53.300	1.64%	-3.71%
			1950	1.588	51.190	1.520	53.300	4.47%	-3.96%
02/02/2021	1900 Body	24.8	1850	1.483	53.281	1.520	53.300	-2.43%	-0.04%
			1860	1.493	53.258	1.520	53.300	-1.78%	-0.08%
			1880	1.514	53.212	1.520	53.300	-0.39%	-0.17%
			1900	1.535	53.160	1.520	53.300	0.99%	-0.26%
			1905	1.540	53.145	1.520	53.300	1.32%	-0.29%
			1910	1.546	53.131	1.520	53.300	1.71%	-0.32%
1950	1.592	53.008	1.520	53.300	4.74%	-0.55%			

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**Table 10-4  
Measured Body Tissue Properties Continued**

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, $\sigma$ (S/m)	Measured Dielectric Constant, $\epsilon$	TARGET Conductivity, $\sigma$ (S/m)	TARGET Dielectric Constant, $\epsilon$	% dev $\sigma$	% dev $\epsilon$
01/21/2021	2450 Body	22.3	2400	1.949	52.125	1.902	52.767	2.47%	-1.22%
			2450	2.015	51.918	1.950	52.700	3.33%	-1.48%
			2480	2.058	51.800	1.993	52.662	3.26%	-1.64%
01/30/2021	2450 Body	23.8	2400	1.985	51.226	1.902	52.767	4.36%	-2.92%
			2450	2.043	51.089	1.950	52.700	4.77%	-3.06%
			2480	2.079	51.007	1.993	52.662	4.32%	-3.14%
			2500	2.103	50.947	2.021	52.636	4.06%	-3.21%
			2510	2.116	50.914	2.035	52.623	3.98%	-3.25%
			2535	2.148	50.832	2.071	52.592	3.72%	-3.35%
			2550	2.167	50.786	2.092	52.573	3.59%	-3.40%
			2560	2.179	50.755	2.106	52.560	3.47%	-3.43%
			2600	2.227	50.627	2.163	52.509	2.96%	-3.58%
			2650	2.286	50.446	2.234	52.445	2.33%	-3.81%
			2680	2.319	50.347	2.277	52.407	1.84%	-3.93%
			2700	2.341	50.278	2.305	52.382	1.56%	-4.02%
02/02/2021	2450 Body	23.9	2300	1.855	51.401	1.809	52.900	2.54%	-2.83%
			2310	1.867	51.371	1.816	52.887	2.81%	-2.87%
			2320	1.879	51.343	1.826	52.873	2.90%	-2.89%
			2400	1.968	51.114	1.902	52.767	3.47%	-3.13%
			2450	2.025	50.982	1.950	52.700	3.85%	-3.26%
			2480	2.058	50.904	1.993	52.662	3.26%	-3.34%
			2500	2.080	50.846	2.021	52.636	2.92%	-3.40%
			2510	2.092	50.818	2.035	52.623	2.80%	-3.43%
			2535	2.122	50.747	2.071	52.592	2.46%	-3.51%
			2550	2.141	50.709	2.092	52.573	2.34%	-3.55%
			2560	2.152	50.683	2.106	52.560	2.18%	-3.57%
			2600	2.199	50.565	2.163	52.509	1.66%	-3.70%
2650	2.258	50.423	2.234	52.445	1.07%	-3.86%			
2680	2.292	50.337	2.277	52.407	0.66%	-3.95%			
2700	2.315	50.275	2.305	52.382	0.43%	-4.02%			
02/06/2021	2450 Body	23.1	2300	1.854	50.966	1.809	52.900	2.49%	-3.66%
			2310	1.865	50.939	1.816	52.887	2.70%	-3.68%
			2320	1.877	50.912	1.826	52.873	2.79%	-3.71%
			2400	1.964	50.687	1.902	52.767	3.26%	-3.94%
			2450	2.021	50.551	1.950	52.700	3.64%	-4.08%
			2480	2.053	50.466	1.993	52.662	3.01%	-4.17%
			2500	2.075	50.406	2.021	52.636	2.67%	-4.24%
			2510	2.086	50.375	2.035	52.623	2.51%	-4.27%
			2535	2.116	50.303	2.071	52.592	2.17%	-4.35%
			2550	2.133	50.263	2.092	52.573	1.96%	-4.39%
			2560	2.145	50.238	2.106	52.560	1.85%	-4.42%
			2600	2.189	50.129	2.163	52.509	1.20%	-4.53%
2650	2.246	49.985	2.234	52.445	0.54%	-4.69%			
2680	2.280	49.904	2.277	52.407	0.13%	-4.78%			
2700	2.302	49.847	2.305	52.382	-0.13%	-4.84%			
02/09/2021	2450 Body	24.0	2400	1.986	52.700	1.902	52.767	4.42%	-0.13%
			2450	2.046	52.540	1.950	52.700	4.92%	-0.30%
			2480	2.081	52.453	1.993	52.662	4.42%	-0.40%
			2500	2.104	52.391	2.021	52.636	4.11%	-0.47%
			2510	2.116	52.358	2.035	52.623	3.98%	-0.50%
			2535	2.146	52.277	2.071	52.592	3.62%	-0.60%
			2550	2.164	52.231	2.092	52.573	3.44%	-0.65%
			2560	2.176	52.202	2.106	52.560	3.32%	-0.68%
			2600	2.220	52.087	2.163	52.509	2.64%	-0.80%
			2650	2.277	51.933	2.234	52.445	1.92%	-0.98%
			2680	2.312	51.850	2.277	52.407	1.54%	-1.06%
			2700	2.335	51.791	2.305	52.382	1.30%	-1.13%
02/19/2021	2450 Body	24.5	2400	1.978	52.440	1.902	52.767	4.00%	-0.62%
			2450	2.035	52.294	1.950	52.700	4.36%	-0.77%
			2480	2.069	52.212	1.993	52.662	3.81%	-0.85%
			2500	2.092	52.153	2.021	52.636	3.51%	-0.92%
			2510	2.104	52.123	2.035	52.623	3.39%	-0.95%
02/08/2021	3600 Body	19.5	3300	3.026	50.885	3.080	51.593	-1.75%	-1.37%
			3350	3.086	50.782	3.139	51.525	-1.69%	-1.44%
			3450	3.202	50.590	3.256	51.389	-1.66%	-1.55%
			3500	3.261	50.500	3.314	51.321	-1.60%	-1.60%
			3550	3.324	50.393	3.372	51.254	-1.42%	-1.68%
			3560	3.339	50.385	3.384	51.240	-1.33%	-1.67%
			3600	3.381	50.316	3.431	51.186	-1.46%	-1.70%
			3650	3.448	50.207	3.489	51.118	-1.18%	-1.78%
			3690	3.496	50.147	3.536	51.063	-1.13%	-1.79%
			3700	3.504	50.135	3.548	51.050	-1.24%	-1.79%
3750	3.573	50.029	3.606	50.982	-0.92%	-1.87%			




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**Table 10-5  
Measured Body Tissue Properties Continued**

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, $\sigma$ (S/m)	Measured Dielectric Constant, $\epsilon$	TARGET Conductivity, $\sigma$ (S/m)	TARGET Dielectric Constant, $\epsilon$	% dev $\sigma$	% dev $\epsilon$
02/15/2021	3600 Body	20.0	3300	3.026	50.654	3.080	51.593	-1.75%	-1.82%
			3350	3.086	50.538	3.139	51.525	-1.69%	-1.92%
			3450	3.202	50.342	3.256	51.389	-1.66%	-2.04%
			3500	3.261	50.239	3.314	51.321	-1.60%	-2.11%
			3550	3.324	50.144	3.372	51.254	-1.42%	-2.17%
			3560	3.335	50.128	3.384	51.240	-1.45%	-2.17%
			3600	3.383	50.068	3.431	51.186	-1.40%	-2.18%
			3650	3.443	49.943	3.489	51.118	-1.32%	-2.30%
			3690	3.496	49.893	3.536	51.063	-1.13%	-2.29%
02/19/2021	3600 Body	19.9	3700	3.445	49.381	3.548	51.050	-2.90%	-3.27%
			3750	3.513	49.274	3.606	50.982	-2.58%	-3.35%
			3900	3.712	49.054	3.781	50.779	-1.82%	-3.40%
			3930	3.727	48.999	3.816	50.738	-2.33%	-3.43%
02/09/2021	5200-5800 Body	24.5	5180	5.386	47.645	5.276	49.041	2.08%	-2.85%
			5190	5.397	47.642	5.288	49.028	2.06%	-2.83%
			5200	5.403	47.617	5.299	49.014	1.96%	-2.85%
			5210	5.408	47.583	5.311	49.001	1.83%	-2.89%
			5220	5.416	47.547	5.323	48.987	1.75%	-2.94%
			5240	5.447	47.476	5.346	48.960	1.89%	-3.03%
			5250	5.472	47.445	5.358	48.947	2.13%	-3.07%
			5260	5.492	47.424	5.369	48.933	2.29%	-3.08%
			5270	5.506	47.430	5.381	48.919	2.32%	-3.04%
			5280	5.517	47.438	5.393	48.906	2.30%	-3.00%
			5290	5.530	47.446	5.404	48.892	2.33%	-2.96%
			5300	5.538	47.434	5.416	48.879	2.25%	-2.96%
			5310	5.541	47.423	5.428	48.865	2.08%	-2.95%
			5320	5.548	47.406	5.439	48.851	2.00%	-2.96%
			5500	5.801	47.094	5.650	48.607	2.67%	-3.11%
			5510	5.809	47.081	5.661	48.594	2.61%	-3.11%
			5520	5.820	47.069	5.673	48.580	2.59%	-3.11%
			5530	5.828	47.048	5.685	48.566	2.52%	-3.13%
			5540	5.839	47.014	5.696	48.553	2.51%	-3.17%
			5550	5.853	46.973	5.708	48.539	2.54%	-3.23%
			5560	5.871	46.940	5.720	48.526	2.64%	-3.27%
			5580	5.908	46.905	5.743	48.499	2.87%	-3.29%
			5600	5.943	46.921	5.766	48.471	3.07%	-3.20%
			5610	5.955	46.919	5.778	48.458	3.06%	-3.18%
			5620	5.964	46.902	5.790	48.444	3.01%	-3.18%
			5640	5.984	46.831	5.813	48.417	2.94%	-3.28%
			5660	6.012	46.752	5.837	48.390	3.00%	-3.38%
			5670	6.028	46.736	5.848	48.376	3.08%	-3.39%
			5680	6.046	46.731	5.860	48.363	3.17%	-3.37%
			5690	6.061	46.737	5.872	48.349	3.22%	-3.33%
			5700	6.077	46.747	5.883	48.336	3.30%	-3.29%
			5710	6.090	46.756	5.895	48.322	3.31%	-3.24%
5720	6.094	46.754	5.907	48.309	3.17%	-3.22%			
5745	6.110	46.652	5.936	48.275	2.93%	-3.36%			
5750	6.118	46.631	5.942	48.268	2.96%	-3.39%			
5755	6.127	46.612	5.947	48.261	3.03%	-3.42%			
5765	6.143	46.584	5.959	48.248	3.09%	-3.45%			
5775	6.166	46.562	5.971	48.234	3.27%	-3.47%			
5785	6.191	46.553	5.982	48.220	3.49%	-3.46%			
5795	6.211	46.549	5.994	48.207	3.62%	-3.44%			
5800	6.221	46.553	6.000	48.200	3.68%	-3.42%			
5805	6.228	46.562	6.006	48.193	3.70%	-3.38%			
5825	6.245	46.599	6.029	48.166	3.58%	-3.25%			

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




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## 10.2 Test System Verification

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

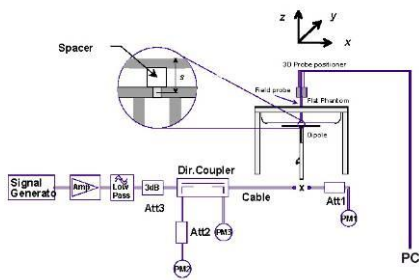
**Table 10-6**  
**System Verification Results – 1g**

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 <sub>1g</sub> (W/kg)	1W Target SAR <sub>1g</sub> (W/kg)	1W Normalized SAR <sub>1g</sub> (W/kg)	Deviation <sub>1g</sub> (%)
H	750	HEAD	01/26/2021	21.5	21.5	0.200	1003	7357	1.690	8.780	1.760	-3.76%
H	750	HEAD	02/02/2021	21.2	20.2	0.200	1161	7357	1.590	8.030	1.610	-1.00%
P	835	HEAD	01/12/2021	22.7	19.9	0.200	4d047	7308	1.820	9.420	1.880	-3.40%
P	835	HEAD	01/26/2021	23.3	20.2	0.200	4d047	7308	1.820	9.420	1.880	-3.40%
D	835	HEAD	02/03/2021	22.6	22.4	0.200	4d133	3589	1.890	9.430	1.890	0.21%
H	1750	HEAD	01/25/2021	20.5	21.0	0.100	1150	7357	3.600	36.500	3.650	-1.37%
L	1900	HEAD	01/12/2021	23.5	23.9	0.100	5d148	7539	4.050	39.100	3.910	3.58%
H	1900	HEAD	01/21/2021	23.5	25.0	0.100	5d149	7357	3.950	39.300	3.930	0.51%
P	1900	HEAD	01/27/2021	21.6	22.0	0.100	5d148	7308	3.850	39.100	3.910	-1.53%
P	2300	HEAD	02/04/2021	20.6	22.8	0.100	1073	7308	4.950	49.200	4.920	0.61%
P	2450	HEAD	02/04/2021	20.6	22.8	0.100	797	7308	5.100	52.400	5.240	-2.67%
E	2450	HEAD	02/09/2021	22.5	22.9	0.100	719	7571	5.050	51.400	5.140	-1.75%
E	2450	HEAD	02/13/2021	22.3	21.7	0.100	719	7571	5.270	51.400	5.140	2.53%
P	2600	HEAD	02/04/2021	20.6	22.8	0.100	1064	7308	5.360	58.100	5.810	-7.75%
D	3500	HEAD	02/19/2021	21.2	19.9	0.100	1059	3589	6.540	63.700	6.370	2.67%
D	3700	HEAD	02/19/2021	21.2	19.9	0.100	1067	3589	6.860	67.200	6.720	2.08%
D	3900	HEAD	02/19/2021	21.2	19.9	0.100	1056	3589	6.900	68.900	6.890	0.15%
H	5250	HEAD	02/09/2021	23.2	20.7	0.050	1237	7357	3.760	81.300	4.070	-7.50%
H	5600	HEAD	02/09/2021	23.2	20.7	0.050	1237	7357	3.860	85.700	4.290	-9.92%
H	5750	HEAD	02/09/2021	23.2	20.7	0.050	1237	7357	3.640	80.600	4.030	-9.68%
L	750	BODY	01/25/2021	23.3	20.8	0.200	1054	7539	1.800	8.530	1.710	5.51%
E	750	BODY	02/02/2021	23.5	21.8	0.200	1161	7571	1.770	8.430	1.690	4.98%
E	750	BODY	02/12/2021	22.9	21.8	0.200	1161	7571	1.600	8.430	1.690	-5.10%
D	835	BODY	01/20/2021	23.1	22.3	0.200	4d133	7552	1.960	9.750	1.950	0.51%
D	835	BODY	01/23/2021	22.3	21.8	0.200	4d047	7552	1.990	9.470	1.890	5.07%
D	835	BODY	01/25/2021	22.3	21.6	0.200	4d133	7552	1.930	9.750	1.950	-1.03%
P	835	BODY	02/02/2021	22.0	20.2	0.200	4d133	7308	2.080	9.750	1.950	6.67%
G	1750	BODY	01/26/2021	23.2	21.1	0.100	1008	7406	3.970	37.400	3.740	6.15%
G	1750	BODY	01/28/2021	23.0	21.1	0.100	1150	7406	3.930	36.600	3.660	7.38%
G	1750	BODY	01/30/2021	23.4	22.0	0.100	1008	7406	3.850	37.400	3.740	2.94%
J	1900	BODY	01/24/2021	22.1	22.6	0.100	5d149	7410	3.870	39.400	3.940	-1.78%
J	1900	BODY	01/27/2021	21.7	22.2	0.100	5d149	7410	4.130	39.400	3.940	4.82%
I	1900	BODY	01/28/2021	22.6	24.2	0.100	5d080	7551	4.110	39.200	3.920	4.85%
J	1900	BODY	02/02/2021	22.7	24.8	0.100	5d080	7410	4.170	39.200	3.920	6.38%
K	2300	BODY	02/02/2021	23.0	22.5	0.100	1073	7409	4.920	47.700	4.770	3.14%
P	2450	BODY	01/21/2021	23.9	22.7	0.100	797	7308	5.100	49.400	4.940	3.24%
K	2450	BODY	01/30/2021	23.0	23.0	0.100	719	7409	5.390	50.700	5.070	6.31%
K	2450	BODY	02/02/2021	23.0	22.5	0.100	719	7409	5.230	50.700	5.070	3.16%
K	2450	BODY	02/06/2021	23.4	22.0	0.100	719	7409	5.250	50.700	5.070	3.55%
K	2450	BODY	02/09/2021	23.5	22.1	0.100	719	7409	5.390	50.700	5.070	6.31%
K	2450	BODY	02/19/2021	23.5	24.5	0.100	719	7409	5.330	50.700	5.070	5.13%
K	2600	BODY	01/30/2021	23.0	23.0	0.100	1004	7409	5.580	54.800	5.480	1.82%
K	2600	BODY	02/02/2021	23.0	22.5	0.100	1004	7409	5.440	54.800	5.480	-0.73%
K	2600	BODY	02/06/2021	23.4	22.0	0.100	1004	7409	5.420	54.800	5.480	-1.09%
L	3500	BODY	02/08/2021	23.3	20.0	0.100	1097	7539	6.840	64.200	6.420	6.54%
L	3700	BODY	02/08/2021	23.3	20.0	0.100	1067	7539	6.800	65.200	6.520	4.29%
L	3700	BODY	02/19/2021	22.3	19.9	0.100	1067	7539	6.740	65.200	6.520	3.37%
L	3900	BODY	02/19/2021	22.3	19.9	0.100	1056	7539	6.690	66.300	6.630	0.90%
G	5250	BODY	02/09/2021	23.5	24.5	0.050	1191	7406	3.470	74.600	3.730	-6.97%
G	5600	BODY	02/09/2021	23.5	24.5	0.050	1191	7406	3.920	78.100	3.910	0.38%
G	5750	BODY	02/09/2021	23.5	24.5	0.050	1191	7406	3.550	74.900	3.750	-5.21%

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**Table 10-7  
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 <sub>10g</sub> (W/kg)	1W Target SAR <sub>10g</sub> (W/kg)	1W Normalized SAR <sub>10g</sub> (W/kg)	Deviation <sub>10g</sub> (%)
G	1750	BODY	01/30/2021	23.4	22.0	0.100	1008	7406	2.000	19.900	1.990	0.50%
I	1750	BODY	02/03/2021	21.1	19.4	0.100	1150	7551	2.030	19.400	1.940	4.64%
J	1900	BODY	01/27/2021	21.7	22.2	0.100	5d149	7410	2.110	20.700	2.070	1.93%
I	1900	BODY	01/28/2021	22.6	24.2	0.100	5d080	7551	2.130	20.600	2.060	3.40%
J	1900	BODY	01/30/2021	21.7	22.8	0.100	5d080	7410	2.080	20.600	2.060	0.97%
K	2300	BODY	02/06/2021	23.4	22.0	0.100	1073	7409	2.370	23.200	2.320	2.16%
K	2450	BODY	02/02/2021	23.0	22.5	0.100	719	7409	2.390	23.900	2.390	0.00%
K	2450	BODY	02/09/2021	23.5	22.1	0.100	719	7409	2.460	23.900	2.390	2.93%
K	2600	BODY	02/02/2021	23.0	22.5	0.100	1004	7409	2.390	24.700	2.470	-3.24%
K	2600	BODY	02/09/2021	23.5	22.1	0.100	1004	7409	2.450	24.700	2.470	-0.81%
L	3500	BODY	02/15/2021	23.3	20.2	0.100	1097	7539	2.500	23.800	2.380	5.04%
L	3700	BODY	02/15/2021	23.3	20.2	0.100	1067	7539	2.440	23.300	2.330	4.72%
L	3700	BODY	02/19/2021	22.3	19.9	0.100	1067	7539	2.420	23.300	2.330	3.86%
L	3900	BODY	02/19/2021	22.3	19.9	0.100	1056	7539	2.310	23.000	2.300	0.43%
G	5250	BODY	02/09/2021	23.5	24.5	0.050	1191	7406	0.970	21.000	1.050	-7.62%
G	5600	BODY	02/09/2021	23.5	24.5	0.050	1191	7406	1.080	21.700	1.090	-0.46%
G	5750	BODY	02/09/2021	23.5	24.5	0.050	1191	7406	0.975	20.800	1.040	-6.25%



**Figure 10-1  
System Verification Setup Diagram**



**Figure 10-2  
System Verification Setup Photo**

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# 11 SAR DATA SUMMARY




## 11.1 Standalone Head SAR Data

**Table 11-1  
CDMA BC10 (§90S) Head SAR**

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
820.10	564	CDMA BC10 (§90S)	RC3 / SO55	26.0	24.82	0.06	Right	Cheek	01842	1:1	0.231	1.312	0.303	A1
820.10	564	CDMA BC10 (§90S)	RC3 / SO55	26.0	24.82	-0.02	Right	Tilt	01842	1:1	0.128	1.312	0.168	
820.10	564	CDMA BC10 (§90S)	RC3 / SO55	26.0	24.82	0.10	Left	Cheek	01842	1:1	0.216	1.312	0.283	
820.10	564	CDMA BC10 (§90S)	RC3 / SO55	26.0	24.82	0.16	Left	Tilt	01842	1:1	0.131	1.312	0.172	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. A	25.0	23.79	0.00	Right	Cheek	01842	1:1	0.204	1.321	0.269	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. A	25.0	23.79	0.09	Right	Tilt	01842	1:1	0.112	1.321	0.148	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. A	25.0	23.79	0.06	Left	Cheek	01842	1:1	0.205	1.321	0.271	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. A	25.0	23.79	0.13	Left	Tilt	01842	1:1	0.104	1.321	0.137	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

**Table 11-2  
CDMA BC0 (§22H) Head SAR**

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.52	384	CDMA BC0 (§22H)	RC3 / SO55	26.0	24.89	0.01	Right	Cheek	01842	1:1	0.235	1.291	0.303	
836.52	384	CDMA BC0 (§22H)	RC3 / SO55	26.0	24.89	0.12	Right	Tilt	01842	1:1	0.115	1.291	0.148	
836.52	384	CDMA BC0 (§22H)	RC3 / SO55	26.0	24.89	0.11	Left	Cheek	01842	1:1	0.210	1.291	0.271	
836.52	384	CDMA BC0 (§22H)	RC3 / SO55	26.0	24.89	0.01	Left	Tilt	01842	1:1	0.117	1.291	0.151	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. A	25.0	23.87	-0.05	Right	Cheek	01842	1:1	0.238	1.297	0.309	A2
836.52	384	CDMA BC0 (§22H)	EVDO Rev. A	25.0	23.87	0.10	Right	Tilt	01842	1:1	0.118	1.297	0.153	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. A	25.0	23.87	0.04	Left	Cheek	01842	1:1	0.208	1.297	0.270	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. A	25.0	23.87	0.11	Left	Tilt	01842	1:1	0.120	1.297	0.156	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

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




MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	600	PCS CDMA	RC3 / SO55	26.0	25.11	0.00	Right	Cheek	01842	1:1	0.143	1.227	0.175	
1880.00	600	PCS CDMA	RC3 / SO55	26.0	25.11	0.19	Right	Tilt	01842	1:1	0.088	1.227	0.108	
1880.00	600	PCS CDMA	RC3 / SO55	26.0	25.11	0.12	Left	Cheek	01842	1:1	0.172	1.227	0.211	A3
1880.00	600	PCS CDMA	RC3 / SO55	26.0	25.11	0.14	Left	Tilt	01842	1:1	0.128	1.227	0.157	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	24.05	0.16	Right	Cheek	01842	1:1	0.133	1.245	0.166	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	24.05	-0.07	Right	Tilt	01842	1:1	0.096	1.245	0.120	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	24.05	0.10	Left	Cheek	01842	1:1	0.148	1.245	0.184	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	24.05	0.14	Left	Tilt	01842	1:1	0.108	1.245	0.134	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

**Table 11-4  
GSM 850 Head SAR**

MEASUREMENT RESULTS														
FREQUENCY		Mode	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	33.5	33.07	-0.16	Right	Cheek	01750	1:8.3	0.212	1.104	0.234	A4
836.60	190	GSM 850	GSM	33.5	33.07	0.19	Right	Tilt	01750	1:8.3	0.109	1.104	0.120	
836.60	190	GSM 850	GSM	33.5	33.07	-0.09	Left	Cheek	01750	1:8.3	0.170	1.104	0.188	
836.60	190	GSM 850	GSM	33.5	33.07	0.13	Left	Tilt	01750	1:8.3	0.104	1.104	0.115	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

**Table 11-5  
GSM 1900 Head SAR**

MEASUREMENT RESULTS														
FREQUENCY		Mode	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	30.5	30.08	0.19	Right	Cheek	01826	1:8.3	0.036	1.102	0.040	
1880.00	661	GSM 1900	GSM	30.5	30.08	0.13	Right	Tilt	01826	1:8.3	0.033	1.102	0.036	
1880.00	661	GSM 1900	GSM	30.5	30.08	0.14	Left	Cheek	01826	1:8.3	0.057	1.102	0.063	A5
1880.00	661	GSM 1900	GSM	30.5	30.08	-0.14	Left	Tilt	01826	1:8.3	0.043	1.102	0.047	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

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**Table 11-6  
UMTS 850 Head SAR**




MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	25.0	23.63	0.19	Right	Cheek	01792	1:1	0.180	1.371	0.247	A6
836.60	4183	UMTS 850	RMC	25.0	23.63	0.13	Right	Tilt	01792	1:1	0.083	1.371	0.114	
836.60	4183	UMTS 850	RMC	25.0	23.63	-0.07	Left	Cheek	01792	1:1	0.147	1.371	0.202	
836.60	4183	UMTS 850	RMC	25.0	23.63	0.14	Left	Tilt	01792	1:1	0.080	1.371	0.110	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

**Table 11-7  
UMTS 1750 Head SAR**

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1732.40	1412	UMTS 1750	RMC	25.0	23.45	0.13	Right	Cheek	01842	1:1	0.198	1.429	0.283	A7
1732.40	1412	UMTS 1750	RMC	25.0	23.45	0.16	Right	Tilt	01842	1:1	0.123	1.429	0.176	
1732.40	1412	UMTS 1750	RMC	25.0	23.45	-0.07	Left	Cheek	01842	1:1	0.153	1.429	0.219	
1732.40	1412	UMTS 1750	RMC	25.0	23.45	0.12	Left	Tilt	01842	1:1	0.147	1.429	0.210	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

**Table 11-8  
UMTS 1900 Head SAR**

MEASUREMENT RESULTS														
FREQUENCY		Mode	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	25.0	24.22	0.14	Right	Cheek	01735	1:1	0.115	1.197	0.138	
1880.00	9400	UMTS 1900	RMC	25.0	24.22	0.16	Right	Tilt	01735	1:1	0.078	1.197	0.093	
1880.00	9400	UMTS 1900	RMC	25.0	24.22	0.06	Left	Cheek	01735	1:1	0.117	1.197	0.140	A8
1880.00	9400	UMTS 1900	RMC	25.0	24.22	0.12	Left	Tilt	01735	1:1	0.078	1.197	0.093	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram						

