PCTEST
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. +1.410.290.6652 / Fax +1.410.290.6654
http://www.pctest.com

SAR EVALUATION REPORT

Applicant Name:
LG Electronics U.S.A., Inc.
111 Sylvan Avenue, North Building
Englewood Cliffs, NJ 07632
United States

Date of Testing:
05/20/20 - 07/10/20
Test Site/Location:
PCTEST, Columbia, MD, USA
Document Serial No.:
1M2004230076-01-R1.ZNF

FCC ID: **ZNFG900VM**

APPLICANT: **LG ELECTRONICS U.S.A., INC.**

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model: LM-G900VM
Additional Model(s): LMG900VM, G900VM, LM-G900QM6, LMG900QM6, G900QM6, LM-G902V, LMG902V, G902V

Equipment Class	Band & Mode	Tx Frequency	SAR			
			1g Head (W/kg)	1g Body-Worn (W/kg)	1g Hotspot (W/kg)	10g Phablet (W/kg)
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.18	0.55	0.60	N/A
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	0.57	1.02	N/A
PCE	UMTS 850	826.40 - 846.60 MHz	0.19	0.59	0.59	N/A
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.14	1.14	0.95	2.88
PCE	Cell. CDMA/EVDO	824.70 - 848.31 MHz	0.19	0.58	0.63	N/A
PCE	PCS CDMA/EVDO	1851.25 - 1908.75 MHz	0.14	1.06	0.78	2.47
PCE	LTE Band 12	699.7 - 715.3 MHz	0.16	0.33	0.33	N/A
PCE	LTE Band 13	779.5 - 784.5 MHz	0.16	0.47	0.47	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	0.19	0.62	0.62	N/A
PCE	LTE Band 66 (AWS)	1710.7 - 1779.3 MHz	0.16	0.96	0.91	2.51
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	0.14	1.19	1.19	2.96
CBE	LTE Band 48	3552.5 - 3697.5 MHz	0.12	0.35	0.35	N/A
PCE	NR Band n5 (Cell)	826.5 -846.5 MHz	0.11	0.50	0.50	N/A
PCE	NR Band n66 (AWS)	1712.5 -1777.5 MHz	0.14	0.33	0.89	N/A
PCE	NR Band n2 (PCS)	1852.5 - 1907.5 MHz	0.20	0.54	1.19	3.09
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.58	0.30	0.47	N/A
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	0.26	N/A
NII	U-NII-2A	5260 - 5320 MHz	0.17	0.25	N/A	1.12
NII	U-NII-2C	5500 - 5720 MHz	0.41	0.36	N/A	0.71
NII	U-NII-3	5745 - 5825 MHz	0.23	0.34	0.34	N/A
DSS/DTS	Bluetooth	2402 - 2480 MHz	0.13	< 0.1	< 0.1	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			1.11	1.59	1.59	3.94

Note: This revised Test Report (1M2004230076-01-R1.ZNF) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 1.9 of this report; for North American frequency bands only.
I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.

Randy Ortanez
President

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.

TABLE OF CONTENTS

1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
Cell. CDMA/EVDO	Voice/Data	824.70 - 848.31 MHz
PCS CDMA/EVDO	Voice/Data	1851.25 - 1908.75 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 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 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 48	Voice/Data	3552.5 - 3697.5 MHz
NR Band n5	Data	826.5 - 846.5 MHz
NR Band n66	Data	1712.5 - 1777.5 MHz
NR Band n2	Data	1852.5 - 1907.5 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2462 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz
WMC	Data	500 Hz - 4 kHz

1.2 Time-Averaging Algorithm for RF Exposure Compliance

The equipment under test (EUT) contains:

Qualcomm® SM7250 modem supporting 2G/3G/4G/5G NR WWAN technologies

Qualcomm® SM7250 modem is enabled with Qualcomm® Smart Transmit feature. This feature performs time averaging algorithm in real time to control and manage transmitting power and ensure the time-averaged RF exposure is in compliance with FCC requirements all the time. Refer to Compliance Summary document for detailed description of Qualcomm® Smart Transmit feature (report SN could be found in Section 1.11 – Bibliography).

Note that WLAN operations are not enabled with Smart Transmit.

The Smart Transmit algorithm maintains the time-averaged transmit power, in turn, time-averaged RF exposure of *SAR_design_target*, 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).

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 +1.0/-1.0 dB for this EUT.

Exposure Scenario:		Head	Body-Worn	Phablet	Hotspot	Phablet	Maximum Tune-Up Output Power*
Averaging Volume:		1g	1g	10g	1g	10g	
Spacing:		0 mm	10 mm	2, 1, 4 mm	10 mm	0 mm	
DSI:		1			5	8	
Technology/Band	Antenna	**Plimit**					**Pmax**
GSM/GPRS/EDGE 850 MHz	1	27.9					24.8
GSM/GPRS/EDGE 1900 MHz	2	23.0					21.8
UMTS B5	1	27.2					24.5
UMTS B2	2	24.6			22.0		24.5
CDMA/EVDO BC0	1	28.2					24.5
CDMA/EVDO BC1	2	24.6			22.0		24.5
LTE FDD B12	1	28.9					24.5
LTE FDD B13	1	28.9					24.5
LTE FDD B5	1	27.5					24.5
LTE FDD B66/B4	2	24.6			23.0		24.5
LTE FDD B2	2	24.7			22.5		24.5
LTE TDD B48	8	20.5					21.5
NR FDD n5	1	27.9					23.8
NR FDD n66	3	23.5					24.5
NR FDD n2	3	23.5					24.5

*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 (for e.g., GSM & LTE TDD).

*Maximum tune up output power P_{max} is used to configure EUT during RF tune up procedure. The maximum allowed output power is equal to maximum Tune up output power + 1.0dB device design uncertainty.

The maximum time-averaged output power (dBm) for any 2G/3G/4G/5G WWAN technology, band, and DSI = minimum of "P_{limit} EFS" and "Maximum tune up output power P_{max}" +1.0/-1.0 dB device uncertainty. SAR values in this report were scaled to this maximum time-averaged output power to determine compliance per KDB Publication 447498 D01v06.

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

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

1.3 Power Reduction for SAR

This device uses an independent fixed level power reduction mechanism for WLAN operations during 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.

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

1.4 Nominal and Maximum Output Power Specifications

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

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

GSM/GPRS/EDGE 850						
Device State Index		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	1 TX Slots	2 TX Slots
All DSI	Max allowed power	33.5	33.5	32.0	27.5	27.0
	Nominal	32.5	32.5	31.0	26.5	26.0
GSM/GPRS/EDGE 1900						
Device State Index		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	1 TX Slots	2 TX Slots
All DSI	Max allowed power	30.5	30.5	29.0	26.5	26.0
	Nominal	29.5	29.5	28.0	25.5	25.0

UMTS Band 5 (850 MHz)				
Device State Index		Modulated Average Output Power (in dBm)		
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6
All DSI	Max allowed power	25.5	25.5	25.5
	Nominal	24.5	24.5	24.5

UMTS Band 2 (1900 MHz)				
Device State Index		Modulated Average Output Power (in dBm)		
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6
DSI = 1 (Head, Bodyworn, or Phablet Max)	Max allowed power	25.5	25.5	25.5
	Nominal	24.5	24.5	24.5
DSI = 5 (Hotspot); DSI = 8 (Phablet Reduced)	Max allowed power	23.0	23.0	23.0
	Nominal	22.0	22.0	22.0

CDMA BC0 (835 MHz)				
Device State Index		Modulated Average Output Power (in dBm)		
		1x-RTT	EVDO Rev 0	EVDO Rev A
All DSI	Max allowed power	25.5	25.5	25.5
	Nominal	24.5	24.5	24.5

CDMA BC1 (1900 MHz)				
Device State Index		Modulated Average Output Power (in dBm)		
		1x-RTT	EVDO Rev 0	EVDO Rev A
DSI = 1 (Head, Bodyworn, or Phablet Max)	Max allowed power	25.5	25.5	25.5
	Nominal	24.5	24.5	24.5
DSI = 5 (Hotspot); DSI = 8 (Phablet Reduced)	Max allowed power	23.0	23.0	23.0
	Nominal	22.0	22.0	22.0

Mode / Band		Modulated Average Output Power (in dBm)	
		DSI = 1 (Head, Bodyworn, or Phablet Max)	DSI = 5 (Hotspot); DSI = 8 (Phablet Reduced)
LTE FDD Band 12	Max allowed power	25.5	25.5
	Nominal	24.5	24.5
LTE FDD Band 13	Max allowed power	25.5	25.5
	Nominal	24.5	24.5
LTE FDD Band 5	Max allowed power	25.5	25.5
	Nominal	24.5	24.5
LTE FDD Band 4	Max allowed power	25.5	24.0
	Nominal	24.5	23.0
LTE FDD Band 66	Max allowed power	25.5	24.0
	Nominal	24.5	23.0
LTE FDD Band 2	Max allowed power	25.5	23.5
	Nominal	24.5	22.5
LTE TDD Band 48	Max allowed power	23.5	23.5
	Nominal	22.5	22.5

Mode / Band		Modulated Average Output Power (in dBm)
		DSI = 1 (Head, Body worn, or Phablet Max) DSI = 5 (Hotspot); DSI = 8 (Phablet Reduced)
NR FDD Band n5	Max allowed power	24.8
	Nominal	23.8
NR FDD Band n66	Max allowed power	24.5
	Nominal	23.5
NR FDD Band n2	Max allowed power	24.5
	Nominal	23.5

1.4.2 Maximum Bluetooth and SISO/MIMO WLAN Output Power

Mode	Band	IEEE 802.11 (in dBm)													
		SISO								MIMO					
		Antenna 1/ Antenna 2													
		b		g		n		ac		g (CDD + STBC)		n (CDD+STBC, SDM)		ac (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	20.5	19.5	19.5 ch. 1: 16.5 ch. 2: 16.5 ch. 10: 17.0 ch. 11: 17.0	18.5 15.5 15.5 16.0 16.0	18.5 ch. 1: 16.0 ch. 2: 16.0 ch. 10: 16.0 ch. 11: 16.0	17.5 15.0 15.0 15.0 15.0	18.5 ch. 1: 16.0 ch. 2: 16.0 ch. 10: 16.0 ch. 11: 16.0	17.5 15.0 15.0 15.0 15.0	22.5 ch. 1: 19.5 ch. 2: 19.5 ch. 10: 20.0 ch. 11: 20.0	21.5 18.5 18.5 19.0 19.0	21.5 ch. 1: 19.0 ch. 2: 19.0 ch. 10: 19.0 ch. 11: 19.0	20.5 18.0 18.0 18.0 18.0	21.5 ch. 1: 19.0 ch. 2: 19.0 ch. 10: 19.0 ch. 11: 19.0	20.5 18.0 18.0 18.0 18.0

Mode	Band	IEEE 802.11 (in dBm)											
		SISO						MIMO					
		Antenna 1/ Antenna 2											
		a		n		ac		a (CDD + STBC)		n (CDD+STBC, SDM)		ac (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	5200 MHz	17.0 ch. 40: 19.0	16.0 18.0	17.0 ch. 40: 19.0	16.0 18.0	17.0 ch. 40: 19.0	16.0 18.0	20.0 ch. 40: 22.0	19.0 21.0	20.0 ch. 40: 22.0	19.0 21.0	20.0 ch. 40: 22.0	19.0 21.0
	5300 MHz	17.0 ch. 56: 19.0	16.0 18.0	17.0 ch. 56: 19.0	16.0 18.0	17.0 ch. 56: 19.0	16.0 18.0	20.0 ch. 56: 22.0	19.0 21.0	20.0 ch. 56: 22.0	19.0 21.0	20.0 ch. 56: 22.0	19.0 21.0
	5500 MHz	17.0	16.0	17.0	16.0	17.0	16.0	20.0	19.0	20.0	19.0	20.0	19.0
	5800 MHz	19.0 ch. 149: 17.0 ch. 153: 17.0	18.0 16.0 16.0	19.0 ch. 149: 17.0 ch. 153: 17.0	18.0 16.0 16.0	19.0 ch. 149: 17.0 ch. 153: 17.0	18.0 16.0 16.0	22.0 ch. 149: 20.0 ch. 153: 20.0	21.0 19.0 19.0	22.0 ch. 149: 20.0 ch. 153: 20.0	21.0 19.0 19.0	22.0 ch. 149: 20.0 ch. 153: 20.0	21.0 19.0 19.0
5 GHz WIFI (40MHz BW)	5200 MHz			16.0	15.0	16.0	15.0			19.0	18.0	19.0	18.0
	5300 MHz			16.0	15.0	16.0	15.0			19.0	18.0	19.0	18.0
	5500 MHz			16.0	15.0	16.0	15.0			19.0	18.0	19.0	18.0
	5800 MHz			16.0	15.0	16.0	15.0			19.0	18.0	19.0	18.0
5 GHz WIFI (80MHz BW)	5200 MHz					14.0	13.0					17.0	16.0
	5300 MHz					14.0	13.0					17.0	16.0
	5500 MHz					14.0	13.0					17.0	16.0
	5800 MHz					14.0	13.0					17.0	16.0

Mode / Band		Modulated Average (dBm)
Bluetooth	Maximum	**11.5**
	Nominal	**10.5**
Bluetooth LE	Maximum	**5.0**
	Nominal	**4.0**

1.4.3 Reduced SISO/MIMO WLAN Output Power

The below tables are applicable in the following conditions:

- Head Conditions
- Simultaneous conditions with 2.4 GHz WLAN and 5 GHz WLAN
- Simultaneous conditions with EN-DC and 2.4 GHz WLAN and/or 5 GHz WLAN

Mode	Band	IEEE 802.11 (in dBm)													
		SISO								MIMO					
		Antenna 1/ Antenna 2													
		b		g		n		ac		g (CDD + STBC)		n (CDD+STBC, SDM)		ac (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	15.0	14.0	15.0	14.0	15.0	14.0	15.0	14.0	18.0	17.0	18.0	17.0	18.0	17.0

Mode	Band	IEEE 802.11 (in dBm)											
		SISO						MIMO					
		Antenna 1/ Antenna 2											
		a		n		ac		a (CDD + STBC)		n (CDD+STBC, SDM)		ac (CDD+STBC, SDM)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	5200 MHz	16.0	15.0	16.0	15.0	16.0	15.0	19.0	18.0	19.0	18.0	19.0	18.0
	5300 MHz	16.0	15.0	16.0	15.0	16.0	15.0	19.0	18.0	19.0	18.0	19.0	18.0
	5500 MHz	16.0	15.0	16.0	15.0	16.0	15.0	19.0	18.0	19.0	18.0	19.0	18.0
	5800 MHz	16.0	15.0	16.0	15.0	16.0	15.0	19.0	18.0	19.0	18.0	19.0	18.0
5 GHz WIFI (40MHz BW)	5200 MHz			16.0	15.0	16.0	15.0			19.0	18.0	19.0	18.0
	5300 MHz			16.0	15.0	16.0	15.0			19.0	18.0	19.0	18.0
	5500 MHz			16.0	15.0	16.0	15.0			19.0	18.0	19.0	18.0
	5800 MHz			16.0	15.0	16.0	15.0			19.0	18.0	19.0	18.0
5 GHz WIFI (80MHz BW)	5200 MHz					14.0	13.0					17.0	16.0
	5300 MHz					14.0	13.0					17.0	16.0
	5500 MHz					14.0	13.0					17.0	16.0
	5800 MHz					14.0	13.0					17.0	16.0

1.5 DUT Antenna Locations

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

Table 1-1
Device Edges/Sides for SAR Testing

Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes	No
GPRS 1900	Yes	Yes	No	Yes	No	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	No
UMTS 1900	Yes	Yes	No	Yes	No	Yes
Cell. EVDO	Yes	Yes	No	Yes	Yes	No
PCS EVDO	Yes	Yes	No	Yes	No	Yes
LTE Band 12	Yes	Yes	No	Yes	Yes	No
LTE Band 13	Yes	Yes	No	Yes	Yes	No
LTE Band 5 (Cell)	Yes	Yes	No	Yes	Yes	No
LTE Band 66 (AWS)	Yes	Yes	No	Yes	No	Yes
LTE Band 2 (PCS)	Yes	Yes	No	Yes	No	Yes
LTE Band 48	Yes	Yes	Yes	No	Yes	No
NR Band n5	Yes	Yes	No	Yes	Yes	No
NR Band n66	Yes	Yes	No	No	Yes	No
NR Band n2	Yes	Yes	No	No	Yes	No
2.4 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
2.4 GHz WLAN Ant 2	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN Ant 1	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN Ant 2	Yes	Yes	Yes	No	No	Yes
Bluetooth	Yes	Yes	Yes	No	No	Yes

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

1.7 Simultaneous Transmission Capabilities

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

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

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Phablet	Notes
1	1x CDMA voice + 2.4 GHz WI-FI	Yes	Yes	N/A	Yes	
2	1x CDMA voice + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
3	1x CDMA voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
4	1x CDMA voice + 2.4 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
5	1x CDMA voice + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
6	1x CDMA voice + 2.4 GHz WI-FI Ant 2 + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
7	1x CDMA voice + 2.4 GHz Bluetooth + 5 GHz WI-FI	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
8	1x CDMA voice + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
9	1x CDMA voice + 2.4 GHz WI-FI Ant 1 + 5 GHz WI-FI Ant 2	Yes	Yes	N/A	Yes	
10	GSM voice + 2.4 GHz WI-FI	Yes	Yes	N/A	Yes	
11	GSM voice + 5 GHz WI-FI	Yes	Yes	N/A	Yes	
12	GSM voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
13	GSM voice + 2.4 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
14	GSM voice + 5 GHz WI-FI MIMO	Yes	Yes	N/A	Yes	
15	GSM voice + 2.4 GHz WI-FI Ant 2 + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
16	GSM voice + 2.4 GHz Bluetooth + 5 GHz WI-FI	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
17	GSM voice + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
18	GSM voice + 2.4 GHz WIFI Ant 1 + 5 GHz WI-FI Ant 2	Yes	Yes	N/A	Yes	
19	UMTS + 2.4 GHz WI-FI	Yes	Yes	Yes	Yes	
20	UMTS + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
21	UMTS + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
22	UMTS + 2.4 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
23	UMTS + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
24	UMTS + 2.4 GHz WI-FI Ant 2 + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
25	UMTS + 2.4 GHz Bluetooth + 5 GHz WI-FI	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
26	UMTS + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
27	UMTS + 2.4 GHz WIFI Ant 1 + 5 GHz WI-FI Ant 2	Yes	Yes	Yes	Yes	
28	LTE + 2.4 GHz WI-FI	Yes	Yes	Yes	Yes	
29	LTE + 5 GHz WI-FI	Yes	Yes	Yes	Yes	
30	LTE + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
31	LTE + 2.4 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
32	LTE + 5 GHz WI-FI MIMO	Yes	Yes	Yes	Yes	
33	LTE + 2.4 GHz WI-FI Ant 2 + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
34	LTE + 2.4 GHz Bluetooth + 5 GHz WI-FI	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
35	LTE + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
36	LTE + 2.4 GHz WIFI Ant 1 + 5 GHz WI-FI Ant 2	Yes	Yes	Yes	Yes	
37	LTE + 5G NR	Yes	Yes	N/A	Yes	
38	LTE + 5 GHz WI-FI + 5G NR	Yes	Yes	Yes	Yes	
39	LTE + 2.4 GHz WI-FI + 5G NR	Yes	Yes	Yes	Yes	
40	LTE + 2.4 GHz Bluetooth + 5G NR	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
41	LTE + 2.4 GHz WI-FI MIMO + 5G NR	Yes	Yes	Yes	Yes	
42	LTE + 5 GHz WI-FI MIMO + 5G NR	Yes	Yes	Yes	Yes	
43	LTE + 2.4 GHz WI-FI Ant 2 + 2.4 GHz Bluetooth + 5G NR	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
44	LTE + 2.4 GHz Bluetooth + 5 GHz WI-FI + 5G NR	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
45	LTE + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO +5G NR	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
46	LTE + 2.4 GHz WI-FI Ant 1 + 5 GHz WIFI Ant 2 + 5G NR	Yes	Yes	Yes	Yes	
47	CDMA/EVDO + 2.4 GHz WI-FI	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered
48	CDMA/EVDO + 5 GHz WI-FI	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered
49	CDMA/EVDO + 2.4 GHz Bluetooth	Yes*^	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered ^ Bluetooth Tethering is considered
50	CDMA/EVDO + 2.4 GHz WI-FI MIMO	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered
51	CDMA/EVDO + 5 GHz WI-FI MIMO	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered
52	CDMA/EVDO + 2.4 GHz WI-FI Ant 2 + 2.4 GHz Bluetooth	Yes*^	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered ^ Bluetooth Tethering is considered
53	CDMA/EVDO + 2.4 GHz Bluetooth + 5 GHz WI-FI	Yes*^	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered ^ Bluetooth Tethering is considered
54	CDMA/EVDO + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	Yes*^	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered ^ Bluetooth Tethering is considered
55	CDMA/EVDO + 2.4 GHz WI-FI Ant 1+ 5 GHz WI-FI Ant 2	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered
56	GPRS/EDGE + 2.4 GHz WI-FI	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered
57	GPRS/EDGE + 5 GHz WI-FI	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered
58	GPRS/EDGE + 2.4 GHz Bluetooth	Yes*^	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered ^ Bluetooth Tethering is considered
59	GPRS/EDGE + 2.4 GHz WI-FI MIMO	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered
60	GPRS/EDGE + 5 GHz WI-FI MIMO	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered
61	GPRS/EDGE + 2.4 GHz WI-FI Ant 2 + 2.4 GHz Bluetooth	Yes*^	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered ^ Bluetooth Tethering is considered
62	GPRS/EDGE + 2.4 GHz Bluetooth + 5 GHz WI-FI	Yes*^	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered ^ Bluetooth Tethering is considered
63	GPRS/EDGE + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	Yes*^	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered ^ Bluetooth Tethering is considered
64	GPRS/EDGE + 2.4 GHz WI-FI Ant 1+ 5 GHz WI-FI Ant 2	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered

1. 2.4 GHz WLAN antenna 1 and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
2. 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.
3. Per the manufacturer, WIFI Direct is 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.
4. 5 GHz Wireless Router is only supported for the U-NII-1 and U-NII-3 by S/W, therefore U-NII-2A, and U-NII-2C were not evaluated for wireless router conditions.
5. This device supports 2x2 MIMO Tx for WLAN 802.11a/g/n/ac. 802.11a/g/n/ac supports CDD and STBC and 802.11n/ac additionally supports SDM. Each WLAN antenna can transmit independently or together when operating with MIMO.
6. This device supports VOLTE.
7. This device supports VOWIFI.
8. This device supports Bluetooth Tethering.
9. LTE + 5G NR FR1 Scenarios are limited to LTE Anchor Bands, B2/B5/B13/B66
10. LTE operations in the table above include intra-band ULCA operations with 2 carriers transmitting in the uplink.

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, head and body-worn 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-2A and U-NII-2C WIFI, only 2.4 GHz, U-NII-1, and U-NII-3 WIFI Hotspot SAR tests and combinations are considered for SAR with respect to Wireless Router configurations according to FCC KDB 941225 D06v02r01.

Per FCC KDB 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-2A & U-NII-2C WLAN, phablet SAR tests were performed. Phablet SAR was not evaluated for 2.4 GHz WLAN, Bluetooth, U-NII-1, and U-NII-3 WLAN operations since wireless router 1g SAR was < 1.2 W/kg.

This device supports IEEE 802.11ac with the following features:

a) Up to 80 MHz Bandwidth only for 5GHz
b) Up to 20 MHz Bandwidth only for 2.4 GHz
c) No aggregate channel configurations
d) 2 Tx antenna output
e) Up to 1024 QAM is supported
f) TDWR and Band gap channels are supported
g) MU-MIMO UL Operations are not supported

(B) Licensed Transmitter(s)

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

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

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

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

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. Additional SAR tests for phablet SAR were evaluated per KDB 616217 Section 6 (See Section 6.9 for more information).

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, LTE bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and 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 intra-band LTE Carrier Aggregation (CA) for LTE Band 5 with two component carriers in the uplink. SAR Measurements and conducted powers were evaluated per 2017 Fall TCB Workshop Notes.

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.

NR implementation of n5, n66, n2 is limited to EN-DC operations only, with LTE B2/B13/B5/B66 acting as the anchor bands. Per FCC Guidance, SAR tests were performed separately for NR Bands and LTE Anchor Bands. Please see Section 11 for more details.

This device supports 64QAM on the uplink and 256QAM on the downlink for LTE Operations. Conducted powers for 64QAM uplink configurations were measured per Section 5.1 of FCC KDB Publication 941225D05v02r05. SAR was not required for 64QAM since the highest maximum output power for 64QAM is ≤ ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45W/kg, per Section 5.2.4 of FCC KDB Publication 941225 D05v02r05.

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)
- April 2018 TCB Workshop Notes (LTE Carrier Aggregation)
- April 2019 TCB Workshop Notes (Dynamic Antenna Tuning)

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
SAR Part 0 Test Report	Rev. F
RF Exposure Part 2 Test Report	1M2004230076-17.ZNF
RF Exposure Compliance Summary Report	1M2004230076-18.ZNF
PD Evaluation Report (Part 1)	1M2004230076-16-R1.ZNF
PD Evaluation Report (Part 0)	Rev. A (Ver. 1.0)
PD Simulation Report	Rev. A (Ver. 1.6)

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 13 (779.5 - 784.5 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 2 (PCS) (1850.7 - 1909.3 MHz)				
	LTE Band 48 (3552.5 - 3697.5 MHz)				
Channel Bandwidths	LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 13: 5 MHz, 10 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 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 48: 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 13: 5 MHz	779.5 (23205)		782 (23230)	784.5 (23255)	
LTE Band 13: 10 MHz	N/A		782 (23230)	N/A	
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 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 48: 5 MHz	3552.5 (55265)	3600.8 (55748)	N/A	3649.2 (56232)	3697.5 (56715)
LTE Band 48: 10 MHz	3555 (55290)	3601.7 (55757)	N/A	3648.3 (56223)	3695 (56690)
LTE Band 48: 15 MHz	3557.5 (55315)	3602.5 (55765)	N/A	3647.5 (56215)	3692.5 (56665)
LTE Band 48: 20 MHz	3560 (55340)	3603.3 (55773)	N/A	3646.7 (56207)	3690 (56640)
UE Category	DL UE Cat 18, UL UE Cat 13				
Modulations Supported in UL	QPSK, 16QAM, 64QAM				
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	YES				
A-MPR (Additional MPR) disabled for SAR Testing?	YES				
LTE Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations				
LTE Additional Information	This device does not support full CA features on 3GPP Release 15. It supports carrier agregation, downlink MIMO, LAA features as shown in section 9 and Appendix F. All other uplink communications are identical to the Release 8 specification. 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 FR1 Information			
Form Factor	Portable Handset		
Frequency Range of each LTE transmission band	NR Band n5 (Cell) (826.5 - 846.5 MHz)		
	NR Band n66 (AWS) (1712.5 - 1777.5 MHz)		
	NR Band n2 (PCS) (1852.5 - 1907.5 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 n2 (PCS): 5 MHz, 10 MHz, 15 MHz, 20 MHz		
Channel Numbers and Frequencies (MHz)	Low	Mid	High
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 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)
SCS for NR Band n5/n66/n2	15 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 2/5/13		
LTE Anchor Bands for NR Band n2 (PCS)	LTE Band 5/13/66		

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:

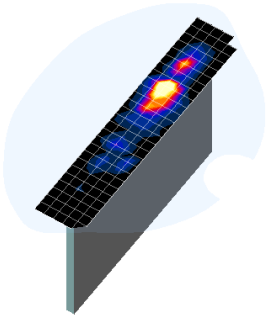


Figure 4-1
Sample SAR Area Scan

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].

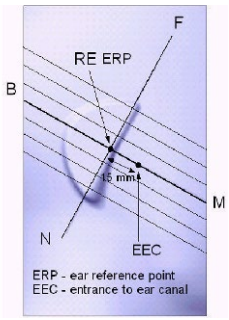


Figure 5-1
Close-Up Side view of ERP

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.

