



SAR EVALUATION REPORT

Applicant Name:
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 Gyeonggi-do, 16677, Korea

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FCC ID: **A3LSMS906E**

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

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): SM-S906E, SM-S906E/DS

Equipment Class	Band & Mode	Tx Frequency	SAR			
			1g Head (W/kg)	1g Body-Worn (W/kg)	1g Hotspot (W/kg)	10g Phablet (W/kg)
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.24	0.24	0.68	N/A
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	0.26	1.38	1.50
PCE	UMTS 850	826.40 - 846.60 MHz	0.27	0.32	0.49	N/A
PCE	UMTS 1750	1712.4 - 1752.6 MHz	0.34	0.94	1.13	2.96
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.19	0.83	1.28	1.90
PCE	LTE Band 12	699.7 - 715.3 MHz	0.15	0.22	0.41	N/A
PCE	LTE Band 17	706.5 - 713.5 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 13	779.5 - 784.5 MHz	0.33	0.33	0.63	N/A
PCE	LTE Band 26 (Cell)	814.7 - 848.3 MHz	0.25	0.28	0.62	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 66 (AWS)	1710.7 - 1779.3 MHz	0.19	0.56	0.76	1.91
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.42	0.17	0.17	N/A
PCE	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	0.22	0.75	0.73	1.59
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 41	2498.5 - 2687.5 MHz	< 0.1	0.11	0.22	2.72
PCE	NR Band n5 (Cell)	826.5 - 846.5 MHz	0.25	0.28	0.45	N/A
PCE	NR Band n66 (AWS)	1712.5 - 1777.5 MHz	0.77	0.53	1.00	2.29
DTS	2.4 GHz WLAN	2412 - 2472 MHz	0.43	0.15	0.43	N/A
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	N/A	N/A
NII	U-NII-2A	5260 - 5320 MHz	0.23*	0.11*	N/A	1.02*
NII	U-NII-2C	5500 - 5720 MHz	0.22*	0.15*	N/A	1.03*
NII	U-NII-3	5745 - 5825 MHz	0.15*	0.16*	0.27*	N/A
NII	U-NII-4	5845 - 5885 MHz	0.14*	0.16*	N/A	1.19*
DSS/DTS	Bluetooth	2402 - 2480 MHz	0.59	< 0.1	0.23	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			1.56	1.33	1.59	3.91

* Note: * SAR values represent RF exposure during MIMO operations.

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
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 17	Voice/Data	706.5 - 713.5 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 26 (Cell)	Voice/Data	814.7 - 848.3 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 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 41	Voice/Data	2498.5 - 2687.5 MHz
NR Band n5 (Cell)	Voice/Data	826.5 - 846.5 MHz
NR Band n66 (AWS)	Voice/Data	1712.5 - 1777.5 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2472 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
U-NII-4	Voice/Data	5845 - 5885 MHz
U-NII-5	Voice/Data	5935 - 6415 MHz
U-NII-6	Voice/Data	6435 - 6525 MHz
U-NII-7	Voice/Data	6535 - 6875 MHz
U-NII-8	Voice/Data	6895 - 7115 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC Data	Data	13.56 MHz
UWB	Data	6489.6 - 7987.2 MHz

1.2 Power Reduction for SAR

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

This device used an independent fixed level power reduction mechanism for WLAN/BT when 5G NR is active and/or 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.

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1.3 Nominal and Maximum Output Power Specifications

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




1.3.1 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
Maximum	Max Allowed Power	33.0	33.0	32.5	30.5	28.5	28.0	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	29.5	27.5	27.0	25.0	23.0	22.0
Proximity Sensor Active	Max Allowed Power	33.0	33.0	32.5	30.5	28.5	28.0	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	29.5	27.5	27.0	25.0	23.0	22.0
RCV Mode Active	Max Allowed Power	33.0	33.0	32.5	30.5	28.5	28.0	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	29.5	27.5	27.0	25.0	23.0	22.0
Hotspot Mode Active	Max Allowed Power	N/A	33.0	32.5	30.5	28.5	28.0	26.0	24.0	23.0
	Nominal	N/A	32.0	31.5	29.5	27.5	27.0	25.0	23.0	22.0
Earjack Active	Max Allowed Power	33.0	33.0	32.5	30.5	28.5	28.0	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	29.5	27.5	27.0	25.0	23.0	22.0
GSM/GPRS/EDGE 1900										
Power Level		Voice (in dBm)	Data - Burst Average GMSK (in dBm)				Data - Burst Average 8-PSK (in dBm)			
		1 TX Slot	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
Maximum	Max Allowed Power	30.0	30.0	29.0	27.5	25.5	26.5	25.0	23.0	22.0
	Nominal	29.0	29.0	28.0	26.5	24.5	25.5	24.0	22.0	21.0
Proximity Sensor Active	Max Allowed Power	28.0	28.0	27.0	25.5	23.5	26.5	25.0	23.0	22.0
	Nominal	27.0	27.0	26.0	24.5	22.5	25.5	24.0	22.0	21.0
RCV Mode Active	Max Allowed Power	30.0	30.0	29.0	27.5	25.5	26.5	25.0	23.0	22.0
	Nominal	29.0	29.0	28.0	26.5	24.5	25.5	24.0	22.0	21.0
Hotspot Mode Active	Max Allowed Power	N/A	28.0	27.0	25.5	23.5	26.5	25.0	23.0	22.0
	Nominal	N/A	27.0	26.0	24.5	22.5	25.5	24.0	22.0	21.0
Earjack Active	Max Allowed Power	28.0	28.0	27.0	25.5	23.5	26.5	25.0	23.0	22.0
	Nominal	27.0	27.0	26.0	24.5	22.5	25.5	24.0	22.0	21.0

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




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UMTS Band 5 (850 MHz)					
Power Level		Modulated Average Output Power			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
Maximum	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
Proximity Sensor Active	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
RCV Mode Active	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
Hotspot Mode Active	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
Earjack Active	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
UMTS Band 4 (1750 MHz)					
Power Level		Modulated Average Output Power			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
Maximum	Max Allowed Power	24.0	23.0	23.0	23.0
	Nominal	23.0	22.0	22.0	22.0
Proximity Sensor Active	Max Allowed Power	21.0	20.0	20.0	20.0
	Nominal	20.0	19.0	19.0	19.0
RCV Mode Active	Max Allowed Power	24.0	23.0	23.0	23.0
	Nominal	23.0	22.0	22.0	22.0
Hotspot Mode Active	Max Allowed Power	20.0	19.0	19.0	19.0
	Nominal	19.0	18.0	18.0	18.0
Earjack Active	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			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
Maximum	Max Allowed Power	24.0	23.0	23.0	23.0
	Nominal	23.0	22.0	22.0	22.0
Proximity Sensor Active	Max Allowed Power	20.5	19.5	19.5	19.5
	Nominal	19.5	18.5	18.5	18.5
RCV Mode Active	Max Allowed Power	24.0	23.0	23.0	23.0
	Nominal	23.0	22.0	22.0	22.0
Hotspot Mode Active	Max Allowed Power	19.5	18.5	18.5	18.5
	Nominal	18.5	17.5	17.5	17.5
Earjack Active	Max Allowed Power	20.5	19.5	19.5	19.5
	Nominal	19.5	18.5	18.5	18.5

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Mode / Band	Antenna		Modulated Average Output Power (in dBm)				
			Maximum	Proximity Sensor Active	RCV Mode Active	Hotspot Mode Active	Earjack Active
LTE Band 12	A	Max Allowed Power	25.0	25.0	25.0	25.0	25.0
		Nominal	24.0	24.0	24.0	24.0	24.0
LTE Band 17	A	Max Allowed Power	25.0	25.0	25.0	25.0	25.0
		Nominal	24.0	24.0	24.0	24.0	24.0
LTE Band 13	A	Max Allowed Power	25.0	25.0	25.0	25.0	25.0
		Nominal	24.0	24.0	24.0	24.0	24.0
LTE Band 26 (Cell)	A	Max Allowed Power	25.5	25.5	25.5	25.5	25.5
		Nominal	24.5	24.5	24.5	24.5	24.5
LTE Band 5 (Cell)	A	Max Allowed Power	25.5	25.5	25.5	25.5	25.5
		Nominal	24.5	24.5	24.5	24.5	24.5
LTE Band 66 (AWS)	A	Max Allowed Power	23.5	19.5	23.5	18.0	19.5
		Nominal	22.5	18.5	22.5	17.0	18.5
LTE Band 4 (AWS)	A	Max Allowed Power	23.5	19.5	23.5	18.0	19.5
		Nominal	22.5	18.5	22.5	17.0	18.5
LTE Band 4 (AWS)	I	Max Allowed Power	21.0	21.0	16.0	16.0	21.0
		Nominal	20.0	20.0	15.0	15.0	20.0
LTE Band 25 (PCS)	A	Max Allowed Power	23.0	19.5	23.0	17.5	19.5
		Nominal	22.0	18.5	22.0	16.5	18.5
LTE Band 2 (PCS)	A	Max Allowed Power	23.0	19.5	23.0	17.5	19.5
		Nominal	22.0	18.5	22.0	16.5	18.5
LTE Band 41 (PC3)	B	Max Allowed Power	24.5	23.5	24.5	23.0	23.5
		Nominal	23.5	22.5	23.5	22.0	22.5
LTE Band 41 (PC2)	B	Max Allowed Power	26.5	23.5	26.5	23.0	23.5
		Nominal	25.5	22.5	25.5	22.0	22.5
Mode / Band	Antenna		Modulated Average Output Power (in dBm)				
			Maximum	Proximity Sensor Active	RCV Mode Active	Hotspot Mode Active	Earjack Active
NR Band n5 (Cell)	A	Max Allowed Power	25.0	25.0	25.0	25.0	25.0
		Nominal	24.0	24.0	24.0	24.0	24.0
NR Band n66 (AWS)	A	Max Allowed Power	24.5	21.0	24.5	19.5	21.0
		Nominal	23.5	20.0	23.5	18.5	20.0
NR Band n66 (AWS)	I	Max Allowed Power	23.0	23.0	19.0	23.0	23.0
		Nominal	22.0	22.0	18.0	22.0	22.0

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

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1.3.2 2.4 GHz Maximum SISO/MIMO WLAN Output Power

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

Mode	Band	IEEE 802.11 (in dBm)							
		SISO		MIMO					
		Antenna 1 & Antenna 2		g (CDD + STBC)		n (CDD + STBC, SDM)		ax(SU) (CDD + STBC, SDM)	
		b							
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
2.4 GHz WIFI	2.45 GHz	18.5	19.5	20.0	21.0	20.0	21.0	20.0	21.0
		Ch. 12: 13.0	Ch. 12: 14.0	Ch. 11: 18.0	Ch. 11: 19.0	Ch. 1: 17.5	Ch. 1: 18.5	Ch. 1: 17.0	Ch. 1: 18.0
		Ch. 13: 2.0	Ch. 13: 3.0	Ch. 12: 16.0	Ch. 12: 17.0	Ch. 11: 17.0	Ch. 11: 18.0	Ch. 11: 16.5	Ch. 11: 17.5
				Ch. 13: 5.0	Ch. 13: 6.0	Ch. 12: 16.0	Ch. 12: 17.0	Ch. 12: 16.0	Ch. 12: 17.0
				Ch. 13: 5.0	Ch. 13: 6.0	Ch. 13: 5.0	Ch. 13: 6.0	Ch. 13: 5.0	Ch. 13: 6.0

1.3.3 2.4 GHz Reduced WLAN Output Powers

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

The below table is applicable in the following conditions:

- RCV Active
- Simultaneous conditions with 5G NR (RCV not Active)
- RCV Active during simultaneous conditions with 5G NR

Mode	Band	IEEE 802.11 (in dBm)							
		SISO		MIMO					
		Antenna 1 & Antenna 2		g (CDD + STBC)		n (CDD + STBC, SDM)		ax(SU) (CDD + STBC, SDM)	
		b							
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
2.4 GHz WIFI	2.45 GHz	16.0	17.0	19.0	20.0	19.0	20.0	19.0	20.0
		Ch. 12: 13.0	Ch. 12: 14.0	Ch. 11: 18.0	Ch. 11: 19.0	Ch. 1: 17.5	Ch. 1: 18.5	Ch. 1: 17.0	Ch. 1: 18.0
		Ch. 13: 2.0	Ch. 13: 3.0	Ch. 12: 16.0	Ch. 12: 17.0	Ch. 11: 17.0	Ch. 11: 18.0	Ch. 11: 16.5	Ch. 11: 17.5
				Ch. 13: 5.0	Ch. 13: 6.0	Ch. 12: 16.0	Ch. 12: 17.0	Ch. 12: 16.0	Ch. 12: 17.0
				Ch. 13: 5.0	Ch. 13: 6.0	Ch. 13: 5.0	Ch. 13: 6.0	Ch. 13: 5.0	Ch. 13: 6.0

The below table is applicable in the following conditions:




- Simultaneous conditions with 5/6 GHz WLAN

Mode	Band	IEEE 802.11 (in dBm)							
		SISO		MIMO					
		Antenna 1 & Antenna 2		g (CDD + STBC)		n (CDD + STBC, SDM)		ax(SU) (CDD + STBC, SDM)	
		b							
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
2.4 GHz WIFI	2.45 GHz	15.0	16.0	18.0	19.0	18.0	19.0	18.0	19.0
		Ch. 12: 13.0	Ch. 12: 14.0	Ch. 11: 18.0	Ch. 11: 19.0	Ch. 1: 17.5	Ch. 1: 18.5	Ch. 1: 17.0	Ch. 1: 18.0
		Ch. 13: 2.0	Ch. 13: 3.0	Ch. 12: 16.0	Ch. 12: 17.0	Ch. 11: 17.0	Ch. 11: 18.0	Ch. 11: 16.5	Ch. 11: 17.5
				Ch. 13: 5.0	Ch. 13: 6.0	Ch. 12: 16.0	Ch. 12: 17.0	Ch. 12: 16.0	Ch. 12: 17.0
				Ch. 13: 5.0	Ch. 13: 6.0	Ch. 13: 5.0	Ch. 13: 6.0	Ch. 13: 5.0	Ch. 13: 6.0

The below table is applicable in the following conditions:

- RCV Active during simultaneous conditions with 5/6 GHz WLAN




Mode	Band	IEEE 802.11 (in dBm)							
		SISO		MIMO					
		Antenna 1 & Antenna 2		g (CDD + STBC)		n (CDD + STBC, SDM)		ax(SU) (CDD + STBC, SDM)	
		b							
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
2.4 GHz WIFI	2.45 GHz	13.0	14.0	16.0	17.0	16.0	17.0	16.0	17.0
		Ch. 13: 2.0	Ch. 13: 3.0	Ch. 13: 5.0	Ch. 13: 6.0	Ch. 13: 5.0	Ch. 13: 6.0	Ch. 13: 5.0	Ch. 13: 6.0

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1.3.4 5 GHz Maximum SISO/MIMO WLAN Output Power

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

Mode	Band	IEEE 802.11 (in dBm)							
		MIMO							
		a (CDD + STBC)		n (CDD + STBC, SDM)		ac (CDD + STBC, SDM)		ax (SU) (CDD + STBC, SDM)	
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
5 GHz WIFI (20MHz BW)	UNII-1	19.0	20.0	19.0	20.0	19.0	20.0	19.0	20.0
	UNII-2A	19.0	20.0	19.0	20.0	19.0	20.0	19.0	20.0
	UNII-2C	19.0	20.0	19.0	20.0	19.0	20.0	19.0	20.0
	UNII-3	19.0	20.0	19.0	20.0	19.0	20.0	19.0	20.0
	UNII-4	19.0	20.0	19.0	20.0	19.0	20.0	19.0	20.0
5 GHz WIFI (40MHz BW)	UNII-1			19.0	20.0	19.0	20.0	19.0	20.0
	UNII-2A			19.0	20.0	19.0	20.0	19.0	20.0
	UNII-2C			19.0	20.0	19.0	20.0	19.0	20.0
	UNII-3			19.0	20.0	19.0	20.0	19.0	20.0
	UNII-4			19.0	20.0	19.0	20.0	19.0	20.0
5 GHz WIFI (80MHz BW)	UNII-1					18.5	19.5	18.5	19.5
	UNII-2A					18.5	19.5	18.5	19.5
	UNII-2C					18.5	19.5	18.5	19.5
	UNII-3					18.5	19.5	18.5	19.5
	UNII-4					18.5	19.5	18.5	19.5
5 GHz WIFI (160MHz BW)	UNII-1/2A					18.0	19.0	18.0	19.0
	UNII-2C					18.0	19.0	18.0	19.0
	UNII-3/4					18.0	19.0	18.0	19.0

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1.3.5 5 GHz Reduced WLAN Output Powers

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

The below table is applicable in the following conditions:

- RCV Active
- Simultaneous conditions with 5G NR
- RCV Active during simultaneous conditions with 5G NR




Mode	Band	IEEE 802.11 (in dBm)							
		MIMO							
		a (CDD + STBC)		n (CDD + STBC, SDM)		ac (CDD + STBC, SDM)		ax (SU) (CDD + STBC, SDM)	
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
5 GHz WIFI (20MHz BW)	UNII-1	16.0	17.0	16.0	17.0	16.0	17.0	16.0	17.0
	UNII-2A	16.0	17.0	16.0	17.0	16.0	17.0	16.0	17.0
	UNII-2C	16.0	17.0	16.0	17.0	16.0	17.0	16.0	17.0
	UNII-3	16.0	17.0	16.0	17.0	16.0	17.0	16.0	17.0
	UNII-4	16.0	17.0	16.0	17.0	16.0	17.0	16.0	17.0
5 GHz WIFI (40MHz BW)	UNII-1			16.0	17.0	16.0	17.0	16.0	17.0
	UNII-2A			16.0	17.0	16.0	17.0	16.0	17.0
	UNII-2C			16.0	17.0	16.0	17.0	16.0	17.0
	UNII-3			16.0	17.0	16.0	17.0	16.0	17.0
	UNII-4			16.0	17.0	16.0	17.0	16.0	17.0
5 GHz WIFI (80MHz BW)	UNII-1					16.0	17.0	16.0	17.0
	UNII-2A					16.0	17.0	16.0	17.0
	UNII-2C					16.0	17.0	16.0	17.0
	UNII-3					16.0	17.0	16.0	17.0
	UNII-4					16.0	17.0	16.0	17.0
5 GHz WIFI (160MHz BW)	UNII-1/2A					16.0	17.0	16.0	17.0
	UNII-2C					16.0	17.0	16.0	17.0
	UNII-3/4					16.0	17.0	16.0	17.0

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The below table is applicable in the following conditions:

- Simultaneous conditions with 2.4 GHz WLAN
- RCXV Active during simultaneous conditions with 2.4 GHz WLAN

Mode	Band	IEEE 802.11 (in dBm)							
		MIMO							
		a (CDD + STBC)		n (CDD + STBC, SDM)		ac (CDD + STBC, SDM)		ax (SU) (CDD + STBC, SDM)	
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
5 GHz WIFI (20MHz BW)	UNII-1	15.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0
	UNII-2A	15.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0
	UNII-2C	15.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0
	UNII-3	15.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0
	UNII-4	15.0	16.0	15.0	16.0	15.0	16.0	15.0	16.0
5 GHz WIFI (40MHz BW)	UNII-1			15.0	16.0	15.0	16.0	15.0	16.0
	UNII-2A			15.0	16.0	15.0	16.0	15.0	16.0
	UNII-2C			15.0	16.0	15.0	16.0	15.0	16.0
	UNII-3			15.0	16.0	15.0	16.0	15.0	16.0
	UNII-4			15.0	16.0	15.0	16.0	15.0	16.0
5 GHz WIFI (80MHz BW)	UNII-1					15.0	16.0	15.0	16.0
	UNII-2A					15.0	16.0	15.0	16.0
	UNII-2C					15.0	16.0	15.0	16.0
	UNII-3					15.0	16.0	15.0	16.0
	UNII-4					15.0	16.0	15.0	16.0
5 GHz WIFI (160MHz BW)	UNII-1/2A					15.0	16.0	15.0	16.0
	UNII-2C					15.0	16.0	15.0	16.0
	UNII-3/4					15.0	16.0	15.0	16.0

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1.3.6 2.4 GHz Maximum Bluetooth Output Power




Mode	ePA Single Antenna				iPA Single Antenna				iPA Single Antenna in Dual Mode				iPA Dual Antenna	
	Antenna 1		Antenna 2		Antenna 1		Antenna 2		Antenna 1		Antenna 2			
	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
Bluetooth (in dBm)	17.5	18.5	16.0	17.0	11.0	12.0	11.0	12.0	10.5	11.5	10.5	11.5	13.5	14.5
Bluetooth EDR (in dBm)	17.0	18.0	15.5	16.5	8.0	9.0	8.0	9.0	9.0	10.0	9.0	10.0	12.0	13.0
Bluetooth LE 2Mbps (in dBm)	17.0	18.0	16.0	17.0	10.0	11.0	10.0	11.0	9.5	10.5	9.5	10.5	12.5	13.5
Bluetooth LE 1Mbps, 125/500 kbps (in dBm)					10.0	11.0	10.0	11.0						

1.3.7 2.4 GHz Reduced Bluetooth Output Power

The below table is applicable in the following conditions:

- RCV active

Mode	ePA Single Antenna				iPA Single Antenna				iPA Single Antenna in Dual Mode				iPA Dual Antenna	
	Antenna 1		Antenna 2		Antenna 1		Antenna 2		Antenna 1		Antenna 2			
	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
Bluetooth (in dBm)	14.0	15.0	14.0	15.0	11.0	12.0	11.0	12.0	10.5	11.5	10.5	11.5	13.5	14.5
Bluetooth EDR (in dBm)	14.0	15.0	14.0	15.0	8.0	9.0	8.0	9.0	8.5	9.5	9.5	10.5	12.0	13.0
Bluetooth LE 2Mbps (in dBm)	14.0	15.0	14.0	15.0	10.0	11.0	10.0	11.0	9.0	10.0	10.0	11.0	12.5	13.5
Bluetooth LE 1Mbps, 125/500 kbps (in dBm)					10.0	11.0	10.0	11.0						

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1.4 DUT Antenna Locations

The overall dimensions of this device are > 9 x 5 cm. A diagram showing the location of the device antennas can be found in Appendix 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**

Device Sides/Edges for SAR Testing						
Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 1750	Yes	Yes	No	Yes	Yes	Yes
UMTS 1900	Yes	Yes	No	Yes	Yes	Yes
LTE Band 12	Yes	Yes	No	Yes	Yes	Yes
LTE Band 13	Yes	Yes	No	Yes	Yes	Yes
LTE Band 26 (Cell)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 66 (AWS) Antenna A	Yes	Yes	No	Yes	Yes	Yes
LTE Band 4 (AWS) Antenna I	Yes	Yes	Yes	No	Yes	No
LTE Band 25 (PCS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 41	Yes	Yes	No	Yes	No	Yes
NR Band n5 (Cell)	Yes	Yes	No	Yes	Yes	Yes
NR Band n66 (AWS) Antenna A	Yes	Yes	No	Yes	Yes	Yes
NR Band n66 (AWS) Antenna I	Yes	Yes	Yes	No	Yes	No
2.4 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
2.4 GHz WLAN Ant 2	Yes	Yes	No	No	No	Yes
2.4 GHz WLAN MIMO	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN MIMO	Yes	Yes	Yes	No	No	Yes
Bluetooth Ant 1	Yes	Yes	Yes	No	No	Yes
Bluetooth Ant 2	Yes	Yes	No	No	No	Yes
Bluetooth MIMO	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, U-NII-4, and WIFI6E operations are disabled.




1.5 Near Field Communications (NFC) Antenna

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

1.6 Simultaneous Transmission Capabilities




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

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

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**Table 1-2
Simultaneous Transmission Scenarios**

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Phablet	Notes
1	GSM voice + 2.4 GHz WLAN	Yes	Yes	N/A	Yes	
2	GSM voice + 2.4 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
3	GSM voice + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
4	GSM voice + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
5	GSM voice + 2.4 GHz Bluetooth	Yes ^A	Yes	N/A	Yes	^A Bluetooth Tethering is considered
6	GSM voice + 2.4 GHz Bluetooth MIMO	Yes	Yes	N/A	Yes	
7	GSM voice + 2.4 GHz WLAN + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
8	GSM voice + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
9	GSM voice + 2.4 GHz WLAN + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
10	GSM voice + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
11	GSM voice + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO	Yes ^A	Yes	N/A	Yes	^A Bluetooth Tethering is considered
12	GSM voice + 2.4 GHz Bluetooth MIMO + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
13	GSM voice + 2.4 GHz Bluetooth + 6 GHz WLAN MIMO	Yes ^A	Yes	N/A	Yes	^A Bluetooth Tethering is considered
14	GSM voice + 2.4 GHz Bluetooth MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
15	UMTS + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
16	UMTS + 2.4 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
17	UMTS + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
18	UMTS + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
19	UMTS + 2.4 GHz Bluetooth	Yes ^A	Yes	Yes ^A	Yes	^A Bluetooth Tethering is considered
20	UMTS + 2.4 GHz Bluetooth MIMO	Yes	Yes	Yes	Yes	
21	UMTS + 2.4 GHz WLAN + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
22	UMTS + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
23	UMTS + 2.4 GHz WLAN + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
24	UMTS + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
25	UMTS + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO	Yes ^A	Yes	Yes ^A	Yes	^A Bluetooth Tethering is considered
26	UMTS + 2.4 GHz Bluetooth MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
27	UMTS + 2.4 GHz Bluetooth + 6 GHz WLAN MIMO	Yes ^A	Yes	N/A	Yes	^A Bluetooth Tethering is considered
28	UMTS + 2.4 GHz Bluetooth MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
29	LTE + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
30	LTE + 2.4 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
31	LTE + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
32	LTE + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
33	LTE + 2.4 GHz Bluetooth	Yes ^A	Yes	Yes ^A	Yes	^A Bluetooth Tethering is considered
34	LTE + 2.4 GHz Bluetooth MIMO	Yes	Yes	Yes	Yes	
35	LTE + 2.4 GHz WLAN + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
36	LTE + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
37	LTE + 2.4 GHz WLAN + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
38	LTE + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
39	LTE + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO	Yes ^A	Yes	Yes ^A	Yes	^A Bluetooth Tethering is considered
40	LTE + 2.4 GHz Bluetooth MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
41	LTE + 2.4 GHz Bluetooth + 6 GHz WLAN MIMO	Yes ^A	Yes	N/A	Yes	^A Bluetooth Tethering is considered
42	LTE + 2.4 GHz Bluetooth MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
43	LTE + NR	Yes	Yes	N/A	Yes	
44	LTE + NR + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
45	LTE + NR + 2.4 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
46	LTE + NR + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
47	LTE + NR + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
48	LTE + NR + 2.4 GHz Bluetooth	Yes ^A	Yes	Yes ^A	Yes	^A Bluetooth Tethering is considered
49	LTE + NR + 2.4 GHz Bluetooth MIMO	Yes	Yes	Yes	Yes	
50	LTE + NR + 2.4 GHz WLAN + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
51	LTE + NR + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
52	LTE + NR + 2.4 GHz WLAN + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
53	LTE + NR + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
54	LTE + NR + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO	Yes ^A	Yes	Yes ^A	Yes	^A Bluetooth Tethering is considered
55	LTE + NR + 2.4 GHz Bluetooth MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
56	LTE + NR + 2.4 GHz Bluetooth + 6 GHz WLAN MIMO	Yes ^A	Yes	N/A	Yes	^A Bluetooth Tethering is considered
57	LTE + NR + 2.4 GHz Bluetooth MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
58	NR + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
59	NR + 2.4 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
60	NR + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
61	NR + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
62	NR + 2.4 GHz Bluetooth	Yes ^A	Yes	Yes ^A	Yes	^A Bluetooth Tethering is considered
63	NR + 2.4 GHz Bluetooth MIMO	Yes	Yes	Yes	Yes	
64	NR + 2.4 GHz WLAN + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
65	NR + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
66	NR + 2.4 GHz WLAN + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
67	NR + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
68	NR + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO	Yes ^A	Yes	Yes ^A	Yes	^A Bluetooth Tethering is considered
69	NR + 2.4 GHz Bluetooth MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
70	NR + 2.4 GHz Bluetooth + 6 GHz WLAN MIMO	Yes ^A	Yes	N/A	Yes	^A Bluetooth Tethering is considered
71	NR + 2.4 GHz Bluetooth MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
72	GPRS/EDGE + 2.4 GHz WLAN	N/A	N/A	N/A	Yes	
73	GPRS/EDGE + 2.4 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
74	GPRS/EDGE + 5 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
75	GPRS/EDGE + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
76	GPRS/EDGE + 2.4 GHz Bluetooth	N/A	N/A	Yes ^A	Yes	^A Bluetooth Tethering is considered
77	GPRS/EDGE + 2.4 GHz Bluetooth MIMO	N/A	N/A	N/A	Yes	
78	GPRS/EDGE + 2.4 GHz WLAN + 5 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
79	GPRS/EDGE + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
80	GPRS/EDGE + 2.4 GHz WLAN + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
81	GPRS/EDGE + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
82	GPRS/EDGE + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO	N/A	N/A	Yes ^A	Yes	^A Bluetooth Tethering is considered
83	GPRS/EDGE + 2.4 GHz Bluetooth MIMO + 5 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
84	GPRS/EDGE + 2.4 GHz Bluetooth + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
85	GPRS/EDGE + 2.4 GHz Bluetooth MIMO + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	

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1. 5 GHz WLAN and 6 GHz WLAN share the same antenna path and cannot transmit simultaneously.
2. 2.4 GHz WLAN and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
3. When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario.
4. Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, there are no simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table.
5. 5 GHz Wireless Router is only supported for the U-NII-3 by S/W, therefore U-NII-1, U-NII2A, U-NII2C, and U-NII4 were not evaluated for wireless router conditions.
6. 6 GHz Wireless Router is not supported, therefore it was not evaluated for wireless router conditions.
7. This device supports 2x2 MIMO Tx for WLAN 802.11a/g/n/ac/ax. 802.11a/g/n/ac/ax supports CDD and STBC and 802.11n/ac/ax additionally supports SDM. 5/6 GHz WLAN can transmit only when operating with MIMO.
8. This device supports VoWIFI.
9. This device supports Bluetooth Tethering in SISO Mode.
10. This device supports VoLTE.
11. This device supports VoNR.
12. LTE + 5G NR FR1 Scenarios are limited to EN-DC combinations with anchor bands as shown in the NR FR1 checklist.

1.7 Miscellaneous SAR Test Considerations

(A) WIFI/BT

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




Since Wireless Router operations are not allowed by the chipset firmware using U-NII-1, U-NII-2A, U-NII-2C, and U-NII-4 WIFI, only 2.4 GHz and U-NII-3 WIFI Hotspot SAR tests and combinations are considered for SAR with respect to Wireless Router configurations according to FCC KDB 941225 D06v02r01.

This device supports IEEE 802.11ax with the following features:

- a) Up to 160 MHz Bandwidth only for 5/6 GHz
- b) Up to 20 MHz Bandwidth only for 2.4 GHz
- c) 2 Tx antenna output
- d) Up to 1024 QAM is supported
- e) TDWR and Band gap channels are supported for 5/6 GHz
- f) 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, and U-NII-4 WLAN, phablet SAR tests were performed. Phablet SAR was not evaluated for 2.4 GHz and U-NII-3 WLAN operations since wireless router 1g SAR was < 1.2 W/kg.

Per April 2019 TCB Workshop Notes, SAR testing was not required for 802.11ax when applying the initial test configuration procedures of KDB 248227, with 802.11ax considered a higher order 802.11 mode. This device supports 6 GHz WIFI Operations. RF Exposure assessment for these bands can be found in the WIFI6E RF Exposure Report (report SN can be found in Section 1.11 – Bibliography). Simultaneous transmission analysis is addressed in Appendix D of this report.

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This device supports channels 1-13 for 2.4 GHz WLAN. However, because channel 12/13 targets are not higher than that of channels 1-11, default channels for SAR testing are determined per FCC KDB 248227 D01v02r02.

(B) Licensed Transmitter(s)

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

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

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

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




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

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

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

NR implementation supports SA and 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. During EN-DC conditions, NR n66 switches to operate on Antenna I. SAR tests were performed separately on Antenna I for NR n66.

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.

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This device supports inter-band LTE Carrier Aggregation (CA) for LTE Bands 2, 4, 5, 12, and 66 with two component carriers in the uplink. For CA_2A-4A uplink conditions, LTE B4 operates using Antenna I. SAR tests were performed separately on Antenna I for LTE B4.

