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SAR EVALUATION REPORT

Applicant Name:
Samsung Electronics Co., Ltd.
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Gyeonggi-do, 16677, Korea

Date of Testing:
02/07/22 - 03/25/22
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
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FCC ID: **A3LSMS906E**

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

DUT Type:	Portable Handset
Application Type:	Class II Permissive Change
FCC Rule Part(s):	CFR §2.1093
Model(s):	SM-S906E, SM-S906E/DS
Permissive Change(s):	See FCC Change Document
Date of Original Certification:	01/10/2022

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 1900	1850.20 - 1909.80 MHz	N/A	N/A	0.79	1.05
PCE	UMTS 1900	1852.4 - 1907.6 MHz	N/A	N/A	0.84	N/A
PCE	LTE Band 41	2498.5 - 2687.5 MHz	N/A	N/A	0.75	3.11
PCE	NR Band n25 (PCS)	1852.5 - 1912.5 MHz	0.20	0.80	1.12	2.72
PCE	NR Band n2 (PCS)	1852.5 - 1907.5 MHz	N/A	N/A	N/A	N/A
PCE	NR Band n41	2506.02 - 2679.99 MHz	0.96	0.10	0.28	1.82
PCE	NR Band n77 DoD	3455.01 - 3544.98 MHz	0.40	0.31	0.75	2.57
PCE	NR Band n77	3705 - 3975 MHz	0.39	0.16	0.56	3.13
Simultaneous SAR per KDB 690783 D01v01r03:			1.59	1.50	1.50	3.84

Only operations relevant to this permissive change were evaluated for compliance. Please see the original compliance evaluation in RF Exposure Technical Report S/N 1M2110010116-01.A3L (Rev1) for complete evaluation of all other operating modes. The operational description includes a description of all changed items.

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

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

Randy Ortanez
President

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

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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
NR Band n25 (PCS)	Voice/Data	1852.5 - 1912.5 MHz
NR Band n2 (PCS)	Voice/Data	1852.5 - 1907.5 MHz
NR Band n41	Voice/Data	2506.02 - 2679.99 MHz
NR Band n77 DoD	Voice/Data	3455.01 - 3544.98 MHz
NR Band n77	Voice/Data	3705 - 3975 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 Time-Averaging Algorithm for RF Exposure Compliance

This Device is enabled with the Qualcomm® Smart Transmit Gen2 feature. This feature performs time averaging algorithm in real time to control and manage transmitting power and ensure the time-averaged RF exposure is in compliance with FCC requirements all the time. Refer to Compliance Summary document for detailed description of Qualcomm® Smart Transmit feature (report SN could be found in Section 1.11 – Bibliography).

Note that WLAN operations are not enabled with Smart Transmit.

The Smart Transmit algorithm maintains the time-averaged transmit power, in turn, time-averaged RF exposure of *SAR_design_target*, below the predefined time-averaged power limit (i.e., P_{limit} for sub-6 radio), for each characterized technology and band (see RF Exposure Part 0 Test Report, report SN could be found in Section 1.11 - Bibliography).

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

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

Exposure Senario			Body-Worn	Phablet Max	Phablet Reduced	Head	Hotspot	Earjack	Maximum Tune-Up Output Power*
Averaging Volume			1g	10g	10g	1g	1g	10g	
Spacing			15 mm	11, 8, 6, 0 mm	0 mm	0 mm	10 mm	0 mm	
DSI			0	0	1	2	3	4	
Technology/Band	Antenna	Antenna Group							Pmax
GSM 850	A	AG0	30.0		28.1	30.0	27.8	28.1	25.3
GSM 1900	A	AG0	26.6		17.8	32.5	17.8	17.8	22.1
UMTS 850	A	AG0	29.9		26.6	30.7	26.6	26.6	24.0
UMTS 1750	A	AG0	24.3		20.0	28.7	19.0	20.0	23.0
UMTS 1900	A	AG0	24.8		19.5	31.2	17.5	19.5	23.0
LTE Band 12/17	A	AG0	31.2		27.8	32.9	27.8	27.8	24.0
LTE Band 13	A	AG0	29.7		27.6	29.9	26.9	27.6	24.0
LTE Band 26/5 (Cell)	A	AG0	29.5		27.4	31.2	27.2	27.4	24.5
LTE Band 66/4 (AWS)	A	AG0	26.0		18.5	30.5	17.0	18.5	22.5
LTE Band 4 (AWS)	I	AG1	21.0		21.0	15.0	15.0	21.0	20.0
LTE Band 25/2 (PCS)	A	AG0	24.1		18.5	29.6	16.5	18.5	22.0
LTE Band 41 (PC3)	B	AG0	27.5		20.5	38.7	20.5	20.5	21.5
LTE Band 41 (PC2)	B	AG0	27.5		20.5	38.7	20.5	20.5	21.9
NR Band n5 (Cell)	A	AG0	30.6		26.5	30.9	26.5	26.5	24.0
NR Band n66 (AWS)	A	AG0	26.1		20.0	30.5	18.5	20.0	23.5
NR Band n66 (AWS)	I	AG1	22.0		22.0	18.0	22.0	22.0	22.0
NR Band n25/n2 (PCS)	A	AG0	25.5		20.5	31.4	18.0	20.5	23.5
NR Band n41 SRS 1	I	AG1	18.0		18.0	16.0	18.0	18.0	24.5
NR Band n41 SRS 2	B	AG0	16.0		16.0	16.0	16.0	16.0	23.5
NR Band n41 SRS 3	E	AG1	13.0		13.0	13.0	13.0	13.0	19.0
NR Band n41 SRS 4	D	AG0	14.0		14.0	14.0	14.0	14.0	20.0
NR Band n77 DoD SRS 1	F	AG1	18.0		18.0	12.5	18.0	18.0	24.5
NR Band n77 DoD SRS 2	C	AG0	16.0		16.0	16.0	16.0	16.0	21.5
NR Band n77 DoD SRS 3	H	AG1	17.5		17.5	15.0	17.5	17.5	24.5
NR Band n77 DoD SRS 4	D	AG0	15.5		15.5	15.5	15.5	15.5	21.5
NR Band n77 SRS 1	F	AG1	18.0		18.0	12.5	18.0	18.0	24.5
NR Band n77 SRS 2	C	AG0	16.0		16.0	16.0	16.0	16.0	21.5
NR Band n77 SRS 3	H	AG1	17.5		17.5	15.0	17.5	17.5	24.5
NR Band n77 SRS 4	D	AG0	15.5		15.5	15.5	15.5	15.5	21.5

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

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

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

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

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

1.3 Power Reduction for SAR

This device used an independent fixed level power reduction mechanism for WLAN/BT when 5G NR is active and also for WLAN/BT during all voice or VoIP held to ear scenarios. Per FCC Guidance, the held-to-ear exposure conditions were evaluated at reduced power according to the head SAR positions described in IEEE 1528-2013. Detailed descriptions of the power reduction mechanism are included in the operational description.

1.4 Nominal and Maximum Output Power Specifications

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

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

GSM/GPRS/EDGE 850										
Power Level		Voice (in dBm)	Data - Burst Average GMSK (in dBm)				Data - Burst Average 8-PSK (in dBm)			
		1 TX Slot	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots
Pmax	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
DSI = 0 (Body-Worn or Phablet Max)	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
DSI = 1 (Phablet Reduced)	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
DSI = 2 (Head)	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
DSI = 3 (Hotspot)	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
DSI = 4 (Earjack)	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
Pmax	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
DSI = 0 (Body-Worn or Phablet Max)	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
DSI = 1 (Phablet Reduced)	Max Allowed Power	28.0	28.0	25.0	23.2	22.0	26.5	25.0	23.0	22.0
	Nominal	27.0	27.0	24.0	22.2	21.0	25.5	24.0	22.0	21.0
DSI = 2 (Head)	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
DSI = 3 (Hotspot)	Max Allowed Power	N/A	28.0	25.0	23.2	22.0	26.5	25.0	23.0	22.0
	Nominal	N/A	27.0	24.0	22.2	21.0	25.5	24.0	22.0	21.0
DSI = 4 (Earjack)	Max Allowed Power	28.0	28.0	25.0	23.2	22.0	26.5	25.0	23.0	22.0
	Nominal	27.0	27.0	24.0	22.2	21.0	25.5	24.0	22.0	21.0

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

UMTS Band 5 (850 MHz)					
Power Level		Modulated Average Output Power			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
Pmax	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
DSI = 0 (Body-Worn or Phablet Max)	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
DSI = 1 (Phablet Reduced)	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
DSI = 2 (Head)	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
DSI = 3 (Hotspot)	Max Allowed Power	25.0	24.0	24.0	24.0
	Nominal	24.0	23.0	23.0	23.0
DSI = 4 (Earjack)	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
Pmax	Max Allowed Power	24.0	23.0	23.0	23.0
	Nominal	23.0	22.0	22.0	22.0
DSI = 0 (Body-Worn or Phablet Max)	Max Allowed Power	24.0	23.0	23.0	23.0
	Nominal	23.0	22.0	22.0	22.0
DSI = 1 (Phablet Reduced)	Max Allowed Power	21.0	20.0	20.0	20.0
	Nominal	20.0	19.0	19.0	19.0
DSI = 2 (Head)	Max Allowed Power	24.0	23.0	23.0	23.0
	Nominal	23.0	22.0	22.0	22.0
DSI = 3 (Hotspot)	Max Allowed Power	20.0	19.0	19.0	19.0
	Nominal	19.0	18.0	18.0	18.0
DSI = 4 (Earjack)	Max Allowed Power	21.0	20.0	20.0	20.0
	Nominal	20.0	19.0	19.0	19.0
UMTS Band 2 (1900 MHz)					
Power Level		Modulated Average Output Power			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
Pmax	Max Allowed Power	24.0	23.0	23.0	23.0
	Nominal	23.0	22.0	22.0	22.0
DSI = 0 (Body-Worn or Phablet Max)	Max Allowed Power	24.0	23.0	23.0	23.0
	Nominal	23.0	22.0	22.0	22.0
DSI = 1 (Phablet Reduced)	Max Allowed Power	20.5	19.5	19.5	19.5
	Nominal	19.5	18.5	18.5	18.5
DSI = 2 (Head)	Max Allowed Power	24.0	23.0	23.0	23.0
	Nominal	23.0	22.0	22.0	22.0
DSI = 3 (Hotspot)	Max Allowed Power	18.5	17.5	17.5	17.5
	Nominal	17.5	16.5	16.5	16.5
DSI = 4 (Earjack)	Max Allowed Power	20.5	19.5	19.5	19.5
	Nominal	19.5	18.5	18.5	18.5

Mode / Band	Antenna		Modulated Average Output Power (in dBm)					
			Pmax	DSI = 0 (Body-Worn or Phablet Max)	DSI = 1 (Phablet Reduced)	DSI = 2 (Head)	DSI = 3 (Hotspot)	DSI = 4 (Earjack)
LTE Band 12	A	Max Allowed Power	25.0	25.0	25.0	25.0	25.0	25.0
		Nominal	24.0	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	25.0
		Nominal	24.0	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	25.0
		Nominal	24.0	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	25.5
		Nominal	24.5	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	25.5
		Nominal	24.5	24.5	24.5	24.5	24.5	24.5
LTE Band 66 (AWS)	A	Max Allowed Power	23.5	23.5	19.5	23.5	18.0	19.5
		Nominal	22.5	22.5	18.5	22.5	17.0	18.5
LTE Band 4 (AWS)	A	Max Allowed Power	23.5	23.5	19.5	23.5	18.0	19.5
		Nominal	22.5	22.5	18.5	22.5	17.0	18.5
LTE Band 4 (AWS)	I	Max Allowed Power	21.0	21.0	21.0	16.0	16.0	21.0
		Nominal	20.0	20.0	20.0	15.0	15.0	20.0
LTE Band 25 (PCS)	A	Max Allowed Power	23.0	23.0	19.5	23.0	17.5	19.5
		Nominal	22.0	22.0	18.5	22.0	16.5	18.5
LTE Band 2 (PCS)	A	Max Allowed Power	23.0	23.0	19.5	23.0	17.5	19.5
		Nominal	22.0	22.0	18.5	22.0	16.5	18.5
LTE Band 41 (PC3)	B	Max Allowed Power	24.5	24.5	23.5	24.5	23.5	23.5
		Nominal	23.5	23.5	22.5	23.5	22.5	22.5
LTE Band 41 (PC2)	B	Max Allowed Power	26.5	26.5	25.1	26.5	25.1	25.1
		Nominal	25.5	25.5	24.1	25.5	24.1	24.1

Mode / Band	Antenna		Modulated Average Output Power (in dBm)					
			Pmax	DSI = 0 (Body-Worn or Phablet Max)	DSI = 1 (Phablet Reduced)	DSI = 2 (Head)	DSI = 3 (Hotspot)	DSI = 4 (Earjack)
NR Band n5 (Cell)	A	Max Allowed Power	25.0	25.0	25.0	25.0	25.0	25.0
		Nominal	24.0	24.0	24.0	24.0	24.0	24.0
NR Band n66 (AWS)	A	Max Allowed Power	24.5	24.5	21.0	24.5	19.5	21.0
		Nominal	23.5	23.5	20.0	23.5	18.5	20.0
NR Band n66 (AWS)	I	Max Allowed Power	23.0	23.0	23.0	19.0	23.0	23.0
		Nominal	22.0	22.0	22.0	18.0	22.0	22.0
NR Band n25 (PCS)	A	Max Allowed Power	24.5	24.5	21.5	24.5	19.0	21.5
		Nominal	23.5	23.5	20.5	23.5	18.0	20.5
NR Band n2 (PCS)	A	Max Allowed Power	24.5	24.5	21.5	24.5	19.0	21.5
		Nominal	23.5	23.5	20.5	23.5	18.0	20.5
NR Band n41 SRS 1	I	Max Allowed Power	25.5	19.0	19.0	17.0	19.0	19.0
		Nominal	24.5	18.0	18.0	16.0	18.0	18.0
NR Band n41 SRS 2	B	Max Allowed Power	24.5	17.0	17.0	17.0	17.0	17.0
		Nominal	23.5	16.0	16.0	16.0	16.0	16.0
NR Band n41 SRS 3	E	Max Allowed Power	20.0	14.0	14.0	14.0	14.0	14.0
		Nominal	19.0	13.0	13.0	13.0	13.0	13.0
NR Band n41 SRS 4	D	Max Allowed Power	21.0	15.0	15.0	15.0	15.0	15.0
		Nominal	20.0	14.0	14.0	14.0	14.0	14.0
NR Band n77 DoD SRS 1	F	Max Allowed Power	25.5	19.0	19.0	13.5	19.0	19.0
		Nominal	24.5	18.0	18.0	12.5	18.0	18.0
NR Band n77 DoD SRS 2	C	Max Allowed Power	22.5	17.0	17.0	17.0	17.0	17.0
		Nominal	21.5	16.0	16.0	16.0	16.0	16.0
NR Band n77 DoD SRS 3	H	Max Allowed Power	25.5	18.5	18.5	16.0	18.5	18.5
		Nominal	24.5	17.5	17.5	15.0	17.5	17.5
NR Band n77 DoD SRS 4	D	Max Allowed Power	22.5	16.5	16.5	16.5	16.5	16.5
		Nominal	21.5	15.5	15.5	15.5	15.5	15.5
NR Band n77 SRS 1	F	Max Allowed Power	25.5	19.0	19.0	13.5	19.0	19.0
		Nominal	24.5	18.0	18.0	12.5	18.0	18.0
NR Band n77 SRS 2	C	Max Allowed Power	22.5	17.0	17.0	17.0	17.0	17.0
		Nominal	21.5	16.0	16.0	16.0	16.0	16.0
NR Band n77 SRS 3	H	Max Allowed Power	25.5	18.5	18.5	16.0	18.5	18.5
		Nominal	24.5	17.5	17.5	15.0	17.5	17.5
NR Band n77 SRS 4	D	Max Allowed Power	22.5	16.5	16.5	16.5	16.5	16.5
		Nominal	21.5	15.5	15.5	15.5	15.5	15.5

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

1.5 DUT Antenna Locations

The overall dimensions of this device are > 9 x 5 cm. A diagram showing the location of the device antennas can be found in Appendix H. 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 1900	Yes	Yes	No	Yes	Yes	Yes
UMTS 1900	Yes	Yes	No	Yes	Yes	Yes
LTE Band 41	Yes	Yes	No	Yes	No	Yes
NR Band n25 (PCS)	Yes	Yes	No	Yes	Yes	Yes
NR Band n41 Antenna I	Yes	Yes	Yes	No	Yes	No
NR Band n41 Antenna B	Yes	Yes	No	Yes	No	Yes
NR Band n41 Antenna E	Yes	Yes	Yes	No	Yes	Yes
NR Band n41 Antenna D	Yes	Yes	No	Yes	Yes	Yes
NR Band n77 DoD Antenna F	Yes	Yes	Yes	No	No	Yes
NR Band n77 DoD Antenna C	Yes	Yes	No	Yes	No	Yes
NR Band n77 DoD Antenna H	Yes	Yes	Yes	No	No	Yes
NR Band n77 DoD Antenna D	Yes	Yes	No	Yes	Yes	Yes
NR Band n77 Antenna F	Yes	Yes	Yes	No	No	Yes
NR Band n77 Antenna C	Yes	Yes	No	Yes	No	Yes
NR Band n77 Antenna H	Yes	Yes	Yes	No	No	Yes
NR Band n77 Antenna D	Yes	Yes	No	Yes	Yes	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.