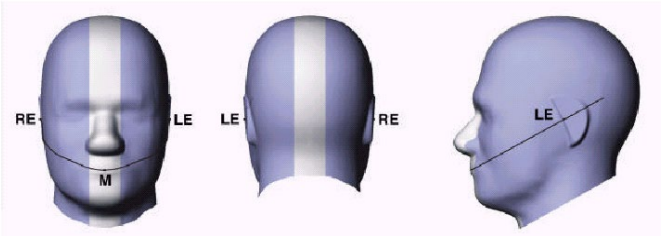


Figure 5-2
Front, back and side view of SAM Twin Phantom

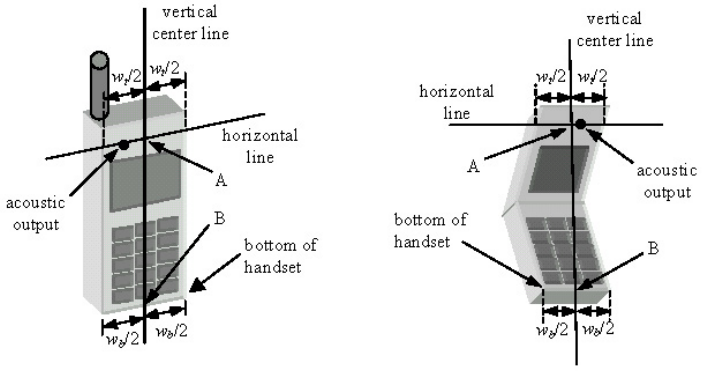


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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.

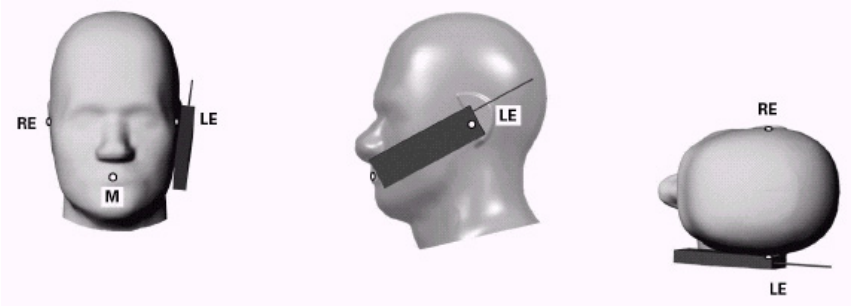


Figure 6-1 Front, Side and Top View of Cheek Position

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).

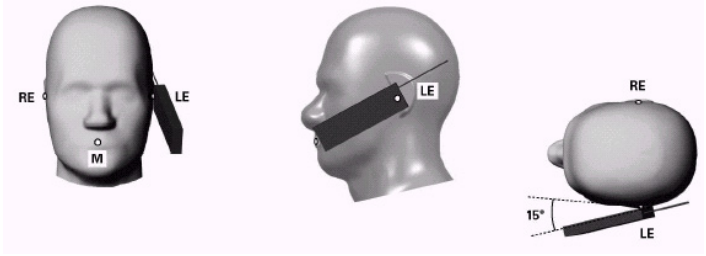


Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position

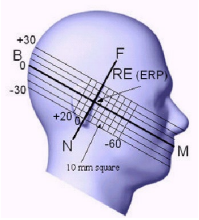


Figure 6-3
Side view w/ relevant markings

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.

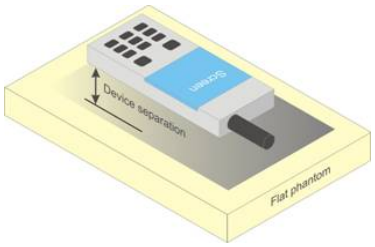


Figure 6-4
Sample Body-Worn Diagram

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.

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 CDMA2000

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

8.4.1 Output Power Verification

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

1. If the mobile station (MS) supports Reverse TCH RC 1 and Forward TCH RC 1, set up a call using Fundamental Channel Test Mode 1 (RC=1/1) with 9600 bps data rate only.
2. Under RC1, C.S0011 Table 4.4.5.2-1, Table 8-1 parameters were applied.
3. If the MS supports the RC 3 Reverse FCH, RC3 Reverse SCH_0 and demodulation of RC 3,4, or 5, set up a call using Supplemental Channel Test Mode 3 (RC 3/3) with 9600 bps Fundamental Channel and 9600 bps SCH0 data rate.
4. Under RC3, C.S0011 Table 4.4.5.2-2, Table 8-2 was applied.

Table 8-1
Parameters for Max. Power for RC1

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

Table 8-2
Parameters for Max. Power for RC3

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

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

8.4.2 Head SAR Measurements

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

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

8.4.3 Body-worn SAR Measurements

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

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

8.4.4 Body-worn SAR Measurements for EVDO Devices

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

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

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

8.4.5 Body SAR Measurements for EVDO Hotspot

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

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

8.5 SAR Measurement Conditions for UMTS

8.5.1 Output Power Verification

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

8.5.2 Head SAR Measurements

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

8.5.3 Body SAR Measurements

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

8.5.4 SAR Measurements with Rel 5 HSDPA

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

8.5.5 SAR Measurements with Rel 6 HSUPA

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

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

8.6 SAR Measurement Conditions for LTE

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

8.6.1 Spectrum Plots for RB Configurations

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

8.6.2 MPR

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

8.6.3 A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting factory test parameters for MCC and MNC on the base station simulator.

8.6.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r04:

a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
   i. The required channel and offset combination with the highest maximum output power is required for SAR.
   ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
   iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.
b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.

c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.
d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sections 5.2.1 through 5.2.3 is less than or equal to ½ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is <1.45 W/kg.

8.6.5 TDD

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

8.6.6 Downlink Only Carrier Aggregation

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

8.7 SAR Testing with 802.11 Transmitters

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

8.7.1 General Device Setup

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

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

8.7.2 U-NII-1 and U-NII-2A

For devices that operate in both U-NII-1 and U-NII-2A bands, when the same maximum output power is specified for both bands, SAR measurement using OFDM SAR test procedures is not required for U-NII-1

unless the highest reported SAR for U-NII-2A is > 1.2 W/kg. When different maximum output powers are specified for the bands, SAR measurement for the U-NII band with the lower maximum output power is not required unless the highest reported SAR for the U-NII band with the higher maximum output power, adjusted by the ratio of lower to higher specified maximum output power for the two bands, is > 1.2 W/kg. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.7.3 U-NII-2C and U-NII-3

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

8.7.4 Initial Test Position Procedure

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

8.7.5 2.4 GHz SAR Test Requirements

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

1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.

2) When the reported SAR is > 0.8 W/kg, SAR is required for that position using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

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

8.7.6 OFDM Transmission Mode and SAR Test Channel Selection

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

band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

8.7.7 Initial Test Configuration Procedure

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

When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤ 1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurements (See Section 8.7.6). When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.7.8 Subsequent Test Configuration Procedures

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

8.7.9 MIMO SAR Considerations

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

9 RF CONDUCTED POWERS

9.1 GSM Conducted Powers

Table 9-1
Measured P_{max}

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**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**
GSM 850	128	33.23	33.31	**31.20**	26.67	26.25
	190	33.30	33.46	**31.37**	26.58	26.22
	251	33.21	33.25	**31.26**	26.88	26.45
GSM 1900	512	30.25	30.27	**28.45**	25.43	25.06
	661	30.48	30.50	**28.87**	25.46	25.07
	810	30.23	30.45	**28.81**	25.45	25.06

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**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**
GSM 850	128	24.03	24.11	**25.01**	17.47	20.06
	190	24.10	24.26	**25.18**	17.38	20.03
	251	24.01	24.05	**25.07**	17.68	20.26
GSM 1900	512	21.05	21.07	**22.26**	16.23	18.87
	661	21.28	21.30	**22.68**	16.26	18.88
	810	21.03	21.25	**22.62**	16.25	18.87

GSM 850	**Frame Avg.Targets:**	23.30	23.30	**24.81**	17.30	19.81
GSM 1900		20.30	20.30	**21.81**	16.30	18.81

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: 10 (Max 2 Tx uplink slots)
EDGE Multislot class: 10 (Max 2 Tx uplink slots)
DTM Multislot Class: N/A

Figure 9-1
Power Measurement Setup

9.2 CDMA Conducted Powers

Table 9-2
Measured *Pmax*

Band	Channel	Rule Part	Frequency	SO55 [dBm]	SO55 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	RC1	RC3	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	1013	22H	824.7	25.15	25.16	25.15	25.15	25.16	25.14
	384	22H	836.52	25.42	25.43	25.40	25.42	25.41	25.40
	777	22H	848.31	25.50	25.47	25.50	25.50	25.49	25.48
PCS	25	24E	1851.25	25.48	25.48	25.48	25.50	25.46	25.47
	600	24E	1880	25.50	25.50	25.50	25.49	25.49	25.48
	1175	24E	1908.75	25.50	25.50	25.50	25.48	25.50	25.49

Table 9-3
Measured *Plimit* for DSI = 5 (Hotspot mode) and/or DSI = 8 (Phablet with grip sensor active)

Band	Channel	Rule Part	Frequency	SO55 [dBm]	SO55 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	RC1	RC3	FCH+SCH	FCH	(RTAP)	(RETAP)
PCS	25	24E	1851.25	22.73	22.72	22.82	22.84	22.88	22.90
	600	24E	1880	22.75	22.75	22.89	22.90	23.00	22.95
	1175	24E	1908.75	22.78	22.77	22.95	22.98	23.00	22.99

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

Figure 9-2
Power Measurement Setup

9.3 UMTS Conducted Powers

Table 9-4
Measured P_{max}

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	25.02	25.50	25.42	25.49	25.44	25.42	-
99		12.2 kbps AMR	24.99	25.50	25.41	25.50	25.42	25.42	-
6	HSDPA	Subtest 1	25.02	25.13	24.83	24.79	24.82	24.72	0
6		Subtest 2	24.99	25.09	23.65	24.78	24.77	24.79	0
6		Subtest 3	24.04	24.57	23.21	24.29	24.30	24.21	0.5
6		Subtest 4	24.05	24.61	23.34	24.31	24.29	24.21	0.5
6	HSUPA	Subtest 1	24.42	24.66	24.36	24.77	24.80	24.71	0
6		Subtest 2	22.38	23.05	22.18	23.12	23.17	23.05	2
6		Subtest 3	23.35	24.05	23.45	24.08	24.15	24.03	1
6		Subtest 4	22.40	23.06	22.48	23.15	23.21	23.07	2
6		Subtest 5	24.43	23.91	24.26	23.95	24.02	24.30	0

Table 9-5
Measured P_{limit} for DSI = 5 (Hotspot mode) and/or DSI = 8 (Phablet with grip sensor active)

3GPP Release Version	Mode	3GPP 34.121 Subtest	PCS Band [dBm]			3GPP MPR [dB]
			9262	9400	9538	
99	WCDMA	12.2 kbps RMC	22.91	22.94	22.80	-
99		12.2 kbps AMR	22.90	22.87	22.80	-
6	HSDPA	Subtest 1	22.89	22.95	22.80	0
6		Subtest 2	22.91	22.94	22.77	0
6		Subtest 3	22.40	22.40	22.30	0.5
6		Subtest 4	22.41	22.44	22.30	0.5
6	HSUPA	Subtest 1	22.72	22.75	22.66	0
6		Subtest 2	20.94	20.96	20.91	2
6		Subtest 3	21.97	22.00	21.98	1
6		Subtest 4	20.94	20.95	20.92	2
6		Subtest 5	22.70	22.75	22.65	0

This device does not support DC-HSDPA

Figure 9-3
Power Measurement Setup

9.4 LTE Conducted Powers

9.4.1 LTE Band 12

Table 9-6
LTE Band 12 Measured P_{max} - 10 MHz Bandwidth

LTE Band 12 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23095 (707.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	25.01	0	0
	1	25	**25.35**		0
	1	49	25.12		0
	25	0	24.24	0-1	1
	25	12	24.16		1
	25	25	**24.32**		1
	50	0	24.27		1
16QAM	1	0	24.18	0-1	1
	1	25	24.50		1
	1	49	24.14		1
	25	0	23.34	0-2	2
	25	12	23.40		2
	25	25	23.41		2
	50	0	23.28		2
64QAM	1	0	22.90	0-2	2
	1	25	22.89		2
	1	49	23.23		2
	25	0	21.64	0-3	3
	25	12	21.59		3
	25	25	21.53		3
	50	0	21.56		3

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

Table 9-7
LTE Band 12 Measured P_{max} - 5 MHz Bandwidth

LTE Band 12 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23035 (701.5 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23155 (713.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.83	24.83	25.08	0	0
	1	12	24.94	24.66	25.19		0
	1	24	24.86	24.82	25.12		0
	12	0	23.95	24.00	24.28	0-1	1
	12	6	24.01	23.75	24.35		1
	12	13	23.98	23.52	24.31		1
	25	0	24.00	23.80	24.30		1
16QAM	1	0	24.48	24.11	24.43	0-1	1
	1	12	24.47	23.92	24.47		1
	1	24	24.48	24.06	24.39		1
	12	0	23.11	23.09	23.33	0-2	2
	12	6	23.16	23.00	23.41		2
	12	13	23.15	22.68	23.34		2
	25	0	23.07	23.00	23.26		2
64QAM	1	0	23.35	23.00	23.49	0-2	2
	1	12	23.34	22.94	23.32		2
	1	24	23.07	22.99	23.50		2
	12	0	21.96	21.75	22.16	0-3	3
	12	6	22.02	21.68	22.26		3
	12	13	21.96	21.67	22.18		3
	25	0	21.97	21.60	22.27		3

Table 9-8
LTE Band 12 Measured P_{max} - 3 MHz Bandwidth

LTE Band 12 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23025 (700.5 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23165 (714.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.94	24.94	24.93	0	0
	1	7	24.85	24.71	24.85		0
	1	14	24.90	24.74	24.87		0
	8	0	24.00	23.89	23.98	0-1	1
	8	4	23.98	23.75	24.02		1
	8	7	23.93	23.73	24.02		1
	15	0	24.00	23.82	23.95		1
16QAM	1	0	24.04	24.14	24.04	0-1	1
	1	7	23.92	23.96	23.94		1
	1	14	23.91	23.97	24.00		1
	8	0	23.10	23.00	23.01	0-2	2
	8	4	23.12	22.99	23.10		2
	8	7	23.07	22.93	23.06		2
	15	0	23.02	22.88	22.92		2
64QAM	1	0	23.34	22.96	23.40	0-2	2
	1	7	23.26	22.78	23.13		2
	1	14	23.25	22.83	23.24		2
	8	0	22.10	21.70	21.95	0-3	3
	8	4	22.10	21.62	22.04		3
	8	7	22.03	21.63	22.00		3
	15	0	21.98	21.53	22.03		3

Table 9-9
LTE Band 12 Measured P_{max} -1.4 MHz Bandwidth

LTE Band 12 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23017 (699.7 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23173 (715.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.91	24.75	24.85	0	0
	1	2	24.94	24.73	24.90		0
	1	5	25.00	24.65	24.85		0
	3	0	24.90	24.70	24.84		0
	3	2	24.93	24.55	24.95		0
	3	3	24.86	24.60	24.89		0
	6	0	23.95	23.73	23.99	0-1	1
16QAM	1	0	24.07	24.12	24.00	0-1	1
	1	2	24.10	24.10	24.05		1
	1	5	24.05	24.28	23.98		1
	3	0	24.00	24.00	24.16		1
	3	2	24.03	24.02	24.22		1
	3	3	24.06	23.99	24.17		1
	6	0	23.12	22.70	23.15	0-2	2
64QAM	1	0	23.40	22.86	23.25	0-2	2
	1	2	23.47	22.92	23.24		2
	1	5	23.34	22.80	23.19		2
	3	0	23.30	22.82	22.96		2
	3	2	23.36	22.85	23.02		2
	3	3	23.30	22.75	22.98		2
	6	0	21.97	21.51	22.10	0-3	3

9.4.2 LTE Band 13

Table 9-10
LTE Band 13 Measured P_{max} - 10 MHz Bandwidth

LTE Band 13 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	25.03	0	0
	1	25	**25.41**		0
	1	49	25.14		0
	25	0	24.26	0-1	1
	25	12	24.36		1
	25	25	**24.44**		1
	50	0	24.40		1
16QAM	1	0	24.20	0-1	1
	1	25	24.50		1
	1	49	24.43		1
	25	0	23.40	0-2	2
	25	12	23.50		2
	25	25	23.50		2
	50	0	23.32		2
64QAM	1	0	23.23	0-2	2
	1	25	23.50		2
	1	49	23.38		2
	25	0	22.43	0-3	3
	25	12	22.50		3
	25	25	22.10		3
	50	0	22.37		3

Table 9-11
LTE Band 13 Measured P_{max} - 5 MHz Bandwidth

LTE Band 13 5 MHz Bandwidth					
Modulation	**RB Size**	**RB Offset**	**Mid Channel** **23230 (782.0 MHz)** **Conducted Power [dBm]**	**MPR Allowed per 3GPP [dB]**	**MPR [dB]**
QPSK	1	0	25.28	0	0
	1	12	25.23		0
	1	24	25.33		0
	12	0	24.41	0-1	1
	12	6	24.45		1
	12	13	24.46		1
	25	0	24.39		1
16QAM	1	0	24.42	0-1	1
	1	12	24.39		1
	1	24	24.40		1
	12	0	23.42	0-2	2
	12	6	23.41		2
	12	13	23.40		2
	25	0	23.40		2
64QAM	1	0	23.48	0-2	2
	1	12	23.33		2
	1	24	23.39		2
	12	0	22.30	0-3	3
	12	6	22.39		3
	12	13	22.44		3
	25	0	22.44		3

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

9.4.3 LTE Band 5 (Cell)

Table 9-12
LTE Band 5 (Cell) Measured P_{max} - 10 MHz Bandwidth

LTE Band 5 (Cell) 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20525 (836.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	24.93	0	0
	1	25	**25.17**		0
	1	49	24.92		0
	25	0	24.30	0-1	1
	25	12	**24.35**		1
	25	25	24.34		1
	50	0	24.24		1
16QAM	1	0	24.33	0-1	1
	1	25	24.50		1
	1	49	24.22		1
	25	0	23.40	0-2	2
	25	12	23.46		2
	25	25	23.45		2
	50	0	23.24		2
64QAM	1	0	23.17	0-2	2
	1	25	23.50		2
	1	49	22.96		2
	25	0	22.40	0-3	3
	25	12	22.44		3
	25	25	22.39		3
	50	0	22.33		3

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

Table 9-13
LTE Band 5 (Cell) Measured P_{max} - 5 MHz Bandwidth

LTE Band 5 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20425 (826.5 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20625 (846.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	25.27	25.20	25.13	0	0
	1	12	25.22	25.25	25.19		0
	1	24	25.27	25.29	24.87		0
	12	0	24.42	24.42	24.37	0-1	1
	12	6	24.43	24.43	24.37		1
	12	13	24.41	24.46	24.38		1
	25	0	24.42	24.45	24.33		1
16QAM	1	0	24.50	24.49	24.49	0-1	1
	1	12	24.49	24.48	24.50		1
	1	24	24.50	24.50	24.50		1
	12	0	23.41	23.47	23.48	0-2	2
	12	6	23.49	23.48	23.50		2
	12	13	23.43	23.47	23.49		2
	25	0	23.44	23.38	23.36		2
64QAM	1	0	23.32	23.48	23.04	0-2	2
	1	12	23.33	23.40	23.40		2
	1	24	22.99	23.48	22.75		2
	12	0	22.48	22.29	22.39	0-3	3
	12	6	22.37	22.35	22.39		3
	12	13	22.14	22.36	22.42		3
	25	0	22.31	22.49	22.32		3

Table 9-14
LTE Band 5 (Cell) Measured P_{max} - 3 MHz Bandwidth

LTE Band 5 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20415 (825.5 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20635 (847.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	25.36	25.24	25.17	0	0
	1	7	25.35	25.30	25.32		0
	1	14	25.25	25.30	24.96		0
	8	0	24.42	24.37	24.27	0-1	1
	8	4	24.44	24.43	24.35		1
	8	7	24.41	24.38	24.31		1
	15	0	24.44	24.39	24.27		1
16QAM	1	0	24.29	24.41	24.50	0-1	1
	1	7	24.31	24.34	24.44		1
	1	14	24.28	24.39	24.37		1
	8	0	23.40	23.49	23.21	0-2	2
	8	4	23.42	23.38	23.27		2
	8	7	23.37	23.39	23.23		2
	15	0	23.45	23.33	23.41		2
64QAM	1	0	23.35	23.26	23.44	0-2	2
	1	7	23.30	23.30	23.46		2
	1	14	23.00	23.26	23.23		2
	8	0	22.40	22.45	22.28	0-3	3
	8	4	22.43	22.48	22.39		3
	8	7	22.40	22.49	22.30		3
	15	0	22.50	22.50	22.40		3

Table 9-15
LTE Band 5 (Cell) Measured P_{max} -1.4 MHz Bandwidth

LTE Band 5 (Cell) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20407 (824.7 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20643 (848.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	25.32	25.16	25.20	0	0
	1	2	25.37	25.29	25.26		0
	1	5	25.31	25.25	24.91		0
	3	0	25.33	25.17	25.14		0
	3	2	25.33	25.29	25.05		0
	3	3	25.27	25.23	24.93		0
	6	0	24.34	24.33	24.20	0-1	1
16QAM	1	0	24.48	24.38	24.33	0-1	1
	1	2	24.50	24.47	24.38		1
	1	5	24.47	24.43	24.14		1
	3	0	24.44	24.27	24.29		1
	3	2	24.50	24.36	24.36		1
	3	3	24.44	24.38	24.27		1
	6	0	23.47	23.47	23.37	0-2	2
64QAM	1	0	23.22	23.49	23.22	0-2	2
	1	2	23.33	23.48	23.26		2
	1	5	23.08	23.50	22.84		2
	3	0	23.47	23.41	23.19		2
	3	2	23.44	23.44	22.89		2
	3	3	23.46	23.45	22.65		2
	6	0	22.33	22.41	21.97	0-3	3

9.4.4 LTE Band 66 (AWS)

Table 9-16
LTE Band 66 (AWS) Measured P_{max} - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	25.22	25.29	25.11	0	0
	1	50	25.25	**25.44**	25.35		0
	1	99	25.03	25.18	25.10		0
	50	0	24.47	24.32	24.35	0-1	1
	50	25	24.49	**24.50**	24.37		1
	50	50	24.43	24.31	24.31		1
	100	0	24.42	24.34	24.31		1
16QAM	1	0	24.49	24.35	24.44	0-1	1
	1	50	24.44	24.41	24.49		1
	1	99	24.33	24.37	24.49		1
	50	0	23.38	23.33	23.38	0-2	2
	50	25	23.35	23.45	23.39		2
	50	50	23.44	23.35	23.23		2
	100	0	23.33	23.39	23.25		2
64QAM	1	0	23.22	23.42	23.42	0-2	2
	1	50	23.50	23.50	23.48		2
	1	99	23.39	23.44	23.39		2
	50	0	22.34	22.38	22.40	0-3	3
	50	25	22.40	22.50	22.40		3
	50	50	22.35	22.47	22.37		3
	100	0	22.35	22.45	22.27		3

Table 9-17
LTE Band 66 (AWS) Measured P_{max} - 15 MHz Bandwidth

LTE Band 66 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132047 (1717.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132597 (1772.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.92	24.95	24.98	0	0
	1	36	25.00	25.06	25.10		0
	1	74	24.85	24.90	24.92		0
	36	0	24.05	24.06	24.10	0-1	1
	36	18	24.10	24.04	24.11		1
	36	37	24.01	24.05	24.09		1
	75	0	24.10	24.08	24.05		1
16QAM	1	0	23.96	24.45	24.41	0-1	1
	1	36	24.01	24.48	24.48		1
	1	74	23.86	24.30	24.33		1
	36	0	23.05	23.05	23.16	0-2	2
	36	18	23.12	23.04	23.13		2
	36	37	23.05	23.03	23.12		2
	75	0	23.10	23.06	23.06		2
64QAM	1	0	23.28	23.49	23.12	0-2	2
	1	36	23.37	23.49	23.25		2
	1	74	23.26	23.49	23.04		2
	36	0	22.15	22.10	22.21	0-3	3
	36	18	22.19	22.08	22.19		3
	36	37	22.12	22.10	22.18		3
	75	0	22.13	22.15	22.11		3

Table 9-18
LTE Band 66 (AWS) Measured P_{max} - 10 MHz Bandwidth

LTE Band 66 (AWS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132022 (1715.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132622 (1775.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.61	24.53	24.68	0	0
	1	25	24.81	24.76	24.83		0
	1	49	24.62	24.52	24.72		0
	25	0	23.88	23.82	23.89	0-1	1
	25	12	23.90	23.85	23.93		1
	25	25	23.79	23.83	23.85		1
	50	0	23.82	23.88	23.85		1
16QAM	1	0	24.00	23.61	23.70	0-1	1
	1	25	24.25	23.84	23.90		1
	1	49	24.00	23.68	23.70		1
	25	0	22.89	22.88	22.89	0-2	2
	25	12	22.94	22.94	22.93		2
	25	25	22.86	22.98	22.90		2
	50	0	22.88	22.90	22.81		2
64QAM	1	0	22.78	22.79	22.96	0-2	2
	1	25	23.00	23.12	23.30		2
	1	49	22.76	22.88	23.01		2
	25	0	21.95	21.92	21.95	0-3	3
	25	12	22.02	21.96	22.00		3
	25	25	21.90	21.94	21.94		3
	50	0	21.89	21.89	21.86		3

Table 9-19
LTE Band 66 (AWS) Measured P_{max} - 5 MHz Bandwidth

LTE Band 66 (AWS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131997 (1712.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132647 (1777.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.85	24.88	24.98	0	0
	1	12	24.83	24.87	24.96		0
	1	24	24.75	24.85	24.85		0
	12	0	23.97	23.91	23.92	0-1	1
	12	6	23.96	23.93	23.99		1
	12	13	23.85	23.89	23.87		1
	25	0	23.90	23.90	23.90		1
16QAM	1	0	24.43	24.04	24.13	0-1	1
	1	12	24.42	24.09	24.10		1
	1	24	24.35	24.00	24.06		1
	12	0	23.09	22.93	23.07	0-2	2
	12	6	23.08	22.94	23.04		2
	12	13	23.00	22.95	23.00		2
	25	0	22.95	22.89	22.97		2
64QAM	1	0	23.22	23.16	22.92	0-2	2
	1	12	23.20	23.23	22.89		2
	1	24	23.12	23.22	22.75		2
	12	0	21.94	22.00	22.00	0-3	3
	12	6	21.93	21.97	22.05		3
	12	13	21.79	22.00	21.91		3
	25	0	21.91	21.99	21.93		3

Table 9-20
LTE Band 66 (AWS) Measured P_{max} - 3 MHz Bandwidth

LTE Band 66 (AWS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131987 (1711.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132657 (1778.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.95	24.80	25.00	0	0
	1	7	24.88	24.78	24.95		0
	1	14	24.85	24.77	24.83		0
	8	0	23.93	23.90	24.03	0-1	1
	8	4	23.92	23.95	23.95		1
	8	7	23.89	23.90	23.92		1
	15	0	23.92	24.00	24.00		1
16QAM	1	0	24.46	24.00	24.37	0-1	1
	1	7	24.22	23.90	24.31		1
	1	14	24.19	23.87	24.28		1
	8	0	23.05	22.94	23.06	0-2	2
	8	4	23.00	23.05	23.09		2
	8	7	22.95	23.00	23.00		2
	15	0	22.98	22.91	23.03		2
64QAM	1	0	23.09	23.16	23.12	0-2	2
	1	7	23.00	23.12	23.08		2
	1	14	22.99	23.06	23.03		2
	8	0	22.02	21.91	22.05	0-3	3
	8	4	22.01	21.93	22.06		3
	8	7	22.00	21.86	22.00		3
	15	0	22.00	22.00	22.03		3