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**Table 11-9  
LTE Band 71 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)		
680.50	133297	Mid	LTE Band 71	20	25.5	24.85	-0.05	0	Right	Cheek	QPSK	1	0	01859	1:1	0.114	1.161	0.132	
680.50	133297	Mid	LTE Band 71	20	24.5	24.04	-0.02	1	Right	Cheek	QPSK	50	0	01859	1:1	0.107	1.112	0.119	
680.50	133297	Mid	LTE Band 71	20	25.5	24.85	0.14	0	Right	Tilt	QPSK	1	0	01859	1:1	0.055	1.161	0.064	
680.50	133297	Mid	LTE Band 71	20	24.5	24.04	0.04	1	Right	Tilt	QPSK	50	0	01859	1:1	0.052	1.112	0.058	
680.50	133297	Mid	LTE Band 71	20	25.5	24.85	0.08	0	Left	Cheek	QPSK	1	0	01859	1:1	0.122	1.161	0.142	A9
680.50	133297	Mid	LTE Band 71	20	24.5	24.04	0.05	1	Left	Cheek	QPSK	50	0	01859	1:1	0.101	1.112	0.112	
680.50	133297	Mid	LTE Band 71	20	25.5	24.85	0.12	0	Left	Tilt	QPSK	1	0	01859	1:1	0.055	1.161	0.064	
680.50	133297	Mid	LTE Band 71	20	24.5	24.04	0.17	1	Left	Tilt	QPSK	50	0	01859	1:1	0.050	1.112	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								

**Table 11-10  
LTE Band 12 Head SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
707.50	23095	Mid	LTE Band 12	10	24.0	22.60	-0.03	0	Right	Cheek	QPSK	1	0	01727	1:1	0.141	1.380	0.195	A10
707.50	23095	Mid	LTE Band 12	10	23.0	21.65	0.01	1	Right	Cheek	QPSK	25	0	01727	1:1	0.109	1.365	0.149	
707.50	23095	Mid	LTE Band 12	10	24.0	22.60	0.14	0	Right	Tilt	QPSK	1	0	01727	1:1	0.068	1.380	0.094	
707.50	23095	Mid	LTE Band 12	10	23.0	21.65	0.10	1	Right	Tilt	QPSK	25	0	01727	1:1	0.052	1.365	0.071	
707.50	23095	Mid	LTE Band 12	10	24.0	22.60	0.07	0	Left	Cheek	QPSK	1	0	01727	1:1	0.115	1.380	0.159	
707.50	23095	Mid	LTE Band 12	10	23.0	21.65	0.09	1	Left	Cheek	QPSK	25	0	01727	1:1	0.091	1.365	0.124	
707.50	23095	Mid	LTE Band 12	10	24.0	22.60	0.09	0	Left	Tilt	QPSK	1	0	01727	1:1	0.059	1.380	0.081	
707.50	23095	Mid	LTE Band 12	10	23.0	21.65	0.12	1	Left	Tilt	QPSK	25	0	01727	1:1	0.045	1.365	0.061	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Head 1.6 W/kg (mW/g) averaged over 1 gram								

**Table 11-11  
LTE Band 13 Head SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
782.00	23230	Mid	LTE Band 13	10	24.0	23.14	0.08	0	Right	Cheek	QPSK	1	49	01727	1:1	0.123	1.219	0.150	A11
782.00	23230	Mid	LTE Band 13	10	23.0	22.13	0.10	1	Right	Cheek	QPSK	25	25	01727	1:1	0.104	1.222	0.127	
782.00	23230	Mid	LTE Band 13	10	24.0	23.14	0.10	0	Right	Tilt	QPSK	1	49	01727	1:1	0.062	1.219	0.076	
782.00	23230	Mid	LTE Band 13	10	23.0	22.13	0.15	1	Right	Tilt	QPSK	25	25	01727	1:1	0.051	1.222	0.062	
782.00	23230	Mid	LTE Band 13	10	24.0	23.14	0.09	0	Left	Cheek	QPSK	1	49	01727	1:1	0.093	1.219	0.113	
782.00	23230	Mid	LTE Band 13	10	23.0	22.13	0.12	1	Left	Cheek	QPSK	25	25	01727	1:1	0.081	1.222	0.099	
782.00	23230	Mid	LTE Band 13	10	24.0	23.14	0.19	0	Left	Tilt	QPSK	1	49	01727	1:1	0.052	1.219	0.063	
782.00	23230	Mid	LTE Band 13	10	23.0	22.13	0.13	1	Left	Tilt	QPSK	25	25	01727	1:1	0.043	1.222	0.053	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Head 1.6 W/kg (mW/g) averaged over 1 gram								

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**Table 11-12  
LTE Band 14 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)		
793.00	23330	Mid	LTE Band 14	10	25.5	24.52	0.03	0	Right	Cheek	QPSK	1	0	01859	1:1	0.195	1.253	0.244	A12
793.00	23330	Mid	LTE Band 14	10	24.5	23.54	0.04	1	Right	Cheek	QPSK	25	12	01859	1:1	0.149	1.247	0.186	
793.00	23330	Mid	LTE Band 14	10	25.5	24.52	0.08	0	Right	Tilt	QPSK	1	0	01859	1:1	0.113	1.253	0.142	
793.00	23330	Mid	LTE Band 14	10	24.5	23.54	0.05	1	Right	Tilt	QPSK	25	12	01859	1:1	0.087	1.247	0.108	
793.00	23330	Mid	LTE Band 14	10	25.5	24.52	0.04	0	Left	Cheek	QPSK	1	0	01859	1:1	0.175	1.253	0.219	
793.00	23330	Mid	LTE Band 14	10	24.5	23.54	0.13	1	Left	Cheek	QPSK	25	12	01859	1:1	0.126	1.247	0.157	
793.00	23330	Mid	LTE Band 14	10	25.5	24.52	0.10	0	Left	Tilt	QPSK	1	0	01859	1:1	0.103	1.253	0.129	
793.00	23330	Mid	LTE Band 14	10	24.5	23.54	0.09	1	Left	Tilt	QPSK	25	12	01859	1:1	0.079	1.247	0.099	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram									

**Table 11-13  
LTE Band 26 (Cell) Head SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.97	-0.03	0	Right	Cheek	QPSK	1	74	01784	1:1	0.201	1.268	0.255	A13
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.05	0.07	1	Right	Cheek	QPSK	36	37	01784	1:1	0.159	1.245	0.198	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.97	0.18	0	Right	Tilt	QPSK	1	74	01784	1:1	0.106	1.268	0.134	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.05	0.02	1	Right	Tilt	QPSK	36	37	01784	1:1	0.081	1.245	0.101	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.97	0.13	0	Left	Cheek	QPSK	1	74	01784	1:1	0.161	1.268	0.204	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.05	0.11	1	Left	Cheek	QPSK	36	37	01784	1:1	0.118	1.245	0.147	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.97	0.03	0	Left	Tilt	QPSK	1	74	01784	1:1	0.094	1.268	0.119	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.05	0.16	1	Left	Tilt	QPSK	36	37	01784	1:1	0.066	1.245	0.082	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram									

**Table 11-14  
LTE Band 5 (Cell) 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	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.14	0.13	0	Right	Cheek	QPSK	1	49	01917	1:1	0.093	1.219	0.113	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.26	0.21	1	Right	Cheek	QPSK	25	12	01917	1:1	0.073	1.186	0.087	
2 CC Uplink	PCC	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.45	0.14	0	Right	Cheek	QPSK	1	49	01917	1:1	0.104	1.135	0.118	A14
	SCC	843.70	20597			5								0							
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.14	0.14	0	Right	Tilt	QPSK	1	49	01917	1:1	0.042	1.219	0.051	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.26	0.19	1	Right	Tilt	QPSK	25	12	01917	1:1	0.030	1.186	0.036	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.14	0.02	0	Left	Cheek	QPSK	1	49	01917	1:1	0.087	1.219	0.106	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.26	0.07	1	Left	Cheek	QPSK	25	12	01917	1:1	0.064	1.186	0.076	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.14	0.06	0	Left	Tilt	QPSK	1	49	01917	1:1	0.047	1.219	0.057	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.26	0.03	1	Left	Tilt	QPSK	25	12	01917	1:1	0.036	1.186	0.043	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram											

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**Table 11-15**  
**LTE Band 66 (AWS) 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	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	23.34	0.18	0	Right	Cheek	QPSK	1	99	01917	1:1	0.159	1.306	0.208	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	23.5	22.44	0.17	1	Right	Cheek	QPSK	50	25	01917	1:1	0.129	1.276	0.165	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	23.34	0.12	0	Right	Tilt	QPSK	1	99	01917	1:1	0.150	1.306	0.196	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	23.5	22.44	0.13	1	Right	Tilt	QPSK	50	25	01917	1:1	0.100	1.276	0.128	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	23.15	0.07	0	Left	Cheek	QPSK	1	0	01917	1:1	0.170	1.365	0.232	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	23.34	0.16	0	Left	Cheek	QPSK	1	99	01917	1:1	0.186	1.306	0.243	
1 CC Uplink	N/A	1775.00	132622	High	LTE Band 66 (AWS)	10	24.5	22.89	0.10	0	Left	Cheek	QPSK	1	0	01917	1:1	0.173	1.449	0.251	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	23.5	22.44	0.13	1	Left	Cheek	QPSK	50	25	01917	1:1	0.145	1.276	0.185	
2 CC Uplink CA_66C	PCC	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	24.24	0.07	0	Left	Cheek	QPSK	1	0	01917	1:1	0.217	1.062	0.230	
	SCC	1750.20	132374			20								1	99						
2 CC Uplink CA_66B	PCC	1775.00	132622	High	LTE Band 66 (AWS)	10	24.5	24.03	0.09	0	Left	Cheek	QPSK	1	0	01917	1:1	0.223	1.114	0.248	A15
	SCC	1765.10	132523			10								1	49						
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	23.34	0.13	0	Left	Tilt	QPSK	1	99	01917	1:1	0.141	1.306	0.184	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	23.5	22.44	0.07	1	Left	Tilt	QPSK	50	25	01917	1:1	0.110	1.276	0.140	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram											

**Table 11-16**  
**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	24.5	23.85	0.19	0	Right	Cheek	QPSK	1	50	01735	1:1	0.111	1.161	0.129	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.5	22.75	0.18	1	Right	Cheek	QPSK	50	25	01735	1:1	0.086	1.189	0.102	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.5	23.85	0.15	0	Right	Tilt	QPSK	1	50	01735	1:1	0.072	1.161	0.084	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.5	22.75	0.12	1	Right	Tilt	QPSK	50	25	01735	1:1	0.057	1.189	0.068	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.5	23.85	0.07	0	Left	Cheek	QPSK	1	50	01735	1:1	0.120	1.161	0.139	A16
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.5	22.75	0.09	1	Left	Cheek	QPSK	50	25	01735	1:1	0.095	1.189	0.113	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.5	23.85	0.18	0	Left	Tilt	QPSK	1	50	01735	1:1	0.066	1.161	0.077	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.5	22.75	0.20	1	Left	Tilt	QPSK	50	25	01735	1:1	0.058	1.189	0.069	
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**Table 11-17**  
**LTE Band 30 Head SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
2310.00	27710	Md	LTE Band 30	10	19.5	18.75	0.06	0	Right	Cheek	QPSK	1	0	01834	1:1	0.475	1.189	0.565	A17
2310.00	27710	Md	LTE Band 30	10	19.5	18.71	-0.11	0	Right	Cheek	QPSK	25	0	01834	1:1	0.474	1.199	0.568	
2310.00	27710	Md	LTE Band 30	10	19.5	18.75	0.09	0	Right	Tilt	QPSK	1	0	01834	1:1	0.225	1.189	0.268	
2310.00	27710	Md	LTE Band 30	10	19.5	18.71	0.10	0	Right	Tilt	QPSK	25	0	01834	1:1	0.218	1.199	0.261	
2310.00	27710	Md	LTE Band 30	10	19.5	18.75	0.02	0	Left	Cheek	QPSK	1	0	01834	1:1	0.123	1.189	0.146	
2310.00	27710	Md	LTE Band 30	10	19.5	18.71	0.08	0	Left	Cheek	QPSK	25	0	01834	1:1	0.125	1.199	0.150	
2310.00	27710	Md	LTE Band 30	10	19.5	18.75	0.17	0	Left	Tilt	QPSK	1	0	01834	1:1	0.095	1.189	0.113	
2310.00	27710	Md	LTE Band 30	10	19.5	18.71	0.15	0	Left	Tilt	QPSK	25	0	01834	1:1	0.098	1.199	0.118	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Head 1.6 W/kg (mW/g) averaged over 1 gram								

**Table 11-18**  
**LTE Band 7 Head SAR**



MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
2535.00	21100	Md	LTE Band 7	20	19.5	19.08	0.02	0	Right	Cheek	QPSK	1	99	01883	1:1	0.474	1.102	0.522	
2535.00	21100	Md	LTE Band 7	20	19.5	19.05	0.04	0	Right	Cheek	QPSK	50	50	01883	1:1	0.522	1.109	0.579	A18
2535.00	21100	Md	LTE Band 7	20	19.5	19.08	0.11	0	Right	Tilt	QPSK	1	99	01883	1:1	0.232	1.102	0.256	
2535.00	21100	Md	LTE Band 7	20	19.5	19.05	0.06	0	Right	Tilt	QPSK	50	50	01883	1:1	0.252	1.109	0.279	
2535.00	21100	Md	LTE Band 7	20	19.5	19.08	0.01	0	Left	Cheek	QPSK	1	99	01883	1:1	0.352	1.102	0.388	
2535.00	21100	Md	LTE Band 7	20	19.5	19.05	0.17	0	Left	Cheek	QPSK	50	50	01883	1:1	0.300	1.109	0.333	
2535.00	21100	Md	LTE Band 7	20	19.5	19.08	0.13	0	Left	Tilt	QPSK	1	99	01883	1:1	0.232	1.102	0.256	
2535.00	21100	Md	LTE Band 7	20	19.5	19.05	0.20	0	Left	Tilt	QPSK	50	50	01883	1:1	0.198	1.109	0.220	
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**Table 11-19  
LTE Band 48 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)		
3560.00	55340	Low	LTE Band 48	20	18.0	17.66	0.04	0	Right	Cheek	QPSK	1	0	51755	1:1.58	0.762	1.081	0.824	
3603.30	55773	Low-Mid	LTE Band 48	20	18.0	16.90	-0.05	0	Right	Cheek	QPSK	1	0	51755	1:1.58	0.691	1.288	0.890	
3646.70	56207	Mid-High	LTE Band 48	20	18.0	17.10	0.04	0	Right	Cheek	QPSK	1	99	51755	1:1.58	0.699	1.230	0.860	
3690.00	56640	High	LTE Band 48	20	18.0	17.87	0.01	0	Right	Cheek	QPSK	1	99	51755	1:1.58	0.711	1.030	0.732	
3560.00	55340	Low	LTE Band 48	20	18.0	17.77	0.04	0	Right	Cheek	QPSK	50	25	51755	1:1.58	0.774	1.054	0.816	
3603.30	55773	Low-Mid	LTE Band 48	20	18.0	16.91	0.02	0	Right	Cheek	QPSK	50	0	51755	1:1.58	0.701	1.285	0.901	
3646.70	56207	Mid-High	LTE Band 48	20	18.0	17.03	0.05	0	Right	Cheek	QPSK	50	50	51755	1:1.58	0.694	1.250	0.868	
3690.00	56640	High	LTE Band 48	20	18.0	17.88	0.00	0	Right	Cheek	QPSK	50	50	51755	1:1.58	0.719	1.028	0.739	
3690.00	56640	High	LTE Band 48	20	18.0	17.77	0.03	0	Right	Cheek	QPSK	100	0	51755	1:1.58	0.772	1.054	0.814	
3560.00	55340	Low	LTE Band 48	20	18.0	17.66	0.04	0	Right	Tilt	QPSK	1	0	51755	1:1.58	0.804	1.081	0.869	
3603.30	55773	Low-Mid	LTE Band 48	20	18.0	16.90	0.12	0	Right	Tilt	QPSK	1	0	51755	1:1.58	0.807	1.288	1.039	
3646.70	56207	Mid-High	LTE Band 48	20	18.0	17.10	-0.03	0	Right	Tilt	QPSK	1	99	51755	1:1.58	0.787	1.230	0.968	
3690.00	56640	High	LTE Band 48	20	18.0	17.87	-0.01	0	Right	Tilt	QPSK	1	99	51755	1:1.58	0.887	1.030	0.914	
3560.00	55340	Low	LTE Band 48	20	18.0	17.77	0.06	0	Right	Tilt	QPSK	50	25	51755	1:1.58	0.819	1.054	0.863	
3603.30	55773	Low-Mid	LTE Band 48	20	18.0	16.91	-0.03	0	Right	Tilt	QPSK	50	0	51755	1:1.58	0.775	1.285	0.996	
3646.70	56207	Mid-High	LTE Band 48	20	18.0	17.03	0.02	0	Right	Tilt	QPSK	50	50	51755	1:1.58	0.793	1.250	0.991	
3690.00	56640	High	LTE Band 48	20	18.0	17.88	0.02	0	Right	Tilt	QPSK	50	50	51755	1:1.58	0.901	1.028	0.926	A19
3690.00	56640	High	LTE Band 48	20	18.0	17.77	-0.02	0	Right	Tilt	QPSK	100	0	51755	1:1.58	0.899	1.054	0.948	
3690.00	56640	High	LTE Band 48	20	18.0	17.87	0.04	0	Left	Cheek	QPSK	1	99	51755	1:1.58	0.350	1.030	0.361	
3690.00	56640	High	LTE Band 48	20	18.0	17.88	0.05	0	Left	Cheek	QPSK	50	50	51755	1:1.58	0.341	1.028	0.351	
3690.00	56640	High	LTE Band 48	20	18.0	17.87	0.02	0	Left	Tilt	QPSK	1	99	51755	1:1.58	0.408	1.030	0.420	
3690.00	56640	High	LTE Band 48	20	18.0	17.88	0.04	0	Left	Tilt	QPSK	50	50	51755	1:1.58	0.414	1.028	0.426	
3560.00	55340	Low	LTE Band 48	20	18.0	17.77	0.00	0	Right	Tilt	QPSK	50	25	51755	1:1.58	0.806	1.054	0.850	
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Note: Blue entry represent variability measurement.



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**Table 11-20  
LTE Band 41 Head SAR**

MEASUREMENT RESULTS																					
1 CC Uplink   2 CC Uplink, Power Class	Component Carrier	FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
		MHz	Ch.														(W/kg)		(W/kg)		
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	21.5	20.49	0.00	0	Right	Cheek	QPSK	1	99	40527	1.1.58	0.434	1.262	0.548	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	21.5	20.62	-0.01	0	Right	Cheek	QPSK	1	0	40527	1.1.58	0.524	1.225	0.642	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.76	-0.01	0	Right	Cheek	QPSK	1	50	40527	1.1.58	0.557	1.186	0.661	A20
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.40	-0.02	0	Right	Cheek	QPSK	1	99	40527	1.1.58	0.481	1.288	0.620	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	21.5	20.33	0.00	0	Right	Cheek	QPSK	1	50	40527	1.1.58	0.401	1.309	0.525	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	21.5	20.26	0.04	0	Right	Cheek	QPSK	1	50	40527	1.1.58	0.428	1.330	0.569	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	21.5	20.58	0.03	0	Right	Cheek	QPSK	50	50	40527	1.1.58	0.415	1.236	0.513	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	21.5	20.71	0.04	0	Right	Cheek	QPSK	50	25	40527	1.1.58	0.543	1.199	0.651	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.77	0.02	0	Right	Cheek	QPSK	50	25	40527	1.1.58	0.550	1.183	0.651	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	21.5	20.45	0.05	0	Right	Cheek	QPSK	50	25	40527	1.1.58	0.400	1.274	0.510	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	21.5	20.42	0.15	0	Right	Cheek	QPSK	50	50	40527	1.1.58	0.434	1.282	0.556	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.65	0.00	0	Right	Cheek	QPSK	100	0	40527	1.1.58	0.538	1.216	0.654	
1 CC Uplink - Power Class 2	N/A	2593.00	40620	Mid	LTE Band 41	20	23.1	22.33	0.05	0	Right	Cheek	QPSK	1	50	40527	1.2.31	0.529	1.194	0.632	
1 CC Uplink - Power Class 2	N/A	2593.00	40620	Mid	LTE Band 41	20	23.1	22.03	0.17	0	Right	Cheek	QPSK	1	99	40527	1.2.31	0.480	1.279	0.614	
2 CC Uplink - Power Class 3	PCC	2593.00	40620	Mid	LTE Band 41	20	21.5	20.76	0.00	0	Right	Cheek	QPSK	1	99	40527	1.1.58	0.525	1.186	0.623	
	SCC	2612.80	40818											1	0						
2 CC Uplink - Power Class 2	PCC	2593.00	40620	Mid	LTE Band 41	20	23.1	22.39	0.01	0	Right	Cheek	QPSK	1	99	40527	1.2.31	0.531	1.178	0.626	
	SCC	2612.80	40818											1	0						
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.76	-0.13	0	Right	Tilt	QPSK	1	50	40527	1.1.58	0.304	1.186	0.361	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.77	0.12	0	Right	Tilt	QPSK	50	25	40527	1.1.58	0.303	1.183	0.358	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.76	0.08	0	Left	Cheek	QPSK	1	50	40527	1.1.58	0.172	1.186	0.204	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.77	0.11	0	Left	Cheek	QPSK	50	25	40527	1.1.58	0.169	1.183	0.200	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.76	0.09	0	Left	Tilt	QPSK	1	50	40527	1.1.58	0.105	1.186	0.125	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.77	0.15	0	Left	Tilt	QPSK	50	25	40527	1.1.58	0.116	1.183	0.137	
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 11-21  
NR Band n71 Head SAR**

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
680.50	136100	Mid	NR Band n71	20	25.0	23.40	0.12	0	Right	Cheek	DFT-S-OFDM	QPSK	1	53	01727	1:1	0.083	1.445	0.120	
680.50	136100	Mid	NR Band n71	20	25.0	23.35	0.03	0	Right	Cheek	DFT-S-OFDM	QPSK	50	28	01727	1:1	0.090	1.462	0.132	A21
680.50	136100	Mid	NR Band n71	20	23.5	21.81	0.10	1.5	Right	Cheek	CP-OFDM	QPSK	1	1	01727	1:1	0.060	1.476	0.089	
680.50	136100	Mid	NR Band n71	20	25.0	23.40	0.15	0	Right	Tilt	DFT-S-OFDM	QPSK	1	53	01727	1:1	0.043	1.445	0.062	
680.50	136100	Mid	NR Band n71	20	25.0	23.35	0.15	0	Right	Tilt	DFT-S-OFDM	QPSK	50	28	01727	1:1	0.040	1.462	0.058	
680.50	136100	Mid	NR Band n71	20	25.0	23.40	0.12	0	Left	Cheek	DFT-S-OFDM	QPSK	1	53	01727	1:1	0.085	1.445	0.123	
680.50	136100	Mid	NR Band n71	20	25.0	23.35	0.06	0	Left	Cheek	DFT-S-OFDM	QPSK	50	28	01727	1:1	0.086	1.462	0.126	
680.50	136100	Mid	NR Band n71	20	25.0	23.40	0.12	0	Left	Tilt	DFT-S-OFDM	QPSK	1	53	01727	1:1	0.043	1.445	0.062	
680.50	136100	Mid	NR Band n71	20	25.0	23.35	0.10	0	Left	Tilt	DFT-S-OFDM	QPSK	50	28	01727	1:1	0.043	1.462	0.063	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram										

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**Table 11-22  
NR Band n5 Head SAR**



MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.62	0.11	0	Right	Cheek	DFT-S-OFDM	QPSK	1	53	01792	1:1	0.157	1.374	0.216	A22
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.43	0.13	0	Right	Cheek	DFT-S-OFDM	QPSK	50	28	01792	1:1	0.144	1.435	0.207	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.5	22.15	0.21	1.5	Right	Cheek	CP-OFDM	QPSK	1	1	01792	1:1	0.090	1.365	0.123	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.62	0.18	0	Right	Tilt	DFT-S-OFDM	QPSK	1	53	01792	1:1	0.071	1.374	0.098	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.43	0.17	0	Right	Tilt	DFT-S-OFDM	QPSK	50	28	01792	1:1	0.072	1.435	0.103	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.62	0.00	0	Left	Cheek	DFT-S-OFDM	QPSK	1	53	01792	1:1	0.124	1.374	0.170	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.43	0.06	0	Left	Cheek	DFT-S-OFDM	QPSK	50	28	01792	1:1	0.127	1.435	0.182	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.62	0.15	0	Left	Tilt	DFT-S-OFDM	QPSK	1	53	01792	1:1	0.075	1.374	0.103	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.43	0.15	0	Left	Tilt	DFT-S-OFDM	QPSK	50	28	01792	1:1	0.075	1.435	0.108	
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 11-23  
NR Band n66 Head SAR**

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.60	0.18	0	Right	Cheek	DFT-S-OFDM	QPSK	1	104	01727	1:1	0.147	1.096	0.161	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.40	0.11	0	Right	Cheek	DFT-S-OFDM	QPSK	50	28	01727	1:1	0.166	1.148	0.191	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.60	0.12	0	Right	Tilt	DFT-S-OFDM	QPSK	1	104	01727	1:1	0.117	1.096	0.128	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.40	0.19	0	Right	Tilt	DFT-S-OFDM	QPSK	50	28	01727	1:1	0.126	1.148	0.145	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.60	0.16	0	Left	Cheek	DFT-S-OFDM	QPSK	1	104	01727	1:1	0.168	1.096	0.184	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.40	0.11	0	Left	Cheek	DFT-S-OFDM	QPSK	50	28	01727	1:1	0.182	1.148	0.209	A23
1745.00	349000	Mid	NR Band n66 (AWS)	20	23.5	22.85	0.10	1.5	Left	Cheek	CP-OFDM	QPSK	1	1	01727	1:1	0.135	1.161	0.157	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.60	-0.20	0	Left	Tilt	DFT-S-OFDM	QPSK	1	104	01727	1:1	0.103	1.096	0.113	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.40	0.00	0	Left	Tilt	DFT-S-OFDM	QPSK	50	28	01727	1:1	0.139	1.148	0.160	
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 11-24  
NR Band n25 Head SAR**

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.78	0.12	0	Right	Cheek	DFT-S-OFDM	QPSK	1	53	01842	1:1	0.143	1.052	0.150	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.66	0.10	0	Right	Cheek	DFT-S-OFDM	QPSK	50	28	01842	1:1	0.128	1.081	0.138	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.78	0.14	0	Right	Tilt	DFT-S-OFDM	QPSK	1	53	01842	1:1	0.096	1.052	0.101	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.66	0.15	0	Right	Tilt	DFT-S-OFDM	QPSK	50	28	01842	1:1	0.099	1.081	0.107	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.78	-0.13	0	Left	Cheek	DFT-S-OFDM	QPSK	1	53	01842	1:1	0.171	1.052	0.180	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.66	0.02	0	Left	Cheek	DFT-S-OFDM	QPSK	50	28	01842	1:1	0.173	1.081	0.187	A24
1860.00	372000	Low	NR Band n25 (PCS)	20	23.5	22.58	0.10	1.5	Left	Cheek	CP-OFDM	QPSK	1	1	01842	1:1	0.130	1.236	0.161	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.78	0.17	0	Left	Tilt	DFT-S-OFDM	QPSK	1	53	01842	1:1	0.099	1.052	0.104	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.66	0.00	0	Left	Tilt	DFT-S-OFDM	QPSK	50	28	01842	1:1	0.102	1.081	0.110	
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 11-25  
NR Band n41 Head SAR**