1.6 Near Field Communications (NFC) Antenna

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

1.7 Simultaneous Transmission Capabilities

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

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

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Phablet	Notes
1	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^	Yes	N/A	Yes	^ 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^	Yes	N/A	Yes	^ 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^	Yes	N/A	Yes	^ 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^	Yes	Yes^	Yes	^ 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^	Yes	Yes^	Yes	^ 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^	Yes	N/A	Yes	^ 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^	Yes	Yes^	Yes	^ 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^	Yes	Yes^	Yes	^ 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^	Yes	N/A	Yes	^ 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^	Yes	Yes^	Yes	^ 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^	Yes	Yes^	Yes	^ 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^	Yes	N/A	Yes	^ 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^	Yes	Yes^	Yes	^ 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^	Yes	Yes^	Yes	^ 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^	Yes	N/A	Yes	^ 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	Yes	Yes	
73	GPRS/EDGE + 2.4 GHz WLAN MIMO	N/A	N/A	Yes	Yes	
74	GPRS/EDGE + 5 GHz WLAN MIMO	N/A	N/A	Yes	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^	Yes	^ Bluetooth Tethering is considered
77	GPRS/EDGE + 2.4 GHz Bluetooth MIMO	N/A	N/A	Yes	Yes	
78	GPRS/EDGE + 2.4 GHz WLAN + 5 GHz WLAN MIMO	N/A	N/A	Yes	Yes	
79	GPRS/EDGE + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	N/A	N/A	Yes	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^	Yes	^ Bluetooth Tethering is considered
83	GPRS/EDGE + 2.4 GHz Bluetooth MIMO + 5 GHz WLAN MIMO	N/A	N/A	Yes	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	

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.

1.8 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, U-NII-4, U-NII-5, U-NII-6, U-NII-7 and U-NII-8 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, U-NII-4, U-NII-5, U-NII-6, U-NII-7 and U-NII-8 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 original filing. Simultaneous transmission analysis is addressed in Appendix E of this report.

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 the original filing.

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.

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

SRS was tested with CW signal per Qualcomm guidance in 80-w2112-4.

1.9 Guidance Applied

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

1.10 Device Serial Numbers

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

1.11 Bibliography

Report Type	Report Serial Number
RF Exposure Part 2 Test Report	1M2202030009-07.A3L
RF Exposure Compliance Summary Report	1M2202030009-08.A3L
RF Exposure Part 0 Test Report	1M2202030009-06.A3L

2 LTE AND NR INFORMATION

LTE Information					
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 17 (706.5 - 713.5 MHz)				
	LTE Band 13 (779.5 - 784.5 MHz)				
	LTE Band 26 (Cell) (814.7 - 848.3 MHz)				
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)				
	LTE Band 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)				
Channel Bandwidths	LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 17: 5 MHz, 10 MHz				
	LTE Band 13: 5 MHz, 10 MHz				
	LTE Band 26 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz				
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 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, LAA features as shown in Appendix I in the original filing. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. The following LTE Release 15 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

NR Information						
Form Factor	Portable Handset					
Frequency Range of each NR transmission band	NR Band n5 (Cell) (826.5 - 846.5 MHz)					
	NR Band n66 (AWS) (1712.5 - 1777.5 MHz)					
	NR Band n25 (PCS) (1852.5 - 1912.5 MHz)					
	NR Band n2 (PCS) (1852.5 - 1907.5 MHz)					
	NR Band n41 (2506.02 - 2679.99 MHz)					
	NR Band n77 DoD (3455.01 - 3544.98 MHz)					
	NR Band n77 (3705 - 3975 MHz)					
Channel Bandwidths	NR Band n5 (Cell): 5 MHz, 10 MHz, 15 MHz, 20 MHz					
	NR Band n66 (AWS): 5 MHz, 10 MHz, 15 MHz, 20 MHz					
	NR Band n25 (PCS): 5 MHz, 10 MHz, 15 MHz, 20 MHz					
	NR Band n2 (PCS): 5 MHz, 10 MHz, 15 MHz, 20 MHz					
	NR Band n41: 20 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz, 80 MHz, 90 MHz, 100 MHz					
	NR Band n77 DoD: 10 MHz, 15 MHz, 20 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz, 70 MHz, 80 MHz, 90 MHz, 100 MHz					
	NR Band n77: 10 MHz, 15 MHz, 20 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz, 70 MHz, 80 MHz, 90 MHz, 100 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)	
NR Band n25 (PCS): 5 MHz	1852.5 (370500)		1882.5 (376500)		1912.5 (382500)	
NR Band n25 (PCS): 10 MHz	1855 (371000)		1882.5 (376500)		1910 (382000)	
NR Band n25 (PCS): 15 MHz	1857.5 (371500)		1882.5 (376500)		1907.5 (381500)	
NR Band n25 (PCS): 20 MHz	1860 (372000)		1882.5 (376500)		1905 (381000)	
NR Band n2 (PCS): 5 MHz	1852.5 (370500)		1880 (376000)		1907.5 (381500)	
NR Band n2 (PCS): 10 MHz	1855 (371000)		1880 (376000)		1905 (381000)	
NR Band n2 (PCS): 15 MHz	1857.5 (371500)		1880 (376000)		1902.5 (380500)	
NR Band n2 (PCS): 20 MHz	1860 (372000)		1880 (376000)		1900 (380000)	
NR Band n41: 20 MHz	2506.02 (501204)	2549.49 (509898)	2592.99 (518598)		2636.49 (527298)	2679.99 (535998)
NR Band n41: 30 MHz	2511 (502200)	2552.01 (510402)	2592.99 (518598)		2634 (526800)	2674.98 (534996)
NR Band n41: 40 MHz	2516.01 (503202)	2567.34 (513468)	N/A		2618.67 (523734)	2670 (534000)
NR Band n41: 50 MHz	2521.02 (504204)		2592.99 (518598)		2664.99 (532998)	
NR Band n41: 60 MHz	2526 (505200)		2592.99 (518598)		2659.98 (531996)	
NR Band n41: 80 MHz	2536.02 (507204)		N/A		2649.99 (529998)	
NR Band n41: 90 MHz	2541 (508200)		N/A		2644.98 (528996)	
NR Band n41: 100 MHz	2546.01 (509202)		2592.99 (518598)		2640 (528000)	
NR Band n77 DoD: 10 MHz	3455.01 (630334)		3500.01 (633334)		3544.98 (636332)	
NR Band n77 DoD: 15 MHz	3457.5 (630500)		3500.01 (633334)		3542.49 (636166)	
NR Band n77 DoD: 20 MHz	3460.02 (630668)		3500.01 (633334)		3540 (636000)	
NR Band n77 DoD: 30 MHz	3465 (631000)		3500.01 (633334)		3534.99 (635666)	
NR Band n77 DoD: 40 MHz	3470.01 (631334)		N/A		3470.01 (631334)	
NR Band n77 DoD: 50 MHz	3475.02 (631668)		N/A		3475.02 (631668)	
NR Band n77 DoD: 60 MHz	N/A		3500.01(633334)		N/A	
NR Band n77 DoD: 70 MHz	N/A		3500.01(633334)		N/A	
NR Band n77 DoD: 80 MHz	N/A		3500.01(633334)		N/A	
NR Band n77 DoD: 90 MHz	N/A		3500.01(633334)		N/A	
NR Band n77 DoD: 100 MHz	N/A		3500.01(633334)		N/A	
NR Band n77: 10 MHz	3705 (647000)	3759 (650600)	3813 (654200)	3867 (657800)	3921 (661400)	3975 (665000)
NR Band n77: 15 MHz	3707.52 (647168)	3760.5 (650700)	3813.51 (654234)	3866.49 (657766)	3919.5 (661300)	3972.48 (664832)
NR Band n77: 20 MHz	3710.01 (647334)	3762 (650800)	3813.99 (654266)	3866.01 (657734)	3918 (661200)	3969.99 (664666)
NR Band n77: 30 MHz	3715.02 (647668)	3765 (651000)	3815.01 (654334)	3864.99 (657666)	3915 (661000)	3964.98 (664332)
NR Band n77: 40 MHz	3720 (648000)	3768 (651200)	3816 (654400)	3864 (657600)	3912 (660800)	3960 (664000)
NR Band n77: 50 MHz	3725.01 (648334)	3782.49 (652166)	3840 (656000)		3897.51 (659834)	3954.99 (663666)
NR Band n77: 60 MHz	3730.02 (648668)	3803.34 (653556)	N/A	N/A	3876.66 (658444)	3949.98 (663332)
NR Band n77: 70 MHz	3735 (649000)	3804.99 (653666)	N/A		3875.01 (658334)	3945 (663000)
NR Band n77: 80 MHz	3740.01 (649334)	N/A	3840 (656000)		N/A	3939.99 (662666)
NR Band n77: 90 MHz	3745.02 (649668)	N/A	3840 (656000)		N/A	3934.98 (662332)
NR Band n77: 100 MHz	3750 (650000)	N/A	N/A	N/A	N/A	3930 (662000)
SCS for NR Band n5/n66/n25/n2	15 kHz					
SCS for NR Band n41/n77	30 kHz					
Modulations Supported in UL	DFT-s-OFDM: π/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					
LTE Anchor Bands for NR Band n25 (PCS)	LTE Band 12/13					
LTE Anchor Bands for NR Band n2 (PCS)	LTE Band 5/12/13					
LTE Anchor Bands for NR Band n41	LTE Band 4/12/66					
LTE Anchor Bands for NR Band n77	LTE Band 2/5/12/13/25/66					

3 INTRODUCTION

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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

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

where:

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

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

4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

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

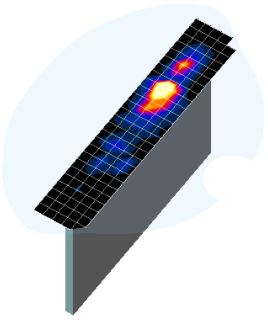

Figure 4-1
Sample SAR Area Scan

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

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

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

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

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

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

*Also compliant to IEEE 1528-2013 Table 6

5 DEFINITION OF REFERENCE POINTS

5.1 EAR REFERENCE POINT

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

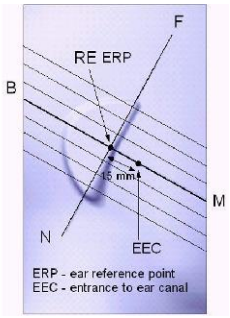

Figure 5-1
Close-Up Side view of ERP

5.2 HANDSET REFERENCE POINTS

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

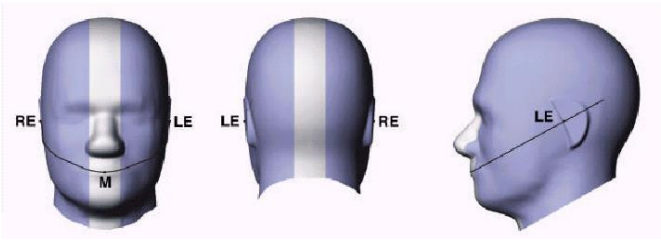

Figure 5-2
Front, back and side view of SAM Twin Phantom

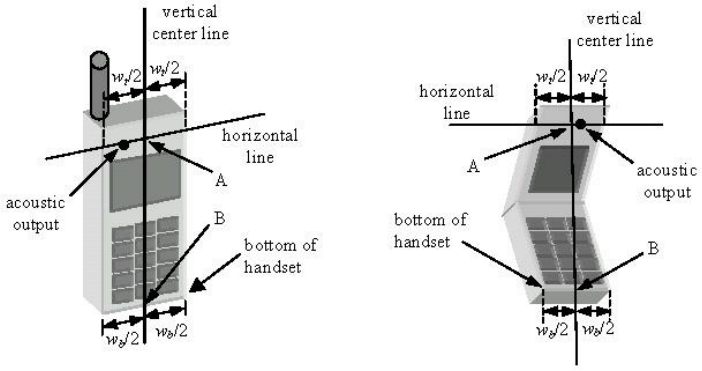

Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

6 TEST CONFIGURATION POSITIONS

6.1 Device Holder

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

6.2 Positioning for Cheek

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

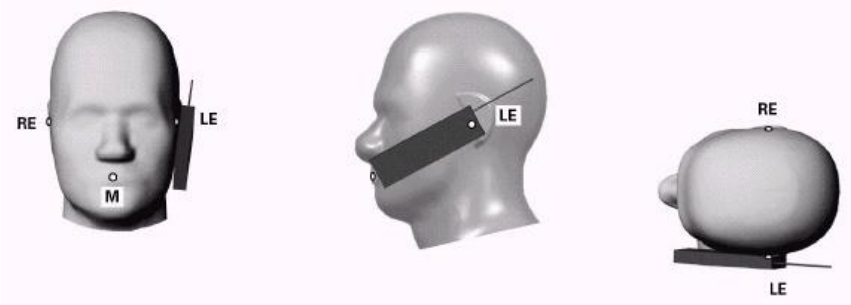

Figure 6-1 Front, Side and Top View of Cheek Position

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

6.3 Positioning for Ear / 15º Tilt

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

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

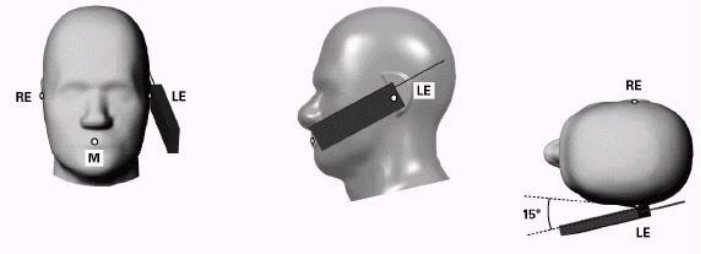

Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

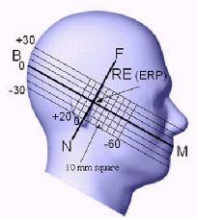

Figure 6-3
Side view w/ relevant markings

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

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

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

6.5 Body-Worn Accessory Configurations

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

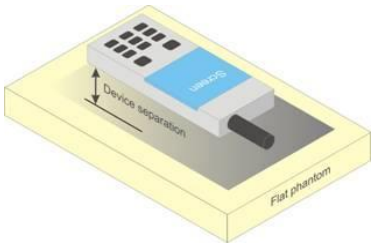

Figure 6-4
Sample Body-Worn Diagram

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

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

6.6 Extremity Exposure Configurations

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

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

6.7 Wireless Router Configurations

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

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

6.8 Phablet Configurations

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

6.9 Proximity Sensor Considerations

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

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

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

7 RF EXPOSURE LIMITS

7.1 Uncontrolled Environment

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

7.2 Controlled Environment

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

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

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

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

8 FCC MEASUREMENT PROCEDURES

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

8.1 Measured and Reported SAR

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

8.2 3G SAR Test Reduction Procedure

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

8.3 Procedures Used to Establish RF Signal for SAR

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

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

8.4 SAR Measurement Conditions for UMTS

8.4.1 Output Power Verification

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

8.4.2 Head SAR Measurements

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

8.4.3 Body SAR Measurements

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

8.4.4 SAR Measurements with Rel 5 HSDPA

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

8.4.5 SAR Measurements with Rel 6 HSUPA

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

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

8.4.6 SAR Measurement Conditions for DC-HSDPA

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

8.5 SAR Measurement Conditions for LTE

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

8.5.1 Spectrum Plots for RB Configurations

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

8.5.2 MPR

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

8.5.3 A-MPR

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

8.5.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r04:

a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
   i. The required channel and offset combination with the highest maximum output power is required for SAR.
   ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
   iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.

b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.

c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.

d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sections 5.2.1 through 5.2.3 is less than or equal to ½ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is <1.45 W/kg.

8.5.5 TDD

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

8.5.6 Downlink Only Carrier Aggregation

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

9 RF CONDUCTED POWERS

All conducted power measurements for 2G/3G/4G/5G Sub6 WWAN technologies and bands in this section were performed by setting Reserve_power_margin (Qualcomm® Smart Transmit EFS entry) to 0dB, so that the EUT transmits continuously at minimum (Plimit, maximum tune up output power Pmax).

9.1 GSM Conducted Powers

Table 9-1
Measured P_{limit} for DSI = 1 (Phablet with grip sensor active), DSI = 3 (Hotspot mode), and/or DSI = 4 (Earjack active)

Maximum Burst-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 1900	512	27.28	27.22	24.18	22.05	**20.42**	25.42	23.87	21.82	20.28
	661	27.16	27.14	24.32	22.15	**20.13**	25.93	23.52	21.53	20.20
	810	27.33	27.21	24.14	22.04	**20.15**	25.88	23.66	21.51	20.23

Calculated Maximum Frame-Averaged Output Power										
		Voice	*GPRS/EDGE Data (GMSK)*				*EDGE Data (8-PSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 1900	512	18.08	18.02	17.99	17.62	**17.24**	16.22	17.68	17.39	17.10
	661	17.96	17.94	18.13	17.72	**16.95**	16.73	17.33	17.10	17.02
	810	18.13	18.01	17.95	17.61	**16.97**	16.68	17.47	17.08	17.05
GSM 1900	**Frame Avg.Targets:**	17.80	17.80	17.81	17.77	**17.82**	16.30	17.81	17.57	17.82

Note:

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

GSM Class: B
GPRS Multislot class: 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 9-2
Measured P_{limit} for DSI = 3 (Hotspot mode)

3GPP Release Version	Mode	3GPP 34.121 Subtest	PCS Band [dBm]			3GPP MPR [dB]
			9262	9400	9538	
99	WCDMA	12.2 kbps RMC	18.42	18.22	18.45	-
99		12.2 kbps AMR	18.27	18.21	18.41	-
6	HSDPA	Subtest 1	16.65	16.63	16.80	0
6		Subtest 2	16.65	16.60	16.73	0
6		Subtest 3	16.10	16.05	16.27	0.5
6		Subtest 4	16.16	16.07	16.20	0.5
6	HSUPA	Subtest 1	16.65	16.57	16.41	0
6		Subtest 2	14.64	14.55	14.77	2
6		Subtest 3	15.10	15.07	15.26	1
6		Subtest 4	14.60	14.58	14.75	2
6		Subtest 5	16.63	16.60	16.72	0
8	DC-HSDPA	Subtest 1	16.64	16.57	16.76	0
8		Subtest 2	16.70	16.57	16.75	0
8		Subtest 3	16.26	16.12	16.28	0.5
8		Subtest 4	16.24	16.08	16.28	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.

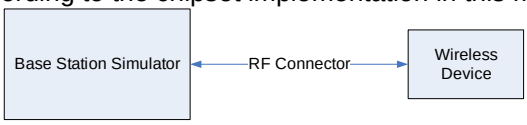

Figure 9-2
Power Measurement Setup

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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 I.