Table 9-21
LTE Band 66 (AWS) Measured P_{max} -1.4 MHz Bandwidth

LTE Band 66 (AWS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131979 (1710.7 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132665 (1779.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.84	24.83	24.75	0	0
	1	2	24.86	24.88	24.80		0
	1	5	24.80	24.76	24.70		0
	3	0	24.75	24.84	24.75		0
	3	2	24.80	24.85	24.80		0
	3	3	24.76	24.80	24.76		0
	6	0	23.84	23.85	23.82	0-1	1
16QAM	1	0	23.95	24.24	23.90	0-1	1
	1	2	24.08	24.29	23.90		1
	1	5	23.94	24.21	23.85		1
	3	0	23.91	24.09	24.04		1
	3	2	23.95	24.08	24.08		1
	3	3	23.93	24.04	24.03		1
	6	0	23.01	22.79	23.04	0-2	2
64QAM	1	0	23.32	23.04	23.09	0-2	2
	1	2	23.35	23.09	23.12		2
	1	5	23.20	22.97	23.08		2
	3	0	23.22	23.03	22.85		2
	3	2	23.21	23.06	22.88		2
	3	3	23.16	23.00	22.86		2
	6	0	21.87	22.16	21.93	0-3	3

Table 9-22
LTE Band 66 (AWS) Measured P_{limit} for DSI = 5 (Hotspot mode) and/or DSI = 8 (Phablet with grip sensor active) - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.21	23.00	23.12	0	0
	1	50	**23.45**	23.12	23.16		0
	1	99	23.00	23.06	23.00		0
	50	0	23.34	23.42	23.48	0-1	0
	50	25	**23.58**	23.52	23.57		0
	50	50	23.26	23.32	23.42		0
	100	0	23.44	23.43	23.31		0
16QAM	1	0	23.39	23.61	23.66	0-1	0
	1	50	23.72	23.80	23.66		0
	1	99	23.29	23.63	23.60		0
	50	0	23.39	23.45	23.32	0-2	0.5
	50	25	23.24	23.36	23.50		0.5
	50	50	23.16	23.29	23.46		0.5
	100	0	23.41	23.27	23.46		0.5
64QAM	1	0	23.26	23.23	23.37	0-2	0.5
	1	50	23.43	23.49	23.46		0.5
	1	99	23.31	23.18	23.21		0.5
	50	0	22.45	22.46	22.32	0-3	1.5
	50	25	22.38	22.35	22.35		1.5
	50	50	22.45	22.46	22.46		1.5
	100	0	22.49	22.45	22.44		1.5

Table 9-23
LTE Band 66 (AWS) Measured P_{limit} for DSI = 5 (Hotspot mode) and/or DSI = 8 (Phablet with grip sensor active) - 15 MHz Bandwidth

LTE Band 66 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132047 (1717.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132597 (1772.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.23	23.09	23.02	0	0
	1	36	23.41	23.24	23.15		0
	1	74	23.15	23.20	23.10		0
	36	0	23.35	23.35	23.22	0-1	0
	36	18	23.42	23.31	23.22		0
	36	37	23.37	23.27	23.17		0
	75	0	23.37	23.28	23.08		0
16QAM	1	0	23.61	23.75	23.23	0-1	0
	1	36	23.68	23.79	23.29		0
	1	74	23.48	23.54	22.98		0
	36	0	23.37	23.29	23.06	0-2	0.5
	36	18	23.44	23.17	23.12		0.5
	36	37	23.27	23.10	23.08		0.5
	75	0	23.18	23.14	23.14		0.5
64QAM	1	0	23.43	22.98	22.99	0-2	0.5
	1	36	23.46	23.22	23.16		0.5
	1	74	23.50	22.92	22.71		0.5
	36	0	22.41	22.46	22.43	0-3	1.5
	36	18	22.42	22.43	22.40		1.5
	36	37	22.44	22.43	22.36		1.5
	75	0	22.43	22.35	22.27		1.5

Table 9-24
LTE Band 66 (AWS) Measured P_{limit} for DSI = 5 (Hotspot mode) and/or DSI = 8 (Phablet with grip sensor active) - 10 MHz Bandwidth

LTE Band 66 (AWS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132022 (1715.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132622 (1775.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.02	23.15	23.04	0	0
	1	25	23.03	23.08	23.21		0
	1	49	23.02	23.11	22.97		0
	25	0	23.20	23.14	23.06	0-1	0
	25	12	23.28	23.17	23.07		0
	25	25	23.15	23.12	23.02		0
	50	0	23.20	23.18	23.00		0
16QAM	1	0	23.27	23.02	23.43	0-1	0
	1	25	23.50	23.26	23.61		0
	1	49	23.17	23.00	23.31		0
	25	0	23.35	23.20	22.91	0-2	0.5
	25	12	23.21	23.05	23.16		0.5
	25	25	23.17	23.22	22.89		0.5
	50	0	23.03	23.01	23.04		0.5
64QAM	1	0	22.92	22.74	22.80	0-2	0.5
	1	25	23.47	22.96	23.02		0.5
	1	49	23.21	22.75	22.88		0.5
	25	0	22.29	22.24	22.13	0-3	1.5
	25	12	22.41	22.29	22.22		1.5
	25	25	22.26	22.25	22.13		1.5
	50	0	22.30	22.29	22.03		1.5

Table 9-25
LTE Band 66 (AWS) Measured P_{limit} for DSI = 5 (Hotspot mode) and/or DSI = 8 (Phablet with grip sensor active) - 5 MHz Bandwidth

LTE Band 66 (AWS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131997 (1712.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132647 (1777.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.11	23.18	23.22	0	0
	1	12	23.15	23.24	23.20		0
	1	24	23.08	23.19	23.14		0
	12	0	23.36	23.29	23.28	0-1	0
	12	6	23.35	23.34	23.26		0
	12	13	23.29	23.26	23.19		0
	25	0	23.35	23.29	23.22		0
16QAM	1	0	23.51	23.32	23.65	0-1	0
	1	12	23.45	23.37	23.62		0
	1	24	23.23	23.19	23.41		0
	12	0	23.36	23.27	23.45	0-2	0.5
	12	6	23.33	23.11	23.28		0.5
	12	13	23.19	23.19	23.23		0.5
	25	0	23.27	23.33	23.13		0.5
64QAM	1	0	23.03	23.24	22.80	0-2	0.5
	1	12	23.16	23.38	22.94		0.5
	1	24	23.30	23.44	22.80		0.5
	12	0	22.16	22.45	22.40	0-3	1.5
	12	6	22.31	22.44	22.38		1.5
	12	13	22.35	22.43	22.30		1.5
	25	0	22.18	22.38	22.31		1.5

Table 9-26
LTE Band 66 (AWS) Measured P_{limit} for DSI = 5 (Hotspot mode) and/or DSI = 8 (Phablet with grip sensor active) - 3 MHz Bandwidth

LTE Band 66 (AWS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131987 (1711.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132657 (1778.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.32	23.23	23.15	0	0
	1	7	23.20	23.20	23.05		0
	1	14	23.22	23.11	23.01		0
	8	0	23.42	23.30	23.29	0-1	0
	8	4	23.35	23.39	23.30		0
	8	7	23.35	23.28	23.22		0
	15	0	23.41	23.36	23.24		0
16QAM	1	0	23.54	23.90	23.57	0-1	0
	1	7	23.31	23.84	23.24		0
	1	14	23.28	23.69	23.25		0
	8	0	23.41	23.40	23.34	0-2	0.5
	8	4	23.27	23.46	23.15		0.5
	8	7	23.27	23.39	23.12		0.5
	15	0	23.14	23.33	23.17		0.5
64QAM	1	0	22.96	23.18	23.37	0-2	0.5
	1	7	22.99	23.00	23.36		0.5
	1	14	23.03	22.98	23.19		0.5
	8	0	22.31	22.42	22.31	0-3	1.5
	8	4	22.33	22.44	22.33		1.5
	8	7	22.31	22.38	22.26		1.5
	15	0	22.41	22.37	22.33		1.5

Table 9-27
LTE Band 66 (AWS) Measured P_{limit} for DSI = 5 (Hotspot mode) and/or DSI = 8 (Phablet with grip sensor active) - 1.4 MHz Bandwidth

LTE Band 66 (AWS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131979 (1710.7 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132665 (1779.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	23.14	23.25	23.27	0	0
	1	2	23.20	23.29	23.30		0
	1	5	23.11	23.18	23.23		0
	3	0	23.26	23.20	23.18		0
	3	2	23.28	23.29	23.17		0
	3	3	23.24	23.18	23.12		0
	6	0	23.32	23.26	23.14	0-1	0
16QAM	1	0	23.57	23.38	23.40	0-1	0
	1	2	23.40	23.30	23.41		0
	1	5	23.34	23.19	23.29		0
	3	0	23.23	23.48	23.34		0
	3	2	23.13	23.37	23.27		0
	3	3	23.13	23.30	23.30		0
	6	0	23.11	23.21	23.24	0-2	0.5
64QAM	1	0	23.29	23.20	23.34	0-2	0.5
	1	2	23.37	23.18	23.42		0.5
	1	5	23.33	23.00	23.32		0.5
	3	0	23.50	23.41	23.35		0.5
	3	2	23.27	23.38	23.43		0.5
	3	3	23.47	23.37	23.27		0.5
	6	0	22.37	22.30	22.15	0-3	1.5

9.4.5 LTE Band 2 (PCS)

Table 9-28
LTE Band 2 (PCS) Measured P_{max} - 20 MHz Bandwidth

LTE Band 2 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18700 (1860.0 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19100 (1900.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	25.20	25.15	24.93	0	0
	1	50	25.41	**25.46**	25.20		0
	1	99	25.18	25.27	25.04		0
	50	0	24.45	24.39	24.38	0-1	1
	50	25	24.41	**24.50**	24.35		1
	50	50	24.37	24.32	24.49		1
	100	0	24.49	24.45	24.42		1
16QAM	1	0	24.26	24.28	24.45	0-1	1
	1	50	24.35	24.39	24.42		1
	1	99	24.47	24.47	24.48		1
	50	0	23.46	23.42	23.35	0-2	2
	50	25	23.43	23.36	23.46		2
	50	50	23.47	23.39	23.49		2
	100	0	23.43	23.45	23.43		2
64QAM	1	0	23.45	23.40	23.42	0-2	2
	1	50	23.42	23.43	23.49		2
	1	99	23.39	23.46	23.40		2
	50	0	22.50	22.47	22.38	0-3	3
	50	25	22.43	22.33	22.48		3
	50	50	22.39	22.42	22.47		3
	100	0	22.34	22.47	22.40		3

Table 9-29
LTE Band 2 (PCS) Measured P_{max} - 15 MHz Bandwidth

LTE Band 2 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18675 (1857.5 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19125 (1902.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.95	24.90	24.88	0	0
	1	36	25.05	25.04	24.92		0
	1	74	25.00	25.00	24.88		0
	36	0	24.12	24.02	24.00	0-1	1
	36	18	24.20	24.08	24.05		1
	36	37	24.16	24.15	24.11		1
	75	0	24.11	24.02	24.00		1
16QAM	1	0	24.36	24.40	23.88	0-1	1
	1	36	24.45	24.49	23.97		1
	1	74	24.40	24.48	23.94		1
	36	0	23.20	23.00	23.00	0-2	2
	36	18	23.22	23.06	23.04		2
	36	37	23.24	23.12	23.11		2
	75	0	23.16	23.04	23.00		2
64QAM	1	0	23.02	23.45	23.10	0-2	2
	1	36	23.18	23.50	23.33		2
	1	74	23.12	23.49	23.23		2
	36	0	22.23	22.06	22.06	0-3	3
	36	18	22.26	22.10	22.10		3
	36	37	22.27	22.18	22.16		3
	75	0	22.18	22.11	22.04		3

Table 9-30
LTE Band 2 (PCS) Measured P_{max} - 10 MHz Bandwidth

LTE Band 2 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18650 (1855.0 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19150 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.55	24.52	24.57	0	0
	1	25	24.87	24.83	24.99		0
	1	49	24.58	24.72	24.63		0
	25	0	23.95	23.83	23.79	0-1	1
	25	12	24.03	23.95	23.87		1
	25	25	23.92	23.90	23.81		1
	50	0	23.95	23.84	23.79		1
16QAM	1	0	23.72	23.60	23.74	0-1	1
	1	25	23.96	23.88	24.05		1
	1	49	23.69	23.61	23.80		1
	25	0	23.06	22.85	22.85	0-2	2
	25	12	23.16	22.92	22.93		2
	25	25	23.00	22.91	22.89		2
	50	0	22.97	22.80	22.75		2
64QAM	1	0	23.00	22.89	22.61	0-2	2
	1	25	23.22	23.30	23.03		2
	1	49	22.90	23.03	22.75		2
	25	0	22.05	21.93	21.90	0-3	3
	25	12	22.12	22.00	22.00		3
	25	25	22.00	21.95	21.93		3
	50	0	21.98	21.83	21.83		3

Table 9-31
LTE Band 2 (PCS) Measured P_{max} - 5 MHz Bandwidth

LTE Band 2 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18625 (1852.5 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19175 (1907.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	25.00	24.95	24.76	0	0
	1	12	24.98	24.98	24.88		0
	1	24	24.94	24.90	24.70		0
	12	0	24.10	23.96	23.96	0-1	1
	12	6	24.13	23.99	23.94		1
	12	13	24.00	23.95	23.86		1
	25	0	24.02	23.93	23.92		1
16QAM	1	0	24.21	23.80	24.40	0-1	1
	1	12	24.21	23.95	24.41		1
	1	24	24.08	23.82	24.33		1
	12	0	23.14	22.96	23.08	0-2	2
	12	6	23.18	23.00	23.06		2
	12	13	23.03	22.97	22.98		2
	25	0	23.00	22.95	22.98		2
64QAM	1	0	23.30	22.80	23.20	0-2	2
	1	12	23.35	22.91	23.24		2
	1	24	23.22	22.83	23.12		2
	12	0	22.14	22.03	21.90	0-3	3
	12	6	22.22	22.05	21.92		3
	12	13	22.06	22.01	21.85		3
	25	0	22.07	21.95	21.92		3

Table 9-32
LTE Band 2 (PCS) Measured P_{max} - 3 MHz Bandwidth

LTE Band 2 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18615 (1851.5 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19185 (1908.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	24.98	24.87	24.85	0	0
	1	7	24.96	24.95	24.75		0
	1	14	24.86	24.85	24.73		0
	8	0	24.06	23.95	23.90	0-1	1
	8	4	24.05	24.05	23.92		1
	8	7	24.00	23.95	23.85		1
	15	0	24.08	23.93	23.94		1
16QAM	1	0	24.05	24.07	23.95	0-1	1
	1	7	24.00	24.10	23.90		1
	1	14	23.90	24.02	23.85		1
	8	0	23.19	23.26	22.96	0-2	2
	8	4	23.21	23.00	22.97		2
	8	7	23.17	23.00	22.91		2
	15	0	23.11	23.47	22.84		2
64QAM	1	0	23.39	23.05	23.15	0-2	2
	1	7	23.31	23.08	23.10		2
	1	14	23.28	23.06	23.04		2
	8	0	22.15	22.00	21.95	0-3	3
	8	4	22.18	22.07	21.95		3
	8	7	22.09	22.01	21.90		3
	15	0	22.08	22.02	21.98		3

Table 9-33
LTE Band 2 (PCS) Measured P_{max} – 1.4 MHz Bandwidth

LTE Band 2 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18607 (1850.7 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19193 (1909.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	25.00	24.82	24.83	0	0
	1	2	24.99	24.88	24.86		0
	1	5	24.91	24.82	24.77		0
	3	0	24.95	24.94	24.75		0
	3	2	24.95	24.88	24.77		0
	3	3	24.90	24.90	24.72		0
	6	0	24.03	24.00	23.86	0-1	1
16QAM	1	0	24.10	23.95	23.94	0-1	1
	1	2	24.19	24.00	24.00		1
	1	5	24.03	23.92	23.93		1
	3	0	24.00	24.13	23.88		1
	3	2	24.00	24.16	23.95		1
	3	3	23.96	24.08	23.90		1
	6	0	23.03	23.14	23.00	0-2	2
64QAM	1	0	23.16	23.15	23.25	0-2	2
	1	2	23.21	23.17	23.30		2
	1	5	23.02	23.11	23.22		2
	3	0	23.33	22.92	23.20		2
	3	2	23.37	22.95	23.21		2
	3	3	23.33	22.88	23.15		2
	6	0	22.47	22.05	21.85	0-3	3

Table 9-34
LTE Band 2 (PCS) Measured P_{limit} for DSI = 5 (Hotspot mode) and/or DSI = 8 (Phablet with grip sensor active) - 20 MHz Bandwidth

LTE Band 2 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18700 (1860.0 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19100 (1900.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.74	22.48	22.61	0	0
	1	50	23.03	**23.08**	22.77		0
	1	99	22.78	22.78	22.86		0
	50	0	22.81	22.83	22.78	0-1	0
	50	25	22.93	**23.13**	23.08		0
	50	50	23.12	22.96	22.88		0
	100	0	23.05	23.02	23.01		0
16QAM	1	0	23.24	23.12	23.14	0-1	0
	1	50	23.14	23.33	23.11		0
	1	99	22.98	23.14	22.85		0
	50	0	23.04	22.74	22.92	0-2	0
	50	25	23.01	22.82	23.03		0
	50	50	22.91	23.06	23.14		0
	100	0	23.01	22.76	23.05		0
64QAM	1	0	22.91	22.93	23.31	0-2	0
	1	50	23.07	23.33	23.11		0
	1	99	22.93	23.17	22.81		0
	50	0	22.37	22.34	22.47	0-3	1
	50	25	22.38	22.44	22.36		1
	50	50	22.32	22.48	22.34		1
	100	0	22.30	22.37	22.21		1

Table 9-35
LTE Band 2 (PCS) Measured P_{limit} for DSI = 5 (Hotspot mode) and/or DSI = 8 (Phablet with grip sensor active) - 15 MHz Bandwidth

LTE Band 2 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18675 (1857.5 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19125 (1902.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.66	22.56	22.60	0	0
	1	36	22.89	22.82	22.87		0
	1	74	22.80	22.70	22.73		0
	36	0	22.82	22.76	22.87	0-1	0
	36	18	22.92	22.89	22.93		0
	36	37	22.90	22.97	23.00		0
	75	0	22.85	22.84	22.89		0
16QAM	1	0	22.97	22.68	23.25	0-1	0
	1	36	23.06	22.90	23.46		0
	1	74	22.98	22.82	23.17		0
	36	0	22.75	22.61	22.75	0-2	0
	36	18	22.89	22.79	22.87		0
	36	37	22.84	22.86	22.92		0
	75	0	22.76	22.74	22.69		0
64QAM	1	0	22.84	22.61	23.20	0-2	0
	1	36	23.08	22.86	23.45		0
	1	74	22.96	22.89	23.28		0
	36	0	22.34	22.31	22.42	0-3	1
	36	18	22.41	22.39	22.49		1
	36	37	22.42	22.47	22.33		1
	75	0	22.35	22.34	22.38		1

Table 9-36
LTE Band 2 (PCS) Measured P_{limit} for DSI = 5 (Hotspot mode) and/or DSI = 8 (Phablet with grip sensor active) - 10 MHz Bandwidth

LTE Band 2 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18650 (1855.0 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19150 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.57	22.49	22.46	0	0
	1	25	22.62	22.63	22.48		0
	1	49	22.61	22.64	22.59		0
	25	0	22.65	22.59	22.65	0-1	0
	25	12	22.80	22.67	22.71		0
	25	25	22.67	22.68	22.69		0
	50	0	22.69	22.62	22.64		0
16QAM	1	0	22.47	22.87	22.71	0-1	0
	1	25	22.81	23.27	23.04		0
	1	49	22.55	22.87	22.78		0
	25	0	22.72	22.51	22.69	0-2	0
	25	12	22.88	22.83	22.85		0
	25	25	22.61	22.57	22.72		0
	50	0	22.70	22.62	22.66		0
64QAM	1	0	22.53	22.89	22.45	0-2	0
	1	25	22.75	23.05	22.98		0
	1	49	22.49	22.97	22.80		0
	25	0	22.17	22.06	22.19	0-3	1
	25	12	22.32	22.20	22.30		1
	25	25	22.16	22.15	22.26		1
	50	0	22.19	22.09	22.11		1

Table 9-37
LTE Band 2 (PCS) Measured P_{limit} for DSI = 5 (Hotspot mode) and/or DSI = 8 (Phablet with grip sensor active) - 5 MHz Bandwidth

LTE Band 2 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18625 (1852.5 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19175 (1907.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.72	22.45	22.61	0	0
	1	12	22.75	22.56	22.70		0
	1	24	22.64	22.47	22.61		0
	12	0	22.79	22.68	22.78	0-1	0
	12	6	22.84	22.70	22.81		0
	12	13	22.71	22.72	22.70		0
	25	0	22.81	22.67	22.72		0
16QAM	1	0	23.16	22.81	22.78	0-1	0
	1	12	23.19	22.93	22.87		0
	1	24	22.95	22.63	22.65		0
	12	0	22.84	22.62	22.70	0-2	0
	12	6	23.01	22.54	22.69		0
	12	13	22.79	22.61	22.55		0
	25	0	22.61	22.59	22.55		0
64QAM	1	0	22.96	22.81	22.57	0-2	0
	1	12	23.03	22.78	22.83		0
	1	24	22.85	22.70	22.59		0
	12	0	22.32	22.25	22.19	0-3	1
	12	6	22.33	22.29	22.22		1
	12	13	22.29	22.28	22.11		1
	25	0	22.25	22.19	22.20		1

Table 9-38
LTE Band 2 (PCS) Measured P_{limit} for DSI = 5 (Hotspot mode) and/or DSI = 8 (Phablet with grip sensor active) - 3 MHz Bandwidth

LTE Band 2 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18615 (1851.5 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19185 (1908.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.66	22.53	22.63	0	0
	1	7	22.64	22.58	22.55		0
	1	14	22.63	22.50	22.48		0
	8	0	22.75	22.74	22.77	0-1	0
	8	4	22.74	22.75	22.78		0
	8	7	22.75	22.73	22.73		0
	15	0	22.77	22.66	22.75		0
16QAM	1	0	22.92	23.27	23.00	0-1	0
	1	7	22.65	23.20	22.77		0
	1	14	22.59	22.98	22.73		0
	8	0	22.67	22.69	22.62	0-2	0
	8	4	22.72	22.75	22.64		0
	8	7	22.66	22.74	22.67		0
	15	0	22.57	22.61	22.73		0
64QAM	1	0	22.78	23.09	22.82	0-2	0
	1	7	22.72	23.15	22.87		0
	1	14	22.74	23.04	22.80		0
	8	0	22.28	22.24	22.20	0-3	1
	8	4	22.34	22.30	22.20		1
	8	7	22.24	22.28	22.16		1
	15	0	22.35	22.15	22.24		1

Table 9-39
LTE Band 2 (PCS) Measured P_{limit} for DSI = 5 (Hotspot mode) and/or DSI = 8 (Phablet with grip sensor active) - 1.4 MHz Bandwidth

LTE Band 2 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 18607 (1850.7 MHz)	Mid Channel 18900 (1880.0 MHz)	High Channel 19193 (1909.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	22.65	22.72	22.50	0	0
	1	2	22.67	22.76	22.54		0
	1	5	22.55	22.72	22.49		0
	3	0	22.59	22.69	22.60		0
	3	2	22.64	22.62	22.64		0
	3	3	22.60	22.61	22.58		0
	6	0	22.73	22.70	22.65	0-1	0
16QAM	1	0	22.80	22.92	22.93	0-1	0
	1	2	22.67	22.87	22.81		0
	1	5	22.58	22.76	22.77		0
	3	0	22.70	22.89	22.55		0
	3	2	22.77	22.85	22.58		0
	3	3	22.72	22.77	22.62		0
	6	0	22.49	22.79	22.51	0-2	0
64QAM	1	0	22.68	22.80	22.87	0-2	0
	1	2	22.72	22.82	22.96		0
	1	5	22.69	22.82	22.86		0
	3	0	22.83	22.87	22.60		0
	3	2	22.75	22.80	22.66		0
	3	3	22.82	22.85	22.60		0
	6	0	22.46	22.15	22.12	0-3	1

9.4.1 LTE Band 48

Table 9-40
LTE Band 48 Measured P_{Limit} - 20 MHz Bandwidth

LTE Band 48 20 MHz Bandwidth								
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			55340 (3560.0 MHz)	55773 (3603.3 MHz)	56207 (3646.7 MHz)	56640 (3690.0 MHz)		
			Conducted Power [dBm]					
QPSK	1	0	23.24	23.20	23.28	23.19	0	0
	1	50	**23.50**	23.33	23.47	23.48		0
	1	99	23.26	23.01	23.18	23.08		0
	50	0	23.28	23.23	23.20	23.23	0-1	0
	50	25	**23.36**	23.22	23.27	23.24		0
	50	50	23.25	23.13	23.22	23.29		0
	100	0	23.30	23.17	23.22	23.18		0
16QAM	1	0	23.44	23.34	23.02	23.18	0-1	0
	1	50	23.50	23.44	23.32	23.01		0
	1	99	23.46	23.12	23.07	23.23		0
	50	0	22.36	22.21	22.22	22.22	0-2	1
	50	25	22.43	22.16	22.30	22.28		1
	50	50	22.29	22.08	22.30	22.23		1
	100	0	22.33	22.16	22.28	22.20		1
64QAM	1	0	22.47	22.42	22.08	22.30	0-2	1
	1	50	22.50	22.40	22.43	22.44		1
	1	99	22.46	22.40	22.16	22.13		1
	50	0	21.34	21.40	21.24	21.20	0-3	2
	50	25	21.46	21.30	21.43	21.32		2
	50	50	21.27	21.12	21.36	21.24		2
	100	0	21.35	21.25	21.18	21.25		2

Table 9-41
LTE Band 48 Measured P_{Limit} - 15 MHz Bandwidth

LTE Band 48 15 MHz Bandwidth								
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			55315 (3557.5 MHz)	55765 (3602.5 MHz)	56215 (3647.5 MHz)	56665 (3692.5 MHz)		
			Conducted Power [dBm]					
QPSK	1	0	23.48	23.46	23.47	23.47	0	0
	1	36	23.50	23.50	23.50	23.47		0
	1	74	23.42	23.31	23.41	23.30		0
	36	0	23.36	23.30	23.32	23.30	0-1	0
	36	18	23.39	23.30	23.38	23.33		0
	36	37	23.33	23.20	23.37	23.27		0
	75	0	23.26	23.21	23.35	23.23		0
16QAM	1	0	23.50	23.44	23.43	23.47	0-1	0
	1	36	23.46	23.50	23.41	23.48		0
	1	74	23.44	23.43	23.39	23.45		0
	36	0	22.41	22.31	22.44	22.31	0-2	1
	36	18	22.39	22.27	22.42	22.40		1
	36	37	22.33	22.16	22.44	22.29		1
	75	0	22.31	22.15	22.36	22.27		1
64QAM	1	0	22.22	22.45	22.36	22.24	0-2	1
	1	36	22.44	22.50	22.42	22.36		1
	1	74	22.29	22.45	22.42	22.10		1
	36	0	21.38	21.28	21.36	21.32	0-3	2
	36	18	21.38	21.24	21.41	21.38		2
	36	37	21.30	21.13	21.45	21.23		2
	75	0	21.30	21.24	21.38	21.28		2

Table 9-42
LTE Band 48 Measured P_{Limit} - 10 MHz Bandwidth

LTE Band 48 10 MHz Bandwidth								
Modulation	RB Size	RB Offset	Low Channel 55290 (3555.0 MHz)	Low-Mid Channel 55757 (3601.7 MHz)	Mid-High Channel 56223 (3648.3 MHz)	High Channel 56690 (3695.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]					
QPSK	1	0	23.40	23.32	23.41	23.41	0	0
	1	25	23.48	23.48	23.47	23.42		0
	1	49	23.32	23.21	23.30	23.32		0
	25	0	23.35	23.28	23.28	23.30	0-1	0
	25	12	23.48	23.42	23.47	23.39		0
	25	25	23.34	23.28	23.42	23.30		0
	50	0	23.32	23.33	23.37	23.30		0
16QAM	1	0	23.29	23.48	23.31	23.43	0-1	0
	1	25	23.50	23.50	23.50	23.49		0
	1	49	23.41	23.42	23.41	23.47		0
	25	0	22.42	22.32	22.18	22.32	0-2	1
	25	12	22.50	22.43	22.35	22.43		1
	25	25	22.41	22.34	22.34	22.35		1
	50	0	22.39	22.38	22.31	22.33		1
64QAM	1	0	22.48	22.14	22.50	22.47	0-2	1
	1	25	22.50	22.50	22.43	22.49		1
	1	49	22.50	22.21	22.46	22.43		1
	25	0	21.16	21.33	21.19	21.33	0-3	2
	25	12	21.42	21.50	21.34	21.49		2
	25	25	21.37	21.37	21.32	21.41		2
	50	0	21.37	21.36	21.31	21.32		2

Table 9-43
LTE Band 48 Measured P_{Limit} - 5 MHz Bandwidth

LTE Band 48 5 MHz Bandwidth								
Modulation	RB Size	RB Offset	Low Channel 55265 (3552.5 MHz)	Low-Mid Channel 55748 (3600.8 MHz)	Mid-High Channel 56232 (3649.2 MHz)	High Channel 56715 (3697.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]					
QPSK	1	0	23.39	23.34	23.33	23.41	0	0
	1	12	23.40	23.48	23.38	23.47		0
	1	24	23.46	23.38	23.37	23.43		0
	12	0	23.42	23.32	23.31	23.32	0-1	0
	12	6	23.33	23.40	23.45	23.39		0
	12	13	23.48	23.42	23.40	23.34		0
	25	0	23.50	23.36	23.39	23.38		0
16QAM	1	0	23.47	23.38	23.26	23.28	0-1	0
	1	12	23.37	23.50	23.37	23.40		0
	1	24	23.50	23.42	23.34	23.38		0
	12	0	22.34	22.40	22.37	22.35	0-2	1
	12	6	22.33	22.50	22.47	22.45		1
	12	13	22.33	22.42	22.46	22.44		1
	25	0	22.21	22.33	22.35	22.36		1
64QAM	1	0	22.47	22.27	22.36	22.40	0-2	1
	1	12	22.50	22.36	22.50	22.50		1
	1	24	22.48	22.37	22.46	22.43		1
	12	0	21.50	21.39	21.41	21.37	0-3	2
	12	6	21.45	21.49	21.47	21.42		2
	12	13	21.44	21.47	21.47	21.41		2
	25	0	21.47	21.30	21.37	21.33		2

9.4.2 LTE Uplink Carrier Aggregation Conducted Powers

Table 9-44
LTE Band 5 Uplink Carrier Aggregation Measured P_{max}

	PCC									SCC									Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC UL Channel	PCC UL Frequency [MHz]	PCC DL Channel	PCC DL Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC UL Channel	SCC UL Frequency [MHz]	SCC DL Channel	SCC DL Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_5B	LTE B5	10	20525	836.5	2525	881.5	QPSK	1	0	LTE B5	5	20453	829.3	2453	874.3	QPSK	1	24	25.50	24.93

Notes:

1. This device supports uplink carrier aggregation for LTE CA_5B with a maximum of two component carriers. For intraband contiguous carrier aggregation scenarios, 3GPP 36.101 Table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when non-contiguous RB allocation is implemented. The conducted powers and MPR settings in this device are permanently implemented per the above 3GPP requirements.
2. Per FCC Guidance, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.