1.8 Guidance Applied




- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r04, D05Av01r02, D06v02r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 648474 D04v01r03 (Phablet Procedures)
- FCC KDB Publication 616217 D04v01r02 (Proximity Sensor)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)
- May 2017 TCB Workshop Notes (LTE 4x4 Downlink MIMO, LTE Band 41 Power Class 2/3)
- April 2018 TCB Workshop Notes (LTE Carrier Aggregation)
- April 2019 TCB Workshop Notes (IEEE 802.11ax, Dynamic Antenna Tuning)
- October 2018 TCB Workshop Notes (Inter-band Uplink Carrier Aggregation)

1.9 Device Serial Numbers

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




1.10 Bibliography

Report Type	Report Serial Number
WIFI 6GHz RF exposure	1M2110010116-25.A3L




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2 LTE AND NR INFORMATION

LTE Information					
Form Factor	Portable Handset				
	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 17 (706.5 - 713.5 MHz)				
	LTE Band 13 (779.5 - 784.5 MHz)				
	LTE Band 26 (Cell) (814.7 - 848.3 MHz)				
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)				
	LTE Band 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 41 (2498.5 - 2687.5 MHz)				
	LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 17: 5 MHz, 10 MHz				
	LTE Band 13: 5 MHz, 10 MHz				
	LTE Band 26 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz				
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 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 41: 5 MHz, 10 MHz, 15 MHz, 20 MHz					
Channel Numbers and Frequencies (MHz)	Low	Low-Mid	Mid	Mid-High	High
LTE Band 12: 1.4 MHz	699.7 (23017)		707.5 (23095)		715.3 (23173)
LTE Band 12: 3 MHz	700.5 (23025)		707.5 (23095)		714.5 (23165)
LTE Band 12: 5 MHz	701.5 (23035)		707.5 (23095)		713.5 (23155)
LTE Band 12: 10 MHz	704 (23060)		707.5 (23095)		711 (23130)
LTE Band 17: 5 MHz	706.5 (23755)		710 (23790)		713.5 (23825)
LTE Band 17: 10 MHz	709 (23780)		710 (23790)		711 (23800)
LTE Band 13: 5 MHz	779.5 (23205)		782 (23230)		784.5 (23255)
LTE Band 13: 10 MHz	N/A		782 (23230)		N/A
LTE Band 26 (Cell): 1.4 MHz	814.7 (26697)		831.5 (26865)		848.3 (27033)
LTE Band 26 (Cell): 3 MHz	815.5 (26705)		831.5 (26865)		847.5 (27025)
LTE Band 26 (Cell): 5 MHz	816.5 (26715)		831.5 (26865)		846.5 (27015)
LTE Band 26 (Cell): 10 MHz	819 (26740)		831.5 (26865)		844 (26990)
LTE Band 26 (Cell): 15 MHz	821.5 (26765)		831.5 (26865)		841.5 (26965)
LTE Band 5 (Cell): 1.4 MHz	824.7 (20407)		836.5 (20525)		848.3 (20643)
LTE Band 5 (Cell): 3 MHz	825.5 (20415)		836.5 (20525)		847.5 (20635)
LTE Band 5 (Cell): 5 MHz	826.5 (20425)		836.5 (20525)		846.5 (20625)
LTE Band 5 (Cell): 10 MHz	829 (20450)		836.5 (20525)		844 (20600)
LTE Band 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 41: 5 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 10 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 15 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 20 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
UE Category	DL UE Cat 20, UL UE Cat 18				
Modulations Supported in UL	QPSK, 16QAM, 64QAM, 256QAM				
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 features as shown in Appendix I. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. The following LTE Release 15 Features are not supported: Relay, HetNet, Enhanced MIMO, eCIC, WIFI Offloading, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

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NR Information				
Form Factor	Portable Handset			
	NR Band n5 (Cell) (826.5 - 846.5 MHz)			
	NR Band n66 (AWS) (1712.5 - 1777.5 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			
Channel Numbers and Frequencies (MHz)				
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)	
SCS for NR Band n5/n66	15 kHz			
Modulations Supported in UL	DFT-s-OFDM: $\pi/2$ 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 n5 (Cell)	LTE Band 2/66			
LTE Anchor Bands for NR Band n66 (AWS)	LTE Band 2/5/12/13			

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3 INTRODUCTION

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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




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

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

where:

- σ = conductivity of the tissue-simulating material (S/m)
- ρ = mass density of the tissue-simulating material (kg/m³)
- E = Total RMS electric field strength (V/m)

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

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4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

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

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

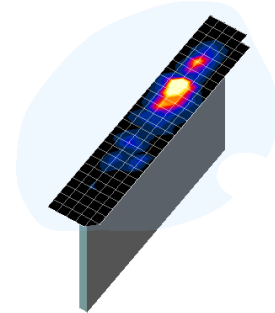




Figure 4-1
Sample SAR Area Scan

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

Frequency	Maximum Area Scan Resolution (mm) ($\Delta x_{\text{area}}, \Delta y_{\text{area}}$)	Maximum Zoom Scan Resolution (mm) ($\Delta x_{\text{zoom}}, \Delta y_{\text{zoom}}$)	Maximum Zoom Scan Spatial Resolution (mm)			Minimum Zoom Scan Volume (mm) (x, y, z)
			Uniform Grid	Graded Grid		
			$\Delta z_{\text{zoom}}(n)$	$\Delta z_{\text{zoom}}(1)^*$	$\Delta z_{\text{zoom}}(n>1)^*$	
≤ 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].

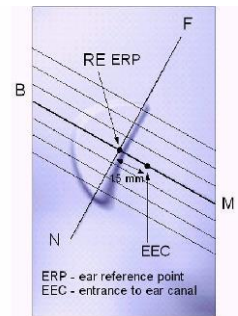


Figure 5-1
Close-Up Side view of ERP

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

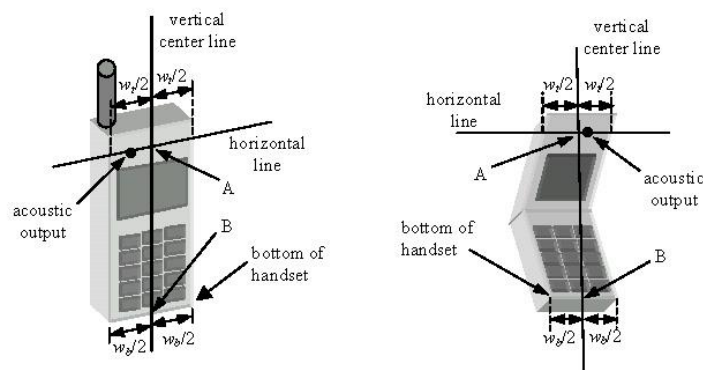





Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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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.

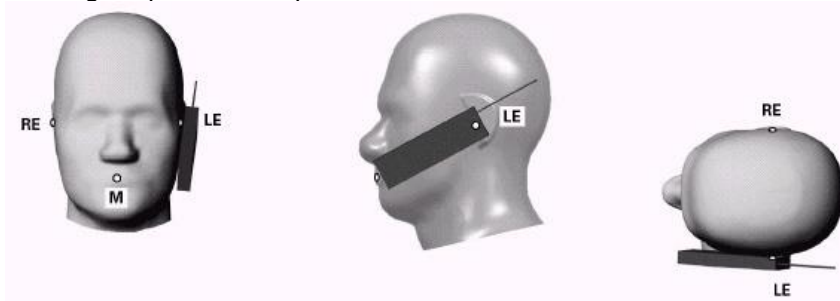





Figure 6-1 Front, Side and Top View of Cheek Position

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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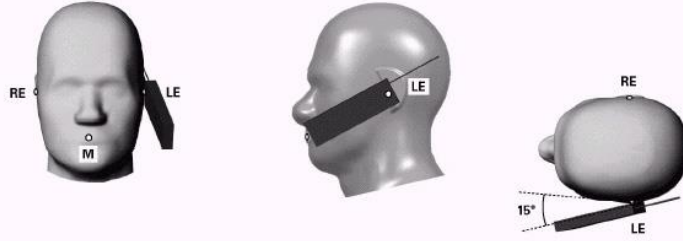


Figure 6-2 Front, Side and Top View of Ear/15° Tilt Position

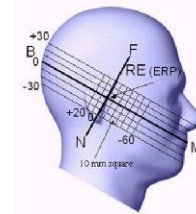


Figure 6-3 Side view w/ relevant markings

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.

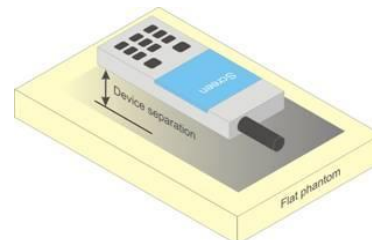





Figure 6-4 Sample Body-Worn Diagram

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

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

6.6 Extremity Exposure Configurations




Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user’s body, SAR compliance for the body is also required. The 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.

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6.8 Phablet Configurations




For smart phones with a display diagonal dimension > 150 mm or an overall diagonal dimension > 160 mm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the phablets procedures outlined in KDB Publication 648474 D04v01r03 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worn accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna ≤ 25 mm from that surface or edge, in direct contact with the phantom, for 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)
Peak Spatial Average SAR Head	1.6	8.0
Whole Body SAR	0.08	0.4
Peak Spatial Average SAR Hands, Feet, Ankle, Wrists, etc.	4.0	20

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

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8 FCC MEASUREMENT PROCEDURES

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

8.1 Measured and Reported SAR

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

8.2 3G SAR Test Reduction Procedure

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

8.3 Procedures Used to Establish RF Signal for SAR




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

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

8.4 SAR Measurement Conditions for UMTS

8.4.1 Output Power Verification

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

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8.4.2 Head SAR Measurements

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

8.4.3 Body SAR Measurements

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

8.4.4 SAR Measurements with Rel 5 HSDPA

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

8.4.5 SAR Measurements with Rel 6 HSUPA

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




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

8.4.6 SAR Measurement Conditions for DC-HSDPA

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

8.5 SAR Measurement Conditions for LTE

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

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8.5.1 Spectrum Plots for RB Configurations

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

8.5.2 MPR

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

8.5.3 A-MPR

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

8.5.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r04:




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

8.5.5 TDD

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

8.5.6 Downlink Only Carrier Aggregation

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

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

8.6 SAR Testing with 802.11 Transmitters

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

8.6.1 General Device Setup

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




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

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

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

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

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

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8.6.4 Initial Test Position Procedure

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

8.6.5 2.4 GHz SAR Test Requirements

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

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




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

8.6.6 OFDM Transmission Mode and SAR Test Channel Selection

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

8.6.7 Initial Test Configuration Procedure

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

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

8.6.8 Subsequent Test Configuration Procedures

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

8.6.9 MIMO SAR considerations

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

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9 RF CONDUCTED POWERS

9.1 GSM Conducted Powers

**Table 9-1
Maximum Conducted Powers**

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	31.48	31.46	31.00	28.84	26.81	26.01	24.57	22.42	21.40
	190	31.62	31.66	31.24	29.09	26.95	26.17	24.93	22.61	21.51
	251	31.68	31.89	31.18	29.08	27.10	26.12	24.90	22.81	21.54
GSM 1900	512	28.87	29.00	27.75	26.21	23.51	25.38	23.80	21.81	20.74
	661	29.16	29.10	27.64	25.57	23.50	25.52	23.72	21.91	20.73
	810	28.90	29.02	27.87	25.78	23.72	25.43	23.77	21.86	20.76

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	22.28	22.26	24.81	24.41	23.63	16.81	18.38	17.99	18.22
	190	22.42	22.46	25.05	24.66	23.77	16.97	18.74	18.18	18.33
	251	22.48	22.69	24.99	24.65	23.92	16.92	18.71	18.38	18.36
GSM 1900	512	19.67	19.80	21.56	21.78	20.33	16.18	17.61	17.38	17.56
	661	19.96	19.90	21.45	21.14	20.32	16.32	17.53	17.48	17.55
	810	19.70	19.82	21.68	21.35	20.54	16.23	17.58	17.43	17.58

GSM 850	Frame	22.80	22.80	25.31	25.07	24.32	17.80	18.81	18.57	18.82
GSM 1900	Avg. Targets:	19.80	19.80	21.81	22.07	21.32	16.30	17.81	17.57	17.82




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Table 9-2

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

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 1900	512	26.80	26.67	25.27	23.55	21.82	25.38	23.80	21.81	20.74
	661	27.03	26.70	25.21	23.51	22.04	25.52	23.72	21.91	20.73
	810	26.30	26.61	25.50	24.16	22.05	25.43	23.77	21.86	20.76

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 1900	512	17.60	17.47	19.08	19.12	18.64	16.18	17.61	17.38	17.56
	661	17.83	17.50	19.02	19.08	18.86	16.32	17.53	17.48	17.55
	810	17.10	17.41	19.31	19.73	18.87	16.23	17.58	17.43	17.58

GSM 1900	Frame Avg.Targets:	17.80	17.80	19.81	20.07	19.32	16.30	17.81	17.57	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 9-1
Power Measurement Setup

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9.2 UMTS Conducted Powers

Table 9-3
Maximum Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	23.76	23.96	24.21	22.94	23.28	23.26	22.99	23.03	23.01	-
99		12.2 kbps AMR	23.78	23.94	24.20	22.94	23.12	23.44	22.96	23.05	22.97	-
6	HSDPA	Subtest 1	22.50	22.55	22.82	21.51	21.67	22.00	21.50	21.55	21.60	0
6		Subtest 2	22.43	22.59	22.87	21.52	21.73	22.03	21.51	21.54	21.53	0
6		Subtest 3	21.91	22.11	22.36	21.04	21.26	21.52	21.01	21.04	21.05	0.5
6		Subtest 4	21.91	22.08	22.37	21.01	21.24	21.53	21.03	21.05	21.06	0.5
6	HSUPA	Subtest 1	22.42	22.59	22.88	21.48	21.71	22.02	21.50	21.53	21.61	0
6		Subtest 2	20.39	20.58	20.87	19.49	19.72	20.01	19.49	19.54	19.55	2
6		Subtest 3	20.90	21.05	21.35	19.00	19.22	19.53	20.02	20.06	20.08	1
6		Subtest 4	20.40	20.57	20.86	19.50	19.73	20.04	19.50	19.56	19.58	2
6		Subtest 5	22.42	22.61	22.89	21.51	21.76	22.06	21.51	21.57	21.59	0
8	DC-HSDPA	Subtest 1	22.39	22.51	22.85	21.47	21.71	22.02	21.53	21.59	21.64	0
8		Subtest 2	22.40	22.55	22.86	21.46	21.75	22.00	21.52	21.59	21.58	0
8		Subtest 3	21.87	22.06	22.34	20.98	21.18	21.53	21.01	21.07	21.09	0.5
8		Subtest 4	21.88	22.05	22.37	20.96	21.21	21.49	21.02	21.11	21.10	0.5

Table 9-4
Reduced Conducted Powers - Hotspot mode 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	18.90	19.12	19.39	18.40	18.50	18.49	-
99		12.2 kbps AMR	18.83	19.07	19.37	18.46	18.53	18.49	-
6	HSDPA	Subtest 1	17.43	17.58	17.71	16.83	16.85	16.70	0
6		Subtest 2	17.41	17.57	17.82	16.84	16.86	16.74	0
6		Subtest 3	16.92	17.09	17.32	16.35	16.36	16.23	0.5
6		Subtest 4	16.95	17.10	17.30	16.33	16.35	16.26	0.5
6	HSUPA	Subtest 1	17.40	17.58	17.83	16.84	16.85	16.73	0
6		Subtest 2	15.40	15.57	15.84	14.83	14.86	14.74	2
6		Subtest 3	15.00	15.07	15.33	15.53	15.58	15.54	1
6		Subtest 4	15.42	15.57	15.85	14.85	14.88	14.74	2
6		Subtest 5	17.42	17.56	17.83	16.87	16.88	16.75	0
8	DC-HSDPA	Subtest 1	17.42	17.57	17.80	16.83	16.86	16.71	0
8		Subtest 2	17.39	17.58	17.83	16.85	16.88	16.73	0
8		Subtest 3	16.91	17.06	17.33	16.32	16.34	16.23	0.5
8		Subtest 4	16.89	17.07	17.31	16.33	16.35	16.26	0.5

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**Table 9-5
Reduced Conducted Powers -Phablet with grip sensor active, and/or Earjack active**

3GPP Release Version	Mode	3GPP 34.121 Subtest	AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	19.83	20.02	20.19	19.44	19.45	19.39	-
99		12.2 kbps AMR	19.74	19.91	20.10	19.48	19.42	19.27	-
6	HSDPA	Subtest 1	18.60	18.80	19.03	17.99	18.03	17.97	0
6		Subtest 2	18.62	18.79	19.02	17.98	18.01	17.94	0
6		Subtest 3	18.12	18.30	18.53	17.47	17.52	17.40	0.5
6		Subtest 4	18.11	18.29	18.52	17.46	17.51	17.41	0.5
6	HSUPA	Subtest 1	18.59	18.78	19.01	17.95	18.00	17.91	0
6		Subtest 2	16.61	16.80	17.02	15.97	16.01	15.93	2
6		Subtest 3	16.10	16.26	16.50	16.60	16.54	16.63	1
6		Subtest 4	16.58	16.78	17.03	15.98	16.00	15.92	2
6		Subtest 5	18.62	18.79	19.02	17.98	18.03	17.92	0
8	DC-HSDPA	Subtest 1	18.60	18.78	19.01	17.98	18.04	17.93	0
8		Subtest 2	18.59	18.42	18.97	17.99	18.04	17.94	0
8		Subtest 3	18.10	18.25	18.50	17.47	17.54	17.46	0.5
8		Subtest 4	18.08	18.27	18.49	17.50	17.53	17.44	0.5




DC-HSDPA considerations

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

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






**Figure 9-2
Power Measurement Setup**

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9.3 LTE Conducted Powers

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




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

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9.3.1 LTE Band 12

**Table 9-6
LTE Band 12 Maximum Conducted Powers - 10 MHz Bandwidth**




LTE Band 12 10 MHz Bandwidth						
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]	
			23095 (707.5 MHz)			
			Conducted Power [dBm]			
QPSK	1	0	24.13	0	0	
	1	25	24.12		0	
	1	49	24.03		0	
	25	0	23.00	0-1	1	
	25	12	23.07		1	
	25	25	22.97		1	
16QAM	50	0	23.01	0-1	1	
	1	0	23.55		1	
	1	25	23.49		1	
	1	49	23.35	0-2	1	
	25	0	21.99		2	
	25	12	22.08		2	
64QAM	25	25	21.98	0-2	2	
	50	0	22.01		2	
	1	0	22.36		2	
	1	25	22.33	0-2	2	
	1	49	22.20		2	
	25	0	21.02		0-3	3
25	12	21.06	3			
25	25	20.94	3			
256QAM	50	0	20.95	0-3	3	
	1	0	18.84		0-5	5
	1	25	19.20			5
	1	49	18.81	5		
	25	0	18.95	5		
	25	12	19.02	5		
25	25	18.95	5			
	50	0	18.96		5	

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9.3.2 LTE Band 13

**Table 9-7
LTE Band 13 Maximum Conducted Powers - 10 MHz Bandwidth**




LTE Band 13 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23230 (782.0 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	24.18	0	0
	1	25	24.05		0
	1	49	24.04		0
	25	0	23.08	0-1	1
	25	12	23.06		1
	25	25	23.03		1
	50	0	23.00		1
16QAM	1	0	23.31	0-1	1
	1	25	23.28		1
	1	49	23.20		1
	25	0	22.06	0-2	2
	25	12	22.04		2
	25	25	22.08		2
	50	0	21.97		2
64QAM	1	0	22.23	0-2	2
	1	25	22.23		2
	1	49	22.12		2
	25	0	21.04	0-3	3
	25	12	21.02		3
	25	25	21.02		3
	50	0	20.96		3
256QAM	1	0	18.78	0-5	5
	1	25	19.13		5
	1	49	18.84		5
	25	0	18.88		5
	25	12	18.98		5
	25	25	18.96		5
	50	0	18.93		5

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9.3.3 LTE Band 26

**Table 9-8
LTE Band 26 (Cell) Maximum Conducted Powers- 15 MHz Bandwidth**

LTE Band 26 (Cell) 15 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26865 (831.5 MHz) Conducted Power [dBm]		
QPSK	1	0	24.13	0	0
	1	36	24.02		0
	1	74	23.94		0
	36	0	23.06	0-1	1
	36	18	23.12		1
	36	37	23.08		1
	75	0	23.09		1
16QAM	1	0	23.41	0-1	1
	1	36	23.39		1
	1	74	23.29		1
	36	0	22.10	0-2	2
	36	18	22.17		2
	36	37	22.11		2
	75	0	22.11		2
64QAM	1	0	22.39	0-2	2
	1	36	22.32		2
	1	74	22.22		2
	36	0	21.10	0-3	3
	36	18	21.16		3
	36	37	21.12		3
	75	0	21.12		3
256QAM	1	0	19.10	0-5	5
	1	36	19.28		5
	1	74	19.10		5
	36	0	19.06		5
	36	18	19.12		5
	36	37	19.08		5
	75	0	19.07		5

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9.3.4 LTE Band 66 Antenna A

**Table 9-9
LTE Band 66 (AWS) Antenna A Maximum Conducted Powers – 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	22.75	22.70	22.83	0	0
	1	50	23.08	23.05	22.82		0
	1	99	22.74	22.64	22.65		0
	50	0	22.02	21.96	21.74	0-1	1
	50	25	22.10	21.95	21.80		1
	50	50	21.91	21.81	21.58		1
100	0	21.98	21.86	21.68	1		
16QAM	1	0	21.92	21.80	22.02	0-1	1
	1	50	22.30	22.32	22.25		1
	1	99	21.94	21.86	21.90		1
	50	0	21.01	20.93	20.74	0-2	2
	50	25	21.12	20.92	20.80		2
	50	50	20.87	20.82	20.59		2
100	0	20.97	20.83	20.70	2		
64QAM	1	0	20.93	20.89	21.04	0-2	2
	1	50	21.35	21.38	21.06		2
	1	99	20.97	20.85	20.83		2
	50	0	20.02	19.92	19.72	0-3	3
	50	25	20.10	19.94	19.83		3
	50	50	19.90	19.82	19.55		3
100	0	20.01	19.85	19.68	3		
256QAM	1	0	17.93	17.89	17.77	0-5	5
	1	50	18.09	18.12	17.81		5
	1	99	17.84	17.64	17.39		5
	50	0	18.01	17.92	17.73		5
	50	25	18.09	17.91	17.81		5
	50	50	17.94	17.79	17.66		5
100	0	17.90	17.84	17.70	5		




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Table 9-10

LTE Band 66 (AWS) Antenna A Reduced Conducted Powers - Hotspot mode 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	16.41	16.60	17.11	0	0
	1	50	16.74	16.89	16.97		0
	1	99	16.50	16.63	16.81		0
	50	0	16.89	16.84	16.62	0-1	0
	50	25	17.02	16.85	16.68		0
	50	50	16.82	16.68	16.44		0
16QAM	100	0	16.90	16.75	16.61	0-1	0
	1	0	16.72	16.61	16.95		0
	1	50	17.23	17.05	16.96		0
	1	99	16.64	16.64	16.83	0-2	0
	50	0	16.91	16.81	16.61		0
	50	25	17.00	16.85	16.67		0
64QAM	50	50	16.80	16.71	16.48	0-2	0
	100	0	16.90	16.70	16.54		0
	1	0	16.71	16.74	16.71		0-2
	1	50	16.81	17.04	16.85	0	
	1	99	16.78	16.75	16.62	0	
	256QAM	50	0	16.92	16.85	16.60	0-3
50		25	16.99	16.87	16.71	0	
50		50	16.79	16.70	16.51	0	
100		0	16.87	16.73	16.56	0-5	0
1		0	16.79	16.78	16.54		0
1		50	17.17	17.05	16.75		0
256QAM	1	99	16.86	16.68	16.37	0-5	0
	50	0	16.94	16.85	16.61		0
	50	25	16.98	16.86	16.66		0
	50	50	16.83	16.73	16.42	0	
	100	0	16.86	16.71	16.60	0	







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Table 9-11
LTE Band 66 (AWS) Antenna A Reduced Conducted Powers -Phablet with grip sensor active, and/or 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	18.09	18.09	18.25	0	0
	1	50	18.48	18.36	18.11		0
	1	99	18.12	18.31	18.06		0
	50	0	18.42	18.27	18.13	0-1	0
	50	25	18.50	18.30	18.18		0
	50	50	18.28	18.19	17.97		0
	100	0	18.39	18.20	18.07		0
16QAM	1	0	18.42	18.32	18.40	0-1	0
	1	50	18.92	18.79	18.24		0
	1	99	18.61	18.25	18.29		0
	50	0	18.45	18.34	18.12	0-2	0
	50	25	18.51	18.31	18.22		0
	50	50	18.34	18.20	18.03		0
	100	0	18.43	18.21	18.09		0
64QAM	1	0	18.33	18.23	18.41	0-2	0
	1	50	18.78	18.65	18.33		0
	1	99	18.32	18.21	18.09		0
	50	0	18.43	18.34	18.10	0-3	0
	50	25	18.51	18.30	18.23		0
	50	50	18.31	18.25	18.03		0
	100	0	18.40	18.24	18.11		0
256QAM	1	0	17.86	17.72	17.65	0-5	1
	1	50	18.09	18.03	17.77		1
	1	99	17.76	17.63	17.36		1
	50	0	17.93	17.84	17.67		1
	50	25	17.99	17.85	17.72		1
	50	50	17.83	17.69	17.50		1
	100	0	17.92	17.71	17.61		1

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9.3.1

LTE Band 4 Antenna I

Table 9-12
LTE Band 4 (AWS) Antenna I Maximum Conducted Powers – 20 MHz Bandwidth

LTE Band 4 (AWS) 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20175 (1732.5 MHz) Conducted Power [dBm]		
QPSK	1	0	20.01	0	0
	1	50	20.26		0
	1	99	20.03		0
	50	0	19.08	0-1	1
	50	25	19.21		1
	50	50	19.11		1
	100	0	19.08		1
16QAM	1	0	19.11	0-1	1
	1	50	19.43		1
	1	99	19.00		1
	50	0	18.08	0-2	2
	50	25	18.16		2
	50	50	18.12		2
	100	0	18.00		2
64QAM	1	0	18.07	0-2	2
	1	50	18.42		2
	1	99	18.00		2
	50	0	17.04	0-3	3
	50	25	17.22		3
	50	50	17.07		3
	100	0	17.05		3
256QAM	1	0	15.00	0-5	5
	1	50	15.29		5
	1	99	15.01		5
	50	0	15.09		5
	50	25	15.17		5
	50	50	15.06		5
	100	0	15.01		5







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Table 9-13
LTE Band 4 (AWS) Antenna I Reduced Conducted Powers -RCV Mode active and/or Hotspot Mode Active
- 20 MHz Bandwidth

LTE Band 4 (AWS) 20 MHz Bandwidth						
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]	
			20175 (1732.5 MHz) Conducted Power [dBm]			
QPSK	1	0	15.00	0	0	
	1	50	15.32		0	
	1	99	15.03		0	
	QPSK	50	0	15.05	0-1	0
		50	25	15.10		0
		50	50	15.03		0
		100	0	15.04		0
16QAM	1	0	15.02	0-1	0	
	1	50	15.43		0	
	1	99	15.07		0	
	16QAM	50	0	15.03	0-2	0
		50	25	15.10		0
		50	50	15.04		0
64QAM	100	0	15.00		0	
	1	0	15.02	0-2	0	
	1	50	15.40		0	
	1	99	15.11		0	
	64QAM	50	0	15.02	0-3	0
		50	25	15.11		0
50		50	15.06	0		
256QAM	100	0	15.05		0	
	1	0	15.00	0-5	0	
	1	50	15.25		0	
	1	99	15.08		0	
	50	0	15.04		0	
	50	25	15.10		0	
	50	50	15.03		0	
100	0	15.07	0			

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9.3.2 LTE Band 25

Table 9-14
LTE Band 25 (PCS) Maximum Conducted Powers - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth								
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]	
			26140 (1860.0 MHz)	26365 (1882.5 MHz)	26590 (1905.0 MHz)			
			Conducted Power [dBm]					
QPSK	1	0	22.64	22.59	22.41	0	0	
	1	50	22.66	22.65	22.48		0	
	1	99	22.51	22.42	22.41		0	
	50	0	21.41	21.42	21.34	0-1	1	
	50	25	21.48	21.39	21.38		1	
	50	50	21.47	21.34	21.28		1	
16QAM	100	0	21.40	21.32	21.30	0-1	1	
	1	0	21.78	21.81	21.49		0-1	1
	1	50	21.76	22.00	21.87			1
	1	99	21.60	21.71	21.44	0-2		1
	50	0	20.44	20.42	20.39		2	
	50	25	20.52	20.39	20.35		2	
64QAM	50	50	20.45	20.36	20.27	0-2	2	
	100	0	20.44	20.29	20.26		2	
	1	0	20.75	20.73	20.60		0-2	2
	1	50	20.70	20.77	20.53	0-3		2
	1	99	20.58	20.58	20.47			2
	50	0	19.45	19.44	19.32		0-3	3
50	25	19.56	19.39	19.36	3			
50	50	19.47	19.38	19.23	3			
256QAM	100	0	19.40	19.28	19.31	0-5	3	
	1	0	17.22	17.17	17.16		0-5	5
	1	50	17.58	17.63	17.52			5
	1	99	17.35	17.17	17.09	0-5		5
	50	0	17.34	17.30	17.25		5	
	50	25	17.51	17.44	17.38		5	
	50	50	17.48	17.31	17.25	0-5	5	
	100	0	17.35	17.33	17.27		5	




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Table 9-15

LTE Band 25 (PCS) Reduced Conducted Powers - Hotspot mode 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	16.85	16.74	16.65	0	0
	1	50	16.90	16.87	16.67		0
	1	99	16.83	16.65	16.57		0
	50	0	16.74	16.75	16.62	0-1	0
	50	25	16.79	16.74	16.64		0
	50	50	16.78	16.71	16.55		0
100	0	16.71	16.62	16.54	0		
16QAM	1	0	16.84	16.79	16.81	0-1	0
	1	50	17.15	17.04	16.81		0
	1	99	17.01	16.75	16.86		0
	50	0	16.78	16.75	16.68	0-2	0
	50	25	16.80	16.74	16.65		0
	50	50	16.80	16.73	16.57		0
100	0	16.72	16.64	16.56	0		
64QAM	1	0	16.86	16.89	16.70	0-2	0
	1	50	17.05	17.12	16.90		0
	1	99	17.02	16.81	16.73		0
	50	0	16.75	16.75	16.65	0-3	0
	50	25	16.78	16.76	16.63		0
	50	50	16.78	16.71	16.54		0
100	0	16.68	16.60	16.58	0		
256QAM	1	0	16.51	16.48	16.47	0-5	0
	1	50	16.74	16.81	16.81		0
	1	99	16.71	16.51	16.51		0
	50	0	16.59	16.61	16.50		0
	50	25	16.82	16.77	16.61		0
	50	50	16.76	16.68	16.49		0
100	0	16.72	16.59	16.58	0		







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Table 9-16
LTE Band 25 (PCS) Reduced Conducted Powers -Phablet with grip sensor active, and/or 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	18.76	18.77	18.64	0	0
	1	50	18.81	18.82	18.77		0
	1	99	18.78	18.60	18.74		0
	50	0	18.56	18.61	18.72	0-1	0
	50	25	18.83	18.70	18.73		0
	50	50	18.72	18.68	18.50		0
16QAM	100	0	18.71	18.64	18.47	0-1	0
	1	0	18.91	18.99	18.75		0
	1	50	19.05	19.00	18.78		0
	1	99	18.90	18.93	18.69	0-2	0
	50	0	18.71	18.69	18.66		0
	50	25	18.80	18.76	18.58		0
64QAM	50	50	18.75	18.70	18.45	0-2	0
	100	0	18.72	18.56	18.63		0
	1	0	18.86	19.00	18.82		0-2
	1	50	18.89	18.75	19.17	0	
	1	99	18.92	18.78	18.82	0	
	256QAM	50	0	18.73	18.66	18.65	0-3
50		25	18.79	18.72	18.68	0	
50		50	18.76	18.72	18.48	0	
100		0	18.71	18.58	18.50	0-5	0
1		0	17.31	17.33	17.20		1.5
1		50	17.48	17.97	17.71		1.5
256QAM	1	99	17.60	17.65	17.29	0-5	1.5
	50	0	17.48	17.49	17.38		1.5
	50	25	17.81	17.65	17.61		1.5
	50	50	17.71	17.59	17.48	1.5	
	100	0	17.63	17.60	17.56	1.5	