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
2592.99	518598	Mid	NR Band n41	100	15.0	14.12	0.15	0	Right	Cheek	DFT-S-OFDM	QPSK	1	1	01859	1:1	0.195	1.225	0.239	
2592.99	518598	Mid	NR Band n41	100	15.0	14.25	0.17	0	Right	Cheek	DFT-S-OFDM	QPSK	135	0	01859	1:1	0.215	1.189	0.256	A25
2592.99	518598	Mid	NR Band n41	100	15.0	14.04	0.13	0	Right	Cheek	CP-OFDM	QPSK	1	1	01859	1:1	0.201	1.247	0.251	
2592.99	518598	Mid	NR Band n41	100	15.0	14.12	0.13	0	Right	Tilt	DFT-S-OFDM	QPSK	1	1	01859	1:1	0.104	1.225	0.127	
2592.99	518598	Mid	NR Band n41	100	15.0	14.25	0.14	0	Right	Tilt	DFT-S-OFDM	QPSK	135	0	01859	1:1	0.102	1.189	0.121	
2592.99	518598	Mid	NR Band n41	100	15.0	14.12	0.10	0	Left	Cheek	DFT-S-OFDM	QPSK	1	1	01859	1:1	0.050	1.225	0.061	
2592.99	518598	Mid	NR Band n41	100	15.0	14.25	0.15	0	Left	Cheek	DFT-S-OFDM	QPSK	135	0	01859	1:1	0.059	1.189	0.070	
2592.99	518598	Mid	NR Band n41	100	15.0	14.12	0.15	0	Left	Tilt	DFT-S-OFDM	QPSK	1	1	01859	1:1	0.028	1.225	0.034	
2592.99	518598	Mid	NR Band n41	100	15.0	14.25	0.18	0	Left	Tilt	DFT-S-OFDM	QPSK	135	0	01859	1:1	0.036	1.189	0.043	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram										

**Table 11-26  
NR Band n77 Head SAR**

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
3750.00	850000	Low	NR Band n77	100	15.5	15.29	0.01	0	Right	Cheek	DFT-S-OFDM	QPSK	1	1	01768	1:1	0.834	1.050	0.876	
3930.00	862000	High	NR Band n77	100	15.5	14.82	0.06	0	Right	Cheek	DFT-S-OFDM	QPSK	1	1	01768	1:1	0.656	1.169	0.767	
3750.00	850000	Low	NR Band n77	100	15.5	14.93	0.05	0	Right	Cheek	DFT-S-OFDM	QPSK	135	69	01768	1:1	0.777	1.140	0.886	
3930.00	862000	High	NR Band n77	100	15.5	14.85	0.02	0	Right	Cheek	DFT-S-OFDM	QPSK	135	0	01768	1:1	0.553	1.161	0.642	
3750.00	850000	Low	NR Band n77	100	15.5	14.58	-0.08	0	Right	Cheek	DFT-S-OFDM	QPSK	270	0	01768	1:1	0.713	1.236	0.881	
3750.00	850000	Low	NR Band n77	100	15.5	15.29	-0.03	0	Right	Tilt	DFT-S-OFDM	QPSK	1	1	01768	1:1	0.988	1.050	1.037	A26
3930.00	862000	High	NR Band n77	100	15.5	14.82	0.02	0	Right	Tilt	DFT-S-OFDM	QPSK	1	1	01768	1:1	0.714	1.169	0.835	
3750.00	850000	Low	NR Band n77	100	15.5	14.93	-0.03	0	Right	Tilt	DFT-S-OFDM	QPSK	135	69	01768	1:1	0.970	1.140	1.106	
3930.00	862000	High	NR Band n77	100	15.5	14.85	0.02	0	Right	Tilt	DFT-S-OFDM	QPSK	135	0	01768	1:1	0.705	1.161	0.819	
3750.00	850000	Low	NR Band n77	100	15.5	14.58	-0.14	0	Right	Tilt	DFT-S-OFDM	QPSK	270	0	01768	1:1	0.822	1.236	1.016	
3750.00	850000	Low	NR Band n77	100	15.5	14.79	0.02	0	Right	Tilt	CP-OFDM	QPSK	1	1	01768	1:1	0.857	1.178	1.010	
3750.00	850000	Low	NR Band n77	100	15.5	15.29	0.06	0	Left	Cheek	DFT-S-OFDM	QPSK	1	1	01768	1:1	0.444	1.050	0.466	
3930.00	862000	High	NR Band n77	100	15.5	14.82	0.09	0	Left	Cheek	DFT-S-OFDM	QPSK	1	1	01768	1:1	0.313	1.169	0.366	
3750.00	850000	Low	NR Band n77	100	15.5	14.93	0.09	0	Left	Cheek	DFT-S-OFDM	QPSK	135	69	01768	1:1	0.434	1.140	0.495	
3930.00	862000	High	NR Band n77	100	15.5	14.85	-0.21	0	Left	Cheek	DFT-S-OFDM	QPSK	135	0	01768	1:1	0.357	1.161	0.414	
3750.00	850000	Low	NR Band n77	100	15.5	14.58	-0.06	0	Left	Cheek	DFT-S-OFDM	QPSK	270	0	01768	1:1	0.376	1.236	0.465	
3750.00	850000	Low	NR Band n77	100	15.5	15.29	0.03	0	Left	Tilt	DFT-S-OFDM	QPSK	1	1	01768	1:1	0.636	1.050	0.668	
3930.00	862000	High	NR Band n77	100	15.5	14.82	0.04	0	Left	Tilt	DFT-S-OFDM	QPSK	1	1	01768	1:1	0.472	1.169	0.552	
3750.00	850000	Low	NR Band n77	100	15.5	14.93	0.04	0	Left	Tilt	DFT-S-OFDM	QPSK	135	69	01768	1:1	0.632	1.140	0.720	
3930.00	862000	High	NR Band n77	100	15.5	14.85	0.02	0	Left	Tilt	DFT-S-OFDM	QPSK	135	0	01768	1:1	0.458	1.161	0.532	
3750.00	850000	Low	NR Band n77	100	15.5	14.58	-0.03	0	Left	Tilt	DFT-S-OFDM	QPSK	270	0	01768	1:1	0.548	1.236	0.677	
3750.00	850000	Low	NR Band n77	100	15.5	15.29	-0.02	0	Right	Tilt	DFT-S-OFDM	QPSK	1	1	01768	1:1	0.977	1.050	1.026	
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 represent variability measurement.

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**Table 11-27  
DTS Head SAR**




MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	16.0	15.92	0.12	Right	Cheek	02030	1	98.7	0.757	0.436	1.019	1.013	0.450	A27
2437	6	802.11b	DSSS	22	16.0	15.92	0.18	Right	Tilt	02030	1	98.7	0.431	0.310	1.019	1.013	0.320	
2437	6	802.11b	DSSS	22	16.0	15.92	-0.12	Left	Cheek	02030	1	98.7	0.204	-	1.019	1.013	-	
2437	6	802.11b	DSSS	22	16.0	15.92	0.02	Left	Tilt	02030	1	98.7	0.153	-	1.019	1.013	-	
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 11-28  
NII Head SAR**

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
5290	58	802.11ac	OFDM	80	11.0	10.72	-0.14	Right	Cheek	02030	29.3	90.2	0.600	0.298	1.067	1.109	0.353	A28
5290	58	802.11ac	OFDM	80	11.0	10.72	0.13	Right	Tilt	02030	29.3	90.2	0.511	-	1.067	1.109	-	
5290	58	802.11ac	OFDM	80	11.0	10.72	0.16	Left	Cheek	02030	29.3	90.2	0.431	-	1.067	1.109	-	
5290	58	802.11ac	OFDM	80	11.0	10.72	0.18	Left	Tilt	02030	29.3	90.2	0.563	-	1.067	1.109	-	
5610	122	802.11ac	OFDM	80	11.0	10.99	0.06	Right	Cheek	02030	29.3	90.2	0.384	-	1.002	1.109	-	
5610	122	802.11ac	OFDM	80	11.0	10.99	0.13	Right	Tilt	02030	29.3	90.2	0.481	-	1.002	1.109	-	
5610	122	802.11ac	OFDM	80	11.0	10.99	0.15	Left	Cheek	02030	29.3	90.2	0.330	-	1.002	1.109	-	
5610	122	802.11ac	OFDM	80	11.0	10.99	0.14	Left	Tilt	02030	29.3	90.2	0.488	0.194	1.002	1.109	0.216	
5775	155	802.11ac	OFDM	80	11.0	10.42	0.20	Right	Cheek	02030	29.3	90.2	0.542	-	1.143	1.109	-	
5775	155	802.11ac	OFDM	80	11.0	10.42	0.13	Right	Tilt	02030	29.3	90.2	0.611	-	1.143	1.109	-	
5775	155	802.11ac	OFDM	80	11.0	10.42	-0.14	Left	Cheek	02030	29.3	90.2	0.570	-	1.143	1.109	-	
5775	155	802.11ac	OFDM	80	11.0	10.42	0.13	Left	Tilt	02030	29.3	90.2	0.655	0.256	1.143	1.109	0.325	
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 11-29  
DSS Head SAR**




MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #	
MHz	Ch.											(W/kg)			(W/kg)		
2441.00	39	Bluetooth	FHSS	13.5	13.29	0.15	Right	Cheek	02030	1	76.8	0.143	1.050	1.302	0.195	A29	
2441.00	39	Bluetooth	FHSS	13.5	13.29	0.06	Right	Tilt	02030	1	76.8	0.090	1.050	1.302	0.123		
2441.00	39	Bluetooth	FHSS	13.5	13.29	0.14	Left	Cheek	02030	1	76.8	0.051	1.050	1.302	0.070		
2441.00	39	Bluetooth	FHSS	13.5	13.29	0.19	Left	Tilt	02030	1	76.8	0.040	1.050	1.302	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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## 11.2 Standalone Body-Worn SAR Data

**Table 11-30  
GSM/UMTS/CDMA Body-Worn SAR Data**

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
820.10	564	CDMA BC10 (§90S)	TDSO / SO32	26.0	24.76	-0.03	15 mm	01750	1:1	back	0.387	1.330	0.515	A30
836.52	384	CDMA BC0 (§22H)	TDSO / SO32	26.0	24.88	0.01	15 mm	01750	1:1	back	0.309	1.294	0.400	A32
1880.00	600	PCS CDMA	TDSO / SO32	26.0	25.03	-0.03	15 mm	01750	1:1	back	0.463	1.250	0.579	A34
836.60	190	GSM 850	GSM	33.5	33.07	-0.02	15 mm	01875	1:8.3	back	0.280	1.104	0.309	A36
1880.00	661	GSM 1900	GSM	30.5	30.08	0.01	15 mm	01826	1:8.3	back	0.163	1.102	0.180	A38
836.60	4183	UMTS 850	RMC	25.0	23.63	0.00	15 mm	01750	1:1	back	0.215	1.371	0.295	A40
1712.40	1312	UMTS 1750	RMC	25.0	23.35	0.04	15 mm	01685	1:1	back	0.439	1.462	0.642	
1732.40	1412	UMTS 1750	RMC	25.0	23.45	-0.01	15 mm	01685	1:1	back	0.512	1.429	0.732	
1752.60	1513	UMTS 1750	RMC	25.0	23.48	0.00	15 mm	01685	1:1	back	0.649	1.419	0.921	A42
1880.00	9400	UMTS 1900	RMC	25.0	24.22	-0.02	15 mm	01750	1:1	back	0.223	1.197	0.267	A44
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 11-31  
LTE Body-Worn SAR**

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)		
680.50	133297	Mid	LTE Band 71	20	N/A	25.5	24.85	0.00	0	01701	QPSK	1	0	15 mm	back	1:1	0.372	1.161	0.432	A46
680.50	133297	Mid	LTE Band 71	20	N/A	24.5	24.04	0.04	1	01701	QPSK	50	0	15 mm	back	1:1	0.303	1.112	0.337	
707.50	23095	Mid	LTE Band 12	10	N/A	24.0	22.60	-0.05	0	01743	QPSK	1	0	15 mm	back	1:1	0.245	1.380	0.338	A48
707.50	23095	Mid	LTE Band 12	10	N/A	23.0	21.65	0.00	1	01743	QPSK	25	0	15 mm	back	1:1	0.201	1.365	0.274	
782.00	23230	Mid	LTE Band 13	10	N/A	24.0	23.14	0.00	0	01743	QPSK	1	49	15 mm	back	1:1	0.246	1.219	0.300	A50
782.00	23230	Mid	LTE Band 13	10	N/A	23.0	22.13	-0.04	1	01743	QPSK	25	25	15 mm	back	1:1	0.207	1.222	0.253	
793.00	23330	Mid	LTE Band 14	10	N/A	25.5	24.52	-0.03	0	01834	QPSK	1	0	15 mm	back	1:1	0.268	1.253	0.336	A52
793.00	23330	Mid	LTE Band 14	10	N/A	24.5	23.54	0.04	1	01834	QPSK	25	12	15 mm	back	1:1	0.219	1.247	0.273	
831.50	26865	Mid	LTE Band 26 (Cell)	15	N/A	25.0	23.97	-0.01	0	01750	QPSK	1	74	15 mm	back	1:1	0.281	1.268	0.356	A54
831.50	26865	Mid	LTE Band 26 (Cell)	15	N/A	24.0	23.05	0.03	1	01750	QPSK	36	37	15 mm	back	1:1	0.223	1.245	0.278	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	N/A	24.5	23.85	-0.04	0	01834	QPSK	1	50	15 mm	back	1:1	0.366	1.161	0.425	A60
1882.50	26365	Mid	LTE Band 25 (PCS)	20	N/A	23.5	22.75	0.03	1	01834	QPSK	50	25	15 mm	back	1:1	0.298	1.189	0.354	
2310.00	27710	Mid	LTE Band 30	10	N/A	23.0	22.75	0.02	0	01834	QPSK	1	49	15 mm	back	1:1	0.583	1.059	0.617	A62
2310.00	27710	Mid	LTE Band 30	10	N/A	22.0	21.80	0.01	1	01834	QPSK	25	12	15 mm	back	1:1	0.479	1.047	0.502	
2510.00	20850	Low	LTE Band 7	20	N/A	24.0	23.55	0.18	0	01883	QPSK	1	0	15 mm	back	1:1	1.120	1.109	1.242	A64
2535.00	21100	Mid	LTE Band 7	20	N/A	24.0	23.29	-0.04	0	01883	QPSK	1	0	15 mm	back	1:1	1.060	1.178	1.249	
2535.00	21100	Mid	LTE Band 7	20	Headphones	19.5	18.79	0.18	0	01883	QPSK	1	0	15 mm	back	1:1	0.489	1.178	0.576	
2560.00	21350	High	LTE Band 7	20	N/A	24.0	22.68	0.13	0	01883	QPSK	1	0	15 mm	back	1:1	0.626	1.355	0.848	
2510.00	20850	Low	LTE Band 7	20	N/A	23.0	22.63	-0.03	1	01883	QPSK	50	0	15 mm	back	1:1	0.904	1.089	0.984	
2535.00	21100	Mid	LTE Band 7	20	N/A	23.0	22.12	0.03	1	01883	QPSK	50	0	15 mm	back	1:1	0.816	1.225	1.000	
2560.00	21350	High	LTE Band 7	20	N/A	23.0	21.91	0.07	1	01883	QPSK	50	0	15 mm	back	1:1	0.507	1.285	0.651	
2510.00	20850	Low	LTE Band 7	20	N/A	23.0	22.43	0.06	1	01883	QPSK	100	0	15 mm	back	1:1	0.853	1.140	0.972	
2510.00	20850	Low	LTE Band 7	20	N/A	24.0	23.55	0.18	0	01883	QPSK	1	0	15 mm	back	1:1	0.957	1.109	1.061	
2535.00	21100	Mid	LTE Band 7	20	N/A	24.0	23.29	0.03	0	01883	QPSK	1	0	15 mm	back	1:1	0.952	1.178	1.121	
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 entries represent variability measurements.

**Table 11-32  
LTE Band 5 (Cell) Body-Worn SAR**

MEASUREMENT RESULTS																					
1 CC Uplink / 2 CC Uplink	Component Carrier	FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
		MHz	Ch.														(W/kg)		(W/kg)		
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.14	-0.14	0	01917	QPSK	1	49	15 mm	back	1:1	0.165	1.219	0.201	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.26	-0.07	1	01917	QPSK	25	12	15 mm	back	1:1	0.130	1.186	0.154	
2 CC Uplink	PCC	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.45	-0.05	0	01917	QPSK	1	49	15 mm	back	1:1	0.175	1.135	0.199	A56
	SCC	843.70	20597		LTE Band 5 (Cell)	5							1	0	15 mm						
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 11-33  
LTE Band 66 (AWS) Body-Worn SAR**



MEASUREMENT RESULTS																					
1 CC Uplink   2 CC Uplink	Component Carrier	FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
		MHz	Ch.														(W/kg)		(W/kg)		
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	23.15	0.05	0	01917	QPSK	1	0	15 mm	back	1:1	0.314	1.365	0.429	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	23.34	0.06	0	01917	QPSK	1	99	15 mm	back	1:1	0.282	1.306	0.368	
1 CC Uplink	N/A	1775.00	132622	High	LTE Band 66 (AWS)	10	24.5	22.89	0.07	0	01917	QPSK	1	0	15 mm	back	1:1	0.291	1.449	0.422	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	23.5	22.44	0.05	1	01917	QPSK	50	25	15 mm	back	1:1	0.246	1.276	0.314	
2 CC Uplink CA_66C	PCC	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	24.24	0.02	0	01917	QPSK	1	0	15 mm	back	1:1	0.404	1.062	0.429	A58
	SCC	1750.20	132374										1	99	15 mm						
2 CC Uplink CA_66B	PCC	1775.00	132622	High	LTE Band 66 (AWS)	10	24.5	24.03	0.07	0	01917	QPSK	1	0	15 mm	back	1:1	0.369	1.114	0.411	
	SCC	1765.10	132523										1	49	15 mm						
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram										

**Table 11-34  
LTE Band 48 Body-Worn SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
3690.00	56640	High	LTE Band 48	20	23.0	22.37	0.01	0	01909	QPSK	1	99	15 mm	back	1:1.58	0.305	1.156	0.353	A66
3690.00	56640	High	LTE Band 48	20	22.0	21.44	0.07	1	01909	QPSK	50	25	15 mm	back	1:1.58	0.236	1.138	0.269	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram								

**Table 11-35  
LTE Band 41 Body-Worn SAR**

MEASUREMENT RESULTS																					
1 CC Uplink   2 CC Uplink, Power Class	Component Carrier	FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
		MHz	Ch.														(W/kg)		(W/kg)		
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	24.5	23.75	0.06	0	40527	QPSK	1	50	15 mm	back	1:1.58	0.374	1.189	0.445	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	24.5	23.37	0.21	0	40527	QPSK	1	99	15 mm	back	1:1.58	0.346	1.297	0.449	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	23.5	22.76	0.08	1	40527	QPSK	50	25	15 mm	back	1:1.58	0.244	1.186	0.289	
1 CC Uplink - Power Class 2	N/A	2593.00	40620	Mid	LTE Band 41	20	27.0	26.20	0.10	0	40527	QPSK	1	50	15 mm	back	1:2.31	0.493	1.202	0.593	A68
1 CC Uplink - Power Class 2	N/A	2593.00	40620	Mid	LTE Band 41	20	27.0	25.90	0.07	0	40527	QPSK	1	99	15 mm	back	1:2.31	0.461	1.288	0.594	
2 CC Uplink - Power Class 3	PCC	2593.00	40620	Mid	LTE Band 41	20	24.5	24.07	0.07	0	40527	QPSK	1	99	15 mm	back	1:1.58	0.410	1.104	0.453	
	SCC	2612.80	40818										1	0							
2 CC Uplink - Power Class 2	PCC	2593.00	40620	Mid	LTE Band 41	20	27.0	26.19	0.01	0	40527	QPSK	1	99	15 mm	back	1:2.31	0.481	1.205	0.580	
	SCC	2612.80	40818										1	0							
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram										

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**Table 11-36  
NR Body-Worn SAR**



MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
680.50	136100	Mid	NR Band n71	20	25.0	23.40	-0.04	0	01818	DFT-S-OFDM	QPSK	1	53	15 mm	back	1:1	0.249	1.445	0.360	
680.50	136100	Mid	NR Band n71	20	25.0	23.35	0.02	0	01818	DFT-S-OFDM	QPSK	50	28	15 mm	back	1:1	0.254	1.462	0.371	A70
680.50	136100	Mid	NR Band n71	20	23.5	21.81	-0.03	1.5	01818	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.187	1.476	0.276	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.62	0.00	0	01750	DFT-S-OFDM	QPSK	1	53	15 mm	back	1:1	0.179	1.374	0.246	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.43	-0.08	0	01750	DFT-S-OFDM	QPSK	50	28	15 mm	back	1:1	0.179	1.435	0.257	A72
836.50	167300	Mid	NR Band n5 (Cell)	20	23.5	22.15	-0.02	1.5	01750	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.104	1.365	0.142	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.60	-0.02	0	01685	DFT-S-OFDM	QPSK	1	104	15 mm	back	1:1	0.393	1.096	0.431	A74
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.40	-0.02	0	01685	DFT-S-OFDM	QPSK	50	28	15 mm	back	1:1	0.384	1.148	0.441	
1745.00	349000	Mid	NR Band n66 (AWS)	20	23.5	22.85	0.00	1.5	01685	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.344	1.161	0.399	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.78	0.00	0	01719	DFT-S-OFDM	QPSK	1	53	15 mm	back	1:1	0.522	1.052	0.549	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.66	0.04	0	01719	DFT-S-OFDM	QPSK	50	28	15 mm	back	1:1	0.522	1.081	0.564	A76
1860.00	372000	Low	NR Band n25 (PCS)	20	23.5	22.58	0.08	1.5	01719	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.438	1.236	0.541	
2592.99	518598	Mid	NR Band n41	100	19.0	18.05	0.15	0	01867	DFT-S-OFDM	QPSK	1	1	15 mm	back	1:1	0.156	1.245	0.194	
2592.99	518598	Mid	NR Band n41	100	19.0	18.13	0.12	0	01867	DFT-S-OFDM	QPSK	135	0	15 mm	back	1:1	0.178	1.222	0.218	A78
2592.99	518598	Mid	NR Band n41	100	19.0	18.00	0.16	0	01867	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.151	1.259	0.190	
3750.00	650000	Low	NR Band n77	100	18.5	17.40	0.05	0	01768	DFT-S-OFDM	QPSK	1	1	15 mm	back	1:1	0.213	1.288	0.274	
3750.00	650000	Low	NR Band n77	100	18.5	17.41	0.20	0	01768	DFT-S-OFDM	QPSK	135	0	15 mm	back	1:1	0.221	1.285	0.284	A80
3750.00	650000	Low	NR Band n77	100	18.5	17.22	-0.07	0	01768	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.206	1.343	0.277	
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 11-37  
DTS Body-Worn SAR**

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)	(W/kg)			(W/kg)	
2462	11	802.11b	DSSS	22	21.0	20.95	-0.11	15 mm	02030	1	back	98.7	0.339	0.202	1.012	1.013	0.207	A82
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 11-38  
NII Body-Worn SAR**

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)	(W/kg)			(W/kg)	
5270	54	802.11n	OFDM	40	18.0	17.48	0.17	15 mm	02014	13.5	back	94.9	0.418	0.197	1.127	1.054	0.234	A84
5710	142	802.11n	OFDM	40	18.0	17.98	-0.12	15 mm	02014	13.5	back	94.9	0.435	0.190	1.005	1.054	0.201	
5795	159	802.11n	OFDM	40	18.0	17.89	0.17	15 mm	02014	13.5	back	94.9	0.429	0.186	1.026	1.054	0.201	
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 11-39  
DSS Body-Worn SAR**

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441	39	Bluetooth	FHSS	16.0	15.91	0.18	15 mm	02014	1	back	76.8	0.047	1.021	1.302	0.062	A86
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram									

FCC ID: A3LSMA426U	 <b>PCTEST</b> <small>Proud to be part of element</small>	<b>SAR EVALUATION REPORT</b>		<b>Approved by:</b> Quality Manager
<b>Document S/N:</b> 1M2101040001-01.A3L (Rev1)	<b>Test Dates:</b> 01/12/21 – 02/19/21	<b>DUT Type:</b> Portable Handset		Page 96 of 149