Figure 9-4
Power Measurement Setup

9.5 NR Conducted Powers

9.5.1 NR Band n5

Table 9-45
NR Band n5 Measured P_{max} for all DSI - 20 MHz Bandwidth

NR Band n5 20 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	167300 (836.5 MHz) Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	24.20	0	0.0
	1	53	24.31		0.0
	1	104	24.17		0.0
	50	0	23.52	0-0.5	0.0
	50	28	23.58	0	0.0
	50	56	23.49	0-0.5	0.0
	100	0	23.51		0.0
DFT-s-OFDM QPSK	1	1	**24.43**	0	0.0
	1	53	24.22		0.0
	1	104	24.15		0.0
	50	0	23.19	0-1	1.0
	50	28	**24.18**	0	0.0
	50	56	23.02	0-1	1.0
	100	0	23.13		1.0
DFT-s-OFDM 16QAM	1	1	23.22	0-1	1.0
CP-OFDM QPSK	1	1	22.58	0-1.5	1.5

Note: NR Band n5 (Cell) at 20 MHz bandwidth does not support non-overlapping channels. Per FCC Guidance, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-46
NR Band n5 Measured P_{max} for all DSI - 15 MHz Bandwidth

NR Band n5 15 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	167300 (836.5 MHz) Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	24.17	0	0.0
	1	40	24.10		0.0
	1	77	23.96		0.0
	36	0	23.33	0-0.5	0.0
	36	22	23.97	0	0.0
	36	43	23.34	0-0.5	0.0
	75	0	23.41		0.0
DFT-s-OFDM QPSK	1	1	24.08	0	0.0
	1	40	24.02		0.0
	1	77	23.90		0.0
	36	0	22.96	0-1	1.0
	36	22	24.02	0	0.0
	36	43	22.98	0-1	1.0
	75	0	23.03		1.0
DFT-s-OFDM 16QAM	1	1	23.27	0-1	1.0
CP-OFDM QPSK	1	1	22.52	0-1.5	1.5

Note: NR Band n5 (Cell) at 15 MHz bandwidth does not support non-overlapping channels. Per FCC Guidance, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-47
NR Band n5 Measured P_{max} for all DSI - 10 MHz Bandwidth

NR Band n5 10 MHz Bandwidth					
			Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	167300 (836.5 MHz) Conducted Power [dBm]		
DFT-s-OFDM π/2 BPSK	1	1	23.92	0	0.0
	1	26	24.00		0.0
	1	50	23.99		0.0
	25	0	23.31	0-0.5	0.0
	25	14	23.87	0	0.0
	25	27	23.27	0-0.5	0.0
	50	0	23.31		0.0
DFT-s-OFDM QPSK	1	1	23.89	0	0.0
	1	26	23.88		0.0
	1	50	23.93		0.0
	25	0	22.97	0-1	1.0
	25	14	23.91	0	0.0
	25	27	22.89	0-1	1.0
	50	0	22.89		1.0
DFT-s-OFDM 16QAM	1	1	23.03	0-1	1.0
CP-OFDM QPSK	1	1	22.25	0-1.5	1.5

Note: NR Band n5 (Cell) at 10 MHz bandwidth does not support non-overlapping channels. Per FCC Guidance, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-48
NR Band n5 Measured P_{max} for all DSI - 5 MHz Bandwidth

NR Band n5 5 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	165300 (826.5 MHz)	167300 (836.5 MHz)	169300 (846.5 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	23.99	24.05	23.48	0	0.0
	1	13	23.82	23.96	23.36		0.0
	1	23	23.71	23.98	22.95		0.0
	12	0	23.24	23.34	23.00	0-0.5	0.0
	12	7	23.85	23.94	23.33	0	0.0
	12	13	23.15	23.23	22.89	0-0.5	0.0
	25	0	23.23	23.25	22.88		0.0
DFT-s-OFDM QPSK	1	1	23.91	23.96	23.39	0	0.0
	1	13	23.84	23.87	23.25		0.0
	1	23	23.76	23.91	22.84		0.0
	12	0	22.88	22.92	22.31	0-1	1.0
	12	7	23.91	23.93	23.30	0	0.0
	12	13	22.70	22.82	21.87	0-1	1.0
	25	0	22.76	22.87	22.31		1.0
DFT-s-OFDM 16QAM	1	1	23.06	23.11	22.61	0-1	1.0
CP-OFDM QPSK	1	1	22.33	22.31	21.77	0-1.5	1.5
	1	13					1.5
	1	23					1.5

9.5.2 NR Band n66 (AWS)

Table 9-49
NR Band n66 (AWS) Measured P_{Limit} - 20 MHz Bandwidth

NR Band n66 20 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	344000 (1720 MHz)	349000 (1745 MHz)	354000 (1770 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	23.67	23.73	23.90	0	0.0
	1	53	23.79	23.98	24.02		0.0
	1	104	23.61	23.57	23.88		0.0
	50	0	23.67	23.80	23.72	0-0.5	0.0
	50	28	23.60	23.72	23.88	0	0.0
	50	56	23.55	23.69	23.87	0-0.5	0.0
	100	0	23.58	23.72	23.83		0.0
DFT-s-OFDM QPSK	1	1	23.69	23.76	23.94	0	0.0
	1	53	23.75	**23.96**	23.95		0.0
	1	104	23.59	23.67	23.94		0.0
	50	0	23.57	**23.87**	23.86	0-1	0.0
	50	28	23.56	23.69	23.85	0	0.0
	50	56	23.51	23.69	23.84	0-1	0.0
	100	0	23.56	23.85	23.75		0.0
DFT-s-OFDM 16QAM	1	1	23.61	23.74	23.35	0-1	0.0
CP-OFDM QPSK	1	1	23.12	23.16	22.91	0-1.5	0.5

Table 9-50
NR Band n66 (AWS) Measured P_{Limit} - 15 MHz Bandwidth

NR Band n66 15 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	343500 (1717.5 MHz)	349000 (1745 MHz)	354500 (1772.5 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	23.42	23.63	23.78	0	0.0
	1	40	23.44	23.60	23.83		0.0
	1	77	23.50	23.59	23.87		0.0
	36	0	23.29	23.58	23.70	0-0.5	0.0
	36	22	23.33	23.55	23.65	0	0.0
	36	43	23.41	23.51	23.68	0-0.5	0.0
	75	0	23.32	23.55	23.71		0.0
DFT-s-OFDM QPSK	1	1	23.37	23.62	23.81	0	0.0
	1	40	23.31	23.55	23.69		0.0
	1	77	23.42	23.65	23.82		0.0
	36	0	23.31	23.60	23.69	0-1	0.0
	36	22	23.26	23.57	23.64	0	0.0
	36	43	23.38	23.61	23.71	0-1	0.0
	75	0	23.29	23.61	23.69		0.0
DFT-s-OFDM 16QAM	1	1	23.49	23.66	23.93	0-1	0.0
CP-OFDM QPSK	1	1	22.62	22.97	23.18	0-1.5	0.5

Table 9-51
NR Band n66 (AWS) Measured P_{Limit} - 10 MHz Bandwidth

NR Band n66 10 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	343000 (1715 MHz)	349000 (1745 MHz)	355000 (1775 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	23.40	23.56	23.86	0	0.0
	1	26	23.85	23.97	24.31		0.0
	1	50	23.46	23.71	23.92		0.0
	25	0	23.35	23.48	23.69	0-0.5	0.0
	25	14	23.34	23.51	23.75	0	0.0
	25	27	23.36	23.50	23.80	0-0.5	0.0
	50	0	23.39	23.52	23.70		0.0
DFT-s-OFDM QPSK	1	1	23.42	23.62	23.78	0	0.0
	1	26	23.40	23.58	23.76		0.0
	1	50	23.49	23.67	23.91		0.0
	25	0	23.38	23.51	23.66	0-1	0.0
	25	14	23.32	23.48	23.69	0	0.0
	25	27	23.30	23.51	23.65	0-1	0.0
	50	0	23.34	23.49	23.57		0.0
DFT-s-OFDM 16QAM	1	1	23.54	23.71	23.98	0-1	0.0
CP-OFDM QPSK	1	1	22.61	22.91	23.20	0-1.5	0.5

Table 9-52
NR Band n66 (AWS) Measured P_{Limit} - 5 MHz Bandwidth

NR Band n66 5 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	342500 (1712.5 MHz)	349000 (1745 MHz)	355500 (1777.5 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	23.50	23.55	23.79	0	0.0
	1	13	23.46	23.49	23.92		0.0
	1	23	23.42	23.46	23.87		0.0
	12	0	23.38	23.48	23.78	0-0.5	0.0
	12	7	23.49	23.59	23.91	0	0.0
	12	13	23.38	23.50	23.75	0-0.5	0.0
	25	0	23.39	23.45	23.74		0.0
DFT-s-OFDM QPSK	1	1	23.37	23.48	23.76	0	0.0
	1	13	23.42	23.53	23.90		0.0
	1	23	23.39	23.49	23.81		0.0
	12	0	23.38	23.52	23.68	0-1	0.0
	12	7	23.45	23.64	23.79	0	0.0
	12	13	23.40	23.51	23.83	0-1	0.0
	25	0	23.34	23.48	23.64		0.0
DFT-s-OFDM 16QAM	1	1	23.53	23.66	23.91	0-1	0.0
CP-OFDM QPSK	1	1	22.78	22.85	23.10	0-1.5	0.5

9.5.3 NR Band n2 (PCS)

Table 9-53
NR Band n2 (PCS) Measured P_{limit} - 20 MHz Bandwidth

NR Band n2 20 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	372000 (1860 MHz)	376000 (1880 MHz)	380000 (1900 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	23.71	24.18	23.94	0	0.0
	1	53	23.76	24.20	23.97		0.0
	1	104	23.68	24.15	23.88		0.0
	50	0	23.67	24.16	23.85	0-0.5	0.0
	50	28	23.69	24.13	23.91	0	0.0
	50	56	23.68	24.22	23.82	0-0.5	0.0
	100	0	23.63	23.76	23.88		0.0
DFT-s-OFDM QPSK	1	1	23.80	24.13	24.11	0	0.0
	1	53	23.82	**24.22**	24.01		0.0
	1	104	23.95	24.08	23.97		0.0
	50	0	23.69	24.03	23.87	0-1	0.0
	50	28	23.90	**24.15**	23.89	0	0.0
	50	56	23.66	24.07	23.84	0-1	0.0
	100	0	23.62	24.13	23.92		0.0
DFT-s-OFDM 16QAM	1	1	23.73	24.06	23.91	0-1	0.0
CP-OFDM QPSK	1	1	23.03	23.42	23.21	0-1.5	0.5

Table 9-54
NR Band n2 (PCS) Measured P_{limit} - 15 MHz Bandwidth

NR Band n2 15 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	371500 (1857.5 MHz)	376000 (1880 MHz)	380500 (1902.5 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	23.66	24.17	23.78	0	0.0
	1	40	23.72	24.21	23.99		0.0
	1	77	23.74	24.21	23.97		0.0
	36	0	23.50	24.03	23.84	0-0.5	0.0
	36	22	23.60	24.04	23.75	0	0.0
	36	43	23.66	24.10	23.78	0-0.5	0.0
	75	0	23.59	24.04	23.76		0.0
DFT-s-OFDM QPSK	1	1	23.54	24.03	23.82	0	0.0
	1	40	23.61	24.06	23.74		0.0
	1	77	23.62	23.99	23.70		0.0
	36	0	23.54	24.03	23.78	0-1	0.0
	36	22	23.59	24.05	23.70	0	0.0
	36	43	23.58	24.04	23.79	0-1	0.0
	75	0	23.59	24.02	23.77		0.0
DFT-s-OFDM 16QAM	1	1	23.67	24.06	23.93	0-1	0.0
CP-OFDM QPSK	1	1	22.83	23.42	23.24	0-1.5	0.5

Table 9-55
NR Band n2 (PCS) Measured P_{limit} - 10 MHz Bandwidth

NR Band n2 10 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	371000 (1855 MHz)	376000 (1880 MHz)	381000 (1905 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	23.46	24.07	23.54	0	0.0
	1	26	23.89	24.44	23.55		0.0
	1	50	23.52	23.96	23.51		0.0
	25	0	23.37	23.94	23.43	0-0.5	0.0
	25	14	23.45	23.93	23.48	0	0.0
	25	27	23.48	23.90	23.52	0-0.5	0.0
	50	0	23.46	23.93	23.51		0.0
DFT-s-OFDM QPSK	1	1	23.42	24.00	23.56	0	0.0
	1	26	23.49	24.01	23.52		0.0
	1	50	23.54	23.98	23.44		0.0
	25	0	23.36	23.83	23.46	0-1	0.0
	25	14	23.46	23.87	23.50	0	0.0
	25	27	23.43	23.85	23.49	0-1	0.0
	50	0	23.45	23.89	23.46		0.0
DFT-s-OFDM 16QAM	1	1	23.59	23.99	23.68	0-1	0.0
CP-OFDM QPSK	1	1	22.86	23.27	22.94	0-1.5	0.5

Table 9-56
NR Band n2 (PCS) Measured P_{limit} - 5 MHz Bandwidth

NR Band n2 5 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	370500 (1852.5 MHz)	376000 (1880 MHz)	381500 (1907.5 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM π/2 BPSK	1	1	23.42	24.02	23.51	0	0.0
	1	13	23.51	23.95	23.60		0.0
	1	23	23.55	23.99	23.55		0.0
	12	0	23.42	23.86	23.41	0-0.5	0.0
	12	7	23.56	24.00	23.57	0	0.0
	12	13	23.44	23.94	23.48	0-0.5	0.0
	25	0	23.38	23.88	23.41		0.0
DFT-s-OFDM QPSK	1	1	23.54	23.92	23.53	0	0.0
	1	13	23.53	23.91	23.47		0.0
	1	23	23.58	23.96	23.49		0.0
	12	0	23.44	23.88	23.48	0-1	0.0
	12	7	23.55	24.03	23.57	0	0.0
	12	13	23.47	23.89	23.49	0-1	0.0
	25	0	23.43	23.86	23.43		0.0
DFT-s-OFDM 16QAM	1	1	23.51	24.09	23.65	0-1	0.0
CP-OFDM QPSK	1	1	22.79	23.30	22.87	0-1.5	0.5

9.6 WLAN Conducted Powers

Table 9-57
2.4 GHz WLAN Maximum Average RF Power – Ant 1

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ac
		Average	Average	Average	Average
2412	1	19.75	15.62	15.02	15.06
2422	3		18.87	17.55	17.63
2437	6	19.84	18.89	17.51	17.57
2452	9		18.88	17.63	17.64
2462	11	19.53	16.11	15.11	15.12

Table 9-58
2.4 GHz WLAN Maximum Average RF Power – Ant 2

Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ac
		Average	Average	Average	Average
2412	1	19.52	16.19	15.07	15.09
2422	3		19.17	18.11	18.18
2437	6	20.04	19.13	18.32	18.31
2452	9		19.05	18.21	18.14
2462	11	19.66	16.25	15.26	15.35

Table 9-59
2.4 GHz WLAN Reduced Average RF Power– Ant 1

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ac
		Average	Average	Average	Average
2412	1	14.21	14.32	14.30	14.13
2437	6	14.51	14.45	14.18	14.27
2462	11	14.35	14.38	14.12	14.09

Table 9-60
2.4 GHz WLAN Reduced Average RF Power – Ant 2

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ac
		Average	Average	Average	Average
2412	1	14.13	14.34	14.15	14.14
2437	6	14.66	14.93	14.83	14.75
2462	11	14.49	14.65	14.56	14.54

Table 9-61
2.4 GHz WLAN Reduced Average RF Power - MIMO

2.4GHz 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
2412	1	14.30	14.15	17.24
2437	6	14.18	14.83	17.53
2462	11	14.12	14.56	17.36

Table 9-62
5 GHz WLAN Maximum Average RF Power – Ant 1

5GHz (20MHz) Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
		Average	Average	Average
5180	36	16.44	16.26	16.33
5200	40	18.59	18.51	18.49
5220	44	16.53	16.37	16.38
5240	48	16.57	16.45	16.45
5260	52	16.48	16.38	16.34
5280	56	18.45	18.35	18.41
5300	60	16.37	16.25	16.19
5320	64	16.30	16.20	16.23
5500	100	16.72	16.55	16.53
5600	120	16.35	16.26	16.22
5620	124	16.45	16.33	16.40
5720	144	16.75	16.69	16.71
5745	149	16.81	16.70	16.65
5785	157	18.84	18.70	18.70
5825	165	18.60	18.62	18.61

Table 9-63
5 GHz WLAN Maximum Average RF Power – Ant 2

5GHz (20MHz) Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
		Average	Average	Average
5180	36	16.49	16.32	16.40
5200	40	18.59	18.48	18.51
5220	44	16.51	16.37	16.35
5240	48	16.51	16.41	16.38
5260	52	16.59	16.44	16.42
5280	56	18.53	18.47	18.46
5300	60	16.54	16.44	16.43
5320	64	16.60	16.44	16.45
5500	100	16.68	16.56	16.49
5600	120	16.54	16.42	16.37
5620	124	16.51	16.41	16.35
5720	144	16.50	16.44	16.40
5745	149	16.48	16.37	16.36
5785	157	18.42	18.37	18.31
5825	165	18.51	18.44	18.37

Table 9-64
5 GHz WLAN Maximum Average RF Power – MIMO

5GHz (20MHz) 802.11n Conducted Power [dBm]				
Freq [MHz]	Channel	ANT1	ANT2	MIMO
5180	36	16.26	16.32	19.30
5200	40	18.51	18.48	21.51
5220	44	16.37	16.37	19.38
5240	48	16.45	16.41	19.44
5260	52	16.38	16.44	19.42
5280	56	18.35	18.47	21.42
5300	60	16.25	16.44	19.36
5320	64	16.20	16.44	19.33
5500	100	16.55	16.56	19.57
5600	120	16.26	16.42	19.35
5620	124	16.33	16.41	19.38
5720	144	16.69	16.44	19.58
5745	149	16.70	16.37	19.55
5785	157	18.70	18.37	21.55
5825	165	18.62	18.44	21.54

Table 9-65
5 GHz WLAN Reduced Average RF Power– Ant 1

5GHz (40MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11n	802.11ac
		Average	Average
5190	38	15.71	15.73
5230	46	15.70	15.66
5270	54	15.54	15.56
5310	62	15.33	15.34
5510	102	15.63	15.62
5590	118	15.76	15.68
5630	126	15.58	15.54
5710	142	15.92	15.90
5755	151	15.81	15.77
5795	159	15.93	15.98

Table 9-66
5 GHz WLAN Reduced Average RF Power– Ant 2

5GHz (40MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11n	802.11ac
		Average	Average
5190	38	15.41	15.39
5230	46	15.48	15.53
5270	54	15.44	15.46
5310	62	15.59	15.72
5510	102	15.78	15.86
5590	118	15.60	15.65
5630	126	15.71	15.75
5710	142	15.71	15.66
5755	151	15.61	15.66
5795	159	15.66	15.71

Table 9-67
5 GHz WLAN Reduced Average RF Power – MIMO

5GHz (40MHz) 802.11n Conducted Power [dBm]				
Freq [MHz]	**Channel**	**ANT1**	**ANT2**	**MIMO**
5190	38	15.71	15.41	18.57
5230	46	15.70	15.48	18.60
5270	54	15.54	15.44	18.50
5310	62	15.33	15.59	18.47
5510	102	15.63	15.78	18.72
5590	118	15.76	15.60	18.69
5630	126	15.58	15.71	18.66
5710	142	15.92	15.71	18.83
5755	151	15.81	15.61	18.72
5795	159	15.93	15.66	18.81

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

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

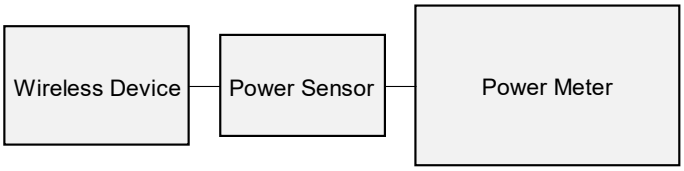


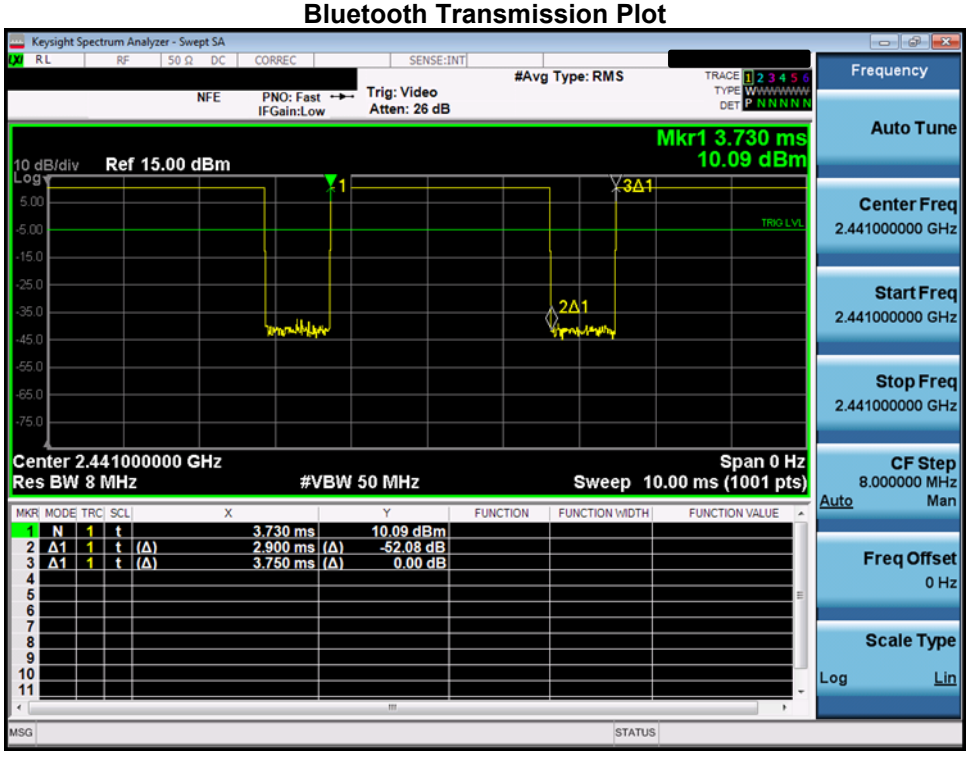
Figure 9-5
Power Measurement Setup

9.7 Bluetooth Conducted Powers

Table 9-68
Bluetooth Average RF Power

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
			[dBm]	[mW]
2402	1.0	0	10.31	10.741
2441	1.0	39	11.36	13.684
2480	1.0	78	10.29	10.686
2402	2.0	0	9.72	9.368
2441	2.0	39	10.78	11.959
2480	2.0	78	9.77	9.475
2402	3.0	0	9.76	9.467
2441	3.0	39	10.82	12.081
2480	3.0	78	9.76	9.470

Figure 9-6
Bluetooth Transmission Plot



Equation 9-1
Bluetooth Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.90\ ms}{3.75\ ms} * 100\% = 77.3\%$$