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9.3.3 LTE Band 41

Table 9-17
LTE Band 41 PC3 Maximum Conducted Powers– 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth										
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]	
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)			
Conducted Power [dBm]										
QPSK	1	0	22.84	23.47	23.00	23.15	23.11	0	0	
	1	50	23.07	23.57	23.45	23.52	23.66		0	
	1	99	23.20	23.52	23.17	23.13	23.59		0	
	50	0	21.89	22.37	22.18	22.31	22.36	0-1	1	
	50	25	22.04	22.42	22.38	22.35	22.59		1	
	50	50	22.09	22.49	22.29	22.24	22.61		1	
100	0	21.91	22.29	22.22	22.20	22.49	0-1	1		
16QAM	1	0	21.82	22.35	21.90	22.02		22.03	1	
	1	50	22.30	22.70	22.64	22.68		22.74	1	
	1	99	22.10	22.32	22.04	22.07		22.60	1	
	50	0	20.90	21.35	21.22	21.29		21.35	0-2	2
	50	25	21.02	21.42	21.40	21.34		21.58		2
	50	50	21.10	21.47	21.34	21.23	21.59	2		
100	0	20.94	21.29	21.27	21.24	21.45	0-2	2		
64QAM	1	0	20.75	21.47	20.85	20.94		20.97	2	
	1	50	20.73	21.57	21.36	21.54		21.66	2	
	1	99	21.05	21.45	21.00	21.02		21.53	2	
	50	0	19.87	20.33	20.20	20.28		20.36	0-3	3
	50	25	20.02	20.40	20.40	20.35		20.58		3
	50	50	20.09	20.45	20.33	20.23	20.59	3		
100	0	19.90	20.24	20.24	20.22	20.46	0-5	3		
256QAM	1	0	17.51	17.89	17.90	18.04		18.05	5	
	1	50	18.15	18.48	18.40	18.34		18.55	5	
	1	99	18.05	18.00	18.00	17.97		18.54	5	
	50	0	17.78	18.25	18.23	18.30		18.33	5	
	50	25	18.08	18.41	18.39	18.36		18.58	5	
	50	50	18.10	18.34	18.32	18.26	18.57	5		
100	0	17.98	18.26	18.29	18.21	18.47	5			

Table 9-18
LTE Band 41 PC2 Maximum Conducted Powers– 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
Conducted Power [dBm]									
QPSK	1	0	24.76	25.03	24.72	24.84	24.65	0	0
	1	50	24.65	24.90	25.05	24.98	25.12		0
	1	99	24.84	24.87	24.73	24.57	24.86		0
	50	0	23.67	23.81	23.74	23.91	23.84	0-1	1
	50	25	23.74	23.79	23.93	24.05	23.99		1
	50	50	23.71	23.79	23.81	23.91	23.89		1
100	0	23.63	23.65	23.82	23.95	23.91	1		



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Table 9-19
LTE Band 41 PC3 Reduced Conducted Powers - Hotspot mode active - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	21.12	21.90	21.50	21.40	21.61	0	0
	1	50	21.52	22.00	21.92	21.72	22.10		0
	1	99	21.54	21.95	21.61	21.18	21.95		0
	50	0	21.23	21.75	21.64	21.90	21.77	0-1	0
	50	25	21.38	21.77	21.91	21.92	22.11		0
	50	50	21.46	21.81	21.82	21.81	22.13		0
100	0	21.28	21.65	21.67	21.81	22.00	0		
16QAM	1	0	21.26	21.99	21.43	21.43	21.50	0-1	0
	1	50	21.75	22.30	21.94	21.86	22.10		0
	1	99	21.65	22.01	21.91	21.28	21.82		0
	50	0	20.72	21.27	21.15	21.41	21.26	0-2	0.5
	50	25	20.87	21.28	21.27	21.45	21.41		0.5
	50	50	20.95	21.34	21.16	21.30	21.42		0.5
100	0	20.78	21.18	21.17	21.07	21.35	0.5		
64QAM	1	0	20.72	21.37	20.94	20.99	20.99	0-2	0.5
	1	50	20.90	21.48	21.36	21.39	21.50		0.5
	1	99	21.09	21.28	20.91	20.79	21.36		0.5
	50	0	19.73	20.26	20.12	20.18	20.24	0-3	1.5
	50	25	19.85	20.29	20.26	20.19	20.42		1.5
	50	50	19.93	20.34	20.38	20.03	20.41		1.5
100	0	19.75	20.17	20.14	20.27	20.32	1.5		
256QAM	1	0	17.76	18.09	17.90	18.26	17.93	0-5	3.5
	1	50	17.81	18.31	18.21	18.53	18.41		3.5
	1	99	17.82	18.15	18.10	18.13	18.66		3.5
	50	0	17.72	18.16	18.14	18.18	18.25	0-5	3.5
	50	25	17.88	18.26	18.26	18.44	18.43		3.5
	50	50	17.92	18.23	18.15	18.36	18.41		3.5
100	0	17.92	18.15	18.16	18.06	18.34	3.5		

Table 9-20
LTE Band 41 PC2 Reduced Conducted Powers - Hotspot mode active - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	21.31	21.87	21.53	21.66	21.56	0	0
	1	50	21.51	21.80	21.70	21.87	21.82		0
	1	99	21.72	21.91	21.42	21.43	22.00		0
	50	0	21.23	21.74	21.67	21.70	21.75	0-1	0
	50	25	21.37	21.78	21.77	21.68	21.91		0
	50	50	21.47	21.81	21.68	21.56	21.90		0
100	0	21.28	21.65	21.66	21.59	21.83	0		




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Table 9-21

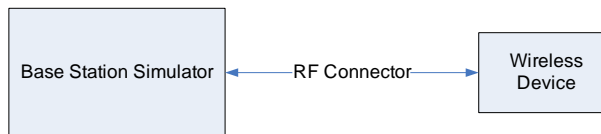
LTE Band 41 PC3 Reduced Conducted Powers -Phablet with grip sensor active, and/or Earjack active - 20 MHz Bandwidth

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	21.62	22.33	21.82	21.82	21.82	0	0
	1	50	21.73	22.34	22.15	22.15	22.35		0
	1	99	21.94	22.26	21.83	21.61	22.28		0
	50	0	21.69	22.33	22.11	22.15	22.22	0-1	0
	50	25	21.83	22.32	22.24	22.14	22.41		0
	50	50	21.90	22.37	22.16	21.99	22.42		0
100	0	21.73	22.22	22.14	22.02	22.33	0		
16QAM	1	0	21.68	22.35	21.93	21.95	21.97	0-1	0
	1	50	22.00	22.48	22.43	22.39	22.55		0
	1	99	21.98	22.32	21.91	21.75	22.24		0
	50	0	20.71	21.31	21.14	21.15	21.22	0-2	1
	50	25	20.81	21.31	21.23	21.18	21.38		1
	50	50	20.90	21.35	21.17	21.01	21.40		1
100	0	20.74	21.21	21.14	21.04	21.32	1		
64QAM	1	0	20.75	21.38	21.00	20.99	20.97	0-2	1
	1	50	20.88	21.51	21.37	21.34	21.55		1
	1	99	21.10	21.35	20.94	20.78	21.32		1
	50	0	19.68	20.32	20.12	20.16	20.21	0-3	2
	50	25	19.81	20.32	20.24	20.14	20.39		2
	50	50	19.89	20.36	20.16	20.00	20.37		2
100	0	19.72	20.22	20.13	20.02	20.28	2		
256QAM	1	0	17.23	17.86	17.92	17.91	17.88	0-5	4
	1	50	17.78	18.30	18.27	18.18	18.30		4
	1	99	17.77	17.88	17.90	17.68	18.25		4
	50	0	17.57	18.19	18.15	18.14	18.18	0-5	4
	50	25	17.83	18.28	18.25	18.12	18.36		4
	50	50	17.87	18.24	18.20	18.00	18.38		4
100	0	17.72	18.17	18.13	18.01	18.26	4		

Table 9-22

LTE Band 41 PC2 Reduced Conducted Powers -Phablet with grip sensor active, and/or 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	21.74	22.43	22.15	21.98	21.99	0	0
	1	50	21.71	22.34	22.37	22.12	22.28		0
	1	99	21.97	22.37	21.92	21.79	22.33		0
	50	0	21.68	22.27	22.12	22.15	22.19	0-1	0
	50	25	21.81	22.28	22.23	22.13	22.37		0
	50	50	21.89	22.33	22.18	22.01	22.38		0
100	0	21.73	22.18	22.14	22.02	22.27	0		



**Figure 9-3
Power Measurement Setup**

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9.4 NR Conducted Powers




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 H.

Note: Some bands do 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.

9.4.1 NR Band n5

Table 9-23
NR Band n5 Maximum Conducted Powers - 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	24.26	0	0.0
	1	53	24.33		0.0
	1	104	24.19		0.0
	50	0	23.80	0-0.5	0.5
	50	28	24.29	0	0.0
	50	56	23.77	0-0.5	0.5
	100	0	23.73		0.5
DFT-s-OFDM QPSK	1	1	24.30	0	0.0
	1	53	24.28		0.0
	1	104	24.09		0.0
	50	0	23.61	0-1	1.0
	50	28	24.25	0	0.0
	50	56	23.60	0-1	1.0
	100	0	23.75		1.0
DFT-s-OFDM 16QAM	1	1	23.62	0-1	1.0
CP-OFDM QPSK	1	1	22.68	0-1.5	1.5

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9.4.2 NR Band n66 Antenna A

Table 9-24
NR Band n66 Antenna A Maximum Conducted Powers - 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	23.72	24.06	23.80	0	0.0
	1	53	23.97	23.98	23.72		0.0
	1	104	23.70	23.88	23.89		0.0
	50	0	22.60	23.28	23.40	0-0.5	0.5
	50	28	23.80	23.80	23.66	0	0.0
	50	56	23.36	23.33	23.39	0-0.5	0.5
	100	0	23.41	22.65	23.27		0.5
DFT-s-OFDM QPSK	1	1	23.01	23.31	23.09	0	0.0
	1	53	23.77	23.71	22.99		0.0
	1	104	23.09	23.59	22.98		0.0
	50	0	22.23	22.16	22.69	0-1	1.0
	50	28	23.70	23.60	23.66	0	0.0
	50	56	22.61	22.80	22.79	0-1	1.0
	100	0	22.31	22.62	22.63		1.0
DFT-s-OFDM 16QAM	1	1	22.27	22.79	22.61	0-1	1.0
CP-OFDM QPSK	1	1	21.55	21.89	22.22	0-1.5	1.5




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Table 9-25

NR Band n66 Antenna A Reduced Conducted Powers - Hotspot mode 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	19.09	19.01	18.95	0	0.0
	1	53	19.05	18.94	18.82		0.0
	1	104	19.09	18.95	18.89		0.0
	50	0	19.04	18.95	18.91	0-0.5	0.0
	50	28	19.02	18.99	18.77	0	0.0
	50	56	19.04	19.00	18.76	0-0.5	0.0
	100	0	19.05	18.99	18.75		0.0
DFT-s-OFDM QPSK	1	1	19.07	19.00	18.95	0	0.0
	1	53	19.06	18.89	18.77		0.0
	1	104	19.12	18.93	18.89		0.0
	50	0	19.05	18.98	18.90	0-1	0.0
	50	28	19.02	18.99	18.78	0	0.0
	50	56	19.01	19.00	18.79	0-1	0.0
	100	0	19.00	18.99	18.78		0.0
DFT-s-OFDM 16QAM	1	1	19.14	19.18	19.02	0-1	0.0
CP-OFDM QPSK	1	1	19.07	18.84	18.87	0-1.5	0.0







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Table 9-26
NR Band n66 Antenna A Reduced Conducted Powers -Phablet with grip sensor active, and/or 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	20.42	20.36	20.35	0	0.0
	1	53	20.39	20.40	20.25		0.0
	1	104	20.51	20.42	20.27		0.0
	50	0	20.45	20.38	20.24	0-0.5	0.0
	50	28	20.41	20.35	20.21	0	0.0
	50	56	20.46	20.39	20.28	0-0.5	0.0
	100	0	20.43	20.41	20.23		0.0
DFT-s-OFDM QPSK	1	1	20.49	20.50	20.41	0	0.0
	1	53	20.44	20.49	20.29		0.0
	1	104	20.52	20.51	20.35		0.0
	50	0	20.41	20.42	20.21	0-1	0.0
	50	28	20.40	20.41	20.26	0	0.0
	50	56	20.50	20.45	20.20	0-1	0.0
	100	0	20.42	20.41	20.26		0.0
DFT-s-OFDM 16QAM	1	1	20.62	20.30	20.59	0-1	0.0
CP-OFDM QPSK	1	1	20.39	20.48	20.31	0-1.5	0.0

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9.4.3 NR Band n66 Antenna I

Table 9-27
NR Band n66 Antenna I Maximum Conducted Powers - 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	21.70	21.32	21.23	0	0.0
	1	53	21.46	21.35	21.12		0.0
	1	104	21.44	21.34	21.14		0.0
	50	0	21.35	21.22	21.01	0-0.5	0.5
	50	28	21.40	21.33	21.20	0	0.0
	50	56	21.20	21.16	20.90	0-0.5	0.5
	100	0	21.23	21.13	20.97		0.5
DFT-s-OFDM QPSK	1	1	21.45	21.32	21.13	0	0.0
	1	53	21.41	21.37	21.14		0.0
	1	104	21.38	21.32	21.15		0.0
	50	0	21.34	21.14	21.09	0-1	1.0
	50	28	21.40	21.32	21.20	0	0.0
	50	56	21.30	21.09	20.99	0-1	1.0
	100	0	21.32	21.18	20.92		1.0
DFT-s-OFDM 16QAM	1	1	21.17	21.16	21.10	0-1	1.0
CP-OFDM QPSK	1	1	20.85	20.82	20.55	0-1.5	1.5




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Table 9-28
NR Band n66 Antenna I Reduced Conducted Powers -RCV Mode 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	18.75	18.62	18.40	0	0.0
	1	53	18.60	18.49	18.05		0.0
	1	104	18.70	18.54	18.40		0.0
	50	0	18.36	18.50	18.45	0-0.5	0.0
	50	28	18.65	18.46	18.39	0	0.0
	50	56	18.31	18.45	18.31	0-0.5	0.0
	100	0	18.37	18.47	18.30		0.0
DFT-s-OFDM QPSK	1	1	18.71	18.61	18.49	0	0.0
	1	53	18.55	18.58	18.34		0.0
	1	104	18.68	18.38	18.39		0.0
	50	0	18.43	18.47	18.39	0-1	0.0
	50	28	18.65	18.44	18.36	0	0.0
	50	56	18.42	18.40	18.29	0-1	0.0
	100	0	18.60	18.44	18.35		0.0
DFT-s-OFDM 16QAM	1	1	18.84	18.69	18.62	0-1	0.0
CP-OFDM QPSK	1	1	18.35	18.45	18.30	0-1.5	0.0

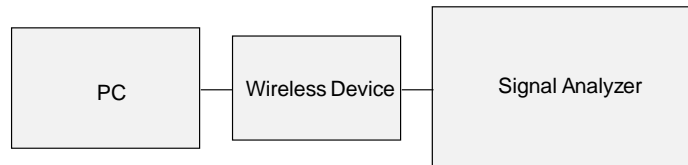


Figure 9-4
Power Measurement Setup

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9.5 WLAN Conducted Powers

Table 9-29
2.4 GHz WLAN Maximum Average RF Power – Ant 1

2.4GHz Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11b
		Average
2412	1	18.35
2437	6	18.46
2462	11	18.26

Table 9-30
2.4 GHz WLAN Maximum Average RF Power – Ant 2

2.4GHz Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11b
		Average
2412	1	18.10
2437	6	18.45
2462	11	18.19

Table 9-31
2.4 GHz WLAN Maximum Average RF Power – MIMO

2.4GHz 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2412	1	15.00	14.98	18.00
2417	2	17.22	17.21	20.23
2437	6	17.38	17.50	20.45
2457	10	17.40	17.70	20.56
2462	11	14.20	14.34	17.28




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Table 9-32
2.4 GHz WLAN Reduced Average RF Power with RCV Active – Ant 1

2.4GHz Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11b
		Average
2412	1	16.07
2437	6	16.25
2462	11	16.03

Table 9-33
2.4 GHz WLAN Reduced Average RF Power with RCV Active – Ant 2

2.4GHz Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11b
		Average
2412	1	15.99
2437	6	16.10
2462	11	16.20

Table 9-34
2.4 GHz WLAN Reduced Average RF Power with RCV Active or During conditions with 5G NR - MIMO

2.4GHz 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2412	1	15.00	14.98	18.00
2417	2	16.00	16.14	19.08
2437	6	16.22	16.35	19.30
2457	10	16.30	16.50	19.41
2462	11	14.20	14.34	17.28

Table 9-35
2.4 GHz WLAN Reduced Average RF Powers During Conditions with 5/6 GHz WLAN- MIMO

2.4GHz 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2412	1	15.00	14.98	18.00
2417	2	15.20	15.10	18.16
2437	6	15.15	15.32	18.25
2457	10	15.40	15.50	18.46
2462	11	14.20	14.34	17.28




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Table 9-36
5 GHz WLAN Maximum Average RF Power – MIMO




5GHz (40MHz) 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
5190	38	15.78	16.29	19.05
5230	46	16.17	16.70	19.45
5270	54	15.71	16.38	19.07
5310	62	15.86	16.42	19.16
5510	102	15.95	16.00	18.99
5590	118	15.88	15.85	18.88
5630	126	16.00	16.00	19.01
5710	142	16.18	16.15	19.18
5755	151	15.75	15.85	18.81
5795	159	15.60	15.65	18.64
5590	167	15.24	15.54	18.40
5630	175	15.33	15.78	18.57

Table 9-37
5 GHz WLAN Reduced Average RF Power with RCV Active - MIMO

5GHz (80MHz) 802.11ac Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
5210	42	12.95	13.65	16.32
5290	58	12.81	13.46	16.16
5530	106	12.66	13.20	15.95
5610	122	12.77	13.00	15.90
5690	138	13.06	13.10	16.09
5775	155	12.75	12.80	15.79
5855	171	12.98	13.08	16.04

Table 9-38
5 GHz WLAN Reduced Average RF Power During Conditions with 2.45 GHz WLAN - MIMO

5GHz (80MHz) 802.11ac Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
5210	42	12.15	12.93	15.57
5290	58	12.39	12.99	15.71
5530	106	12.25	12.90	15.60
5610	122	12.68	12.96	15.83
5690	138	12.99	12.98	15.99
5775	155	12.16	12.59	15.39
5855	171	12.14	12.21	15.19

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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.

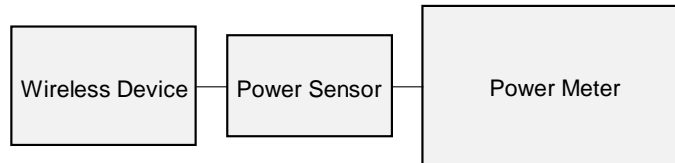








Figure 9-5
Power Measurement Setup

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9.6 Bluetooth Conducted Powers




Table 9-39
Bluetooth Maximum Average RF Power– Antenna 1

Frequency [MHz]	Data Rate [Mbps]	Power Scheme	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	1.0	ePA	0	17.85	60.890
2441	1.0	ePA	39	18.26	66.918
2480	1.0	ePA	78	17.15	51.880
2402	1.0	iPA	0	11.81	15.174
2441	1.0	iPA	39	11.95	15.666
2480	1.0	iPA	78	11.29	13.462
2402	2.0	ePA	0	16.38	43.430
2441	2.0	ePA	39	17.36	54.411
2480	2.0	ePA	78	15.97	39.535
2402	2.0	iPA	0	8.40	6.918
2441	2.0	iPA	39	8.60	7.244
2480	2.0	iPA	78	7.74	5.943
2402	3.0	ePA	0	16.45	44.135
2441	3.0	ePA	39	17.47	55.788
2480	3.0	ePA	78	15.90	38.874
2402	3.0	iPA	0	8.47	7.031
2441	3.0	iPA	39	8.68	7.379
2480	3.0	iPA	78	7.83	6.067

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**Table 9-40
Bluetooth Maximum Average RF Power– Antenna 2**

Frequency [MHz]	Data Rate [Mbps]	Power Scheme	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	1.0	ePA	0	15.57	36.043
2441	1.0	ePA	39	16.61	45.854
2480	1.0	ePA	78	15.50	35.483
2402	1.0	iPA	0	11.18	13.123
2441	1.0	iPA	39	11.69	14.767
2480	1.0	iPA	78	10.80	12.025
2402	2.0	ePA	0	15.02	31.778
2441	2.0	ePA	39	16.15	41.244
2480	2.0	ePA	78	15.38	34.486
2402	2.0	iPA	0	8.42	6.945
2441	2.0	iPA	39	8.79	7.573
2480	2.0	iPA	78	7.63	5.793
2402	3.0	ePA	0	14.89	30.849
2441	3.0	ePA	39	16.04	40.148
2480	3.0	ePA	78	15.45	35.093
2402	3.0	iPA	0	8.62	7.285
2441	3.0	iPA	39	8.94	7.840
2480	3.0	iPA	78	7.63	5.789

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**Table 9-41
Bluetooth Maximum Average RF Power– MIMO**

Frequency [MHz]	Data Rate [Mbps]	Power Scheme	Channel No.	ANT1 Avg Conducted Power		ANT2 Avg Conducted Power		Dual Avg Conducted Power	
				[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]
				2402	1.0	iPA	0	11.14	13.000
2441	1.0	iPA	39	11.00	12.585	10.96	12.463	13.99	25.047
2480	1.0	iPA	78	10.15	10.354	9.80	9.549	12.99	19.904
2402	2.0	iPA	0	8.50	7.079	8.57	7.188	11.54	14.268
2441	2.0	iPA	39	8.45	6.998	8.94	7.842	11.71	14.840
2480	2.0	iPA	78	7.31	5.383	7.72	5.909	10.53	11.292
2402	3.0	iPA	0	8.02	6.336	8.47	7.031	11.26	13.367
2441	3.0	iPA	39	8.53	7.133	8.93	7.821	11.75	14.954
2480	3.0	iPA	78	7.50	5.625	7.76	5.963	10.64	11.588

**Table 9-42
Bluetooth Reduced Average RF Power (RCV Active) – Antenna 1**

Frequency [MHz]	Data Rate [Mbps]	Mod.	Power Scheme	Channel No.	Avg Conducted Power	
					[dBm]	[mW]
2402	1.0	GFSK	ePA	0	13.62	23.014
2441	1.0	GFSK	ePA	39	14.28	26.792
2480	1.0	GFSK	ePA	78	13.45	22.131

**Table 9-43
Bluetooth Reduced Average RF Power (RCV Active) – Antenna 2**

Frequency [MHz]	Data Rate [Mbps]	Mod.	Power Scheme	Channel No.	Avg Conducted Power	
					[dBm]	[mW]
2402	1.0	GFSK	ePA	0	12.87	19.364
2441	1.0	GFSK	ePA	39	13.87	24.378
2480	1.0	GFSK	ePA	78	12.77	18.923



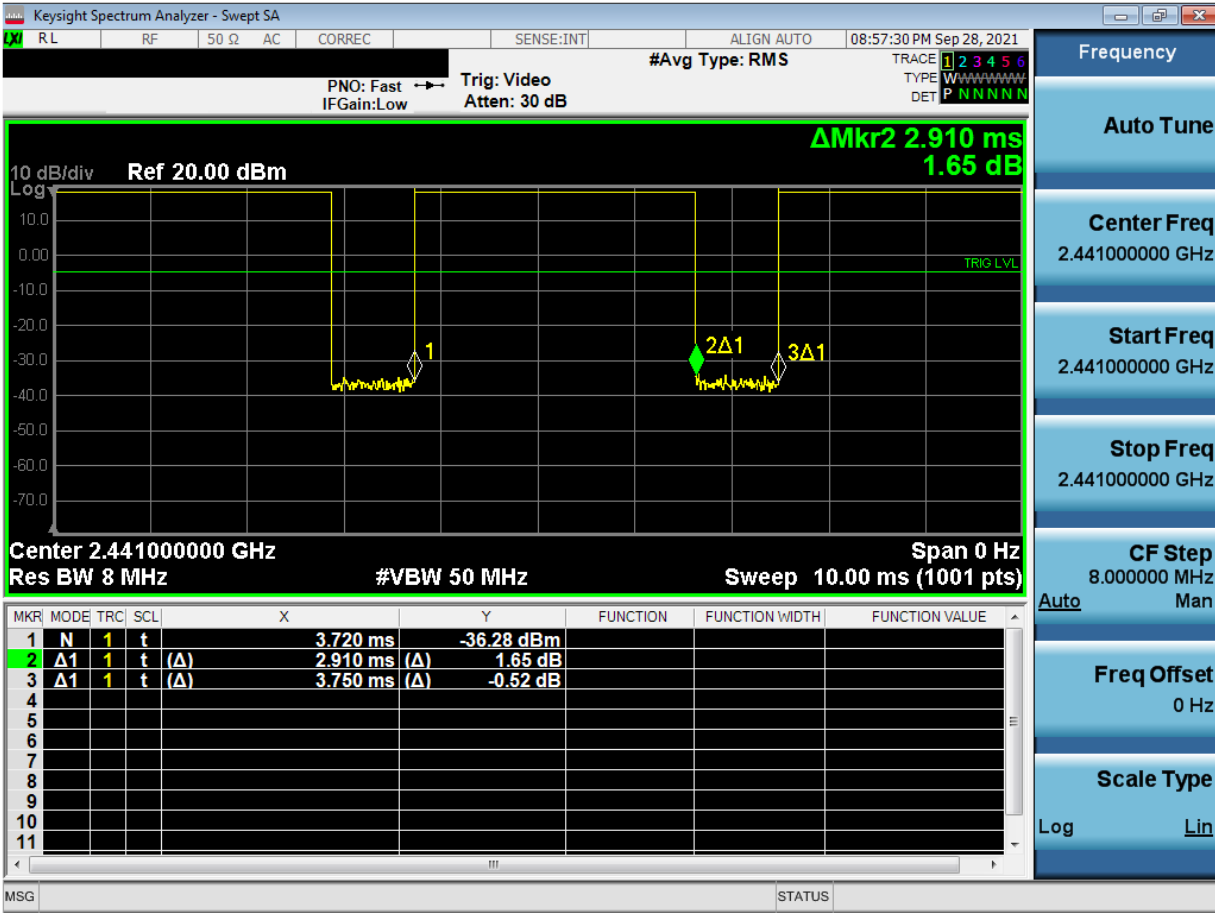
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Figure 9-6
Bluetooth Antenna 1 Transmission Plot



Equation 9-1
Bluetooth Antenna 1 Duty Cycle Calculation

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




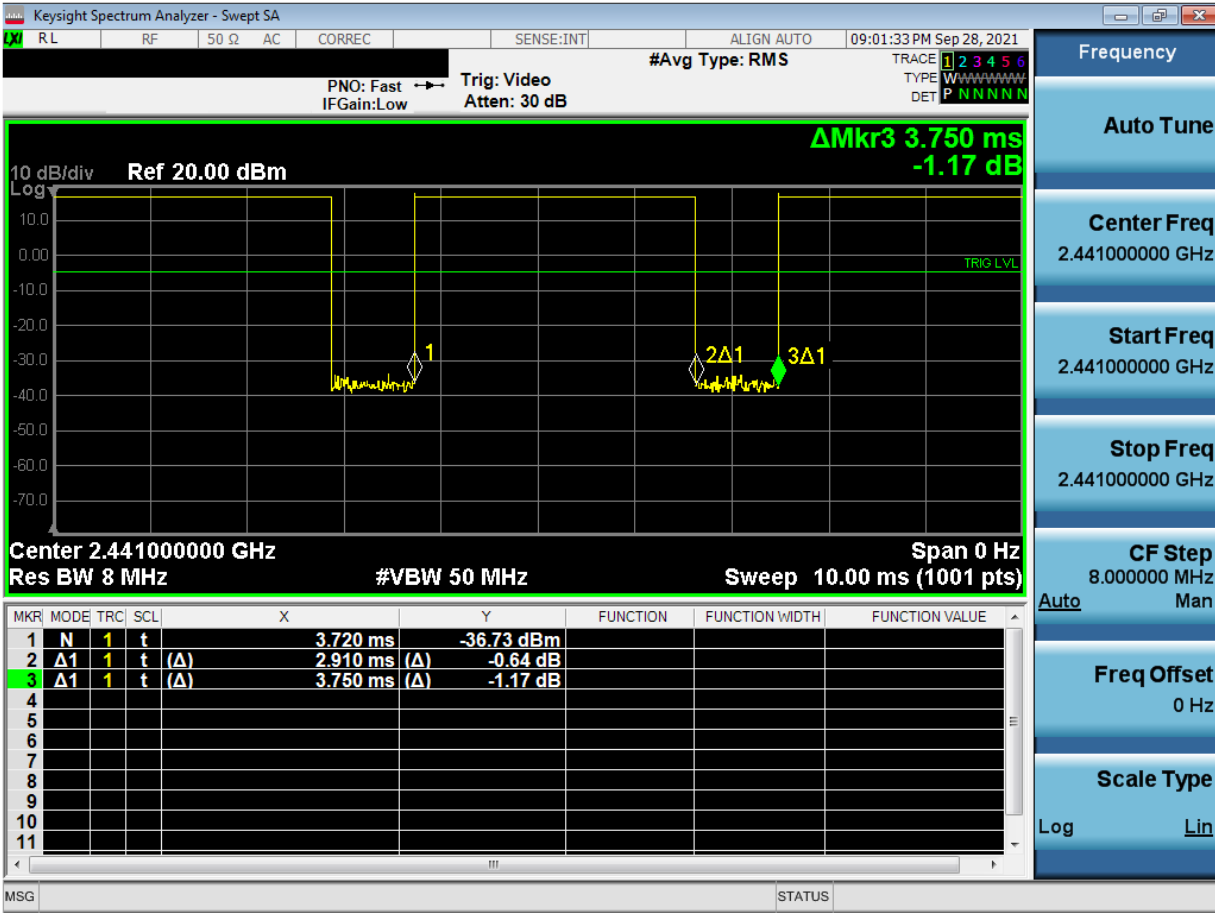
FCC ID: A3LSMS906E	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
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Figure 9-7
Bluetooth Antenna 2 Transmission Plot