# 11.3 Standalone Hotspot SAR Data



**Table 11-40  
GPRS/UMTS/CDMA Hotspot SAR Data**

MEASUREMENT RESULTS															
FREQUENCY MHz	Ch.	Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. 0	25.0	23.81	-0.09	10 mm	01750	N/A	1:1	back	0.589	1.315	0.775	A31
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. 0	25.0	23.81	0.02	10 mm	01750	N/A	1:1	front	0.216	1.315	0.284	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. 0	25.0	23.81	0.02	10 mm	01750	N/A	1:1	bottom	0.271	1.315	0.356	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. 0	25.0	23.81	0.00	10 mm	01750	N/A	1:1	right	0.264	1.315	0.347	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. 0	25.0	23.81	0.02	10 mm	01750	N/A	1:1	left	0.115	1.315	0.151	
824.70	1013	CDMA BC0 (\$22H)	EVDO Rev. 0	25.0	23.92	0.00	10 mm	01750	N/A	1:1	back	0.638	1.282	0.818	A33
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. 0	25.0	23.98	0.02	10 mm	01750	N/A	1:1	back	0.629	1.265	0.796	
848.31	777	CDMA BC0 (\$22H)	EVDO Rev. 0	25.0	23.65	0.00	10 mm	01750	N/A	1:1	back	0.606	1.365	0.827	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. 0	25.0	23.98	0.05	10 mm	01750	N/A	1:1	front	0.191	1.265	0.242	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. 0	25.0	23.98	0.02	10 mm	01750	N/A	1:1	bottom	0.298	1.265	0.377	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. 0	25.0	23.98	-0.05	10 mm	01750	N/A	1:1	right	0.259	1.265	0.328	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. 0	25.0	23.98	-0.02	10 mm	01750	N/A	1:1	left	0.125	1.265	0.158	
1880.00	600	PCS CDMA	EVDO Rev. 0	20.0	19.35	0.00	10 mm	01750	N/A	1:1	back	0.302	1.161	0.351	A35
1880.00	600	PCS CDMA	EVDO Rev. 0	20.0	19.35	0.14	10 mm	01750	N/A	1:1	front	0.098	1.161	0.114	
1880.00	600	PCS CDMA	EVDO Rev. 0	20.0	19.35	-0.14	10 mm	01750	N/A	1:1	bottom	0.282	1.161	0.327	
1880.00	600	PCS CDMA	EVDO Rev. 0	20.0	19.35	-0.07	10 mm	01750	N/A	1:1	right	0.034	1.161	0.039	
1880.00	600	PCS CDMA	EVDO Rev. 0	20.0	19.35	-0.02	10 mm	01750	N/A	1:1	left	0.068	1.161	0.079	
824.20	128	GSM 850	GPRS	30.0	28.81	0.16	10 mm	01875	4	1:2.076	back	0.715	1.315	0.940	A37
836.60	190	GSM 850	GPRS	30.0	29.27	0.05	10 mm	01875	4	1:2.076	back	0.686	1.183	0.812	
848.80	251	GSM 850	GPRS	30.0	28.71	-0.17	10 mm	01875	4	1:2.076	back	0.646	1.346	0.870	
836.60	190	GSM 850	GPRS	30.0	29.27	0.06	10 mm	01875	4	1:2.076	front	0.228	1.183	0.270	
836.60	190	GSM 850	GPRS	30.0	29.27	-0.01	10 mm	01875	4	1:2.076	bottom	0.264	1.183	0.312	
836.60	190	GSM 850	GPRS	30.0	29.27	-0.11	10 mm	01875	4	1:2.076	right	0.303	1.183	0.358	
836.60	190	GSM 850	GPRS	30.0	29.27	-0.04	10 mm	01875	4	1:2.076	left	0.152	1.183	0.180	
1850.20	512	GSM 1900	GPRS	28.0	27.34	0.13	10 mm	01826	3	1:2.76	back	0.782	1.164	0.910	A39
1880.00	661	GSM 1900	GPRS	28.0	27.39	-0.13	10 mm	01826	3	1:2.76	back	0.622	1.151	0.716	
1909.80	810	GSM 1900	GPRS	28.0	27.03	0.03	10 mm	01826	3	1:2.76	back	0.506	1.250	0.633	
1880.00	661	GSM 1900	GPRS	28.0	27.39	0.10	10 mm	01826	3	1:2.76	front	0.161	1.151	0.185	
1880.00	661	GSM 1900	GPRS	28.0	27.39	-0.10	10 mm	01826	3	1:2.76	bottom	0.507	1.151	0.584	
1880.00	661	GSM 1900	GPRS	28.0	27.39	-0.01	10 mm	01826	3	1:2.76	right	0.060	1.151	0.069	
1880.00	661	GSM 1900	GPRS	28.0	27.39	-0.04	10 mm	01826	3	1:2.76	left	0.126	1.151	0.145	
836.60	4183	UMTS 850	RMC	25.0	23.63	0.02	10 mm	01750	N/A	1:1	back	0.390	1.371	0.535	A41
836.60	4183	UMTS 850	RMC	25.0	23.63	0.03	10 mm	01750	N/A	1:1	front	0.181	1.371	0.248	
836.60	4183	UMTS 850	RMC	25.0	23.63	0.01	10 mm	01750	N/A	1:1	bottom	0.230	1.371	0.315	
836.60	4183	UMTS 850	RMC	25.0	23.63	0.01	10 mm	01750	N/A	1:1	right	0.276	1.371	0.378	
836.60	4183	UMTS 850	RMC	25.0	23.63	0.02	10 mm	01750	N/A	1:1	left	0.135	1.371	0.185	
1712.40	1312	UMTS 1750	RMC	21.0	20.39	0.00	10 mm	01792	N/A	1:1	back	0.434	1.151	0.500	
1732.40	1412	UMTS 1750	RMC	21.0	20.88	-0.01	10 mm	01792	N/A	1:1	back	0.583	1.028	0.610	
1752.60	1513	UMTS 1750	RMC	21.0	21.00	0.02	10 mm	01792	N/A	1:1	back	0.825	1.000	0.825	A43
1752.60	1513	UMTS 1750	RMC	21.0	21.00	-0.03	10 mm	01792	N/A	1:1	front	0.300	1.000	0.300	
1752.60	1513	UMTS 1750	RMC	21.0	21.00	-0.15	10 mm	01792	N/A	1:1	bottom	0.494	1.000	0.494	
1752.60	1513	UMTS 1750	RMC	21.0	21.00	0.05	10 mm	01792	N/A	1:1	right	0.132	1.000	0.132	
1752.60	1513	UMTS 1750	RMC	21.0	21.00	0.05	10 mm	01792	N/A	1:1	left	0.212	1.000	0.212	
1752.60	1513	UMTS 1750	RMC	21.0	21.00	0.03	10 mm	01792	N/A	1:1	back	0.794	1.000	0.794	
1880.00	9400	UMTS 1900	RMC	22.0	20.46	-0.04	10 mm	01750	N/A	1:1	back	0.395	1.426	0.563	A45
1880.00	9400	UMTS 1900	RMC	22.0	20.46	0.05	10 mm	01750	N/A	1:1	front	0.125	1.426	0.178	
1880.00	9400	UMTS 1900	RMC	22.0	20.46	-0.13	10 mm	01750	N/A	1:1	bottom	0.356	1.426	0.508	
1880.00	9400	UMTS 1900	RMC	22.0	20.46	0.13	10 mm	01750	N/A	1:1	right	0.042	1.426	0.060	
1880.00	9400	UMTS 1900	RMC	22.0	20.46	0.04	10 mm	01750	N/A	1:1	left	0.088	1.426	0.125	

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.




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**Table 11-41  
LTE Band 71 Hotspot SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
680.50	133297	Mid	LTE Band 71	20	25.5	24.85	0.04	0	01701	QPSK	1	0	10 mm	back	1:1	0.400	1.161	0.464	
680.50	133297	Mid	LTE Band 71	20	24.5	24.04	0.01	1	01701	QPSK	50	0	10 mm	back	1:1	0.339	1.112	0.377	
680.50	133297	Mid	LTE Band 71	20	25.5	24.85	0.03	0	01701	QPSK	1	0	10 mm	front	1:1	0.224	1.161	0.260	
680.50	133297	Mid	LTE Band 71	20	24.5	24.04	0.00	1	01701	QPSK	50	0	10 mm	front	1:1	0.185	1.112	0.206	
680.50	133297	Mid	LTE Band 71	20	25.5	24.85	0.09	0	01701	QPSK	1	0	10 mm	bottom	1:1	0.107	1.161	0.124	
680.50	133297	Mid	LTE Band 71	20	24.5	24.04	0.04	1	01701	QPSK	50	0	10 mm	bottom	1:1	0.089	1.112	0.099	
680.50	133297	Mid	LTE Band 71	20	25.5	24.85	0.08	0	01701	QPSK	1	0	10 mm	right	1:1	0.407	1.161	0.473	A47
680.50	133297	Mid	LTE Band 71	20	24.5	24.04	0.03	1	01701	QPSK	50	0	10 mm	right	1:1	0.332	1.112	0.369	
680.50	133297	Mid	LTE Band 71	20	25.5	24.85	-0.02	0	01701	QPSK	1	0	10 mm	left	1:1	0.295	1.161	0.342	
680.50	133297	Mid	LTE Band 71	20	24.5	24.04	0.01	1	01701	QPSK	50	0	10 mm	left	1:1	0.222	1.112	0.247	
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 11-42  
LTE Band 12 Hotspot SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
707.50	23095	Mid	LTE Band 12	10	24.0	22.60	-0.03	0	01743	QPSK	1	0	10 mm	back	1:1	0.275	1.380	0.380	
707.50	23095	Mid	LTE Band 12	10	23.0	21.65	0.00	1	01743	QPSK	25	0	10 mm	back	1:1	0.223	1.365	0.304	
707.50	23095	Mid	LTE Band 12	10	24.0	22.60	-0.02	0	01743	QPSK	1	0	10 mm	front	1:1	0.145	1.380	0.200	
707.50	23095	Mid	LTE Band 12	10	23.0	21.65	0.01	1	01743	QPSK	25	0	10 mm	front	1:1	0.117	1.365	0.160	
707.50	23095	Mid	LTE Band 12	10	24.0	22.60	0.06	0	01743	QPSK	1	0	10 mm	bottom	1:1	0.097	1.380	0.134	
707.50	23095	Mid	LTE Band 12	10	23.0	21.65	0.00	1	01743	QPSK	25	0	10 mm	bottom	1:1	0.079	1.365	0.108	
707.50	23095	Mid	LTE Band 12	10	24.0	22.60	0.00	0	01743	QPSK	1	0	10 mm	right	1:1	0.297	1.380	0.410	A49
707.50	23095	Mid	LTE Band 12	10	23.0	21.65	0.04	1	01743	QPSK	25	0	10 mm	right	1:1	0.238	1.365	0.325	
707.50	23095	Mid	LTE Band 12	10	24.0	22.60	0.19	0	01743	QPSK	1	0	10 mm	left	1:1	0.146	1.380	0.201	
707.50	23095	Mid	LTE Band 12	10	23.0	21.65	0.10	1	01743	QPSK	25	0	10 mm	left	1:1	0.125	1.365	0.171	
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 11-43**  
**LTE Band 13 Hotspot SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
782.00	23230	Mid	LTE Band 13	10	24.0	23.14	0.00	0	01743	QPSK	1	49	10 mm	back	1:1	0.345	1.219	0.421	A51
782.00	23230	Mid	LTE Band 13	10	23.0	22.13	0.03	1	01743	QPSK	25	25	10 mm	back	1:1	0.277	1.222	0.338	
782.00	23230	Mid	LTE Band 13	10	24.0	23.14	0.00	0	01743	QPSK	1	49	10 mm	front	1:1	0.144	1.219	0.176	
782.00	23230	Mid	LTE Band 13	10	23.0	22.13	0.02	1	01743	QPSK	25	25	10 mm	front	1:1	0.125	1.222	0.153	
782.00	23230	Mid	LTE Band 13	10	24.0	23.14	0.05	0	01743	QPSK	1	49	10 mm	bottom	1:1	0.168	1.219	0.205	
782.00	23230	Mid	LTE Band 13	10	23.0	22.13	0.02	1	01743	QPSK	25	25	10 mm	bottom	1:1	0.135	1.222	0.165	
782.00	23230	Mid	LTE Band 13	10	24.0	23.14	-0.12	0	01743	QPSK	1	49	10 mm	right	1:1	0.246	1.219	0.300	
782.00	23230	Mid	LTE Band 13	10	23.0	22.13	-0.07	1	01743	QPSK	25	25	10 mm	right	1:1	0.215	1.222	0.263	
782.00	23230	Mid	LTE Band 13	10	24.0	23.14	0.11	0	01743	QPSK	1	49	10 mm	left	1:1	0.109	1.219	0.133	
782.00	23230	Mid	LTE Band 13	10	23.0	22.13	0.01	1	01743	QPSK	25	25	10 mm	left	1:1	0.098	1.222	0.120	
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 11-44**  
**LTE Band 14 Hotspot SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
793.00	23330	Mid	LTE Band 14	10	25.5	24.52	-0.08	0	01834	QPSK	1	0	10 mm	back	1:1	0.518	1.253	0.649	A53
793.00	23330	Mid	LTE Band 14	10	24.5	23.54	-0.05	1	01834	QPSK	25	12	10 mm	back	1:1	0.424	1.247	0.529	
793.00	23330	Mid	LTE Band 14	10	25.5	24.52	0.02	0	01834	QPSK	1	0	10 mm	front	1:1	0.183	1.253	0.229	
793.00	23330	Mid	LTE Band 14	10	24.5	23.54	0.02	1	01834	QPSK	25	12	10 mm	front	1:1	0.145	1.247	0.181	
793.00	23330	Mid	LTE Band 14	10	25.5	24.52	0.10	0	01834	QPSK	1	0	10 mm	bottom	1:1	0.224	1.253	0.281	
793.00	23330	Mid	LTE Band 14	10	24.5	23.54	0.06	1	01834	QPSK	25	12	10 mm	bottom	1:1	0.177	1.247	0.221	
793.00	23330	Mid	LTE Band 14	10	25.5	24.52	0.02	0	01834	QPSK	1	0	10 mm	right	1:1	0.282	1.253	0.353	
793.00	23330	Mid	LTE Band 14	10	24.5	23.54	0.02	1	01834	QPSK	25	12	10 mm	right	1:1	0.228	1.247	0.284	
793.00	23330	Mid	LTE Band 14	10	25.5	24.52	0.02	0	01834	QPSK	1	0	10 mm	left	1:1	0.133	1.253	0.167	
793.00	23330	Mid	LTE Band 14	10	24.5	23.54	0.02	1	01834	QPSK	25	12	10 mm	left	1:1	0.107	1.247	0.133	
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 11-45**  
**LTE Band 26 (Cell) Hotspot SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.97	-0.03	0	01750	QPSK	1	74	10 mm	back	1:1	0.454	1.268	0.576	A55
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.05	-0.04	1	01750	QPSK	36	37	10 mm	back	1:1	0.344	1.245	0.428	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.97	0.02	0	01750	QPSK	1	74	10 mm	front	1:1	0.144	1.268	0.183	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.05	0.06	1	01750	QPSK	36	37	10 mm	front	1:1	0.124	1.245	0.154	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.97	0.05	0	01750	QPSK	1	74	10 mm	bottom	1:1	0.260	1.268	0.330	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.05	0.03	1	01750	QPSK	36	37	10 mm	bottom	1:1	0.205	1.245	0.255	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.97	0.02	0	01750	QPSK	1	74	10 mm	right	1:1	0.188	1.268	0.238	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.05	0.02	1	01750	QPSK	36	37	10 mm	right	1:1	0.167	1.245	0.208	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.97	0.07	0	01750	QPSK	1	74	10 mm	left	1:1	0.098	1.268	0.124	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	23.05	0.02	1	01750	QPSK	36	37	10 mm	left	1:1	0.088	1.245	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									

**Table 11-46**  
**LTE Band 5 (Cell) Hotspot SAR**

MEASUREMENT RESULTS																					
1 CC Uplink   2 CC Uplink	Component Carrier	FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
		MHz	Ch.														(W/kg)		(W/kg)		
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.14	-0.04	0	01917	QPSK	1	49	10 mm	back	1:1	0.319	1.219	0.389	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.26	-0.06	1	01917	QPSK	25	12	10 mm	back	1:1	0.222	1.186	0.263	
2 CC Uplink	PCC	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.45	-0.01	0	01917	QPSK	1	49	10 mm	back	1:1	0.333	1.135	0.378	A57
	SCC	843.70	20597			5							1	0							
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.14	0.03	0	01917	QPSK	1	49	10 mm	front	1:1	0.149	1.219	0.182	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.26	0.02	1	01917	QPSK	25	12	10 mm	front	1:1	0.126	1.186	0.149	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.14	-0.18	0	01917	QPSK	1	49	10 mm	bottom	1:1	0.224	1.219	0.273	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.26	0.05	1	01917	QPSK	25	12	10 mm	bottom	1:1	0.177	1.186	0.210	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.14	-0.01	0	01917	QPSK	1	49	10 mm	right	1:1	0.202	1.219	0.246	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.26	0.00	1	01917	QPSK	25	12	10 mm	right	1:1	0.170	1.186	0.202	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	23.14	0.02	0	01917	QPSK	1	49	10 mm	left	1:1	0.107	1.219	0.130	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	22.26	0.03	1	01917	QPSK	25	12	10 mm	left	1:1	0.091	1.186	0.108	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram											

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**Table 11-47**  
**LTE Band 66 (AWS) Hotspot SAR**

MEASUREMENT RESULTS																					
1 CC Uplink   2 CC Uplink	Component Carrier	FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
		MHz	Ch.														(W/kg)		(W/kg)		
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	22.0	21.06	0.06	0	01917	QPSK	1	99	10 mm	back	1:1	0.407	1.242	0.505	
1 CC Uplink	N/A	1720.00	132072	Low	LTE Band 66 (AWS)	20	22.0	21.02	0.06	0	01917	QPSK	50	25	10 mm	back	1:1	0.338	1.253	0.424	
1 CC Uplink	N/A	1745.00	132322	Mid	LTE Band 66 (AWS)	20	22.0	20.78	0.00	0	01917	QPSK	50	25	10 mm	back	1:1	0.484	1.324	0.641	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	22.0	20.88	-0.10	0	01917	QPSK	50	0	10 mm	back	1:1	0.496	1.294	0.642	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	22.0	21.07	0.06	0	01917	QPSK	50	50	10 mm	back	1:1	0.475	1.239	0.589	
1 CC Uplink	N/A	1775.00	132622	High	LTE Band 66 (AWS)	10	22.0	21.08	0.18	0	01917	QPSK	25	0	10 mm	back	1:1	0.440	1.236	0.544	
2 CC Uplink CA_66C	PCC	1770.00	132572	High	LTE Band 66 (AWS)	20	22.0	21.15	0.19	0	01917	QPSK	50	0	10 mm	back	1:1	0.506	1.216	0.615	A59
	SCC	1750.20	132374										50	50							
2 CC Uplink CA_66B	PCC	1775.00	132622	High	LTE Band 66 (AWS)	10	22.0	21.17	0.18	0	01917	QPSK	25	0	10 mm	back	1:1	0.469	1.211	0.568	
	SCC	1765.10	132523										25	25							
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	22.0	21.06	0.04	0	01917	QPSK	1	99	10 mm	front	1:1	0.285	1.242	0.354	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	22.0	21.07	0.11	0	01917	QPSK	50	50	10 mm	front	1:1	0.302	1.239	0.374	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	22.0	21.06	-0.01	0	01917	QPSK	1	99	10 mm	bottom	1:1	0.371	1.242	0.461	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	22.0	21.07	0.00	0	01917	QPSK	50	50	10 mm	bottom	1:1	0.371	1.239	0.460	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	22.0	21.06	0.09	0	01917	QPSK	1	99	10 mm	right	1:1	0.104	1.242	0.129	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	22.0	21.07	0.07	0	01917	QPSK	50	50	10 mm	right	1:1	0.109	1.239	0.135	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	22.0	21.06	0.00	0	01917	QPSK	1	99	10 mm	left	1:1	0.300	1.242	0.373	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	22.0	21.07	0.02	0	01917	QPSK	50	50	10 mm	left	1:1	0.306	1.239	0.379	
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 11-48**  
**LTE Band 25 (PCS) Hotspot SAR**

MEASUREMENT RESULTS																			
FREQUENCY	Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #		
														MHz		Ch.		(W/kg)	(W/kg)
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	19.67	-0.03	0	01750	QPSK	1	50	10 mm	back	1:1	0.348	1.079	0.375	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	19.77	-0.05	0	01750	QPSK	50	25	10 mm	back	1:1	0.353	1.054	0.372	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	19.67	-0.02	0	01750	QPSK	1	50	10 mm	front	1:1	0.132	1.079	0.142	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	19.77	-0.06	0	01750	QPSK	50	25	10 mm	front	1:1	0.132	1.054	0.139	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	19.67	-0.01	0	01750	QPSK	1	50	10 mm	bottom	1:1	0.351	1.079	0.379	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	19.77	-0.05	0	01750	QPSK	50	25	10 mm	bottom	1:1	0.363	1.054	0.383	A61
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	19.67	-0.12	0	01750	QPSK	1	50	10 mm	right	1:1	0.048	1.079	0.052	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	19.77	-0.14	0	01750	QPSK	50	25	10 mm	right	1:1	0.049	1.054	0.052	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	19.67	0.05	0	01750	QPSK	1	50	10 mm	left	1:1	0.086	1.079	0.093	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	19.77	0.03	0	01750	QPSK	50	25	10 mm	left	1:1	0.083	1.054	0.087	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram									




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**Table 11-49  
LTE Band 30 Hotspot SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
2310.00	27710	Mid	LTE Band 30	10	19.5	18.75	-0.04	0	01834	QPSK	1	0	10 mm	back	1:1	0.571	1.189	0.679	
2310.00	27710	Mid	LTE Band 30	10	19.5	18.71	0.03	0	01834	QPSK	25	0	10 mm	back	1:1	0.596	1.199	0.715	A63
2310.00	27710	Mid	LTE Band 30	10	19.5	18.75	0.00	0	01834	QPSK	1	0	10 mm	front	1:1	0.105	1.189	0.125	
2310.00	27710	Mid	LTE Band 30	10	19.5	18.71	-0.05	0	01834	QPSK	25	0	10 mm	front	1:1	0.105	1.199	0.126	
2310.00	27710	Mid	LTE Band 30	10	19.5	18.75	0.15	0	01834	QPSK	1	0	10 mm	top	1:1	0.052	1.189	0.062	
2310.00	27710	Mid	LTE Band 30	10	19.5	18.71	0.19	0	01834	QPSK	25	0	10 mm	top	1:1	0.053	1.199	0.064	
2310.00	27710	Mid	LTE Band 30	10	19.5	18.75	-0.18	0	01834	QPSK	1	0	10 mm	left	1:1	0.361	1.189	0.429	
2310.00	27710	Mid	LTE Band 30	10	19.5	18.71	0.15	0	01834	QPSK	25	0	10 mm	left	1:1	0.342	1.199	0.410	
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 11-50  
LTE Band 7 Hotspot SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
2510.00	20850	Low	LTE Band 7	20	19.5	18.71	0.03	0	01883	QPSK	1	99	10 mm	back	1:1	0.803	1.199	0.963	
2535.00	21100	Mid	LTE Band 7	20	19.5	19.08	0.03	0	01883	QPSK	1	99	10 mm	back	1:1	0.649	1.102	0.715	
2560.00	21350	High	LTE Band 7	20	19.5	19.01	0.06	0	01883	QPSK	1	0	10 mm	back	1:1	0.503	1.119	0.563	
2510.00	20850	Low	LTE Band 7	20	19.5	18.65	0.01	0	01883	QPSK	50	50	10 mm	back	1:1	0.868	1.216	1.055	A65
2535.00	21100	Mid	LTE Band 7	20	19.5	19.05	0.04	0	01883	QPSK	50	50	10 mm	back	1:1	0.703	1.109	0.780	
2560.00	21350	High	LTE Band 7	20	19.5	19.04	0.04	0	01883	QPSK	50	25	10 mm	back	1:1	0.515	1.112	0.573	
2560.00	21350	High	LTE Band 7	20	19.5	18.91	0.03	0	01883	QPSK	100	0	10 mm	back	1:1	0.503	1.146	0.576	
2535.00	21100	Mid	LTE Band 7	20	19.5	19.08	-0.05	0	01883	QPSK	1	99	10 mm	front	1:1	0.128	1.102	0.141	
2535.00	21100	Mid	LTE Band 7	20	19.5	19.05	0.08	0	01883	QPSK	50	50	10 mm	front	1:1	0.128	1.109	0.142	
2535.00	21100	Mid	LTE Band 7	20	19.5	19.08	0.13	0	01883	QPSK	1	99	10 mm	top	1:1	0.066	1.102	0.073	
2535.00	21100	Mid	LTE Band 7	20	19.5	19.05	0.19	0	01883	QPSK	50	50	10 mm	top	1:1	0.070	1.109	0.078	
2535.00	21100	Mid	LTE Band 7	20	19.5	19.08	0.01	0	01883	QPSK	1	99	10 mm	left	1:1	0.345	1.102	0.380	
2535.00	21100	Mid	LTE Band 7	20	19.5	19.05	0.02	0	01883	QPSK	50	50	10 mm	left	1:1	0.349	1.109	0.387	
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 11-51  
LTE Band 48 Hotspot SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
3690.00	56640	High	LTE Band 48	20	21.5	20.93	-0.04	0	01909	QPSK	1	99	10 mm	back	1:1.58	0.462	1.140	0.527	
3690.00	56640	High	LTE Band 48	20	21.5	21.00	-0.08	0	01909	QPSK	50	25	10 mm	back	1:1.58	0.461	1.122	0.517	
3690.00	56640	High	LTE Band 48	20	21.5	20.93	-0.14	0	01909	QPSK	1	99	10 mm	front	1:1.58	0.320	1.140	0.365	
3690.00	56640	High	LTE Band 48	20	21.5	21.00	-0.07	0	01909	QPSK	50	25	10 mm	front	1:1.58	0.323	1.122	0.362	
3560.00	55340	Low	LTE Band 48	20	21.5	20.70	0.00	0	01909	QPSK	1	0	10 mm	top	1:1.58	0.624	1.202	0.750	
3603.30	55773	Low-Mid	LTE Band 48	20	21.5	20.21	-0.02	0	01909	QPSK	1	0	10 mm	top	1:1.58	0.570	1.346	0.767	
3646.70	56207	Mid-High	LTE Band 48	20	21.5	20.21	-0.04	0	01909	QPSK	1	50	10 mm	top	1:1.58	0.616	1.346	0.829	
3690.00	56640	High	LTE Band 48	20	21.5	20.93	-0.07	0	01909	QPSK	1	99	10 mm	top	1:1.58	0.780	1.140	0.889	A67
3560.00	55340	Low	LTE Band 48	20	21.5	20.77	0.01	0	01909	QPSK	50	25	10 mm	top	1:1.58	0.639	1.183	0.756	
3603.30	55773	Low-Mid	LTE Band 48	20	21.5	20.18	-0.03	0	01909	QPSK	50	0	10 mm	top	1:1.58	0.575	1.355	0.779	
3646.70	56207	Mid-High	LTE Band 48	20	21.5	20.33	-0.03	0	01909	QPSK	50	25	10 mm	top	1:1.58	0.621	1.309	0.813	
3690.00	56640	High	LTE Band 48	20	21.5	21.00	-0.02	0	01909	QPSK	50	25	10 mm	top	1:1.58	0.769	1.122	0.863	
3690.00	56640	High	LTE Band 48	20	21.5	20.90	-0.09	0	01909	QPSK	100	0	10 mm	top	1:1.58	0.754	1.148	0.866	
3690.00	56640	High	LTE Band 48	20	21.5	20.93	-0.08	0	01909	QPSK	1	99	10 mm	left	1:1.58	0.222	1.140	0.253	
3690.00	56640	High	LTE Band 48	20	21.5	21.00	-0.04	0	01909	QPSK	50	25	10 mm	left	1:1.58	0.215	1.122	0.241	
<b>ANSI / IEEE C95.1 1992 - SAFETY LIMIT</b> Spatial Peak Uncontrolled Exposure/General Population								<b>Body</b> 1.6 W/kg (mW/g) averaged over 1 gram											

**Table 11-52  
LTE Band 41 Hotspot SAR**

MEASUREMENT RESULTS																					
1 CC Uplink   2 CC Uplink, Power Class	Component Carrier	FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
		MHz	Ch.														(W/kg)		(W/kg)		
1 CC Uplink - Power Class 3	NA	2593.00	40620	Md	LTE Band 41	20	21.5	20.76	0.02	0	40527	QPSK	1	50	10 mm	back	1:1.58	0.387	1.186	0.459	
1 CC Uplink - Power Class 3	NA	2593.00	40620	Md	LTE Band 41	20	21.5	20.77	-0.03	0	40527	QPSK	50	25	10 mm	back	1:1.58	0.394	1.183	0.466	
1 CC Uplink - Power Class 3	NA	2593.00	40620	Md	LTE Band 41	20	21.5	20.73	0.12	0	40527	QPSK	50	50	10 mm	back	1:1.58	0.407	1.194	0.486	
1 CC Uplink - Power Class 2	NA	2593.00	40620	Md	LTE Band 41	20	23.1	22.36	0.05	0	40527	QPSK	50	25	10 mm	back	1:2.31	0.413	1.186	0.490	
1 CC Uplink - Power Class 2	NA	2593.00	40620	Md	LTE Band 41	20	23.1	22.29	-0.18	0	40527	QPSK	50	50	10 mm	back	1:2.31	0.416	1.205	0.501	
2 CC Uplink - Power Class 3	PCC	2593.00	40620	Md	LTE Band 41	20	21.5	21.00	0.00	0	40527	QPSK	50	50	10 mm	back	1:1.58	0.450	1.122	0.505	
	SCC	2612.80	40818										50	0							
2 CC Uplink - Power Class 2	PCC	2593.00	40620	Md	LTE Band 41	20	23.1	22.52	0.06	0	40527	QPSK	50	50	10 mm	back	1:2.31	0.452	1.143	0.517	A69
	SCC	2612.80	40818										50	0							
1 CC Uplink - Power Class 3	NA	2593.00	40620	Md	LTE Band 41	20	21.5	20.76	0.09	0	40527	QPSK	1	50	10 mm	front	1:1.58	0.116	1.186	0.138	
1 CC Uplink - Power Class 3	NA	2593.00	40620	Md	LTE Band 41	20	21.5	20.77	0.12	0	40527	QPSK	50	25	10 mm	front	1:1.58	0.117	1.183	0.138	
1 CC Uplink - Power Class 3	NA	2593.00	40620	Md	LTE Band 41	20	21.5	20.76	0.14	0	40527	QPSK	1	50	10 mm	top	1:1.58	0.051	1.186	0.060	
1 CC Uplink - Power Class 3	NA	2593.00	40620	Md	LTE Band 41	20	21.5	20.77	0.15	0	40527	QPSK	50	25	10 mm	top	1:1.58	0.052	1.183	0.062	
1 CC Uplink - Power Class 3	NA	2593.00	40620	Md	LTE Band 41	20	21.5	20.76	0.06	0	40527	QPSK	1	50	10 mm	left	1:1.58	0.362	1.186	0.429	
1 CC Uplink - Power Class 3	NA	2593.00	40620	Md	LTE Band 41	20	21.5	20.77	0.00	0	40527	QPSK	50	25	10 mm	left	1:1.58	0.362	1.183	0.428	
<b>ANSI / IEEE C95.1 1992 - SAFETY LIMIT</b> Spatial Peak Uncontrolled Exposure/General Population								<b>Body</b> 1.6 W/kg (mW/g) averaged over 1 gram													