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

9.3.1 LTE Band 41

Table 9-3
LTE Band 41 PC3 P_{Limit} for DSI = 1 (Phablet with Grip Sensor Active), or DSI = 3 (Hotspot Mode), and/or DSI = 4 (Earjack Active) - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	22.50	22.63	22.64	22.73	22.68	0	0
	1	50	22.53	22.68	22.90	23.12	**23.22**		0
	1	99	22.63	22.65	22.67	22.86	23.18		0
	50	0	22.57	22.57	22.65	22.98	23.04	0-1	0
	50	25	22.69	22.64	22.83	23.17	23.06		0
	50	50	22.66	22.60	22.85	23.13	**23.19**		0
	100	0	22.58	22.57	22.77	23.04	23.16		0
16QAM	1	0	22.53	22.65	22.50	22.63	22.55	0-1	0
	1	50	22.44	22.63	22.30	22.91	23.40		0
	1	99	22.58	22.75	22.71	22.68	23.23		0
	50	0	21.60	21.37	21.71	22.02	22.03	0-2	1
	50	25	21.63	21.46	21.82	22.15	22.10		1
	50	50	21.73	21.44	21.99	22.20	22.15		1
	100	0	21.70	21.31	21.87	22.12	22.17		1
64QAM	1	0	21.94	21.57	21.62	21.79	21.63	0-2	1
	1	50	21.75	21.53	21.50	21.50	22.12		1
	1	99	21.82	21.80	21.77	21.90	21.96		1
	50	0	20.60	20.75	20.71	20.95	21.03	0-3	2
	50	25	20.59	20.67	20.66	21.18	21.19		2
	50	50	20.69	20.72	20.93	21.10	21.17		2
	100	0	20.68	20.58	20.85	21.12	21.14		2
256QAM	1	0	18.36	18.90	19.02	18.76	18.75	0-5	4
	1	50	18.45	18.79	19.01	19.13	19.20		4
	1	99	18.65	18.67	18.66	18.80	19.05		4
	50	0	18.70	18.76	18.80	18.95	19.03		4
	50	25	18.59	18.71	18.74	19.00	19.18		4
	50	50	18.76	18.74	18.98	19.18	19.24		4
	100	0	18.70	18.66	18.88	19.08	19.15		4

Table 9-4
LTE Band 41 PC2 P_{Limit} for DSI = 1 (Phablet with Grip Sensor Active), or DSI = 3 (Hotspot Mode), and/or DSI = 4 (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	24.43	24.52	24.25	24.64	24.59	0	0
	1	50	24.55	24.66	24.38	24.77	25.02		0
	1	99	24.56	24.55	24.51	24.62	**25.08**		0
	50	0	24.40	24.45	24.50	24.75	24.94	0-1	0
	50	25	24.52	24.55	24.64	24.79	**25.09**		0
	50	50	24.51	24.53	24.58	24.81	25.04		0
	100	0	24.46	24.47	24.58	24.91	25.01		0

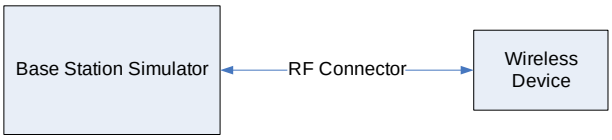

Figure 9-3
Power Measurement Setup

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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 I.

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 n25

Table 9-5
NR Band n25 Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 2 (Head) - 20 MHz Bandwidth

NR Band n25 20 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	372000 (1860 MHz)	376500 (1882.5 MHz)	381000 (1905 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	23.21	23.30	23.44	0	0.0
	1	53	23.27	23.25	23.37		0.0
	1	104	23.37	23.20	23.29		0.0
	50	0	22.92	22.95	22.94	0-0.5	0.5
	50	28	23.40	23.41	23.44	0	0.0
	50	56	22.93	22.88	22.95	0-0.5	0.5
	100	0	22.93	22.94	22.97		0.5
DFT-s-OFDM QPSK	1	1	23.23	23.28	23.26	0	0.0
	1	53	23.31	23.25	**23.33**		0.0
	1	104	23.21	23.20	23.30		0.0
	50	0	22.44	22.44	22.37	0-1	1.0
	50	28	23.39	23.41	**23.47**	0	0.0
	50	56	22.40	22.39	22.44	0-1	1.0
	100	0	22.48	22.37	22.48		1.0
DFT-s-OFDM 16QAM	1	1	22.57	22.67	22.56	0-1	1.0
CP-OFDM QPSK	1	1	21.70	21.76	21.79	0-1.5	1.5

Table 9-6
NR Band n25 Measured P_{Limit} for DSI = 1 (Phablet with Grip Sensor Active) and/or DSI = 4 (Earjack Active) - 20 MHz Bandwidth

NR Band n25 20 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	372000 (1860 MHz)	376500 (1882.5 MHz)	381000 (1905 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	20.71	20.83	20.75		0.0
	1	53	20.83	20.80	20.85	0	0.0
	1	104	20.91	20.68	20.79		0.0
	50	0	20.94	20.91	20.89	0-0.5	0.0
	50	28	20.89	20.90	20.95	0	0.0
	50	56	20.88	20.91	20.93	0-0.5	0.0
	100	0	20.92	20.92	20.97		0.0
DFT-s-OFDM QPSK	1	1	20.61	20.79	20.80		0.0
	1	53	20.67	20.77	**20.90**	0	0.0
	1	104	20.75	20.71	20.72		0.0
	50	0	20.90	20.88	20.82	0-1	0.0
	50	28	20.92	20.90	**20.96**	0	0.0
	50	56	20.87	20.86	20.88	0-1	0.0
	100	0	20.82	20.87	20.89		0.0
DFT-s-OFDM 16QAM	1	1	21.10	21.13	21.09	0-1	0.0
CP-OFDM QPSK	1	1	20.74	20.75	20.76	0-1.5	0.0

Table 9-7
NR Band n25 Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 20 MHz Bandwidth

NR Band n25 20 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	372000 (1860 MHz)	376500 (1882.5 MHz)	381000 (1905 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	18.37	18.51	18.46		0.0
	1	53	18.41	18.48	18.49	0	0.0
	1	104	18.49	18.41	18.40		0.0
	50	0	18.58	18.55	18.54	0-0.5	0.0
	50	28	18.59	18.53	18.61	0	0.0
	50	56	18.57	18.55	18.58	0-0.5	0.0
	100	0	18.59	18.56	18.59		0.0
DFT-s-OFDM QPSK	1	1	18.29	18.33	18.43		0.0
	1	53	18.40	18.44	**18.52**	0	0.0
	1	104	18.45	18.27	18.39		0.0
	50	0	18.57	18.59	18.51	0-1	0.0
	50	28	18.59	18.55	**18.61**	0	0.0
	50	56	18.58	18.52	18.57	0-1	0.0
	100	0	18.49	18.50	18.51		0.0
DFT-s-OFDM 16QAM	1	1	18.67	18.79	18.73	0-1	0.0
CP-OFDM QPSK	1	1	18.38	18.42	18.39	0-1.5	0.0

9.4.1 NR Band n41 Antenna I

Table 9-8
NR Band n41 Antenna I Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with Grip Sensor Active), or DSI = 3 (Hotspot Mode), and/or DSI = 4 (Earjack Active) - 100 MHz Bandwidth

NR Band n41 100 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	518598 (2592.99 MHz) Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	18.33	0	0.0
	1	137	18.72		0.0
	1	271	18.62		0.0
	135	0	18.54	0-0.5	0.0
	135	69	18.62	0	0.0
	135	138	18.59	0-0.5	0.0
	270	0	18.57		0.0
DFT-s-OFDM QPSK	1	1	18.54	0	0.0
	1	137	**18.89**		0.0
	1	271	18.69		0.0
	135	0	18.66	0-1	0.0
	135	69	**18.78**	0	0.0
	135	138	18.64	0-1	0.0
	270	0	18.59		0.0
DFT-s-OFDM 16QAM	1	1	18.53	0-1	0.0
CP-OFDM QPSK	1	1	18.41	0-1.5	0.0

Table 9-9
NR Band n41 Antenna I Measured P_{Limit} for DSI = 2 (Head) - 100 MHz Bandwidth

NR Band n41 100 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	518598 (2592.99 MHz) Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	15.92	0	0.0
	1	137	16.31		0.0
	1	271	16.22		0.0
	135	0	16.08	0-0.5	0.0
	135	69	16.18	0	0.0
	135	138	16.15	0-0.5	0.0
	270	0	16.07		0.0
DFT-s-OFDM QPSK	1	1	15.93	0	0.0
	1	137	**16.37**		0.0
	1	271	16.34		0.0
	135	0	16.15	0-1	0.0
	135	69	**16.24**	0	0.0
	135	138	16.12	0-1	0.0
	270	0	16.10		0.0
DFT-s-OFDM 16QAM	1	1	15.82	0-1	0.0
CP-OFDM QPSK	1	1	15.91	0-1.5	0.0

9.4.2 NR Band n41 SRS Antenna B, E, D

Table 9-10
NR Band n41 SRS Antenna B, E, D Measured P_{Limit} for all DSI - 100 MHz Bandwidth

NR Band n41 100 MHz Bandwidth	
	Channel
Antenna	518598 (2592.99 MHz) Conducted Power [dBm]
SRS #2 Ant B	16.58
SRS #3 Ant E	13.41
SRS #4 Ant D	14.09

9.4.3 NR Band n77 DoD Antenna F

Table 9-11
NR Band n77 DoD Antenna F Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with Grip Sensor Active), or DSI = 3 (Hotspot Mode), and/or DSI = 4 (Earjack Active) - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	633334 (3500.01 MHz) Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	18.32	0	0.0
	1	137	18.21		0.0
	1	271	18.21		0.0
	135	0	18.22	0-0.5	0.0
	135	69	18.13	0	0.0
	135	138	18.03	0-0.5	0.0
	270	0	18.12		0.0
DFT-s-OFDM QPSK	1	1	**18.35**	0	0.0
	1	137	18.18		0.0
	1	271	18.17		0.0
	135	0	**18.24**	0-1	0.0
	135	69	18.08	0	0.0
	135	138	17.98	0-1	0.0
	270	0	18.09		0.0
DFT-s-OFDM 16QAM	1	1	18.52	0-1	0.0
CP-OFDM QPSK	1	1	18.08	0-1.5	0.0

Table 9-12
NR Band n77 DoD Antenna F Measured P_{Limit} for DSI = 2 (Head) - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	633334 (3500.01 MHz) Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	12.81	0	0.0
	1	137	12.59		0.0
	1	271	12.41		0.0
	135	0	12.77	0-0.5	0.0
	135	69	12.62	0	0.0
	135	138	12.46	0-0.5	0.0
	270	0	12.64		0.0
DFT-s-OFDM QPSK	1	1	**12.86**	0	0.0
	1	137	12.64		0.0
	1	271	12.45		0.0
	135	0	**12.81**	0-1	0.0
	135	69	12.65	0	0.0
	135	138	12.45	0-1	0.0
	270	0	12.63		0.0
DFT-s-OFDM 16QAM	1	1	12.80	0-1	0.0
CP-OFDM QPSK	1	1	12.61	0-1.5	0.0

9.4.4 NR Band n77 DoD SRS Antenna C, H, D

Table 9-13
NR Band n77 DoD SRS Antenna H Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with Grip Sensor Active), or DSI = 3 (Hotspot Mode), and/or DSI = 4 (Earjack Active); Antenna C, and D Measured P_{Limit} for all DSI - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth	
	Channel
Antenna	633334 (3500.01 MHz)
	Conducted Power [dBm]
SRS #2 Ant C	15.57
SRS #3 Ant H	17.41
SRS #4 Ant D	15.08

Table 9-14
NR Band n77 DoD SRS Antenna H Measured P_{Limit} for DSI = 2 (Head) - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth	
	Channel
Antenna	633334 (3500.01 MHz)
	Conducted Power [dBm]
SRS #3 Ant H	14.55

9.4.5 NR Band n77 C-Band Antenna F

Table 9-15
NR Band n77 C-Band Antenna F Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with Grip Sensor Active), or DSI = 3 (Hotspot Mode), and/or DSI = 4 (Earjack Active) - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth						
			Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	650000 (3750 MHz)	662000 (3930 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM π/2 BPSK	1	1	18.32	18.29	0	0.0
	1	137	18.98	18.97		0.0
	1	271	18.85	18.83		0.0
	135	0	18.89	18.49	0-0.5	0.0
	135	69	18.93	18.80	0	0.0
	135	138	18.69	18.88	0-0.5	0.0
	270	0	18.85	18.69		0.0
DFT-s-OFDM QPSK	1	1	18.31	18.30	0	0.0
	1	137	**18.98**	18.90		0.0
	1	271	18.88	18.79		0.0
	135	0	18.89	18.53	0-1	0.0
	135	69	**18.93**	18.84	0	0.0
	135	138	18.73	18.91	0-1	0.0
	270	0	18.86	18.68		0.0
DFT-s-OFDM 16QAM	1	1	18.33	18.48	0-1	0.0
CP-OFDM QPSK	1	1	18.28	18.13	0-1.5	0.0

Table 9-16
NR Band n77 C-Band Antenna F Measured P_{Limit} for DSI = 2 (Head) - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth						
			Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	650000 (3750 MHz)	662000 (3930 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM π/2 BPSK	1	1	12.74	12.34	0	0.0
	1	137	13.25	12.51		0.0
	1	271	13.39	12.50		0.0
	135	0	13.00	12.41	0-0.5	0.0
	135	69	13.08	12.45	0	0.0
	135	138	13.18	12.48	0-0.5	0.0
	270	0	13.06	12.44		0.0
DFT-s-OFDM QPSK	1	1	12.81	12.42	0	0.0
	1	137	13.34	12.53		0.0
	1	271	**13.44**	12.54		0.0
	135	0	13.01	12.42	0-1	0.0
	135	69	13.04	12.48	0	0.0
	135	138	**13.24**	12.47	0-1	0.0
	270	0	13.05	12.44		0.0
DFT-s-OFDM 16QAM	1	1	12.78	12.57	0-1	0.0
CP-OFDM QPSK	1	1	12.83	12.21	0-1.5	0.0

9.4.6 NR Band n77 C-Band SRS Antenna C, H, D

Table 9-17
NR Band n77 C-Band SRS Antenna H Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with Grip Sensor Active), or DSI = 3 (Hotspot Mode), and/or DSI = 4 (Earjack Active); Antenna C, and D Measured P_{Limit} for all DSI - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth		
	Channel	
Antenna	650000 (3750 MHz)	662000 (3930 MHz)
	Conducted Power [dBm]	
SRS #2 Ant C	**16.53**	15.75
SRS #3 Ant H	17.72	**17.89**
SRS #4 Ant D	**16.26**	16.10

Table 9-18
NR Band n77 C-Band SRS Antenna H Measured P_{Limit} for DSI = 2 (Head) - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth		
	Channel	
Antenna	650000 (3750 MHz)	662000 (3930 MHz)
	Conducted Power [dBm]	
SRS #3 Ant H	**15.46**	15.02

Figure 9-4
Power Measurement Setup – NR FDD

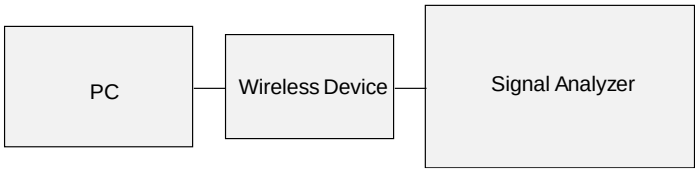


Figure 9-5
Power Measurement Setup – NR TDD

10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
02/22/2022	1900 Head	23.4	1850	1.362	39.560	1.400	40.000	-2.71%	-1.10%
			1860	1.372	39.519	1.400	40.000	-2.00%	-1.20%
			1880	1.392	39.443	1.400	40.000	-0.57%	-1.39%
			1900	1.413	39.359	1.400	40.000	0.93%	-1.60%
			1905	1.418	39.339	1.400	40.000	1.29%	-1.65%
			1910	1.423	39.318	1.400	40.000	1.64%	-1.71%
03/14/2022	2450 Head	19.3	2300	1.738	38.587	1.670	39.500	4.07%	-2.31%
			2310	1.746	38.560	1.679	39.480	3.99%	-2.33%
			2320	1.754	38.535	1.687	39.460	3.97%	-2.34%
			2400	1.815	38.393	1.756	39.289	3.36%	-2.28%
			2450	1.853	38.295	1.800	39.200	2.94%	-2.31%
			2480	1.876	38.262	1.833	39.162	2.35%	-2.30%
			2500	1.891	38.239	1.855	39.136	1.94%	-2.29%
			2510	1.898	38.224	1.866	39.123	1.71%	-2.30%
			2535	1.919	38.178	1.893	39.092	1.37%	-2.34%
			2550	1.933	38.152	1.909	39.073	1.26%	-2.36%
			2560	1.942	38.139	1.920	39.060	1.15%	-2.36%
			2600	1.975	38.083	1.964	39.009	0.56%	-2.37%
			2650	2.019	37.963	2.018	38.945	0.05%	-2.52%
			2680	2.046	37.917	2.051	38.907	-0.24%	-2.54%
			2700	2.061	37.886	2.073	38.882	-0.58%	-2.56%
03/17/2022	3600 Head	20.0	3300	2.627	39.730	2.708	38.157	-2.99%	4.12%
			3350	2.672	39.635	2.759	38.100	-3.15%	4.03%
			3450	2.764	39.482	2.861	37.986	-3.39%	3.94%
			3500	2.810	39.396	2.913	37.929	-3.54%	3.87%
			3550	2.855	39.303	2.964	37.871	-3.68%	3.78%
			3560	2.866	39.284	2.974	37.860	-3.63%	3.76%
			3600	2.904	39.228	3.015	37.814	-3.68%	3.74%
			3650	2.952	39.121	3.066	37.757	-3.72%	3.61%
			3690	2.988	39.064	3.107	37.711	-3.83%	3.59%
			3700	2.998	39.047	3.117	37.700	-3.82%	3.57%
			3750	3.047	38.954	3.169	37.643	-3.85%	3.48%
			3900	3.197	38.733	3.323	37.471	-3.79%	3.37%
			3930	3.228	38.677	3.353	37.437	-3.73%	3.31%
			4100	3.406	38.419	3.528	37.243	-3.46%	3.16%
			4150	3.458	38.314	3.579	37.186	-3.38%	3.03%
03/25/2022	3600 Head	20.9	3300	2.607	39.649	2.708	38.157	-3.73%	3.91%
			3350	2.650	39.542	2.759	38.100	-3.95%	3.78%
			3450	2.744	39.381	2.861	37.986	-4.09%	3.67%
			3500	2.789	39.310	2.913	37.929	-4.26%	3.64%
			3550	2.837	39.203	2.964	37.871	-4.28%	3.52%
			3560	2.849	39.194	2.974	37.860	-4.20%	3.52%
			3600	2.885	39.145	3.015	37.814	-4.31%	3.52%
			3650	2.934	39.049	3.066	37.757	-4.31%	3.42%
			3690	2.969	38.994	3.107	37.711	-4.44%	3.40%
			3700	2.977	38.977	3.117	37.700	-4.49%	3.39%
			3750	3.032	38.882	3.169	37.643	-4.32%	3.29%
			3900	3.179	38.642	3.323	37.471	-4.33%	3.13%
			3930	3.216	38.579	3.353	37.437	-4.09%	3.05%
			4100	3.392	38.308	3.528	37.243	-3.85%	2.86%
			4150	3.445	38.254	3.579	37.186	-3.74%	2.87%