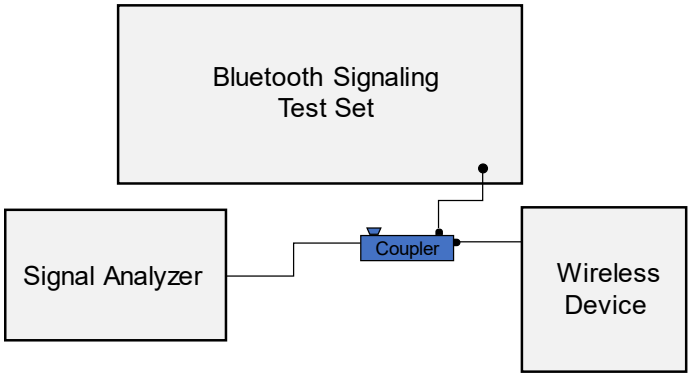


Figure 9-7
Power Measurement Setup

10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Tissue Properties - Head

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
6/15/2020	750 Head	21.3	680	0.863	43.213	0.888	42.305	-2.82%	2.15%
			695	0.868	43.169	0.889	42.227	-2.36%	2.23%
			700	0.870	43.157	0.889	42.201	-2.14%	2.27%
			710	0.873	43.136	0.890	42.149	-1.91%	2.34%
			725	0.878	43.105	0.891	42.071	-1.46%	2.46%
			750	0.888	43.036	0.894	41.942	-0.67%	2.61%
			770	0.895	42.971	0.895	41.838	0.00%	2.71%
			785	0.901	42.924	0.896	41.760	0.56%	2.79%
			800	0.906	42.881	0.897	41.682	1.00%	2.88%
5/20/2020	835 Head	21.2	820	0.896	40.883	0.899	41.578	-0.33%	-1.67%
			835	0.902	40.830	0.900	41.500	0.22%	-1.61%
			850	0.908	40.777	0.916	41.500	-0.87%	-1.74%
6/10/2020	835 Head	21.6	820	0.879	40.688	0.899	41.578	-2.22%	-2.14%
			835	0.886	40.641	0.900	41.500	-1.56%	-2.07%
			850	0.891	40.605	0.916	41.500	-2.73%	-2.16%
6/10/2020	1750 Head	21.7	1710	1.331	39.316	1.348	40.142	-1.26%	-2.06%
			1720	1.336	39.313	1.354	40.126	-1.33%	-2.03%
			1745	1.349	39.271	1.368	40.087	-1.39%	-2.04%
			1750	1.353	39.243	1.371	40.079	-1.31%	-2.09%
			1770	1.366	39.216	1.383	40.047	-1.23%	-2.08%
			1790	1.377	39.171	1.394	40.016	-1.22%	-2.11%
6/12/2020	1900 Head	21.8	1850	1.397	39.547	1.400	40.000	-0.21%	-1.13%
			1860	1.409	39.498	1.400	40.000	0.64%	-1.26%
			1880	1.429	39.398	1.400	40.000	2.07%	-1.50%
			1900	1.451	39.329	1.400	40.000	3.64%	-1.68%
			1905	1.456	39.293	1.400	40.000	4.00%	-1.77%
			1910	1.462	39.281	1.400	40.000	4.43%	-1.80%
6/26/2020	1900 Head	21.3	1850	1.370	40.338	1.400	40.000	-2.14%	0.85%
			1860	1.376	40.327	1.400	40.000	-1.71%	0.82%
			1880	1.388	40.304	1.400	40.000	-0.86%	0.76%
			1900	1.401	40.275	1.400	40.000	0.07%	0.69%
			1905	1.404	40.268	1.400	40.000	0.29%	0.67%
			1910	1.407	40.260	1.400	40.000	0.50%	0.65%
6/19/2020	2450 Head	22.4	2400	1.754	40.161	1.756	39.289	-0.11%	2.22%
			2450	1.791	40.085	1.800	39.200	-0.50%	2.26%
			2480	1.815	40.027	1.833	39.162	-0.98%	2.21%
6/23/2020	3500 Head	21.5	3500	2.905	39.728	2.913	37.929	-0.27%	4.74%
			3550	2.943	39.651	2.964	37.871	-0.71%	4.70%
			3560	2.951	39.630	2.974	37.860	-0.77%	4.68%
7/10/2020	5200-5800 Head	20.4	5250	4.488	37.144	4.706	35.929	-4.63%	3.38%
			5270	4.514	37.097	4.727	35.906	-4.51%	3.32%
			5310	4.565	37.078	4.768	35.860	-4.26%	3.40%
			5510	4.780	36.728	4.973	35.632	-3.88%	3.08%
			5600	4.885	36.581	5.065	35.529	-3.55%	2.96%
			5710	5.011	36.395	5.178	35.403	-3.23%	2.80%
			5750	5.063	36.350	5.219	35.357	-2.99%	2.81%
			5795	5.106	36.273	5.265	35.305	-3.02%	2.74%

Table 10-2
Measured Tissue Properties – Body

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
5/27/2020	750 Body	21.8	680	0.931	54.413	0.958	55.804	-2.82%	-2.49%
			695	0.936	54.384	0.959	55.745	-2.40%	-2.44%
			700	0.938	54.377	0.959	55.726	-2.19%	-2.42%
			710	0.941	54.358	0.960	55.687	-1.98%	-2.39%
			725	0.947	54.329	0.961	55.629	-1.46%	-2.34%
			750	0.957	54.277	0.964	55.531	-0.73%	-2.26%
			770	0.965	54.241	0.965	55.453	0.00%	-2.19%
			785	0.971	54.208	0.966	55.395	0.52%	-2.14%
			800	0.977	54.171	0.967	55.336	1.03%	-2.11%
6/22/2020	750 Body	23.5	680	0.926	56.823	0.958	55.804	-3.34%	1.83%
			695	0.930	56.794	0.959	55.745	-3.02%	1.88%
			700	0.932	56.786	0.959	55.726	-2.82%	1.90%
			710	0.936	56.768	0.960	55.687	-2.50%	1.94%
			725	0.941	56.738	0.961	55.629	-2.08%	1.99%
			750	0.951	56.673	0.964	55.531	-1.35%	2.06%
			770	0.958	56.627	0.965	55.453	-0.73%	2.12%
			785	0.963	56.593	0.966	55.395	-0.31%	2.16%
			800	0.969	56.561	0.967	55.336	0.21%	2.21%
6/15/2020	835 Body	21.7	820	0.946	53.588	0.969	55.258	-2.37%	-3.02%
			835	0.961	53.410	0.970	55.200	-0.93%	-3.24%
			850	0.977	53.282	0.988	55.154	-1.11%	-3.39%
6/17/2020	835 Body	21.6	820	0.934	53.236	0.969	55.258	-3.61%	-3.66%
			835	0.950	53.076	0.970	55.200	-2.06%	-3.85%
			850	0.966	52.921	0.988	55.154	-2.23%	-4.05%
6/24/2020	1750 Body	21.8	1710	1.470	52.117	1.463	53.537	0.48%	-2.65%
			1720	1.481	52.073	1.469	53.511	0.82%	-2.69%
			1745	1.508	51.959	1.485	53.445	1.55%	-2.78%
			1750	1.514	51.937	1.488	53.432	1.75%	-2.80%
			1770	1.535	51.851	1.501	53.379	2.27%	-2.86%
			1790	1.557	51.768	1.514	53.326	2.84%	-2.92%
6/22/2020	1900 Body	23.6	1850	1.521	52.013	1.520	53.300	0.07%	-2.41%
			1860	1.532	51.978	1.520	53.300	0.79%	-2.48%
			1880	1.554	51.904	1.520	53.300	2.24%	-2.62%
			1900	1.576	51.829	1.520	53.300	3.68%	-2.76%
			1905	1.582	51.809	1.520	53.300	4.08%	-2.80%
			1910	1.587	51.789	1.520	53.300	4.41%	-2.83%
6/24/2020	1900 Body	23.6	1850	1.507	51.459	1.520	53.300	-0.86%	-3.45%
			1860	1.518	51.425	1.520	53.300	-0.13%	-3.52%
			1880	1.540	51.366	1.520	53.300	1.32%	-3.63%
			1900	1.562	51.309	1.520	53.300	2.76%	-3.74%
			1905	1.567	51.295	1.520	53.300	3.09%	-3.76%
			1910	1.573	51.279	1.520	53.300	3.49%	-3.79%
6/26/2020	1900 Body	23.5	1850	1.499	52.195	1.520	53.300	-1.38%	-2.07%
			1860	1.511	52.158	1.520	53.300	-0.59%	-2.14%
			1880	1.532	52.088	1.520	53.300	0.79%	-2.27%
			1900	1.554	52.014	1.520	53.300	2.24%	-2.41%
			1905	1.559	51.995	1.520	53.300	2.57%	-2.45%
			1910	1.565	51.976	1.520	53.300	2.96%	-2.48%
6/29/2020	1900 Body	23.8	1850	1.528	51.458	1.520	53.300	0.53%	-3.46%
			1860	1.539	51.424	1.520	53.300	1.25%	-3.52%
			1880	1.561	51.358	1.520	53.300	2.70%	-3.64%
			1900	1.583	51.289	1.520	53.300	4.14%	-3.77%
			1905	1.589	51.270	1.520	53.300	4.54%	-3.81%
			1910	1.594	51.251	1.520	53.300	4.87%	-3.84%
7/1/2020	1900 Body	23.5	1850	1.529	52.474	1.520	53.300	0.59%	-1.55%
			1860	1.539	52.461	1.520	53.300	1.25%	-1.57%
			1880	1.563	52.387	1.520	53.300	2.83%	-1.71%
			1900	1.584	52.325	1.520	53.300	4.21%	-1.83%
			1905	1.589	52.322	1.520	53.300	4.54%	-1.83%
			1910	1.595	52.303	1.520	53.300	4.93%	-1.87%

Table 10-3
Measured Tissue Properties – Body Continued

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
6/22/2020	2450 Body	23.8	2400	1.963	50.850	1.902	52.767	3.21%	-3.63%
			2450	2.019	50.715	1.950	52.700	3.54%	-3.77%
			2480	2.056	50.628	1.993	52.662	3.16%	-3.86%
6/24/2020	3500 Body	22.3	3500	3.380	49.224	3.314	51.321	1.99%	-4.09%
			3550	3.432	49.172	3.372	51.254	1.78%	-4.06%
			3560	3.444	49.153	3.384	51.240	1.77%	-4.07%
6/14/2020	5200-5800 Body	21.0	5200	5.373	47.636	5.299	49.014	1.40%	-2.81%
			5220	5.398	47.594	5.323	48.987	1.41%	-2.84%
			5240	5.422	47.559	5.346	48.960	1.42%	-2.86%
			5260	5.453	47.517	5.369	48.933	1.56%	-2.89%
			5600	5.907	46.984	5.766	48.471	2.45%	-3.07%
			5745	6.109	46.749	5.936	48.275	2.91%	-3.16%
			5765	6.130	46.711	5.959	48.248	2.87%	-3.19%
			5785	6.159	46.687	5.982	48.220	2.96%	-3.18%
			5800	6.180	46.669	6.000	48.200	3.00%	-3.18%
			5805	6.184	46.665	6.006	48.193	2.96%	-3.17%
			5825	6.216	46.645	6.029	48.166	3.10%	-3.16%
6/29/2020	5200-5800 Body	22.9	5220	5.395	46.892	5.323	48.987	1.35%	-4.28%
			5240	5.419	46.847	5.346	48.960	1.37%	-4.32%
			5250	5.429	46.818	5.358	48.947	1.33%	-4.35%
			5260	5.445	46.791	5.369	48.933	1.42%	-4.38%
			5270	5.461	46.766	5.381	48.919	1.49%	-4.40%
			5280	5.478	46.754	5.393	48.906	1.58%	-4.40%
			5290	5.492	46.742	5.404	48.892	1.63%	-4.40%
			5300	5.505	46.736	5.416	48.879	1.64%	-4.38%
			5310	5.514	46.725	5.428	48.865	1.58%	-4.38%
			5320	5.526	46.713	5.439	48.851	1.60%	-4.38%
			5500	5.763	46.408	5.650	48.607	2.00%	-4.52%
			5510	5.778	46.387	5.661	48.594	2.07%	-4.54%
			5520	5.791	46.370	5.673	48.580	2.08%	-4.55%
			5530	5.805	46.363	5.685	48.566	2.11%	-4.54%
			5540	5.816	46.355	5.696	48.553	2.11%	-4.53%
			5550	5.825	46.339	5.708	48.539	2.05%	-4.53%
			5560	5.835	46.314	5.720	48.526	2.01%	-4.56%
			5580	5.864	46.281	5.743	48.499	2.11%	-4.57%
			5600	5.896	46.244	5.766	48.471	2.25%	-4.59%
			5610	5.912	46.221	5.778	48.458	2.32%	-4.62%
			5620	5.930	46.207	5.790	48.444	2.42%	-4.62%
			5640	5.955	46.191	5.813	48.417	2.44%	-4.60%
			5660	5.979	46.160	5.837	48.390	2.43%	-4.61%
			5670	5.992	46.139	5.848	48.376	2.46%	-4.62%
			5680	6.007	46.120	5.860	48.363	2.51%	-4.64%
			5690	6.020	46.100	5.872	48.349	2.52%	-4.65%
			5700	6.036	46.078	5.883	48.336	2.60%	-4.67%
			5710	6.051	46.061	5.895	48.322	2.65%	-4.68%
			5720	6.063	46.045	5.907	48.309	2.64%	-4.69%
			5745	6.096	46.016	5.936	48.275	2.70%	-4.68%
			5750	6.103	46.008	5.942	48.268	2.71%	-4.68%
			5785	6.149	45.952	5.982	48.220	2.79%	-4.70%
			5795	6.163	45.935	5.994	48.207	2.82%	-4.71%
			5800	6.171	45.925	6.000	48.200	2.85%	-4.72%
			5805	6.177	45.918	6.006	48.193	2.85%	-4.72%
			5825	6.202	45.887	6.029	48.166	2.87%	-4.73%

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 D.

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 SAR_{1g} (W/kg)	1 W Target SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	$Deviation_{1g}$ (%)
E	750	HEAD	06/15/2020	22.5	21.5	0.200	1054	3589	1.770	8.630	8.850	2.55%
P	835	HEAD	05/20/2020	21.9	21.8	0.200	4d132	7551	1.930	9.650	9.650	0.00%
L	835	HEAD	06/10/2020	24.0	21.6	0.200	4d132	7410	1.860	9.650	9.300	-3.63%
P	1750	HEAD	06/10/2020	23.5	21.7	0.100	1150	7551	3.780	36.500	37.800	3.56%
P	1900	HEAD	06/12/2020	23.9	22.0	0.100	5d148	7551	4.190	39.100	41.900	7.16%
L	1900	HEAD	06/26/2020	24.6	21.8	0.100	5d148	7410	4.120	39.100	41.200	5.37%
L	2450	HEAD	06/19/2020	24.9	22.5	0.100	981	7410	5.330	52.300	53.300	1.91%
D	3500	HEAD	06/23/2020	22.1	21.5	0.100	1059	7488	6.240	64.600	62.400	-3.41%
H	5250	HEAD	07/10/2020	21.4	22.0	0.050	1057	7357	3.700	79.200	74.000	-6.57%
H	5600	HEAD	07/10/2020	21.4	22.0	0.050	1057	7357	4.110	84.100	82.200	-2.26%
H	5750	HEAD	07/10/2020	21.4	22.0	0.050	1057	7357	3.790	80.500	75.800	-5.84%
L	750	BODY	05/27/2020	22.4	21.8	0.200	1054	7410	1.710	8.530	8.550	0.23%
E	750	BODY	06/22/2020	23.2	22.0	0.200	1003	3589	1.820	8.610	9.100	5.69%
P	835	BODY	06/15/2020	23.1	21.7	0.200	4d132	7551	1.940	9.960	9.700	-2.61%
P	835	BODY	06/17/2020	22.0	21.6	0.200	4d047	7551	2.020	9.470	10.100	6.65%
L	1750	BODY	06/24/2020	24.3	21.8	0.100	1148	7410	3.910	36.300	39.100	7.71%
H	1900	BODY	06/22/2020	21.5	21.8	0.100	5d080	7357	4.070	39.200	40.700	3.83%
H	1900	BODY	06/24/2020	22.2	22.0	0.100	5d080	7357	4.050	39.200	40.500	3.32%
H	1900	BODY	06/26/2020	22.1	22.0	0.100	5d080	7357	3.870	39.200	38.700	-1.28%
K	2450	BODY	06/22/2020	22.0	22.0	0.100	719	7547	5.200	50.800	52.000	2.36%
D	3500	BODY	06/24/2020	22.5	22.3	0.100	1059	7488	6.610	65.100	66.100	1.54%
G	5250	BODY	06/14/2020	22.6	22.4	0.050	1191	7538	3.590	77.000	71.800	-6.75%
G	5250	BODY	06/29/2020	21.9	22.9	0.050	1237	7538	3.520	75.600	70.400	-6.88%
G	5600	BODY	06/14/2020	22.6	22.4	0.050	1191	7538	3.760	78.600	75.200	-4.33%
G	5600	BODY	06/29/2020	21.9	22.9	0.050	1237	7538	3.840	78.500	76.800	-2.17%
G	5750	BODY	06/14/2020	22.6	22.4	0.050	1191	7538	3.680	76.900	73.600	-4.29%
G	5750	BODY	06/29/2020	21.9	22.9	0.050	1237	7538	3.580	75.900	71.600	-5.67%

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 SAR_{10g} (W/kg)	1 W Target SAR_{10g} (W/kg)	1 W Normalized SAR_{10g} (W/kg)	$Deviation_{10g}$ (%)
L	1750	BODY	06/24/2020	24.3	21.8	0.100	1148	7410	2.080	19.300	20.800	7.77%
H	1900	BODY	06/22/2020	21.5	21.8	0.100	5d080	7357	2.090	20.600	20.900	1.46%
H	1900	BODY	06/24/2020	22.2	22.0	0.100	5d080	7357	2.080	20.600	20.800	0.97%
J	1900	BODY	06/29/2020	22.5	23.8	0.100	5d149	7571	2.200	20.700	22.000	6.28%
J	1900	BODY	07/01/2020	23.0	23.0	0.100	5d149	7571	2.160	20.700	21.600	4.35%
G	5250	BODY	06/29/2020	21.9	22.9	0.050	1237	7538	0.976	21.200	19.520	-7.92%
G	5600	BODY	06/29/2020	21.9	22.9	0.050	1237	7538	1.060	22.000	21.200	-3.64%
G	5750	BODY	06/29/2020	21.9	22.9	0.050	1237	7538	0.980	21.200	19.600	-7.55%

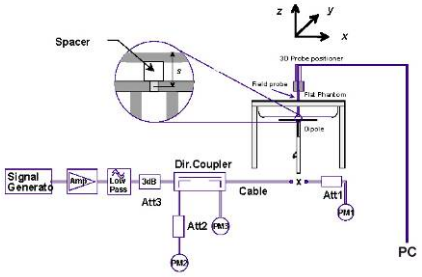


Figure 10-1
System Verification Setup Diagram

Figure 10-2
System Verification Setup Photo

11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

Table 11-1
GSM 850 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	# of Time Slots	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.5	33.30	-0.07	Right	Cheek	00227	1	1:8.3	0.096	1.047	0.101	
836.60	190	GSM 850	GSM	33.5	33.30	-0.01	Right	Tilt	00227	1	1:8.3	0.054	1.047	0.057	
836.60	190	GSM 850	GSM	33.5	33.30	0.13	Left	Cheek	00227	1	1:8.3	0.130	1.047	0.136	
836.60	190	GSM 850	GSM	33.5	33.30	0.04	Left	Tilt	00227	1	1:8.3	0.059	1.047	0.062	
836.60	190	GSM 850	GPRS	32.0	31.37	-0.08	Right	Cheek	00227	2	1:4.15	0.115	1.156	0.133	
836.60	190	GSM 850	GPRS	32.0	31.37	0.03	Right	Tilt	00227	2	1:4.15	0.072	1.156	0.083	
836.60	190	GSM 850	GPRS	32.0	31.37	0.03	Left	Cheek	00227	2	1:4.15	0.154	1.156	0.178	A1
836.60	190	GSM 850	GPRS	32.0	31.37	-0.13	Left	Tilt	00227	2	1:4.15	0.072	1.156	0.083	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-2
GSM 1900 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	# of Time Slots	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1880.00	661	GSM 1900	GSM	30.5	30.48	0.04	Right	Cheek	00227	1	1:8.3	0.052	1.005	0.052	
1880.00	661	GSM 1900	GSM	30.5	30.48	0.05	Right	Tilt	00227	1	1:8.3	0.016	1.005	0.016	
1880.00	661	GSM 1900	GSM	30.5	30.48	-0.03	Left	Cheek	00227	1	1:8.3	0.045	1.005	0.045	
1880.00	661	GSM 1900	GSM	30.5	30.48	0.14	Left	Tilt	00227	1	1:8.3	0.033	1.005	0.033	
1880.00	661	GSM 1900	GPRS	29.0	28.87	0.06	Right	Cheek	00227	2	1:4.15	0.059	1.030	0.061	A2
1880.00	661	GSM 1900	GPRS	29.0	28.87	0.02	Right	Tilt	00227	2	1:4.15	0.020	1.030	0.021	
1880.00	661	GSM 1900	GPRS	29.0	28.87	0.06	Left	Cheek	00227	2	1:4.15	0.058	1.030	0.060	
1880.00	661	GSM 1900	GPRS	29.0	28.87	-0.06	Left	Tilt	00227	2	1:4.15	0.042	1.030	0.043	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-3
UMTS 850 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Ant State	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	25.5	25.50	0.09	Right	Cheek	32	00227	1:1	0.146	1.000	0.146	
836.60	4183	UMTS 850	RMC	25.5	25.50	0.03	Right	Tilt	32	00227	1:1	0.088	1.000	0.088	
836.60	4183	UMTS 850	RMC	25.5	25.50	0.14	Left	Cheek	32	00227	1:1	0.189	1.000	0.189	A3
836.60	4183	UMTS 850	RMC	25.5	25.50	-0.02	Left	Tilt	32	00227	1:1	0.090	1.000	0.090	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-4
UMTS 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	9400	UMTS 1900	RMC	25.5	25.44	0.08	Right	Cheek	00268	1:1	0.136	1.014	0.138	A4
1880.00	9400	UMTS 1900	RMC	25.5	25.44	0.02	Right	Tilt	00268	1:1	0.046	1.014	0.047	
1880.00	9400	UMTS 1900	RMC	25.5	25.44	0.15	Left	Cheek	00268	1:1	0.123	1.014	0.125	
1880.00	9400	UMTS 1900	RMC	25.5	25.44	0.03	Left	Tilt	00268	1:1	0.096	1.014	0.097	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-5
Cell. CDMA Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Ant State	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.52	384	Cell. CDMA	RC3 / SO55	25.5	25.43	0.06	Right	Cheek	17	00227	1:1	0.138	1.016	0.140	
836.52	384	Cell. CDMA	RC3 / SO55	25.5	25.43	0.06	Right	Tilt	17	00227	1:1	0.083	1.016	0.084	
836.52	384	Cell. CDMA	RC3 / SO55	25.5	25.43	0.03	Left	Cheek	17	00227	1:1	0.191	1.016	0.194	A5
836.52	384	Cell. CDMA	RC3 / SO55	25.5	25.43	0.04	Left	Tilt	17	00227	1:1	0.073	1.016	0.074	
836.52	384	Cell. CDMA	EVDO Rev. A	25.5	25.40	0.02	Right	Cheek	17	00227	1:1	0.147	1.023	0.150	
836.52	384	Cell. CDMA	EVDO Rev. A	25.5	25.40	-0.12	Right	Tilt	17	00227	1:1	0.079	1.023	0.081	
836.52	384	Cell. CDMA	EVDO Rev. A	25.5	25.40	-0.17	Left	Cheek	17	00227	1:1	0.179	1.023	0.183	
836.52	384	Cell. CDMA	EVDO Rev. A	25.5	25.40	0.03	Left	Tilt	17	00227	1:1	0.072	1.023	0.074	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-6
PCS CDMA Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	600	PCS CDMA	RC3 / SO55	25.5	25.50	0.20	Right	Cheek	00268	1:1	0.137	1.000	0.137	A6
1880.00	600	PCS CDMA	RC3 / SO55	25.5	25.50	0.02	Right	Tilt	00268	1:1	0.039	1.000	0.039	
1880.00	600	PCS CDMA	RC3 / SO55	25.5	25.50	0.05	Left	Cheek	00268	1:1	0.122	1.000	0.122	
1880.00	600	PCS CDMA	RC3 / SO55	25.5	25.50	0.04	Left	Tilt	00268	1:1	0.096	1.000	0.096	
1880.00	600	PCS CDMA	EVDO Rev. A	25.5	25.48	0.02	Right	Cheek	00268	1:1	0.134	1.005	0.135	
1880.00	600	PCS CDMA	EVDO Rev. A	25.5	25.48	0.10	Right	Tilt	00268	1:1	0.053	1.005	0.053	
1880.00	600	PCS CDMA	EVDO Rev. A	25.5	25.48	0.02	Left	Cheek	00268	1:1	0.123	1.005	0.124	
1880.00	600	PCS CDMA	EVDO Rev. A	25.5	25.48	0.02	Left	Tilt	00268	1:1	0.085	1.005	0.085	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-7
LTE Band 12 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Ant State	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.5	25.35	-0.01	0	Right	Cheek	11	QPSK	1	25	00383	1:1	0.150	1.035	0.155	
707.50	23095	Mid	LTE Band 12	10	24.5	24.32	0.13	1	Right	Cheek	11	QPSK	25	25	00383	1:1	0.117	1.042	0.122	
707.50	23095	Mid	LTE Band 12	10	25.5	25.35	-0.08	0	Right	Tilt	11	QPSK	1	25	00383	1:1	0.080	1.035	0.083	
707.50	23095	Mid	LTE Band 12	10	24.5	24.32	0.03	1	Right	Tilt	11	QPSK	25	25	00383	1:1	0.066	1.042	0.069	
707.50	23095	Mid	LTE Band 12	10	25.5	25.35	0.03	0	Left	Cheek	11	QPSK	1	25	00383	1:1	0.150	1.035	0.155	A7
707.50	23095	Mid	LTE Band 12	10	24.5	24.32	0.01	1	Left	Cheek	11	QPSK	25	25	00383	1:1	0.121	1.042	0.126	
707.50	23095	Mid	LTE Band 12	10	25.5	25.35	0.03	0	Left	Tilt	11	QPSK	1	25	00383	1:1	0.071	1.035	0.073	
707.50	23095	Mid	LTE Band 12	10	24.5	24.32	0.07	1	Left	Tilt	11	QPSK	25	25	00383	1:1	0.046	1.042	0.048	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-8
LTE Band 13 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Ant State	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	25.5	25.41	0.04	0	Right	Cheek	24	QPSK	1	25	00383	1:1	0.155	1.021	0.158	A8
782.00	23230	Mid	LTE Band 13	10	24.5	24.44	0.10	1	Right	Cheek	24	QPSK	25	25	00383	1:1	0.127	1.014	0.129	
782.00	23230	Mid	LTE Band 13	10	25.5	25.41	-0.16	0	Right	Tilt	24	QPSK	1	25	00383	1:1	0.087	1.021	0.089	
782.00	23230	Mid	LTE Band 13	10	24.5	24.44	-0.20	1	Right	Tilt	24	QPSK	25	25	00383	1:1	0.079	1.014	0.080	
782.00	23230	Mid	LTE Band 13	10	25.5	25.41	0.05	0	Left	Cheek	24	QPSK	1	25	00383	1:1	0.109	1.021	0.111	
782.00	23230	Mid	LTE Band 13	10	24.5	24.44	0.00	1	Left	Cheek	24	QPSK	25	25	00383	1:1	0.079	1.014	0.080	
782.00	23230	Mid	LTE Band 13	10	25.5	25.41	0.00	0	Left	Tilt	24	QPSK	1	25	00383	1:1	0.037	1.021	0.038	
782.00	23230	Mid	LTE Band 13	10	24.5	24.44	0.20	1	Left	Tilt	24	QPSK	25	25	00383	1:1	0.029	1.014	0.029	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-9
LTE Band 5 (Cell) Head SAR

MEASUREMENT RESULTS																								
1 CC Uplink | 2 CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Ant State	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
		MHz	Ch.																				
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.17	0.13	0	Right	Cheek	17	QPSK	1	25	00235	1:1	0.139	1.079	0.150	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.35	-0.08	1	Right	Cheek	17	QPSK	25	12	00235	1:1	0.108	1.035	0.112	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.17	0.03	0	Right	Tilt	17	QPSK	1	25	00235	1:1	0.069	1.079	0.074	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.35	-0.05	1	Right	Tilt	17	QPSK	25	12	00235	1:1	0.055	1.035	0.057	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.93	0.16	0	Left	Cheek	17	QPSK	1	0	00235	1:1	0.160	1.140	0.182	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.17	0.10	0	Left	Cheek	17	QPSK	1	25	00235	1:1	0.159	1.079	0.172	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.35	0.00	1	Left	Cheek	17	QPSK	25	12	00235	1:1	0.129	1.035	0.134	
2 CC Uplink	PCC	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.50	0.03	0	Left	Cheek	17	QPSK	1	0	00235	1:1	0.188	1.000	0.188	A9
	SCC	829.30	20453			5										24						
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.17	0.13	0	Left	Tilt	17	QPSK	1	25	00235	1:1	0.063	1.079	0.068	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.35	0.14	1	Left	Tilt	17	QPSK	25	12	00235	1:1	0.050	1.035	0.052	