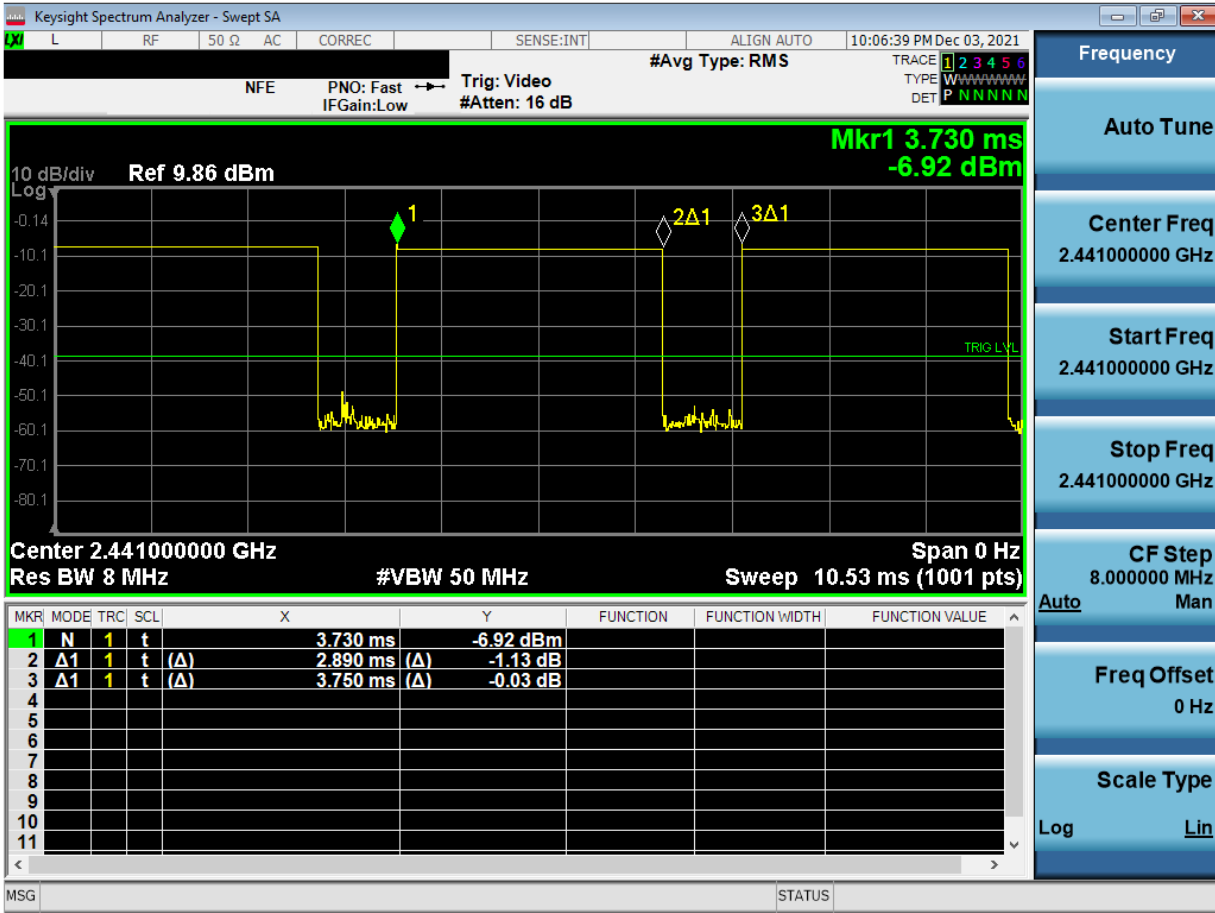


Equation 9-2
Bluetooth Antenna 2 Duty Cycle Calculation

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

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Figure 9-8
Bluetooth MIMO Transmission Plot



Equation 9-3
Bluetooth MIMO Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.89ms}{3.75ms} * 100\% = 77.1\%$$

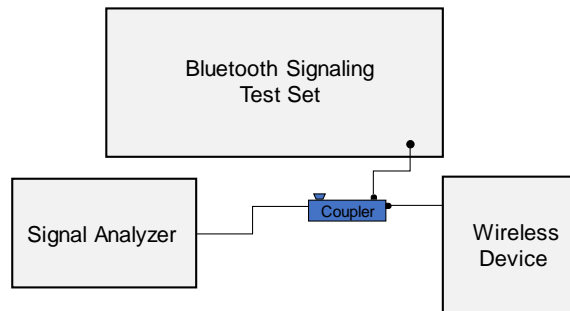


Figure 9-9
Power Measurement Setup




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10 SYSTEM VERIFICATION

10.1 Tissue Verification




**Table 10-1
Measured Head Tissue Properties**

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
11/03/2021	750 Head	21.1	680	0.892	42.818	0.888	42.305	0.45%	1.21%
			695	0.898	42.765	0.889	42.227	1.01%	1.32%
			700	0.899	42.771	0.889	42.201	1.12%	1.35%
			710	0.902	42.739	0.890	42.149	1.35%	1.40%
			725	0.908	42.683	0.891	42.071	1.91%	1.45%
			750	0.917	42.593	0.894	41.942	2.57%	1.55%
			770	0.925	42.533	0.895	41.838	3.35%	1.66%
			785	0.930	42.495	0.896	41.760	3.79%	1.76%
			800	0.936	42.461	0.897	41.682	4.35%	1.87%
11/01/2021	835 Head	19.5	815	0.929	42.545	0.898	41.594	3.45%	2.29%
			820	0.931	42.530	0.899	41.578	3.56%	2.29%
			835	0.937	42.486	0.900	41.500	4.11%	2.38%
			850	0.943	42.451	0.916	41.500	2.95%	2.29%
			815	0.921	42.444	0.898	41.594	2.56%	2.04%
11/04/2021	835 Head	20.0	820	0.923	42.433	0.899	41.578	2.67%	2.06%
			835	0.929	42.397	0.900	41.500	3.22%	2.16%
			850	0.934	42.362	0.916	41.500	1.97%	2.08%
11/15/2021	835 Head	21.7	815	0.883	43.136	0.898	41.594	-1.67%	3.71%
			820	0.884	43.128	0.899	41.578	-1.67%	3.73%
			835	0.889	43.103	0.900	41.500	-1.22%	3.86%
			850	0.894	43.072	0.916	41.500	-2.40%	3.79%
11/08/2021	1750 Head	21.1	1710	1.320	38.895	1.348	40.142	-2.08%	-3.11%
			1720	1.326	38.884	1.354	40.126	-2.07%	-3.10%
			1745	1.340	38.857	1.368	40.087	-2.05%	-3.07%
			1750	1.343	38.849	1.371	40.079	-2.04%	-3.07%
			1770	1.354	38.816	1.383	40.047	-2.10%	-3.07%
			1790	1.367	38.784	1.394	40.016	-1.94%	-3.08%
11/18/2021	1750 Head	20.4	1710	1.292	39.153	1.348	40.142	-4.15%	-2.46%
			1720	1.301	39.116	1.354	40.126	-3.91%	-2.52%
			1745	1.322	39.012	1.368	40.087	-3.36%	-2.68%
			1750	1.327	38.990	1.371	40.079	-3.21%	-2.72%
			1770	1.345	38.903	1.383	40.047	-2.75%	-2.86%
			1790	1.365	38.825	1.394	40.016	-2.08%	-2.98%
11/22/2021	1750 Head	20.3	1710	1.318	39.480	1.348	40.142	-2.23%	-1.65%
			1720	1.327	39.445	1.354	40.126	-1.99%	-1.70%
			1745	1.351	39.343	1.368	40.087	-1.24%	-1.86%
			1750	1.355	39.320	1.371	40.079	-1.17%	-1.89%
			1770	1.375	39.228	1.383	40.047	-0.58%	-2.05%
			1790	1.395	39.141	1.394	40.016	0.07%	-2.19%
12/07/2021	1750 Head	22.3	1710	1.363	39.723	1.348	40.142	1.11%	-1.04%
			1720	1.369	39.706	1.354	40.126	1.11%	-1.05%
			1745	1.384	39.660	1.368	40.087	1.17%	-1.07%
			1750	1.387	39.651	1.371	40.079	1.17%	-1.07%
			1770	1.398	39.612	1.383	40.047	1.08%	-1.09%
			1790	1.409	39.573	1.394	40.016	1.08%	-1.11%
11/08/2021	1900 Head	21.1	1850	1.402	38.700	1.400	40.000	0.14%	-3.25%
			1860	1.408	38.678	1.400	40.000	0.57%	-3.31%
			1880	1.421	38.642	1.400	40.000	1.50%	-3.39%
			1900	1.433	38.618	1.400	40.000	2.36%	-3.45%
			1905	1.436	38.613	1.400	40.000	2.57%	-3.47%
			1910	1.439	38.607	1.400	40.000	2.79%	-3.48%
12/06/2021	1900 Head	25.0	1850	1.340	39.784	1.400	40.000	-4.29%	-0.54%
			1860	1.351	39.738	1.400	40.000	-3.50%	-0.66%
			1880	1.373	39.664	1.400	40.000	-1.93%	-0.84%
			1900	1.393	39.613	1.400	40.000	-0.50%	-0.97%
			1905	1.398	39.598	1.400	40.000	-0.14%	-1.01%
			1910	1.402	39.582	1.400	40.000	0.14%	-1.05%
11/15/2021	2450 Head	24.1	2300	1.683	38.616	1.670	39.500	0.78%	-2.24%
			2310	1.696	38.576	1.679	39.480	1.01%	-2.29%
			2320	1.708	38.538	1.687	39.460	1.24%	-2.34%
			2400	1.798	38.209	1.756	39.289	2.39%	-2.75%
			2450	1.857	38.025	1.800	39.200	3.17%	-3.00%
			2480	1.890	37.884	1.833	39.162	3.11%	-3.26%
			2500	1.913	37.787	1.855	39.136	3.13%	-3.45%
			2510	1.926	37.745	1.866	39.123	3.22%	-3.52%
			2535	1.956	37.652	1.893	39.092	3.33%	-3.68%
			2550	1.973	37.599	1.909	39.073	3.35%	-3.77%
			2560	1.984	37.557	1.920	39.060	3.33%	-3.85%
			2600	2.030	37.378	1.964	39.009	3.36%	-4.18%
			2650	2.088	37.187	2.018	38.945	3.47%	-4.51%
			2680	2.123	37.053	2.051	38.907	3.51%	-4.77%
			2700	2.146	36.971	2.073	38.882	3.52%	-4.91%

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**Table 10-2
Measured Head Tissue Properties (cont.)**

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ			
11/19/2021	2450 Head	24.1	2300	1.676	39.371	1.670	39.500	0.36%	-0.33%			
			2310	1.688	39.329	1.679	39.480	0.54%	-0.36%			
			2320	1.700	39.291	1.687	39.460	0.77%	-0.43%			
			2400	1.793	38.970	1.756	39.289	2.11%	-0.81%			
			2450	1.851	38.777	1.800	39.200	2.83%	-1.08%			
			2480	1.885	38.650	1.833	39.162	2.84%	-1.31%			
			2500	1.908	38.557	1.855	39.136	2.86%	-1.48%			
			2510	1.919	38.515	1.866	39.123	2.84%	-1.55%			
			2535	1.948	38.422	1.893	39.092	2.91%	-1.71%			
			2550	1.966	38.367	1.909	39.073	2.99%	-1.81%			
			2560	1.978	38.328	1.920	39.060	3.02%	-1.87%			
			2600	2.025	38.156	1.964	39.009	3.11%	-2.19%			
			2650	2.080	37.961	2.018	38.945	3.07%	-2.53%			
			2680	2.118	37.832	2.051	38.907	3.27%	-2.76%			
			2700	2.142	37.757	2.073	38.882	3.33%	-2.89%			
			11/22/2021	5200-5800 Head	20.1	5180	4.592	35.809	4.635	36.009	-0.93%	-0.56%
						5190	4.605	35.779	4.645	35.998	-0.86%	-0.61%
5200	4.618	35.745				4.655	35.986	-0.79%	-0.67%			
5210	4.629	35.713				4.666	35.975	-0.79%	-0.73%			
5220	4.639	35.692				4.676	35.963	-0.79%	-0.75%			
5240	4.664	35.667				4.696	35.940	-0.68%	-0.76%			
5250	4.677	35.660				4.706	35.929	-0.62%	-0.75%			
5260	4.687	35.649				4.717	35.917	-0.64%	-0.75%			
5270	4.698	35.629				4.727	35.906	-0.61%	-0.77%			
5280	4.707	35.605				4.737	35.894	-0.63%	-0.81%			
5290	4.718	35.580				4.748	35.883	-0.63%	-0.84%			
5300	4.727	35.560				4.758	35.871	-0.65%	-0.87%			
5310	4.737	35.537				4.768	35.860	-0.65%	-0.90%			
5320	4.749	35.516				4.778	35.849	-0.61%	-0.93%			
5500	4.951	35.213				4.963	35.643	-0.24%	-1.21%			
5510	4.961	35.192				4.973	35.632	-0.24%	-1.23%			
5520	4.974	35.168				4.983	35.620	-0.18%	-1.27%			
5530	4.987	35.148				4.994	35.609	-0.14%	-1.29%			
5540	5.001	35.135				5.004	35.597	-0.06%	-1.30%			
5550	5.015	35.116				5.014	35.586	0.02%	-1.32%			
5560	5.026	35.103				5.024	35.574	0.04%	-1.32%			
5580	5.048	35.063				5.045	35.551	0.06%	-1.37%			
5600	5.069	35.014				5.065	35.529	0.08%	-1.45%			
5610	5.082	34.994				5.076	35.518	0.12%	-1.48%			
5620	5.095	34.980				5.086	35.506	0.16%	-1.48%			
5640	5.121	34.948				5.106	35.483	0.29%	-1.51%			
5660	5.141	34.914				5.127	35.460	0.27%	-1.54%			
5670	5.152	34.894				5.137	35.449	0.29%	-1.57%			
5680	5.165	34.875				5.147	35.437	0.35%	-1.59%			
5690	5.178	34.857				5.158	35.426	0.39%	-1.61%			
5700	5.189	34.838				5.168	35.414	0.41%	-1.63%			
5710	5.201	34.819				5.178	35.403	0.44%	-1.65%			
5720	5.213	34.806				5.188	35.391	0.48%	-1.65%			
5745	5.241	34.765				5.214	35.363	0.52%	-1.69%			
5750	5.246	34.759				5.219	35.357	0.52%	-1.69%			
5755	5.252	34.750				5.224	35.351	0.54%	-1.70%			
5765	5.263	34.732				5.234	35.340	0.55%	-1.72%			
5775	5.275	34.701				5.245	35.329	0.57%	-1.78%			
5785	5.287	34.675				5.255	35.317	0.61%	-1.82%			
5795	5.299	34.661				5.265	35.305	0.65%	-1.82%			
5805	5.310	34.654				5.275	35.294	0.66%	-1.81%			
5825	5.333	34.631	5.296	35.271	0.70%	-1.81%						
5835	5.345	34.602	5.305	35.230	0.75%	-1.78%						
5845	5.356	34.578	5.315	35.210	0.77%	-1.79%						
5855	5.367	34.566	5.325	35.197	0.79%	-1.79%						
5875	5.392	34.538	5.347	35.183	0.84%	-1.83%						
5885	5.402	34.508	5.357	35.177	0.84%	-1.90%						
5905	5.428	34.480	5.379	35.163	0.91%	-1.94%						
12/06/2021	5200-5800 Head	22.0	5800	5.293	34.765	5.270	35.300	0.44%	-1.52%			
			5805	5.299	34.757	5.275	35.294	0.45%	-1.52%			
			5825	5.317	34.707	5.296	35.271	0.40%	-1.60%			
			5835	5.327	34.684	5.305	35.230	0.41%	-1.55%			
			5845	5.339	34.671	5.315	35.210	0.45%	-1.53%			
			5855	5.356	34.659	5.325	35.197	0.58%	-1.53%			
			5865	5.369	34.639	5.336	35.190	0.62%	-1.57%			
			5865	5.369	34.639	5.336	35.190	0.62%	-1.57%			
			5865	5.369	34.639	5.336	35.190	0.62%	-1.57%			
			5875	5.380	34.619	5.347	35.183	0.62%	-1.60%			
			5885	5.392	34.601	5.357	35.177	0.65%	-1.64%			
5905	5.414	34.583	5.379	35.163	0.65%	-1.65%						

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**Table 10-3
Measured Body Tissue Properties (cont.)**

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
11/04/2021	750 Body	20.5	680	0.935	55.145	0.958	55.804	-2.40%	-1.18%
			695	0.940	55.116	0.959	55.745	-1.98%	-1.13%
			700	0.942	55.101	0.959	55.726	-1.77%	-1.12%
			710	0.946	55.066	0.960	55.687	-1.46%	-1.12%
			725	0.951	55.012	0.961	55.629	-1.04%	-1.11%
			750	0.960	54.934	0.964	55.531	-0.41%	-1.08%
			770	0.968	54.905	0.965	55.453	0.31%	-0.99%
			785	0.975	54.891	0.966	55.395	0.93%	-0.91%
			800	0.981	54.858	0.967	55.336	1.45%	-0.86%
			11/08/2021	750 Body	21.0	680	0.939	54.380	0.958
695	0.944	54.336				0.959	55.745	-1.56%	-2.53%
700	0.946	54.320				0.959	55.726	-1.36%	-2.52%
710	0.950	54.288				0.960	55.687	-1.04%	-2.51%
725	0.955	54.243				0.961	55.629	-0.62%	-2.49%
750	0.964	54.187				0.964	55.531	0.00%	-2.42%
770	0.971	54.147				0.965	55.453	0.62%	-2.36%
785	0.977	54.117				0.966	55.395	1.14%	-2.31%
800	0.983	54.080				0.967	55.336	1.65%	-2.27%
11/01/2021	835 Body	22.9				815	1.010	52.869	0.968
			820	1.012	52.851	0.969	55.258	4.44%	-4.36%
			835	1.018	52.803	0.970	55.200	4.95%	-4.34%
			850	1.024	52.765	0.988	55.154	3.64%	-4.33%
11/09/2021	835 Body	22.5	815	1.003	54.766	0.968	55.271	3.62%	-0.91%
			820	1.004	54.757	0.969	55.258	3.61%	-0.91%
			835	1.010	54.725	0.970	55.200	4.12%	-0.86%
			850	1.017	54.700	0.988	55.154	2.94%	-0.82%
11/29/2021	835 Body	19.1	815	0.955	52.870	0.968	55.271	-1.34%	-4.34%
			820	0.957	52.863	0.969	55.258	-1.24%	-4.33%
			835	0.964	52.834	0.970	55.200	-0.62%	-4.29%
			850	0.969	52.789	0.988	55.154	-1.92%	-4.29%
11/29/2021	1750 Body	21.9	1710	1.406	52.289	1.463	53.537	-3.90%	-2.33%
			1720	1.413	52.277	1.469	53.511	-3.81%	-2.31%
			1745	1.429	52.243	1.485	53.445	-3.77%	-2.25%
			1750	1.432	52.236	1.488	53.432	-3.76%	-2.24%
			1770	1.445	52.212	1.501	53.379	-3.73%	-2.19%
			1790	1.458	52.182	1.514	53.326	-3.70%	-2.15%
12/06/2021	1750 Body	21.2	1710	1.446	53.405	1.463	53.537	-1.16%	-0.25%
			1720	1.454	53.386	1.469	53.511	-1.02%	-0.23%
			1745	1.471	53.335	1.485	53.445	-0.94%	-0.21%
			1750	1.474	53.323	1.488	53.432	-0.94%	-0.20%
			1770	1.487	53.282	1.501	53.379	-0.93%	-0.18%
			1790	1.501	53.248	1.514	53.326	-0.86%	-0.15%
12/09/2021	1750 Body	21.2	1710	1.446	53.544	1.463	53.537	-1.16%	0.01%
			1720	1.453	53.525	1.469	53.511	-1.09%	0.03%
			1745	1.469	53.473	1.485	53.445	-1.08%	0.05%
			1750	1.473	53.465	1.488	53.432	-1.01%	0.06%
			1770	1.486	53.428	1.501	53.379	-1.00%	0.09%
			1790	1.499	53.404	1.514	53.326	-0.99%	0.15%
12/12/2021	1750 Body	21.2	1710	1.434	52.596	1.463	53.537	-1.98%	-1.76%
			1720	1.442	52.584	1.469	53.511	-1.84%	-1.73%
			1745	1.460	52.549	1.485	53.445	-1.68%	-1.68%
			1750	1.463	52.542	1.488	53.432	-1.68%	-1.67%
			1770	1.477	52.511	1.501	53.379	-1.60%	-1.63%
			1790	1.491	52.480	1.514	53.326	-1.52%	-1.59%
12/13/2021	1750 Body	21.5	1710	1.487	52.329	1.463	53.537	1.64%	-2.26%
			1720	1.498	52.294	1.469	53.511	1.97%	-2.27%
			1745	1.527	52.201	1.485	53.445	2.83%	-2.33%
			1750	1.533	52.181	1.488	53.432	3.02%	-2.34%
			1770	1.557	52.100	1.501	53.379	3.73%	-2.40%
			1790	1.580	52.018	1.514	53.326	4.36%	-2.45%
11/16/2021	1900 Body	21.2	1850	1.536	52.256	1.520	53.300	1.05%	-1.96%
			1860	1.543	52.239	1.520	53.300	1.51%	-1.99%
			1880	1.558	52.211	1.520	53.300	2.50%	-2.04%
			1900	1.572	52.189	1.520	53.300	3.42%	-2.08%
			1905	1.575	52.180	1.520	53.300	3.62%	-2.10%
			1910	1.579	52.173	1.520	53.300	3.88%	-2.11%
11/29/2021	1900 Body	20.9	1850	1.457	53.235	1.520	53.300	-4.14%	-0.12%
			1860	1.463	53.221	1.520	53.300	-3.75%	-0.15%
			1880	1.477	53.195	1.520	53.300	-2.83%	-0.20%
			1900	1.491	53.165	1.520	53.300	-1.91%	-0.25%
			1905	1.494	53.157	1.520	53.300	-1.71%	-0.27%
			1910	1.497	53.149	1.520	53.300	-1.51%	-0.28%

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**Table 10-4
Measured Body Tissue Properties (cont.)**




Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
11/29/2021	1900 Body	21.9	1850	1.496	52.072	1.520	53.300	-1.58%	-2.30%
			1860	1.503	52.059	1.520	53.300	-1.12%	-2.33%
			1880	1.515	52.041	1.520	53.300	-0.33%	-2.36%
			1900	1.527	52.026	1.520	53.300	0.46%	-2.39%
			1905	1.530	52.023	1.520	53.300	0.66%	-2.40%
			1910	1.533	52.019	1.520	53.300	0.86%	-2.40%
12/02/2021	1900 Body	24.7	1850	1.495	52.864	1.520	53.300	-1.64%	-0.82%
			1860	1.506	52.828	1.520	53.300	-0.92%	-0.89%
			1880	1.527	52.758	1.520	53.300	0.46%	-1.02%
			1900	1.548	52.695	1.520	53.300	1.84%	-1.14%
			1905	1.553	52.678	1.520	53.300	2.17%	-1.17%
			1910	1.558	52.660	1.520	53.300	2.50%	-1.20%
12/06/2021	1900 Body	24.8	1850	1.513	52.045	1.520	53.300	-0.46%	-2.35%
			1860	1.524	52.012	1.520	53.300	0.26%	-2.42%
			1880	1.546	51.943	1.520	53.300	1.71%	-2.55%
			1900	1.569	51.879	1.520	53.300	3.22%	-2.67%
			1905	1.574	51.864	1.520	53.300	3.55%	-2.69%
			1910	1.580	51.847	1.520	53.300	3.95%	-2.73%
11/01/2021	2450 Body	22.0	2300	1.797	52.645	1.809	52.900	-0.66%	-0.48%
			2310	1.811	52.612	1.816	52.887	-0.28%	-0.52%
			2320	1.825	52.580	1.826	52.873	-0.05%	-0.55%
			2400	1.931	52.275	1.902	52.767	1.52%	-0.93%
			2450	1.998	52.105	1.950	52.700	2.46%	-1.13%
			2480	2.038	51.972	1.993	52.662	2.26%	-1.31%
			2500	2.066	51.888	2.021	52.636	2.23%	-1.42%
			2510	2.080	51.856	2.035	52.623	2.21%	-1.46%
			2535	2.115	51.785	2.071	52.592	2.12%	-1.53%
			2550	2.134	51.736	2.092	52.573	2.01%	-1.59%
			2560	2.147	51.694	2.106	52.560	1.95%	-1.65%
			2600	2.203	51.528	2.163	52.509	1.85%	-1.87%
			2650	2.275	51.348	2.234	52.445	1.84%	-2.09%
			2680	2.316	51.239	2.277	52.407	1.71%	-2.23%
			2700	2.344	51.165	2.305	52.382	1.69%	-2.32%
			11/03/2021	2450 Body	22.3	2300	1.809	53.403	1.809
2310	1.823	53.374				1.816	52.887	0.39%	0.92%
2320	1.836	53.347				1.826	52.873	0.55%	0.90%
2400	1.943	53.081				1.902	52.767	2.16%	0.60%
2450	2.013	52.930				1.950	52.700	3.23%	0.44%
2480	2.053	52.803				1.993	52.662	3.01%	0.27%
2500	2.083	52.724				2.021	52.636	3.07%	0.17%
2510	2.098	52.690				2.035	52.623	3.10%	0.13%
2535	2.134	52.611				2.071	52.592	3.04%	0.04%
2550	2.155	52.560				2.092	52.573	3.01%	-0.02%
2560	2.168	52.520				2.106	52.560	2.94%	-0.08%
2600	2.227	52.346				2.163	52.509	2.96%	-0.31%
2650	2.299	52.151				2.234	52.445	2.91%	-0.56%
2680	2.342	52.028				2.277	52.407	2.85%	-0.72%
2700	2.370	51.946				2.305	52.382	2.82%	-0.83%
11/10/2021	2450 Body	22.5				2300	1.794	52.782	1.809
			2310	1.808	52.748	1.816	52.887	-0.44%	-0.26%
			2320	1.822	52.717	1.826	52.873	-0.22%	-0.30%
			2400	1.929	52.411	1.902	52.767	1.42%	-0.67%
			2450	1.997	52.243	1.950	52.700	2.41%	-0.87%
			2480	2.035	52.117	1.993	52.662	2.11%	-1.03%
			2500	2.063	52.037	2.021	52.636	2.08%	-1.14%
			2510	2.077	52.001	2.035	52.623	2.06%	-1.18%
			2535	2.112	51.912	2.071	52.592	1.98%	-1.29%
			2550	2.132	51.857	2.092	52.573	1.91%	-1.36%
			2560	2.146	51.822	2.106	52.560	1.90%	-1.40%
			2600	2.201	51.661	2.163	52.509	1.76%	-1.61%
			2650	2.271	51.470	2.234	52.445	1.66%	-1.86%
			2680	2.313	51.363	2.277	52.407	1.58%	-1.99%
			2700	2.341	51.286	2.305	52.382	1.56%	-2.09%
			11/12/2021	2450 Body	22.7	2300	1.815	53.509	1.809
2310	1.830	53.476				1.816	52.887	0.77%	1.11%
2320	1.844	53.445				1.826	52.873	0.99%	1.08%
2400	1.954	53.132				1.902	52.767	2.73%	0.69%
2450	2.024	52.959				1.950	52.700	3.79%	0.49%
2480	2.064	52.822				1.993	52.662	3.56%	0.30%
2500	2.092	52.738				2.021	52.636	3.51%	0.19%
2510	2.107	52.698				2.035	52.623	3.54%	0.14%
2535	2.144	52.601				2.071	52.592	3.52%	0.02%
2550	2.164	52.543				2.092	52.573	3.44%	-0.06%
2560	2.178	52.504				2.106	52.560	3.42%	-0.11%
2600	2.233	52.340				2.163	52.509	3.24%	-0.32%
2650	2.305	52.138				2.234	52.445	3.18%	-0.59%
2680	2.346	52.025				2.277	52.407	3.03%	-0.73%
2700	2.373	51.940				2.305	52.382	2.95%	-0.84%

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

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
11/09/2021	5200-5800 Body	20.8	5180	5.276	47.217	5.276	49.041	0.00%	-3.72%
			5190	5.289	47.200	5.288	49.028	0.02%	-3.73%
			5200	5.306	47.184	5.299	49.014	0.13%	-3.73%
			5210	5.322	47.164	5.311	49.001	0.21%	-3.75%
			5220	5.336	47.138	5.323	48.987	0.24%	-3.77%
			5240	5.368	47.107	5.346	48.960	0.41%	-3.78%
			5250	5.382	47.092	5.358	48.947	0.45%	-3.79%
			5260	5.394	47.067	5.369	48.933	0.47%	-3.81%
			5270	5.407	47.043	5.381	48.919	0.48%	-3.83%
			5280	5.419	47.014	5.393	48.906	0.48%	-3.87%
			5290	5.431	46.994	5.404	48.892	0.50%	-3.88%
			5300	5.447	46.977	5.416	48.879	0.57%	-3.89%
			5310	5.463	46.959	5.428	48.865	0.64%	-3.90%
			5320	5.480	46.943	5.439	48.851	0.75%	-3.91%
			5500	5.732	46.597	5.650	48.607	1.45%	-4.14%
			5510	5.744	46.583	5.661	48.594	1.47%	-4.14%
			5520	5.755	46.560	5.673	48.580	1.45%	-4.16%
			5530	5.769	46.545	5.685	48.566	1.48%	-4.16%
			5540	5.786	46.519	5.696	48.553	1.58%	-4.19%
			5550	5.804	46.492	5.708	48.539	1.68%	-4.22%
			5560	5.822	46.479	5.720	48.526	1.78%	-4.22%
			5580	5.849	46.450	5.743	48.499	1.85%	-4.22%
			5600	5.877	46.409	5.766	48.471	1.93%	-4.25%
			5610	5.893	46.387	5.778	48.458	1.99%	-4.27%
			5620	5.908	46.367	5.790	48.444	2.04%	-4.29%
			5640	5.940	46.324	5.813	48.417	2.18%	-4.32%
			5660	5.967	46.291	5.837	48.390	2.23%	-4.34%
			5670	5.979	46.270	5.848	48.376	2.24%	-4.35%
			5680	5.997	46.249	5.860	48.363	2.34%	-4.37%
			5690	6.014	46.227	5.872	48.349	2.42%	-4.39%
			5700	6.032	46.212	5.883	48.336	2.53%	-4.39%
			5710	6.046	46.200	5.895	48.322	2.56%	-4.39%
			5720	6.061	46.187	5.907	48.309	2.61%	-4.39%
			5745	6.094	46.121	5.936	48.275	2.66%	-4.46%
			5750	6.101	46.111	5.942	48.268	2.68%	-4.47%
			5755	6.108	46.100	5.947	48.261	2.71%	-4.48%
			5765	6.122	46.076	5.959	48.248	2.74%	-4.50%
			5775	6.136	46.053	5.971	48.234	2.76%	-4.52%
			5785	6.152	46.041	5.982	48.220	2.84%	-4.52%
			5795	6.168	46.029	5.994	48.207	2.90%	-4.52%
			5800	6.178	46.022	6.000	48.200	2.97%	-4.52%
			5805	6.187	46.015	6.006	48.193	3.01%	-4.52%
			5825	6.217	45.964	6.029	48.166	3.12%	-4.57%
			5835	6.231	45.948	6.042	48.130	3.13%	-4.53%
			5845	6.245	45.930	6.054	48.110	3.15%	-4.53%
			5855	6.256	45.916	6.066	48.093	3.13%	-4.53%
			5865	6.266	45.895	6.077	48.080	3.11%	-4.54%
			5875	6.281	45.879	6.088	48.067	3.17%	-4.55%
5885	6.299	45.864	6.100	48.053	3.26%	-4.56%			
5905	6.333	45.825	6.122	48.027	3.45%	-4.58%			
12/09/2021	5200-5800 Body	22.8	5800	6.231	46.441	6.000	48.200	3.85%	-3.65%
			5805	6.238	46.428	6.006	48.193	3.86%	-3.66%
			5825	6.261	46.358	6.029	48.166	3.85%	-3.75%
			5835	6.273	46.342	6.042	48.130	3.82%	-3.71%
			5845	6.290	46.324	6.054	48.110	3.90%	-3.71%
			5855	6.309	46.298	6.066	48.093	4.01%	-3.73%
			5865	6.324	46.267	6.077	48.080	4.06%	-3.77%
			5875	6.337	46.235	6.088	48.067	4.09%	-3.81%
			5885	6.352	46.217	6.100	48.053	4.13%	-3.82%
			5905	6.377	46.182	6.122	48.027	4.17%	-3.84%

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 F.