Table 10-2
Measured 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
02/07/2022	1900 Body	20.6	1850	1.497	53.826	1.520	53.300	-1.51%	0.99%
			1860	1.508	53.796	1.520	53.300	-0.79%	0.93%
			1880	1.530	53.730	1.520	53.300	0.66%	0.81%
			1900	1.554	53.659	1.520	53.300	2.24%	0.67%
			1905	1.559	53.639	1.520	53.300	2.57%	0.64%
			1910	1.565	53.621	1.520	53.300	2.96%	0.60%
02/17/2022	1900 Body	21.3	1850	1.516	52.905	1.520	53.300	-0.26%	-0.74%
			1860	1.527	52.878	1.520	53.300	0.46%	-0.79%
			1880	1.550	52.830	1.520	53.300	1.97%	-0.88%
			1900	1.572	52.766	1.520	53.300	3.42%	-1.00%
			1905	1.578	52.751	1.520	53.300	3.82%	-1.03%
			1910	1.584	52.735	1.520	53.300	4.21%	-1.06%
02/22/2022	1900 Body	21.4	1850	1.523	52.438	1.520	53.300	0.20%	-1.62%
			1860	1.535	52.403	1.520	53.300	0.99%	-1.68%
			1880	1.557	52.334	1.520	53.300	2.43%	-1.81%
			1900	1.579	52.258	1.520	53.300	3.88%	-1.95%
			1905	1.585	52.240	1.520	53.300	4.28%	-1.99%
			1910	1.591	52.222	1.520	53.300	4.67%	-2.02%
02/27/2022	2450 Body	25.0	2400	1.982	52.061	1.902	52.767	4.21%	-1.34%
			2450	2.027	51.981	1.950	52.700	3.95%	-1.36%
			2480	2.053	51.927	1.993	52.662	3.01%	-1.40%
			2500	2.071	51.883	2.021	52.636	2.47%	-1.43%
			2510	2.080	51.863	2.035	52.623	2.21%	-1.44%
			2535	2.103	51.823	2.071	52.592	1.55%	-1.46%
			2550	2.116	51.808	2.092	52.573	1.15%	-1.46%
			2560	2.125	51.798	2.106	52.560	0.90%	-1.45%
			2600	2.158	51.738	2.163	52.509	-0.23%	-1.47%
			2650	2.205	51.656	2.234	52.445	-1.30%	-1.50%
			2680	2.232	51.629	2.277	52.407	-1.98%	-1.48%
03/01/2022	2450 Body	24.9	2400	1.969	51.275	1.902	52.767	3.52%	-2.83%
			2450	2.013	51.214	1.950	52.700	3.23%	-2.82%
			2480	2.038	51.169	1.993	52.662	2.26%	-2.84%
			2500	2.056	51.135	2.021	52.636	1.73%	-2.85%
			2510	2.066	51.120	2.035	52.623	1.52%	-2.86%
			2535	2.088	51.093	2.071	52.592	0.82%	-2.85%
			2550	2.102	51.079	2.092	52.573	0.48%	-2.84%
			2560	2.111	51.069	2.106	52.560	0.24%	-2.84%
			2600	2.146	51.016	2.163	52.509	-0.79%	-2.84%
			2650	2.193	50.939	2.234	52.445	-1.84%	-2.87%
			2680	2.221	50.901	2.277	52.407	-2.46%	-2.87%
03/17/2022	2450 Body	22.9	2400	1.987	52.536	1.902	52.767	4.47%	-0.44%
			2450	2.033	52.450	1.950	52.700	4.26%	-0.47%
			2480	2.056	52.408	1.993	52.662	3.16%	-0.48%
			2500	2.073	52.368	2.021	52.636	2.57%	-0.51%
			2510	2.082	52.350	2.035	52.623	2.31%	-0.52%
			2535	2.105	52.310	2.071	52.592	1.64%	-0.54%
			2550	2.118	52.296	2.092	52.573	1.24%	-0.53%
			2560	2.126	52.289	2.106	52.560	0.95%	-0.52%
			2600	2.158	52.242	2.163	52.509	-0.23%	-0.51%
			2650	2.205	52.155	2.234	52.445	-1.30%	-0.55%
			2680	2.232	52.133	2.277	52.407	-1.98%	-0.52%
03/21/2022	2450 Body	21.5	2400	1.985	52.076	1.902	52.767	4.36%	-1.31%
			2450	2.030	52.033	1.950	52.700	4.10%	-1.27%
			2480	2.054	52.005	1.993	52.662	3.06%	-1.25%
			2500	2.071	51.976	2.021	52.636	2.47%	-1.25%
			2510	2.081	51.963	2.035	52.623	2.26%	-1.25%
			2535	2.105	51.939	2.071	52.592	1.64%	-1.24%
			2550	2.119	51.931	2.092	52.573	1.29%	-1.22%
			2560	2.128	51.926	2.106	52.560	1.04%	-1.21%
			2600	2.163	51.883	2.163	52.509	0.00%	-1.19%
			2650	2.212	51.801	2.234	52.445	-0.98%	-1.23%
			2680	2.240	51.773	2.277	52.407	-1.62%	-1.21%

Table 10-3
Measured 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
02/07/2022	3600 Body	21.0	3300	2.955	49.479	3.080	51.593	-4.06%	-4.10%
			3350	3.010	49.425	3.139	51.525	-4.11%	-4.08%
			3450	3.120	49.263	3.256	51.389	-4.18%	-4.14%
			3500	3.175	49.188	3.314	51.321	-4.19%	-4.16%
			3550	3.230	49.108	3.372	51.254	-4.21%	-4.19%
			3560	3.240	49.101	3.384	51.240	-4.26%	-4.17%
			3600	3.284	49.042	3.431	51.186	-4.28%	-4.19%
			3650	3.337	48.959	3.489	51.118	-4.36%	-4.22%
			3690	3.382	48.872	3.536	51.063	-4.36%	-4.29%
			3700	3.393	48.854	3.548	51.050	-4.37%	-4.30%
			3750	3.451	48.763	3.606	50.982	-4.30%	-4.35%
			3900	3.631	48.439	3.781	50.779	-3.97%	-4.61%
			3930	3.670	48.372	3.816	50.738	-3.83%	-4.66%
			4100	3.896	48.067	4.015	50.507	-2.96%	-4.83%
			4150	3.964	47.972	4.073	50.439	-2.68%	-4.89%
02/09/2022	3600 Body	21.0	3300	2.991	50.212	3.080	51.593	-2.89%	-2.68%
			3350	3.047	50.143	3.139	51.525	-2.93%	-2.68%
			3450	3.159	49.948	3.256	51.389	-2.98%	-2.80%
			3500	3.213	49.867	3.314	51.321	-3.05%	-2.83%
			3550	3.269	49.773	3.372	51.254	-3.05%	-2.89%
			3560	3.281	49.762	3.384	51.240	-3.04%	-2.88%
			3600	3.325	49.695	3.431	51.186	-3.09%	-2.91%
			3650	3.382	49.613	3.489	51.118	-3.07%	-2.94%
			3690	3.425	49.541	3.536	51.063	-3.14%	-2.98%
			3700	3.438	49.525	3.548	51.050	-3.10%	-2.99%
			3750	3.496	49.445	3.606	50.982	-3.05%	-3.01%
			3900	3.682	49.167	3.781	50.779	-2.62%	-3.17%
			3930	3.724	49.113	3.816	50.738	-2.41%	-3.20%
			4100	3.952	48.821	4.015	50.507	-1.57%	-3.34%
			4150	4.020	48.740	4.073	50.439	-1.30%	-3.37%
02/13/2022	3600 Body	20.6	3300	3.003	50.141	3.080	51.593	-2.50%	-2.81%
			3350	3.058	50.069	3.139	51.525	-2.58%	-2.83%
			3450	3.171	49.888	3.256	51.389	-2.61%	-2.92%
			3500	3.224	49.816	3.314	51.321	-2.72%	-2.93%
			3550	3.281	49.727	3.372	51.254	-2.70%	-2.98%
			3560	3.293	49.718	3.384	51.240	-2.69%	-2.97%
			3600	3.339	49.664	3.431	51.186	-2.68%	-2.97%
			3650	3.395	49.573	3.489	51.118	-2.69%	-3.02%
			3690	3.442	49.484	3.536	51.063	-2.66%	-3.09%
			3700	3.454	49.472	3.548	51.050	-2.65%	-3.09%
			3750	3.512	49.388	3.606	50.982	-2.61%	-3.13%
			3900	3.698	49.038	3.781	50.779	-2.20%	-3.43%
			3930	3.742	48.952	3.816	50.738	-1.94%	-3.52%
			4100	3.965	48.628	4.015	50.507	-1.25%	-3.72%
			4150	4.036	48.533	4.073	50.439	-0.91%	-3.78%

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

10.2 Test System Verification

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

Table 10-4
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 (%)
E	1900	HEAD	02/22/2022	22.7	21.6	0.10	5d080	7538	4.010	40.50	40.100	-0.99%
S	2600	HEAD	03/14/2022	20.5	19.3	0.10	1064	7552	6.170	58.10	61.700	6.20%
L	3500	HEAD	03/25/2022	23.5	21.0	0.10	1059	7670	6.250	63.70	62.500	-1.88%
L	3700	HEAD	03/17/2022	23.2	20.0	0.10	1067	7670	6.740	67.20	67.400	0.30%
L	3900	HEAD	03/17/2022	23.2	20.0	0.10	1056	7670	6.990	68.90	69.900	1.45%
A	1900	BODY	02/07/2022	21.6	20.6	0.10	5d149	7406	4.210	40.40	42.100	4.21%
A	1900	BODY	02/17/2022	23.5	21.3	0.10	5d149	7406	4.140	40.40	41.400	2.48%
A	1900	BODY	02/22/2022	22.9	21.4	0.10	5d080	7406	4.360	40.70	43.600	7.13%
A	2450	BODY	03/17/2022	24.0	22.9	0.10	719	7406	4.810	52.00	48.100	-7.50%
H	2600	BODY	02/27/2022	21.5	23.0	0.10	1004	7409	5.490	55.40	54.900	-0.90%
H	2600	BODY	03/01/2022	21.4	25.0	0.10	1071	7409	5.560	54.30	55.600	2.39%
A	2600	BODY	03/17/2022	24.0	22.9	0.10	1004	7406	5.570	55.40	55.700	0.54%
I	3500	BODY	02/13/2022	21.3	20.6	0.10	1097	7661	6.630	64.20	66.300	3.27%
I	3700	BODY	02/07/2022	21.3	21.0	0.10	1018	7661	6.450	63.50	64.500	1.57%
I	3900	BODY	02/07/2022	21.3	21.0	0.10	1073	7661	6.640	64.30	66.400	3.27%

Table 10-5
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 (%)
A	1900	BODY	02/07/2022	21.6	20.6	0.10	5d149	7406	2.170	21.10	21.700	2.84%
A	1900	BODY	02/17/2022	23.5	21.3	0.10	5d149	7406	2.140	21.10	21.400	1.42%
A	2450	BODY	03/21/2022	22.5	21.5	0.10	719	7406	2.370	24.70	23.700	-4.05%
H	2600	BODY	03/01/2022	21.4	25.0	0.10	1071	7409	2.490	24.10	24.900	3.32%
A	2600	BODY	03/21/2022	22.5	21.5	0.10	1004	7406	2.430	24.80	24.300	-2.02%
I	3500	BODY	02/09/2022	21.6	21.0	0.10	1097	7661	2.470	23.80	24.700	3.78%
I	3700	BODY	02/09/2022	21.6	21.0	0.10	1018	7661	2.430	22.50	24.300	8.00%
I	3900	BODY	02/09/2022	21.6	21.0	0.10	1073	7661	2.410	22.00	24.100	9.55%

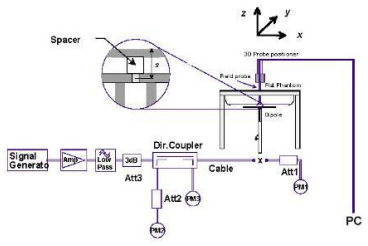


Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
NR Band n25 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)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																		(W/kg)		(W/kg)	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.33	A	-0.02	0	Right	Cheek	112	DFT-S-OFDM	QPSK	1	53	7631V	1:1	0.080	1.309	0.105	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.47	A	0.01	0	Right	Cheek	112	DFT-S-OFDM	QPSK	50	28	7631V	1:1	0.093	1.268	0.118	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.33	A	0.16	0	Right	Tilt	112	DFT-S-OFDM	QPSK	1	53	7631V	1:1	0.071	1.309	0.093	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.47	A	0.00	0	Right	Tilt	112	DFT-S-OFDM	QPSK	50	28	7631V	1:1	0.073	1.268	0.093	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.33	A	-0.09	0	Left	Cheek	112	DFT-S-OFDM	QPSK	1	53	7631V	1:1	0.155	1.309	0.203	A1
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.47	A	-0.10	0	Left	Cheek	112	DFT-S-OFDM	QPSK	50	28	7631V	1:1	0.154	1.268	0.195	
1905.00	381000	High	NR Band n25 (PCS)	20	23.0	21.79	A	-0.10	1.5	Left	Cheek	112	CP-OFDM	QPSK	1	1	7631V	1:1	0.103	1.321	0.136	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.33	A	0.14	0	Left	Tilt	112	DFT-S-OFDM	QPSK	1	53	7631V	1:1	0.043	1.309	0.056	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.47	A	-0.03	0	Left	Tilt	112	DFT-S-OFDM	QPSK	50	28	7631V	1:1	0.048	1.268	0.061	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram													

Table 11-2
NR Band n41 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	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
2592.99	518598	Mid	NR Band n41	100	17.0	16.37	I	0.09	0	Right	Cheek	DFT-S-OFDM	QPSK	1	137	1489M	1:1	0.269	1.156	0.311	
2592.99	518598	Mid	NR Band n41	100	17.0	16.24	I	0.01	0	Right	Cheek	DFT-S-OFDM	QPSK	135	69	1489M	1:1	0.264	1.191	0.314	
2592.99	518598	Mid	NR Band n41	100	17.0	16.37	I	-0.03	0	Right	Tilt	DFT-S-OFDM	QPSK	1	137	1489M	1:1	0.419	1.156	0.484	
2592.99	518598	Mid	NR Band n41	100	17.0	16.24	I	-0.03	0	Right	Tilt	DFT-S-OFDM	QPSK	135	69	1489M	1:1	0.403	1.191	0.480	
2592.99	518598	Mid	NR Band n41	100	17.0	16.37	I	0.00	0	Left	Cheek	DFT-S-OFDM	QPSK	1	137	1489M	1:1	0.555	1.156	0.642	
2592.99	518598	Mid	NR Band n41	100	17.0	16.24	I	0.02	0	Left	Cheek	DFT-S-OFDM	QPSK	135	69	1489M	1:1	0.536	1.191	0.638	
2592.99	518598	Mid	NR Band n41	100	17.0	16.10	I	0.01	0	Left	Cheek	DFT-S-OFDM	QPSK	270	0	1489M	1:1	0.521	1.230	0.641	
2592.99	518598	Mid	NR Band n41	100	17.0	16.37	I	-0.07	0	Left	Tilt	DFT-S-OFDM	QPSK	1	137	1489M	1:1	0.701	1.156	0.810	
2592.99	518598	Mid	NR Band n41	100	17.0	16.24	I	0.00	0	Left	Tilt	DFT-S-OFDM	QPSK	135	69	1489M	1:1	0.700	1.191	0.834	
2592.99	518598	Mid	NR Band n41	100	17.0	16.10	I	0.02	0	Left	Tilt	DFT-S-OFDM	QPSK	270	0	1489M	1:1	0.699	1.230	0.860	
2592.99	518598	Mid	NR Band n41	100	17.0	15.91	I	0.00	0	Left	Tilt	CP-OFDM	QPSK	1	1	1489M	1:1	0.747	1.285	**0.960**	A2
2592.99	518598	Mid	NR Band n41	100	17.0	16.58	B	0.10	N/A	Right	Cheek	CW/SRS	N/A	N/A	N/A	1489M	1:1	0.011	1.102	0.012	
2592.99	518598	Mid	NR Band n41	100	17.0	16.58	B	0.12	N/A	Right	Tilt	CW/SRS	N/A	N/A	N/A	1489M	1:1	0.001	1.102	0.001	
2592.99	518598	Mid	NR Band n41	100	17.0	16.58	B	-0.13	N/A	Left	Cheek	CW/SRS	N/A	N/A	N/A	1489M	1:1	0.012	1.102	0.013	
2592.99	518598	Mid	NR Band n41	100	17.0	16.58	B	-0.17	N/A	Left	Tilt	CW/SRS	N/A	N/A	N/A	1489M	1:1	0.023	1.102	0.025	
2592.99	518598	Mid	NR Band n41	100	14.0	13.41	E	-0.17	N/A	Right	Cheek	CW/SRS	N/A	N/A	N/A	1489M	1:1	0.110	1.146	0.126	
2592.99	518598	Mid	NR Band n41	100	14.0	13.41	E	0.01	N/A	Right	Tilt	CW/SRS	N/A	N/A	N/A	1489M	1:1	0.059	1.146	0.068	
2592.99	518598	Mid	NR Band n41	100	14.0	13.41	E	-0.10	N/A	Left	Cheek	CW/SRS	N/A	N/A	N/A	1489M	1:1	0.062	1.146	0.071	
2592.99	518598	Mid	NR Band n41	100	14.0	13.41	E	-0.20	N/A	Left	Tilt	CW/SRS	N/A	N/A	N/A	1489M	1:1	0.054	1.146	0.062	
2592.99	518598	Mid	NR Band n41	100	15.0	14.09	D	0.13	N/A	Right	Cheek	CW/SRS	N/A	N/A	N/A	1489M	1:1	0.009	1.233	0.011	
2592.99	518598	Mid	NR Band n41	100	15.0	14.09	D	0.15	N/A	Right	Tilt	CW/SRS	N/A	N/A	N/A	1489M	1:1	0.010	1.233	0.012	
2592.99	518598	Mid	NR Band n41	100	15.0	14.09	D	-0.14	N/A	Left	Cheek	CW/SRS	N/A	N/A	N/A	1489M	1:1	0.016	1.233	0.020	
2592.99	518598	Mid	NR Band n41	100	15.0	14.09	D	0.13	N/A	Left	Tilt	CW/SRS	N/A	N/A	N/A	1489M	1:1	0.022	1.233	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												