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

Table 11-10
LTE Band 66 (AWS) Head SAR

MEASUREMENT RESULTS																		
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																		
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.5	25.44	0.02	0	Right	Cheek	QPSK	1	50	00227	1:1	0.162	1.014	0.164	A10
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.5	24.50	0.01	1	Right	Cheek	QPSK	50	25	00227	1:1	0.129	1.000	0.129	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.5	25.44	0.19	0	Right	Tilt	QPSK	1	50	00227	1:1	0.065	1.014	0.066	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.5	24.50	0.02	1	Right	Tilt	QPSK	50	25	00227	1:1	0.051	1.000	0.051	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.5	25.44	0.14	0	Left	Cheek	QPSK	1	50	00227	1:1	0.092	1.014	0.093	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.5	24.50	0.01	1	Left	Cheek	QPSK	50	25	00227	1:1	0.070	1.000	0.070	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.5	25.44	0.05	0	Left	Tilt	QPSK	1	50	00227	1:1	0.066	1.014	0.067	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.5	24.50	0.02	1	Left	Tilt	QPSK	50	25	00227	1:1	0.051	1.000	0.051	

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

Table 11-11
LTE Band 2 (PCS) Head SAR

FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #
MHz	Ch.																		
1880.00	18900	Mid	LTE Band 2 (PCS)	20	25.5	25.46	0.14	0	Right	Cheek	QPSK	1	50	00227	1:1	0.140	1.009	0.141	A11
1880.00	18900	Mid	LTE Band 2 (PCS)	20	24.5	24.50	0.07	1	Right	Cheek	QPSK	50	25	00227	1:1	0.118	1.000	0.118	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	25.5	25.46	0.16	0	Right	Tilt	QPSK	1	50	00227	1:1	0.049	1.009	0.049	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	24.5	24.50	0.16	1	Right	Tilt	QPSK	50	25	00227	1:1	0.039	1.000	0.039	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	25.5	25.46	-0.01	0	Left	Cheek	QPSK	1	50	00227	1:1	0.132	1.009	0.133	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	24.5	24.50	0.05	1	Left	Cheek	QPSK	50	25	00227	1:1	0.098	1.000	0.098	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	25.5	25.46	0.10	0	Left	Tilt	QPSK	1	50	00227	1:1	0.081	1.009	0.082	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	24.5	24.50	0.03	1	Left	Tilt	QPSK	50	25	00227	1:1	0.076	1.000	0.076	

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

Table 11-12
LTE Band 48 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
3560.00	55340	Low	LTE Band 48	20	23.5	23.50	0.02	0	Right	Cheek	QPSK	1	50	00284	1:1.58	0.069	1.000	0.069	
3560.00	55340	Low	LTE Band 48	20	23.5	23.36	0.03	0	Right	Cheek	QPSK	50	25	00284	1:1.58	0.072	1.033	0.074	
3560.00	55340	Low	LTE Band 48	20	23.5	23.50	0.05	0	Right	Tilt	QPSK	1	50	00284	1:1.58	0.028	1.000	0.028	
3560.00	55340	Low	LTE Band 48	20	23.5	23.36	0.08	0	Right	Tilt	QPSK	50	25	00284	1:1.58	0.029	1.033	0.030	
3560.00	55340	Low	LTE Band 48	20	23.5	23.50	0.17	0	Left	Cheek	QPSK	1	50	00284	1:1.58	0.088	1.000	0.088	
3560.00	55340	Low	LTE Band 48	20	23.5	23.36	0.06	0	Left	Cheek	QPSK	50	25	00284	1:1.58	0.113	1.033	**0.117**	A12
3560.00	55340	Low	LTE Band 48	20	23.5	23.50	0.09	0	Left	Tilt	QPSK	1	50	00284	1:1.58	0.103	1.000	0.103	
3560.00	55340	Low	LTE Band 48	20	23.5	23.36	-0.10	0	Left	Tilt	QPSK	50	25	00284	1:1.58	0.112	1.033	0.116	

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

Table 11-13
NR Band n5 (Cell) Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Ant 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)	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.43	-0.03	0	Right	Cheek	17	DFT-S-OFDM	QPSK	1	1	00292	1:1	0.075	1.089	0.082	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.18	0.16	0	Right	Cheek	17	DFT-S-OFDM	QPSK	50	28	00292	1:1	0.074	1.153	0.085	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.43	0.03	0	Right	Tilt	17	DFT-S-OFDM	QPSK	1	1	00292	1:1	0.045	1.089	0.049	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.18	0.19	0	Right	Tilt	17	DFT-S-OFDM	QPSK	50	28	00292	1:1	0.038	1.153	0.044	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.43	-0.09	0	Left	Cheek	17	DFT-S-OFDM	QPSK	1	1	00292	1:1	0.101	1.089	0.110	A13
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.18	0.08	0	Left	Cheek	17	DFT-S-OFDM	QPSK	50	28	00292	1:1	0.095	1.153	0.110	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.3	22.58	0.12	1.5	Left	Cheek	17	CP-OFDM	QPSK	1	1	00292	1:1	0.063	1.180	0.074	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.43	-0.14	0	Left	Tilt	17	DFT-S-OFDM	QPSK	1	1	00292	1:1	0.031	1.089	0.034	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.18	0.04	0	Left	Tilt	17	DFT-S-OFDM	QPSK	50	28	00292	1:1	0.034	1.153	0.039	

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

Table 11-14
NR Band n66 (AWS) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.96	0.07	0	Right	Cheek	DFT-S-OFDM	QPSK	1	53	00300	1:1	0.116	1.132	0.131	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.87	0.10	0	Right	Cheek	DFT-S-OFDM	QPSK	50	0	00300	1:1	0.118	1.156	0.136	A14
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.0	23.16	0.02	0.5	Right	Cheek	CP-OFDM	QPSK	1	1	00300	1:1	0.113	1.213	0.137	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.96	0.03	0	Right	Tilt	DFT-S-OFDM	QPSK	1	53	00300	1:1	0.058	1.132	0.066	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.87	0.03	0	Right	Tilt	DFT-S-OFDM	QPSK	50	0	00300	1:1	0.060	1.156	0.069	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.96	0.20	0	Left	Cheek	DFT-S-OFDM	QPSK	1	53	00300	1:1	0.067	1.132	0.076	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.87	0.02	0	Left	Cheek	DFT-S-OFDM	QPSK	50	0	00300	1:1	0.063	1.156	0.073	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.96	0.03	0	Left	Tilt	DFT-S-OFDM	QPSK	1	53	00300	1:1	0.045	1.132	0.051	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.87	0.03	0	Left	Tilt	DFT-S-OFDM	QPSK	50	0	00300	1:1	0.049	1.156	0.057	

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

Table 11-15
NR Band n2 (PCS) Head SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.22	0.12	0	Right	Cheek	DFT-S-OFDM	QPSK	1	53	00292	1:1	0.177	1.067	0.189	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.15	0.01	0	Right	Cheek	DFT-S-OFDM	QPSK	50	28	00292	1:1	0.187	1.084	**0.203**	A15
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.0	23.42	-0.01	0.5	Right	Cheek	CP-OFDM	QPSK	1	1	00292	1:1	0.163	1.143	0.186	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.22	0.02	0	Right	Tilt	DFT-S-OFDM	QPSK	1	53	00292	1:1	0.070	1.067	0.075	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.15	0.16	0	Right	Tilt	DFT-S-OFDM	QPSK	50	28	00292	1:1	0.070	1.084	0.076	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.22	0.19	0	Left	Cheek	DFT-S-OFDM	QPSK	1	53	00292	1:1	0.109	1.067	0.116	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.15	0.03	0	Left	Cheek	DFT-S-OFDM	QPSK	50	28	00292	1:1	0.119	1.084	0.129	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.22	-0.05	0	Left	Tilt	DFT-S-OFDM	QPSK	1	53	00292	1:1	0.134	1.067	0.143	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.15	0.01	0	Left	Tilt	DFT-S-OFDM	QPSK	50	28	00292	1:1	0.139	1.084	0.151	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									**Head 1.6 W/kg (mW/g) averaged over 1 gram**												

Table 11-16
DTS Head SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Ant Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	15.0	14.51	0.18	Right	Cheek	1	00425	1	99.3	0.481	0.294	1.119	1.007	0.331	
2437	6	802.11b	DSSS	22	15.0	14.51	0.03	Right	Tilt	1	00425	1	99.3	0.463	-	1.119	1.007	-	
2437	6	802.11b	DSSS	22	15.0	14.51	0.20	Left	Cheek	1	00425	1	99.3	0.145	-	1.119	1.007	-	
2437	6	802.11b	DSSS	22	15.0	14.51	0.04	Left	Tilt	1	00425	1	99.3	0.169	-	1.119	1.007	-	
2437	6	802.11b	DSSS	22	15.0	14.66	0.06	Right	Cheek	2	00425	1	99.3	0.719	0.490	1.081	1.007	0.533	
2437	6	802.11b	DSSS	22	15.0	14.66	0.04	Right	Tilt	2	00425	1	99.3	0.927	0.531	1.081	1.007	**0.578**	A16
2437	6	802.11b	DSSS	22	15.0	14.66	0.07	Left	Cheek	2	00425	1	99.3	0.385	-	1.081	1.007	-	
2437	6	802.11b	DSSS	22	15.0	14.66	-0.20	Left	Tilt	2	00425	1	99.3	0.544	-	1.081	1.007	-	
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 11-17
NII Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Ant Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5270	54	802.11n	OFDM	40	16.0	15.54	0.20	Right	Cheek	1	00417	13.5	97.4	0.186	0.062	1.112	1.027	0.071	
5270	54	802.11n	OFDM	40	16.0	15.54	0.20	Right	Tilt	1	00417	13.5	97.4	0.174	-	1.112	1.027	-	
5270	54	802.11n	OFDM	40	16.0	15.54	0.06	Left	Cheek	1	00417	13.5	97.4	0.134	-	1.112	1.027	-	
5270	54	802.11n	OFDM	40	16.0	15.54	0.10	Left	Tilt	1	00417	13.5	97.4	0.109	-	1.112	1.027	-	
5310	62	802.11n	OFDM	40	16.0	15.59	-0.02	Right	Cheek	2	00417	13.5	97.3	0.259	0.153	1.099	1.028	0.173	
5310	62	802.11n	OFDM	40	16.0	15.59	0.20	Right	Tilt	2	00417	13.5	97.3	0.176	-	1.099	1.028	-	
5310	62	802.11n	OFDM	40	16.0	15.59	-0.10	Left	Cheek	2	00417	13.5	97.3	0.113	-	1.099	1.028	-	
5310	62	802.11n	OFDM	40	16.0	15.59	0.04	Left	Tilt	2	00417	13.5	97.3	0.072	-	1.099	1.028	-	
5710	142	802.11n	OFDM	40	16.0	15.92	0.00	Right	Cheek	1	00417	13.5	97.4	0.018	-	1.019	1.027	-	
5710	142	802.11n	OFDM	40	16.0	15.92	0.01	Right	Tilt	1	00417	13.5	97.4	0.032	-	1.019	1.027	-	
5710	142	802.11n	OFDM	40	16.0	15.92	0.01	Left	Cheek	1	00417	13.5	97.4	0.045	-	1.019	1.027	-	
5710	142	802.11n	OFDM	40	16.0	15.92	0.01	Left	Tilt	1	00417	13.5	97.4	0.054	0.018	1.019	1.027	0.019	
5510	102	802.11n	OFDM	40	16.0	15.78	-0.06	Right	Cheek	2	00417	13.5	97.3	0.956	0.379	1.052	1.028	**0.410**	A17
5510	102	802.11n	OFDM	40	16.0	15.78	0.10	Right	Tilt	2	00417	13.5	97.3	0.404	0.175	1.052	1.028	0.189	
5510	102	802.11n	OFDM	40	16.0	15.78	-0.20	Left	Cheek	2	00417	13.5	97.3	0.260	-	1.052	1.028	-	
5510	102	802.11n	OFDM	40	16.0	15.78	0.04	Left	Tilt	2	00417	13.5	97.3	0.206	-	1.052	1.028	-	
5795	159	802.11n	OFDM	40	16.0	15.93	0.01	Right	Cheek	1	00417	13.5	97.4	0.031	-	1.016	1.027	-	
5795	159	802.11n	OFDM	40	16.0	15.93	0.01	Right	Tilt	1	00417	13.5	97.4	0.034	-	1.016	1.027	-	
5795	159	802.11n	OFDM	40	16.0	15.93	0.01	Left	Cheek	1	00417	13.5	97.4	0.045	-	1.016	1.027	-	
5795	159	802.11n	OFDM	40	16.0	15.93	0.01	Left	Tilt	1	00417	13.5	97.4	0.067	0.019	1.016	1.027	0.020	
5795	159	802.11n	OFDM	40	16.0	15.66	0.10	Right	Cheek	2	00417	13.5	97.3	0.504	0.205	1.081	1.028	0.228	
5795	159	802.11n	OFDM	40	16.0	15.66	-0.04	Right	Tilt	2	00417	13.5	97.3	0.392	-	1.081	1.028	-	
5795	159	802.11n	OFDM	40	16.0	15.66	0.05	Left	Cheek	2	00417	13.5	97.3	0.228	-	1.081	1.028	-	
5795	159	802.11n	OFDM	40	16.0	15.66	0.03	Left	Tilt	2	00417	13.5	97.3	0.198	-	1.081	1.028	-	

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

Table 11-18
DSS Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441.00	39	Bluetooth	FHSS	11.5	11.36	-0.03	Right	Cheek	00425	1	77.3	0.095	1.033	1.294	**0.127**	A18
2441.00	39	Bluetooth	FHSS	11.5	11.36	0.06	Right	Tilt	00425	1	77.3	0.065	1.033	1.294	0.087	
2441.00	39	Bluetooth	FHSS	11.5	11.36	-0.06	Left	Cheek	00425	1	77.3	0.023	1.033	1.294	0.031	
2441.00	39	Bluetooth	FHSS	11.5	11.36	0.08	Left	Tilt	00425	1	77.3	0.038	1.033	1.294	0.051	

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

11.2 Standalone Body-Worn SAR Data

Table 11-19
GSM/UMTS/CDMA Body-Worn SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Ant State	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.5	33.30	-0.05	10 mm	N/A	00268	1	1:8.3	back	0.423	1.047	0.443	
836.60	190	GSM 850	GPRS	32.0	31.37	-0.14	10 mm	N/A	00227	2	1:4.15	back	0.477	1.156	0.551	A19
1880.00	661	GSM 1900	GSM	30.5	30.48	-0.04	10 mm	N/A	00383	1	1:8.3	back	0.389	1.005	0.391	
1880.00	661	GSM 1900	GPRS	29.0	28.87	0.03	10 mm	N/A	00383	2	1:4.15	back	0.550	1.030	0.567	A21
836.60	4183	UMTS 850	RMC	25.5	25.50	-0.03	10 mm	17	00268	N/A	1:1	back	0.586	1.000	0.586	A23
1852.40	9262	UMTS 1900	RMC	25.5	25.49	-0.02	10 mm	N/A	00235	N/A	1:1	back	1.090	1.002	1.092	
1880.00	9400	UMTS 1900	RMC	25.5	25.44	-0.02	10 mm	N/A	00235	N/A	1:1	back	1.120	1.014	1.136	A24
1907.60	9538	UMTS 1900	RMC	25.5	25.42	0.01	10 mm	N/A	00235	N/A	1:1	back	1.050	1.019	1.070	
836.52	384	Cell. CDMA	TDSO / SO32	25.5	25.42	-0.01	10 mm	17	00227	N/A	1:1	back	0.569	1.019	0.580	A26
1851.25	25	PCS CDMA	TDSO / SO32	25.5	25.50	-0.03	10 mm	N/A	00383	N/A	1:1	back	1.060	1.000	1.060	A28
1880.00	600	PCS CDMA	TDSO / SO32	25.5	25.49	-0.02	10 mm	N/A	00383	N/A	1:1	back	1.040	1.002	1.042	
1908.75	1175	PCS CDMA	TDSO / SO32	25.5	25.48	0.02	10 mm	N/A	00383	N/A	1:1	back	1.000	1.005	1.005	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-20
LTE Body-Worn SAR

MEASUREMENT RESULTS																								
1 CC Uplink | 2 CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Ant State	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
		MHz	Ch.																(W/kg)		(W/kg)	
1 CC Uplink	N/A	707.50	23095	Mid	LTE Band 12	10	25.5	25.35	-0.03	0	12	00268	QPSK	1	25	10 mm	back	1:1	0.315	1.035	0.326	A30
1 CC Uplink	N/A	707.50	23095	Mid	LTE Band 12	10	24.5	24.32	0.10	1	12	00268	QPSK	25	25	10 mm	back	1:1	0.254	1.042	0.265	
1 CC Uplink	N/A	782.00	23230	Mid	LTE Band 13	10	25.5	25.41	-0.04	0	24	00268	QPSK	1	25	10 mm	back	1:1	0.459	1.021	0.469	A31
1 CC Uplink	N/A	782.00	23230	Mid	LTE Band 13	10	24.5	24.44	-0.12	1	24	00268	QPSK	25	25	10 mm	back	1:1	0.386	1.014	0.391	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.93	-0.03	0	17	00268	QPSK	1	0	10 mm	back	1:1	0.528	1.140	0.602	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.17	-0.01	0	17	00268	QPSK	1	25	10 mm	back	1:1	0.574	1.079	0.619	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.35	0.18	1	17	00268	QPSK	25	12	10 mm	back	1:1	0.487	1.035	0.504	
2 CC Uplink	PCC	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.50	-0.05	0	17	00268	QPSK	1	0	10 mm	back	1:1	0.624	1.000	0.624	A32
	SCC	829.30	20453			5									24							
1 CC Uplink	N/A	1720.00	132072	Low	LTE Band 66 (AWS)	20	25.5	25.25	0.01	0	N/A	00268	QPSK	1	50	10 mm	back	1:1	0.832	1.059	0.881	
1 CC Uplink	N/A	1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.5	25.44	0.00	0	N/A	00268	QPSK	1	50	10 mm	back	1:1	0.833	1.014	0.845	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	25.5	25.35	0.00	0	N/A	00268	QPSK	1	50	10 mm	back	1:1	0.930	1.035	0.963	A33
1 CC Uplink	N/A	1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.5	24.50	0.00	1	N/A	00268	QPSK	50	25	10 mm	back	1:1	0.688	1.000	0.688	
1 CC Uplink	N/A	1720.00	132072	Low	LTE Band 66 (AWS)	20	24.5	24.42	-0.02	1	N/A	00268	QPSK	100	0	10 mm	back	1:1	0.673	1.019	0.686	
1 CC Uplink	N/A	1770.00	132572	High	LTE Band 66 (AWS)	20	25.5	25.35	0.00	0	N/A	00268	QPSK	1	50	10 mm	back	1:1	0.893	1.035	0.924	
1 CC Uplink	N/A	1860.00	18700	Low	LTE Band 2 (PCS)	20	25.5	25.41	-0.01	0	N/A	00235	QPSK	1	50	10 mm	back	1:1	1.150	1.021	1.174	A35
1 CC Uplink	N/A	1880.00	18900	Mid	LTE Band 2 (PCS)	20	25.5	25.46	0.06	0	N/A	00235	QPSK	1	50	10 mm	back	1:1	1.130	1.009	1.140	
1 CC Uplink	N/A	1900.00	19100	High	LTE Band 2 (PCS)	20	25.5	25.20	-0.04	0	N/A	00235	QPSK	1	50	10 mm	back	1:1	1.110	1.072	**1.190**	
1 CC Uplink	N/A	1860.00	18700	Low	LTE Band 2 (PCS)	20	24.5	24.45	-0.01	1	N/A	00235	QPSK	50	0	10 mm	back	1:1	0.911	1.012	0.922	
1 CC Uplink	N/A	1880.00	18900	Mid	LTE Band 2 (PCS)	20	24.5	24.50	0.01	1	N/A	00235	QPSK	50	25	10 mm	back	1:1	0.932	1.000	0.932	
1 CC Uplink	N/A	1900.00	19100	High	LTE Band 2 (PCS)	20	24.5	24.49	0.01	1	N/A	00235	QPSK	50	50	10 mm	back	1:1	0.888	1.002	0.890	
1 CC Uplink	N/A	1860.00	18700	Low	LTE Band 2 (PCS)	20	24.5	24.49	0.01	1	N/A	00235	QPSK	100	0	10 mm	back	1:1	0.946	1.002	0.948	
1 CC Uplink	N/A	1860.00	18700	Low	LTE Band 2 (PCS)	20	25.5	25.41	0.01	0	N/A	00235	QPSK	1	50	10 mm	back	1:1	1.100	1.021	1.123	
1 CC Uplink	N/A	3560.00	55340	Low	LTE Band 48	20	23.5	23.50	0.06	0	N/A	00284	QPSK	1	50	10 mm	back	1:1.58	0.327	1.000	0.327	
1 CC Uplink	N/A	3560.00	55340	Low	LTE Band 48	20	23.5	23.36	0.14	0	N/A	00284	QPSK	50	25	10 mm	back	1:1.58	0.337	1.033	**0.348**	A37
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram									

Note: Blue entries represent variability measurements

Table 11-21
NR Body-Worn SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.43	-0.08	0	00292	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.424	1.089	0.462	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.18	-0.05	0	00292	DFT-S-OFDM	QPSK	50	28	10 mm	back	1:1	0.429	1.153	0.495	A38
836.50	167300	Mid	NR Band n5 (Cell)	20	23.3	22.58	0.00	1.5	00292	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.292	1.180	0.345	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.96	-0.02	0	00300	DFT-S-OFDM	QPSK	1	53	10 mm	back	1:1	0.290	1.132	0.328	A39
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.87	0.06	0	00300	DFT-S-OFDM	QPSK	50	0	10 mm	back	1:1	0.281	1.156	0.325	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.0	23.16	0.09	0.5	00300	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.241	1.213	0.292	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.22	-0.02	0	00292	DFT-S-OFDM	QPSK	1	53	10 mm	back	1:1	0.488	1.067	0.521	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.15	-0.08	0	00292	DFT-S-OFDM	QPSK	50	28	10 mm	back	1:1	0.502	1.084	0.544	A41
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.0	23.42	-0.18	0.5	00292	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.408	1.143	0.466	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Body 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-22
DTS Body-Worn SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Ant Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	20.5	19.84	0.12	10 mm	1	00417	1	back	99.3	0.307	0.195	1.164	1.007	0.229	
2437	6	802.11b	DSSS	22	15.0	14.51	-0.03	10 mm	1	00417	1	back	99.3	0.088	0.055	1.119	1.007	0.062	
2437	6	802.11b	DSSS	22	20.5	20.04	0.20	10 mm	2	00417	1	back	99.3	0.373	0.269	1.112	1.007	**0.301**	A43
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**								**Body** **1.6 W/kg (mW/g)** averaged over 1 gram											

Table 11-23
DTS MIMO Body-Worn SAR for Conditions with 5G NR FR2

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Spacing	Ant Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															W/kg	(W/kg)			(W/kg)	
2437	6	802.11n	OFDM	20	15.0	14.18	15.0	14.83	-0.04	10 mm	MIMO	00417	13	back	98.2	0.166	0.112	1.208	1.018	0.138	
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:
1. For channel 6, to achieve the 18.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 15.0 dBm.

Table 11-24
NII Body-Worn SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Ant Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5280	56	802.11a	OFDM	20	19.0	18.45	0.19	10 mm	1	00417	6	back	98.3	0.489	0.215	1.135	1.017	0.248	
5280	56	802.11a	OFDM	20	19.0	18.53	0.07	10 mm	2	00417	6	back	96.4	0.270	0.117	1.114	1.037	0.135	
5310	62	802.11n	OFDM	40	16.0	15.59	-0.03	10 mm	2	00417	13.5	back	97.3	0.248	0.103	1.099	1.028	0.116	
5720	144	802.11a	OFDM	20	17.0	16.75	0.02	10 mm	1	00417	6	back	98.3	0.253	0.105	1.059	1.017	0.113	
5500	100	802.11a	OFDM	20	17.0	16.68	0.03	10 mm	2	00417	6	back	96.4	0.782	0.319	1.076	1.037	**0.356**	
5510	102	802.11n	OFDM	40	16.0	15.78	0.13	10 mm	2	00417	13.5	back	97.3	0.370	0.159	1.052	1.028	0.172	
5785	157	802.11a	OFDM	20	19.0	18.84	0.01	10 mm	1	00417	6	back	98.3	0.471	0.195	1.038	1.017	0.206	
5825	165	802.11a	OFDM	20	19.0	18.51	-0.05	10 mm	2	00417	6	back	96.4	0.616	0.293	1.119	1.037	0.340	
5795	159	802.11n	OFDM	40	16.0	15.66	0.20	10 mm	2	00417	13.5	back	97.3	0.399	0.196	1.081	1.028	0.218	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**								**Body** **1.6 W/kg (mW/g)** averaged over 1 gram											

Table 11-25
NII MIMO Body-Worn SAR

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Spacing	Ant Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															W/kg	(W/kg)			(W/kg)	
5280	56	802.11n	OFDM	20	19.0	18.35	19.0	18.47	-0.02	10 mm	MIMO	00417	13	back	98.2	0.704	0.303	1.161	1.018	0.358	
5270	54	802.11n	OFDM	40	16.0	15.54	16.0	15.44	0.19	10 mm	MIMO	00417	27	back	97.2	0.317	0.131	1.138	1.029	0.153	
5720	144	802.11n	OFDM	20	17.0	16.69	17.0	16.44	-0.15	10 mm	MIMO	00417	13	back	98.2	0.898	0.405	1.138	1.018	0.469	
5710	142	802.11n	OFDM	40	16.0	15.92	16.0	15.71	0.09	10 mm	MIMO	00417	27	back	97.2	0.770	0.304	1.069	1.029	0.334	
5785	157	802.11n	OFDM	20	19.0	18.70	19.0	18.37	-0.01	10 mm	MIMO	00417	13	back	98.2	0.984	0.451	1.156	1.018	0.531	A45
5795	159	802.11n	OFDM	40	16.0	15.93	16.0	15.66	0.14	10 mm	MIMO	00417	27	back	97.2	0.691	0.295	1.081	1.029	0.328	
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:

1. For channel 56, 157 to achieve the 22.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 19.0 dBm. For channel 144 to achieve the 20.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 17.0 dBm. For channel 54, 142,159 to achieve the 19.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 16.0 dBm.