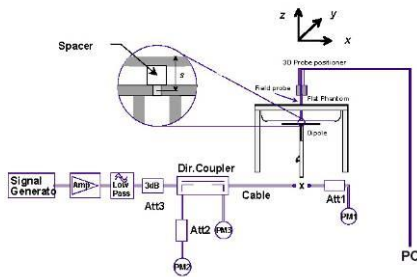
Table 10-6
System Verification Results – 1g

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 SAR1g (W/kg)	1W Target SAR1g (W/kg)	1W Normalized SAR 1g (W/kg)	Deviation1g (%)
K4	750	HEAD	11/03/2021	21.5	21.1	0.20	1046	7640	1.610	8.59	8.050	-6.29%
K4	835	HEAD	11/01/2021	20.5	19.5	0.20	4d119	7640	2.040	9.64	10.200	5.81%
K4	835	HEAD	11/04/2021	21.0	20.0	0.20	4d119	7640	1.990	9.64	9.950	3.22%
AM4	835	HEAD	11/15/2021	21.9	21.5	0.20	4d040	7427	1.750	9.50	8.750	-7.89%
AM2	1750	HEAD	11/08/2021	20.9	19.9	0.10	1083	7532	3.430	36.10	34.300	-4.99%
AM4	1750	HEAD	11/18/2021	21.5	21.3	0.10	1083	7427	3.450	36.10	34.500	-4.43%
AM5	1750	HEAD	11/22/2021	20.3	20.3	0.10	1083	7546	3.570	36.10	35.700	-1.11%
A	1750	HEAD	12/07/2021	22.5	22.1	0.10	1148	7406	3.610	35.90	36.100	0.56%
AM2	1900	HEAD	11/08/2021	20.9	19.9	0.10	5d030	7532	4.040	39.90	40.400	1.25%
A	1900	HEAD	12/06/2021	22.9	23.0	0.10	5d149	7406	4.230	40.50	42.300	4.44%
AM9	2450	HEAD	11/15/2021	23.1	24.0	0.10	750	3949	5.140	53.10	51.400	-3.20%
AM9	2450	HEAD	11/19/2021	23.5	22.9	0.10	750	3949	5.030	53.10	50.300	-5.27%
AM9	2600	HEAD	11/15/2021	23.1	24.0	0.10	1042	3949	6.000	57.70	60.000	3.99%
AM2	5250	HEAD	11/22/2021	20.9	20.1	0.05	1123	7532	3.900	82.20	78.000	-5.11%
AM2	5600	HEAD	11/22/2021	20.9	20.1	0.05	1123	7532	4.220	84.50	84.400	-0.12%
AM2	5750	HEAD	11/22/2021	20.9	20.1	0.05	1123	7532	3.950	81.30	79.000	-2.83%
B	5800	HEAD	12/06/2021	22.5	22.0	0.05	1191	7552	4.020	79.20	80.400	1.52%
K1	750	BODY	11/04/2021	20.7	20.5	0.20	1034	7558	1.660	8.91	8.300	-6.85%
K4	750	BODY	11/08/2021	24.0	20.3	0.20	1046	7640	1.740	8.79	8.700	-1.02%
K1	835	BODY	11/01/2021	22.9	22.9	0.20	4d180	7558	2.010	9.67	10.050	3.93%
K4	835	BODY	11/09/2021	22.6	22.5	0.20	4d119	7640	2.090	9.90	10.450	5.56%
AM9	850	BODY	11/29/2021	19.6	18.5	0.20	1010	3949	1.970	9.97	9.850	-1.20%
AM6	1750	BODY	11/29/2021	21.4	20.5	0.10	1083	7416	3.810	37.10	38.100	2.70%
G	1750	BODY	12/06/2021	22.4	21.2	0.10	1150	7357	3.910	37.80	39.100	3.44%
G	1750	BODY	12/09/2021	23.2	21.2	0.10	1148	7357	3.780	36.30	37.800	4.13%
D	1750	BODY	12/13/2021	21.9	20.8	0.10	1150	3589	4.010	37.80	40.100	6.08%
AM6	1900	BODY	11/16/2021	22.5	21.2	0.10	5d030	7416	4.170	39.90	41.700	4.51%
AM3	1900	BODY	11/29/2021	22.7	21.2	0.10	5d030	7421	3.920	39.90	39.200	-1.75%
P	1900	BODY	12/02/2021	23.3	22.7	0.10	5d148	7410	4.130	39.10	41.300	5.63%
P	1900	BODY	12/06/2021	23.3	22.9	0.10	5d148	7410	4.190	39.10	41.900	7.16%
AM6	2450	BODY	11/01/2021	22.9	21.7	0.10	750	7416	5.290	51.00	52.900	3.73%
AM6	2450	BODY	11/03/2021	23.3	21.5	0.10	750	7416	5.320	51.00	53.200	4.31%
AM6	2450	BODY	11/10/2021	23.0	22.2	0.10	750	7416	5.230	51.00	52.300	2.55%
AM6	2600	BODY	11/10/2021	23.0	22.2	0.10	1042	7416	5.650	55.20	56.500	2.36%
AM2	5250	BODY	11/09/2021	23.8	21.9	0.05	1163	7532	3.640	76.30	72.800	-4.59%
AM2	5600	BODY	11/09/2021	23.8	21.9	0.05	1163	7532	3.890	76.30	77.800	1.97%
AM2	5750	BODY	11/09/2021	23.8	21.9	0.05	1163	7532	3.600	76.30	72.000	-5.64%
B	5800	BODY	12/09/2021	23.0	22.5	0.05	1191	7552	3.810	73.50	76.200	3.67%

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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 SAR10g (W/kg)	1W Target SAR10g (W/kg)	1W Normalized SAR10g (W/kg)	Deviation10g (%)
G	1750	BODY	12/06/2021	22.4	21.2	0.10	1150	7357	2.080	20.00	20.800	4.00%
G	1750	BODY	12/12/2021	22.2	21.2	0.10	1150	7357	1.990	20.00	19.900	-0.50%
D	1750	BODY	12/13/2021	21.9	20.8	0.10	1150	3589	2.120	20.00	21.200	6.00%
AM6	1900	BODY	11/29/2021	21.4	20.5	0.10	5d030	7416	2.220	21.10	22.200	5.21%
P	1900	BODY	12/06/2021	23.3	22.9	0.10	5d148	7410	2.140	20.50	21.400	4.39%
AM6	2450	BODY	11/12/2021	23.3	23.2	0.10	750	7416	2.430	24.10	24.300	0.83%
AM6	2600	BODY	11/12/2021	23.3	23.2	0.10	1042	7416	2.570	24.90	25.700	3.21%
AM2	5250	BODY	11/09/2021	23.8	21.9	0.05	1163	7532	1.020	21.10	20.400	-3.32%
AM2	5600	BODY	11/09/2021	23.8	21.9	0.05	1163	7532	1.090	21.10	21.800	3.32%
AM2	5750	BODY	11/09/2021	23.8	21.9	0.05	1163	7532	1.000	20.90	20.000	-4.31%
B	5800	BODY	12/09/2021	23.0	22.5	0.05	1191	7552	1.080	20.20	21.600	6.93%



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



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

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11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

**Table 11-1
GSM 850 Head SAR**



MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
848.80	251	GSM 850	GSM	33.0	31.68	0.07	Right	Cheek	A	1462M	1:8.3	0.175	1.355	0.237	A1
848.80	251	GSM 850	GSM	33.0	31.68	-0.05	Right	Tilt	A	1462M	1:8.3	0.093	1.355	0.126	
848.80	251	GSM 850	GSM	33.0	31.68	0.02	Left	Cheek	A	1462M	1:8.3	0.146	1.355	0.198	
848.80	251	GSM 850	GSM	33.0	31.68	-0.02	Left	Tilt	A	1462M	1:8.3	0.082	1.355	0.111	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

**Table 11-2
GSM 1900 Head SAR**

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1880.00	661	GSM 1900	GSM	30.0	29.16	-0.07	Right	Cheek	A	1324M	1:8.3	0.032	1.213	0.039	
1880.00	661	GSM 1900	GSM	30.0	29.16	0.07	Right	Tilt	A	1324M	1:8.3	0.021	1.213	0.025	
1880.00	661	GSM 1900	GSM	30.0	29.16	0.01	Left	Cheek	A	1324M	1:8.3	0.056	1.213	0.068	A2
1880.00	661	GSM 1900	GSM	30.0	29.16	-0.12	Left	Tilt	A	1324M	1:8.3	0.020	1.213	0.024	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

**Table 11-3
UMTS 850 Head SAR**

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
846.60	4233	UMTS 850	RMC	25.0	24.21	112	0.06	Right	Cheek	A	1462M	1:1	0.226	1.199	0.271	A3
846.60	4233	UMTS 850	RMC	25.0	24.21	112	0.02	Right	Tilt	A	1462M	1:1	0.122	1.199	0.146	
846.60	4233	UMTS 850	RMC	25.0	24.21	112	0.03	Left	Cheek	A	1462M	1:1	0.196	1.199	0.235	
846.60	4233	UMTS 850	RMC	25.0	24.21	112	0.02	Left	Tilt	A	1462M	1:1	0.114	1.199	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									

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**Table 11-4
UMTS 1750 Head SAR**




MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
1732.40	1412	UMTS 1750	RMC	24.0	23.28	22	0.00	Right	Cheek	A	3721R	1:1	0.113	1.180	0.133	
1732.40	1412	UMTS 1750	RMC	24.0	23.28	22	-0.07	Right	Tilt	A	3721R	1:1	0.123	1.180	0.145	
1732.40	1412	UMTS 1750	RMC	24.0	23.28	22	0.00	Left	Cheek	A	3721R	1:1	0.284	1.180	0.335	A4
1732.40	1412	UMTS 1750	RMC	24.0	23.28	22	0.05	Left	Tilt	A	3721R	1:1	0.078	1.180	0.092	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram						

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

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
1880.00	9400	UMTS 1900	RMC	24.0	23.03	1	-0.12	Right	Cheek	A	1324M	1:1	0.096	1.250	0.120	
1880.00	9400	UMTS 1900	RMC	24.0	23.03	1	-0.10	Right	Tilt	A	1324M	1:1	0.072	1.250	0.090	
1880.00	9400	UMTS 1900	RMC	24.0	23.03	1	0.06	Left	Cheek	A	1324M	1:1	0.151	1.250	0.189	A5
1880.00	9400	UMTS 1900	RMC	24.0	23.03	1	-0.12	Left	Tilt	A	1324M	1:1	0.053	1.250	0.066	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram						

**Table 11-6
LTE Band 12 Head SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.																(W/kg)		(W/kg)		
707.50	23095	Mid	LTE Band 12	10	25.0	24.13	0	0.09	0	Right	Cheek	A	QPSK	1	0	1462M	1:1	0.125	1.222	0.153	A6
707.50	23095	Mid	LTE Band 12	10	24.0	23.07	0	0.05	1	Right	Cheek	A	QPSK	25	12	1462M	1:1	0.105	1.239	0.130	
707.50	23095	Mid	LTE Band 12	10	25.0	24.13	0	0.12	0	Right	Tilt	A	QPSK	1	0	1462M	1:1	0.063	1.222	0.077	
707.50	23095	Mid	LTE Band 12	10	24.0	23.07	0	0.12	1	Right	Tilt	A	QPSK	25	12	1462M	1:1	0.051	1.239	0.063	
707.50	23095	Mid	LTE Band 12	10	25.0	24.13	0	0.14	0	Left	Cheek	A	QPSK	1	0	1462M	1:1	0.093	1.222	0.114	
707.50	23095	Mid	LTE Band 12	10	24.0	23.07	0	0.01	1	Left	Cheek	A	QPSK	25	12	1462M	1:1	0.081	1.239	0.100	
707.50	23095	Mid	LTE Band 12	10	25.0	24.13	0	0.17	0	Left	Tilt	A	QPSK	1	0	1462M	1:1	0.050	1.222	0.061	
707.50	23095	Mid	LTE Band 12	10	24.0	23.07	0	0.12	1	Left	Tilt	A	QPSK	25	12	1462M	1:1	0.043	1.239	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 11-7
LTE Band 13 Head SAR**



MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.																(W/kg)		(W/kg)		
782.00	23230	Mid	LTE Band 13	10	25.0	24.18	112	0.08	0	Right	Cheek	A	QPSK	1	0	1462M	1:1	0.270	1.208	0.326	A7
782.00	23230	Mid	LTE Band 13	10	24.0	23.08	112	0.03	1	Right	Cheek	A	QPSK	25	0	1462M	1:1	0.201	1.236	0.248	
782.00	23230	Mid	LTE Band 13	10	25.0	24.18	112	0.03	0	Right	Tilt	A	QPSK	1	0	1462M	1:1	0.134	1.208	0.162	
782.00	23230	Mid	LTE Band 13	10	24.0	23.08	112	0.07	1	Right	Tilt	A	QPSK	25	0	1462M	1:1	0.099	1.236	0.122	
782.00	23230	Mid	LTE Band 13	10	25.0	24.18	112	-0.02	0	Left	Cheek	A	QPSK	1	0	1462M	1:1	0.211	1.208	0.255	
782.00	23230	Mid	LTE Band 13	10	24.0	23.08	112	0.10	1	Left	Cheek	A	QPSK	25	0	1462M	1:1	0.160	1.236	0.198	
782.00	23230	Mid	LTE Band 13	10	25.0	24.18	112	0.06	0	Left	Tilt	A	QPSK	1	0	1462M	1:1	0.116	1.208	0.140	
782.00	23230	Mid	LTE Band 13	10	24.0	23.08	112	-0.01	1	Left	Tilt	A	QPSK	25	0	1462M	1:1	0.101	1.236	0.125	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Head 1.6 W/kg (mW/g) averaged over 1 gram										

**Table 11-8
LTE Band 26 (Cell) Head SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.																(W/kg)		(W/kg)		
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.13	65	-0.01	0	Right	Cheek	A	QPSK	1	0	3893R	1:1	0.185	1.371	0.254	A8
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.12	65	0.08	1	Right	Cheek	A	QPSK	36	18	3893R	1:1	0.154	1.374	0.212	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.13	65	0.16	0	Right	Tilt	A	QPSK	1	0	3893R	1:1	0.098	1.371	0.134	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.12	65	0.12	1	Right	Tilt	A	QPSK	36	18	3893R	1:1	0.082	1.374	0.113	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.13	65	-0.04	0	Left	Cheek	A	QPSK	1	0	3893R	1:1	0.162	1.371	0.222	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.12	112	0.11	1	Left	Cheek	A	QPSK	36	18	3893R	1:1	0.129	1.374	0.177	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.13	112	0.08	0	Left	Tilt	A	QPSK	1	0	3893R	1:1	0.115	1.371	0.158	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.12	112	0.08	1	Left	Tilt	A	QPSK	36	18	3893R	1:1	0.091	1.374	0.125	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Head 1.6 W/kg (mW/g) averaged over 1 gram										

**Table 11-9
LTE Band 66 (AWS) Head SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.																(W/kg)		(W/kg)		
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	23.08	23	0.18	0	Right	Cheek	A	QPSK	1	50	1324M	1:1	0.099	1.102	0.109	
1720.00	132072	Low	LTE Band 66 (AWS)	20	22.5	22.10	23	-0.01	1	Right	Cheek	A	QPSK	50	25	1324M	1:1	0.054	1.096	0.059	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	23.08	7	-0.11	0	Right	Tilt	A	QPSK	1	50	1324M	1:1	0.080	1.102	0.088	
1720.00	132072	Low	LTE Band 66 (AWS)	20	22.5	22.10	21	0.04	1	Right	Tilt	A	QPSK	50	25	1324M	1:1	0.057	1.096	0.062	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	23.08	23	-0.05	0	Left	Cheek	A	QPSK	1	50	1324M	1:1	0.176	1.102	0.194	A9
1720.00	132072	Low	LTE Band 66 (AWS)	20	22.5	22.10	23	0.00	1	Left	Cheek	A	QPSK	50	25	1324M	1:1	0.144	1.096	0.158	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	23.08	23	0.05	0	Left	Tilt	A	QPSK	1	50	1324M	1:1	0.015	1.102	0.017	
1720.00	132072	Low	LTE Band 66 (AWS)	20	22.5	22.10	23	-0.02	1	Left	Tilt	A	QPSK	50	25	1324M	1:1	0.011	1.096	0.012	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Head 1.6 W/kg (mW/g) averaged over 1 gram										

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**Table 11-10
LTE Band 4 (AWS) Head SAR**



MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #	
MHz	Ch.																			
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.32	-0.03	0	Right	Cheek	I	QPSK	1	50	3891R	1:1	0.157	1.169	0.184	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.10	0.00	0	Right	Cheek	I	QPSK	50	25	3891R	1:1	0.154	1.230	0.189	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.32	-0.09	0	Right	Tilt	I	QPSK	1	50	3891R	1:1	0.240	1.169	0.281	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.10	-0.05	0	Right	Tilt	I	QPSK	50	25	3891R	1:1	0.241	1.230	0.296	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.32	-0.10	0	Left	Cheek	I	QPSK	1	50	3891R	1:1	0.265	1.169	0.310	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.10	0.00	0	Left	Cheek	I	QPSK	50	25	3891R	1:1	0.266	1.230	0.327	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.32	0.02	0	Left	Tilt	I	QPSK	1	50	3891R	1:1	0.334	1.169	0.390	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.10	0.02	0	Left	Tilt	I	QPSK	50	25	3891R	1:1	0.340	1.230	0.418	A10
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 25 (PCS) Head SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #	
MHz	Ch.																				
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.0	22.66	113	0.01	0	Right	Cheek	A	QPSK	1	50	1324M	1:1	0.095	1.081	0.103	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.48	113	-0.02	1	Right	Cheek	A	QPSK	50	25	1324M	1:1	0.078	1.127	0.088	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.0	22.66	113	0.13	0	Right	Tilt	A	QPSK	1	50	1324M	1:1	0.054	1.081	0.058	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.48	113	-0.12	1	Right	Tilt	A	QPSK	50	25	1324M	1:1	0.043	1.127	0.048	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.0	22.66	113	-0.11	0	Left	Cheek	A	QPSK	1	50	1324M	1:1	0.202	1.081	0.218	A11
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.48	113	0.09	1	Left	Cheek	A	QPSK	50	25	1324M	1:1	0.146	1.127	0.165	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.0	22.66	113	0.05	0	Left	Tilt	A	QPSK	1	50	1324M	1:1	0.062	1.081	0.067	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.48	113	0.19	1	Left	Tilt	A	QPSK	50	25	1324M	1:1	0.031	1.127	0.035	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram											

**Table 11-12
LTE Band 41 Head SAR**

MEASUREMENT RESULTS																					
Power Class	FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #	
	MHz	Ch.																			
Power Class 3	2680.00	41490	High	LTE Band 41	20	24.5	23.66	-0.02	0	Right	Cheek	B	QPSK	1	50	1336M	1:1.58	0.013	1.213	0.016	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.61	-0.06	1	Right	Cheek	B	QPSK	50	50	1336M	1:1.58	0.011	1.227	0.013	
Power Class 3	2680.00	41490	High	LTE Band 41	20	24.5	23.66	-0.08	0	Right	Tilt	B	QPSK	1	50	1336M	1:1.58	0.012	1.213	0.015	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.61	0.04	1	Right	Tilt	B	QPSK	50	50	1336M	1:1.58	0.008	1.227	0.010	
Power Class 3	2680.00	41490	High	LTE Band 41	20	24.5	23.66	0.06	0	Left	Cheek	B	QPSK	1	50	1336M	1:1.58	0.019	1.213	0.023	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.61	0.06	1	Left	Cheek	B	QPSK	50	50	1336M	1:1.58	0.014	1.227	0.017	
Power Class 3	2680.00	41490	High	LTE Band 41	20	24.5	23.66	0.18	0	Left	Tilt	B	QPSK	1	50	1336M	1:1.58	0.020	1.213	0.024	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.61	-0.04	1	Left	Tilt	B	QPSK	50	50	1336M	1:1.58	0.014	1.227	0.017	
Power Class 2	2680.00	41490	High	LTE Band 41	20	26.5	25.12	-0.04	0	Left	Tilt	B	QPSK	1	50	1336M	1:2.31	0.021	1.374	0.029	A12
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram											

FCC ID: A3LSMS906E		SAR EVALUATION REPORT		Approved by: Quality Manager
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**Table 11-13
NR Band n5 Head SAR**




MEASUREMENT RESULTS																						
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Side	Test Position	Tune State	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #	
MHz	Ch.																					
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.30	A	0.02	0	Right	Cheek	65	DFT-S-OFDM	QPSK	1	1	1434M	1:1	0.210	1.175	0.247	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.25	A	-0.01	0	Right	Cheek	65	DFT-S-OFDM	QPSK	50	28	1434M	1:1	0.209	1.189	0.249	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.30	A	-0.03	0	Right	Tilt	65	DFT-S-OFDM	QPSK	1	1	1434M	1:1	0.133	1.175	0.156	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.25	A	0.00	0	Right	Tilt	65	DFT-S-OFDM	QPSK	50	28	1434M	1:1	0.128	1.189	0.152	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.30	A	0.08	0	Left	Cheek	65	DFT-S-OFDM	QPSK	1	1	1434M	1:1	0.182	1.175	0.214	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.25	A	0.03	0	Left	Cheek	112	DFT-S-OFDM	QPSK	50	28	1434M	1:1	0.214	1.189	0.254	A13
836.50	167300	Mid	NR Band n5 (Cell)	20	23.5	22.68	A	0.02	1.5	Left	Cheek	65	CP-OFDM	QPSK	1	1	1434M	1:1	0.130	1.208	0.157	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.30	A	0.01	0	Left	Tilt	112	DFT-S-OFDM	QPSK	1	1	1434M	1:1	0.166	1.175	0.195	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.25	A	0.00	0	Left	Tilt	112	DFT-S-OFDM	QPSK	50	28	1434M	1:1	0.171	1.189	0.203	
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
NR Band n66 Head SAR**

MEASUREMENT RESULTS																						
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Side	Test Position	Tune State	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #	
MHz	Ch.																					
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.77	A	0.04	0	Right	Cheek	23	DFT-S-OFDM	QPSK	1	53	1324M	1:1	0.089	1.183	0.105	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.70	A	-0.06	0	Right	Cheek	23	DFT-S-OFDM	QPSK	50	28	1324M	1:1	0.092	1.202	0.111	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.77	A	0.01	0	Right	Tilt	7	DFT-S-OFDM	QPSK	1	53	1324M	1:1	0.090	1.183	0.106	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.70	A	-0.08	0	Right	Tilt	21	DFT-S-OFDM	QPSK	50	28	1324M	1:1	0.089	1.202	0.107	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.77	A	-0.11	0	Left	Cheek	23	DFT-S-OFDM	QPSK	1	53	1324M	1:1	0.173	1.183	0.205	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.70	A	-0.04	0	Left	Cheek	23	DFT-S-OFDM	QPSK	50	28	1324M	1:1	0.182	1.202	0.219	
1770.00	354000	High	NR Band n66 (AWS)	20	23.0	22.22	A	0.04	1.5	Left	Cheek	23	CP-OFDM	QPSK	1	1	1324M	1:1	0.147	1.197	0.176	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.77	A	0.10	0	Left	Tilt	23	DFT-S-OFDM	QPSK	1	53	1324M	1:1	0.078	1.183	0.092	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.70	A	0.04	0	Left	Tilt	23	DFT-S-OFDM	QPSK	50	28	1324M	1:1	0.075	1.202	0.090	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.0	18.71	I	-0.01	0	Right	Cheek	N/A	DFT-S-OFDM	QPSK	1	1	3892R	1:1	0.345	1.069	0.369	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.0	18.65	I	-0.01	0	Right	Cheek	N/A	DFT-S-OFDM	QPSK	50	28	3892R	1:1	0.326	1.084	0.353	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.0	18.71	I	-0.01	0	Right	Tilt	N/A	DFT-S-OFDM	QPSK	1	1	3892R	1:1	0.493	1.069	0.527	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.0	18.65	I	-0.01	0	Right	Tilt	N/A	DFT-S-OFDM	QPSK	50	28	3892R	1:1	0.474	1.084	0.514	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.0	18.71	I	-0.01	0	Left	Cheek	N/A	DFT-S-OFDM	QPSK	1	1	3892R	1:1	0.578	1.069	0.618	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.0	18.65	I	-0.02	0	Left	Cheek	N/A	DFT-S-OFDM	QPSK	50	28	3892R	1:1	0.555	1.084	0.602	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.0	18.71	I	0.03	0	Left	Tilt	N/A	DFT-S-OFDM	QPSK	1	1	3892R	1:1	0.724	1.069	0.774	A14
1745.00	349000	Mid	NR Band n66 (AWS)	20	19.0	18.61	I	-0.07	0	Left	Tilt	N/A	DFT-S-OFDM	QPSK	1	1	3892R	1:1	0.654	1.094	0.715	
1770.00	354000	High	NR Band n66 (AWS)	20	19.0	18.49	I	0.00	0	Left	Tilt	N/A	DFT-S-OFDM	QPSK	1	1	3892R	1:1	0.574	1.125	0.646	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.0	18.65	I	0.01	0	Left	Tilt	N/A	DFT-S-OFDM	QPSK	50	28	3892R	1:1	0.656	1.084	0.713	
1745.00	349000	Mid	NR Band n66 (AWS)	20	19.0	18.45	I	-0.07	0	Left	Tilt	N/A	CP-OFDM	QPSK	1	1	3892R	1:1	0.649	1.135	0.737	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Head 1.6 W/kg (mW/g) averaged over 1 gram										

**Table 11-15
DTS Head SISO SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan (W/kg)	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																		
2437	6	802.11b	DSSS	22	17.0	16.25	-0.17	Right	Cheek	1	3722R	1	99.8	0.026	0.018	1.189	1.002	0.021	
2437	6	802.11b	DSSS	22	17.0	16.25	-0.19	Right	Tilt	1	3722R	1	99.8	0.005	0.003	1.189	1.002	0.004	
2437	6	802.11b	DSSS	22	17.0	16.25	0.07	Left	Cheek	1	3722R	1	99.8	0.003	0.000	1.189	1.002	0.000	
2437	6	802.11b	DSSS	22	17.0	16.25	0.14	Left	Tilt	1	3722R	1	99.8	0.003	0.000	1.189	1.002	0.000	
2462	11	802.11b	DSSS	22	17.0	16.20	0.00	Right	Cheek	2	3722R	1	99.9	0.541	0.360	1.202	1.001	0.433	A15
2462	11	802.11b	DSSS	22	17.0	16.20	-0.01	Right	Tilt	2	3722R	1	99.9	0.078	0.062	1.202	1.001	0.075	
2462	11	802.11b	DSSS	22	17.0	16.20	0.00	Left	Cheek	2	3722R	1	99.9	0.182	0.138	1.202	1.001	0.166	
2462	11	802.11b	DSSS	22	17.0	16.20	0.06	Left	Tilt	2	3722R	1	99.9	0.039	0.032	1.202	1.001	0.039	
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 11-16
DTS Head MIMO SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)	(W/kg)			(W/kg)	
2457	10	802.11n	OFDM	20	17.0	15.40	17.0	15.50	0.03	Right	Cheek	MMO	3892R	13	96.8	0.384	0.237	1.445	1.033	0.354	
2457	10	802.11n	OFDM	20	17.0	15.40	17.0	15.50	-0.09	Right	Tilt	MMO	3892R	13	96.8	0.088	-	1.445	1.033	-	
2457	10	802.11n	OFDM	20	17.0	15.40	17.0	15.50	-0.11	Left	Cheek	MMO	3892R	13	96.8	0.161	-	1.445	1.033	-	
2457	10	802.11n	OFDM	20	17.0	15.40	17.0	15.50	-0.02	Left	Tilt	MMO	3892R	13	96.8	0.042	-	1.445	1.033	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Head 1.6 W/kg (mW/g) averaged over 1 gram									

Note: To achieve the 20.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 17.0 dBm.



**Table 11-17
NII MIMO Head SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)	(W/kg)			(W/kg)	
5290	58	802.11ac	OFDM	80	14.0	12.81	14.0	13.46	-0.06	Right	Cheek	MMO	1025M	58.5	90.5	0.230	0.159	1.315	1.105	0.231	
5290	58	802.11ac	OFDM	80	14.0	12.81	14.0	13.46	0.12	Right	Tilt	MMO	1025M	58.5	90.5	0.128	0.069	1.315	1.105	0.100	
5290	58	802.11ac	OFDM	80	14.0	12.81	14.0	13.46	0.13	Left	Cheek	MMO	1025M	58.5	90.5	0.104	0.066	1.315	1.105	0.096	
5290	58	802.11ac	OFDM	80	14.0	12.81	14.0	13.46	0.17	Left	Tilt	MMO	1025M	58.5	90.5	0.067	0.037	1.315	1.105	0.054	
5690	138	802.11ac	OFDM	80	14.0	13.06	14.0	13.10	-0.05	Right	Cheek	MMO	1025M	58.5	90.5	0.180	0.163	1.242	1.105	0.224	A16
5690	138	802.11ac	OFDM	80	14.0	13.06	14.0	13.10	0.02	Right	Tilt	MMO	1025M	58.5	90.5	0.076	0.053	1.242	1.105	0.073	
5690	138	802.11ac	OFDM	80	14.0	13.06	14.0	13.10	0.03	Left	Cheek	MMO	1025M	58.5	90.5	0.039	0.022	1.242	1.105	0.030	
5690	138	802.11ac	OFDM	80	14.0	13.06	14.0	13.10	-0.11	Left	Tilt	MMO	1025M	58.5	90.5	0.024	0.016	1.242	1.105	0.022	
5775	155	802.11ac	OFDM	80	14.0	12.75	14.0	12.80	-0.11	Right	Cheek	MMO	1025M	58.5	90.5	0.220	0.103	1.334	1.105	0.178	
5775	155	802.11ac	OFDM	80	14.0	12.75	14.0	12.80	-0.15	Right	Tilt	MMO	1025M	58.5	90.5	0.055	0.053	1.334	1.105	0.078	
5775	155	802.11ac	OFDM	80	14.0	12.75	14.0	12.80	-0.19	Left	Cheek	MMO	1025M	58.5	90.5	0.040	0.036	1.334	1.105	0.053	
5775	155	802.11ac	OFDM	80	14.0	12.75	14.0	12.80	0.05	Left	Tilt	MMO	1025M	58.5	90.5	0.024	0.015	1.334	1.105	0.022	
5855	171	802.11ac	OFDM	80	14.0	12.98	14.0	13.08	-0.10	Right	Cheek	MMO	1025M	58.5	90.5	0.131	0.100	1.265	1.105	0.140	
5855	171	802.11ac	OFDM	80	14.0	12.98	14.0	13.08	0.02	Right	Tilt	MMO	1025M	58.5	90.5	0.070	0.054	1.265	1.105	0.075	
5855	171	802.11ac	OFDM	80	14.0	12.98	14.0	13.08	0.13	Left	Cheek	MMO	1025M	58.5	90.5	0.037	0.016	1.265	1.105	0.022	
5855	171	802.11ac	OFDM	80	14.0	12.98	14.0	13.08	-0.09	Left	Tilt	MMO	1025M	58.5	90.5	0.144	0.019	1.265	1.105	0.027	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Head 1.6 W/kg (mW/g) averaged over 1 gram									

Note: To achieve the 17.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 14.0 dBm.