Table 11-3
NR Band n77 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	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
3500.01	633334	Mid	NR Band n77 DoD	100	13.5	12.86	F	-0.03	0	Right	Cheek	DFT-S-OFDM	QPSK	1	1	7506V	1:1	0.339	1.159	0.393	A3
3500.01	633334	Mid	NR Band n77 DoD	100	13.5	12.81	F	0.01	0	Right	Cheek	DFT-S-OFDM	QPSK	135	0	7506V	1:1	0.336	1.172	0.394	
3500.01	633334	Mid	NR Band n77 DoD	100	13.5	12.61	F	0.03	0	Right	Cheek	CP-OFDM	QPSK	1	1	7506V	1:1	0.324	1.227	0.398	
3500.01	633334	Mid	NR Band n77 DoD	100	13.5	12.86	F	0.00	0	Right	Tilt	DFT-S-OFDM	QPSK	1	1	7506V	1:1	0.164	1.159	0.190	
3500.01	633334	Mid	NR Band n77 DoD	100	13.5	12.81	F	-0.03	0	Right	Tilt	DFT-S-OFDM	QPSK	135	0	7506V	1:1	0.174	1.172	0.204	
3500.01	633334	Mid	NR Band n77 DoD	100	13.5	12.86	F	-0.09	0	Left	Cheek	DFT-S-OFDM	QPSK	1	1	7506V	1:1	0.142	1.159	0.165	
3500.01	633334	Mid	NR Band n77 DoD	100	13.5	12.81	F	0.05	0	Left	Cheek	DFT-S-OFDM	QPSK	135	0	7506V	1:1	0.129	1.172	0.151	
3500.01	633334	Mid	NR Band n77 DoD	100	13.5	12.86	F	0.04	0	Left	Tilt	DFT-S-OFDM	QPSK	1	1	7506V	1:1	0.124	1.159	0.144	
3500.01	633334	Mid	NR Band n77 DoD	100	13.5	12.81	F	0.05	0	Left	Tilt	DFT-S-OFDM	QPSK	135	0	7506V	1:1	0.135	1.172	0.158	
3500.01	633334	Mid	NR Band n77 DoD	100	17.0	15.57	C	0.16	N/A	Right	Cheek	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.011	1.390	0.015	
3500.01	633334	Mid	NR Band n77 DoD	100	17.0	15.57	C	0.07	N/A	Right	Tilt	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.015	1.390	0.021	
3500.01	633334	Mid	NR Band n77 DoD	100	17.0	15.57	C	-0.08	N/A	Left	Cheek	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.060	1.390	0.083	
3500.01	633334	Mid	NR Band n77 DoD	100	17.0	15.57	C	-0.15	N/A	Left	Tilt	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.018	1.390	0.025	
3500.01	633334	Mid	NR Band n77 DoD	100	16.0	14.55	H	-0.16	N/A	Right	Cheek	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.396	0.000	
3500.01	633334	Mid	NR Band n77 DoD	100	16.0	14.55	H	0.19	N/A	Right	Tilt	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.396	0.000	
3500.01	633334	Mid	NR Band n77 DoD	100	16.0	14.55	H	0.16	N/A	Left	Cheek	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.396	0.000	
3500.01	633334	Mid	NR Band n77 DoD	100	16.0	14.55	H	0.20	N/A	Left	Tilt	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.396	0.000	
3500.01	633334	Mid	NR Band n77 DoD	100	16.5	15.08	D	0.13	N/A	Right	Cheek	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.387	0.000	
3500.01	633334	Mid	NR Band n77 DoD	100	16.5	15.08	D	-0.14	N/A	Right	Tilt	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.387	0.000	
3500.01	633334	Mid	NR Band n77 DoD	100	16.5	15.08	D	-0.16	N/A	Left	Cheek	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.387	0.000	
3500.01	633334	Mid	NR Band n77 DoD	100	16.5	15.08	D	-0.13	N/A	Left	Tilt	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.387	0.000	
3750.00	650000	Low	NR Band n77	100	13.5	13.44	F	-0.03	0	Right	Cheek	DFT-S-OFDM	QPSK	1	271	7506V	1:1	0.337	1.014	0.342	A4
3750.00	650000	Low	NR Band n77	100	13.5	13.24	F	0.00	0	Right	Cheek	DFT-S-OFDM	QPSK	135	138	7506V	1:1	0.334	1.062	0.355	
3750.00	650000	Low	NR Band n77	100	13.5	12.83	F	0.04	0	Right	Cheek	CP-OFDM	QPSK	1	1	7506V	1:1	0.331	1.167	0.386	
3750.00	650000	Low	NR Band n77	100	13.5	13.44	F	0.01	0	Right	Tilt	DFT-S-OFDM	QPSK	1	271	7506V	1:1	0.174	1.014	0.176	
3750.00	650000	Low	NR Band n77	100	13.5	13.24	F	-0.01	0	Right	Tilt	DFT-S-OFDM	QPSK	135	138	7506V	1:1	0.170	1.062	0.181	
3750.00	650000	Low	NR Band n77	100	13.5	13.44	F	-0.04	0	Left	Cheek	DFT-S-OFDM	QPSK	1	271	7506V	1:1	0.176	1.014	0.178	
3750.00	650000	Low	NR Band n77	100	13.5	13.24	F	0.11	0	Left	Cheek	DFT-S-OFDM	QPSK	135	138	7506V	1:1	0.180	1.062	0.191	
3750.00	650000	Low	NR Band n77	100	13.5	13.44	F	-0.05	0	Left	Tilt	DFT-S-OFDM	QPSK	1	271	7506V	1:1	0.170	1.014	0.172	
3750.00	650000	Low	NR Band n77	100	13.5	13.24	F	0.00	0	Left	Tilt	DFT-S-OFDM	QPSK	135	138	7506V	1:1	0.169	1.062	0.179	
3750.00	650000	Low	NR Band n77	100	17.0	16.53	C	0.17	N/A	Right	Cheek	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.042	1.114	0.047	
3750.00	650000	Low	NR Band n77	100	17.0	16.53	C	0.00	N/A	Right	Tilt	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.046	1.114	0.051	
3750.00	650000	Low	NR Band n77	100	17.0	16.53	C	-0.14	N/A	Left	Cheek	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.083	1.114	0.092	
3750.00	650000	Low	NR Band n77	100	17.0	16.53	C	0.18	N/A	Left	Tilt	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.014	1.114	0.016	
3750.00	650000	Low	NR Band n77	100	16.0	15.46	H	-0.03	N/A	Right	Cheek	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.132	0.000	
3750.00	650000	Low	NR Band n77	100	16.0	15.46	H	0.14	N/A	Right	Tilt	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.132	0.000	
3750.00	650000	Low	NR Band n77	100	16.0	15.46	H	-0.18	N/A	Left	Cheek	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.132	0.000	
3750.00	650000	Low	NR Band n77	100	16.0	15.46	H	0.13	N/A	Left	Tilt	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.132	0.000	
3750.00	650000	Low	NR Band n77	100	16.5	16.26	D	0.00	N/A	Right	Cheek	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.057	0.000	
3750.00	650000	Low	NR Band n77	100	16.5	16.26	D	0.13	N/A	Right	Tilt	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.057	0.000	
3750.00	650000	Low	NR Band n77	100	16.5	16.26	D	0.15	N/A	Left	Cheek	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.057	0.000	
3750.00	650000	Low	NR Band n77	100	16.5	16.26	D	0.19	N/A	Left	Tilt	CW/SRS	N/A	N/A	N/A	7506V	1:1	0.000	1.057	0.000	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Head 1.6 W/kg (mW/g) averaged over 1 gram								

11.2 Standalone Body-Worn SAR Data

Table 11-4
NR Band n25 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)	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.33	A	0.03	0	20	7631V	DFT-S-OFDM	QPSK	1	53	15 mm	back	1:1	0.606	1.309	0.793	
1860.00	372000	Low	NR Band n25 (PCS)	20	24.5	23.39	A	0.04	0	20	7631V	DFT-S-OFDM	QPSK	50	28	15 mm	back	1:1	0.508	1.291	0.656	
1882.50	376500	Mid	NR Band n25 (PCS)	20	24.5	23.41	A	0.00	0	20	7631V	DFT-S-OFDM	QPSK	50	28	15 mm	back	1:1	0.598	1.285	0.768	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.47	A	0.02	0	20	7631V	DFT-S-OFDM	QPSK	50	28	15 mm	back	1:1	0.630	1.268	0.799	A5
1905.00	381000	High	NR Band n25 (PCS)	20	23.0	21.79	A	0.10	1.5	20	7631V	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.414	1.321	0.547	
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 11-5
NR Band n41 Body-Worn SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
2592.99	518598	Mid	NR Band n41	100	19.0	18.89	I	0.20	0	7446V	DFT-S-OFDM	QPSK	1	137	15 mm	back	1:1	0.077	1.026	0.079	
2592.99	518598	Mid	NR Band n41	100	19.0	18.78	I	0.05	0	7446V	DFT-S-OFDM	QPSK	135	69	15 mm	back	1:1	0.079	1.052	0.083	
2592.99	518598	Mid	NR Band n41	100	19.0	18.41	I	0.16	0	7446V	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.084	1.146	0.096	A6
2592.99	518598	Mid	NR Band n41	100	17.0	16.58	B	0.09	N/A	7464V	CW/SRS	N/A	N/A	N/A	15 mm	back	1:1	0.053	1.102	0.058	
2592.99	518598	Mid	NR Band n41	100	14.0	13.41	E	0.00	N/A	7464V	CW/SRS	N/A	N/A	N/A	15 mm	back	1:1	0.008	1.146	0.009	
2592.99	518598	Mid	NR Band n41	100	15.0	14.09	D	-0.15	N/A	7464V	CW/SRS	N/A	N/A	N/A	15 mm	back	1:1	0.013	1.233	0.016	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Body 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-6
NR Band n77 Body-Worn SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.35	F	0.04	0	7446V	DFT-S-OFDM	QPSK	1	1	15 mm	back	1:1	0.116	1.161	0.135	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.24	F	-0.17	0	7446V	DFT-S-OFDM	QPSK	135	0	15 mm	back	1:1	0.113	1.191	0.135	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.08	F	-0.10	0	7446V	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.111	1.236	0.137	
3500.01	633334	Mid	NR Band n77 DoD	100	17.0	15.57	C	0.19	N/A	7841V	CW/SRS	N/A	N/A	N/A	15 mm	back	1:1	0.053	1.390	0.074	
3500.01	633334	Mid	NR Band n77 DoD	100	18.5	17.41	H	0.13	N/A	7446V	CW/SRS	N/A	N/A	N/A	15 mm	back	1:1	0.011	1.285	0.014	
3500.01	633334	Mid	NR Band n77 DoD	100	16.5	15.08	D	0.00	N/A	7841V	CW/SRS	N/A	N/A	N/A	15 mm	back	1:1	0.220	1.387	0.305	A7
3750.00	650000	Low	NR Band n77	100	19.0	18.98	F	-0.18	0	7446V	DFT-S-OFDM	QPSK	1	137	15 mm	back	1:1	0.156	1.005	0.157	A8
3750.00	650000	Low	NR Band n77	100	19.0	18.93	F	-0.13	0	7446V	DFT-S-OFDM	QPSK	135	69	15 mm	back	1:1	0.137	1.016	0.139	
3750.00	650000	Low	NR Band n77	100	19.0	18.28	F	-0.11	0	7446V	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.135	1.180	0.159	
3750.00	650000	Low	NR Band n77	100	17.0	16.53	C	-0.13	N/A	7446V	CW/SRS	N/A	N/A	N/A	15 mm	back	1:1	0.079	1.114	0.088	
3930.00	662000	High	NR Band n77	100	18.5	17.89	H	-0.16	N/A	7446V	CW/SRS	N/A	N/A	N/A	15 mm	back	1:1	0.022	1.151	0.025	
3750.00	650000	Low	NR Band n77	100	16.5	16.26	D	0.13	N/A	7446V	CW/SRS	N/A	N/A	N/A	15 mm	back	1:1	0.102	1.057	0.108	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Body 1.6 W/kg (mW/g) averaged over 1 gram									

11.3 Standalone Hotspot SAR Data

Table 11-7
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)	
1850.20	512	GSM 1900	GPRS	22.0	20.42	0.14	10 mm	A	7631V	4	1:2.076	back	0.282	1.439	0.406	
1850.20	512	GSM 1900	GPRS	22.0	20.42	-0.06	10 mm	A	7631V	4	1:2.076	front	0.252	1.439	0.363	
1850.20	512	GSM 1900	GPRS	22.0	20.42	-0.04	10 mm	A	7631V	4	1:2.076	bottom	0.510	1.439	0.734	
1880.00	661	GSM 1900	GPRS	22.0	20.13	-0.10	10 mm	A	7631V	4	1:2.076	bottom	0.480	1.538	0.738	
1909.80	810	GSM 1900	GPRS	22.0	20.15	-0.06	10 mm	A	7631V	4	1:2.076	bottom	0.517	1.531	0.792	A9
1850.20	512	GSM 1900	GPRS	22.0	20.42	0.01	10 mm	A	7631V	4	1:2.076	right	0.030	1.439	0.043	
1850.20	512	GSM 1900	GPRS	22.0	20.42	-0.02	10 mm	A	7631V	4	1:2.076	left	0.070	1.439	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 11-8
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)	
1907.60	9538	UMTS 1900	RMC	18.5	18.45	21	0.01	10 mm	A	7631V	1:1	back	0.448	1.012	0.453	
1907.60	9538	UMTS 1900	RMC	18.5	18.45	21	0.00	10 mm	A	7631V	1:1	front	0.313	1.012	0.317	
1852.40	9262	UMTS 1900	RMC	18.5	18.42	21	-0.02	10 mm	A	7631V	1:1	bottom	0.710	1.019	0.723	
1880.00	9400	UMTS 1900	RMC	18.5	18.22	21	0.00	10 mm	A	7631V	1:1	bottom	0.757	1.067	0.808	
1907.60	9538	UMTS 1900	RMC	18.5	18.45	21	0.04	10 mm	A	7631V	1:1	bottom	0.832	1.012	0.842	A10
1907.60	9538	UMTS 1900	RMC	18.5	18.45	21	0.08	10 mm	A	7631V	1:1	right	0.053	1.012	0.054	
1907.60	9538	UMTS 1900	RMC	18.5	18.45	21	-0.02	10 mm	A	7631V	1:1	left	0.066	1.012	0.067	
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 11-9
LTE B41 Hotspot SAR Data