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**Table 11-53  
NR Band n71 Hotspot SAR**

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
680.50	136100	Mid	NR Band n71	20	25.0	23.40	0.01	0	01818	DFT-S-OFDM	QPSK	1	53	10 mm	back	1:1	0.291	1.445	0.420	
680.50	136100	Mid	NR Band n71	20	25.0	23.35	-0.01	0	01818	DFT-S-OFDM	QPSK	50	28	10 mm	back	1:1	0.302	1.462	0.442	A71
680.50	136100	Mid	NR Band n71	20	23.5	21.81	-0.03	1.5	01818	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.229	1.476	0.338	
680.50	136100	Mid	NR Band n71	20	25.0	23.40	0.01	0	01818	DFT-S-OFDM	QPSK	1	53	10 mm	front	1:1	0.139	1.445	0.201	
680.50	136100	Mid	NR Band n71	20	25.0	23.35	-0.02	0	01818	DFT-S-OFDM	QPSK	50	28	10 mm	front	1:1	0.145	1.462	0.212	
680.50	136100	Mid	NR Band n71	20	25.0	23.40	0.01	0	01818	DFT-S-OFDM	QPSK	1	53	10 mm	bottom	1:1	0.099	1.445	0.143	
680.50	136100	Mid	NR Band n71	20	25.0	23.35	-0.02	0	01818	DFT-S-OFDM	QPSK	50	28	10 mm	bottom	1:1	0.102	1.462	0.149	
680.50	136100	Mid	NR Band n71	20	25.0	23.40	-0.02	0	01818	DFT-S-OFDM	QPSK	1	53	10 mm	right	1:1	0.280	1.445	0.405	
680.50	136100	Mid	NR Band n71	20	25.0	23.35	0.02	0	01818	DFT-S-OFDM	QPSK	50	28	10 mm	right	1:1	0.277	1.462	0.405	
680.50	136100	Mid	NR Band n71	20	25.0	23.40	-0.05	0	01818	DFT-S-OFDM	QPSK	1	53	10 mm	left	1:1	0.177	1.445	0.256	
680.50	136100	Mid	NR Band n71	20	25.0	23.35	0.05	0	01818	DFT-S-OFDM	QPSK	50	28	10 mm	left	1:1	0.166	1.462	0.243	
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 11-54  
NR Band n5 Hotspot SAR**

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	MPR [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.62	0.08	0	01750	DFT-S-OFDM	QPSK	1	53	10 mm	back	1:1	0.427	1.374	0.587	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.43	0.00	0	01750	DFT-S-OFDM	QPSK	50	28	10 mm	back	1:1	0.427	1.435	0.613	A73
836.50	167300	Mid	NR Band n5 (Cell)	20	23.5	22.15	-0.01	1.5	01750	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.235	1.365	0.321	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.62	0.01	0	01750	DFT-S-OFDM	QPSK	1	53	10 mm	front	1:1	0.149	1.374	0.205	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.43	0.00	0	01750	DFT-S-OFDM	QPSK	50	28	10 mm	front	1:1	0.151	1.435	0.217	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.62	0.10	0	01750	DFT-S-OFDM	QPSK	1	53	10 mm	bottom	1:1	0.201	1.374	0.276	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.43	-0.06	0	01750	DFT-S-OFDM	QPSK	50	28	10 mm	bottom	1:1	0.200	1.435	0.287	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.62	-0.03	0	01750	DFT-S-OFDM	QPSK	1	53	10 mm	right	1:1	0.182	1.374	0.250	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.43	-0.06	0	01750	DFT-S-OFDM	QPSK	50	28	10 mm	right	1:1	0.181	1.435	0.260	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.62	-0.04	0	01750	DFT-S-OFDM	QPSK	1	53	10 mm	left	1:1	0.099	1.374	0.136	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.43	-0.04	0	01750	DFT-S-OFDM	QPSK	50	28	10 mm	left	1:1	0.100	1.435	0.144	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram									



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**Table 11-55  
NR Band n66 Hotspot SAR**

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	MPR [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
1745.00	349000	Mid	NR Band n66 (AWS)	20	22.0	21.58	0.00	0	01685	DFT-S-OFDM	QPSK	1	104	10 mm	back	1:1	0.427	1.102	0.471	A75
1745.00	349000	Mid	NR Band n66 (AWS)	20	22.0	21.61	-0.04	0	01685	DFT-S-OFDM	QPSK	50	0	10 mm	back	1:1	0.402	1.094	0.440	
1745.00	349000	Mid	NR Band n66 (AWS)	20	22.0	21.55	-0.03	0	01685	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.400	1.109	0.444	
1745.00	349000	Mid	NR Band n66 (AWS)	20	22.0	21.58	0.04	0	01685	DFT-S-OFDM	QPSK	1	104	10 mm	front	1:1	0.222	1.102	0.245	
1745.00	349000	Mid	NR Band n66 (AWS)	20	22.0	21.61	0.03	0	01685	DFT-S-OFDM	QPSK	50	0	10 mm	front	1:1	0.282	1.094	0.309	
1745.00	349000	Mid	NR Band n66 (AWS)	20	22.0	21.58	-0.10	0	01685	DFT-S-OFDM	QPSK	1	104	10 mm	bottom	1:1	0.411	1.102	0.453	
1745.00	349000	Mid	NR Band n66 (AWS)	20	22.0	21.61	-0.21	0	01685	DFT-S-OFDM	QPSK	50	0	10 mm	bottom	1:1	0.371	1.094	0.406	
1745.00	349000	Mid	NR Band n66 (AWS)	20	22.0	21.58	-0.19	0	01685	DFT-S-OFDM	QPSK	1	104	10 mm	right	1:1	0.070	1.102	0.077	
1745.00	349000	Mid	NR Band n66 (AWS)	20	22.0	21.61	-0.10	0	01685	DFT-S-OFDM	QPSK	50	0	10 mm	right	1:1	0.089	1.094	0.097	
1745.00	349000	Mid	NR Band n66 (AWS)	20	22.0	21.58	0.02	0	01685	DFT-S-OFDM	QPSK	1	104	10 mm	left	1:1	0.241	1.102	0.266	
1745.00	349000	Mid	NR Band n66 (AWS)	20	22.0	21.61	0.14	0	01685	DFT-S-OFDM	QPSK	50	0	10 mm	left	1:1	0.286	1.094	0.313	
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 11-56  
NR Band n25 Hotspot SAR**

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	MPR [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
1860.00	372000	Low	NR Band n25 (PCS)	20	22.0	21.33	-0.01	0	01719	DFT-S-OFDM	QPSK	1	104	10 mm	back	1:1	0.469	1.167	0.547	
1860.00	372000	Low	NR Band n25 (PCS)	20	22.0	21.38	-0.01	0	01719	DFT-S-OFDM	QPSK	50	28	10 mm	back	1:1	0.512	1.153	0.590	
1860.00	372000	Low	NR Band n25 (PCS)	20	22.0	21.23	0.06	0	01719	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.554	1.194	0.661	A77
1860.00	372000	Low	NR Band n25 (PCS)	20	22.0	21.33	0.09	0	01719	DFT-S-OFDM	QPSK	1	104	10 mm	front	1:1	0.159	1.167	0.186	
1860.00	372000	Low	NR Band n25 (PCS)	20	22.0	21.38	-0.03	0	01719	DFT-S-OFDM	QPSK	50	28	10 mm	front	1:1	0.164	1.153	0.189	
1860.00	372000	Low	NR Band n25 (PCS)	20	22.0	21.33	0.00	0	01719	DFT-S-OFDM	QPSK	1	104	10 mm	bottom	1:1	0.430	1.167	0.502	
1860.00	372000	Low	NR Band n25 (PCS)	20	22.0	21.38	-0.04	0	01719	DFT-S-OFDM	QPSK	50	28	10 mm	bottom	1:1	0.461	1.153	0.532	
1860.00	372000	Low	NR Band n25 (PCS)	20	22.0	21.33	0.09	0	01719	DFT-S-OFDM	QPSK	1	104	10 mm	right	1:1	0.050	1.167	0.058	
1860.00	372000	Low	NR Band n25 (PCS)	20	22.0	21.38	0.04	0	01719	DFT-S-OFDM	QPSK	50	28	10 mm	right	1:1	0.052	1.153	0.060	
1860.00	372000	Low	NR Band n25 (PCS)	20	22.0	21.33	0.00	0	01719	DFT-S-OFDM	QPSK	1	104	10 mm	left	1:1	0.110	1.167	0.128	
1860.00	372000	Low	NR Band n25 (PCS)	20	22.0	21.38	0.14	0	01719	DFT-S-OFDM	QPSK	50	28	10 mm	left	1:1	0.112	1.153	0.129	
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 11-57  
NR Band n41 Hotspot SAR**

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	MPR [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
2592.99	518598	Mid	NR Band n41	100	19.0	18.05	0.10	0	01867	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.289	1.245	0.360	
2592.99	518598	Mid	NR Band n41	100	19.0	18.13	0.06	0	01867	DFT-S-OFDM	QPSK	135	0	10 mm	back	1:1	0.329	1.222	0.402	A79
2592.99	518598	Mid	NR Band n41	100	19.0	18.00	-0.16	0	01867	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.314	1.259	0.395	
2592.99	518598	Mid	NR Band n41	100	19.0	18.05	0.17	0	01867	DFT-S-OFDM	QPSK	1	1	10 mm	front	1:1	0.053	1.245	0.066	
2592.99	518598	Mid	NR Band n41	100	19.0	18.13	0.15	0	01867	DFT-S-OFDM	QPSK	135	0	10 mm	front	1:1	0.061	1.222	0.075	
2592.99	518598	Mid	NR Band n41	100	19.0	18.05	0.17	0	01867	DFT-S-OFDM	QPSK	1	1	10 mm	top	1:1	0.030	1.245	0.037	
2592.99	518598	Mid	NR Band n41	100	19.0	18.13	0.16	0	01867	DFT-S-OFDM	QPSK	135	0	10 mm	top	1:1	0.033	1.222	0.040	
2592.99	518598	Mid	NR Band n41	100	19.0	18.05	0.19	0	01867	DFT-S-OFDM	QPSK	1	1	10 mm	left	1:1	0.122	1.245	0.152	
2592.99	518598	Mid	NR Band n41	100	19.0	18.13	0.06	0	01867	DFT-S-OFDM	QPSK	135	0	10 mm	left	1:1	0.174	1.222	0.213	
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 11-58  
NR Band n77 Hotspot SAR**

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	MPR [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
3750.00	650000	Low	NR Band n77	100	18.5	17.40	-0.11	0	01768	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.429	1.288	0.553	
3930.00	662000	High	NR Band n77	100	18.5	17.39	-0.14	0	01768	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.327	1.291	0.422	
3750.00	650000	Low	NR Band n77	100	18.5	17.41	-0.20	0	01768	DFT-S-OFDM	QPSK	135	0	10 mm	back	1:1	0.434	1.285	0.558	
3930.00	662000	High	NR Band n77	100	18.5	17.25	-0.04	0	01768	DFT-S-OFDM	QPSK	135	0	10 mm	back	1:1	0.295	1.334	0.394	
3750.00	650000	Low	NR Band n77	100	18.5	17.25	-0.08	0	01768	DFT-S-OFDM	QPSK	270	0	10 mm	back	1:1	0.405	1.334	0.540	
3750.00	650000	Low	NR Band n77	100	18.5	17.40	-0.19	0	01768	DFT-S-OFDM	QPSK	1	1	10 mm	front	1:1	0.271	1.288	0.349	
3750.00	650000	Low	NR Band n77	100	18.5	17.41	-0.11	0	01768	DFT-S-OFDM	QPSK	135	0	10 mm	front	1:1	0.274	1.285	0.352	
3750.00	650000	Low	NR Band n77	100	18.5	17.40	-0.02	0	01768	DFT-S-OFDM	QPSK	1	1	10 mm	top	1:1	0.691	1.288	0.890	
3930.00	662000	High	NR Band n77	100	18.5	17.39	-0.13	0	01768	DFT-S-OFDM	QPSK	1	1	10 mm	top	1:1	0.585	1.291	0.755	
3750.00	650000	Low	NR Band n77	100	18.5	17.41	-0.07	0	01768	DFT-S-OFDM	QPSK	135	0	10 mm	top	1:1	0.720	1.285	0.925	A81
3930.00	662000	High	NR Band n77	100	18.5	17.25	-0.03	0	01768	DFT-S-OFDM	QPSK	135	0	10 mm	top	1:1	0.528	1.334	0.704	
3750.00	650000	Low	NR Band n77	100	18.5	17.25	-0.06	0	01768	DFT-S-OFDM	QPSK	270	0	10 mm	top	1:1	0.697	1.334	0.930	
3750.00	650000	Low	NR Band n77	100	18.5	17.22	-0.10	0	01768	CP-OFDM	QPSK	1	1	10 mm	top	1:1	0.668	1.343	0.897	
3750.00	650000	Low	NR Band n77	100	18.5	17.40	-0.01	0	01768	DFT-S-OFDM	QPSK	1	1	10 mm	left	1:1	0.193	1.288	0.249	
3750.00	650000	Low	NR Band n77	100	18.5	17.41	-0.13	0	01768	DFT-S-OFDM	QPSK	135	0	10 mm	left	1:1	0.194	1.285	0.249	
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 11-59  
WLAN Hotspot SAR**

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
2462	11	802.11b	DSSS	22	21.0	20.95	-0.07	10 mm	02030	1	back	98.7	0.896	0.520	1.012	1.013	0.533	A83
2462	11	802.11b	DSSS	22	21.0	20.95	0.06	10 mm	02030	1	front	98.7	0.436	-	1.012	1.013	-	
2462	11	802.11b	DSSS	22	21.0	20.95	-0.11	10 mm	02030	1	top	98.7	0.230	-	1.012	1.013	-	
2462	11	802.11b	DSSS	22	21.0	20.95	0.13	10 mm	02030	1	left	98.7	0.471	0.294	1.012	1.013	0.301	
5795	159	802.11n	OFDM	40	18.0	17.89	0.16	10 mm	02014	13.5	back	94.9	0.619	0.271	1.026	1.054	0.293	
5795	159	802.11n	OFDM	40	18.0	17.89	0.14	10 mm	02014	13.5	front	94.9	0.509	0.227	1.026	1.054	0.245	
5795	159	802.11n	OFDM	40	18.0	17.89	0.14	10 mm	02014	13.5	top	94.9	1.319	0.544	1.026	1.054	0.588	A85
5795	159	802.11n	OFDM	40	18.0	17.89	0.19	10 mm	02014	13.5	left	94.9	0.114	0.053	1.026	1.054	0.057	
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 11-60  
DSS Hotspot SAR**




MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441	39	Bluetooth	FHSS	16.0	15.91	0.15	10 mm	02014	1	back	76.8	0.109	1.021	1.302	0.145	A87
2441	39	Bluetooth	FHSS	16.0	15.91	0.03	10 mm	02014	1	front	76.8	0.057	1.021	1.302	0.076	
2441	39	Bluetooth	FHSS	16.0	15.91	-0.01	10 mm	02014	1	top	76.8	0.028	1.021	1.302	0.037	
2441	39	Bluetooth	FHSS	16.0	15.91	0.15	10 mm	02014	1	left	76.8	0.056	1.021	1.302	0.074	
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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# 11.4 Standalone Phablet SAR Data

Table 11-61  
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)	
1880.00	600	PCS CDMA	TDSO / SO32	26.0	25.03	-0.19	7 mm	01750	1:1	back	0.853	1.250	1.066	
1880.00	600	PCS CDMA	TDSO / SO32	26.0	25.03	-0.03	0 mm	01750	1:1	front	1.010	1.250	1.263	
1851.25	25	PCS CDMA	TDSO / SO32	26.0	25.12	-0.16	0 mm	01750	1:1	bottom	2.560	1.225	3.136	A88
1880.00	600	PCS CDMA	TDSO / SO32	26.0	25.03	-0.14	0 mm	01750	1:1	bottom	2.440	1.250	3.050	
1908.75	1175	PCS CDMA	TDSO / SO32	26.0	24.91	-0.12	0 mm	01750	1:1	bottom	2.160	1.285	2.776	
1880.00	600	PCS CDMA	TDSO / SO32	26.0	25.03	-0.01	0 mm	01750	1:1	right	0.114	1.250	0.143	
1880.00	600	PCS CDMA	TDSO / SO32	26.0	25.03	-0.09	0 mm	01750	1:1	left	0.698	1.250	0.873	
1880.00	600	PCS CDMA	EVDO Rev. 0	20.0	19.35	-0.14	0 mm	01750	1:1	back	0.973	1.161	1.130	
1732.40	1412	UMTS 1750	RMC	25.0	23.45	-0.05	7 mm	01792	1:1	back	0.910	1.429	1.300	
1712.40	1312	UMTS 1750	RMC	25.0	23.35	0.06	0 mm	01792	1:1	front	1.510	1.462	2.208	
1732.40	1412	UMTS 1750	RMC	25.0	23.45	0.05	0 mm	01792	1:1	front	1.620	1.429	2.315	
1752.60	1513	UMTS 1750	RMC	25.0	23.48	0.06	0 mm	01792	1:1	front	1.640	1.419	2.327	
1712.40	1312	UMTS 1750	RMC	25.0	23.35	-0.06	0 mm	01792	1:1	bottom	2.030	1.462	2.968	
1732.40	1412	UMTS 1750	RMC	25.0	23.45	0.07	0 mm	01792	1:1	bottom	2.120	1.429	3.029	A89
1752.60	1513	UMTS 1750	RMC	25.0	23.48	-0.15	0 mm	01792	1:1	bottom	1.770	1.419	2.512	
1732.40	1412	UMTS 1750	RMC	25.0	23.45	0.02	0 mm	01792	1:1	right	0.416	1.429	0.594	
1732.40	1412	UMTS 1750	RMC	25.0	23.45	-0.03	0 mm	01792	1:1	left	0.999	1.429	1.428	
1752.60	1513	UMTS 1750	RMC	21.0	21.00	0.07	0 mm	01792	1:1	back	1.170	1.000	1.170	
1880.00	9400	UMTS 1900	RMC	25.0	24.22	-0.18	7 mm	01826	1:1	back	0.423	1.197	0.506	
1880.00	9400	UMTS 1900	RMC	25.0	24.22	0.12	0 mm	01826	1:1	front	0.612	1.197	0.733	
1852.40	9262	UMTS 1900	RMC	25.0	24.23	-0.01	0 mm	01826	1:1	bottom	1.290	1.194	1.540	
1880.00	9400	UMTS 1900	RMC	25.0	24.22	0.16	0 mm	01826	1:1	bottom	1.330	1.197	1.592	A90
1907.60	9538	UMTS 1900	RMC	25.0	24.21	0.01	0 mm	01826	1:1	bottom	1.130	1.199	1.355	
1880.00	9400	UMTS 1900	RMC	25.0	24.22	-0.13	0 mm	01826	1:1	right	0.061	1.197	0.073	
1880.00	9400	UMTS 1900	RMC	25.0	24.22	0.01	0 mm	01826	1:1	left	0.393	1.197	0.470	
1880.00	9400	UMTS 1900	RMC	22.0	20.46	-0.15	0 mm	01826	1:1	back	0.782	1.426	1.115	
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 11-62  
LTE Band 66 (AWS) Phablet SAR**

MEASUREMENT RESULTS																					
1 CC Uplink / 2 CC Uplink	Component Carrier	FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #	
		MHz	Ch.														(W/kg)		(W/kg)		
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	23.34	0.02	0	01917	QPSK	1	99	7 mm	back	1:1	0.551	1.306	0.720	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	23.5	22.44	0.02	1	01917	QPSK	50	25	7 mm	back	1:1	0.489	1.276	0.624	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	23.34	0.08	0	01917	QPSK	1	99	0 mm	front	1:1	1.380	1.306	1.802	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	23.5	22.44	0.08	1	01917	QPSK	50	25	0 mm	front	1:1	1.130	1.276	1.442	
1 CC Uplink	N/A	1720.00	132072	Low	LTE Band 66 (AWS)	20	24.5	23.30	0.00	0	01917	QPSK	1	50	0 mm	bottom	1:1	1.080	1.318	1.423	
1 CC Uplink	N/A	1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.5	22.78	0.03	0	01917	QPSK	1	99	0 mm	bottom	1:1	1.180	1.486	1.753	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	23.15	0.05	0	01917	QPSK	1	0	0 mm	bottom	1:1	1.410	1.365	1.925	
1 CC Uplink	N/A	1775.00	132622	High	LTE Band 66 (AWS)	10	24.5	22.89	0.04	0	01917	QPSK	1	0	0 mm	bottom	1:1	1.390	1.449	2.014	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	23.34	0.02	0	01917	QPSK	1	99	0 mm	bottom	1:1	1.560	1.306	2.037	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	23.5	22.44	0.04	1	01917	QPSK	50	25	0 mm	bottom	1:1	1.170	1.276	1.493	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	23.5	22.35	-0.01	1	01917	QPSK	100	0	0 mm	bottom	1:1	0.935	1.303	1.218	
2 CC Uplink CA_66C	PCC	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	24.24	-0.13	0	01917	QPSK	1	0	0 mm	bottom	1:1	1.900	1.062	2.018	A91
	SCC	1750.20	132374										1	99							
2 CC Uplink CA_66B	PCC	1775.00	132622	High	LTE Band 66 (AWS)	10	24.5	24.03	0.06	0	01917	QPSK	1	0	0 mm	bottom	1:1	1.720	1.114	1.916	
	SCC	1765.10	132523										1	49							
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	23.34	0.16	0	01917	QPSK	1	99	0 mm	right	1:1	0.175	1.306	0.229	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	23.5	22.44	-0.03	1	01917	QPSK	50	25	0 mm	right	1:1	0.152	1.276	0.194	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	24.5	23.34	-0.17	0	01917	QPSK	1	99	0 mm	left	1:1	1.300	1.306	1.698	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	23.5	22.44	-0.13	1	01917	QPSK	50	25	0 mm	left	1:1	1.090	1.276	1.391	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	22.0	21.06	-0.04	0	01917	QPSK	1	99	0 mm	back	1:1	1.290	1.242	1.602	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	22.0	21.07	-0.04	0	01917	QPSK	50	50	0 mm	back	1:1	1.260	1.239	1.561	
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 11-63  
LTE Band 25 (PCS) Phablet SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.5	23.85	-0.01	0	01834	QPSK	1	50	7 mm	back	1:1	0.360	1.161	0.418	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.5	22.75	0.01	1	01834	QPSK	50	25	7 mm	back	1:1	0.288	1.189	0.342	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.5	23.85	0.05	0	01834	QPSK	1	50	0 mm	front	1:1	1.070	1.161	1.242	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.5	22.75	0.10	1	01834	QPSK	50	25	0 mm	front	1:1	0.876	1.189	1.042	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.5	23.46	-0.01	0	01834	QPSK	1	99	0 mm	bottom	1:1	2.190	1.271	2.783	A92
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.5	23.85	-0.05	0	01834	QPSK	1	50	0 mm	bottom	1:1	2.120	1.161	2.461	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.5	23.48	-0.02	0	01834	QPSK	1	0	0 mm	bottom	1:1	1.990	1.265	2.517	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.5	22.74	-0.06	1	01834	QPSK	50	25	0 mm	bottom	1:1	1.810	1.191	2.156	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.5	22.75	-0.09	1	01834	QPSK	50	25	0 mm	bottom	1:1	1.720	1.189	2.045	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.5	22.55	-0.02	1	01834	QPSK	50	0	0 mm	bottom	1:1	1.620	1.245	2.017	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.5	22.63	-0.06	1	01834	QPSK	100	0	0 mm	bottom	1:1	1.650	1.222	2.016	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.5	23.85	0.04	0	01834	QPSK	1	50	0 mm	right	1:1	0.105	1.161	0.122	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.5	22.75	0.05	1	01834	QPSK	50	25	0 mm	right	1:1	0.088	1.189	0.105	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.5	23.85	-0.03	0	01834	QPSK	1	50	0 mm	left	1:1	0.645	1.161	0.749	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.5	22.75	-0.04	1	01834	QPSK	50	25	0 mm	left	1:1	0.517	1.189	0.615	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	19.67	-0.20	0	01826	QPSK	1	50	0 mm	back	1:1	1.120	1.079	1.208	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	20.0	19.77	-0.13	0	01826	QPSK	50	25	0 mm	back	1:1	1.140	1.054	1.202	
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 11-64  
LTE Band 30 Phablet SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
2310.00	27710	Mid	LTE Band 30	10	23.0	22.75	0.02	0	01735	QPSK	1	49	10 mm	back	1:1	0.489	1.059	0.518	
2310.00	27710	Mid	LTE Band 30	10	22.0	21.80	0.02	1	01735	QPSK	25	12	10 mm	back	1:1	0.397	1.047	0.416	
2310.00	27710	Mid	LTE Band 30	10	23.0	22.75	-0.13	0	01735	QPSK	1	49	0 mm	front	1:1	0.719	1.059	0.761	
2310.00	27710	Mid	LTE Band 30	10	22.0	21.80	-0.17	1	01735	QPSK	25	12	0 mm	front	1:1	0.587	1.047	0.615	
2310.00	27710	Mid	LTE Band 30	10	23.0	22.75	0.12	0	01735	QPSK	1	49	0 mm	top	1:1	0.185	1.059	0.196	
2310.00	27710	Mid	LTE Band 30	10	22.0	21.80	0.12	1	01735	QPSK	25	12	0 mm	top	1:1	0.151	1.047	0.158	
2310.00	27710	Mid	LTE Band 30	10	23.0	22.75	0.14	0	01735	QPSK	1	49	6 mm	left	1:1	0.721	1.059	0.764	
2310.00	27710	Mid	LTE Band 30	10	22.0	21.80	0.08	1	01735	QPSK	25	12	6 mm	left	1:1	0.583	1.047	0.610	
2310.00	27710	Mid	LTE Band 30	10	19.5	18.75	0.01	0	01834	QPSK	1	0	0 mm	back	1:1	2.220	1.189	2.640	
2310.00	27710	Mid	LTE Band 30	10	19.5	18.71	0.00	0	01834	QPSK	25	0	0 mm	back	1:1	2.290	1.199	2.746	
2310.00	27710	Mid	LTE Band 30	10	19.5	18.67	0.03	0	01834	QPSK	50	0	0 mm	back	1:1	2.290	1.211	2.773	A93
2310.00	27710	Mid	LTE Band 30	10	19.5	18.75	-0.03	0	01834	QPSK	1	0	0 mm	left	1:1	1.510	1.189	1.795	
2310.00	27710	Mid	LTE Band 30	10	19.5	18.71	0.00	0	01834	QPSK	25	0	0 mm	left	1:1	1.550	1.199	1.858	
2310.00	27710	Mid	LTE Band 30	10	19.5	18.67	0.08	0	01834	QPSK	50	0	0 mm	left	1:1	1.520	1.211	1.841	
2310.00	27710	Mid	LTE Band 30	10	19.5	18.67	0.02	0	01834	QPSK	50	0	0 mm	back	1:1	2.290	1.211	2.773	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Phablet 4.0 W/kg (mW/g) averaged over 10 grams									

Note: Blue entry represents variability measurement.