Table 11-26
DSS Body-Worn SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441	39	Bluetooth	FHSS	11.5	11.36	0.02	10 mm	00425	1	back	77.3	0.016	1.033	1.294	**0.021**	A47
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 11-27
GPRS/UMTS/CDMA Hotspot SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Ant State	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
836.60	190	GSM 850	GPRS	32.0	31.37	-0.14	10 mm	N/A	00227	2	1:4.15	back	0.477	1.156	0.551	
836.60	190	GSM 850	GPRS	32.0	31.37	-0.06	10 mm	N/A	00227	2	1:4.15	front	0.518	1.156	0.599	A20
836.60	190	GSM 850	GPRS	32.0	31.37	0.12	10 mm	N/A	00227	2	1:4.15	bottom	0.225	1.156	0.260	
836.60	190	GSM 850	GPRS	32.0	31.37	-0.10	10 mm	N/A	00227	2	1:4.15	right	0.216	1.156	0.250	
1880.00	661	GSM 1900	GPRS	29.0	28.87	0.03	10 mm	N/A	00383	2	1:4.15	back	0.550	1.030	0.567	
1880.00	661	GSM 1900	GPRS	29.0	28.87	-0.01	10 mm	N/A	00383	2	1:4.15	front	0.364	1.030	0.375	
1850.20	512	GSM 1900	GPRS	29.0	28.45	-0.03	10 mm	N/A	00383	2	1:4.15	bottom	0.899	1.135	1.020	A22
1880.00	661	GSM 1900	GPRS	29.0	28.87	-0.05	10 mm	N/A	00383	2	1:4.15	bottom	0.781	1.030	0.804	
1909.80	810	GSM 1900	GPRS	29.0	28.81	-0.02	10 mm	N/A	00383	2	1:4.15	bottom	0.796	1.045	0.832	
1880.00	661	GSM 1900	GPRS	29.0	28.87	0.09	10 mm	N/A	00383	2	1:4.15	left	0.120	1.030	0.124	
836.60	4183	UMTS 850	RMC	25.5	25.50	-0.03	10 mm	17	00268	N/A	1:1	back	0.586	1.000	0.586	A23
836.60	4183	UMTS 850	RMC	25.5	25.50	0.03	10 mm	17	00268	N/A	1:1	front	0.506	1.000	0.506	
836.60	4183	UMTS 850	RMC	25.5	25.50	0.11	10 mm	17	00268	N/A	1:1	bottom	0.255	1.000	0.255	
836.60	4183	UMTS 850	RMC	25.5	25.50	-0.03	10 mm	17	00268	N/A	1:1	right	0.221	1.000	0.221	
1852.40	9262	UMTS 1900	RMC	23.0	22.91	0.02	10 mm	N/A	00235	N/A	1:1	back	0.602	1.021	0.615	
1880.00	9400	UMTS 1900	RMC	23.0	22.94	0.03	10 mm	N/A	00235	N/A	1:1	back	0.620	1.014	0.629	
1907.60	9538	UMTS 1900	RMC	23.0	22.80	-0.01	10 mm	N/A	00235	N/A	1:1	back	0.578	1.047	0.605	
1880.00	9400	UMTS 1900	RMC	23.0	22.94	0.03	10 mm	N/A	00235	N/A	1:1	front	0.459	1.014	0.465	
1852.40	9262	UMTS 1900	RMC	23.0	22.91	-0.05	10 mm	N/A	00235	N/A	1:1	bottom	0.930	1.021	0.950	
1880.00	9400	UMTS 1900	RMC	23.0	22.94	-0.01	10 mm	N/A	00235	N/A	1:1	bottom	0.937	1.014	0.950	A25
1907.60	9538	UMTS 1900	RMC	23.0	22.80	-0.02	10 mm	N/A	00235	N/A	1:1	bottom	0.892	1.047	0.934	
1880.00	9400	UMTS 1900	RMC	23.0	22.94	0.02	10 mm	N/A	00235	N/A	1:1	left	0.156	1.014	0.158	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.5	25.41	-0.02	10 mm	17	00227	N/A	1:1	back	0.620	1.021	0.633	
824.70	1013	Cell. CDMA	EVDO Rev. 0	25.5	25.16	-0.02	10 mm	17	00227	N/A	1:1	front	0.535	1.081	0.578	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.5	25.41	-0.01	10 mm	17	00227	N/A	1:1	front	0.621	1.021	0.634	A27
848.31	777	Cell. CDMA	EVDO Rev. 0	25.5	25.49	0.05	10 mm	17	00227	N/A	1:1	front	0.500	1.002	0.501	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.5	25.41	0.02	10 mm	17	00227	N/A	1:1	bottom	0.074	1.021	0.076	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.5	25.41	0.06	10 mm	17	00227	N/A	1:1	right	0.230	1.021	0.235	
1880.00	600	PCS CDMA	EVDO Rev. 0	23.0	23.00	-0.10	10 mm	N/A	00383	N/A	1:1	back	0.481	1.000	0.481	
1880.00	600	PCS CDMA	EVDO Rev. 0	23.0	23.00	-0.02	10 mm	N/A	00383	N/A	1:1	front	0.337	1.000	0.337	
1851.25	25	PCS CDMA	EVDO Rev. 0	23.0	22.88	-0.05	10 mm	N/A	00383	N/A	1:1	bottom	0.757	1.028	0.778	
1880.00	600	PCS CDMA	EVDO Rev. 0	23.0	23.00	-0.02	10 mm	N/A	00383	N/A	1:1	bottom	0.777	1.000	0.777	A29
1908.75	1175	PCS CDMA	EVDO Rev. 0	23.0	23.00	-0.02	10 mm	N/A	00383	N/A	1:1	bottom	0.765	1.000	0.765	
1880.00	600	PCS CDMA	EVDO Rev. 0	23.0	23.00	-0.20	10 mm	N/A	00383	N/A	1:1	left	0.109	1.000	0.109	
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 11-28
LTE Band 12 Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Ant State	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
707.50	23095	Mid	LTE Band 12	10	25.5	25.35	-0.03	0	12	00268	QPSK	1	25	10 mm	back	1:1	0.315	1.035	0.326	A30
707.50	23095	Mid	LTE Band 12	10	24.5	24.32	0.10	1	12	00268	QPSK	25	25	10 mm	back	1:1	0.254	1.042	0.265	
707.50	23095	Mid	LTE Band 12	10	25.5	25.35	0.04	0	12	00268	QPSK	1	25	10 mm	front	1:1	0.272	1.035	0.282	
707.50	23095	Mid	LTE Band 12	10	24.5	24.32	0.04	1	12	00268	QPSK	25	25	10 mm	front	1:1	0.227	1.042	0.237	
707.50	23095	Mid	LTE Band 12	10	25.5	25.35	-0.02	0	12	00268	QPSK	1	25	10 mm	bottom	1:1	0.142	1.035	0.147	
707.50	23095	Mid	LTE Band 12	10	24.5	24.32	-0.01	1	12	00268	QPSK	25	25	10 mm	bottom	1:1	0.109	1.042	0.114	
707.50	23095	Mid	LTE Band 12	10	25.5	25.35	-0.02	0	12	00268	QPSK	1	25	10 mm	right	1:1	0.229	1.035	0.237	
707.50	23095	Mid	LTE Band 12	10	24.5	24.32	0.13	1	12	00268	QPSK	25	25	10 mm	right	1:1	0.172	1.042	0.179	
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 11-29
LTE Band 13 Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Ant State	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
782.00	23230	Mid	LTE Band 13	10	25.5	25.41	-0.04	0	24	00268	QPSK	1	25	10 mm	back	1:1	0.459	1.021	0.469	A31
782.00	23230	Mid	LTE Band 13	10	24.5	24.44	-0.12	1	24	00268	QPSK	25	25	10 mm	back	1:1	0.386	1.014	0.391	
782.00	23230	Mid	LTE Band 13	10	25.5	25.41	0.03	0	24	00268	QPSK	1	25	10 mm	front	1:1	0.347	1.021	0.354	
782.00	23230	Mid	LTE Band 13	10	24.5	24.44	0.03	1	24	00268	QPSK	25	25	10 mm	front	1:1	0.280	1.014	0.284	
782.00	23230	Mid	LTE Band 13	10	25.5	25.41	0.10	0	24	00268	QPSK	1	25	10 mm	bottom	1:1	0.163	1.021	0.166	
782.00	23230	Mid	LTE Band 13	10	24.5	24.44	-0.05	1	24	00268	QPSK	25	25	10 mm	bottom	1:1	0.135	1.014	0.137	
782.00	23230	Mid	LTE Band 13	10	25.5	25.41	0.02	0	24	00268	QPSK	1	25	10 mm	right	1:1	0.146	1.021	0.149	
782.00	23230	Mid	LTE Band 13	10	24.5	24.44	0.06	1	24	00268	QPSK	25	25	10 mm	right	1:1	0.116	1.014	0.118	
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 11-30
LTE Band 5 (Cell) Hotspot SAR

MEASUREMENT RESULTS																							
1 CC Uplink | 2 CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Ant State	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
		MHz	Ch.																(W/kg)		(W/kg)	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	24.93	-0.03	0	17	00268	QPSK	1	0	10 mm	back	1:1	0.528	1.140	0.602	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.17	-0.01	0	17	00268	QPSK	1	25	10 mm	back	1:1	0.574	1.079	0.619	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.35	0.18	1	17	00268	QPSK	25	12	10 mm	back	1:1	0.487	1.035	0.504	
2 CC Uplink	PCC	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.50	-0.05	0	17	00268	QPSK	1	0	10 mm	back	1:1	0.624	1.000	0.624	A32
	SCC	829.30	20453			5									24							
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.17	-0.08	0	17	00268	QPSK	1	25	10 mm	front	1:1	0.539	1.079	0.582	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.35	0.04	1	17	00268	QPSK	25	12	10 mm	front	1:1	0.444	1.035	0.460	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.17	-0.07	0	17	00268	QPSK	1	25	10 mm	bottom	1:1	0.274	1.079	0.296	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.35	-0.06	1	17	00268	QPSK	25	12	10 mm	bottom	1:1	0.226	1.035	0.234	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	25.5	25.17	0.00	0	17	00268	QPSK	1	25	10 mm	right	1:1	0.220	1.079	0.237	
1 CC Uplink	N/A	836.50	20525	Mid	LTE Band 5 (Cell)	10	24.5	24.35	0.07	1	17	00268	QPSK	25	12	10 mm	right	1:1	0.177	1.035	0.183	
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 11-31
LTE Band 66 (AWS) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.45	-0.01	0	00268	QPSK	1	50	10 mm	back	1:1	0.501	1.135	0.569	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.58	-0.03	0	00268	QPSK	50	25	10 mm	back	1:1	0.529	1.102	0.583	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.45	-0.20	0	00268	QPSK	1	50	10 mm	front	1:1	0.410	1.135	0.465	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.58	-0.10	0	00268	QPSK	50	25	10 mm	front	1:1	0.432	1.102	0.476	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.45	0.03	0	00268	QPSK	1	50	10 mm	bottom	1:1	0.754	1.135	0.856	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.12	0.04	0	00268	QPSK	1	50	10 mm	bottom	1:1	0.742	1.225	0.909	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.0	23.16	0.07	0	00268	QPSK	1	50	10 mm	bottom	1:1	0.736	1.213	0.893	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.58	0.01	0	00268	QPSK	50	25	10 mm	bottom	1:1	0.797	1.102	0.878	A34
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.52	0.03	0	00268	QPSK	50	25	10 mm	bottom	1:1	0.779	1.117	0.870	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.0	23.57	0.06	0	00268	QPSK	50	25	10 mm	bottom	1:1	0.768	1.104	0.848	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.44	-0.01	0	00268	QPSK	100	0	10 mm	bottom	1:1	0.782	1.138	0.890	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.45	-0.04	0	00268	QPSK	1	50	10 mm	left	1:1	0.140	1.135	0.159	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.58	0.04	0	00268	QPSK	50	25	10 mm	left	1:1	0.145	1.102	0.160	
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 11-32
LTE Band 2 (PCS) Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.08	0.01	0	00235	QPSK	1	50	10 mm	back	1:1	0.600	1.102	0.661	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.13	0.00	0	00235	QPSK	50	25	10 mm	back	1:1	0.616	1.089	0.671	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.08	-0.05	0	00235	QPSK	1	50	10 mm	front	1:1	0.455	1.102	0.501	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.13	-0.06	0	00235	QPSK	50	25	10 mm	front	1:1	0.471	1.089	0.513	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	23.03	-0.07	0	00235	QPSK	1	50	10 mm	bottom	1:1	1.070	1.114	1.192	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.08	-0.05	0	00235	QPSK	1	50	10 mm	bottom	1:1	1.020	1.102	1.124	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.5	22.86	-0.05	0	00235	QPSK	1	99	10 mm	bottom	1:1	0.927	1.159	1.074	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	23.12	-0.04	0	00235	QPSK	50	50	10 mm	bottom	1:1	1.080	1.091	1.178	A36
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.13	-0.06	0	00235	QPSK	50	25	10 mm	bottom	1:1	1.040	1.089	1.133	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.5	23.08	-0.05	0	00235	QPSK	50	25	10 mm	bottom	1:1	1.050	1.102	1.157	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	23.05	-0.05	0	00235	QPSK	100	0	10 mm	bottom	1:1	1.060	1.109	1.176	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.08	-0.04	0	00235	QPSK	1	50	10 mm	left	1:1	0.154	1.102	0.170	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.13	0.04	0	00235	QPSK	50	25	10 mm	left	1:1	0.154	1.089	0.168	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Body 1.6 W/kg (mW/g) averaged over 1 gram					

Table 11-33
LTE Band 48 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
3560.00	55340	Low	LTE Band 48	20	23.5	23.50	0.06	0	00284	QPSK	1	50	10 mm	back	1:1.58	0.327	1.000	0.327	
3560.00	55340	Low	LTE Band 48	20	23.5	23.36	0.14	0	00284	QPSK	50	25	10 mm	back	1:1.58	0.337	1.033	**0.348**	A37
3560.00	55340	Low	LTE Band 48	20	23.5	23.50	0.03	0	00284	QPSK	1	50	10 mm	front	1:1.58	0.037	1.000	0.037	
3560.00	55340	Low	LTE Band 48	20	23.5	23.36	0.02	0	00284	QPSK	50	25	10 mm	front	1:1.58	0.040	1.033	0.041	
3560.00	55340	Low	LTE Band 48	20	23.5	23.50	-0.02	0	00284	QPSK	1	50	10 mm	top	1:1.58	0.032	1.000	0.032	
3560.00	55340	Low	LTE Band 48	20	23.5	23.36	-0.16	0	00284	QPSK	50	25	10 mm	top	1:1.58	0.032	1.033	0.033	
3560.00	55340	Low	LTE Band 48	20	23.5	23.50	-0.11	0	00284	QPSK	1	50	10 mm	right	1:1.58	0.168	1.000	0.168	
3560.00	55340	Low	LTE Band 48	20	23.5	23.36	0.02	0	00284	QPSK	50	25	10 mm	right	1:1.58	0.172	1.033	0.178	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**										**Body** **1.6 W/kg (mW/g)** averaged over 1 gram									

Table 11-34
NR Band n5 (Cell) Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Ant State	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																	(W/kg)		(W/kg)	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.43	-0.08	0	17	00292	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.424	1.089	0.462	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.18	-0.05	0	17	00292	DFT-S-OFDM	QPSK	50	28	10 mm	back	1:1	0.429	1.153	0.495	A38
836.50	167300	Mid	NR Band n5 (Cell)	20	23.3	22.58	0.00	1.5	17	00292	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.292	1.180	0.345	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.43	-0.02	0	17	00292	DFT-S-OFDM	QPSK	1	1	10 mm	front	1:1	0.391	1.089	0.426	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.18	0.07	0	17	00292	DFT-S-OFDM	QPSK	50	28	10 mm	front	1:1	0.398	1.153	0.459	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.43	-0.04	0	17	00292	DFT-S-OFDM	QPSK	1	1	10 mm	bottom	1:1	0.228	1.089	0.248	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.18	-0.11	0	17	00292	DFT-S-OFDM	QPSK	50	28	10 mm	bottom	1:1	0.214	1.153	0.247	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.43	0.00	0	17	00292	DFT-S-OFDM	QPSK	1	1	10 mm	right	1:1	0.173	1.089	0.188	
836.50	167300	Mid	NR Band n5 (Cell)	20	24.8	24.18	-0.03	0	17	00292	DFT-S-OFDM	QPSK	50	28	10 mm	right	1:1	0.189	1.153	0.218	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**												**Body** **1.6 W/kg (mW/g)** averaged over 1 gram									

Table 11-35
NR Band n66 (AWS) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.96	-0.02	0	00300	DFT-S-OFDM	QPSK	1	53	10 mm	back	1:1	0.290	1.132	0.328	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.87	0.06	0	00300	DFT-S-OFDM	QPSK	50	0	10 mm	back	1:1	0.281	1.156	0.325	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.96	-0.05	0	00300	DFT-S-OFDM	QPSK	1	53	10 mm	front	1:1	0.223	1.132	0.252	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.87	0.04	0	00300	DFT-S-OFDM	QPSK	50	0	10 mm	front	1:1	0.221	1.156	0.255	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.96	-0.01	0	00300	DFT-S-OFDM	QPSK	1	53	10 mm	right	1:1	0.540	1.132	0.611	
1720.00	344000	Low	NR Band n66 (AWS)	20	24.5	23.57	-0.08	0	00300	DFT-S-OFDM	QPSK	50	0	10 mm	right	1:1	0.472	1.239	0.585	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.87	-0.01	0	00300	DFT-S-OFDM	QPSK	50	0	10 mm	right	1:1	0.596	1.156	0.689	
1770.00	354000	High	NR Band n66 (AWS)	20	24.5	23.86	-0.10	0	00300	DFT-S-OFDM	QPSK	50	0	10 mm	right	1:1	0.770	1.159	0.892	A40
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.5	23.85	-0.10	0	00300	DFT-S-OFDM	QPSK	100	0	10 mm	right	1:1	0.620	1.161	0.720	
1745.00	349000	Mid	NR Band n66 (AWS)	20	24.0	23.16	-0.03	0.5	00300	CP-OFDM	QPSK	1	1	10 mm	right	1:1	0.449	1.213	0.545	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**												**Body** **1.6 W/kg (mW/g)** averaged over 1 gram									

Table 11-36
NR Band n2 (PCS) Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.22	-0.02	0	00292	DFT-S-OFDM	QPSK	1	53	10 mm	back	1:1	0.488	1.067	0.521	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.15	-0.08	0	00292	DFT-S-OFDM	QPSK	50	28	10 mm	back	1:1	0.502	1.084	0.544	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.22	0.02	0	00292	DFT-S-OFDM	QPSK	1	53	10 mm	front	1:1	0.386	1.067	0.412	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.15	-0.03	0	00292	DFT-S-OFDM	QPSK	50	28	10 mm	front	1:1	0.396	1.084	0.429	
1860.00	372000	Low	NR Band n2 (PCS)	20	24.5	23.95	0.01	0	00292	DFT-S-OFDM	QPSK	1	104	10 mm	right	1:1	0.863	1.135	0.980	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.22	-0.03	0	00292	DFT-S-OFDM	QPSK	1	53	10 mm	right	1:1	0.957	1.067	1.021	
1900.00	380000	High	NR Band n2 (PCS)	20	24.5	24.11	0.10	0	00292	DFT-S-OFDM	QPSK	1	1	10 mm	right	1:1	0.827	1.094	0.905	
1860.00	372000	Low	NR Band n2 (PCS)	20	24.5	23.90	0.02	0	00292	DFT-S-OFDM	QPSK	50	28	10 mm	right	1:1	1.040	1.148	**1.194**	A42
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.15	-0.01	0	00292	DFT-S-OFDM	QPSK	50	28	10 mm	right	1:1	0.965	1.084	1.046	
1900.00	380000	High	NR Band n2 (PCS)	20	24.5	23.89	-0.02	0	00292	DFT-S-OFDM	QPSK	50	28	10 mm	right	1:1	0.760	1.151	0.875	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.13	-0.03	0	00292	DFT-S-OFDM	QPSK	100	0	10 mm	right	1:1	0.961	1.089	1.047	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.0	23.42	0.04	0.5	00292	CP-OFDM	QPSK	1	1	10 mm	right	1:1	0.900	1.143	1.029	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																					
Body 1.6 W/kg (mW/g) averaged over 1 gram																					

Table 11-37
WLAN Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Ant Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	20.5	19.84	0.12	10 mm	1	00417	1	back	99.3	0.307	0.195	1.164	1.007	0.229	
2437	6	802.11b	DSSS	22	15.0	14.51	-0.03	10 mm	1	00417	1	back	99.3	0.088	0.055	1.119	1.007	0.062	
2437	6	802.11b	DSSS	22	20.5	19.84	0.03	10 mm	1	00417	1	front	99.3	0.225	-	1.164	1.007	-	
2437	6	802.11b	DSSS	22	20.5	19.84	0.09	10 mm	1	00417	1	top	99.3	0.426	0.261	1.164	1.007	0.306	
2437	6	802.11b	DSSS	22	15.0	14.51	-0.02	10 mm	1	00417	1	top	99.3	0.101	0.063	1.119	1.007	0.071	
2437	6	802.11b	DSSS	22	20.5	19.84	0.13	10 mm	1	00417	1	left	99.3	0.624	0.400	1.164	1.007	**0.469**	A44
2437	6	802.11b	DSSS	22	15.0	14.51	0.02	10 mm	1	00417	1	left	99.3	0.223	0.134	1.119	1.007	0.151	
2437	6	802.11b	DSSS	22	20.5	20.04	0.20	10 mm	2	00417	1	back	99.3	0.373	0.269	1.112	1.007	0.301	
2437	6	802.11b	DSSS	22	20.5	20.04	0.07	10 mm	2	00417	1	front	99.3	0.309	-	1.112	1.007	-	
2437	6	802.11b	DSSS	22	20.5	20.04	0.03	10 mm	2	00417	1	top	99.3	0.626	0.392	1.112	1.007	0.439	
2437	6	802.11b	DSSS	22	15.0	14.66	0.11	10 mm	2	00417	1	top	99.3	0.179	0.115	1.081	1.007	0.125	
2437	6	802.11b	DSSS	22	20.5	20.04	0.03	10 mm	2	00417	1	left	99.3	0.098	-	1.112	1.007	-	
2437	6	802.11b	DSSS	22	15.0	14.66	-0.18	10 mm	2	00417	1	left	99.3	0.027	0.017	1.081	1.007	0.019	
5200	40	802.11a	OFDM	20	19.0	18.59	0.00	10 mm	1	00417	6	back	98.3	0.549	0.230	1.099	1.017	0.257	
5200	40	802.11a	OFDM	20	19.0	18.59	0.00	10 mm	1	00417	6	front	98.3	0.167	-	1.099	1.017	-	
5200	40	802.11a	OFDM	20	19.0	18.59	0.05	10 mm	1	00417	6	top	98.3	0.207	-	1.099	1.017	-	
5200	40	802.11a	OFDM	20	19.0	18.59	0.00	10 mm	1	00417	6	left	98.3	0.174	-	1.099	1.017	-	
5200	40	802.11a	OFDM	20	19.0	18.59	-0.03	10 mm	2	00417	6	back	96.4	0.194	0.088	1.099	1.037	0.100	
5230	46	802.11n	OFDM	40	16.0	15.48	0.04	10 mm	2	00417	13.5	back	97.3	0.069	0.024	1.127	1.028	0.028	
5200	40	802.11a	OFDM	20	19.0	18.59	0.00	10 mm	2	00417	6	front	96.4	0.087	-	1.099	1.037	-	
5200	40	802.11a	OFDM	20	19.0	18.59	0.00	10 mm	2	00417	6	top	96.4	0.081	-	1.099	1.037	-	
5200	40	802.11a	OFDM	20	19.0	18.59	0.04	10 mm	2	00417	6	left	96.4	0.098	-	1.099	1.037	-	
5230	46	802.11n	OFDM	40	16.0	15.48	0.01	10 mm	2	00417	13.5	left	97.3	0.026	0.009	1.127	1.028	0.010	
5785	157	802.11a	OFDM	20	19.0	18.84	0.01	10 mm	1	00417	6	back	98.3	0.471	0.195	1.038	1.017	0.206	
5785	157	802.11a	OFDM	20	19.0	18.84	0.00	10 mm	1	00417	6	front	98.3	0.016	-	1.038	1.017	-	
5785	157	802.11a	OFDM	20	19.0	18.84	0.01	10 mm	1	00417	6	top	98.3	0.185	-	1.038	1.017	-	
5785	157	802.11a	OFDM	20	19.0	18.84	0.00	10 mm	1	00417	6	left	98.3	0.138	-	1.038	1.017	-	
5825	165	802.11a	OFDM	20	19.0	18.51	-0.05	10 mm	2	00417	6	back	96.4	0.616	0.293	1.119	1.037	**0.340**	A46
5795	159	802.11n	OFDM	40	16.0	15.66	0.20	10 mm	2	00417	13.5	back	97.3	0.399	0.196	1.081	1.028	0.218	
5825	165	802.11a	OFDM	20	19.0	18.51	-0.01	10 mm	2	00417	6	front	96.4	0.095	-	1.119	1.037	-	
5825	165	802.11a	OFDM	20	19.0	18.51	0.02	10 mm	2	00417	6	top	96.4	0.354	-	1.119	1.037	-	
5825	165	802.11a	OFDM	20	19.0	18.51	0.00	10 mm	2	00417	6	left	96.4	0.163	-	1.119	1.037	-	
5795	159	802.11n	OFDM	40	16.0	15.66	0.01	10 mm	2	00417	13.5	left	97.3	0.083	0.029	1.081	1.028	0.032	

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

Table 11-38
WLAN MIMO Hotspot SAR for Conditions with 5G NR FR2

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Spacing	Ant Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.															W/kg	(W/kg)			(W/kg)	
2437	6	802.11n	OFDM	20	15.0	14.18	15.0	14.83	-0.04	10 mm	MIMO	00417	13	back	98.2	0.166	0.112	1.208	1.018	0.138	
5230	46	802.11n	OFDM	40	16.0	15.70	16.0	15.48	-0.02	10 mm	MIMO	00417	27	back	97.2	0.340	0.144	1.127	1.029	0.167	
5230	46	802.11n	OFDM	40	16.0	15.70	16.0	15.48	-0.03	10 mm	MIMO	00417	27	left	97.2	0.129	0.049	1.127	1.029	0.057	
5795	159	802.11n	OFDM	40	16.0	15.93	16.0	15.66	0.14	10 mm	MIMO	00417	27	back	97.2	0.691	0.295	1.081	1.029	0.328	
5795	159	802.11n	OFDM	40	16.0	15.93	16.0	15.66	-0.01	10 mm	MIMO	00417	27	left	97.2	0.219	0.070	1.081	1.029	0.078	
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:
1. For channel 6, to achieve the 18.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 15.0 dBm. For channel 46,159 to achieve the 19.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 16.0 dBm.