MEASUREMENT RESULTS																						
# CC Uplink, 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)	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.22	-0.09	0	B	7841V	QPSK	1	50	10 mm	back	1:1.58	0.288	1.067	0.307	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.19	-0.02	0	B	7841V	QPSK	50	50	10 mm	back	1:1.58	0.293	1.074	0.315	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.22	-0.09	0	B	7841V	QPSK	1	50	10 mm	front	1:1.58	0.283	1.067	0.302	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.19	0.00	0	B	7841V	QPSK	50	50	10 mm	front	1:1.58	0.276	1.074	0.296	
1 CC Uplink - Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.5	22.63	-0.08	0	B	7841V	QPSK	1	99	10 mm	bottom	1:1.58	0.400	1.222	0.489	
1 CC Uplink - Power Class 3	2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.68	0.03	0	B	7841V	QPSK	1	50	10 mm	bottom	1:1.58	0.500	1.208	0.604	
1 CC Uplink - Power Class 3	2593.00	40620	Mid	LTE Band 41	20	23.5	22.90	0.06	0	B	7841V	QPSK	1	50	10 mm	bottom	1:1.58	0.618	1.148	0.709	
1 CC Uplink - Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	23.5	23.12	0.00	0	B	7841V	QPSK	1	50	10 mm	bottom	1:1.58	0.686	1.091	0.748	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.22	0.01	0	B	7841V	QPSK	1	50	10 mm	bottom	1:1.58	0.652	1.067	0.696	
1 CC Uplink - Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.5	22.69	0.01	0	B	7841V	QPSK	50	25	10 mm	bottom	1:1.58	0.373	1.205	0.449	
1 CC Uplink - Power Class 3	2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.64	-0.02	0	B	7841V	QPSK	50	25	10 mm	bottom	1:1.58	0.500	1.219	0.610	
1 CC Uplink - Power Class 3	2593.00	40620	Mid	LTE Band 41	20	23.5	22.85	0.01	0	B	7841V	QPSK	50	50	10 mm	bottom	1:1.58	0.622	1.161	0.722	
1 CC Uplink - Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	23.5	23.17	-0.01	0	B	7841V	QPSK	50	25	10 mm	bottom	1:1.58	0.689	1.079	0.743	A11
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.19	0.03	0	B	7841V	QPSK	50	50	10 mm	bottom	1:1.58	0.632	1.074	0.679	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.16	0.00	0	B	7841V	QPSK	100	0	10 mm	bottom	1:1.58	0.623	1.081	0.673	
1 CC Uplink - Power Class 2	2636.50	41055	Mid-High	LTE Band 41	20	25.1	24.77	0.04	0	B	7841V	QPSK	1	50	10 mm	bottom	1:2.31	0.621	1.079	0.670	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.22	-0.08	0	B	7841V	QPSK	1	50	10 mm	left	1:1.58	0.282	1.067	0.301	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.19	-0.03	0	B	7841V	QPSK	50	50	10 mm	left	1:1.58	0.280	1.074	0.301	
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 11-10
NR Band n25 Hotspot 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)	
1905.00	381000	High	NR Band n25 (PCS)	20	19.0	18.52	A	0.02	0	20	7631V	DFT-S-OFDM	QPSK	1	53	10 mm	back	1:1	0.476	1.117	0.532	
1905.00	381000	High	NR Band n25 (PCS)	20	19.0	18.61	A	0.01	0	20	7631V	DFT-S-OFDM	QPSK	50	28	10 mm	back	1:1	0.498	1.094	0.545	
1905.00	381000	High	NR Band n25 (PCS)	20	19.0	18.52	A	-0.03	0	20	7631V	DFT-S-OFDM	QPSK	1	53	10 mm	front	1:1	0.352	1.117	0.393	
1905.00	381000	High	NR Band n25 (PCS)	20	19.0	18.61	A	0.15	0	20	7631V	DFT-S-OFDM	QPSK	50	28	10 mm	front	1:1	0.372	1.094	0.407	
1860.00	372000	Low	NR Band n25 (PCS)	20	19.0	18.45	A	0.01	0	20	7631V	DFT-S-OFDM	QPSK	1	104	10 mm	bottom	1:1	0.787	1.135	0.893	
1882.50	376500	Mid	NR Band n25 (PCS)	20	19.0	18.44	A	-0.06	0	20	7631V	DFT-S-OFDM	QPSK	1	53	10 mm	bottom	1:1	0.821	1.138	0.934	
1905.00	381000	High	NR Band n25 (PCS)	20	19.0	18.52	A	-0.02	0	20	7631V	DFT-S-OFDM	QPSK	1	53	10 mm	bottom	1:1	0.940	1.117	1.050	
1860.00	372000	Low	NR Band n25 (PCS)	20	19.0	18.59	A	0.01	0	20	7631V	DFT-S-OFDM	QPSK	50	28	10 mm	bottom	1:1	0.832	1.099	0.914	
1882.50	376500	Mid	NR Band n25 (PCS)	20	19.0	18.59	A	0.03	0	20	7631V	DFT-S-OFDM	QPSK	50	0	10 mm	bottom	1:1	0.864	1.099	0.950	
1905.00	381000	High	NR Band n25 (PCS)	20	19.0	18.61	A	-0.05	0	20	7631V	DFT-S-OFDM	QPSK	50	28	10 mm	bottom	1:1	0.967	1.094	1.058	
1905.00	381000	High	NR Band n25 (PCS)	20	19.0	18.51	A	-0.02	0	20	7631V	DFT-S-OFDM	QPSK	100	0	10 mm	bottom	1:1	0.998	1.119	**1.117**	A12
1882.50	376500	Mid	NR Band n25 (PCS)	20	19.0	18.42	A	0.01	0	20	7631V	CP-OFDM	QPSK	1	1	10 mm	bottom	1:1	0.837	1.143	0.957	
1905.00	381000	High	NR Band n25 (PCS)	20	19.0	18.52	A	0.09	0	20	7631V	DFT-S-OFDM	QPSK	1	53	10 mm	right	1:1	0.068	1.117	0.076	
1905.00	381000	High	NR Band n25 (PCS)	20	19.0	18.61	A	-0.09	0	20	7631V	DFT-S-OFDM	QPSK	50	28	10 mm	right	1:1	0.071	1.094	0.078	
1905.00	381000	High	NR Band n25 (PCS)	20	19.0	18.52	A	-0.02	0	20	7631V	DFT-S-OFDM	QPSK	1	53	10 mm	left	1:1	0.063	1.117	0.070	
1905.00	381000	High	NR Band n25 (PCS)	20	19.0	18.61	A	0.06	0	20	7631V	DFT-S-OFDM	QPSK	50	28	10 mm	left	1:1	0.067	1.094	0.073	
1905.00	381000	High	NR Band n25 (PCS)	20	19.0	18.51	A	0.02	0	20	7631V	DFT-S-OFDM	QPSK	100	0	10 mm	bottom	1:1	0.998	1.119	**1.117**	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram									

Note: Blue entry represents variability measurement

Table 11-11
NR Band n41 Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
2592.99	518598	Mid	NR Band n41	100	19.0	18.89	I	0.00	0	7446V	DFT-S-OFDM	QPSK	1	137	10 mm	back	1:1	0.151	1.026	0.155	
2592.99	518598	Mid	NR Band n41	100	19.0	18.78	I	0.04	0	7446V	DFT-S-OFDM	QPSK	135	69	10 mm	back	1:1	0.148	1.052	0.156	
2592.99	518598	Mid	NR Band n41	100	19.0	18.89	I	-0.11	0	7446V	DFT-S-OFDM	QPSK	1	137	10 mm	front	1:1	0.078	1.026	0.080	
2592.99	518598	Mid	NR Band n41	100	19.0	18.78	I	0.13	0	7446V	DFT-S-OFDM	QPSK	135	69	10 mm	front	1:1	0.069	1.052	0.073	
2592.99	518598	Mid	NR Band n41	100	19.0	18.89	I	0.04	0	7446V	DFT-S-OFDM	QPSK	1	137	10 mm	top	1:1	0.262	1.026	0.269	
2592.99	518598	Mid	NR Band n41	100	19.0	18.78	I	-0.12	0	7446V	DFT-S-OFDM	QPSK	135	69	10 mm	top	1:1	0.266	1.052	0.280	A13
2592.99	518598	Mid	NR Band n41	100	19.0	18.41	I	0.09	0	7446V	CP-OFDM	QPSK	1	1	10 mm	top	1:1	0.244	1.146	0.280	
2592.99	518598	Mid	NR Band n41	100	19.0	18.89	I	-0.18	0	7446V	DFT-S-OFDM	QPSK	1	137	10 mm	right	1:1	0.040	1.026	0.041	
2592.99	518598	Mid	NR Band n41	100	19.0	18.78	I	-0.06	0	7446V	DFT-S-OFDM	QPSK	135	69	10 mm	right	1:1	0.041	1.052	0.043	
2592.99	518598	Mid	NR Band n41	100	17.0	16.58	B	0.01	N/A	7464V	CW/SRS	N/A	N/A	N/A	10 mm	back	1:1	0.105	1.102	0.116	
2592.99	518598	Mid	NR Band n41	100	17.0	16.58	B	0.04	N/A	7464V	CW/SRS	N/A	N/A	N/A	10 mm	front	1:1	0.081	1.102	0.089	
2592.99	518598	Mid	NR Band n41	100	17.0	16.58	B	0.05	N/A	7464V	CW/SRS	N/A	N/A	N/A	10 mm	bottom	1:1	0.248	1.102	0.273	
2592.99	518598	Mid	NR Band n41	100	17.0	16.58	B	0.11	N/A	7464V	CW/SRS	N/A	N/A	N/A	10 mm	left	1:1	0.097	1.102	0.107	
2592.99	518598	Mid	NR Band n41	100	14.0	13.41	E	-0.13	N/A	7464V	CW/SRS	N/A	N/A	N/A	10 mm	back	1:1	0.012	1.146	0.014	
2592.99	518598	Mid	NR Band n41	100	14.0	13.41	E	-0.12	N/A	7464V	CW/SRS	N/A	N/A	N/A	10 mm	front	1:1	0.016	1.146	0.018	
2592.99	518598	Mid	NR Band n41	100	14.0	13.41	E	0.14	N/A	7464V	CW/SRS	N/A	N/A	N/A	10 mm	top	1:1	0.005	1.146	0.006	
2592.99	518598	Mid	NR Band n41	100	14.0	13.41	E	-0.17	N/A	7464V	CW/SRS	N/A	N/A	N/A	10 mm	right	1:1	0.001	1.146	0.001	
2592.99	518598	Mid	NR Band n41	100	14.0	13.41	E	-0.04	N/A	7464V	CW/SRS	N/A	N/A	N/A	10 mm	left	1:1	0.011	1.146	0.013	
2592.99	518598	Mid	NR Band n41	100	15.0	14.09	D	-0.11	N/A	7464V	CW/SRS	N/A	N/A	N/A	10 mm	back	1:1	0.038	1.233	0.047	
2592.99	518598	Mid	NR Band n41	100	15.0	14.09	D	0.12	N/A	7464V	CW/SRS	N/A	N/A	N/A	10 mm	front	1:1	0.004	1.233	0.005	
2592.99	518598	Mid	NR Band n41	100	15.0	14.09	D	-0.08	N/A	7464V	CW/SRS	N/A	N/A	N/A	10 mm	bottom	1:1	0.020	1.233	0.025	
2592.99	518598	Mid	NR Band n41	100	15.0	14.09	D	-0.15	N/A	7464V	CW/SRS	N/A	N/A	N/A	10 mm	right	1:1	0.005	1.233	0.006	
2592.99	518598	Mid	NR Band n41	100	15.0	14.09	D	0.12	N/A	7464V	CW/SRS	N/A	N/A	N/A	10 mm	left	1:1	0.005	1.233	0.006	
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 11-12
NR Band n77 Hotspot SAR

MEASUREMENT RESULTS																						
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.35	F	0.07	0	7446V	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.230	1.161	0.267	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.24	F	0.08	0	7446V	DFT-S-OFDM	QPSK	135	0	10 mm	back	1:1	0.224	1.191	0.267	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.35	F	-0.15	0	7446V	DFT-S-OFDM	QPSK	1	1	10 mm	front	1:1	0.120	1.161	0.139	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.24	F	-0.04	0	7446V	DFT-S-OFDM	QPSK	135	0	10 mm	front	1:1	0.121	1.191	0.144	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.35	F	-0.07	0	7446V	DFT-S-OFDM	QPSK	1	1	10 mm	top	1:1	0.130	1.161	0.151	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.24	F	-0.08	0	7446V	DFT-S-OFDM	QPSK	135	0	10 mm	top	1:1	0.143	1.191	0.170	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.35	F	-0.13	0	7446V	DFT-S-OFDM	QPSK	1	1	10 mm	left	1:1	0.369	1.161	0.428	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.24	F	-0.06	0	7446V	DFT-S-OFDM	QPSK	135	0	10 mm	left	1:1	0.366	1.191	0.436	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.09	F	0.04	0	7446V	DFT-S-OFDM	QPSK	270	0	10 mm	left	1:1	0.355	1.233	0.438	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.08	F	0.04	0	7446V	CP-OFDM	QPSK	1	1	10 mm	left	1:1	0.367	1.236	0.454	
3500.01	633334	Mid	NR Band n77 DoD	100	17.0	15.57	C	-0.10	N/A	7841V	CW/SRS	N/A	N/A	N/A	10 mm	back	1:1	0.142	1.390	0.197	
3500.01	633334	Mid	NR Band n77 DoD	100	17.0	15.57	C	0.10	N/A	7841V	CW/SRS	N/A	N/A	N/A	10 mm	front	1:1	0.056	1.390	0.078	
3500.01	633334	Mid	NR Band n77 DoD	100	17.0	15.57	C	-0.13	N/A	7841V	CW/SRS	N/A	N/A	N/A	10 mm	bottom	1:1	0.037	1.390	0.051	
3500.01	633334	Mid	NR Band n77 DoD	100	17.0	15.57	C	-0.01	N/A	7841V	CW/SRS	N/A	N/A	N/A	10 mm	left	1:1	0.234	1.390	0.325	
3500.01	633334	Mid	NR Band n77 DoD	100	18.5	17.41	H	-0.05	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	back	1:1	0.033	1.285	0.042	
3500.01	633334	Mid	NR Band n77 DoD	100	18.5	17.41	H	0.13	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	front	1:1	0.003	1.285	0.004	
3500.01	633334	Mid	NR Band n77 DoD	100	18.5	17.41	H	0.00	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	top	1:1	0.002	1.285	0.003	
3500.01	633334	Mid	NR Band n77 DoD	100	18.5	17.41	H	-0.17	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	left	1:1	0.006	1.285	0.008	
3500.01	633334	Mid	NR Band n77 DoD	100	16.5	15.08	D	-0.03	N/A	7841V	CW/SRS	N/A	N/A	N/A	10 mm	back	1:1	0.539	1.387	0.748	A14
3500.01	633334	Mid	NR Band n77 DoD	100	16.5	15.08	D	-0.15	N/A	7841V	CW/SRS	N/A	N/A	N/A	10 mm	front	1:1	0.030	1.387	0.042	
3500.01	633334	Mid	NR Band n77 DoD	100	16.5	15.08	D	0.16	N/A	7841V	CW/SRS	N/A	N/A	N/A	10 mm	bottom	1:1	0.072	1.387	0.100	
3500.01	633334	Mid	NR Band n77 DoD	100	16.5	15.08	D	-0.03	N/A	7841V	CW/SRS	N/A	N/A	N/A	10 mm	right	1:1	0.020	1.387	0.028	
3500.01	633334	Mid	NR Band n77 DoD	100	16.5	15.08	D	-0.10	N/A	7841V	CW/SRS	N/A	N/A	N/A	10 mm	left	1:1	0.004	1.387	0.006	
3750.00	650000	Low	NR Band n77	100	19.0	18.98	F	0.08	0	7446V	DFT-S-OFDM	QPSK	1	137	10 mm	back	1:1	0.281	1.005	0.282	
3750.00	650000	Low	NR Band n77	100	19.0	18.93	F	0.05	0	7446V	DFT-S-OFDM	QPSK	135	69	10 mm	back	1:1	0.253	1.016	0.257	
3750.00	650000	Low	NR Band n77	100	19.0	18.98	F	0.02	0	7446V	DFT-S-OFDM	QPSK	1	137	10 mm	front	1:1	0.132	1.005	0.133	
3750.00	650000	Low	NR Band n77	100	19.0	18.93	F	-0.06	0	7446V	DFT-S-OFDM	QPSK	135	69	10 mm	front	1:1	0.117	1.016	0.119	
3750.00	650000	Low	NR Band n77	100	19.0	18.98	F	0.04	0	7446V	DFT-S-OFDM	QPSK	1	137	10 mm	top	1:1	0.210	1.005	0.211	
3750.00	650000	Low	NR Band n77	100	19.0	18.93	F	0.04	0	7446V	DFT-S-OFDM	QPSK	135	69	10 mm	top	1:1	0.199	1.016	0.202	
3750.00	650000	Low	NR Band n77	100	19.0	18.98	F	0.03	0	7446V	DFT-S-OFDM	QPSK	1	137	10 mm	left	1:1	0.529	1.005	0.532	
3930.00	662000	High	NR Band n77	100	19.0	18.90	F	0.04	0	7446V	DFT-S-OFDM	QPSK	1	137	10 mm	left	1:1	0.549	1.023	0.562	
3750.00	650000	Low	NR Band n77	100	19.0	18.93	F	0.02	0	7446V	DFT-S-OFDM	QPSK	135	69	10 mm	left	1:1	0.464	1.016	0.471	
3930.00	662000	High	NR Band n77	100	19.0	18.91	F	-0.05	0	7446V	DFT-S-OFDM	QPSK	135	138	10 mm	left	1:1	0.551	1.021	0.563	A15
3750.00	650000	Low	NR Band n77	100	19.0	18.86	F	0.00	0	7446V	DFT-S-OFDM	QPSK	270	0	10 mm	left	1:1	0.488	1.033	0.504	
3750.00	650000	Low	NR Band n77	100	19.0	18.28	F	-0.19	0	7446V	CP-OFDM	QPSK	1	1	10 mm	left	1:1	0.414	1.180	0.489	
3750.00	650000	Low	NR Band n77	100	17.0	16.53	C	-0.02	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	back	1:1	0.223	1.114	0.248	
3750.00	650000	Low	NR Band n77	100	17.0	16.53	C	-0.13	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	front	1:1	0.124	1.114	0.138	
3750.00	650000	Low	NR Band n77	100	17.0	16.53	C	0.14	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	bottom	1:1	0.045	1.114	0.050	
3750.00	650000	Low	NR Band n77	100	17.0	16.53	C	-0.03	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	left	1:1	0.258	1.114	0.287	
3930.00	662000	High	NR Band n77	100	18.5	17.89	H	0.20	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	back	1:1	0.051	1.151	0.059	
3930.00	662000	High	NR Band n77	100	18.5	17.89	H	-0.17	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	front	1:1	0.000	1.151	0.000	
3930.00	662000	High	NR Band n77	100	18.5	17.89	H	-0.19	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	top	1:1	0.012	1.151	0.014	
3930.00	662000	High	NR Band n77	100	18.5	17.89	H	0.01	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	left	1:1	0.003	1.151	0.003	
3750.00	650000	Low	NR Band n77	100	16.5	16.26	D	0.02	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	back	1:1	0.255	1.057	0.270	
3750.00	650000	Low	NR Band n77	100	16.5	16.26	D	0.14	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	front	1:1	0.009	1.057	0.010	
3750.00	650000	Low	NR Band n77	100	16.5	16.26	D	-0.07	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	bottom	1:1	0.041	1.057	0.043	
3750.00	650000	Low	NR Band n77	100	16.5	16.26	D	0.03	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	right	1:1	0.009	1.057	0.010	
3750.00	650000	Low	NR Band n77	100	16.5	16.26	D	-0.15	N/A	7446V	CW/SRS	N/A	N/A	N/A	10 mm	left	1:1	0.006	1.057	0.006	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram						