**Table 11-65  
LTE Band 7 Phablet SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
2510.00	20850	Low	LTE Band 7	20	24.0	23.55	-0.01	0	01883	QPSK	1	0	10 mm	back	1:1	1.300	1.109	1.442	
2510.00	20850	Low	LTE Band 7	20	23.0	22.63	0.06	1	01883	QPSK	50	0	10 mm	back	1:1	1.050	1.089	1.143	
2510.00	20850	Low	LTE Band 7	20	24.0	23.55	0.13	0	01883	QPSK	1	0	0 mm	front	1:1	1.130	1.109	1.253	
2510.00	20850	Low	LTE Band 7	20	23.0	22.63	0.17	1	01883	QPSK	50	0	0 mm	front	1:1	0.899	1.089	0.979	
2510.00	20850	Low	LTE Band 7	20	24.0	23.55	0.04	0	01883	QPSK	1	0	0 mm	top	1:1	0.366	1.109	0.406	
2510.00	20850	Low	LTE Band 7	20	23.0	22.63	0.12	1	01883	QPSK	50	0	0 mm	top	1:1	0.279	1.089	0.304	
2510.00	20850	Low	LTE Band 7	20	24.0	23.55	0.07	0	01883	QPSK	1	0	6 mm	left	1:1	1.100	1.109	1.220	
2510.00	20850	Low	LTE Band 7	20	23.0	22.63	0.07	1	01883	QPSK	50	0	6 mm	left	1:1	0.858	1.089	0.934	
2535.00	21100	Mid	LTE Band 7	20	19.5	19.08	0.12	0	01883	QPSK	1	99	0 mm	back	1:1	1.220	1.102	1.344	
2535.00	21100	Mid	LTE Band 7	20	19.5	19.05	0.06	0	01883	QPSK	50	50	0 mm	back	1:1	1.300	1.109	1.442	A94
2535.00	21100	Mid	LTE Band 7	20	19.5	19.08	0.07	0	01883	QPSK	1	99	0 mm	left	1:1	0.775	1.102	0.854	
2535.00	21100	Mid	LTE Band 7	20	19.5	19.05	0.11	0	01883	QPSK	50	50	0 mm	left	1:1	0.797	1.109	0.884	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Phablet 4.0 W/kg (mW/g) averaged over 10 grams									

FCC ID: A3LSMA426U	 PCTEST Proud to be part of element	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2101040001-01.A3L (Rev1)	Test Dates: 01/12/21 – 02/19/21	DUT Type: Portable Handset		Page 111 of 149



**Table 11-66  
LTE Band 48 Phablet SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
3560.00	55340	Low	LTE Band 48	20	23.0	22.20	0.21	0	01909	QPSK	1	0	0 mm	top	1:1.58	1.910	1.202	2.296	
3603.30	55773	Low-Mid	LTE Band 48	20	23.0	21.40	0.14	0	01909	QPSK	1	0	0 mm	top	1:1.58	1.610	1.445	2.326	
3646.70	56207	Mid-High	LTE Band 48	20	23.0	21.86	0.15	0	01909	QPSK	1	99	0 mm	top	1:1.58	1.720	1.300	2.236	
3690.00	56640	High	LTE Band 48	20	23.0	22.37	-0.14	0	01909	QPSK	1	99	0 mm	top	1:1.58	2.290	1.156	2.647	A95
3560.00	55340	Low	LTE Band 48	20	22.0	21.25	0.16	1	01909	QPSK	50	25	0 mm	top	1:1.58	1.460	1.189	1.736	
3603.30	55773	Low-Mid	LTE Band 48	20	22.0	20.39	0.16	1	01909	QPSK	50	0	0 mm	top	1:1.58	1.240	1.449	1.797	
3646.70	56207	Mid-High	LTE Band 48	20	22.0	20.73	0.16	1	01909	QPSK	50	50	0 mm	top	1:1.58	1.350	1.340	1.809	
3690.00	56640	High	LTE Band 48	20	22.0	21.44	-0.12	1	01909	QPSK	50	25	0 mm	top	1:1.58	1.630	1.138	1.855	
3690.00	56640	High	LTE Band 48	20	22.0	21.27	0.17	1	01909	QPSK	100	0	0 mm	top	1:1.58	1.590	1.183	1.881	
3690.00	56640	High	LTE Band 48	20	23.0	22.37	-0.12	0	01909	QPSK	1	99	0 mm	top	1:1.58	2.230	1.156	2.578	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Phablet 4.0 W/kg (mW/g) averaged over 10 grams										

Note: Blue entry represents variability measurement.

**Table 11-67  
LTE Band 41 Phablet SAR**

MEASUREMENT RESULTS																					
1 CC Uplink   2 CC Uplink, Power Class	Component Carrier	FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #	
		MHz	Ch.														(W/kg)		(W/kg)		
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	24.5	23.75	0.03	0	40527	QPSK	1	50	10 mm	back	1:1.58	0.352	1.189	0.419	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	23.5	22.76	0.02	1	40527	QPSK	50	25	10 mm	back	1:1.58	0.277	1.186	0.329	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	24.5	23.75	0.16	0	40527	QPSK	1	50	0 mm	front	1:1.58	0.777	1.189	0.924	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	23.5	22.76	0.14	1	40527	QPSK	50	25	0 mm	front	1:1.58	0.630	1.186	0.747	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	24.5	23.75	0.11	0	40527	QPSK	1	50	0 mm	top	1:1.58	0.190	1.189	0.226	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	23.5	22.76	0.13	1	40527	QPSK	50	25	0 mm	top	1:1.58	0.155	1.186	0.184	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	24.5	23.75	-0.02	0	40527	QPSK	1	50	6 mm	left	1:1.58	0.552	1.189	0.656	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	23.5	22.76	0.00	1	40527	QPSK	50	25	6 mm	left	1:1.58	0.445	1.186	0.528	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.76	0.01	0	40527	QPSK	1	50	0 mm	back	1:1.58	1.060	1.186	1.257	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.77	0.00	0	40527	QPSK	50	25	0 mm	back	1:1.58	1.080	1.183	1.278	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.73	0.01	0	40527	QPSK	50	50	0 mm	back	1:1.58	1.040	1.194	1.242	
1 CC Uplink - Power Class 2	N/A	2593.00	40620	Mid	LTE Band 41	20	23.1	22.36	0.00	0	40527	QPSK	50	25	0 mm	back	1:2.31	1.080	1.186	1.281	
1 CC Uplink - Power Class 2	N/A	2593.00	40620	Mid	LTE Band 41	20	23.1	22.29	-0.03	0	40527	QPSK	50	50	0 mm	back	1:2.31	1.080	1.205	1.301	
2 CC Uplink - Power Class 3	PCC	2593.00	40620	Mid	LTE Band 41	20	21.5	21.00	0.03	0	40527	QPSK	50	50	0 mm	back	1:1.58	1.120	1.122	1.257	
	SCC	2612.80	40818										50	0							
2 CC Uplink - Power Class 2	PCC	2593.00	40620	Mid	LTE Band 41	20	23.1	22.52	-0.02	0	40527	QPSK	50	50	0 mm	back	1:2.31	1.140	1.143	1.303	A96
	SCC	2612.80	40818										50	0							
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.76	0.02	0	40527	QPSK	1	50	0 mm	left	1:1.58	0.746	1.186	0.885	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	21.5	20.77	0.03	0	40527	QPSK	50	25	0 mm	left	1:1.58	0.751	1.183	0.888	
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 11-68  
NR Band n66 Phablet SAR**




MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g) (W/kg)	Scaling Factor	Reported SAR (10g) (W/kg)	Plot #	
MHz	Ch.																			
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.60	-0.13	0	01792	DFT-S-OFDM	QPSK	1	104	7 mm	back	1:1	1.210	1.096	1.326	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.40	-0.18	0	01792	DFT-S-OFDM	QPSK	50	28	7 mm	back	1:1	1.090	1.148	1.251	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.60	0.02	0	01792	DFT-S-OFDM	QPSK	1	104	0 mm	front	1:1	0.970	1.096	1.063	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.40	0.08	0	01792	DFT-S-OFDM	QPSK	50	28	0 mm	front	1:1	1.270	1.148	1.458	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.43	0.07	0	01792	DFT-S-OFDM	QPSK	1	104	0 mm	bottom	1:1	2.500	1.140	2.850	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.60	-0.06	0	01792	DFT-S-OFDM	QPSK	1	104	0 mm	bottom	1:1	2.490	1.096	2.729	
1770.00	354000	High	NR Band n66 (AWS)	20	25.0	24.59	0.09	0	01792	DFT-S-OFDM	QPSK	1	104	0 mm	bottom	1:1	2.270	1.099	2.495	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.20	-0.17	0	01792	DFT-S-OFDM	QPSK	50	28	0 mm	bottom	1:1	2.310	1.202	2.777	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.40	-0.13	0	01792	DFT-S-OFDM	QPSK	50	28	0 mm	bottom	1:1	2.660	1.148	3.054	A87
1770.00	354000	High	NR Band n66 (AWS)	20	25.0	24.39	0.04	0	01792	DFT-S-OFDM	QPSK	50	28	0 mm	bottom	1:1	2.330	1.151	2.682	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.0	23.35	-0.16	1	01792	DFT-S-OFDM	QPSK	100	0	0 mm	bottom	1:1	2.080	1.161	2.415	
1745.00	349000	Mid	NR Band n66 (AWS)	20	23.5	22.85	-0.07	1.5	01792	CP-OFDM	QPSK	1	1	0 mm	bottom	1:1	1.700	1.161	1.974	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.60	0.03	0	01792	DFT-S-OFDM	QPSK	1	104	0 mm	right	1:1	0.175	1.096	0.192	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.40	-0.01	0	01792	DFT-S-OFDM	QPSK	50	28	0 mm	right	1:1	0.198	1.148	0.227	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.60	0.03	0	01792	DFT-S-OFDM	QPSK	1	104	0 mm	left	1:1	1.010	1.096	1.107	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.40	0.04	0	01792	DFT-S-OFDM	QPSK	50	28	0 mm	left	1:1	1.250	1.148	1.435	
1745.00	349000	Mid	NR Band n66 (AWS)	20	22.0	21.58	-0.06	0	01685	DFT-S-OFDM	QPSK	1	104	0 mm	back	1:1	1.150	1.102	1.267	
1745.00	349000	Mid	NR Band n66 (AWS)	20	22.0	21.61	-0.09	0	01685	DFT-S-OFDM	QPSK	50	0	0 mm	back	1:1	1.260	1.094	1.378	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.40	-0.10	0	01792	DFT-S-OFDM	QPSK	50	28	0 mm	bottom	1:1	2.610	1.148	2.996	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Phablet 4.0 W/kg (mW/g) averaged over 10 grams									

Note: Blue entry represents variability measurement.

**Table 11-69  
NR Band n25 Phablet SAR**

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g) (W/kg)	Scaling Factor	Reported SAR (10g) (W/kg)	Plot #	
MHz	Ch.																			
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.78	0.04	0	01719	DFT-S-OFDM	QPSK	1	53	7 mm	back	1:1	0.881	1.052	0.927	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.66	0.03	0	01719	DFT-S-OFDM	QPSK	50	28	7 mm	back	1:1	0.911	1.081	0.985	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.78	0.07	0	01719	DFT-S-OFDM	QPSK	1	53	0 mm	front	1:1	1.260	1.052	1.326	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.66	0.11	0	01719	DFT-S-OFDM	QPSK	50	28	0 mm	front	1:1	1.260	1.081	1.362	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.78	-0.08	0	01719	DFT-S-OFDM	QPSK	1	53	0 mm	bottom	1:1	2.470	1.052	2.598	
1882.50	376500	Mid	NR Band n25 (PCS)	20	25.0	24.33	-0.01	0	01719	DFT-S-OFDM	QPSK	1	1	0 mm	bottom	1:1	2.400	1.167	2.801	
1905.00	381000	High	NR Band n25 (PCS)	20	25.0	24.33	-0.01	0	01719	DFT-S-OFDM	QPSK	1	53	0 mm	bottom	1:1	1.980	1.167	2.311	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.66	0.18	0	01719	DFT-S-OFDM	QPSK	50	28	0 mm	bottom	1:1	2.600	1.081	2.811	A98
1882.50	376500	Mid	NR Band n25 (PCS)	20	25.0	24.64	0.00	0	01719	DFT-S-OFDM	QPSK	50	28	0 mm	bottom	1:1	2.430	1.086	2.639	
1905.00	381000	High	NR Band n25 (PCS)	20	25.0	24.65	-0.01	0	01719	DFT-S-OFDM	QPSK	50	28	0 mm	bottom	1:1	2.130	1.084	2.309	
1860.00	372000	Low	NR Band n25 (PCS)	20	24.0	23.60	-0.05	1	01719	DFT-S-OFDM	QPSK	100	0	0 mm	bottom	1:1	2.070	1.096	2.269	
1860.00	372000	Low	NR Band n25 (PCS)	20	23.5	22.58	-0.16	1.5	01719	CP-OFDM	QPSK	1	1	0 mm	bottom	1:1	1.710	1.236	2.114	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.78	0.01	0	01719	DFT-S-OFDM	QPSK	1	53	0 mm	right	1:1	0.088	1.052	0.093	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.66	0.05	0	01719	DFT-S-OFDM	QPSK	50	28	0 mm	right	1:1	0.086	1.081	0.093	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.78	-0.05	0	01719	DFT-S-OFDM	QPSK	1	53	0 mm	left	1:1	0.746	1.052	0.785	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.66	-0.03	0	01719	DFT-S-OFDM	QPSK	50	28	0 mm	left	1:1	0.691	1.081	0.747	
1860.00	372000	Low	NR Band n25 (PCS)	20	22.0	21.33	-0.01	0	01719	DFT-S-OFDM	QPSK	1	104	0 mm	back	1:1	1.240	1.167	1.447	
1860.00	372000	Low	NR Band n25 (PCS)	20	22.0	21.38	-0.03	0	01719	DFT-S-OFDM	QPSK	50	28	0 mm	back	1:1	1.230	1.153	1.418	
1860.00	372000	Low	NR Band n25 (PCS)	20	25.0	24.66	0.18	0	01719	DFT-S-OFDM	QPSK	50	28	0 mm	bottom	1:1	2.570	1.081	2.778	
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.

FCC ID: A3LSMA426U	 PCTEST Proud to be part of  element	<b>SAR EVALUATION REPORT</b>		Approved by: Quality Manager
Document S/N: 1M2101040001-01.A3L (Rev1)	Test Dates: 01/12/21 – 02/19/21	DUT Type: Portable Handset	Page 113 of 149	

**Table 11-70  
NR Band n41 Phablet SAR**



MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
2592.99	518598	Mid	NR Band n41	100	19.0	18.05	0.12	0	01867	DFT-S-OFDM	QPSK	1	1	0 mm	back	1:1	0.600	1.245	0.747	
2592.99	518598	Mid	NR Band n41	100	19.0	18.13	-0.06	0	01867	DFT-S-OFDM	QPSK	135	0	0 mm	back	1:1	0.608	1.222	0.743	A99
2592.99	518598	Mid	NR Band n41	100	19.0	18.00	0.11	0	01867	CP-OFDM	QPSK	1	1	0 mm	back	1:1	0.606	1.259	0.763	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Phablet 4.0 W/kg (mW/g) averaged over 10 grams									

**Table 11-71  
NR Band n77 Phablet SAR**

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	MPR [dB]	Duty Cycle	Scaling Factor	SAR (10g)	Reported SAR (10g)	Plot #	
MHz	Ch.															(W/kg)	(W/kg)			
3750.00	650000	Low	NR Band n77	100	18.5	17.40	-0.17	0	01768	DFT-S-OFDM	QPSK	1	1	0 mm	back	1:1	1.288	0.949	1.222	
3930.00	662000	High	NR Band n77	100	18.5	17.39	-0.17	0	01768	DFT-S-OFDM	QPSK	1	1	0 mm	back	1:1	1.291	0.917	1.184	
3750.00	650000	Low	NR Band n77	100	18.5	17.41	-0.13	0	01768	DFT-S-OFDM	QPSK	135	0	0 mm	back	1:1	1.285	0.962	1.236	
3930.00	662000	High	NR Band n77	100	18.5	17.25	-0.18	0	01768	DFT-S-OFDM	QPSK	135	0	0 mm	back	1:1	1.334	0.846	1.129	
3750.00	650000	Low	NR Band n77	100	18.5	17.25	-0.12	0	01768	DFT-S-OFDM	QPSK	270	0	0 mm	back	1:1	1.334	0.949	1.266	
3750.00	650000	Low	NR Band n77	100	18.5	17.40	-0.13	0	01768	DFT-S-OFDM	QPSK	1	1	0 mm	front	1:1	1.288	1.150	1.481	
3930.00	662000	High	NR Band n77	100	18.5	17.39	-0.15	0	01768	DFT-S-OFDM	QPSK	1	1	0 mm	front	1:1	1.291	0.913	1.179	
3750.00	650000	Low	NR Band n77	100	18.5	17.41	-0.21	0	01768	DFT-S-OFDM	QPSK	135	0	0 mm	front	1:1	1.285	1.200	1.542	
3930.00	662000	High	NR Band n77	100	18.5	17.25	-0.05	0	01768	DFT-S-OFDM	QPSK	135	0	0 mm	front	1:1	1.334	0.849	1.133	
3750.00	650000	Low	NR Band n77	100	18.5	17.25	-0.14	0	01768	DFT-S-OFDM	QPSK	270	0	0 mm	front	1:1	1.334	1.160	1.547	
3750.00	650000	Low	NR Band n77	100	18.5	17.40	-0.13	0	01768	DFT-S-OFDM	QPSK	1	1	0 mm	top	1:1	1.288	1.770	2.280	
3930.00	662000	High	NR Band n77	100	18.5	17.39	0.01	0	01768	DFT-S-OFDM	QPSK	1	1	0 mm	top	1:1	1.291	1.710	2.208	
3750.00	650000	Low	NR Band n77	100	18.5	17.41	-0.17	0	01768	DFT-S-OFDM	QPSK	135	0	0 mm	top	1:1	1.285	1.810	2.326	A100
3930.00	662000	High	NR Band n77	100	18.5	17.25	0.03	0	01768	DFT-S-OFDM	QPSK	135	0	0 mm	top	1:1	1.334	1.590	2.121	
3750.00	650000	Low	NR Band n77	100	18.5	17.25	-0.13	0	01768	DFT-S-OFDM	QPSK	270	0	0 mm	top	1:1	1.334	1.800	2.401	
3750.00	650000	Low	NR Band n77	100	18.5	17.22	0.15	0	01768	CP-OFDM	QPSK	1	1	0 mm	top	1:1	1.343	1.660	2.229	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Phablet 4 W/kg (mW/g) averaged over 10 gram									

**Table 11-72  
WLAN Phablet SAR**

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.												(W/kg)	(W/kg)			(W/kg)	
5270	54	802.11n	OFDM	40	18.0	17.48	0.07	0 mm	02014	13.5	back	94.9	8.066	0.843	1.127	1.054	1.001	A101
5270	54	802.11n	OFDM	40	18.0	17.48	0.13	0 mm	02014	13.5	front	94.9	4.626	-	1.127	1.054	-	
5270	54	802.11n	OFDM	40	18.0	17.48	0.15	0 mm	02014	13.5	top	94.9	10.570	0.713	1.127	1.054	0.847	
5270	54	802.11n	OFDM	40	18.0	17.48	0.19	0 mm	02014	13.5	left	94.9	1.147	0.143	1.127	1.054	0.170	
5710	142	802.11n	OFDM	40	18.0	17.98	-0.15	0 mm	02014	13.5	back	94.9	4.190	0.550	1.005	1.054	0.583	
5710	142	802.11n	OFDM	40	18.0	17.98	0.08	0 mm	02014	13.5	front	94.9	5.305	-	1.005	1.054	-	
5710	142	802.11n	OFDM	40	18.0	17.98	0.13	0 mm	02014	13.5	top	94.9	10.674	0.551	1.005	1.054	0.584	
5710	142	802.11n	OFDM	40	18.0	17.98	-0.19	0 mm	02014	13.5	left	94.9	0.344	0.045	1.005	1.054	0.048	
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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## 11.5 SAR Test Notes

### General Notes:




1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated with a headset connected to the device when the standalone reported body-worn SAR was  $\geq 1.2$  W/kg.
8. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 13 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).
10. Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is  $> 160$  mm and  $< 200$  mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR  $> 1.2$  W/kg.
11. Additional SAR tests for phablet SAR were evaluated per KDB 616217 Section 6 (See Section 6.9 for more information).
12. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the 1g thresholds for the equivalent test cases.
13. This device uses Qualcomm Smart Transmit for 2G/3G/4G/5G operations to control and manage transmitting power in real time to ensure RF Exposure compliance. Per FCC Guidance, compliance for was assessed at the minimum of the time averaged power and the maximum output power for each band/mode/exposure condition (DSI).

### GSM Test Notes:

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

### CDMA Notes:

1. Head SAR for CDMA2000 mode was tested under RC3/SO55 per FCC KDB Publication 941225 D01v03r01.

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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  $\leq 0.8$  W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is  $> \frac{1}{2}$  dB, instead of the middle channel, the highest output power channel was used.
6. CDMA 1X Advanced technology was not required for SAR since the maximum allowed output powers for 1X Advanced was not more than 0.25 dB higher than the maximum powers for 1X.

**UMTS Notes:**

1. UMTS mode 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  $\leq 0.8$  W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is  $> \frac{1}{2}$  dB, instead of the middle channel, the highest output power channel was used.

**LTE Notes:**

1. LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r04. The general test procedures used for testing can be found in Section 8.6.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 and MCC=001 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
4. Per FCC KDB Publication 447498 D01v06, when the reported 1g SAR measured at the highest output power channel in a given a test configuration was  $> 0.6$  W/kg for LTE B41/48, and  $> 0.4$  for NR n77, testing at the other channels was required for such test configurations.
5. TDD LTE was tested per the guidance provided in FCC KDB Publication 941225 D05v02r04. Testing was performed using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.
6. Per KDB Publication 941225 D05Av01r02, SAR for downlink only LTE CA operations was not needed since the maximum average output power in LTE CA mode was not  $>0.25$  dB higher than the maximum output power when downlink carrier aggregation was inactive.
7. This device supports Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operations is 43.3 % using UL-DL configuration 1. Per FCC Guidance, all SAR tests were performed using Power Class 3. SAR with power class 2 at the available

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duty factor was additionally performed for the power class 3 configuration with the highest SAR configuration for each exposure conditions. Please see Section 14 for linearity results.




8. For LTE Band 5, LTE Band 66, and 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.
9. This device supports LTE Band 41 ULCA active with Power Class 2. Highest SAR test configuration for each exposure condition in Power Class 3 with ULCA active was repeated with Power Class 2 with ULCA active.

**NR Notes:**

1. NR implementation supports NSA mode. In EN-DC mode, NR operates with the LTE Bands shown in the NR FR1 checklist acting as anchor bands. Per FCC guidance, SAR tests for NR Bands and LTE Anchors Bands were performed separately due to limitations in SAR probe calibration factors.
2. Due to test setup limitations, SAR testing for NR was performed using test mode software to establish the connection.
3. Simultaneous transmission analysis for EN-DC operations is addressed in the Part 2 Test Report (Serial Number can be found in the bibliography).
4. This device additionally supports some EN-DC conditions where additional LTE carriers are added on the downlink only.
5. Per FCC Guidance, NR modulations and RB Sizes/Offsets were selected for testing such that configurations with the highest output power were evaluated for SAR tests.




**WLAN Notes:**

1. For held-to-ear, and hotspot, and phablet operations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is  $\leq 0.4$  W/kg for 1g evaluations, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is  $\leq 0.8$  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 for 1g evaluations. See Section 8.7.6 for more information.
4. When the maximum reported 1g averaged SAR is  $\leq 0.8$  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  $\leq 1.20$  W/kg for 1g evaluations or all test channels were measured.
5. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated EMC test reports.
6. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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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 9.7 for the time domain plot and calculation for the duty factor of the device.
2. Head and Hotspot Bluetooth SAR were evaluated for BT BR tethering applications.

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## 12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

### 12.1 Introduction

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




### 12.2 Simultaneous Transmission Procedures

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

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

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




Qualcomm Smart Transmit algorithm in WWAN adds directly the time-averaged RF exposure from 4G and time-averaged RF exposure from 5G NR. Smart Transmit algorithm controls the total RF exposure from both 4G and 5G NR to not exceed FCC limit. Therefore, simultaneous transmission compliance between 4G+5G operations is demonstrated in the Qualcomm Part 2 Report during algorithm validation.