**Table 11-18
DSS Head SAR**

MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	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	15.0	14.28	-0.02	Right	Cheek	1	3722R	1	77.6	0.028	1.180	1.289	0.043	
2441.00	39	Bluetooth	FHSS	15.0	14.28	0.03	Right	Tilt	1	3722R	1	77.6	0.009	1.180	1.289	0.014	
2441.00	39	Bluetooth	FHSS	15.0	14.28	-0.04	Left	Cheek	1	3722R	1	77.6	0.003	1.180	1.289	0.005	
2441.00	39	Bluetooth	FHSS	15.0	14.28	-0.02	Left	Tilt	1	3722R	1	77.6	0.004	1.180	1.289	0.006	
2441.00	39	Bluetooth	FHSS	15.0	13.87	0.00	Right	Cheek	2	3722R	1	77.6	0.355	1.297	1.289	0.594	A17
2441.00	39	Bluetooth	FHSS	15.0	13.87	-0.01	Right	Tilt	2	3722R	1	77.6	0.057	1.297	1.289	0.095	
2441.00	39	Bluetooth	FHSS	15.0	13.87	0.15	Left	Cheek	2	3722R	1	77.6	0.182	1.297	1.289	0.304	
2441.00	39	Bluetooth	FHSS	15.0	13.87	-0.03	Left	Tilt	2	3722R	1	77.6	0.025	1.297	1.289	0.042	
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 11-19
GSM Body-Worn SAR Data**



MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.											(W/kg)		(W/kg)		
848.80	251	GSM 850	GSM	33.0	31.68	-0.09	15 mm	A	1457M	1:1	back	0.178	1.355	0.241	A18	
1880.00	661	GSM 1900	GSM	30.0	29.16	-0.03	15 mm	A	1330M	1:1	back	0.216	1.213	0.262	A20	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram									

**Table 11-20
UMTS Body-Worn SAR Data**

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
846.60	4233	UMTS 850	RMC	25.0	24.21	112	0.02	15 mm	A	1457M	1:1	back	0.267	1.199	0.320	A22
1712.40	1312	UMTS 1750	RMC	24.0	22.94	23	0.00	15 mm	A	1315M	1:1	back	0.721	1.276	0.920	
1732.40	1412	UMTS 1750	RMC	24.0	23.28	23	0.00	15 mm	A	1315M	1:1	back	0.730	1.180	0.861	
1752.60	1513	UMTS 1750	RMC	24.0	23.26	23	0.02	15 mm	A	1315M	1:1	back	0.789	1.186	0.936	A24
1852.40	9262	UMTS 1900	RMC	24.0	22.99	13	0.01	15 mm	A	1330M	1:1	back	0.661	1.262	0.834	A26
1880.00	9400	UMTS 1900	RMC	24.0	23.03	13	0.03	15 mm	A	1330M	1:1	back	0.651	1.250	0.814	
1907.60	9538	UMTS 1900	RMC	24.0	23.01	13	0.12	15 mm	A	1330M	1:1	back	0.643	1.256	0.808	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram									

**Table 11-21
LTE Body-Worn SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.																(W/kg)		(W/kg)		
707.50	23095	Mid	LTE Band 12	10	25.0	24.13	112	0.01	0	A	1457M	QPSK	1	0	15 mm	back	1:1	0.179	1.222	0.219	A28
707.50	23095	Mid	LTE Band 12	10	24.0	23.07	112	-0.02	1	A	1457M	QPSK	25	12	15 mm	back	1:1	0.155	1.239	0.192	
782.00	23230	Mid	LTE Band 13	10	25.0	24.18	113	0.01	0	A	1457M	QPSK	1	0	15 mm	back	1:1	0.275	1.208	0.332	A30
782.00	23230	Mid	LTE Band 13	10	24.0	23.08	113	0.01	1	A	1457M	QPSK	25	0	15 mm	back	1:1	0.218	1.236	0.269	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.13	112	0.00	0	A	3893R	QPSK	1	0	15 mm	back	1:1	0.204	1.371	0.280	A32
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.12	112	0.02	1	A	3893R	QPSK	36	18	15 mm	back	1:1	0.165	1.374	0.227	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	23.08	38	0.02	0	A	3892R	QPSK	1	50	15 mm	back	1:1	0.506	1.102	0.558	A34
1720.00	132072	Low	LTE Band 66 (AWS)	20	22.5	22.10	38	0.10	1	A	3892R	QPSK	50	25	15 mm	back	1:1	0.409	1.096	0.448	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	21.0	20.26	N/A	0.05	0	I	1336M	QPSK	1	50	15 mm	back	1:1	0.139	1.186	0.165	A36
1732.50	20175	Mid	LTE Band 4 (AWS)	20	20.0	19.21	N/A	0.01	1	I	1336M	QPSK	50	25	15 mm	back	1:1	0.109	1.199	0.131	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.0	22.66	112	-0.01	0	A	1324M	QPSK	1	50	15 mm	back	1:1	0.690	1.081	0.746	A38
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.0	22.65	112	0.02	0	A	1324M	QPSK	1	50	15 mm	back	1:1	0.642	1.084	0.696	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.0	22.48	112	0.07	0	A	1324M	QPSK	1	50	15 mm	back	1:1	0.661	1.127	0.745	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.48	112	0.03	1	A	1324M	QPSK	50	25	15 mm	back	1:1	0.547	1.127	0.616	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.40	112	-0.03	1	A	1324M	QPSK	100	0	15 mm	back	1:1	0.529	1.148	0.607	
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 11-22
LTE Band 41 Body-Worn SAR**

MEASUREMENT RESULTS																					
Power Class	FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
	MHz	Ch.															(W/kg)		(W/kg)		
Power Class 3	2680.00	41490	High	LTE Band 41	20	24.5	23.66	-0.09	0	B	1330M	QPSK	1	50	15 mm	back	1:1.58	0.088	1.213	0.107	A40
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.61	0.00	1	B	1330M	QPSK	50	50	15 mm	back	1:1.58	0.074	1.227	0.091	
Power Class 2	2680.00	41490	High	LTE Band 41	20	26.5	25.12	0.01	0	B	1330M	QPSK	1	50	15 mm	back	1:2.31	0.077	1.374	0.106	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram											

**Table 11-23
NR Body-Worn SAR**

MEASUREMENT RESULTS																						
FREQUENCY	Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config.	Power Drift [dB]	MPR [dB]	Tune State	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)
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.30	A	0.03	0	112	1330M	DFT-S-OFDM	QPSK	1	1	15 mm	back	1:1	0.234	1.175	0.275	A42
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.25	A	-0.01	0	112	1330M	DFT-S-OFDM	QPSK	50	28	15 mm	back	1:1	0.222	1.189	0.264	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.5	22.88	A	0.00	1.5	112	1330M	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.161	1.208	0.194	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.77	A	-0.16	0	38	3892R	DFT-S-OFDM	QPSK	1	53	15 mm	back	1:1	0.437	1.183	0.517	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.70	A	0.03	0	38	3892R	DFT-S-OFDM	QPSK	50	28	15 mm	back	1:1	0.439	1.202	0.528	A44
1770.00	354000	High	NR Band n66 (AWS)	20	23.0	22.22	A	-0.01	1.5	38	3892R	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.405	1.197	0.485	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.0	21.45	I	0.06	0	N/A	3892R	DFT-S-OFDM	QPSK	1	1	15 mm	back	1:1	0.169	1.429	0.242	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.0	21.40	I	0.13	0	N/A	3892R	DFT-S-OFDM	QPSK	50	28	15 mm	back	1:1	0.176	1.445	0.254	
1720.00	344000	Low	NR Band n66 (AWS)	20	21.5	20.85	I	0.01	1.5	N/A	3892R	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.171	1.161	0.199	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram												



**Table 11-24
DTS SISO Body-Worn SAR**

MEASUREMENT RESULTS																			
FREQUENCY	Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #	
													(W/kg)	(W/kg)			(W/kg)		
2437	6	802.11b	DSSS	22	19.5	18.46	-0.01	15 mm	1	1025M	1	back	99.8	0.137	0.115	1.271	1.002	0.146	A46
2437	6	802.11b	DSSS	22	19.5	18.45	-0.01	15 mm	2	1025M	1	back	99.9	0.114	0.093	1.274	1.001	0.119	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram									

**Table 11-25
DTS Body-worn MIMO SAR during conditions with 5/6 GHz WLAN**

MEASUREMENT RESULTS																					
FREQUENCY	Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #	
															(W/kg)	(W/kg)			(W/kg)		
2457	10	802.11n	OFDM	20	16.0	15.40	16.0	15.50	-0.01	15 mm	MIMO	7322R	13	back	96.8	0.035	0.029	1.148	1.033	0.034	
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: 2.4 GHz MIMO was additionally evaluated at the maximum allowed output power during simultaneous operations with 5/6 GHz WLAN. 5/6 GHz WIFI was not transmitting during the above evaluations. To achieve the 19.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 16.0 dBm

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**Table 11-26
NII MIMO Body-Worn SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															W/kg	(W/kg)			(W/kg)	
5310	62	802.11n	OFDM	40	17.0	15.86	17.0	16.42	-0.14	15 mm	MIMO	1025M	27	back	94.8	0.118	0.081	1.300	1.055	0.111	
5710	142	802.11n	OFDM	40	17.0	16.18	17.0	16.15	0.02	15 mm	MIMO	1025M	27	back	94.8	0.190	0.119	1.216	1.055	0.153	A48
5755	151	802.11n	OFDM	40	17.0	15.75	17.0	15.85	0.07	15 mm	MIMO	1025M	27	back	94.8	0.159	0.112	1.334	1.055	0.158	
5875	175	802.11n	OFDM	40	17.0	15.33	17.0	15.78	-0.08	15 mm	MIMO	1025M	27	back	94.8	0.138	0.101	1.469	1.055	0.157	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram											

Note: To achieve the 20.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 17.0 dBm.



**Table 11-27
NII MIMO Body-Worn SAR for Conditions with 2.4 GHz WLAN SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															W/kg	(W/kg)			(W/kg)	
5290	58	802.11ac	OFDM	80	13.0	12.39	13.0	12.99	-0.02	15 mm	MIMO	1025M	58.5	back	90.5	0.037	0.028	1.151	1.105	0.036	
5690	138	802.11ac	OFDM	80	13.0	12.99	13.0	12.98	-0.12	15 mm	MIMO	1025M	58.5	back	90.5	0.116	0.094	1.005	1.105	0.104	
5775	155	802.11ac	OFDM	80	13.0	12.16	13.0	12.59	0.01	15 mm	MIMO	1025M	58.5	back	90.5	0.114	0.088	1.213	1.105	0.118	
5855	171	802.11ac	OFDM	80	13.0	12.14	13.0	12.21	-0.14	15 mm	MIMO	1025M	58.5	back	90.5	0.063	0.041	1.219	1.105	0.055	
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: 5 GHz MIMO was additionally evaluated at the maximum allowed output power during simultaneous operations with 2.4 GHz WLAN. 2.4 GHz WLAN was not transmitting during the above evaluations. To achieve the 16.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 13.0 dBm

**Table 11-28
DSS Body-Worn SAR**




MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	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	18.5	18.26	0.05	15 mm	1	3718R	1	back	77.6	1.058	1.289	0.065		
2441	39	Bluetooth	FHSS	17.0	16.61	-0.04	15 mm	2	3718R	1	back	77.6	1.093	1.289	0.083	A50	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram							

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11.3 Standalone Hotspot SAR Data

**Table 11-29
GPRS Hotspot SAR Data**

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
824.20	128	GSM850	GPRS	30.5	28.84	0.01	10 mm	A	1457M	3	1:2.76	back	0.461	1.466	0.676	A19
836.60	190	GSM850	GPRS	30.5	29.09	-0.03	10 mm	A	1457M	3	1:2.76	back	0.449	1.384	0.621	
848.80	251	GSM850	GPRS	30.5	29.08	-0.01	10 mm	A	1457M	3	1:2.76	back	0.410	1.387	0.569	
836.60	190	GSM850	GPRS	30.5	29.09	-0.11	10 mm	A	1457M	3	1:2.76	front	0.279	1.384	0.386	
836.60	190	GSM850	GPRS	30.5	29.09	0.03	10 mm	A	1457M	3	1:2.76	bottom	0.105	1.384	0.145	
836.60	190	GSM850	GPRS	30.5	29.09	-0.02	10 mm	A	1457M	3	1:2.76	right	0.351	1.384	0.486	
836.60	190	GSM850	GPRS	30.5	29.09	0.01	10 mm	A	1457M	3	1:2.76	left	0.296	1.384	0.410	
1909.80	810	GSM1900	GPRS	25.5	24.16	0.05	10 mm	A	1330M	3	1:2.76	back	0.427	1.361	0.581	
1909.80	810	GSM1900	GPRS	25.5	24.16	-0.01	10 mm	A	1330M	3	1:2.76	front	0.277	1.361	0.377	
1850.20	512	GSM1900	GPRS	25.5	23.55	0.01	10 mm	A	1330M	3	1:2.76	bottom	0.883	1.567	1.384	A21
1880.00	661	GSM1900	GPRS	25.5	23.51	0.06	10 mm	A	1330M	3	1:2.76	bottom	0.844	1.581	1.334	
1909.80	810	GSM1900	GPRS	25.5	24.16	0.00	10 mm	A	1330M	3	1:2.76	bottom	0.878	1.361	1.195	
1909.80	810	GSM1900	GPRS	25.5	24.16	0.06	10 mm	A	1330M	3	1:2.76	right	0.061	1.361	0.083	
1909.80	810	GSM1900	GPRS	25.5	24.16	0.00	10 mm	A	1330M	3	1:2.76	left	0.091	1.361	0.124	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram									

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**Table 11-30
UMTS Hotspot SAR Data**

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
846.60	4233	UMTS 850	RMC	25.0	24.21	112	0.01	10 mm	A	1457M	1:1	back	0.411	1.199	0.493	A23
846.60	4233	UMTS 850	RMC	25.0	24.21	112	0.03	10 mm	A	1457M	1:1	front	0.286	1.199	0.343	
846.60	4233	UMTS 850	RMC	25.0	24.21	112	0.01	10 mm	A	1457M	1:1	bottom	0.086	1.199	0.103	
846.60	4233	UMTS 850	RMC	25.0	24.21	112	-0.01	10 mm	A	1457M	1:1	right	0.346	1.199	0.415	
846.60	4233	UMTS 850	RMC	25.0	24.21	112	0.03	10 mm	A	1457M	1:1	left	0.301	1.199	0.361	
1752.60	1513	UMTS 1750	RMC	20.0	19.39	23	0.01	10 mm	A	1315M	1:1	back	0.571	1.151	0.657	
1752.60	1513	UMTS 1750	RMC	20.0	19.39	23	-0.01	10 mm	A	1315M	1:1	front	0.417	1.151	0.480	
1712.40	1312	UMTS 1750	RMC	20.0	18.90	23	-0.03	10 mm	A	1315M	1:1	bottom	0.823	1.288	1.060	
1732.40	1412	UMTS 1750	RMC	20.0	19.12	23	0.01	10 mm	A	1315M	1:1	bottom	0.893	1.225	1.094	
1752.60	1513	UMTS 1750	RMC	20.0	19.39	23	-0.02	10 mm	A	1315M	1:1	bottom	0.984	1.151	1.133	A25
1752.60	1513	UMTS 1750	RMC	20.0	19.39	23	-0.01	10 mm	A	1315M	1:1	right	0.063	1.151	0.073	
1752.60	1513	UMTS 1750	RMC	20.0	19.39	23	0.00	10 mm	A	1315M	1:1	left	0.141	1.151	0.162	
1752.60	1513	UMTS 1750	RMC	20.0	19.39	23	0.02	10 mm	A	1315M	1:1	bottom	0.909	1.151	1.046	
1880.00	9400	UMTS 1900	RMC	19.5	18.50	13	-0.10	10 mm	A	1330M	1:1	back	0.467	1.259	0.588	
1880.00	9400	UMTS 1900	RMC	19.5	18.50	13	0.12	10 mm	A	1330M	1:1	front	0.364	1.259	0.458	
1852.40	9262	UMTS 1900	RMC	19.5	18.40	13	0.03	10 mm	A	1330M	1:1	bottom	0.902	1.288	1.162	
1880.00	9400	UMTS 1900	RMC	19.5	18.50	13	0.09	10 mm	A	1330M	1:1	bottom	0.968	1.259	1.219	
1907.60	9538	UMTS 1900	RMC	19.5	18.49	13	0.00	10 mm	A	1330M	1:1	bottom	1.010	1.262	1.275	A27
1880.00	9400	UMTS 1900	RMC	19.5	18.50	13	-0.15	10 mm	A	1330M	1:1	right	0.059	1.259	0.074	
1880.00	9400	UMTS 1900	RMC	19.5	18.50	13	-0.03	10 mm	A	1330M	1:1	left	0.095	1.259	0.120	
1907.60	9538	UMTS 1900	RMC	19.5	18.49	13	-0.05	10 mm	A	1330M	1:1	bottom	0.964	1.262	1.217	
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 11-31
LTE Band 12 Hotspot SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.																(W/kg)		(W/kg)		
707.50	23095	Mid	LTE Band 12	10	25.0	24.13	112	0.01	0	A	3893R	QPSK	1	0	10 mm	back	1:1	0.338	1.222	0.413	A29
707.50	23095	Mid	LTE Band 12	10	24.0	23.07	112	0.01	1	A	3893R	QPSK	25	12	10 mm	back	1:1	0.285	1.239	0.353	
707.50	23095	Mid	LTE Band 12	10	25.0	24.13	112	-0.07	0	A	3893R	QPSK	1	0	10 mm	front	1:1	0.265	1.222	0.324	
707.50	23095	Mid	LTE Band 12	10	24.0	23.07	112	0.02	1	A	3893R	QPSK	25	12	10 mm	front	1:1	0.212	1.239	0.263	
707.50	23095	Mid	LTE Band 12	10	25.0	24.13	112	0.00	0	A	3893R	QPSK	1	0	10 mm	bottom	1:1	0.085	1.222	0.104	
707.50	23095	Mid	LTE Band 12	10	24.0	23.07	112	0.01	1	A	3893R	QPSK	25	12	10 mm	bottom	1:1	0.068	1.239	0.084	
707.50	23095	Mid	LTE Band 12	10	25.0	24.13	112	0.02	0	A	3893R	QPSK	1	0	10 mm	right	1:1	0.333	1.222	0.407	
707.50	23095	Mid	LTE Band 12	10	24.0	23.07	112	0.01	1	A	3893R	QPSK	25	12	10 mm	right	1:1	0.283	1.239	0.351	
707.50	23095	Mid	LTE Band 12	10	25.0	24.13	112	0.01	0	A	3893R	QPSK	1	0	10 mm	left	1:1	0.288	1.222	0.352	
707.50	23095	Mid	LTE Band 12	10	24.0	23.07	112	-0.02	1	A	3893R	QPSK	25	12	10 mm	left	1:1	0.236	1.239	0.292	
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 11-32
LTE Band 13 Hotspot SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.																(W/kg)		(W/kg)		
782.00	23230	Mid	LTE Band 13	10	25.0	24.18	113	0.00	0	A	3893R	QPSK	1	0	10 mm	back	1:1	0.524	1.208	0.633	A31
782.00	23230	Mid	LTE Band 13	10	24.0	23.08	113	0.00	1	A	3893R	QPSK	25	0	10 mm	back	1:1	0.412	1.236	0.509	
782.00	23230	Mid	LTE Band 13	10	25.0	24.18	113	0.15	0	A	3893R	QPSK	1	0	10 mm	front	1:1	0.302	1.208	0.365	
782.00	23230	Mid	LTE Band 13	10	24.0	23.08	113	-0.01	1	A	3893R	QPSK	25	0	10 mm	front	1:1	0.233	1.236	0.288	
782.00	23230	Mid	LTE Band 13	10	25.0	24.18	113	0.00	0	A	3893R	QPSK	1	0	10 mm	bottom	1:1	0.140	1.208	0.169	
782.00	23230	Mid	LTE Band 13	10	24.0	23.08	113	0.02	1	A	3893R	QPSK	25	0	10 mm	bottom	1:1	0.109	1.236	0.135	
782.00	23230	Mid	LTE Band 13	10	25.0	24.18	113	-0.01	0	A	3893R	QPSK	1	0	10 mm	right	1:1	0.289	1.208	0.349	
782.00	23230	Mid	LTE Band 13	10	24.0	23.08	113	0.03	1	A	3893R	QPSK	25	0	10 mm	right	1:1	0.212	1.236	0.262	
782.00	23230	Mid	LTE Band 13	10	25.0	24.18	113	0.02	0	A	3893R	QPSK	1	0	10 mm	left	1:1	0.170	1.208	0.205	
782.00	23230	Mid	LTE Band 13	10	24.0	23.08	113	0.02	1	A	3893R	QPSK	25	0	10 mm	left	1:1	0.123	1.236	0.152	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram											

**Table 11-33
LTE Band 26 (Cell) Hotspot SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.																(W/kg)		(W/kg)		
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.13	39	0.03	0	A	3893R	QPSK	1	0	10 mm	back	1:1	0.449	1.371	0.616	A33
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.12	65	-0.01	1	A	3893R	QPSK	36	18	10 mm	back	1:1	0.394	1.374	0.541	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.13	112	-0.06	0	A	3893R	QPSK	1	0	10 mm	front	1:1	0.276	1.371	0.378	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.12	112	0.03	1	A	3893R	QPSK	36	18	10 mm	front	1:1	0.222	1.374	0.305	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.13	112	-0.06	0	A	3893R	QPSK	1	0	10 mm	bottom	1:1	0.117	1.371	0.160	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.12	112	0.01	1	A	3893R	QPSK	36	18	10 mm	bottom	1:1	0.096	1.374	0.132	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.13	112	-0.05	0	A	3893R	QPSK	1	0	10 mm	right	1:1	0.260	1.371	0.356	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.12	112	0.01	1	A	3893R	QPSK	36	18	10 mm	right	1:1	0.211	1.374	0.290	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.5	24.13	112	0.01	0	A	3893R	QPSK	1	0	10 mm	left	1:1	0.190	1.371	0.260	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.5	23.12	112	0.00	1	A	3893R	QPSK	36	18	10 mm	left	1:1	0.128	1.374	0.176	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram											

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**Table 11-34
LTE Band 66 (AWS) Hotspot SAR**




MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #	
MHz	Ch.																				
1770.00	132572	High	LTE Band 66 (AWS)	20	18.0	17.11	23	-0.09	0	A	3892R	QPSK	1	0	10 mm	back	1:1	0.391	1.227	0.480	
1720.00	132072	Low	LTE Band 66 (AWS)	20	18.0	17.02	23	0.02	0	A	3892R	QPSK	50	25	10 mm	back	1:1	0.357	1.253	0.447	
1770.00	132572	High	LTE Band 66 (AWS)	20	18.0	17.11	23	0.04	0	A	3892R	QPSK	1	0	10 mm	front	1:1	0.288	1.227	0.353	
1720.00	132072	Low	LTE Band 66 (AWS)	20	18.0	17.02	23	-0.03	0	A	3892R	QPSK	50	25	10 mm	front	1:1	0.276	1.253	0.346	
1720.00	132072	Low	LTE Band 66 (AWS)	20	18.0	16.74	22	-0.01	0	A	3892R	QPSK	1	50	10 mm	bottom	1:1	0.555	1.337	0.742	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	18.0	16.89	22	0.01	0	A	3892R	QPSK	1	50	10 mm	bottom	1:1	0.587	1.291	0.758	
1770.00	132572	High	LTE Band 66 (AWS)	20	18.0	17.11	22	-0.01	0	A	3892R	QPSK	1	0	10 mm	bottom	1:1	0.597	1.227	0.733	A35
1720.00	132072	Low	LTE Band 66 (AWS)	20	18.0	17.02	22	-0.03	0	A	3892R	QPSK	50	25	10 mm	bottom	1:1	0.564	1.253	0.707	
1770.00	132572	High	LTE Band 66 (AWS)	20	18.0	17.11	23	0.07	0	A	3892R	QPSK	1	0	10 mm	right	1:1	0.035	1.227	0.043	
1720.00	132072	Low	LTE Band 66 (AWS)	20	18.0	17.02	23	0.02	0	A	3892R	QPSK	50	25	10 mm	right	1:1	0.040	1.253	0.050	
1770.00	132572	High	LTE Band 66 (AWS)	20	18.0	17.11	23	-0.01	0	A	3892R	QPSK	1	0	10 mm	left	1:1	0.084	1.227	0.103	
1720.00	132072	Low	LTE Band 66 (AWS)	20	18.0	17.02	23	-0.07	0	A	3892R	QPSK	50	25	10 mm	left	1:1	0.091	1.253	0.114	
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 4 (AWS) Hotspot SAR**

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #	
MHz	Ch.																			
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.32	0.14	0	I	3892R	QPSK	1	50	10 mm	back	1:1	0.076	1.169	0.089	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.10	0.08	0	I	3892R	QPSK	50	25	10 mm	back	1:1	0.076	1.230	0.093	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.32	0.18	0	I	3892R	QPSK	1	50	10 mm	front	1:1	0.058	1.169	0.068	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.10	0.03	0	I	3892R	QPSK	50	25	10 mm	front	1:1	0.057	1.230	0.070	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.32	0.13	0	I	3892R	QPSK	1	50	10 mm	top	1:1	0.131	1.169	0.153	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.10	0.05	0	I	3892R	QPSK	50	25	10 mm	top	1:1	0.134	1.230	0.165	A37
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.32	0.05	0	I	3892R	QPSK	1	50	10 mm	right	1:1	0.024	1.169	0.028	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	16.0	15.10	0.04	0	I	3892R	QPSK	50	25	10 mm	right	1:1	0.022	1.230	0.027	
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 11-36
LTE Band 25 (PCS) Hotspot SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #	
MHz	Ch.																				
1860.00	26140	Low	LTE Band 25 (PCS)	20	17.5	16.90	112	0.04	0	A	3891R	QPSK	1	50	10 mm	back	1:1	0.338	1.148	0.388	
1860.00	26140	Low	LTE Band 25 (PCS)	20	17.5	16.79	112	-0.02	0	A	3891R	QPSK	50	25	10 mm	back	1:1	0.331	1.178	0.390	
1860.00	26140	Low	LTE Band 25 (PCS)	20	17.5	16.90	112	-0.03	0	A	3891R	QPSK	1	50	10 mm	front	1:1	0.281	1.148	0.323	
1860.00	26140	Low	LTE Band 25 (PCS)	20	17.5	16.79	112	-0.01	0	A	3891R	QPSK	50	25	10 mm	front	1:1	0.276	1.178	0.325	
1860.00	26140	Low	LTE Band 25 (PCS)	20	17.5	16.90	112	-0.11	0	A	3891R	QPSK	1	50	10 mm	bottom	1:1	0.585	1.148	0.672	
1860.00	26140	Low	LTE Band 25 (PCS)	20	17.5	16.79	112	-0.01	0	A	3891R	QPSK	50	25	10 mm	bottom	1:1	0.575	1.178	0.677	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	17.5	16.75	112	-0.03	0	A	3891R	QPSK	50	0	10 mm	bottom	1:1	0.570	1.189	0.678	
1905.00	26590	High	LTE Band 25 (PCS)	20	17.5	16.64	112	0.01	0	A	3891R	QPSK	50	25	10 mm	bottom	1:1	0.600	1.219	0.731	A39
1860.00	26140	Low	LTE Band 25 (PCS)	20	17.5	16.90	112	-0.02	0	A	3891R	QPSK	1	50	10 mm	right	1:1	0.031	1.148	0.036	
1860.00	26140	Low	LTE Band 25 (PCS)	20	17.5	16.79	112	0.01	0	A	3891R	QPSK	50	25	10 mm	right	1:1	0.030	1.178	0.035	
1860.00	26140	Low	LTE Band 25 (PCS)	20	17.5	16.90	112	-0.10	0	A	3891R	QPSK	1	50	10 mm	left	1:1	0.090	1.148	0.103	
1860.00	26140	Low	LTE Band 25 (PCS)	20	17.5	16.79	112	-0.12	0	A	3891R	QPSK	50	25	10 mm	left	1:1	0.086	1.178	0.101	
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 11-37
LTE Band 41 Hotspot SAR**

MEASUREMENT RESULTS																				
Power Class	FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
	MHz	Ch.															(W/kg)		(W/kg)	
Power Class 3	2680.00	41490	High	20	23.0	22.10	0.01	0	B	1330M	QPSK	1	50	10 mm	back	1:1.58	0.109	1.230	0.134	
Power Class 3	2680.00	41490	High	20	23.0	22.13	0.02	0	B	1330M	QPSK	50	50	10 mm	back	1:1.58	0.106	1.222	0.130	
Power Class 3	2680.00	41490	High	20	23.0	22.10	0.05	0	B	1330M	QPSK	1	50	10 mm	front	1:1.58	0.073	1.230	0.090	
Power Class 3	2680.00	41490	High	20	23.0	22.13	-0.04	0	B	1330M	QPSK	50	50	10 mm	front	1:1.58	0.075	1.222	0.092	
Power Class 3	2680.00	41490	High	20	23.0	22.10	0.01	0	B	1330M	QPSK	1	50	10 mm	bottom	1:1.58	0.179	1.230	0.220	
Power Class 3	2680.00	41490	High	20	23.0	22.13	0.03	0	B	1330M	QPSK	50	50	10 mm	bottom	1:1.58	0.181	1.222	0.221	A41
Power Class 2	2680.00	41490	High	20	23.0	21.90	-0.02	0	B	1330M	QPSK	50	50	10 mm	bottom	1:2.31	0.128	1.288	0.165	
Power Class 3	2680.00	41490	High	20	23.0	22.10	0.04	0	B	1330M	QPSK	1	50	10 mm	left	1:1.58	0.086	1.230	0.106	
Power Class 3	2680.00	41490	High	20	23.0	22.13	-0.02	0	B	1330M	QPSK	50	50	10 mm	left	1:1.58	0.083	1.222	0.101	
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
NR Band n5 Hotspot SAR**

MEASUREMENT RESULTS																						
MHz	Ch.	Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Tune State	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
																		(W/kg)		(W/kg)		
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.30	A	-0.05	0	39	1330M	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.381	1.175	0.448	A43
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.25	A	0.00	0	65	1330M	DFT-S-OFDM	QPSK	50	28	10 mm	back	1:1	0.355	1.189	0.422	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.5	22.68	A	0.00	1.5	39	1330M	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.234	1.208	0.283	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.30	A	-0.03	0	112	1330M	DFT-S-OFDM	QPSK	1	1	10 mm	front	1:1	0.268	1.175	0.315	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.25	A	-0.01	0	112	1330M	DFT-S-OFDM	QPSK	50	28	10 mm	front	1:1	0.255	1.189	0.303	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.30	A	-0.06	0	112	1330M	DFT-S-OFDM	QPSK	1	1	10 mm	bottom	1:1	0.089	1.175	0.106	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.25	A	0.04	0	112	1330M	DFT-S-OFDM	QPSK	50	28	10 mm	bottom	1:1	0.090	1.189	0.107	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.30	A	-0.01	0	112	1330M	DFT-S-OFDM	QPSK	1	1	10 mm	right	1:1	0.311	1.175	0.365	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.25	A	0.03	0	112	1330M	DFT-S-OFDM	QPSK	50	28	10 mm	right	1:1	0.286	1.189	0.340	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.30	A	-0.06	0	112	1330M	DFT-S-OFDM	QPSK	1	1	10 mm	left	1:1	0.212	1.175	0.249	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	24.25	A	-0.04	0	112	1330M	DFT-S-OFDM	QPSK	50	28	10 mm	left	1:1	0.192	1.189	0.228	
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
NR Band n66 Hotspot SAR**

MEASUREMENT RESULTS																						
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Tune Step	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #	
MHz	Ch.																					
1720.00	344000	Low	NR Band n66 (AWS)	20	19.5	19.12	A	0.01	0	23	3892R	DFT-S-OFDM	QPSK	1	104	10 mm	back	1:1	0.476	1.091	0.519	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.5	19.05	A	-0.01	0	23	3892R	DFT-S-OFDM	QPSK	50	0	10 mm	back	1:1	0.472	1.109	0.523	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.5	19.12	A	-0.01	0	23	3892R	DFT-S-OFDM	QPSK	1	104	10 mm	front	1:1	0.349	1.091	0.381	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.5	19.05	A	0.00	0	23	3892R	DFT-S-OFDM	QPSK	50	0	10 mm	front	1:1	0.328	1.109	0.364	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.5	19.12	A	0.00	0	22	3892R	DFT-S-OFDM	QPSK	1	104	10 mm	bottom	1:1	0.879	1.091	0.959	
1745.00	349000	Mid	NR Band n66 (AWS)	20	19.5	19.00	A	0.00	0	22	3892R	DFT-S-OFDM	QPSK	1	1	10 mm	bottom	1:1	0.886	1.122	0.994	
1770.00	354000	High	NR Band n66 (AWS)	20	19.5	18.95	A	0.02	0	22	3892R	DFT-S-OFDM	QPSK	1	1	10 mm	bottom	1:1	0.879	1.135	0.998	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.5	19.05	A	0.00	0	22	3892R	DFT-S-OFDM	QPSK	50	0	10 mm	bottom	1:1	0.772	1.109	0.856	
1745.00	349000	Mid	NR Band n66 (AWS)	20	19.5	19.00	A	0.02	0	22	3892R	DFT-S-OFDM	QPSK	50	56	10 mm	bottom	1:1	0.895	1.122	1.004	A45
1770.00	354000	High	NR Band n66 (AWS)	20	19.5	18.90	A	0.01	0	22	3892R	DFT-S-OFDM	QPSK	50	0	10 mm	bottom	1:1	0.861	1.148	0.988	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.5	19.00	A	-0.04	0	22	3892R	DFT-S-OFDM	QPSK	100	0	10 mm	bottom	1:1	0.802	1.122	0.900	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.5	19.07	A	0.00	0	22	3892R	CP-OFDM	QPSK	1	1	10 mm	bottom	1:1	0.719	1.104	0.794	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.5	19.12	A	-0.04	0	23	3892R	DFT-S-OFDM	QPSK	1	104	10 mm	right	1:1	0.054	1.091	0.059	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.5	19.05	A	0.03	0	23	3892R	DFT-S-OFDM	QPSK	50	0	10 mm	right	1:1	0.051	1.109	0.057	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.5	19.12	A	0.04	0	23	3892R	DFT-S-OFDM	QPSK	1	104	10 mm	left	1:1	0.129	1.091	0.141	
1720.00	344000	Low	NR Band n66 (AWS)	20	19.5	19.05	A	0.11	0	23	3892R	DFT-S-OFDM	QPSK	50	0	10 mm	left	1:1	0.132	1.109	0.146	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.0	21.45	I	0.10	0	N/A	3892R	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.339	1.429	0.484	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.0	21.40	I	-0.02	0	N/A	3892R	DFT-S-OFDM	QPSK	50	28	10 mm	back	1:1	0.340	1.445	0.491	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.0	21.45	I	0.02	0	N/A	3892R	DFT-S-OFDM	QPSK	1	1	10 mm	front	1:1	0.303	1.429	0.433	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.0	21.40	I	-0.01	0	N/A	3892R	DFT-S-OFDM	QPSK	50	28	10 mm	front	1:1	0.300	1.445	0.434	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.0	21.45	I	-0.01	0	N/A	3892R	DFT-S-OFDM	QPSK	1	1	10 mm	top	1:1	0.566	1.429	0.609	
1745.00	349000	Mid	NR Band n66 (AWS)	20	23.0	21.37	I	-0.10	0	N/A	3892R	DFT-S-OFDM	QPSK	1	53	10 mm	top	1:1	0.473	1.455	0.688	
1770.00	354000	High	NR Band n66 (AWS)	20	23.0	21.15	I	0.07	0	N/A	3892R	DFT-S-OFDM	QPSK	1	104	10 mm	top	1:1	0.487	1.531	0.746	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.0	21.40	I	-0.03	0	N/A	3892R	DFT-S-OFDM	QPSK	50	28	10 mm	top	1:1	0.553	1.445	0.799	
1720.00	344000	Low	NR Band n66 (AWS)	20	22.0	21.32	I	0.07	1	N/A	3892R	DFT-S-OFDM	QPSK	100	0	10 mm	top	1:1	0.555	1.169	0.649	
1720.00	344000	Low	NR Band n66 (AWS)	20	21.5	20.85	I	0.13	1.5	N/A	3892R	CP-OFDM	QPSK	1	1	10 mm	top	1:1	0.558	1.161	0.659	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.0	21.45	I	0.00	0	N/A	3892R	DFT-S-OFDM	QPSK	1	1	10 mm	right	1:1	0.103	1.429	0.147	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.0	21.40	I	0.06	0	N/A	3892R	DFT-S-OFDM	QPSK	50	28	10 mm	right	1:1	0.100	1.445	0.145	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT													Body									
Spatial Peak													1.6 W/kg (mW/g)									
Uncontrolled Exposure/General Population													averaged over 1 gram									