11.4 Standalone Phablet SAR Data

Table 11-13
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	22.0	20.42	-0.10	0 mm	A	7631V	4	1:2.076	back	0.678	1.439	0.976	
1850.20	512	GSM 1900	GPRS	22.0	20.42	0.02	0 mm	A	7631V	4	1:2.076	front	0.727	1.439	1.046	A16
1850.20	512	GSM 1900	GPRS	22.0	20.42	-0.01	0 mm	A	7631V	4	1:2.076	bottom	0.596	1.439	0.858	
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 11-14
LTE B41 Phablet SAR Data

MEASUREMENT RESULTS																						
# CC Uplink, 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)	Scaling Factor	Reported SAR (10g)	Plot #
	MHz	Ch.																(W/kg)		(W/kg)	
1 CC Uplink - Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.5	22.63	-0.02	0	B	7506V	QPSK	1	99	0 mm	back	1:1.58	2.500	1.222	3.055	
1 CC Uplink - Power Class 3	2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.68	0.02	0	B	7506V	QPSK	1	50	0 mm	back	1:1.58	2.570	1.208	3.105	
1 CC Uplink - Power Class 3	2593.00	40620	Mid	LTE Band 41	20	23.5	22.90	0.03	0	B	7506V	QPSK	1	50	0 mm	back	1:1.58	2.590	1.148	2.973	
1 CC Uplink - Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	23.5	23.12	0.00	0	B	7506V	QPSK	1	50	0 mm	back	1:1.58	2.710	1.091	2.957	A17
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.22	-0.01	0	B	7506V	QPSK	1	50	0 mm	back	1:1.58	2.260	1.067	2.411	
1 CC Uplink - Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.5	22.69	0.04	0	B	7506V	QPSK	50	25	0 mm	back	1:1.58	2.540	1.205	3.061	
1 CC Uplink - Power Class 3	2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.64	0.01	0	B	7506V	QPSK	50	25	0 mm	back	1:1.58	2.530	1.219	3.084	
1 CC Uplink - Power Class 3	2593.00	40620	Mid	LTE Band 41	20	23.5	22.85	0.10	0	B	7506V	QPSK	50	50	0 mm	back	1:1.58	2.600	1.161	3.019	
1 CC Uplink - Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	23.5	23.17	0.01	0	B	7506V	QPSK	50	25	0 mm	back	1:1.58	2.650	1.079	2.859	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.19	-0.01	0	B	7506V	QPSK	50	50	0 mm	back	1:1.58	2.260	1.074	2.427	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.16	0.01	0	B	7506V	QPSK	100	0	0 mm	back	1:1.58	2.230	1.081	2.411	
1 CC Uplink - Power Class 2	2549.50	40185	Low-Mid	LTE Band 41	20	25.1	24.66	0.03	0	B	7506V	QPSK	1	50	0 mm	back	1:2.31	2.670	1.107	2.956	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.22	-0.10	0	B	7506V	QPSK	1	50	0 mm	front	1:1.58	0.849	1.067	0.906	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.19	-0.03	0	B	7506V	QPSK	50	50	0 mm	front	1:1.58	0.840	1.074	0.902	
1 CC Uplink - Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.5	22.63	-0.02	0	B	7506V	QPSK	1	99	0 mm	bottom	1:1.58	1.620	1.222	1.980	
1 CC Uplink - Power Class 3	2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.68	-0.06	0	B	7506V	QPSK	1	50	0 mm	bottom	1:1.58	1.550	1.208	1.872	
1 CC Uplink - Power Class 3	2593.00	40620	Mid	LTE Band 41	20	23.5	22.90	0.01	0	B	7506V	QPSK	1	50	0 mm	bottom	1:1.58	1.540	1.148	1.768	
1 CC Uplink - Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	23.5	23.12	-0.02	0	B	7506V	QPSK	1	50	0 mm	bottom	1:1.58	1.460	1.091	1.593	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.22	0.00	0	B	7506V	QPSK	1	50	0 mm	bottom	1:1.58	1.410	1.067	1.504	
1 CC Uplink - Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.5	22.69	-0.01	0	B	7506V	QPSK	50	25	0 mm	bottom	1:1.58	1.580	1.205	1.904	
1 CC Uplink - Power Class 3	2549.50	40185	Low-Mid	LTE Band 41	20	23.5	22.64	0.01	0	B	7506V	QPSK	50	25	0 mm	bottom	1:1.58	1.560	1.219	1.902	
1 CC Uplink - Power Class 3	2593.00	40620	Mid	LTE Band 41	20	23.5	22.85	0.00	0	B	7506V	QPSK	50	50	0 mm	bottom	1:1.58	1.510	1.161	1.753	
1 CC Uplink - Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	23.5	23.17	-0.01	0	B	7506V	QPSK	50	25	0 mm	bottom	1:1.58	1.470	1.079	1.586	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.19	-0.01	0	B	7506V	QPSK	50	50	0 mm	bottom	1:1.58	1.410	1.074	1.514	
1 CC Uplink - Power Class 3	2680.00	41490	High	LTE Band 41	20	23.5	23.16	0.02	0	B	1330M	QPSK	100	0	0 mm	bottom	1:1.58	1.390	1.081	1.503	
1 CC Uplink - Power Class 3	2506.00	39750	Low	LTE Band 41	20	23.5	22.69	0.10	0	B	7506V	QPSK	50	25	0 mm	back	1:1.58	2.480	1.205	2.988	
1 CC Uplink - Power Class 3	2636.50	41055	Mid-High	LTE Band 41	20	23.5	23.12	-0.08	0	B	7506V	QPSK	1	50	0 mm	back	1:1.58	2.410	1.091	2.629	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Phablet 4.0 W/kg (mW/g) averaged over 10 grams												

Note: Blue entries represent variability measurements

Table 11-15
NR Band n25 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)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.																		(W/kg)		(W/kg)	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.33	A	0.06	0	20	7631V	DFT-S-OFDM	QPSK	1	53	8 mm	back	1:1	0.931	1.309	1.219	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.47	A	0.04	0	20	7631V	DFT-S-OFDM	QPSK	50	28	8 mm	back	1:1	0.995	1.268	1.262	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.33	A	0.00	0	20	7631V	DFT-S-OFDM	QPSK	1	53	6 mm	front	1:1	0.857	1.309	1.122	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.47	A	0.00	0	20	7631V	DFT-S-OFDM	QPSK	50	28	6 mm	front	1:1	0.911	1.268	1.155	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.33	A	0.05	0	20	7631V	DFT-S-OFDM	QPSK	1	53	11 mm	bottom	1:1	1.040	1.309	1.361	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.47	A	0.02	0	20	7631V	DFT-S-OFDM	QPSK	50	28	11 mm	bottom	1:1	1.150	1.268	1.458	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.33	A	-0.03	0	20	7631V	DFT-S-OFDM	QPSK	1	53	0 mm	right	1:1	0.380	1.309	0.497	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.47	A	0.02	0	20	7631V	DFT-S-OFDM	QPSK	50	28	0 mm	right	1:1	0.394	1.268	0.500	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.33	A	0.12	0	20	7631V	DFT-S-OFDM	QPSK	1	53	0 mm	left	1:1	0.588	1.309	0.770	
1905.00	381000	High	NR Band n25 (PCS)	20	24.5	23.47	A	-0.01	0	20	7631V	DFT-S-OFDM	QPSK	50	28	0 mm	left	1:1	0.612	1.268	0.776	
1860.00	372000	Low	NR Band n25 (PCS)	20	21.5	20.75	A	-0.05	0	20	7631V	DFT-S-OFDM	QPSK	1	104	0 mm	back	1:1	1.690	1.189	2.009	
1882.50	376500	Mid	NR Band n25 (PCS)	20	21.5	20.79	A	-0.04	0	20	7631V	DFT-S-OFDM	QPSK	1	1	0 mm	back	1:1	1.870	1.178	2.203	
1905.00	381000	High	NR Band n25 (PCS)	20	21.5	20.90	A	-0.03	0	20	7631V	DFT-S-OFDM	QPSK	1	53	0 mm	back	1:1	1.900	1.148	2.181	
1860.00	372000	Low	NR Band n25 (PCS)	20	21.5	20.92	A	-0.02	0	20	7631V	DFT-S-OFDM	QPSK	50	28	0 mm	back	1:1	1.710	1.143	1.955	
1882.50	376500	Mid	NR Band n25 (PCS)	20	21.5	20.90	A	-0.02	0	20	7631V	DFT-S-OFDM	QPSK	50	28	0 mm	back	1:1	1.930	1.148	2.216	
1905.00	381000	High	NR Band n25 (PCS)	20	21.5	20.96	A	-0.08	0	20	7631V	DFT-S-OFDM	QPSK	50	28	0 mm	back	1:1	1.990	1.132	2.253	
1905.00	381000	High	NR Band n25 (PCS)	20	21.5	20.89	A	-0.04	0	20	7631V	DFT-S-OFDM	QPSK	100	0	0 mm	back	1:1	1.940	1.151	2.233	
1860.00	372000	Low	NR Band n25 (PCS)	20	21.5	20.75	A	0.02	0	20	7631V	DFT-S-OFDM	QPSK	1	104	0 mm	front	1:1	1.640	1.189	1.950	
1882.50	376500	Mid	NR Band n25 (PCS)	20	21.5	20.79	A	0.03	0	20	7631V	DFT-S-OFDM	QPSK	1	1	0 mm	front	1:1	1.860	1.178	2.191	
1905.00	381000	High	NR Band n25 (PCS)	20	21.5	20.90	A	0.00	0	20	7631V	DFT-S-OFDM	QPSK	1	53	0 mm	front	1:1	1.940	1.148	2.227	
1860.00	372000	Low	NR Band n25 (PCS)	20	21.5	20.92	A	-0.01	0	20	7631V	DFT-S-OFDM	QPSK	50	28	0 mm	front	1:1	1.710	1.143	1.955	
1882.50	376500	Mid	NR Band n25 (PCS)	20	21.5	20.90	A	0.03	0	20	7631V	DFT-S-OFDM	QPSK	50	28	0 mm	front	1:1	1.880	1.148	2.158	
1905.00	381000	High	NR Band n25 (PCS)	20	21.5	20.96	A	0.00	0	20	7631V	DFT-S-OFDM	QPSK	50	28	0 mm	front	1:1	1.970	1.132	2.230	
1905.00	381000	High	NR Band n25 (PCS)	20	21.5	20.89	A	0.01	0	20	7631V	DFT-S-OFDM	QPSK	100	0	0 mm	front	1:1	1.930	1.151	2.221	
1860.00	372000	Low	NR Band n25 (PCS)	20	21.5	20.75	A	0.01	0	20	7631V	DFT-S-OFDM	QPSK	1	104	0 mm	bottom	1:1	1.920	1.189	2.283	
1882.50	376500	Mid	NR Band n25 (PCS)	20	21.5	20.79	A	-0.03	0	20	7631V	DFT-S-OFDM	QPSK	1	1	0 mm	bottom	1:1	2.260	1.178	2.662	
1905.00	381000	High	NR Band n25 (PCS)	20	21.5	20.90	A	0.00	0	20	7631V	DFT-S-OFDM	QPSK	1	53	0 mm	bottom	1:1	2.280	1.148	2.617	
1860.00	372000	Low	NR Band n25 (PCS)	20	21.5	20.92	A	0.00	0	20	7631V	DFT-S-OFDM	QPSK	50	28	0 mm	bottom	1:1	2.010	1.143	2.297	
1882.50	376500	Mid	NR Band n25 (PCS)	20	21.5	20.90	A	0.01	0	20	7631V	DFT-S-OFDM	QPSK	50	28	0 mm	bottom	1:1	2.280	1.148	2.617	
1905.00	381000	High	NR Band n25 (PCS)	20	21.5	20.96	A	0.00	0	20	7631V	DFT-S-OFDM	QPSK	50	28	0 mm	bottom	1:1	2.200	1.132	2.490	
1905.00	381000	High	NR Band n25 (PCS)	20	21.5	20.89	A	0.00	0	20	7631V	DFT-S-OFDM	QPSK	100	0	0 mm	bottom	1:1	2.280	1.151	2.624	
1905.00	381000	High	NR Band n25 (PCS)	20	21.5	20.76	A	0.01	0	20	7631V	CP-OFDM	QPSK	1	1	0 mm	bottom	1:1	2.290	1.186	2.716	A18
1905.00	381000	High	NR Band n25 (PCS)	20	21.5	20.76	A	-0.02	0	20	7631V	CP-OFDM	QPSK	1	1	0 mm	bottom	1:1	2.090	1.186	2.479	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Phablet 4.0 W/kg (mW/g) averaged over 10 grams										

Note: Blue entry represents variability measurement

Table 11-16
NR Band n41 Phablet SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
2592.99	518598	Mid	NR Band n41	100	19.0	18.89	I	-0.11	0	7446V	DFT-S-OFDM	QPSK	1	137	0 mm	top	1:1	1.490	1.026	1.529	
2592.99	518598	Mid	NR Band n41	100	19.0	18.78	I	0.01	0	7446V	DFT-S-OFDM	QPSK	135	69	0 mm	top	1:1	1.490	1.052	1.567	
2592.99	518598	Mid	NR Band n41	100	19.0	18.59	I	0.00	0	7446V	DFT-S-OFDM	QPSK	270	0	0 mm	top	1:1	1.660	1.099	1.824	A19
2592.99	518598	Mid	NR Band n41	100	19.0	18.41	I	-0.06	0	7446V	CP-OFDM	QPSK	1	1	0 mm	top	1:1	1.430	1.146	1.639	
2592.99	518598	Mid	NR Band n41	100	17.0	16.58	B	-0.03	0	7464V	CW/SRS	N/A	N/A	N/A	0 mm	bottom	1:1	0.456	1.102	0.503	
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 11-17
NR Band n77 Phablet SAR

MEASUREMENT RESULTS																						
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	Scaling Factor	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																		(W/kg)	(W/kg)	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.35	F	-0.01	0	7446V	DFT-S-OFDM	QPSK	1	1	0 mm	left	1:1	1.161	2.110	2.450	A20
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.24	F	0.04	0	7446V	DFT-S-OFDM	QPSK	135	0	0 mm	left	1:1	1.191	2.000	2.382	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.09	F	0.03	0	7446V	DFT-S-OFDM	QPSK	270	0	0 mm	left	1:1	1.233	1.970	2.429	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.08	F	-0.02	0	7446V	CP-OFDM	QPSK	1	1	0 mm	left	1:1	1.236	2.080	2.571	
3500.01	633334	Mid	NR Band n77 DoD	100	16.5	15.08	D	-0.07	N/A	7841V	CW/SRS	N/A	N/A	N/A	0 mm	back	1:1	1.387	1.400	1.942	
3500.01	633334	Mid	NR Band n77 DoD	100	19.0	18.35	F	-0.06	0	7446V	DFT-S-OFDM	QPSK	1	1	0 mm	left	1:1	1.161	2.080	2.415	
3750.00	650000	Low	NR Band n77	100	19.0	18.98	F	-0.02	0	7446V	DFT-S-OFDM	QPSK	1	137	0 mm	back	1:1	1.005	1.210	1.216	
3930.00	662000	High	NR Band n77	100	19.0	18.90	F	0.03	0	7446V	DFT-S-OFDM	QPSK	1	137	0 mm	back	1:1	1.023	1.110	1.136	
3750.00	650000	Low	NR Band n77	100	19.0	18.93	F	0.04	0	7446V	DFT-S-OFDM	QPSK	135	69	0 mm	back	1:1	1.016	0.981	0.997	
3930.00	662000	High	NR Band n77	100	19.0	18.91	F	0.03	0	7446V	DFT-S-OFDM	QPSK	135	138	0 mm	back	1:1	1.021	1.290	1.317	
3750.00	650000	Low	NR Band n77	100	19.0	18.86	F	-0.01	0	7446V	DFT-S-OFDM	QPSK	270	0	0 mm	back	1:1	1.033	1.020	1.054	
3750.00	650000	Low	NR Band n77	100	19.0	18.98	F	0.06	0	7446V	DFT-S-OFDM	QPSK	1	137	0 mm	left	1:1	1.005	2.520	2.533	
3930.00	662000	High	NR Band n77	100	19.0	18.90	F	0.00	0	7446V	DFT-S-OFDM	QPSK	1	137	0 mm	left	1:1	1.023	3.060	**3.130**	A21
3750.00	650000	Low	NR Band n77	100	19.0	18.93	F	-0.04	0	7446V	DFT-S-OFDM	QPSK	135	69	0 mm	left	1:1	1.016	2.400	2.438	
3930.00	662000	High	NR Band n77	100	19.0	18.91	F	0.01	0	7446V	DFT-S-OFDM	QPSK	135	138	0 mm	left	1:1	1.021	2.980	3.043	
3750.00	650000	Low	NR Band n77	100	19.0	18.86	F	-0.03	0	7446V	DFT-S-OFDM	QPSK	270	0	0 mm	left	1:1	1.033	2.360	2.438	
3750.00	650000	Low	NR Band n77	100	19.0	18.28	F	0.03	0	7446V	CP-OFDM	QPSK	1	1	0 mm	left	1:1	1.180	2.170	2.561	
3750.00	650000	Low	NR Band n77	100	19.0	18.98	F	0.03	0	7446V	DFT-S-OFDM	QPSK	1	137	0 mm	left	1:1	1.005	2.400	2.412	
3930.00	662000	High	NR Band n77	100	19.0	18.90	F	-0.04	0	7446V	DFT-S-OFDM	QPSK	1	137	0 mm	left	1:1	1.023	3.050	3.120	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Phablet 4 W/kg (mW/g) averaged over 10 grams												

Note: Blue entries represent variability measurements

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. 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.
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).

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).