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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)**

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	CDMA/EVDO BC10 (§90S)	0.303	0.450	0.753
	CDMA/EVDO BC0 (§22H)	0.309	0.450	0.759
	PCS CDMA/EVDO	0.211	0.450	0.661
	GSM 850	0.234	0.450	0.684
	GSM 1900	0.063	0.450	0.513
	UMTS 850	0.247	0.450	0.697
	UMTS 1750	0.283	0.450	0.733
	UMTS 1900	0.140	0.450	0.590
	LTE Band 71	0.142	0.450	0.592
	LTE Band 12	0.195	0.450	0.645
	LTE Band 13	0.150	0.450	0.600
	LTE Band 14	0.244	0.450	0.694
	LTE Band 26 (Cell)	0.255	0.450	0.705
	LTE Band 5 (Cell)	0.118	0.450	0.568
	LTE Band 66 (AWS)	0.251	0.450	0.701
	LTE Band 25 (PCS)	0.139	0.450	0.589
	LTE Band 30	0.568	0.450	1.018
	LTE Band 7	0.579	0.450	1.029
	LTE Band 48	1.039	0.450	1.489
	LTE Band 41	0.661	0.450	1.111
NR Band n71	0.132	0.450	0.582	
NR Band n5 (Cell)	0.216	0.450	0.666	
NR Band n66 (AWS)	0.209	0.450	0.659	
NR Band n25 (PCS)	0.187	0.450	0.637	
NR Band n41	0.256	0.450	0.706	
NR Band n77	1.106	0.450	<b>1.556</b>	

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

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	CDMA/EVDO BC10 (§90S)	0.303	0.353	0.656
	CDMA/EVDO BC0 (§22H)	0.309	0.353	0.662
	PCS CDMA/EVDO	0.211	0.353	0.564
	GSM 850	0.234	0.353	0.587
	GSM 1900	0.063	0.353	0.416
	UMTS 850	0.247	0.353	0.600
	UMTS 1750	0.283	0.353	0.636
	UMTS 1900	0.140	0.353	0.493
	LTE Band 71	0.142	0.353	0.495
	LTE Band 12	0.195	0.353	0.548
	LTE Band 13	0.150	0.353	0.503
	LTE Band 14	0.244	0.353	0.597
	LTE Band 26 (Cell)	0.255	0.353	0.608
	LTE Band 5 (Cell)	0.118	0.353	0.471
	LTE Band 66 (AWS)	0.251	0.353	0.604
	LTE Band 25 (PCS)	0.139	0.353	0.492
	LTE Band 30	0.568	0.353	0.921
	LTE Band 7	0.579	0.353	0.932
	LTE Band 48	1.039	0.353	1.392
	LTE Band 41	0.661	0.353	1.014
	NR Band n71	0.132	0.353	0.485
	NR Band n5 (Cell)	0.216	0.353	0.569
	NR Band n66 (AWS)	0.209	0.353	0.562
NR Band n25 (PCS)	0.187	0.353	0.540	
NR Band n41	0.256	0.353	0.609	
NR Band n77	1.106	0.353	1.459	

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**Table 12-3  
Simultaneous Transmission Scenario with Bluetooth (Held to Ear)**




Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	CDMA/EVDO BC10 (§90S)	0.303	0.195	0.498
	CDMA/EVDO BC0 (§22H)	0.309	0.195	0.504
	PCS CDMA/EVDO	0.211	0.195	0.406
	GSM 850	0.234	0.195	0.429
	GSM 1900	0.063	0.195	0.258
	UMTS 850	0.247	0.195	0.442
	UMTS 1750	0.283	0.195	0.478
	UMTS 1900	0.140	0.195	0.335
	LTE Band 71	0.142	0.195	0.337
	LTE Band 12	0.195	0.195	0.390
	LTE Band 13	0.150	0.195	0.345
	LTE Band 14	0.244	0.195	0.439
	LTE Band 26 (Cell)	0.255	0.195	0.450
	LTE Band 5 (Cell)	0.118	0.195	0.313
	LTE Band 66 (AWS)	0.251	0.195	0.446
	LTE Band 25 (PCS)	0.139	0.195	0.334
	LTE Band 30	0.568	0.195	0.763
	LTE Band 7	0.579	0.195	0.774
	LTE Band 48	1.039	0.195	1.234
	LTE Band 41	0.661	0.195	0.856
	NR Band n71	0.132	0.195	0.327
	NR Band n5 (Cell)	0.216	0.195	0.411
	NR Band n66 (AWS)	0.209	0.195	0.404
NR Band n25 (PCS)	0.187	0.195	0.382	
NR Band n41	0.256	0.195	0.451	
NR Band n77	1.106	0.195	<b>1.301</b>	

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**Table 12-4**  
**Simultaneous Transmission Scenario with Bluetooth and 5 GHz WLAN (Held to Ear)**

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	CDMA/EVDO BC10 (§90S)	0.303	0.195	0.353	0.851
	CDMA/EVDO BC0 (§22H)	0.309	0.195	0.353	0.857
	PCS CDMA/EVDO	0.211	0.195	0.353	0.759
	GSM 850	0.234	0.195	0.353	0.782
	GSM 1900	0.063	0.195	0.353	0.611
	UMTS 850	0.247	0.195	0.353	0.795
	UMTS 1750	0.283	0.195	0.353	0.831
	UMTS 1900	0.140	0.195	0.353	0.688
	LTE Band 71	0.142	0.195	0.353	0.690
	LTE Band 12	0.195	0.195	0.353	0.743
	LTE Band 13	0.150	0.195	0.353	0.698
	LTE Band 14	0.244	0.195	0.353	0.792
	LTE Band 26 (Cell)	0.255	0.195	0.353	0.803
	LTE Band 5 (Cell)	0.118	0.195	0.353	0.666
	LTE Band 66 (AWS)	0.251	0.195	0.353	0.799
	LTE Band 25 (PCS)	0.139	0.195	0.353	0.687
	LTE Band 30	0.568	0.195	0.353	1.116
	LTE Band 7	0.579	0.195	0.353	1.127
	LTE Band 48	1.039	0.195	0.353	<b>1.587</b>
	LTE Band 41	0.661	0.195	0.353	1.209
	NR Band n71	0.132	0.195	0.353	0.680
	NR Band n5 (Cell)	0.216	0.195	0.353	0.764
	NR Band n66 (AWS)	0.209	0.195	0.353	0.757
	NR Band n25 (PCS)	0.187	0.195	0.353	0.735
NR Band n41	0.256	0.195	0.353	0.804	
NR Band n77	1.106	0.195	0.353	See Table Below	



Simult Tx	Configuration	NR Band n77 SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	Right Cheek	0.886	0.195	0.353	1.434
	Right Tilt	1.106	0.123	0.353*	<b>1.582</b>
	Left Cheek	0.495	0.070	0.353*	0.918
	Left Tilt	0.720	0.055	0.325	1.100

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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)**




Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body - Worn SAR	CDMA BC10 (\$90S)	0.515	0.207	0.722
	CDMA BC0 (\$22H)	0.400	0.207	0.607
	PCS CDMA	0.579	0.207	0.786
	GSM 850	0.309	0.207	0.516
	GSM 1900	0.180	0.207	0.387
	UMTS 850	0.295	0.207	0.502
	UMTS 1750	0.921	0.207	1.128
	UMTS 1900	0.267	0.207	0.474
	LTE Band 71	0.432	0.207	0.639
	LTE Band 12	0.338	0.207	0.545
	LTE Band 13	0.300	0.207	0.507
	LTE Band 14	0.336	0.207	0.543
	LTE Band 26 (Cell)	0.356	0.207	0.563
	LTE Band 5 (Cell)	0.201	0.207	0.408
	LTE Band 66 (AWS)	0.429	0.207	0.636
	LTE Band 25 (PCS)	0.425	0.207	0.632
	LTE Band 30	0.617	0.207	0.824
	LTE Band 7	1.249	0.207	<b>1.456</b>
	LTE Band 48	0.353	0.207	0.560
	LTE Band 41	0.594	0.207	0.801
	NR Band n71	0.371	0.207	0.578
	NR Band n5 (Cell)	0.257	0.207	0.464
	NR Band n66 (AWS)	0.441	0.207	0.648
	NR Band n25 (PCS)	0.564	0.207	0.771
NR Band n41	0.218	0.207	0.425	
NR Band n77	0.284	0.207	0.491	

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

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	
Body - Worn SAR	CDMA BC10 (§90S)	0.515	0.234	0.749
	CDMA BC0 (§22H)	0.400	0.234	0.634
	PCS CDMA	0.579	0.234	0.813
	GSM 850	0.309	0.234	0.543
	GSM 1900	0.180	0.234	0.414
	UMTS 850	0.295	0.234	0.529
	UMTS 1750	0.921	0.234	1.155
	UMTS 1900	0.267	0.234	0.501
	LTE Band 71	0.432	0.234	0.666
	LTE Band 12	0.338	0.234	0.572
	LTE Band 13	0.300	0.234	0.534
	LTE Band 14	0.336	0.234	0.570
	LTE Band 26 (Cell)	0.356	0.234	0.590
	LTE Band 5 (Cell)	0.201	0.234	0.435
	LTE Band 66 (AWS)	0.429	0.234	0.663
	LTE Band 25 (PCS)	0.425	0.234	0.659
	LTE Band 30	0.617	0.234	0.851
	LTE Band 7	1.249	0.234	<b>1.483</b>
	LTE Band 48	0.353	0.234	0.587
	LTE Band 41	0.594	0.234	0.828
	NR Band n71	0.371	0.234	0.605
	NR Band n5 (Cell)	0.257	0.234	0.491
	NR Band n66 (AWS)	0.441	0.234	0.675
	NR Band n25 (PCS)	0.564	0.234	0.798
NR Band n41	0.218	0.234	0.452	
NR Band n77	0.284	0.234	0.518	

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

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	
Body - Worn SAR	CDMA BC10 (§90S)	0.515	0.062	0.577
	CDMA BC0 (§22H)	0.400	0.062	0.462
	PCS CDMA	0.579	0.062	0.641
	GSM 850	0.309	0.062	0.371
	GSM 1900	0.180	0.062	0.242
	UMTS 850	0.295	0.062	0.357
	UMTS 1750	0.921	0.062	0.983
	UMTS 1900	0.267	0.062	0.329
	LTE Band 71	0.432	0.062	0.494
	LTE Band 12	0.338	0.062	0.400
	LTE Band 13	0.300	0.062	0.362
	LTE Band 14	0.336	0.062	0.398
	LTE Band 26 (Cell)	0.356	0.062	0.418
	LTE Band 5 (Cell)	0.201	0.062	0.263
	LTE Band 66 (AWS)	0.429	0.062	0.491
	LTE Band 25 (PCS)	0.425	0.062	0.487
	LTE Band 30	0.617	0.062	0.679
	LTE Band 7	1.249	0.062	<b>1.311</b>
	LTE Band 48	0.353	0.062	0.415
	LTE Band 41	0.594	0.062	0.656
	NR Band n71	0.371	0.062	0.433
	NR Band n5 (Cell)	0.257	0.062	0.319
	NR Band n66 (AWS)	0.441	0.062	0.503
NR Band n25 (PCS)	0.564	0.062	0.626	
NR Band n41	0.218	0.062	0.280	
NR Band n77	0.284	0.062	0.346	

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




Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body - Worn SAR	CDMA BC10 (§90S)	0.515	0.062	0.234	0.811
	CDMA BC0 (§22H)	0.400	0.062	0.234	0.696
	PCS CDMA	0.579	0.062	0.234	0.875
	GSM 850	0.309	0.062	0.234	0.605
	GSM 1900	0.180	0.062	0.234	0.476
	UMTS 850	0.295	0.062	0.234	0.591
	UMTS 1750	0.921	0.062	0.234	1.217
	UMTS 1900	0.267	0.062	0.234	0.563
	LTE Band 71	0.432	0.062	0.234	0.728
	LTE Band 12	0.338	0.062	0.234	0.634
	LTE Band 13	0.300	0.062	0.234	0.596
	LTE Band 14	0.336	0.062	0.234	0.632
	LTE Band 26 (Cell)	0.356	0.062	0.234	0.652
	LTE Band 5 (Cell)	0.201	0.062	0.234	0.497
	LTE Band 66 (AWS)	0.429	0.062	0.234	0.725
	LTE Band 25 (PCS)	0.425	0.062	0.234	0.721
	LTE Band 30	0.617	0.062	0.234	0.913
	LTE Band 7	1.249	0.062	0.234	<b>1.545</b>
	LTE Band 48	0.353	0.062	0.234	0.649
	LTE Band 41	0.594	0.062	0.234	0.890
	NR Band n71	0.371	0.062	0.234	0.667
	NR Band n5 (Cell)	0.257	0.062	0.234	0.553
	NR Band n66 (AWS)	0.441	0.062	0.234	0.737
	NR Band n25 (PCS)	0.564	0.062	0.234	0.860
NR Band n41	0.218	0.062	0.234	0.514	
NR Band n77	0.284	0.062	0.234	0.580	

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## 12.5 Hotspot SAR Simultaneous Transmission Analysis

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

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	EVDO BC10 (\$90S)	0.775	0.533	1.308
	EVDO BC0 (\$22H)	0.827	0.533	1.360
	PCS EVDO	0.351	0.533	0.884
	GPRS 850	0.940	0.533	1.473
	GPRS 1900	0.910	0.533	1.443
	UMTS 850	0.535	0.533	1.068
	UMTS 1750	0.825	0.533	1.358
	UMTS 1900	0.563	0.533	1.096
	LTE Band 71	0.473	0.533	1.006
	LTE Band 12	0.410	0.533	0.943
	LTE Band 13	0.421	0.533	0.954
	LTE Band 14	0.649	0.533	1.182
	LTE Band 26 (Cell)	0.576	0.533	1.109
	LTE Band 5 (Cell)	0.389	0.533	0.922
	LTE Band 66 (AWS)	0.642	0.533	1.175
	LTE Band 25 (PCS)	0.383	0.533	0.916
	LTE Band 30	0.715	0.533	1.248
	LTE Band 7	1.055	0.533	<b>1.588</b>
	LTE Band 48	0.889	0.533	1.422
	LTE Band 41	0.517	0.533	1.050
NR Band n71	0.442	0.533	0.975	
NR Band n5 (Cell)	0.613	0.533	1.146	
NR Band n66 (AWS)	0.471	0.533	1.004	
NR Band n25 (PCS)	0.661	0.533	1.194	
NR Band n41	0.402	0.533	0.935	
NR Band n77	0.930	0.533	1.463	



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

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	EVDO BC10 (§90S)	0.775	0.588	1.363
	EVDO BC0 (§22H)	0.827	0.588	1.415
	PCS EVDO	0.351	0.588	0.939
	GPRS 850	0.940	0.588	<b>1.528</b>
	GPRS 1900	0.910	0.588	1.498
	UMTS 850	0.535	0.588	1.123
	UMTS 1750	0.825	0.588	1.413
	UMTS 1900	0.563	0.588	1.151
	LTE Band 71	0.473	0.588	1.061
	LTE Band 12	0.410	0.588	0.998
	LTE Band 13	0.421	0.588	1.009
	LTE Band 14	0.649	0.588	1.237
	LTE Band 26 (Cell)	0.576	0.588	1.164
	LTE Band 5 (Cell)	0.389	0.588	0.977
	LTE Band 66 (AWS)	0.642	0.588	1.230
	LTE Band 25 (PCS)	0.383	0.588	0.971
	LTE Band 30	0.715	0.588	1.303
	LTE Band 7	1.055	0.588	See Table Below
	LTE Band 48	0.889	0.588	1.477
	LTE Band 41	0.517	0.588	1.105
	NR Band n71	0.442	0.588	1.030
	NR Band n5 (Cell)	0.613	0.588	1.201
	NR Band n66 (AWS)	0.471	0.588	1.059
	NR Band n25 (PCS)	0.661	0.588	1.249
NR Band n41	0.402	0.588	0.990	
NR Band n77	0.930	0.588	1.518	




  

Simult Tx	Configuration	LTE Band 7 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	Back	1.055	0.293	<b>1.348</b>
	Front	0.142	0.245	0.387
	Top	0.078	0.588	0.666
	Bottom	-	-	-
	Right	-	-	-
	Left	0.387	0.057	0.444

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**Table 12-11**  
**Simultaneous Transmission Scenario with Bluetooth (Hotspot at 1.0 cm)**

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	EVDO BC10 (§90S)	0.775	0.145	0.920
	EVDO BC0 (§22H)	0.827	0.145	0.972
	PCS EVDO	0.351	0.145	0.496
	GPRS 850	0.940	0.145	1.085
	GPRS 1900	0.910	0.145	1.055
	UMTS 850	0.535	0.145	0.680
	UMTS 1750	0.825	0.145	0.970
	UMTS 1900	0.563	0.145	0.708
	LTE Band 71	0.473	0.145	0.618
	LTE Band 12	0.410	0.145	0.555
	LTE Band 13	0.421	0.145	0.566
	LTE Band 14	0.649	0.145	0.794
	LTE Band 26 (Cell)	0.576	0.145	0.721
	LTE Band 5 (Cell)	0.389	0.145	0.534
	LTE Band 66 (AWS)	0.642	0.145	0.787
	LTE Band 25 (PCS)	0.383	0.145	0.528
	LTE Band 30	0.715	0.145	0.860
	LTE Band 7	1.055	0.145	<b>1.200</b>
	LTE Band 48	0.889	0.145	1.034
	LTE Band 41	0.517	0.145	0.662
	NR Band n71	0.442	0.145	0.587
	NR Band n5 (Cell)	0.613	0.145	0.758
	NR Band n66 (AWS)	0.471	0.145	0.616
NR Band n25 (PCS)	0.661	0.145	0.806	
NR Band n41	0.402	0.145	0.547	
NR Band n77	0.930	0.145	1.075	

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

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	2	1+2+3
Hotspot SAR	EVDO BC10 (§90S)	0.775	0.145	0.588	1.508
	EVDO BC0 (§22H)	0.827	0.145	0.588	<b>1.560</b>
	PCS EVDO	0.351	0.145	0.588	1.084
	GPRS 850	0.940	0.145	0.588	See Table Below
	GPRS 1900	0.910	0.145	0.588	See Table Below
	UMTS 850	0.535	0.145	0.588	1.268
	UMTS 1750	0.825	0.145	0.588	1.558
	UMTS 1900	0.563	0.145	0.588	1.296
	LTE Band 71	0.473	0.145	0.588	1.206
	LTE Band 12	0.410	0.145	0.588	1.143
	LTE Band 13	0.421	0.145	0.588	1.154
	LTE Band 14	0.649	0.145	0.588	1.382
	LTE Band 26 (Cell)	0.576	0.145	0.588	1.309
	LTE Band 5 (Cell)	0.389	0.145	0.588	1.122
	LTE Band 66 (AWS)	0.642	0.145	0.588	1.375
	LTE Band 25 (PCS)	0.383	0.145	0.588	1.116
	LTE Band 30	0.715	0.145	0.588	1.448
	LTE Band 7	1.055	0.145	0.588	See Table Below
	LTE Band 48	0.889	0.145	0.588	See Table Below
	LTE Band 41	0.517	0.145	0.588	1.250
	NR Band n71	0.442	0.145	0.588	1.175
	NR Band n5 (Cell)	0.613	0.145	0.588	1.346
	NR Band n66 (AWS)	0.471	0.145	0.588	1.204
NR Band n25 (PCS)	0.661	0.145	0.588	1.394	
NR Band n41	0.402	0.145	0.588	1.135	
NR Band n77	0.930	0.145	0.588	See Table Below	

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Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3			1	2	3	1+2+3
Body SAR	Back	0.940	0.145	0.293	<b>1.378</b>	Body SAR	Back	0.910	0.145	0.293	<b>1.348</b>
	Front	0.270	0.076	0.245	0.591		Front	0.185	0.076	0.245	0.506
	Top	-	0.037	0.588	0.625		Top	-	0.037	0.588	0.625
	Bottom	0.312	-	-	0.312		Bottom	0.584	-	-	0.584
	Right	0.358	-	-	0.358		Right	0.069	-	-	0.069
	Left	0.180	0.074	0.057	0.311		Left	0.145	0.074	0.057	0.276
Simult Tx	Configuration	LTE Band 7 SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 48 SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3			1	2	3	1+2+3
Body SAR	Back	1.055	0.145	0.293	<b>1.493</b>	Body SAR	Back	0.527	0.145	0.293	0.965
	Front	0.142	0.076	0.245	0.463		Front	0.365	0.076	0.245	0.686
	Top	0.078	0.037	0.588	0.703		Top	0.889	0.037	0.588	<b>1.514</b>
	Bottom	-	-	-	-		Bottom	-	-	-	-
	Right	-	-	-	-		Right	-	-	-	-
	Left	0.387	0.074	0.057	0.518		Left	0.253	0.074	0.057	0.384

Simult Tx	Configuration	NR Band n77 SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body SAR	Back	0.558	0.145	0.293	0.996
	Front	0.352	0.076	0.245	0.673
	Top	0.930	0.037	0.588	<b>1.555</b>
	Bottom	-	-	-	-
	Right	-	-	-	-
	Left	0.249	0.074	0.057	0.380

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## 12.6 Phablet Simultaneous Transmission Analysis

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.

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 with 5 GHz WLAN (Phablet)**

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Phablet SAR	PCS CDMA/EVDO	3.136	1.001	See Table Below
	UMTS 1750	3.029	1.001	See Table Below
	UMTS 1900	1.592	1.001	2.593
	LTE Band 66 (AWS)	2.037	1.001	3.038
	LTE Band 25 (PCS)	2.783	1.001	3.784
	LTE Band 30	2.773	1.001	3.774
	LTE Band 7	1.442	1.001	2.443
	LTE Band 48	2.647	1.001	3.648
	LTE Band 41	1.303	1.001	2.304
	NR Band n66 (AWS)	3.054	1.001	See Table Below
	NR Band n25 (PCS)	2.811	1.001	<b>3.812</b>
	NR Band n41	0.763	1.001	1.764
	NR Band n77	2.401	1.001	3.402




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Simult Tx	Configuration	PCS CDMA/ EVDO SAR (W/kg)	5 GHz WLAN SAR (W/kg)	$\Sigma$ SAR (W/kg)	Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	$\Sigma$ SAR (W/kg)
		1	2	1+2			1	2	1+2
Phablet SAR	Back	1.130	1.001	2.131	Phablet SAR	Back	1.300	1.001	2.301
	Front	1.263	1.001*	2.264		Front	2.327	1.001*	<b>3.328</b>
	Top	-	0.847	0.847		Top	-	0.847	0.847
	Bottom	3.136	-	<b>3.136</b>		Bottom	3.029	-	3.029
	Right	0.143	-	0.143		Right	0.594	-	0.594
	Left	0.873	0.170	1.043		Left	1.428	0.170	1.598

Simult Tx	Configuration	NR Band n66 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	$\Sigma$ SAR (W/kg)
		1	2	1+2
Phablet SAR	Back	1.378	1.001	2.379
	Front	1.458	1.001*	2.459
	Top	-	0.847	0.847
	Bottom	3.054	-	<b>3.054</b>
	Right	0.227	-	0.227
	Left	1.435	0.170	1.605

## 12.7 Simultaneous Transmission Conclusion

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

**Table 13-1  
Head SAR Measurement Variability Results**

HEAD VARIABILITY RESULTS													
Band	FREQUENCY		Mode	Service	Side	Test Position	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)	
3500	3560.00	55340	LTE Band 48, 20 MHz Bandwidth	QPSK, 50 RB, 25 RB Offset	Right	Tilt	0.819	0.806	1.02	N/A	N/A	N/A	N/A
3700	3750.00	650000	NR Band n77, 100 MHz Bandwidth	DFT-S-OFDM, QPSK, 1 RB, 1 RB Offset	Right	Tilt	0.988	0.977	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							

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**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)	
1750	1752.60	1513	UMTS 1750	RMC	back	10 mm	0.825	0.794	1.04	N/A	N/A	N/A	N/A
2450	2510.00	20850	LTE Band 7, 20 MHz Bandwidth	QPSK, 1 RB, 0 RB Offset	back	15 mm	1.120	0.957	1.17	N/A	N/A	N/A	N/A
2600	2535.00	21100	LTE Band 7, 20 MHz Bandwidth	QPSK, 1 RB, 0 RB Offset	back	15 mm	1.060	0.952	1.11	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						

**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)	
2300	2310.00	27710	LTE Band 30, 10 MHz Bandwidth	QPSK, 50 RB, 0 RB Offset	back	0 mm	2.290	2.290	1.00	N/A	N/A	N/A	N/A
3700	3690.00	56640	LTE Band 48, 20 MHz Bandwidth	QPSK, 1 RB, 99 RB Offset	top	0 mm	2.290	2.230	1.03	N/A	N/A	N/A	N/A
1750	1745.00	349000	NR Band n66 (AWS), 20 MHz Bandwidth	DFT-S-OFDM, QPSK, 50 RB, 28 RB Offset	bottom	0 mm	2.660	2.610	1.02	N/A	N/A	N/A	N/A
1900	1860.00	372000	NR Band n25 (PCS), 20 MHz Bandwidth	DFT-S-OFDM, QPSK, 50 RB, 28 RB Offset	bottom	0 mm	2.600	2.570	1.01	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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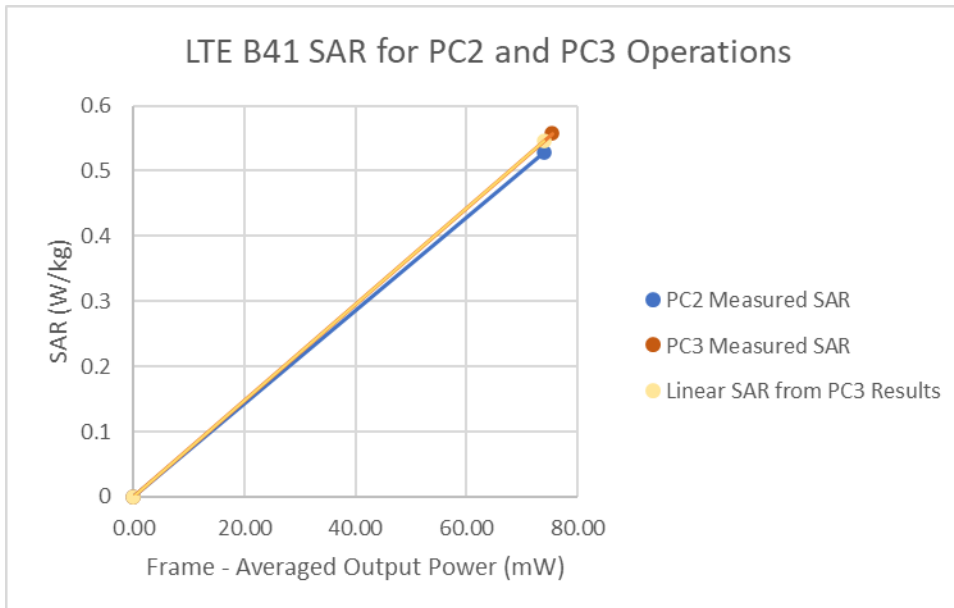
# 14 ADDITIONAL TESTING PER FCC GUIDANCE

## 14.1 LTE Band 41 Power Class 2 and Power Class 3 Linearity

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

**Table 14-1**  
**LTE Band 41 Head Linearity Data**

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	21.50	23.10
Measured Output Power (dBm)	20.76	22.33
Measured SAR (W/kg)	0.557	0.529
Measured Power (mW)	119.12	171.00
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	75.41	74.04
% deviation from expected linearity		-3.28%

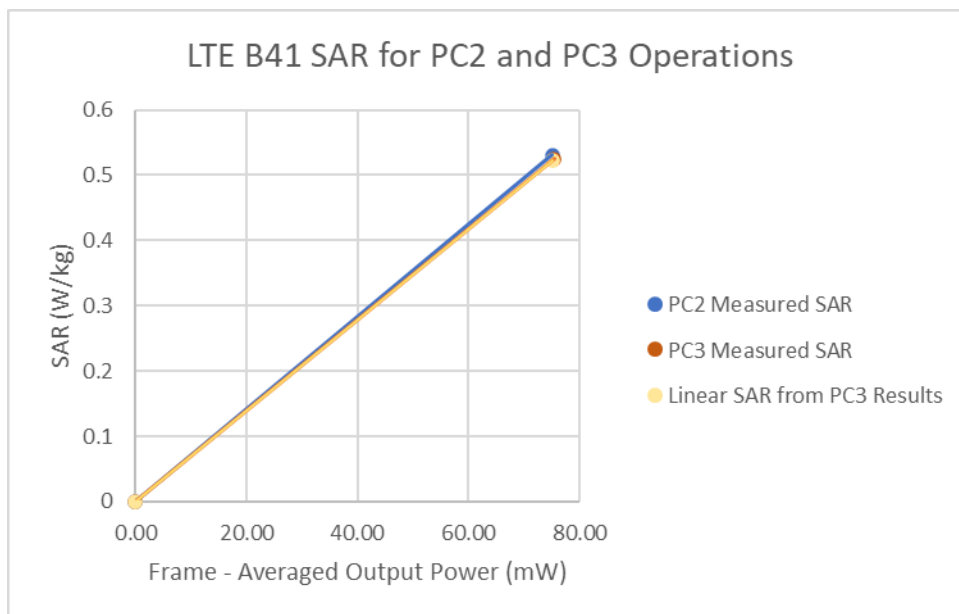


**Figure 14-1**  
**LTE Band 41 Head Linearity**



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**Table 14-2  
LTE Band 41 ULCA Head Linearity Data**