**Table 11-40
DTS SISO WLAN Hotspot SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan (W/kg)	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																		
2437	6	802.11b	DSSS	22	19.5	18.46	0.02	10 mm	1	1025M	1	back	99.8	0.390	0.335	1.271	1.002	0.427	A47
2437	6	802.11b	DSSS	22	19.5	18.46	0.01	10 mm	1	1025M	1	front	99.8	0.009	0.009	1.271	1.002	0.011	
2437	6	802.11b	DSSS	22	19.5	18.46	0.04	10 mm	1	1025M	1	top	99.8	0.023	0.019	1.271	1.002	0.024	
2437	6	802.11b	DSSS	22	19.5	18.46	-0.10	10 mm	1	1025M	1	left	99.8	0.017	0.012	1.271	1.002	0.015	
2437	6	802.11b	DSSS	22	19.5	18.45	0.00	10 mm	2	1025M	1	back	99.9	0.250	0.209	1.274	1.001	0.267	
2437	6	802.11b	DSSS	22	19.5	18.45	0.04	10 mm	2	1025M	1	front	99.9	0.260	0.211	1.274	1.001	0.269	
2437	6	802.11b	DSSS	22	19.5	18.45	-0.05	10 mm	2	1025M	1	left	99.9	0.442	0.316	1.274	1.001	0.403	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT													Body						
Spatial Peak													1.6 W/kg (mW/g)						
Uncontrolled Exposure/General Population													averaged over 1 gram						

**Table 11-41
DTS Hotspot MIMO SAR**

MEASUREMENT RESULTS																							
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan (W/kg)	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																						
2457	10	802.11n	OFDM	20	18.0	17.40	18.0	17.70	17.70	0.14	10 mm	MIMO	1434M	13	back	96.8	0.340	0.306	1.148	1.033	0.363		
2457	10	802.11n	OFDM	20	18.0	17.40	18.0	17.70	17.70	0.09	10 mm	MIMO	1434M	13	front	96.8	0.175	-	1.148	1.033	-		
2457	10	802.11n	OFDM	20	18.0	17.40	18.0	17.70	17.70	0.02	10 mm	MIMO	1434M	13	top	96.8	0.034	-	1.148	1.033	-		
2457	10	802.11n	OFDM	20	18.0	17.40	18.0	17.70	17.70	0.02	10 mm	MIMO	1434M	13	left	96.8	0.278	-	1.148	1.033	-		
ANSI / IEEE C95.1 1992 - SAFETY LIMIT													Body										
Spatial Peak													1.6 W/kg (mW/g)										
Uncontrolled Exposure/General Population													averaged over 1 gram										

Note: To achieve the 21.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 18.0 dBm

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Table 11-42
DTS Hotspot MIMO SAR during Conditions with 5/6 GHz WLAN

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															W/kg	(W/kg)	(W/kg)	(W/kg)		
2457	10	802.11n	OFDM	20	16.0	15.40	16.0	15.50	-0.01	10 mm	MIMO	7322R	13	back	96.8	0.120	0.106	1.148	1.033	0.126	
2457	10	802.11n	OFDM	20	16.0	15.40	16.0	15.50	-0.11	10 mm	MIMO	7322R	13	front	96.8	0.062	-	1.148	1.033	-	
2457	10	802.11n	OFDM	20	16.0	15.40	16.0	15.50	0.03	10 mm	MIMO	7322R	13	top	96.8	0.012	-	1.148	1.033	-	
2457	10	802.11n	OFDM	20	16.0	15.40	16.0	15.50	0.02	10 mm	MIMO	7322R	13	left	96.8	0.073	-	1.148	1.033	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT										Body											
Spatial Peak										1.6 W/kg (mW/g)											
Uncontrolled Exposure/General Population										averaged over 1 gram											

Note: 2.4 GHz MIMO was additionally evaluated at the maximum allowed output power during simultaneous operations with 5/6 GHz WLAN. 5/6 GHz WLAN was not transmitting during the above evaluations. To achieve the 19.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 16.0 dBm

Table 11-43
NII MIMO WLAN Hotspot SAR



MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															W/kg	(W/kg)	(W/kg)	(W/kg)		
5755	151	802.11n	OFDM	40	17.0	15.75	17.0	15.85	-0.13	10 mm	MIMO	1025M	27	back	94.8	0.275	0.191	1.334	1.055	0.269	A49
5755	151	802.11n	OFDM	40	17.0	15.75	17.0	15.85	0.16	10 mm	MIMO	1025M	27	front	94.8	0.028	0.024	1.334	1.055	0.034	
5755	151	802.11n	OFDM	40	17.0	15.75	17.0	15.85	-0.10	10 mm	MIMO	1025M	27	top	94.8	0.042	0.031	1.334	1.055	0.044	
5755	151	802.11n	OFDM	40	17.0	15.75	17.0	15.85	0.02	10 mm	MIMO	1025M	27	left	94.8	0.073	0.045	1.334	1.055	0.063	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT										Body											
Spatial Peak										1.6 W/kg (mW/g)											
Uncontrolled Exposure/General Population										averaged over 1 gram											

Note: To achieve the 20.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 17.0 dBm

Table 11-44
WLAN MIMO Hotspot SAR for Conditions with 2.4 GHz WLAN SAR

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															W/kg	(W/kg)	(W/kg)	(W/kg)		
5775	155	802.11ac	OFDM	80	13.0	12.16	13.0	12.59	-0.03	10 mm	MIMO	1025M	58.5	back	90.5	0.136	0.114	1.213	1.105	0.153	
5775	155	802.11ac	OFDM	80	13.0	12.16	13.0	12.59	-0.12	10 mm	MIMO	1025M	58.5	front	90.5	0.020	-	1.213	1.105	-	
5775	155	802.11ac	OFDM	80	13.0	12.16	13.0	12.59	0.07	10 mm	MIMO	1025M	58.5	top	90.5	0.022	-	1.213	1.105	-	
5775	155	802.11ac	OFDM	80	13.0	12.16	13.0	12.59	0.02	10 mm	MIMO	1025M	58.5	left	90.5	0.046	-	1.213	1.105	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT										Body											
Spatial Peak										1.6 W/kg (mW/g)											
Uncontrolled Exposure/General Population										averaged over 1 gram											

Note: 5 GHz MIMO was additionally evaluated at the maximum allowed output power during simultaneous operations with 2.4 GHz WLAN. 2.4 GHz WLAN was not transmitting during the above evaluations. To achieve the 16.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 13.0 dBm

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**Table 11-45
DSS Hotspot SAR**

MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	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	18.5	18.26	0.02	10 mm	1	3718R	1	back	77.6	0.138	1.058	1.289	0.188	
2441	39	Bluetooth	FHSS	18.5	18.26	0.17	10 mm	1	3718R	1	front	77.6	0.003	1.058	1.289	0.004	
2441	39	Bluetooth	FHSS	18.5	18.26	0.01	10 mm	1	3718R	1	top	77.6	0.007	1.058	1.289	0.010	
2441	39	Bluetooth	FHSS	18.5	18.26	0.00	10 mm	1	3718R	1	left	77.6	0.003	1.058	1.289	0.004	
2441	39	Bluetooth	FHSS	17.0	16.61	-0.03	10 mm	2	3718R	1	back	77.6	0.140	1.093	1.289	0.197	
2441	39	Bluetooth	FHSS	17.0	16.61	0.17	10 mm	2	3718R	1	front	77.6	0.097	1.093	1.289	0.137	
2441	39	Bluetooth	FHSS	17.0	16.61	0.00	10 mm	2	3718R	1	left	77.6	0.161	1.093	1.289	0.227	A51
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
DSS MIMO Hotspot SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.														(W/kg)			(W/kg)	
2441	39	Bluetooth	FHSS	11.5	11.00	11.5	10.96	-0.08	10 mm	MIMO	1434M	1	back	77.1	0.076	1.133	1.297	0.112	
2441	39	Bluetooth	FHSS	11.5	11.00	11.5	10.96	0.18	10 mm	MIMO	1434M	1	front	77.1	0.025	1.133	1.297	0.037	
2441	39	Bluetooth	FHSS	11.5	11.00	11.5	10.96	-0.17	10 mm	MIMO	1434M	1	top	77.1	0.006	1.133	1.297	0.009	
2441	39	Bluetooth	FHSS	11.5	11.00	11.5	10.96	-0.04	10 mm	MIMO	1434M	1	left	77.1	0.034	1.133	1.297	0.050	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram												

Note: To achieve the 14.5 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 11.5 dBm.

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11.4 Standalone Phablet SAR Data



**Table 11-47
GPRS Phablet SAR Data**

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
1850.20	512	GSM 1900	GPRS	27.5	26.21	0.02	8 mm	A	1324M	3	1:2.76	back	0.323	1.346	0.435	
1850.20	512	GSM 1900	GPRS	27.5	26.21	-0.07	6 mm	A	1324M	3	1:2.76	front	0.355	1.346	0.478	
1850.20	512	GSM 1900	GPRS	27.5	26.21	0.08	11 mm	A	1324M	3	1:2.76	bottom	0.299	1.346	0.402	
1850.20	512	GSM 1900	GPRS	27.5	26.21	-0.04	0 mm	A	1324M	3	1:2.76	right	0.141	1.346	0.190	
1850.20	512	GSM 1900	GPRS	27.5	26.21	-0.04	0 mm	A	1324M	3	1:2.76	left	0.376	1.346	0.506	
1909.80	810	GSM 1900	GPRS	25.5	24.16	-0.03	0 mm	A	1324M	3	1:2.76	back	0.981	1.361	1.335	
1909.80	810	GSM 1900	GPRS	25.5	24.16	-0.07	0 mm	A	1324M	3	1:2.76	front	1.100	1.361	1.497	A52
1909.80	810	GSM 1900	GPRS	25.5	24.16	-0.18	0 mm	A	1324M	3	1:2.76	bottom	0.760	1.361	1.034	
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 11-48
UMTS 1750 Phablet SAR Data**

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Duty Cycle	Side	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
1732.40	1412	UMTS 1750	RMC	24.0	23.28	23	-0.01	8 mm	A	1315M	1:1	back	1.130	1.180	1.333	
1732.40	1412	UMTS 1750	RMC	24.0	23.28	23	-0.01	6 mm	A	1315M	1:1	front	1.110	1.180	1.310	
1732.40	1412	UMTS 1750	RMC	24.0	23.28	23	0.02	11 mm	A	1315M	1:1	bottom	1.180	1.180	1.392	
1732.40	1412	UMTS 1750	RMC	24.0	23.28	23	-0.04	0 mm	A	1315M	1:1	right	0.267	1.180	0.315	
1732.40	1412	UMTS 1750	RMC	24.0	23.28	23	-0.07	0 mm	A	1315M	1:1	left	0.982	1.180	1.159	
1712.40	1312	UMTS 1750	RMC	21.0	19.83	23	0.03	0 mm	A	1315M	1:1	back	1.880	1.309	2.461	
1732.40	1412	UMTS 1750	RMC	21.0	20.02	23	0.02	0 mm	A	1315M	1:1	back	1.890	1.253	2.368	
1752.60	1513	UMTS 1750	RMC	21.0	20.19	23	-0.04	0 mm	A	1315M	1:1	back	1.950	1.205	2.350	
1712.40	1312	UMTS 1750	RMC	21.0	19.83	23	0.01	0 mm	A	1315M	1:1	front	1.280	1.309	1.676	
1732.40	1412	UMTS 1750	RMC	21.0	20.02	23	0.03	0 mm	A	1315M	1:1	front	1.320	1.253	1.654	
1752.60	1513	UMTS 1750	RMC	21.0	20.19	23	0.01	0 mm	A	1315M	1:1	front	1.740	1.205	2.097	
1712.40	1312	UMTS 1750	RMC	21.0	19.83	23	-0.02	0 mm	A	1315M	1:1	bottom	2.260	1.309	2.958	A53
1732.40	1412	UMTS 1750	RMC	21.0	20.02	23	0.00	0 mm	A	1315M	1:1	bottom	1.930	1.253	2.418	
1752.60	1513	UMTS 1750	RMC	21.0	20.19	23	-0.01	0 mm	A	1315M	1:1	bottom	1.950	1.205	2.350	
1712.40	1312	UMTS 1750	RMC	21.0	19.83	23	-0.02	0 mm	A	1315M	1:1	bottom	2.260	1.309	2.958	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Phablet 4.0 W/kg (mW/g) averaged over 10 grams									

Note: Blue entry represents variability measurement

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**Table 11-49
UMTS 1900 Phablet SAR Data**

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Duty Cycle	Side	SAR (10g)	Scaling Factor	Reported SAR	Plot #
MHz	Ch.												(W/kg)		(10g) (W/kg)	
1880.00	9400	UMTS 1900	RMC	24.0	23.03	13	0.01	8 mm	A	1330M	1:1	back	0.924	1.250	1.155	
1880.00	9400	UMTS 1900	RMC	24.0	23.03	13	0.01	6 mm	A	1330M	1:1	front	0.953	1.250	1.191	
1880.00	9400	UMTS 1900	RMC	24.0	23.03	13	0.03	11 mm	A	1330M	1:1	bottom	1.280	1.250	1.600	
1880.00	9400	UMTS 1900	RMC	24.0	23.03	13	0.03	0 mm	A	1330M	1:1	right	0.376	1.250	0.470	
1880.00	9400	UMTS 1900	RMC	24.0	23.03	13	0.00	0 mm	A	1330M	1:1	left	0.726	1.250	0.908	
1880.00	9400	UMTS 1900	RMC	20.5	19.45	13	0.13	0 mm	A	1330M	1:1	back	1.490	1.274	1.898	
1852.40	9262	UMTS 1900	RMC	20.5	19.44	13	0.04	0 mm	A	1330M	1:1	front	1.110	1.276	1.416	
1880.00	9400	UMTS 1900	RMC	20.5	19.45	13	-0.04	0 mm	A	1330M	1:1	front	1.490	1.274	1.898	A54
1907.60	9538	UMTS 1900	RMC	20.5	19.39	13	0.03	0 mm	A	1330M	1:1	front	1.300	1.291	1.678	
1880.00	9400	UMTS 1900	RMC	20.5	19.45	13	-0.03	0 mm	A	1330M	1:1	bottom	1.400	1.274	1.784	
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 11-50
LTE Band 66 (AWS) Phablet SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR	Plot #	
MHz	Ch.																(W/kg)		(10g) (W/kg)		
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	23.08	64	0.08	0	A	3892R	QPSK	1	50	8 mm	back	1:1	0.807	1.102	0.889	
1720.00	132072	Low	LTE Band 66 (AWS)	20	22.5	22.10	64	-0.04	1	A	3892R	QPSK	50	25	8 mm	back	1:1	0.653	1.096	0.716	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	23.08	38	0.06	0	A	3892R	QPSK	1	50	6 mm	front	1:1	0.691	1.102	0.761	
1720.00	132072	Low	LTE Band 66 (AWS)	20	22.5	22.10	38	-0.01	1	A	3892R	QPSK	50	25	6 mm	front	1:1	0.558	1.096	0.612	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	23.08	22	0.03	0	A	3892R	QPSK	1	50	11 mm	bottom	1:1	0.933	1.102	1.028	
1720.00	132072	Low	LTE Band 66 (AWS)	20	22.5	22.10	22	0.00	1	A	3892R	QPSK	50	25	11 mm	bottom	1:1	0.735	1.096	0.806	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	23.08	24	0.07	0	A	3892R	QPSK	1	50	0 mm	right	1:1	0.283	1.102	0.312	
1720.00	132072	Low	LTE Band 66 (AWS)	20	22.5	22.10	24	0.03	1	A	3892R	QPSK	50	25	0 mm	right	1:1	0.228	1.096	0.250	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	23.08	22	-0.01	0	A	3892R	QPSK	1	50	0 mm	left	1:1	0.461	1.102	0.508	
1720.00	132072	Low	LTE Band 66 (AWS)	20	22.5	22.10	22	-0.01	1	A	3892R	QPSK	50	25	0 mm	left	1:1	0.369	1.096	0.404	
1720.00	132072	Low	LTE Band 66 (AWS)	20	19.5	18.48	38	0.09	0	A	3892R	QPSK	1	50	0 mm	back	1:1	1.270	1.265	1.607	
1720.00	132072	Low	LTE Band 66 (AWS)	20	19.5	18.50	38	0.13	0	A	3892R	QPSK	50	25	0 mm	back	1:1	1.290	1.259	1.624	
1720.00	132072	Low	LTE Band 66 (AWS)	20	19.5	18.48	38	-0.02	0	A	3892R	QPSK	1	50	0 mm	front	1:1	0.948	1.265	1.199	
1720.00	132072	Low	LTE Band 66 (AWS)	20	19.5	18.50	38	-0.01	0	A	3892R	QPSK	50	25	0 mm	front	1:1	0.963	1.259	1.212	
1720.00	132072	Low	LTE Band 66 (AWS)	20	19.5	18.48	64	-0.04	0	A	3892R	QPSK	1	50	0 mm	bottom	1:1	1.510	1.265	1.910	A55
1745.00	132322	Mid	LTE Band 66 (AWS)	20	19.5	18.36	61	0.06	0	A	3892R	QPSK	1	50	0 mm	bottom	1:1	1.440	1.300	1.872	
1770.00	132572	High	LTE Band 66 (AWS)	20	19.5	18.25	64	0.04	0	A	3892R	QPSK	1	0	0 mm	bottom	1:1	1.310	1.334	1.748	
1720.00	132072	Low	LTE Band 66 (AWS)	20	19.5	18.50	64	-0.04	0	A	3892R	QPSK	50	25	0 mm	bottom	1:1	1.430	1.259	1.800	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	19.5	18.30	35	0.06	0	A	3892R	QPSK	50	25	0 mm	bottom	1:1	1.410	1.318	1.858	
1770.00	132572	High	LTE Band 66 (AWS)	20	19.5	18.18	64	0.06	0	A	3892R	QPSK	50	25	0 mm	bottom	1:1	1.300	1.355	1.762	
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 11-51
LTE Band 25 (PCS) Phablet SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Tune State	Power Drift [dB]	MPR [dB]	Antenna Config.	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g) [W/kg]	Scaling Factor	Reported SAR (10g) [W/kg]	Plot #
MHz	Ch.	Low																			
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.0	22.66	112	0.01	0	A	1324M	QPSK	1	50	8 mm	back	1:1	0.951	1.081	1.028	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.48	112	0.02	1	A	1324M	QPSK	50	25	8 mm	back	1:1	0.748	1.127	0.843	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.0	22.66	112	-0.06	0	A	1324M	QPSK	1	50	6 mm	front	1:1	1.180	1.081	1.276	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.48	112	-0.02	1	A	1324M	QPSK	50	25	6 mm	front	1:1	0.945	1.127	1.065	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.0	22.66	112	-0.09	0	A	1324M	QPSK	1	50	11 mm	bottom	1:1	1.050	1.081	1.135	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.48	112	0.01	1	A	1324M	QPSK	50	25	11 mm	bottom	1:1	0.842	1.127	0.949	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.0	22.66	112	0.03	0	A	1324M	QPSK	1	50	0 mm	right	1:1	0.348	1.081	0.376	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.48	112	0.03	1	A	1324M	QPSK	50	25	0 mm	right	1:1	0.278	1.127	0.313	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.0	22.66	112	0.03	0	A	1324M	QPSK	1	50	0 mm	left	1:1	0.746	1.081	0.806	
1860.00	26140	Low	LTE Band 25 (PCS)	20	22.0	21.48	112	0.05	1	A	1324M	QPSK	50	25	0 mm	left	1:1	0.608	1.127	0.685	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	19.5	18.82	112	-0.04	0	A	3891R	QPSK	1	50	0 mm	back	1:1	1.270	1.169	1.485	
1860.00	26140	Low	LTE Band 25 (PCS)	20	19.5	18.83	112	-0.08	0	A	3891R	QPSK	50	25	0 mm	back	1:1	1.150	1.167	1.342	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	19.5	18.82	112	-0.02	0	A	3891R	QPSK	1	50	0 mm	front	1:1	1.230	1.169	1.438	
1860.00	26140	Low	LTE Band 25 (PCS)	20	19.5	18.83	112	-0.05	0	A	3891R	QPSK	50	25	0 mm	front	1:1	1.100	1.167	1.284	
1860.00	26140	Low	LTE Band 25 (PCS)	20	19.5	18.81	112	0.02	0	A	3891R	QPSK	1	50	0 mm	bottom	1:1	1.100	1.172	1.289	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	19.5	18.82	112	-0.02	0	A	3891R	QPSK	1	50	0 mm	bottom	1:1	1.360	1.169	1.590	A56
1905.00	26590	High	LTE Band 25 (PCS)	20	19.5	18.77	112	-0.09	0	A	3891R	QPSK	1	50	0 mm	bottom	1:1	1.260	1.183	1.491	
1860.00	26140	Low	LTE Band 25 (PCS)	20	19.5	18.83	112	0.00	0	A	3891R	QPSK	50	25	0 mm	bottom	1:1	1.130	1.167	1.319	
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 11-52
LTE Band 41 Phablet SAR

MEASUREMENT RESULTS																					
Power Class	FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g) [W/kg]	Scaling Factor	Reported SAR (10g) [W/kg]	Plot #	
	MHz	Ch.																			High
Power Class 3	2680.00	41490	High	LTE Band 41	20	24.5	23.66	-0.11	0	B	1330M	QPSK	1	50	8 mm	back	1:1.58	0.114	1.213	0.138	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.61	-0.08	1	B	1330M	QPSK	50	50	8 mm	back	1:1.58	0.090	1.227	0.110	
Power Class 3	2680.00	41490	High	LTE Band 41	20	24.5	23.66	-0.08	0	B	1330M	QPSK	1	50	6 mm	front	1:1.58	0.110	1.213	0.133	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.61	-0.04	1	B	1330M	QPSK	50	50	6 mm	front	1:1.58	0.086	1.227	0.106	
Power Class 3	2680.00	41490	High	LTE Band 41	20	24.5	23.66	0.07	0	B	1330M	QPSK	1	50	11 mm	bottom	1:1.58	0.114	1.213	0.138	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.61	0.04	1	B	1330M	QPSK	50	50	11 mm	bottom	1:1.58	0.095	1.227	0.117	
Power Class 3	2680.00	41490	High	LTE Band 41	20	24.5	23.66	-0.02	0	B	1330M	QPSK	1	50	0 mm	left	1:1.58	0.662	1.213	0.803	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.61	-0.08	1	B	1330M	QPSK	50	50	0 mm	left	1:1.58	0.516	1.227	0.633	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.5	21.94	0.02	0	B	1330M	QPSK	1	99	0 mm	back	1:1.58	1.550	1.432	2.220	
Power Class 3	2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.34	-0.04	0	B	1330M	QPSK	1	50	0 mm	back	1:1.58	1.650	1.306	2.155	
Power Class 3	2593.00	40620	Mid	LTE Band 41	20	23.5	22.15	0.02	0	B	1330M	QPSK	1	50	0 mm	back	1:1.58	1.990	1.365	2.716	A57
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	23.5	22.15	0.05	0	B	1330M	QPSK	1	50	0 mm	back	1:1.58	1.060	1.365	1.447	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.35	0.01	0	B	1330M	QPSK	1	50	0 mm	back	1:1.58	1.190	1.303	1.551	
Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.5	21.90	0.00	0	B	1330M	QPSK	50	50	0 mm	back	1:1.58	1.530	1.445	2.211	
Power Class 3	2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.37	-0.01	0	B	1330M	QPSK	50	50	0 mm	back	1:1.58	1.650	1.297	2.140	
Power Class 3	2593.00	40620	Mid	LTE Band 41	20	23.5	22.24	0.00	0	B	1330M	QPSK	50	25	0 mm	back	1:1.58	1.990	1.337	2.661	
Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	23.5	22.15	-0.04	0	B	1330M	QPSK	50	0	0 mm	back	1:1.58	1.040	1.365	1.420	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.42	0.14	0	B	1330M	QPSK	50	50	0 mm	back	1:1.58	1.190	1.282	1.526	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.33	0.03	0	B	1330M	QPSK	100	0	0 mm	back	1:1.58	1.100	1.309	1.440	
Power Class 2	2593.00	40620	Mid	LTE Band 41	20	23.5	22.37	-0.02	0	B	1330M	QPSK	1	50	0 mm	back	1:2.31	1.480	1.297	1.920	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.35	-0.08	0	B	1330M	QPSK	1	50	0 mm	front	1:1.58	0.463	1.303	0.603	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.42	-0.05	0	B	1330M	QPSK	50	50	0 mm	front	1:1.58	0.448	1.282	0.574	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.35	0.04	0	B	1330M	QPSK	1	50	0 mm	bottom	1:1.58	0.576	1.303	0.751	
Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	22.42	-0.04	0	B	1330M	QPSK	50	50	0 mm	bottom	1:1.58	0.589	1.282	0.755	
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 11-53
NR Band n66 Phablet SAR**

MEASUREMENT RESULTS																						
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Tune State	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.																					
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.77	A	0.10	0	64	3892R	DFT-S-OFDM	QPSK	1	53	8 mm	back	1:1	1.020	1.183	1.207	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.70	A	0.01	0	64	3892R	DFT-S-OFDM	QPSK	50	28	8 mm	back	1:1	1.030	1.202	1.238	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.77	A	0.02	0	38	3892R	DFT-S-OFDM	QPSK	1	53	6 mm	front	1:1	0.851	1.183	1.007	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.70	A	-0.01	0	38	3892R	DFT-S-OFDM	QPSK	50	28	6 mm	front	1:1	0.855	1.202	1.028	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.77	A	-0.04	0	22	3892R	DFT-S-OFDM	QPSK	1	53	11 mm	bottom	1:1	1.100	1.183	1.301	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.70	A	0.00	0	22	3892R	DFT-S-OFDM	QPSK	50	28	11 mm	bottom	1:1	1.100	1.202	1.322	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.77	A	-0.05	0	24	3892R	DFT-S-OFDM	QPSK	1	53	0 mm	right	1:1	0.391	1.183	0.463	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.70	A	0.03	0	24	3892R	DFT-S-OFDM	QPSK	50	28	0 mm	right	1:1	0.387	1.202	0.465	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.77	A	-0.01	0	22	3892R	DFT-S-OFDM	QPSK	1	53	0 mm	left	1:1	0.303	1.183	1.068	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.70	A	-0.01	0	22	3892R	DFT-S-OFDM	QPSK	50	28	0 mm	left	1:1	0.914	1.202	1.099	
1720.00	344000	Low	NR Band n66 (AWS)	20	21.0	20.52	A	0.10	0	38	3892R	DFT-S-OFDM	QPSK	1	104	0 mm	back	1:1	1.250	1.117	1.386	
1720.00	344000	Low	NR Band n66 (AWS)	20	21.0	20.50	A	-0.03	0	38	3892R	DFT-S-OFDM	QPSK	50	56	0 mm	back	1:1	1.250	1.122	1.403	
1720.00	344000	Low	NR Band n66 (AWS)	20	21.0	20.52	A	-0.02	0	38	3892R	DFT-S-OFDM	QPSK	1	104	0 mm	front	1:1	1.280	1.117	1.430	
1720.00	344000	Low	NR Band n66 (AWS)	20	21.0	20.50	A	0.01	0	38	3892R	DFT-S-OFDM	QPSK	50	56	0 mm	front	1:1	1.310	1.122	1.470	
1720.00	344000	Low	NR Band n66 (AWS)	20	21.0	20.52	A	-0.02	0	64	3892R	DFT-S-OFDM	QPSK	1	104	0 mm	bottom	1:1	1.990	1.117	2.223	
1745.00	349000	Mid	NR Band n66 (AWS)	20	21.0	20.51	A	0.01	0	61	3892R	DFT-S-OFDM	QPSK	1	104	0 mm	bottom	1:1	1.870	1.119	2.093	
1770.00	354000	High	NR Band n66 (AWS)	20	21.0	20.41	A	0.01	0	64	3892R	DFT-S-OFDM	QPSK	1	1	0 mm	bottom	1:1	1.800	1.146	2.063	
1720.00	344000	Low	NR Band n66 (AWS)	20	21.0	20.50	A	0.04	0	64	3892R	DFT-S-OFDM	QPSK	50	56	0 mm	bottom	1:1	2.000	1.122	2.244	
1745.00	349000	Mid	NR Band n66 (AWS)	20	21.0	20.45	A	0.00	0	35	3892R	DFT-S-OFDM	QPSK	50	56	0 mm	bottom	1:1	1.900	1.135	2.157	
1770.00	354000	High	NR Band n66 (AWS)	20	21.0	20.26	A	0.04	0	64	3892R	DFT-S-OFDM	QPSK	50	28	0 mm	bottom	1:1	1.740	1.186	2.064	
1720.00	344000	Low	NR Band n66 (AWS)	20	21.0	20.42	A	0.00	0	64	3892R	DFT-S-OFDM	QPSK	100	0	0 mm	bottom	1:1	2.000	1.143	2.286	A58
1745.00	349000	Mid	NR Band n66 (AWS)	20	21.0	20.48	A	0.02	0	61	3892R	CP-OFDM	QPSK	1	1	0 mm	bottom	1:1	1.840	1.127	2.074	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT										Extremity												
Spatial Peak										4.0 W/kg (mW/g)												
Uncontrolled Exposure/General Population										averaged over 10 grams												

**Table 11-54
WLAN MIMO Phablet SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan [W/kg]	SAR (10g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g) (W/kg)	Plot #
MHz	Ch.																				
5310	62	802.11n	OFDM	40	17.0	15.86	17.0	16.42	0.06	0 mm	MIMO	1025M	27	back	94.8	5.920	0.742	1.300	1.055	1.018	
5310	62	802.11n	OFDM	40	17.0	15.86	17.0	16.42	-0.19	0 mm	MIMO	1025M	27	front	94.8	2.250	0.548	1.300	1.055	0.752	
5310	62	802.11n	OFDM	40	17.0	15.86	17.0	16.42	0.03	0 mm	MIMO	1025M	27	top	94.8	0.742	0.097	1.300	1.055	0.133	
5310	62	802.11n	OFDM	40	17.0	15.86	17.0	16.42	0.08	0 mm	MIMO	1025M	27	left	94.8	2.390	0.400	1.300	1.055	0.549	
5710	142	802.11n	OFDM	40	17.0	16.18	17.0	16.15	0.03	0 mm	MIMO	1025M	27	back	94.8	6.480	0.800	1.216	1.055	1.026	A59
5710	142	802.11n	OFDM	40	17.0	16.18	17.0	16.15	-0.03	0 mm	MIMO	1025M	27	front	94.8	1.130	0.278	1.216	1.055	0.357	
5710	142	802.11n	OFDM	40	17.0	16.18	17.0	16.15	-0.03	0 mm	MIMO	1025M	27	top	94.8	0.313	0.074	1.216	1.055	0.095	
5710	142	802.11n	OFDM	40	17.0	16.18	17.0	16.15	-0.13	0 mm	MIMO	1025M	27	left	94.8	1.300	0.233	1.216	1.055	0.299	
5875	175	802.11n	OFDM	40	17.0	15.33	17.0	15.78	0.00	0 mm	MIMO	1025M	27	back	94.8	7.620	0.769	1.469	1.055	1.192	
5875	175	802.11n	OFDM	40	17.0	15.33	17.0	15.78	-0.02	0 mm	MIMO	1025M	27	front	94.8	0.813	0.210	1.469	1.055	0.325	
5875	175	802.11n	OFDM	40	17.0	15.33	17.0	15.78	0.00	0 mm	MIMO	1025M	27	top	94.8	0.299	0.070	1.469	1.055	0.108	
5875	175	802.11n	OFDM	40	17.0	15.33	17.0	15.78	-0.04	0 mm	MIMO	1025M	27	left	94.8	1.200	0.247	1.469	1.055	0.383	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT										Phablet											
Spatial Peak										4.0 W/kg (mW/g)											
Uncontrolled Exposure/General Population										averaged over 10 grams											

Note: To achieve the 20.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 17.0 dBm.