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 the Part 2 Test report (Serial Number can be found in the bibliography)
4. This device additionally supports some EN-DC conditions where additional LTE carriers are added on the downlink only.
5. Per FCC Guidance, NR modulations and RB Sizes/Offsets were selected for testing such that configurations with the highest output power were evaluated for SAR tests.
6. SRS was tested with CW signal per Qualcomm guidance in 80-w2112-4.

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	Antenna Config	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1900	1905.00	381000	NR Band n25 (PCS), 20 MHz Bandwidth	DFT-S-OFDM, QPSK, 100 RB, 0 RB Offset	bottom	10 mm	A	0.998	0.998	1.00	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	Antenna Config	Measured SAR (10g)	1st Repeated SAR (10g)	Ratio	2nd Repeated SAR (10g)	Ratio	3rd Repeated SAR (10g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1900	1905.00	381000	NR Band n25 (PCS), 20 MHz Bandwidth	CP-OFDM, QPSK, 1 RB, 1 RB Offset	bottom	0 mm	A	2.290	2.090	1.10	N/A	N/A	N/A	N/A
2450	2506.00	39750	LTE Band 41, 20 MHz Bandwidth	QPSK, 50 RB, 25 RB Offset	back	0 mm	B	2.540	2.480	1.02	N/A	N/A	N/A	N/A
2600	2636.50	41055	LTE Band 41, 20 MHz Bandwidth	QPSK, 1 RB, 50 RB Offset	back	0 mm	B	2.710	2.410	1.12	N/A	N/A	N/A	N/A
3500	3500.01	633334	NR Band n77 DoD, 100 MHz Bandwidth	DFT-S-OFDM, QPSK, 1 RB, 1 RB Offset	left	0 mm	F	2.110	2.080	1.014	N/A	N/A	N/A	N/A
3700	3750.00	650000	NR Band n77, 100 MHz Bandwidth	DFT-S-OFDM, QPSK, 1 RB, 137 RB Offset	left	0 mm	F	2.520	2.400	1.050	N/A	N/A	N/A	N/A
3900	3930.00	662000	NR Band n77, 100 MHz Bandwidth	DFT-S-OFDM, QPSK, 1 RB, 137 RB Offset	left	0 mm	F	3.060	3.050	1.003	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Phablet 4.0 W/kg (mW/g) averaged over 10 grams						

12.2 Measurement Uncertainty

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

13 ADDITIONAL TESTING PER FCC GUIDANCE

13.1 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.

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.

Table 13-1
NR Supplemental Head SAR Data

NR Band n25	
DFT-s-OFDM QPSK, 20 MHz Bandwidth, 1 RB, 53 RB Offset	
Test Position	Left Cheek
Frequency (MHz)	1905.00
Channel	381000
Measured 1g SAR (W/kg)	0.155
Average Value of Time Sweep (W/kg)	
Auto-tune (State 112)	0.176
Default (State 0)	0.165
State 1	0.168
State 5	0.166
State 8	0.153
State 9	0.131
State 12	0.074
State 13	0.171
State 17	0.173
State 21	0.159
State 24	0.111
State 25	0.078
State 29	0.162
State 33	0.165
State 35	0.167
State 36	0.149
State 37	0.124
State 41	0.128
State 45	0.117
State 48	0.089
State 49	0.073
State 53	0.149
State 57	0.156
State 60	0.171
State 61	0.165
State 65	0.135
State 69	0.137
State 72	0.135
State 73	0.115
State 76	0.070
State 77	0.051
State 81	0.158
State 85	0.150
State 88	0.119
State 89	0.098
State 93	0.162
State 97	0.156
State 100	0.141
State 101	0.126
State 105	0.167
State 109	0.131
State 112	0.167
State 113	0.168
State 117	0.135

Table 13-2
UMTS/NR Supplemental Body SAR Data

UMTS B2		NR Band n25	
RMC		DFT-s-OFDM QPSK, 20 MHz Bandwidth, 100 RB, 0 RB Offset	
Test Position	Bottom	Test Position	Bottom
Spacing	10 mm	Spacing	10 mm
Frequency (MHz)	1907.60	Frequency (MHz)	1905.00
Channel	9538	Channel	381000
Measured 1g SAR (W/kg)	0.832	Measured 1g SAR (W/kg)	0.998
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 21)	0.910	Auto-tune (State 20)	1.110
Default (State 0)	0.878	Default (State 0)	1.050
State 0	0.878	State 3	1.070
State 2	0.889	State 7	1.060
State 4	0.893	State 8	0.979
State 6	0.891	State 11	0.813
State 10	0.767	State 15	1.060
State 14	0.876	State 19	1.110
State 16	0.887	State 20	1.120
State 18	0.901	State 23	1.010
State 21	0.925	State 24	0.848
State 22	0.894	State 27	0.932
State 26	0.76	State 31	0.960
State 28	0.786	State 32	0.933
State 30	0.803	State 35	1.030
State 32	0.826	State 39	0.727
State 34	0.854	State 43	0.769
State 38	0.633	State 44	0.739
State 40	0.643	State 47	0.734
State 42	0.645	State 51	0.400
State 46	0.637	State 55	0.872
State 50	0.438	State 56	0.842
State 52	0.679	State 59	0.985
State 54	0.721	State 63	1.020
State 58	0.789	State 64	0.798
State 62	0.893	State 67	0.859
State 64	0.698	State 68	0.816
State 66	0.707	State 71	0.895
State 70	0.736	State 75	0.737
State 74	0.676	State 79	0.986
State 78	0.803	State 83	1.000
State 80	0.829	State 84	0.957
State 82	0.833	State 87	0.944
State 86	0.825	State 91	0.928
State 90	0.556	State 92	0.927
State 92	0.812	State 95	0.999
State 94	0.824	State 96	0.960
State 98	0.877	State 99	1.050
State 102	0.753	State 103	0.740
State 104	0.873	State 107	0.722
State 106	0.76	State 108	0.775
State 110	0.805	State 111	0.928
State 114	0.761	State 113	1.020
State 116	0.68	State 115	0.718
State 118	0.807	State 119	0.927

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 13-3
LTE Band 41 Hotspot Linearity Data

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	23.50	25.10
Measured Output Power (dBm)	23.12	24.77
Measured SAR (W/kg)	0.686	0.621
Measured Power (mW)	205.12	299.92
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	129.84	129.86
% deviation from expected linearity		-9.49%

Figure 13-1
LTE Band 41 Hotspot Linearity

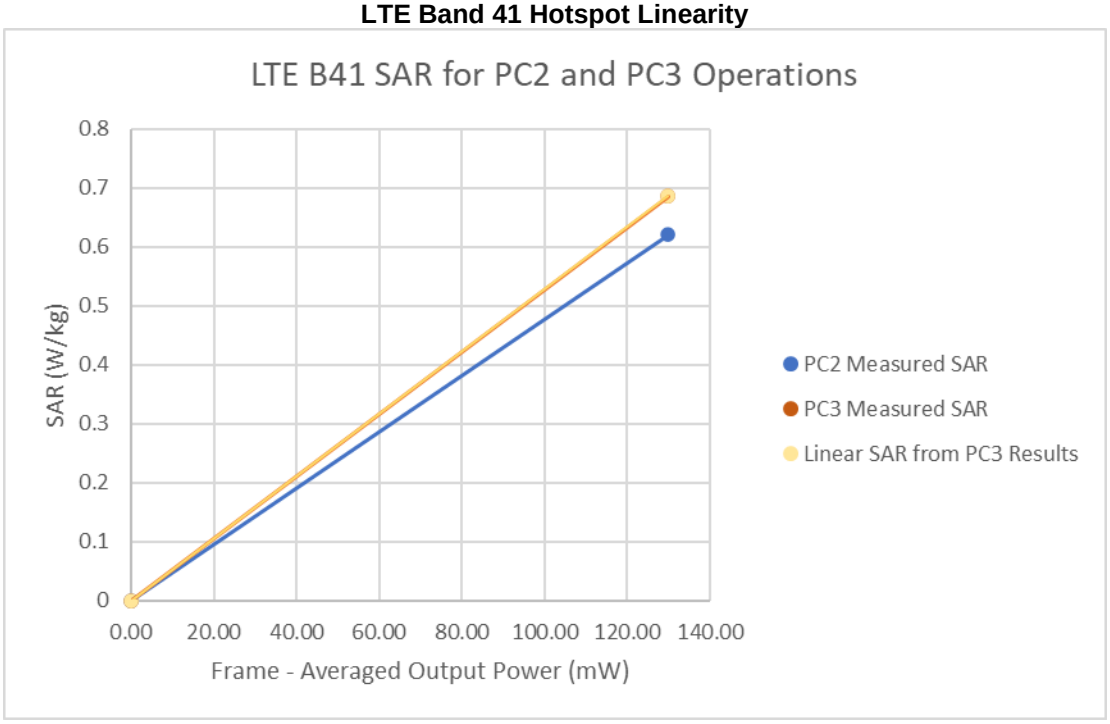
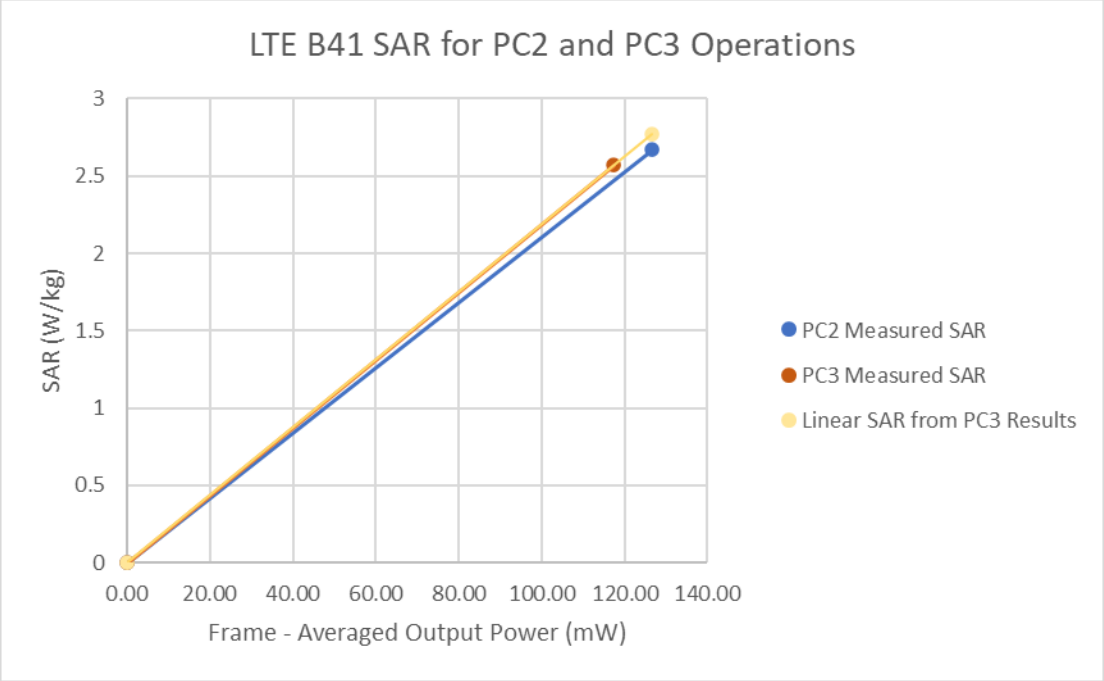


Table 13-4
LTE Band 41 Phablet Linearity Data

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	23.50	25.10
Measured Output Power (dBm)	22.68	24.66
Measured SAR (W/kg)	2.570	2.670
Measured Power (mW)	185.35	292.42
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	117.33	126.62
% deviation from expected linearity		-3.73%

Figure 13-2
LTE Band 41 Phablet Linearity



14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E4404B	Spectrum Analyzer	N/A	N/A	N/A	MY45113242
Agilent	E4438C	ESG Vector Signal Generator	2/14/2022	Annual	2/14/2023	MY42082385
Agilent	E4438C	ESG Vector Signal Generator	11/21/2021	Annual	11/21/2022	MY47270002
Agilent	N5182A	MXG Vector Signal Generator	6/15/2021	Annual	6/15/2022	MY47420800
Agilent	N5182A	MXG Vector Signal Generator	6/21/2021	Annual	6/21/2022	MY47420603
Agilent	8753ES	S-Parameter Vector Network Analyzer	12/17/2021	Annual	12/17/2022	MY40000670
Agilent	8753ES	S-Parameter Vector Network Analyzer	2/11/2022	Annual	2/11/2023	MY40003841
Agilent	E5515C	Wireless Communications Test Set	5/6/2021	Annual	5/6/2022	GB44400860
Agilent	E5515C	Wireless Communications Test Set	2/6/2021	Annual	2/6/2022	GB43304278
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Amplifier Research	1S51G6	Amplifier	CBT	N/A	CBT	433972
Amplifier Research	1S51G6	Amplifier	CBT	N/A	CBT	433974
Anritsu	ML2496A	Power Meter	2/19/2021	Annual	2/19/2022	1138001
Anritsu	ML2496A	Power Meter	4/21/2021	Annual	4/21/2022	1351001
Anritsu	MA2411B	Pulse Power Sensor	8/10/2021	Annual	8/10/2022	1207364
Anritsu	MA2411B	Pulse Power Sensor	9/21/2021	Annual	9/21/2022	1339008
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	5/21/2021	Annual	5/21/2022	6201144419
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	4/14/2021	Annual	4/14/2022	6261895213
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	9/26/2021	Annual	9/26/2022	6201524637
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	3/2/2021	Annual	3/2/2022	6262044715
Anritsu	MT8000A	Radio Communication Test Station	7/28/2021	Annual	7/28/2022	6272337419
Anritsu	MT8000A	Radio Communication Test Station	8/2/2021	Annual	8/2/2022	6272337439
Anritsu	MT8000A	Radio Communication Test Station	7/29/2021	Annual	7/29/2022	6272337405
Anritsu	MA24106A	USB Power Sensor	8/10/2021	Annual	8/10/2022	1231538
Anritsu	MA24106A	USB Power Sensor	8/10/2021	Annual	8/10/2022	1231535
Control Company	4353	Long Stem Thermometer	10/28/2020	Biennial	10/28/2022	200670623
Control Company	4353	Long Stem Thermometer	10/28/2020	Biennial	10/28/2022	200670633
Control Company	4353	Long Stem Thermometer	10/28/2020	Biennial	10/28/2022	200670635
Control Company	4040	Therm./ Clock/ Humidity Monitor	2/28/2018	Biennial	CBT	170151872
Control Company	4040	Therm./ Clock/ Humidity Monitor	2/28/2018	Biennial	CBT	170151893
Control Company	4040	Therm./ Clock/ Humidity Monitor	2/23/2021	Annual	2/23/2022	160574418
Keysight Technologies	N6705B	DC Power Analyzer	5/5/2021	Triennial	5/5/2024	MY53004059
Keysight Technologies	N9020A	MXA Signal Analyzer	2/24/2021	Annual	2/24/2022	MY48010233
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
Mini-Circuits	VLF-6000+	Low Pass Filter DC to 6000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	VLF-6000+	Low Pass Filter DC to 6000 MHz	7/6/2021	Annual	7/6/2022	31634
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	ZUDC10-83-S+	Directional Coupler	CBT	N/A	CBT	2050
Mitutoyo	500-196-30	CD-6"ASX 6Inch Digital Caliper	2/16/2022	Triennial	2/16/2025	A20238413
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	7/19/2021	Annual	7/19/2022	128635
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	9/24/2021	Annual	9/24/2022	167286
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	7/28/2021	Annual	7/28/2022	140148
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	9/30/2021	Annual	9/30/2022	140144
SPEAG	DAK-3.5	Dielectric Assessment Kit	11/9/2021	Annual	11/9/2022	1277
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	8/18/2021	Annual	8/18/2022	1041
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1379
SPEAG	D1900V2	1900 MHz SAR Dipole	10/22/2021	Annual	10/22/2022	5d080
SPEAG	D1900V2	1900 MHz SAR Dipole	9/21/2021	Annual	9/21/2022	5d149
SPEAG	D2450V2	2450 MHz SAR Dipole	8/18/2021	Annual	8/18/2022	719
SPEAG	D2600V2	2600 MHz SAR Dipole	6/14/2019	Triennial	6/14/2022	1064
SPEAG	D2600V2	2600 MHz SAR Dipole	4/14/2021	Annual	4/14/2022	1004
SPEAG	D2600V2	2600 MHz SAR Dipole	11/12/2019	Triennial	11/12/2022	1071
SPEAG	D3500V2	3500 MHz SAR Dipole	1/19/2021	Biennial	1/19/2023	1059
SPEAG	D3500V2	3500 MHz SAR Dipole	1/21/2020	Triennial	1/21/2023	1097
SPEAG	D3700V2	3700 MHz SAR Dipole	1/21/2020	Triennial	1/21/2023	1067
SPEAG	D3700V2	3700 MHz SAR Dipole	1/19/2021	Biennial	1/19/2023	1018
SPEAG	D3900V2	3900 MHz SAR Dipole	10/9/2020	Biennial	10/9/2022	1056
SPEAG	D3900V2	3900 MHz SAR Dipole	6/10/2021	Annual	6/10/2022	1073
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/21/2021	Annual	6/21/2022	1676
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/10/2021	Annual	11/10/2022	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/4/2021	Annual	8/4/2022	1680
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/3/2021	Annual	8/3/2022	1681
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/15/2021	Annual	6/15/2022	1334
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/16/2021	Annual	8/16/2022	1450
SPEAG	EX3DV4	SAR Probe	7/20/2021	Annual	7/20/2022	7406
SPEAG	EX3DV4	SAR Probe	11/16/2021	Annual	11/16/2022	7538
SPEAG	EX3DV4	SAR Probe	9/20/2021	Annual	9/20/2022	7552
SPEAG	EX3DV4	SAR Probe	8/5/2021	Annual	8/5/2022	7670
SPEAG	EX3DV4	SAR Probe	6/21/2021	Annual	6/21/2022	7409
SPEAG	EX3DV4	SAR Probe	6/28/2021	Annual	6/28/2022	7661

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

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

15 MEASUREMENT UNCERTAINTIES

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

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

16 CONCLUSION

16.1 Measurement Conclusion

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

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

17 REFERENCES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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