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	21.50	23.10
Measured Output Power (dBm)	20.76	22.39
Measured SAR (W/kg)	0.525	0.531
Measured Power (mW)	119.12	173.38
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	75.41	75.07
% deviation from expected linearity		1.59%

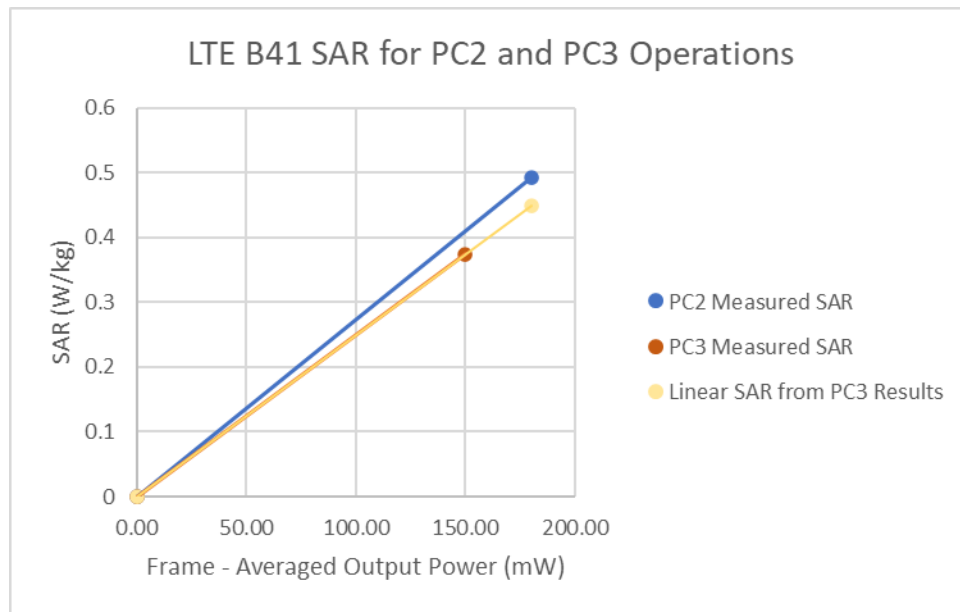


**Figure 14-2  
LTE Band 41 ULCA Head Linearity**




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**Table 14-3  
LTE Band 41 Body-Worn Linearity Data**

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	24.50	27.00
Measured Output Power (dBm)	23.75	26.20
Measured SAR (W/kg)	0.374	0.493
Measured Power (mW)	237.14	416.87
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	150.11	180.50
% deviation from expected linearity		9.62%

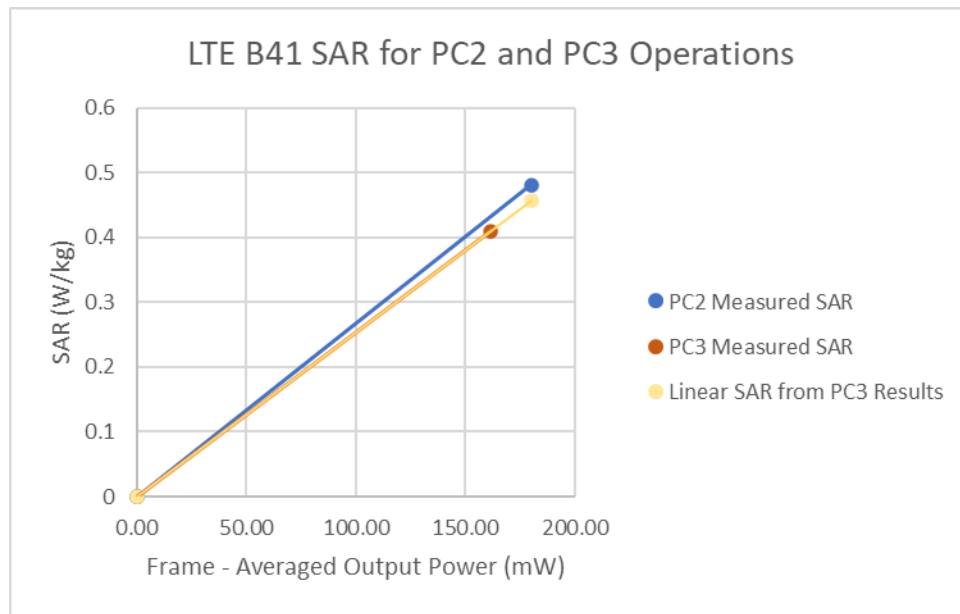


**Figure 14-3  
LTE Band 41 Body-Worn Linearity**




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**Table 14-4**  
**LTE Band 41 ULCA Body-Worn Linearity Data**

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	24.50	27.00
Measured Output Power (dBm)	24.07	26.19
Measured SAR (W/kg)	0.410	0.481
Measured Power (mW)	255.27	415.91
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	161.59	180.09
% deviation from expected linearity		5.26%



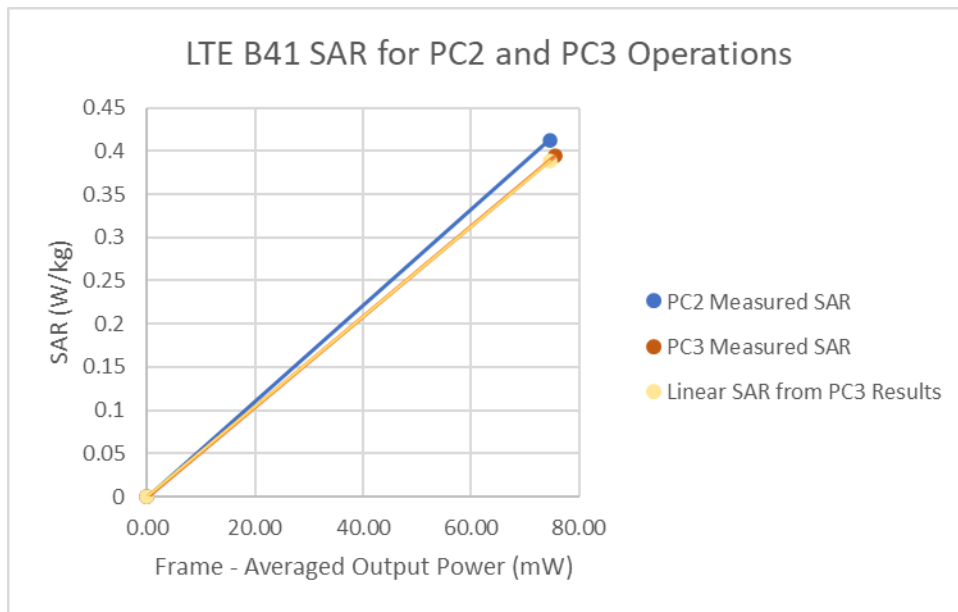
**Figure 14-4**  
**LTE Band 41 ULCA Body-Worn Linearity**

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**Table 14-5  
LTE Band 41 Hotspot Linearity Data**

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	21.50	23.10
Measured Output Power (dBm)	20.77	22.36
Measured SAR (W/kg)	0.394	0.413
Measured Power (mW)	119.40	172.19
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	75.58	74.56
% deviation from expected linearity		6.26%

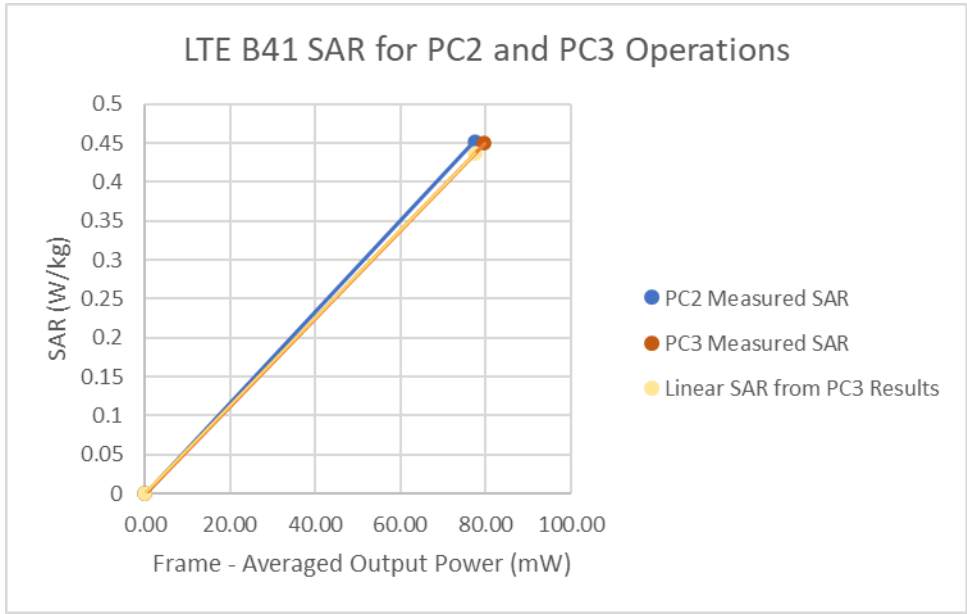


**Figure 14-5  
LTE Band 41 Hotspot Linearity**




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**Table 14-6  
LTE Band 41 ULCA Hotspot Linearity Data**

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	21.50	23.10
Measured Output Power (dBm)	21.00	22.52
Measured SAR (W/kg)	0.450	0.452
Measured Power (mW)	125.89	178.65
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	79.69	77.35
% deviation from expected linearity		3.48%

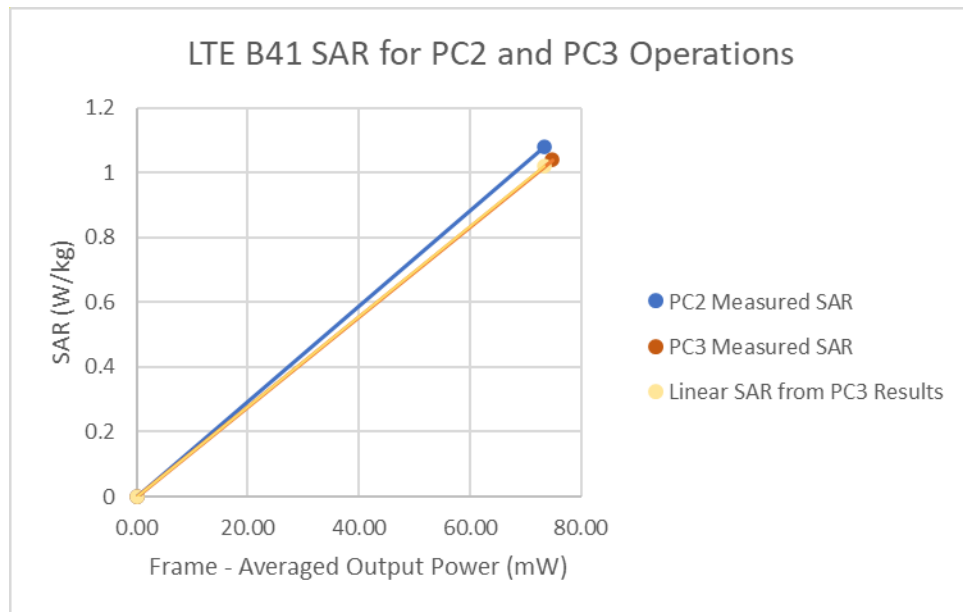


**Figure 14-6  
LTE Band 41 ULCA Hotspot Linearity**




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**Table 14-7**  
**LTE Band 41 Phablet Linearity Data**

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	21.50	23.10
Measured Output Power (dBm)	20.73	22.29
Measured SAR (W/kg)	1.040	1.080
Measured Power (mW)	118.30	169.43
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	74.89	73.36
% deviation from expected linearity		6.00%

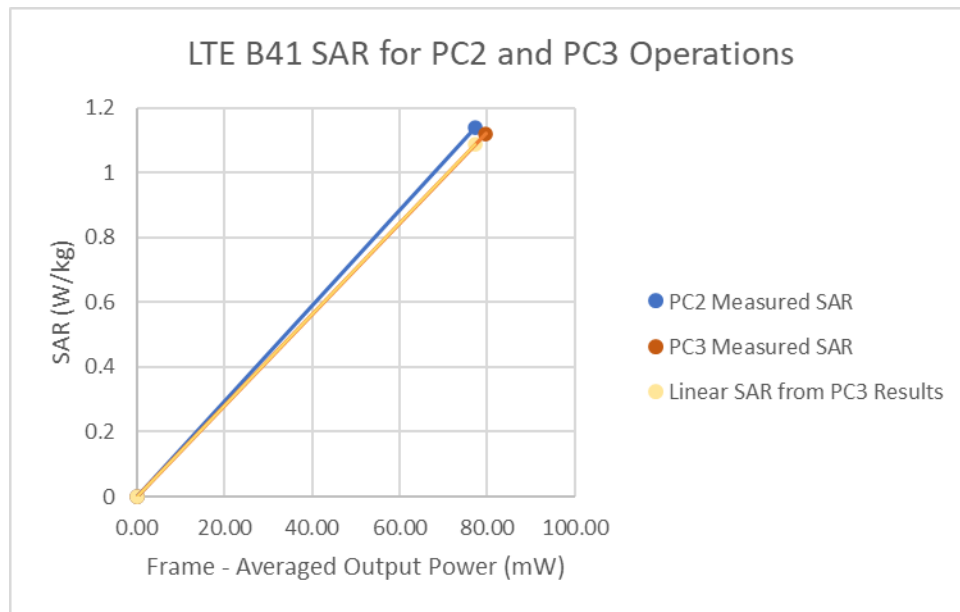


**Figure 14-7**  
**LTE Band 41 Phablet Linearity**




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**Table 14-8  
LTE Band 41 ULCA Phablet Linearity Data**

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	21.50	23.10
Measured Output Power (dBm)	21.00	22.52
Measured SAR (W/kg)	1.120	1.140
Measured Power (mW)	125.89	178.65
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	79.69	77.35
% deviation from expected linearity		4.86%



**Figure 14-8  
LTE Band 41 ULCA Phablet Linearity**




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# 15 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	85033E	3.5mm Standard Calibration Kit	6/6/2009	Annual	6/6/2021	MYS3400393
Agilent	8594A	(90Hz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051400187
Agilent	8753ES	Network Analyzer	3/5/2020	Annual	3/5/2021	MV40001472
Agilent	8753ES	S-Parameter Network Analyzer	9/26/2020	Annual	9/26/2021	MV40000670
Agilent	8753ES	S-Parameter Vector Network Analyzer	12/15/2020	Annual	12/15/2021	MV40000944
Agilent	E4438C	ESG Vector Signal Generator	8/10/2020	Annual	8/10/2021	MV4720002
Agilent	E4438C	ESG Vector Signal Generator	9/18/2020	Annual	9/18/2021	MV45091346
Agilent	E4440A	PSA Series Spectrum Analyzer	1/29/2021	Annual	1/29/2022	MV46186272
Agilent	ES515C	Wireless Communications Test Set	2/26/2020	Annual	2/26/2021	6844400860
Agilent	ES515C	Wireless Communications Test Set	12/15/2020	Annual	12/15/2021	6842361078
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	6846170464
Agilent	N5182A	MVG Vector Signal Generator	5/13/2020	Annual	5/13/2021	MV47420603
Agilent	N5182A	MVG Vector Signal Generator	9/25/2020	Annual	9/25/2021	US46240505
Agilent	N9020A	MXA Signal Analyzer	12/12/2020	Annual	12/12/2021	MYS0200571
Amplifier Research	1551GG	Amplifier	CBT	N/A	CBT	433973
Amplifier Research	1551GG	Amplifier	CBT	N/A	CBT	433974
Anritsu	MA24106A	USB Power Sensor	2/27/2020	Annual	2/27/2021	1244524
Anritsu	MA24106A	USB Power Sensor	2/27/2020	Annual	2/27/2021	1349509
Anritsu	MA24106A	USB Power Sensor	2/27/2020	Annual	2/27/2021	1526503
Anritsu	MA24106A	USB Power Sensor	2/27/2020	Annual	2/27/2021	1520501
Anritsu	MA24118	Pulse Power Sensor	7/28/2020	Annual	7/28/2021	1330418
Anritsu	MA24118	Pulse Power Sensor	8/12/2020	Annual	8/12/2021	1207364
Anritsu	ML2496A	Power Meter	1/13/2020	Annual	1/13/2021	1030008
Anritsu	ML2496A	Power Meter	1/23/2020	Annual	1/23/2021	1351001
Anritsu	MT8820C	Radio Communication Analyzer	9/17/2020	Annual	9/17/2021	6201300711
Anritsu	MT8820C	Radio Communication Analyzer	9/30/2020	Annual	9/30/2021	6201240128
Anritsu	MT8821C	Radio Communication Analyzer	2/22/2020	Annual	2/22/2021	6261895213
Anritsu	MT8821C	Radio Communication Analyzer	3/12/2020	Annual	3/12/2021	6200921190
Anritsu	MT8821C	Radio Communication Analyzer	6/15/2020	Annual	6/15/2021	6201381794
Anritsu	MT8821C	Radio Communication Analyzer	7/3/2020	Annual	7/3/2021	6262150047
Anritsu	MT8862A	Wireless Connectivity Test Set	10/29/2020	Annual	10/29/2021	6262182395
Control Company	4040	Therm / Clock/ Humidity Monitor	2/12/2020	Biennial	2/12/2022	200113499
Control Company	4040	Therm / Clock/ Humidity Monitor	2/12/2020	Biennial	2/12/2022	200113274
Control Company	4040	Therm / Clock/ Humidity Monitor	3/6/2020	Biennial	3/6/2022	200170313
Control Company	4352	Long Stem Thermometer	6/26/2019	Biennial	6/26/2021	152282744
Control Company	4352	Long Stem Thermometer	6/26/2019	Biennial	6/26/2021	192282739
Control Company	4352	Long Stem Thermometer	6/26/2019	Biennial	6/26/2021	192382745
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MYS2180215
KEYSIGHT	E4438C	VECTOR SIGNAL GENERATOR	6/22/2020	Annual	6/22/2021	MV45092078
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	9/1/2020	Annual	9/1/2021	MYS3401181
Keysight Technologies	N9705B	DC Power Analyzer	4/27/2019	Biennial	4/27/2021	MYS3004059
Keysight Technologies	N9020A	MXA Signal Analyzer	8/24/2020	Annual	8/24/2021	1546479561
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	8/17/2020	Annual	8/17/2021	MYS2350166
Keysight Technologies	U3401A	Digital Multimeter	5/14/2020	Biennial	5/14/2022	MYS7201470
Minicircuits	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1339
Minicircuits	SLP-2400	Low Pass Filter	CBT	N/A	CBT	889796903
Minicircuits	VLF-6090+	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-2050+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-53W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	NC-100	Torque Wrench	12/1/2020	Annual	12/1/2021	N/A
Pasternack	NC-100	Torque Wrench	8/4/2020	Biennial	8/4/2022	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMW500	Radio Communication Tester	3/27/2020	Annual	3/27/2021	128833
Rohde & Schwarz	CMW500	Radio Communication Tester	4/23/2020	Annual	4/23/2021	157286
Rohde & Schwarz	CMW500	Radio Communication Tester	5/2/2020	Annual	5/2/2021	157286
Rohde & Schwarz	ZNL6E	Vector Network Analyzer	9/29/2020	Annual	9/29/2021	101307
Insize	1108-150	Digital Caliper	1/17/2020	Biennial	1/17/2022	409193536
SPEAG	D1750V2	1750 MHz SAR Dipole	10/22/2018	Triennial	10/22/2021	11310
SPEAG	D1760V2	1760 MHz SAR Dipole	5/22/2018	Triennial	5/22/2021	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	2/21/2019	Biennial	2/21/2021	56148
SPEAG	D1900V2	1900 MHz SAR Dipole	10/23/2018	Triennial	10/23/2021	56080
SPEAG	D1900V2	1900 MHz SAR Dipole	10/23/2018	Triennial	10/23/2021	56149
SPEAG	D2300V2	2300 MHz SAR Dipole	8/13/2018	Triennial	8/13/2021	15206
SPEAG	D2450V2	2450 MHz SAR Dipole	8/14/2020	Annual	8/14/2021	719
SPEAG	D2450V2	2450 MHz SAR Dipole	9/9/2020	Annual	9/9/2021	797
SPEAG	D2600V2	2600 MHz SAR Dipole	4/11/2018	Triennial	4/11/2021	1004
SPEAG	D2600V2	2600 MHz SAR Dipole	6/14/2019	Biennial	6/14/2021	1064
SPEAG	D3500V2	3500 MHz SAR Dipole	1/21/2020	Annual	1/21/2022	1080
SPEAG	D3500V2	3500 MHz SAR Dipole	1/19/2021	Annual	1/19/2022	1059
SPEAG	D3700V2	3700 MHz SAR Dipole	1/21/2020	Biennial	1/21/2022	1067
SPEAG	D3900V2	3900 MHz SAR Dipole	10/9/2020	Annual	10/9/2021	1056
SPEAG	D50H12	5 GHz SAR Dipole	8/10/2018	Triennial	8/10/2021	1237
SPEAG	D50H12	5 GHz SAR Dipole	9/10/2020	Annual	9/10/2021	1191
SPEAG	D750V3	750 MHz SAR Dipole	3/11/2020	Annual	3/11/2021	1054
SPEAG	D750V3	750 MHz SAR Dipole	10/19/2018	Triennial	10/19/2021	1161
SPEAG	D750V3	750 MHz SAR Dipole	3/12/2020	Annual	3/12/2021	1003
SPEAG	D835V2	835 MHz SAR Dipole	3/13/2019	Biennial	3/13/2021	4047
SPEAG	D835V2	835 MHz SAR Dipole	10/19/2018	Triennial	10/19/2021	40133
SPEAG	DAE4	Dasv Data Acquisition Electronics	4/15/2020	Annual	4/15/2021	1407
SPEAG	DAE4	Dasv Data Acquisition Electronics	5/14/2020	Annual	5/14/2021	1583
SPEAG	DAE4	Dasv Data Acquisition Electronics	5/20/2020	Annual	5/20/2021	728
SPEAG	DAE4	Dasv Data Acquisition Electronics	6/25/2020	Annual	6/25/2021	1344
SPEAG	DAE4	Dasv Data Acquisition Electronics	7/15/2020	Annual	7/15/2021	1322
SPEAG	DAE4	Dasv Data Acquisition Electronics	8/11/2020	Annual	8/11/2021	1450
SPEAG	DAE4	Dasv Data Acquisition Electronics	9/10/2020	Annual	9/10/2021	1449
SPEAG	DAE4	Dasv Data Acquisition Electronics	10/16/2020	Annual	10/16/2021	1333
SPEAG	DAE4	Dasv Data Acquisition Electronics	11/13/2021	Annual	11/13/2022	1558
SPEAG	DAE4	Dasv Data Acquisition Electronics	12/7/2020	Annual	12/7/2021	1533
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/12/2020	Annual	5/12/2021	1070
SPEAG	EX30V4	SAR Probe	4/21/2020	Annual	4/21/2021	7357
SPEAG	EX30V4	SAR Probe	6/23/2020	Annual	6/23/2021	7406
SPEAG	EX30V4	SAR Probe	6/23/2020	Annual	6/23/2021	7409
SPEAG	EX30V4	SAR Probe	7/20/2020	Annual	7/20/2021	7410
SPEAG	EX30V4	SAR Probe	7/31/2020	Annual	7/31/2021	7308
SPEAG	EX30V4	SAR Probe	9/11/2020	Annual	9/11/2021	7520
SPEAG	EX30V4	SAR Probe	10/20/2020	Annual	10/20/2021	7551
SPEAG	EX30V4	SAR Probe	10/20/2020	Annual	10/20/2021	7539
SPEAG	EX30V4	SAR Probe	12/11/2020	Annual	12/11/2021	7571
SPEAG	EX30V4	SAR Probe	1/20/2021	Annual	1/20/2022	3589

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




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# 16

# MEASUREMENT UNCERTAINTIES

Uncertainty Component	IEEE 1528 Sec.	Tol. ( $\pm$ %)	Prob. Dist.	Div.	$c_1$ 1gm	$c_1$ 10 gms	1gm $u_i$ ( $\pm$ %)	10gms $u_i$ ( $\pm$ %)	$V_i$
<b>Measurement System</b>									
Probe Calibration	E.2.1	6.55	N	1	1	1	6.6	6.6	$\infty$
Axial Isotropy	E.2.2	0.25	N	1	0.7	0.7	0.2	0.2	$\infty$
Hemishperical Isotropy	E.2.2	1.3	N	1	0.7	0.7	0.9	0.9	$\infty$
Boundary Effect	E.2.3	2	R	1.732	1	1	1.2	1.2	$\infty$
Linearity	E.2.4	0.3	N	1	1	1	0.3	0.3	$\infty$
System Detection Limits	E.2.4	0.25	R	1.732	1	1	0.1	0.1	$\infty$
Readout Electronics	E.2.6	0.3	N	1	1	1	0.3	0.3	$\infty$
Response Time	E.2.7	0.8	R	1.732	1	1	0.5	0.5	$\infty$
Integration Time	E.2.8	2.6	R	1.732	1	1	1.5	1.5	$\infty$
RF Ambient Conditions - Noise	E.6.1	3	R	1.732	1	1	1.7	1.7	$\infty$
RF Ambient Conditions - Reflections	E.6.1	3	R	1.732	1	1	1.7	1.7	$\infty$
Probe Positioner Mechanical Tolerance	E.6.2	0.8	R	1.732	1	1	0.5	0.5	$\infty$
Probe Positioning w/ respect to Phantom	E.6.3	6.7	R	1.732	1	1	3.9	3.9	$\infty$
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	E.5	4	R	1.732	1	1	2.3	2.3	$\infty$
<b>Test Sample Related</b>									
Test Sample Positioning	E.4.2	3.12	N	1	1	1	3.1	3.1	35
Device Holder Uncertainty	E.4.1	1.67	N	1	1	1	1.7	1.7	5
Output Power Variation - SAR drift measurement	E.2.9	5	R	1.732	1	1	2.9	2.9	$\infty$
SAR Scaling	E.6.5	0	R	1.732	1	1	0.0	0.0	$\infty$
<b>Phantom &amp; Tissue Parameters</b>									
Phantom Uncertainty (Shape & Thickness tolerances)	E.3.1	7.6	R	1.73	1.0	1.0	4.4	4.4	$\infty$
Liquid Conductivity - measurement uncertainty	E.3.3	4.3	N	1	0.78	0.71	3.3	3.0	76
Liquid Permittivity - measurement uncertainty	E.3.3	4.2	N	1	0.23	0.26	1.0	1.1	75
Liquid Conductivity - Temperature Uncertainty	E.3.4	3.4	R	1.732	0.78	0.71	1.5	1.4	$\infty$
Liquid Permittivity - Temperature Uncertainty	E.3.4	0.6	R	1.732	0.23	0.26	0.1	0.1	$\infty$
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	$\infty$
Liquid Permittivity - deviation from target values	E.3.2	5.0	R	1.73	0.60	0.49	1.7	1.4	$\infty$
<b>Combined Standard Uncertainty (k=1)</b>	RSS						11.6	11.4	191
<b>Expanded Uncertainty (95% CONFIDENCE LEVEL)</b>	k=2						23.2	22.8	

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



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# 17 CONCLUSION

## 17.1 Measurement Conclusion




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

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

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