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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 without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.
8. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 12 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).
10. Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is > 160 mm and < 200 mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.
11. This device supports dynamic antenna tuning for some bands. Per FCC Guidance, SAR was measured according to the normally required SAR measurement configurations with tuner active. The auto-tune state determined by the device was verified before and after each SAR measurement and is listed in tables above. Please see Section 13 for supplemental data.
12. Additional SAR tests for phablet SAR were evaluated per KDB 616217 Section 6 (See Section 6.9 for more information).
13. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the 1g thresholds for the equivalent test cases.

GSM Test Notes:

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

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UMTS Notes:




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

LTE Notes:

1. LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r04. The general test procedures used for testing can be found in Section 8.5.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 and MCC=001 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
4. Per FCC KDB Publication 447498 D01v06, when the reported 1g SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for LTE B41.
5. TDD LTE was tested per the guidance provided in FCC KDB Publication 941225 D05v02r04. Testing was performed using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.
6. Per KDB Publication 941225 D05Av01r02, SAR for downlink only LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.
7. This device supports Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operations is 43.3 % using UL-DL configuration 1. Per FCC Guidance, all SAR tests were performed using Power Class 3. SAR with power class 2 at the available duty factor was additionally performed for the power class 3 configuration with the highest SAR configuration for each exposure conditions. Please see Section 13 for linearity results.

NR Notes:

1. NR implementation supports SA and 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 TDD was performed using test mode software to establish the connection.
3. Simultaneous transmission analysis for EN-DC operations is addressed in Appendix D.
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.




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WLAN Notes:

1. For held-to-ear, and hotspot, and phablet operations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg for 1g evaluations, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n/ax) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 8.6.5 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg for 1g evaluations. See Section 8.6.6 for more information.
4. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D01v06 by either evaluating the sum of the 1g SAR values of each antenna transmitting independently or making a SAR measurement with both antennas transmitting simultaneously. Please see Appendix D for complete analysis.
5. When the maximum reported 1g averaged SAR is ≤ 0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg for 1g evaluations or all test channels were measured.
6. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated EMC test reports.
7. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

Bluetooth Notes

1. Bluetooth SAR was measured with the device connected to a call box with hopping disabled with DH5 operation and Tx Tests test mode type. Per October 2016 TCB Workshop Notes, the reported SAR was scaled to the 100% transmission duty factor to determine compliance. See Section 9 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 SAR MEASUREMENT VARIABILITY

12.1 Measurement Variability

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

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

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

Table 12-1
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	bottom	10 mm	0.984	0.909	1.08	N/A	N/A	N/A	N/A
1900	1907.60	9538	UMTS 1900	RMC	bottom	10 mm	1.010	0.964	1.05	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram						

Table 12-2
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)	
1750	1712.40	1312	UMTS 1750	RMC	bottom	0 mm	2.260	2.260	1.00	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Phablet 4.0 W/kg (mW/g) averaged over 10 grams						

12.2 Measurement Uncertainty

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

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13 ADDITIONAL TESTING PER FCC GUIDANCE

13.1 Tuner Testing

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

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

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




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Table 13-1
UMTS Supplemental Head SAR Data

Supplemental Head SAR Data					
UMTS B5		UMTS B4		UMTS B2	
RMC		RMC		RMC	
Test Position	Right Cheek	Test Position	Left Cheek	Test Position	Left Cheek
Frequency (MHz)	846.60	Frequency (MHz)	1732.40	Frequency (MHz)	1880.00
Channel	4233	Channel	1412	Channel	9400
Measured 1g SAR (W/kg)	0.226	Measured 1g SAR (W/kg)	0.284	Measured 1g SAR (W/kg)	0.151
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 112)	0.298	Auto-tune (State 22)	0.298	Auto-tune (State 1)	0.175
Default (State 0)	0.291	Default (State 0)	0.223	Default (State 0)	0.182
State 0	0.291	State 1	0.229	State 1	0.178
State 3	0.273	State 6	0.238	State 2	0.181
State 10	0.101	State 22	0.298	State 9	0.159
State 39	0.272	State 40	0.119	State 41	0.113
State 78	0.172	State 79	0.210	State 80	0.165
State 112	0.291	State 108	0.132	State 107	0.109
State 117	0.269	State 118	0.204	State 119	0.159

Table 13-2
LTE Supplemental Head SAR Data

Supplemental Head SAR Data									
LTE B12		LTE B13		LTE B26		LTE B66		LTE B25	
QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offset		QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offset		QPSK, 15 MHz Bandwidth, 1 RB, 0 RB Offset		QPSK, 20 MHz Bandwidth, 1 RB, 50 RB Offset		QPSK, 20 MHz Bandwidth, 1 RB, 50 RB Offset	
Test Position	Right Cheek	Test Position	Right Cheek	Test Position	Right Cheek	Test Position	Left Cheek	Test Position	Left Cheek
Frequency (MHz)	707.50	Frequency (MHz)	782.00	Frequency (MHz)	831.50	Frequency (MHz)	1720.00	Frequency (MHz)	1860.00
Channel	23095	Channel	23230	Channel	26865	Channel	132072	Channel	26140
Measured 1g SAR (W/kg)	0.125	Measured 1g SAR (W/kg)	0.270	Measured 1g SAR (W/kg)	0.185	Measured 1g SAR (W/kg)	0.176	Measured 1g SAR (W/kg)	0.202
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 0)	0.158	Auto-tune (State 112)	0.341	Auto-tune (State 65)	0.233	Auto-tune (State 23)	0.179	Auto-tune (State 113)	0.220
Default (State 0)	0.153	Default (State 0)	0.334	Default (State 0)	0.242	Default (State 0)	0.116	Default (State 0)	0.206
State 0	0.153	State 8	0.173	State 11	0.043	State 12	0.098	State 14	0.200
State 7	0.148	State 15	0.300	State 16	0.233	State 19	0.153	State 24	0.136
State 10	0.095	State 29	0.124	State 50	0.034	State 23	0.180	State 53	0.163
State 46	0.144	State 47	0.143	State 65	0.231	State 51	0.055	State 83	0.185
State 52	0.022	State 86	0.042	State 89	0.019	State 90	0.104	State 88	0.140
State 85	0.083	State 97	0.151	State 94	0.155	State 93	0.125	State 92	0.179
State 102	0.163	State 112	0.334	State 113	0.225	State 104	0.114	State 113	0.195

Table 13-3
NR Supplemental Head SAR Data

Supplemental Head SAR Data			
NR Band n5		NR Band n66	
DFT-s-OFDM QPSK, 20 MHz Bandwidth, 50 RB, 28 RB Offset		DFT-s-OFDM QPSK, 20 MHz Bandwidth, 50 RB, 28 RB Offset	
Test Position	Left Cheek	Test Position	Left Cheek
Frequency (MHz)	836.50	Frequency (MHz)	1720.00
Channel	167300	Channel	344000
Measured 1g SAR (W/kg)	0.214	Measured 1g SAR (W/kg)	0.182
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 112)	0.216	Auto-tune (State 23)	0.190
Default (State 0)	0.224	Default (State 0)	0.155
State 17	0.177	State 18	0.177
State 25	0.046	State 23	0.196
State 42	0.212	State 26	0.165
State 56	0.140	State 30	0.162
State 87	0.032	State 57	0.150
State 95	0.156	State 82	0.150
State 112	0.225	State 96	0.168



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Table 13-4
UMTS Supplemental Body SAR Data



Supplemental Body SAR Data					
UMTS B5		UMTS B4		UMTS B2	
RMC		RMC		RMC	
Test Position	Back	Test Position	Bottom	Test Position	Bottom
Spacing	10 mm	Spacing	10 mm	Spacing	10 mm
Frequency (MHz)	846.60	Frequency (MHz)	1752.60	Frequency (MHz)	1907.60
Channel	4233	Channel	1513	Channel	9538
Measured 1g SAR (W/kg)	0.411	Measured 1g SAR (W/kg)	0.984	Measured 1g SAR (W/kg)	1.010
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 112)	0.651	Auto-tune (State 23)	1.010	Auto-tune (State 13)	1.140
Default (State 0)	0.671	Default (State 0)	0.695	Default (State 0)	1.180
State 4	0.683	State 8	0.732	State 13	1.100
State 20	0.493	State 21	0.928	State 22	1.150
State 25	0.102	State 23	0.962	State 38	0.848
State 34	0.140	State 35	0.735	State 61	1.080
State 59	0.256	State 60	0.766	State 74	0.804
State 81	0.347	State 77	0.457	State 84	1.060
State 98	0.315	State 99	0.852	State 91	0.979
State 112	0.672	State 116	0.528	State 100	1.060

Table 13-5
LTE Supplemental Body SAR Data

Supplemental Body SAR Data									
LTE B12		LTE B13		LTE B26		LTE B66		LTE B25	
QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offset		QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offset		QPSK, 15 MHz Bandwidth, 1 RB, 0 RB Offset		QPSK, 20 MHz Bandwidth, 1 RB, 0 RB Offset		QPSK, 20 MHz Bandwidth, 1 RB, 50 RB Offset	
Test Position	Back	Test Position	Back	Test Position	Back	Test Position	Bottom	Test Position	Back
Spacing	10 mm	Spacing	10 mm	Spacing	10 mm	Spacing	10 mm	Spacing	15 mm
Frequency (MHz)	707.50	Frequency (MHz)	782.00	Frequency (MHz)	831.50	Frequency (MHz)	1770.00	Frequency (MHz)	1860.00
Channel	23095	Channel	23230	Channel	26865	Channel	132572	Channel	26140
Measured 1g SAR (W/kg)	0.338	Measured 1g SAR (W/kg)	0.524	Measured 1g SAR (W/kg)	0.449	Measured 1g SAR (W/kg)	0.597	Measured 1g SAR (W/kg)	0.690
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 112)	0.518	Auto-tune (State 113)	0.848	Auto-tune (State 39)	0.789	Auto-tune (State 22)	0.675	Auto-tune (State 112)	1.072
Default (State 0)	0.507	Default (State 0)	0.842	Default (State 0)	0.810	Default (State 0)	0.526	Default (State 0)	0.968
State 5	0.536	State 3	0.685	State 14	0.773	State 22	0.684	State 33	0.973
State 15	0.331	State 13	0.830	State 31	0.439	State 23	0.687	State 54	0.894
State 27	0.157	State 28	0.511	State 39	0.750	State 32	0.481	State 64	0.706
State 44	0.498	State 45	0.400	State 48	0.229	State 49	0.287	State 72	0.657
State 66	0.348	State 67	0.751	State 68	0.724	State 65	0.304	State 87	0.715
State 73	0.117	State 69	0.682	State 70	0.652	State 71	0.434	State 101	0.757
State 105	0.294	State 106	0.530	State 91	0.351	State 103	0.556	State 111	0.874
State 112	0.507	State 113	0.828	State 109	0.763	State 110	0.493	State 112	0.961

Table 13-6
NR Supplemental Body SAR Data

Supplemental Body SAR Data			
NR Band n5		NR Band n66	
DFT-s-OFDM QPSK, 20 MHz Bandwidth, 1 RB, 1 RB Offset		DFT-s-OFDM QPSK, 20 MHz Bandwidth, 50 RB, 56 RB Offset	
Test Position	Back	Test Position	Bottom
Spacing	10 mm	Spacing	10 mm
Frequency (MHz)	836.50	Frequency (MHz)	1745.00
Channel	167300	Channel	349000
Measured 1g SAR (W/kg)	0.381	Measured 1g SAR (W/kg)	0.895
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 39)	0.388	Auto-tune (State 22)	1.050
Default (State 0)	0.392	Default (State 0)	0.807
State 33	0.114	State 17	0.867
State 36	0.035	State 22	1.050
State 39	0.388	State 23	1.050
State 43	0.339	State 37	0.822
State 55	0.182	State 58	0.588
State 63	0.010	State 62	0.869
State 75	0.115	State 76	0.710
State 114	0.160	State 115	0.397

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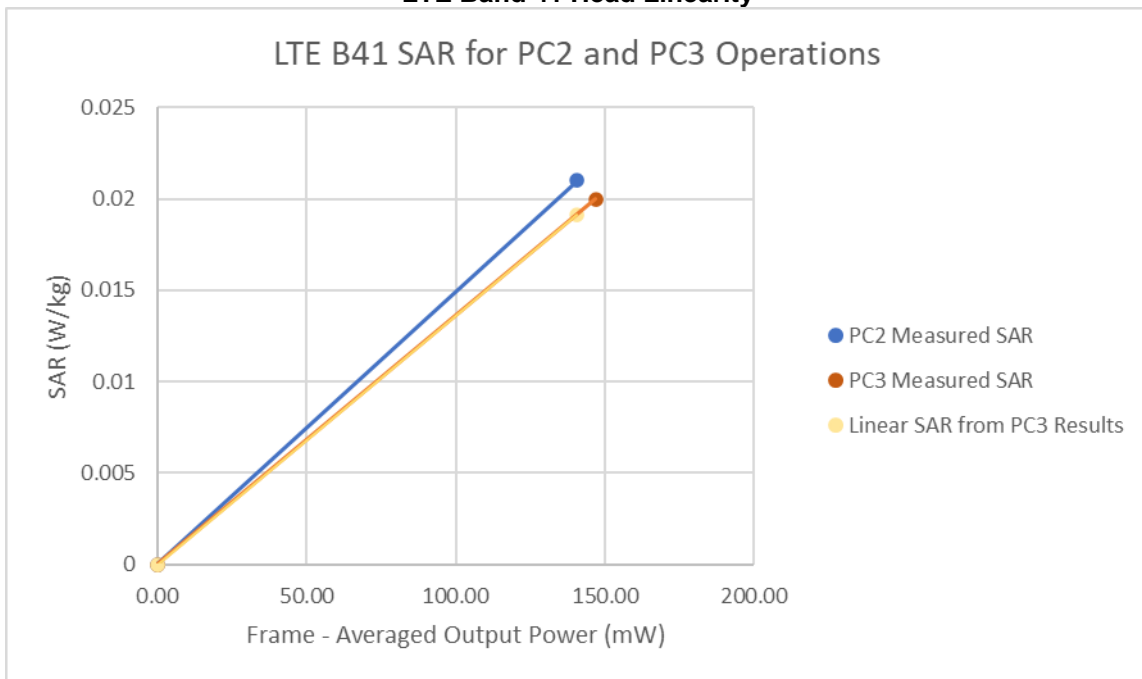
13.1 LTE Band 41 Power Class 2 and Power Class 3 Linearity

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

**Table 13-7
LTE Band 41 Head Linearity Data**

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	24.5	26.5
Measured Output Power (dBm)	23.66	25.12
Measured SAR (W/kg)	0.020	0.021
Measured Power (mW)	232.27	325.09
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	147.03	140.76
% deviation from expected linearity		9.67%

**Figure 13-1
LTE Band 41 Head Linearity**

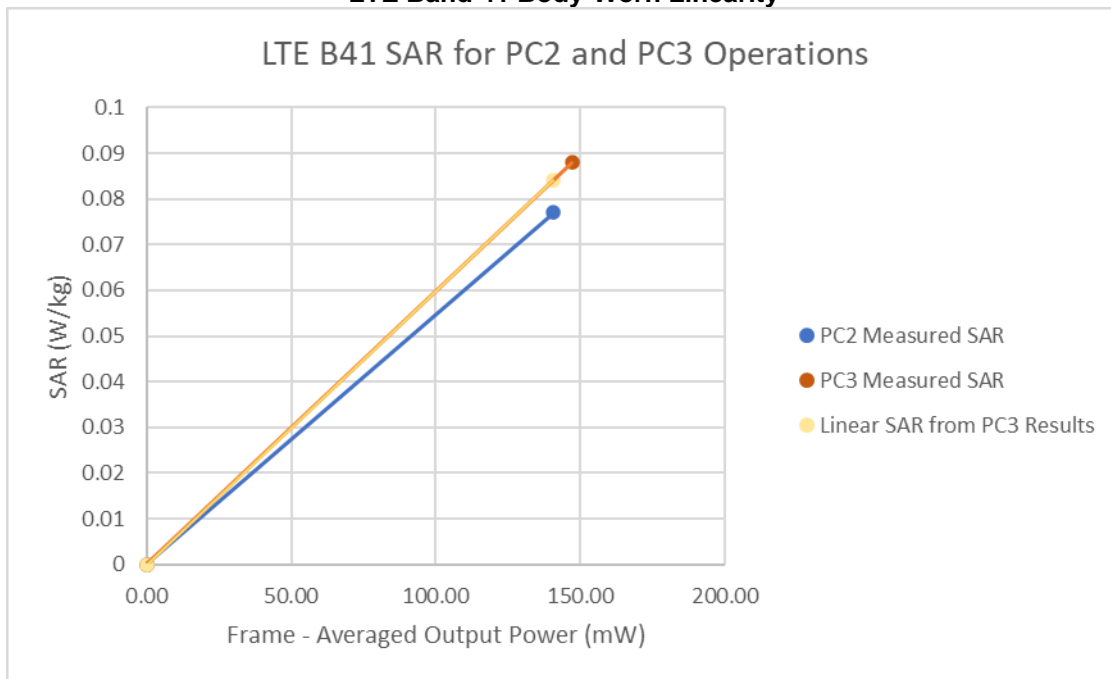


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**Table 13-8
LTE Band 41 Body-Worn Linearity Data**

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	24.5	26.5
Measured Output Power (dBm)	23.66	25.12
Measured SAR (W/kg)	0.088	0.077
Measured Power (mW)	232.27	325.09
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	147.03	140.76
% deviation from expected linearity		-8.60%

**Figure 13-2
LTE Band 41 Body-Worn Linearity**

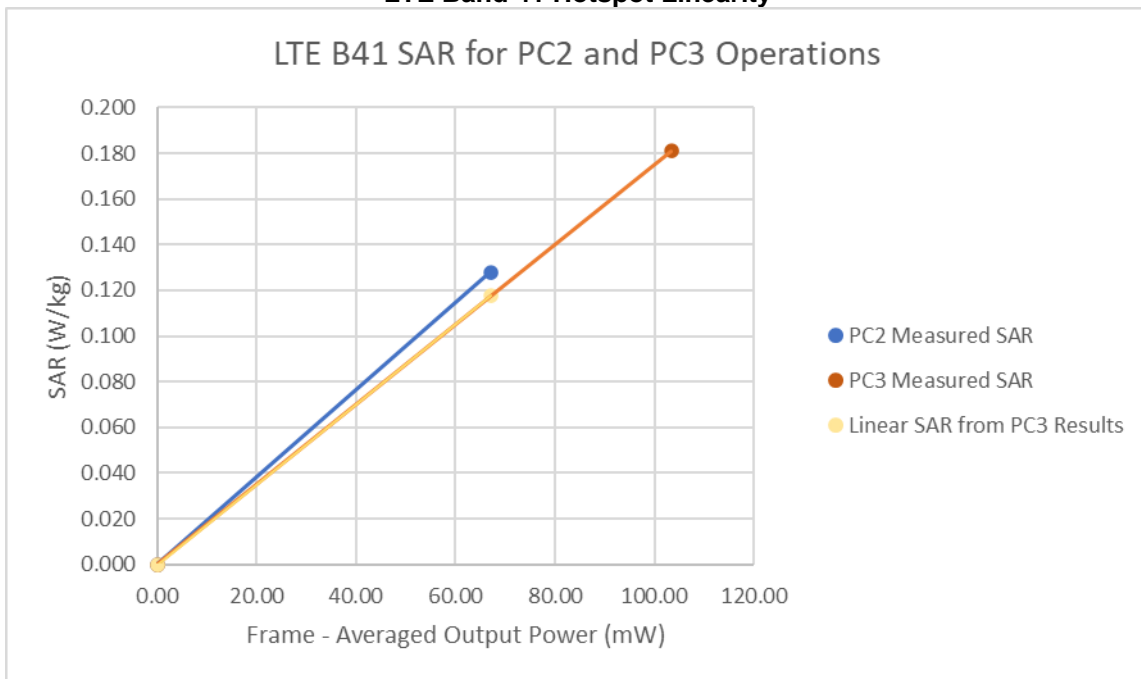


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**Table 13-9
LTE Band 41 Hotspot Linearity Data**

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	23.0	23.0
Measured Output Power (dBm)	22.13	21.90
Measured SAR (W/kg)	0.181	0.128
Measured Power (mW)	163.31	154.88
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	103.37	67.06
% deviation from expected linearity		9.01%

**Figure 13-3
LTE Band 41 Hotspot Linearity**






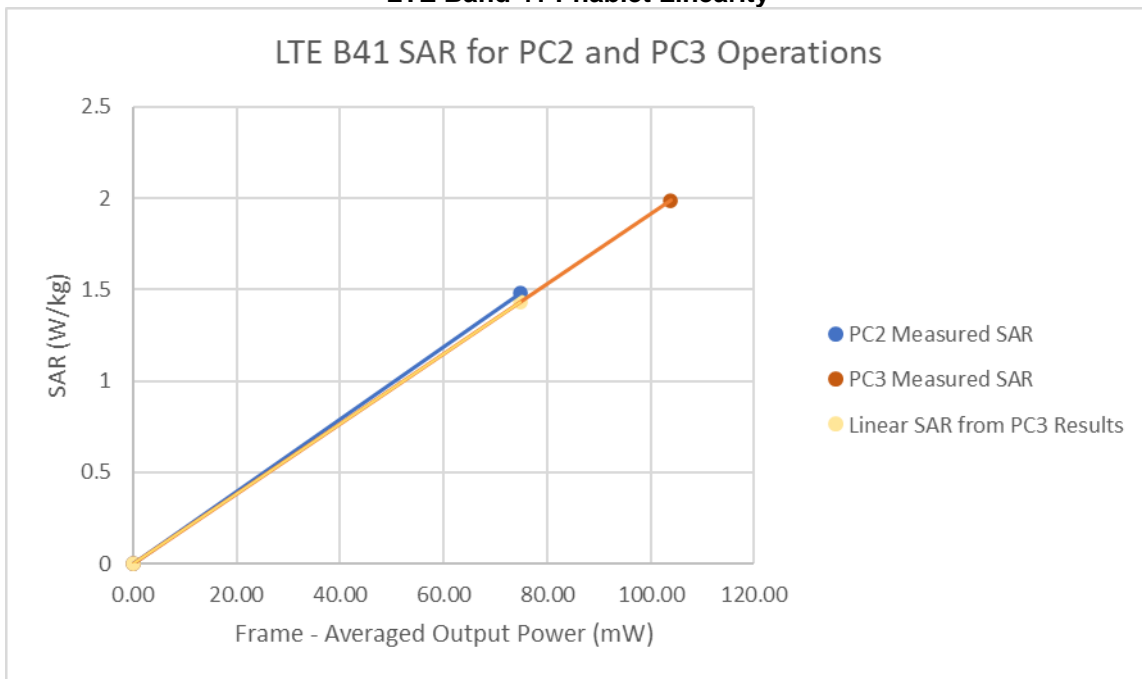



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Table 13-10
LTE Band 41 Phablet Linearity Data

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	23.5	23.5
Measured Output Power (dBm)	22.15	22.37
Measured SAR (W/kg)	1.990	1.480
Measured Power (mW)	164.06	172.58
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	103.85	74.73
% deviation from expected linearity		3.35%

Figure 13-4
LTE Band 41 Phablet Linearity





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14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8964A	(9Hz-2.9GHz) Spectrum Analyzer	CBT	N/A	CBT	3051A00197
Agilent	85933E	3.5mm Standard Calibration Kit	7/7/2021	Annual	7/7/2022	MY3402352
Agilent	E4438C	ESG Vector Signal Generator	12/14/2020	Biennial	12/14/2022	MY42082385
Agilent	E4432B	ESG-D Series Signal Generator	2/24/2021	Annual	2/24/2022	US-40053896
Agilent	N5182A	MXG Vector Signal Generator	6/21/2021	Annual	6/21/2022	MY47420603
Agilent	N5182A	MXG Vector Signal Generator	6/15/2021	Annual	6/15/2022	MY47420800
Agilent	8753ES	S-Parameter Vector Network Analyzer	2/2/2021	Annual	2/2/2022	US39170122
Agilent	E5515C	Wireless Communications Test Set	2/4/2021	Annual	2/4/2022	GB43193563
Agilent	N401DA	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Amplifier Research	15516G	Amplifier	CBT	N/A	CBT	353317
Amplifier Research	15516G	Amplifier	CBT	N/A	CBT	433979
Anritsu	ML2496A	Power Meter	3/3/2021	Annual	3/3/2022	1206209
Anritsu	ML2496A	Power Meter	4/21/2021	Annual	4/21/2022	1351001
Anritsu	MA2411B	Pulse Power Sensor	12/18/2020	Annual	12/18/2021	1126066
Anritsu	MA2411B	Pulse Power Sensor	3/9/2021	Annual	3/9/2022	1207470
Anritsu	MT8821C	Radio Communication Analyzer	4/16/2021	Annual	4/16/2022	6200901190
Anritsu	MT8821C	Radio Communication Analyzer	7/18/2021	Annual	7/18/2022	6262150047
Anritsu	MA24106A	USB Power Sensor	3/2/2021	Annual	3/2/2022	1349509
Anritsu	MA24106A	USB Power Sensor	6/29/2021	Annual	6/29/2022	1349513
COMtech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M153A00-009
COMtech	AR85729-5/579B	Solid State Amplifier	CBT	N/A	CBT	M33W4A00-1002
Control Company	4352	Long Stem Thermometer	1/24/2020	Biennial	1/24/2022	200043588
Control Company	4352	Long Stem Thermometer	5/16/2020	Biennial	5/16/2022	200294604
Control Company	4040	Therm./Clock/Humidity Monitor	3/6/2020	Biennial	3/6/2022	200170296
Control Company	4040	Therm./Clock/Humidity Monitor	3/6/2020	Biennial	3/6/2022	200170313
Insize	110B-150	Digital Caliper	1/17/2020	Biennial	1/17/2022	409193536
Keysight Technologies	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	N6705B	DC Power Analyzer	5/5/2021	Triennial	5/5/2024	MY33004059
Keysight Technologies	N9020A	MXA Signal Analyzer	2/24/2021	Annual	2/24/2022	MY48010233
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
Mini-Circuits	WF-600+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	SLP-1400+	Low Pass Filter	CBT	N/A	CBT	R807950903
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mini-Circuits	TVA-11-422	RF Power Amp	CBT	N/A	CBT	QA1303002
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	BW-53W2	Attenuator (3dB)	CBT	N/A	CBT	120
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	NC-100	Torque Wrench	8/4/2020	Biennial	8/4/2022	N/A
Pasternack	NC-100	Torque Wrench (8in-lbs)	8/5/2020	Biennial	8/5/2022	47639-47
Rohde & Schwarz	CMW500	Radio Communication Tester	2/18/2021	Annual	2/18/2022	101767
Rohde & Schwarz	CMW500	Radio Communication Tester	3/22/2021	Annual	3/22/2022	167283
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	2/10/2021	Annual	2/10/2022	161662
SPEAG	D750V3	750 MHz SAR Dipole	5/11/2021	Annual	5/11/2022	1034
SPEAG	D750V3	750 MHz SAR Dipole	2/17/2021	Annual	2/17/2022	1046
SPEAG	D835V2	835 MHz SAR Dipole	6/20/2019	Triennial	6/20/2022	404040
SPEAG	D835V2	835 MHz SAR Dipole	4/15/2021	Annual	4/15/2022	46119
SPEAG	D835V2	835 MHz SAR Dipole	5/11/2021	Annual	5/11/2022	46182
SPEAG	D850V2	850 MHz SAR Dipole	9/8/2020	Annual	9/8/2022	1010
SPEAG	D1750V2	1750 MHz SAR Dipole	6/19/2019	Triennial	6/19/2022	1083
SPEAG	D1750V2	1750 MHz SAR Dipole	5/12/2020	Biennial	5/12/2022	1148
SPEAG	D1750V2	1750 MHz SAR Dipole	10/22/2021	Annual	10/22/2022	1150
SPEAG	D1900V2	1900 MHz SAR Dipole	6/19/2019	Triennial	6/19/2022	50030
SPEAG	D1900V2	1900 MHz SAR Dipole	2/21/2019	Triennial	2/21/2022	50148
SPEAG	D1900V2	1900 MHz SAR Dipole	9/21/2021	Annual	9/21/2022	50149
SPEAG	D2450V2	2450 MHz SAR Dipole	6/14/2019	Triennial	6/14/2022	750
SPEAG	D2600V2	2600 MHz SAR Dipole	6/14/2019	Triennial	6/14/2022	1042
SPEAG	DS6HV2	5 GHz SAR Dipole	3/10/2021	Annual	3/10/2022	1123
SPEAG	DS6HV2	5 GHz SAR Dipole	6/9/2021	Annual	6/9/2022	1163
SPEAG	DS6HV2	5 GHz SAR Dipole	9/15/2021	Annual	9/15/2022	1191
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/13/2021	Annual	4/13/2022	501
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/2/2021	Annual	8/2/2022	604
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/11/2021	Annual	5/11/2022	701
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/13/2021	Annual	9/13/2022	1364
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/14/2021	Annual	7/14/2022	1402
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/11/2021	Annual	2/11/2022	1403
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/7/2021	Annual	4/7/2022	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/11/2021	Annual	8/11/2022	1428
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/13/2021	Annual	1/13/2022	1558
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/13/2021	Annual	7/13/2022	1583
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/11/2021	Annual	1/11/2022	1645
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/21/2021	Annual	6/21/2022	1676
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/22/2021	Annual	6/22/2022	1677
SPEAG	DAK-3.5	Dielectric Parameter Probes	12/9/2020	Annual	12/9/2021	1278
SPEAG	DAK-3.5	Dielectric Parameter Probes	12/1/2021	Annual	12/1/2022	1278
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	N/A
SPEAG	EX3DV4	SAR Probe	1/20/2021	Annual	1/20/2022	3389
SPEAG	EX3DV4	SAR Probe	8/26/2021	Annual	8/26/2022	3949
SPEAG	EX3DV4	SAR Probe	4/19/2021	Annual	4/19/2022	7357
SPEAG	EX3DV4	SAR Probe	7/20/2021	Annual	7/20/2022	7406
SPEAG	EX3DV4	SAR Probe	7/20/2021	Annual	7/20/2022	7410
SPEAG	EX3DV4	SAR Probe	5/18/2021	Annual	5/18/2022	7416
SPEAG	EX3DV4	SAR Probe	3/11/2021	Annual	3/11/2022	7421
SPEAG	EX3DV4	SAR Probe	2/17/2021	Annual	2/17/2022	7427
SPEAG	EX3DV4	SAR Probe	4/19/2021	Annual	4/19/2022	7532
SPEAG	EX3DV4	SAR Probe	7/21/2021	Annual	7/21/2022	7546
SPEAG	EX3DV4	SAR Probe	9/20/2021	Annual	9/20/2022	7552
SPEAG	EX3DV4	SAR Probe	9/17/2021	Annual	9/17/2022	7558
SPEAG	EX3DV4	SAR Probe	3/3/2021	Annual	3/3/2022	7640

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




Note: CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.

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15 MEASUREMENT UNCERTAINTIES

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

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




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16 CONCLUSION

16.1 Measurement Conclusion




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

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



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