Table 11-39
DSS Hotspot SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441	39	Bluetooth	FHSS	11.5	11.36	0.02	10 mm	00425	1	back	77.3	0.016	1.033	1.294	0.021	
2441	39	Bluetooth	FHSS	11.5	11.36	-0.02	10 mm	00425	1	front	77.3	0.016	1.033	1.294	0.021	
2441	39	Bluetooth	FHSS	11.5	11.36	0.04	10 mm	00425	1	top	77.3	0.023	1.033	1.294	0.031	
2441	39	Bluetooth	FHSS	11.5	11.36	0.12	10 mm	00425	1	left	77.3	0.036	1.033	1.294	**0.048**	A48
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 11-40
CDMA Phablet SAR Data

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Duty Cycle	Side	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1851.25	25	PCS CDMA	EVDO Rev. 0	25.5	25.46	0.04	2 mm	00383	1:1	back	2.200	1.009	2.220	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.5	25.49	0.04	2 mm	00383	1:1	back	2.150	1.002	2.154	
1908.75	1175	PCS CDMA	EVDO Rev. 0	25.5	25.50	0.05	2 mm	00383	1:1	back	2.080	1.000	2.080	
1851.25	25	PCS CDMA	EVDO Rev. 0	25.5	25.46	0.06	1 mm	00383	1:1	front	2.270	1.009	2.290	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.5	25.49	0.00	1 mm	00383	1:1	front	2.240	1.002	2.244	
1908.75	1175	PCS CDMA	EVDO Rev. 0	25.5	25.50	0.06	1 mm	00383	1:1	front	2.160	1.000	2.160	
1851.25	25	PCS CDMA	EVDO Rev. 0	25.5	25.46	-0.07	4 mm	00383	1:1	bottom	2.240	1.009	2.260	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.5	25.49	-0.06	4 mm	00383	1:1	bottom	2.400	1.002	2.405	
1908.75	1175	PCS CDMA	EVDO Rev. 0	25.5	25.50	-0.04	4 mm	00383	1:1	bottom	2.470	1.000	2.470	A49
1880.00	600	PCS CDMA	EVDO Rev. 0	25.5	25.49	-0.13	0 mm	00383	1:1	left	0.718	1.002	0.719	
1880.00	600	PCS CDMA	EVDO Rev. 0	23.0	23.00	-0.06	0 mm	00383	1:1	back	1.990	1.000	1.990	
1880.00	600	PCS CDMA	EVDO Rev. 0	23.0	23.00	-0.07	0 mm	00383	1:1	front	1.440	1.000	1.440	
1880.00	600	PCS CDMA	EVDO Rev. 0	23.0	23.00	-0.02	0 mm	00383	1:1	bottom	1.910	1.000	1.910	
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 11-41
UMTS Phablet SAR Data

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Duty Cycle	Side	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1852.40	9262	UMTS 1900	RMC	25.5	25.49	0.03	2 mm	00235	1:1	back	2.440	1.002	2.445	
1880.00	9400	UMTS 1900	RMC	25.5	25.44	-0.03	2 mm	00235	1:1	back	2.400	1.014	2.434	
1907.60	9538	UMTS 1900	RMC	25.5	25.42	-0.02	2 mm	00235	1:1	back	2.410	1.019	2.456	
1852.40	9262	UMTS 1900	RMC	25.5	25.49	0.05	1 mm	00235	1:1	front	2.820	1.002	2.826	
1880.00	9400	UMTS 1900	RMC	25.5	25.44	0.04	1 mm	00235	1:1	front	2.840	1.014	2.880	A50
1907.60	9538	UMTS 1900	RMC	25.5	25.42	0.06	1 mm	00235	1:1	front	2.800	1.019	2.853	
1852.40	9262	UMTS 1900	RMC	25.5	25.49	-0.03	4 mm	00235	1:1	bottom	2.350	1.002	2.355	
1880.00	9400	UMTS 1900	RMC	25.5	25.44	-0.01	4 mm	00235	1:1	bottom	2.480	1.014	2.515	
1907.60	9538	UMTS 1900	RMC	25.5	25.42	-0.04	4 mm	00235	1:1	bottom	2.450	1.019	2.497	
1880.00	9400	UMTS 1900	RMC	25.5	25.44	0.02	0 mm	00235	1:1	left	0.874	1.014	0.886	
1852.40	9262	UMTS 1900	RMC	23.0	22.91	0.00	0 mm	00235	1:1	back	2.150	1.021	2.195	
1880.00	9400	UMTS 1900	RMC	23.0	22.94	0.02	0 mm	00235	1:1	back	2.150	1.014	2.180	
1907.60	9538	UMTS 1900	RMC	23.0	22.80	-0.01	0 mm	00235	1:1	back	2.110	1.047	2.209	
1880.00	9400	UMTS 1900	RMC	23.0	22.94	-0.03	0 mm	00235	1:1	front	1.770	1.014	1.795	
1852.40	9262	UMTS 1900	RMC	23.0	22.91	-0.04	0 mm	00235	1:1	bottom	2.160	1.021	2.205	
1880.00	9400	UMTS 1900	RMC	23.0	22.94	-0.04	0 mm	00235	1:1	bottom	2.270	1.014	2.302	
1907.60	9538	UMTS 1900	RMC	23.0	22.80	-0.02	0 mm	00235	1:1	bottom	2.340	1.047	2.450	
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 11-42
LTE Band 66 (AWS) Phablet SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.5	25.44	-0.02	0	00268	QPSK	1	50	2 mm	back	1:1	1.880	1.014	1.906	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.5	24.50	-0.03	1	00268	QPSK	50	25	2 mm	back	1:1	1.580	1.000	1.580	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.5	25.44	-0.03	0	00268	QPSK	1	50	1 mm	front	1:1	1.580	1.014	1.602	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.5	24.50	-0.03	1	00268	QPSK	50	25	1 mm	front	1:1	1.320	1.000	1.320	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.5	25.44	0.00	0	00268	QPSK	1	50	4 mm	bottom	1:1	1.740	1.014	1.764	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.5	24.50	-0.07	1	00268	QPSK	50	25	4 mm	bottom	1:1	1.430	1.000	1.430	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	25.5	25.44	-0.13	0	00268	QPSK	1	50	0 mm	left	1:1	0.565	1.014	0.573	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.5	24.50	-0.17	1	00268	QPSK	50	25	0 mm	left	1:1	0.470	1.000	0.470	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.45	-0.06	0	00268	QPSK	1	50	0 mm	back	1:1	1.870	1.135	2.122	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.12	-0.16	0	00268	QPSK	1	50	0 mm	back	1:1	1.930	1.225	2.364	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.0	23.16	-0.06	0	00268	QPSK	1	50	0 mm	back	1:1	2.040	1.213	2.475	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.58	-0.04	0	00268	QPSK	50	25	0 mm	back	1:1	1.980	1.102	2.182	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.52	0.03	0	00268	QPSK	50	25	0 mm	back	1:1	2.050	1.117	2.290	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.0	23.57	-0.07	0	00268	QPSK	50	25	0 mm	back	1:1	2.150	1.104	2.374	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.44	-0.01	0	00268	QPSK	100	0	0 mm	back	1:1	2.000	1.138	2.276	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.45	-0.05	0	00268	QPSK	1	50	0 mm	front	1:1	1.790	1.135	2.032	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.12	-0.11	0	00268	QPSK	1	50	0 mm	front	1:1	1.810	1.225	2.217	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.0	23.16	-0.11	0	00268	QPSK	1	50	0 mm	front	1:1	1.890	1.213	2.293	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.58	-0.13	0	00268	QPSK	50	25	0 mm	front	1:1	1.910	1.102	2.105	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.52	-0.15	0	00268	QPSK	50	25	0 mm	front	1:1	1.940	1.117	2.167	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.0	23.57	-0.14	0	00268	QPSK	50	25	0 mm	front	1:1	1.980	1.104	2.186	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.44	-0.12	0	00268	QPSK	100	0	0 mm	front	1:1	1.880	1.138	2.139	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.45	-0.12	0	00268	QPSK	1	50	0 mm	bottom	1:1	1.990	1.135	2.259	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.12	-0.11	0	00268	QPSK	1	50	0 mm	bottom	1:1	2.010	1.225	2.462	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.0	23.16	-0.07	0	00268	QPSK	1	50	0 mm	bottom	1:1	2.070	1.213	2.511	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.58	-0.08	0	00268	QPSK	50	25	0 mm	bottom	1:1	2.130	1.102	2.347	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	24.0	23.52	-0.08	0	00268	QPSK	50	25	0 mm	bottom	1:1	2.150	1.117	2.402	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.0	23.57	-0.07	0	00268	QPSK	50	25	0 mm	bottom	1:1	2.210	1.104	2.440	A51
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.0	23.44	-0.07	0	00268	QPSK	100	0	0 mm	bottom	1:1	2.100	1.138	2.390	
1770.00	132572	High	LTE Band 66 (AWS)	20	24.0	23.57	-0.07	0	00268	QPSK	50	25	0 mm	bottom	1:1	2.170	1.104	2.396	
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 measurements.

Table 11-43
LTE Band 2 (PCS) Phablet SAR

MEASUREMENT RESULTS																				
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1860.00	18700	Low	LTE Band 2 (PCS)	20	25.5	25.41	-0.05	0	00235	QPSK	1	50	2 mm	back	1:1	2.030	1.021	2.073	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	25.5	25.46	-0.07	0	00235	QPSK	1	50	2 mm	back	1:1	2.070	1.009	2.089	
1900.00	19100	High	LTE Band 2 (PCS)	20	25.5	25.20	-0.03	0	00235	QPSK	1	50	2 mm	back	1:1	1.990	1.072	2.133	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	24.5	24.50	-0.05	1	00235	QPSK	50	25	2 mm	back	1:1	1.660	1.000	1.660	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.5	24.49	-0.05	1	00235	QPSK	100	0	2 mm	back	1:1	1.670	1.002	1.673	
1860.00	18700	Low	LTE Band 2 (PCS)	20	25.5	25.41	-0.02	0	00235	QPSK	1	50	1 mm	front	1:1	2.400	1.021	2.450	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	25.5	25.46	-0.20	0	00235	QPSK	1	50	1 mm	front	1:1	2.450	1.009	2.472	
1900.00	19100	High	LTE Band 2 (PCS)	20	25.5	25.20	-0.03	0	00235	QPSK	1	50	1 mm	front	1:1	2.380	1.072	2.551	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	24.5	24.50	-0.02	1	00235	QPSK	50	25	1 mm	front	1:1	1.990	1.000	1.990	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.5	24.49	-0.20	1	00235	QPSK	100	0	1 mm	front	1:1	1.980	1.002	1.984	
1860.00	18700	Low	LTE Band 2 (PCS)	20	25.5	25.41	-0.05	0	00235	QPSK	1	50	4 mm	bottom	1:1	2.290	1.021	2.338	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	25.5	25.46	-0.01	0	00235	QPSK	1	50	4 mm	bottom	1:1	2.280	1.009	2.301	
1900.00	19100	High	LTE Band 2 (PCS)	20	25.5	25.20	-0.03	0	00235	QPSK	1	50	4 mm	bottom	1:1	2.250	1.072	2.412	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	24.5	24.50	-0.20	1	00235	QPSK	50	25	4 mm	bottom	1:1	1.850	1.000	1.850	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.5	24.49	-0.03	1	00235	QPSK	100	0	4 mm	bottom	1:1	1.860	1.002	1.864	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	25.5	25.46	-0.15	0	00235	QPSK	1	50	0 mm	left	1:1	0.772	1.009	0.779	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	24.5	24.50	-0.09	1	00235	QPSK	50	25	0 mm	left	1:1	0.606	1.000	0.606	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	23.03	-0.02	0	00235	QPSK	1	50	0 mm	back	1:1	2.130	1.114	2.373	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.08	-0.02	0	00235	QPSK	1	50	0 mm	back	1:1	2.140	1.102	2.358	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.5	22.86	-0.04	0	00235	QPSK	1	99	0 mm	back	1:1	2.040	1.159	2.364	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	23.12	-0.03	0	00235	QPSK	50	50	0 mm	back	1:1	2.230	1.091	2.433	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.13	-0.03	0	00235	QPSK	50	25	0 mm	back	1:1	2.210	1.089	2.407	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.5	23.08	-0.04	0	00235	QPSK	50	25	0 mm	back	1:1	2.230	1.102	2.457	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	23.05	-0.04	0	00235	QPSK	100	0	0 mm	back	1:1	2.230	1.109	2.473	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	23.03	-0.02	0	00235	QPSK	1	50	0 mm	front	1:1	2.070	1.114	2.306	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.08	-0.02	0	00235	QPSK	1	50	0 mm	front	1:1	2.070	1.102	2.281	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.5	22.86	-0.02	0	00235	QPSK	1	99	0 mm	front	1:1	1.790	1.159	2.075	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	23.12	-0.02	0	00235	QPSK	50	50	0 mm	front	1:1	2.150	1.091	2.346	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.13	-0.02	0	00235	QPSK	50	25	0 mm	front	1:1	2.140	1.089	2.330	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.5	23.08	-0.02	0	00235	QPSK	50	25	0 mm	front	1:1	1.970	1.102	2.171	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	23.05	-0.02	0	00235	QPSK	100	0	0 mm	front	1:1	2.140	1.109	2.373	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	23.03	-0.07	0	00235	QPSK	1	50	0 mm	bottom	1:1	2.460	1.114	2.740	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.08	-0.03	0	00235	QPSK	1	50	0 mm	bottom	1:1	2.480	1.102	2.733	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.5	22.86	-0.05	0	00235	QPSK	1	99	0 mm	bottom	1:1	2.420	1.159	2.805	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	23.12	-0.05	0	00235	QPSK	50	50	0 mm	bottom	1:1	2.530	1.091	2.760	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.5	23.13	-0.06	0	00235	QPSK	50	25	0 mm	bottom	1:1	2.560	1.089	2.788	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.5	23.08	-0.06	0	00235	QPSK	50	25	0 mm	bottom	1:1	2.690	1.102	2.964	A52
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.5	23.05	-0.03	0	00235	QPSK	100	0	0 mm	bottom	1:1	2.520	1.109	2.795	
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 11-44
NR Band n2 (PCS) Phablet SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	
1860.00	372000	Low	NR Band n2 (PCS)	20	24.5	23.95	0.03	0	00292	DFT-S-OFDM	QPSK	1	104	0 mm	right	1:1	2.080	1.135	2.361	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.22	0.19	0	00292	DFT-S-OFDM	QPSK	1	53	0 mm	right	1:1	2.900	1.067	**3.094**	A53
1900.00	380000	High	NR Band n2 (PCS)	20	24.5	24.11	-0.05	0	00292	DFT-S-OFDM	QPSK	1	1	0 mm	right	1:1	2.450	1.094	2.680	
1860.00	372000	Low	NR Band n2 (PCS)	20	24.5	23.90	0.03	0	00292	DFT-S-OFDM	QPSK	50	28	0 mm	right	1:1	2.230	1.148	2.560	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.15	0.02	0	00292	DFT-S-OFDM	QPSK	50	28	0 mm	right	1:1	2.680	1.084	2.905	
1900.00	380000	High	NR Band n2 (PCS)	20	24.5	23.89	-0.04	0	00292	DFT-S-OFDM	QPSK	50	28	0 mm	right	1:1	2.490	1.151	2.866	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.13	0.10	0	00292	DFT-S-OFDM	QPSK	100	0	0 mm	right	1:1	2.550	1.089	2.777	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.0	23.42	0.02	0.5	00292	CP-OFDM	QPSK	1	1	0 mm	right	1:1	2.220	1.143	2.537	
1880.00	376000	Mid	NR Band n2 (PCS)	20	24.5	24.22	0.00	0	00292	DFT-S-OFDM	QPSK	1	53	0 mm	right	1:1	2.870	1.067	3.062	
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 measurements.

Table 11-45
WLAN Phablet SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5280	56	802.11a	OFDM	20	19.0	18.45	0.04	0 mm	1	00425	6	back	98.3	8.939	0.967	1.135	1.017	**1.116**	
5270	54	802.11n	OFDM	40	16.0	15.54	0.01	0 mm	1	00425	13.5	back	97.4	2.998	0.361	1.112	1.027	0.412	
5280	56	802.11a	OFDM	20	19.0	18.45	0.00	0 mm	1	00425	6	front	98.3	1.131	0.144	1.135	1.017	0.166	
5280	56	802.11a	OFDM	20	19.0	18.45	0.10	0 mm	1	00425	6	top	98.3	1.363	-	1.135	1.017	-	
5280	56	802.11a	OFDM	20	19.0	18.45	0.01	0 mm	1	00425	6	left	98.3	2.482	0.213	1.135	1.017	0.246	
5280	56	802.11a	OFDM	20	19.0	18.53	0.00	0 mm	2	00425	6	back	96.4	4.390	0.457	1.114	1.037	0.528	
5280	56	802.11a	OFDM	20	19.0	18.53	0.00	0 mm	2	00425	6	front	96.4	1.502	0.210	1.114	1.037	0.243	
5280	56	802.11a	OFDM	20	19.0	18.53	0.00	0 mm	2	00425	6	top	96.4	1.057	-	1.114	1.037	-	
5280	56	802.11a	OFDM	20	19.0	18.53	0.00	0 mm	2	00425	6	left	96.4	1.479	-	1.114	1.037	-	
5720	144	802.11a	OFDM	20	17.0	16.75	0.05	0 mm	1	00425	6	back	98.3	5.710	0.594	1.059	1.017	0.640	
5710	142	802.11n	OFDM	40	16.0	15.92	0.10	0 mm	1	00425	13.5	back	97.4	5.173	0.388	1.019	1.027	0.406	
5720	144	802.11a	OFDM	20	17.0	16.75	0.00	0 mm	1	00425	6	front	98.3	0.090	0.008	1.059	1.017	0.009	
5720	144	802.11a	OFDM	20	17.0	16.75	0.00	0 mm	1	00425	6	top	98.3	0.524	-	1.059	1.017	-	
5720	144	802.11a	OFDM	20	17.0	16.75	0.00	0 mm	1	00425	6	left	98.3	0.836	-	1.059	1.017	-	
5500	100	802.11a	OFDM	20	17.0	16.68	0.03	0 mm	2	00425	6	back	96.4	5.541	0.634	1.076	1.037	0.707	
5500	100	802.11a	OFDM	20	17.0	16.68	0.00	0 mm	2	00425	6	front	96.4	1.757	0.235	1.076	1.037	0.262	
5500	100	802.11a	OFDM	20	17.0	16.68	-0.07	0 mm	2	00425	6	top	96.4	1.398	-	1.076	1.037	-	
5500	100	802.11a	OFDM	20	17.0	16.68	0.00	0 mm	2	00425	6	left	96.4	3.265	-	1.076	1.037	-	
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 11-46
WLAN MIMO Phablet SAR

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power (Ant 1) [dBm]	Conducted Power (Ant 1) [dBm]	Maximum Allowed Power (Ant 2) [dBm]	Conducted Power (Ant 2) [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.															W/kg	(W/kg)			(W/kg)	
5280	56	802.11n	OFDM	20	19.0	18.35	19.0	18.47	0.10	0 mm	MIMO	00425	13	back	98.2	9.704	1.240	1.161	1.018	1.466	
5280	56	802.11n	OFDM	20	19.0	18.35	19.0	18.47	0.09	0 mm	MIMO	00425	13	front	98.2	1.641	0.282	1.161	1.018	0.333	
5280	56	802.11n	OFDM	20	19.0	18.35	19.0	18.47	-0.16	0 mm	MIMO	00425	13	top	98.2	1.537	-	1.161	1.018	-	
5280	56	802.11n	OFDM	20	19.0	18.35	19.0	18.47	0.01	0 mm	MIMO	00425	13	right	98.2	0.812	0.059	1.161	1.018	0.070	
5280	56	802.11n	OFDM	20	19.0	18.35	19.0	18.47	0.10	0 mm	MIMO	00425	13	left	98.2	2.783	0.234	1.161	1.018	0.277	
5270	54	802.11n	OFDM	40	16.0	15.54	16.0	15.44	0.01	0 mm	MIMO	00425	27	back	97.2	5.037	0.602	1.138	1.029	0.705	
5720	144	802.11n	OFDM	20	17.0	16.69	17.0	16.44	0.07	0 mm	MIMO	00425	13	back	98.2	12.839	1.240	1.138	1.018	1.437	A54
5720	144	802.11n	OFDM	20	17.0	16.69	17.0	16.44	0.09	0 mm	MIMO	00425	13	front	98.2	1.377	0.165	1.138	1.018	0.191	
5720	144	802.11n	OFDM	20	17.0	16.69	17.0	16.44	-0.13	0 mm	MIMO	00425	13	top	98.2	1.404	-	1.138	1.018	-	
5720	144	802.11n	OFDM	20	17.0	16.69	17.0	16.44	0.00	0 mm	MIMO	00425	13	right	98.2	0.120	0.007	1.138	1.018	0.008	
5720	144	802.11n	OFDM	20	17.0	16.69	17.0	16.44	0.09	0 mm	MIMO	00425	13	left	98.2	1.911	0.165	1.138	1.018	0.191	
5710	142	802.11n	OFDM	40	16.0	15.92	16.0	15.71	-0.20	0 mm	MIMO	00425	27	back	97.2	7.500	0.817	1.069	1.029	0.899	
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:
1. For channel 56 to achieve the 22.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 19.0 dBm. For channel 144 to achieve the 20.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 17.0 dBm. For channel 54, 142 to achieve the 19.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 16.0 dBm.

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 orange highlights throughout the report represents the highest SAR per FCC Equipment Class reflected on the FCC Grant.
5. 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.
6. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
7. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10 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.
8. 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.
9. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 13 for variability analysis.
10. 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).
11. 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. Additional SAR tests for phablet SAR were evaluated per KDB 616217 Section 6 (See Section 6.9 for more information)

12. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the 1g thresholds for the equivalent test cases.
13. This device uses Qualcomm Smart Transmit for 2G/3G/4G/5G operations to control and manage transmitting power in real time to ensure RF Exposure compliance. Per FCC Guidance, compliance was assessed at the minimum of the time averaged power and the maximum output power for each band/mode/exposure condition (DSI).

GSM Test Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
3. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.
4. GPRS was additionally evaluated for head and body-worn exposure conditions to address possible VoIP scenarios.

CDMA Notes:

1. Head SAR for CDMA2000 mode was tested under RC3/SO55 per FCC KDB Publication 941225 D01v03r01.
2. Body-Worn SAR was tested with 1x RTT with TDSO / SO32 FCH Only. EVDO Rev0 and RevA and TDSO / SO32 FCH+SCH SAR tests were not required per the 3G SAR Test Reduction Procedure in FCC KDB Publication 941225 D01v03r01.
3. CDMA Wireless Router SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0 according to KDB 941225 D01v03r01 procedures for data devices. Wireless Router SAR tests for Subtype 2 of Rev.A and 1x RTT configurations were not required per the 3G SAR Test Reduction Policy in KDB Publication 941225 D01v03r01.
4. Head SAR was additionally evaluated using EVDO Rev. A to determine compliance for VoIP operations.
5. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

UMTS Notes:

1. UMTS mode was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. AMR and HSPA SAR was not required per the 3G Test Reduction Procedure in KDB Publication 941225 D01v03r01.
2. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

LTE Notes:

1. LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r04. The general test procedures used for testing can be found in Section 8.6.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
4. TDD LTE was tested per the guidance provided in FCC KDB Publication 941225 D05v02r04. Testing was performed using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.
5. Per KDB Publication 941225 D05Av01r02, SAR for downlink only LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.
6. For LTE Band 5, per FCC guidance, SAR was first measured with only a single carrier active in the uplink (carrier aggregation not active). For each exposure condition, the uplink CA scenario with two component carriers was additionally tested for the configuration with the highest SAR when carrier aggregation was not active. The SCC was configured with the closest available contiguous channel. The two component carriers were configured so the resource blocks are physically allocated side by side to achieve the maximum output power.

NR Notes:

1. NR implementation is limited to EN-DC operations only. Per FCC guidance, SAR tests for NR Bands and LTE Anchors Bands were performed separately due to limitations in SAR probe calibration factors.
2. Due to test setup limitations, SAR testing for NR was performed using test mode software to establish the connection.
3. Simultaneous transmission analysis for EN-DC operations is addressed in the Part 2 Test Report (Serial Number can be found in Section 1.11 - 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. Per FCC Guidance, the device was configured with the tuner state selected by the device in LTE mode with auto-tune active at the same frequency as the NR test results. Additional tuner states were evaluated per April 2019 TCBC Workshop Guidance. Please see Section 14 for supplemental data.

WLAN Notes:

1. For held-to-ear, hotspot, and phablet operations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg for 1g evaluations, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 8.7.5 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not

investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg for 1g evaluations. See Section 8.7.6 for more information.

4. When the maximum reported 1g averaged SAR is ≤0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg for 1g evaluations or all test channels were measured.
5. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated EMC test reports.
6. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D01v06 by either evaluating the sum of the 1g SAR values of each antenna transmitting independently or making a SAR measurement with both antennas transmitting simultaneously. Please see Section 12 for complete analysis.

Bluetooth Notes

1. Bluetooth SAR was measured with the device connected to a call box with hopping disabled with DH5 operation and Tx Tests test mode type. Per October 2016 TCB Workshop Notes, the reported SAR was scaled to the 100% transmission duty factor to determine compliance. See Section 9.7 for the time domain plot and calculation for the duty factor of the device.
2. Head and Hotspot Bluetooth SAR were evaluated for BT BR tethering applications.

12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

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

12.2 Simultaneous Transmission Procedures

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

Qualcomm Smart Transmit algorithm in WWAN adds directly the time-averaged RF exposure from 4G and time-averaged RF exposure from 5G NR. Smart Transmit algorithm controls the total RF exposure from both 4G and 5G NR to not exceed FCC limit. Therefore, simultaneous transmission compliance between 4G+5G operations is demonstrated in the Qualcomm Part 2 Report during algorithm validation. Per FCC KDB Publication 941225 D06v02r01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR ("-").
(*) For test positions that were not required to be evaluated for WLAN SAR per FCC KDB publication 248227, the worst case WLAN SAR result for the applicable exposure conditions was used for simultaneous tran smission analysis.

12.3 Head SAR Simultaneous Transmission Analysis

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

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head	GSM/GPRS 850	0.178	0.331	0.578	0.509	0.756	1.087
	GSM/GPRS 1900	0.061	0.331	0.578	0.392	0.639	0.970
	UMTS 850	0.189	0.331	0.578	0.520	0.767	1.098
	UMTS 1900	0.138	0.331	0.578	0.469	0.716	1.047
	Cell. CDMA/EVDO	0.194	0.331	0.578	0.525	0.772	1.103
	PCS CDMA/EVDO	0.137	0.331	0.578	0.468	0.715	1.046
	LTE Band 12	0.155	0.331	0.578	0.486	0.733	1.064
	LTE Band 13	0.158	0.331	0.578	0.489	0.736	1.067
	LTE Band 5 (Cell)	0.188	0.331	0.578	0.519	0.766	1.097
	LTE Band 66 (AWS)	0.164	0.331	0.578	0.495	0.742	1.073
	LTE Band 2 (PCS)	0.141	0.331	0.578	0.472	0.719	1.050
	LTE Band 48	0.117	0.331	0.578	0.448	0.695	1.026
	NR Band n5 (Cell)	0.110	0.331	0.578	0.441	0.688	1.019
	NR Band n66 (AWS)	0.137	0.331	0.578	0.468	0.715	1.046
	NR Band n2 (PCS)	0.203	0.331	0.578	0.534	0.781	**1.112**

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

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head	GSM/GPRS 850	0.178	0.071	0.410	0.249	0.588	0.659
	GSM/GPRS 1900	0.061	0.071	0.410	0.132	0.471	0.542
	UMTS 850	0.189	0.071	0.410	0.260	0.599	0.670
	UMTS 1900	0.138	0.071	0.410	0.209	0.548	0.619
	Cell. CDMA	0.194	0.071	0.410	0.265	0.604	0.675
	PCS CDMA	0.137	0.071	0.410	0.208	0.547	0.618
	LTE Band 12	0.155	0.071	0.410	0.226	0.565	0.636
	LTE Band 13	0.158	0.071	0.410	0.229	0.568	0.639
	LTE Band 5 (Cell)	0.188	0.071	0.410	0.259	0.598	0.669
	LTE Band 66 (AWS)	0.164	0.071	0.410	0.235	0.574	0.645
	LTE Band 2 (PCS)	0.141	0.071	0.410	0.212	0.551	0.622
	LTE Band 48	0.117	0.071	0.410	0.188	0.527	0.598
	NR Band n5 (Cell)	0.110	0.071	0.410	0.181	0.520	0.591
	NR Band n66 (AWS)	0.137	0.071	0.410	0.208	0.547	0.618
	NR Band n2 (PCS)	0.203	0.071	0.410	0.274	0.613	**0.684**

Table 12-3
Simultaneous Transmission Scenario with 2.4 GHz WLAN Ant 1 and 5 GHz WLAN Ant 2 (Held to Ear)

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head	GSM/GPRS 850	0.178	0.331	0.410	0.919
	GSM/GPRS 1900	0.061	0.331	0.410	0.802
	UMTS 850	0.189	0.331	0.410	0.930
	UMTS 1900	0.138	0.331	0.410	0.879
	Cell. CDMA	0.194	0.331	0.410	0.935
	PCS CDMA	0.137	0.331	0.410	0.878
	LTE Band 12	0.155	0.331	0.410	0.896
	LTE Band 13	0.158	0.331	0.410	0.899
	LTE Band 5 (Cell)	0.188	0.331	0.410	0.929
	LTE Band 66 (AWS)	0.164	0.331	0.410	0.905
	LTE Band 2 (PCS)	0.141	0.331	0.410	0.882
	LTE Band 48	0.117	0.331	0.410	0.858
	NR Band n5 (Cell)	0.110	0.331	0.410	0.851
	NR Band n66 (AWS)	0.137	0.331	0.410	0.878
	NR Band n2 (PCS)	0.203	0.331	0.410	**0.944**

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

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head	GSM/GPRS 850	0.178	0.127	0.305
	GSM/GPRS 1900	0.061	0.127	0.188
	UMTS 850	0.189	0.127	0.316
	UMTS 1900	0.138	0.127	0.265
	Cell. CDMA	0.194	0.127	0.321
	PCS CDMA	0.137	0.127	0.264
	LTE Band 12	0.155	0.127	0.282
	LTE Band 13	0.158	0.127	0.285
	LTE Band 5 (Cell)	0.188	0.127	0.315
	LTE Band 66 (AWS)	0.164	0.127	0.291
	LTE Band 2 (PCS)	0.141	0.127	0.268
	LTE Band 48	0.117	0.127	0.244
	NR Band n5 (Cell)	0.110	0.127	0.237
	NR Band n66 (AWS)	0.137	0.127	0.264
	NR Band n2 (PCS)	0.203	0.127	**0.330**

Table 12-5
Simultaneous Transmission Scenario with 2.4 GHz WLAN Antenna 2 and Bluetooth (Held to Ear)

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	Bluetooth SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head	GSM/GPRS 850	0.178	0.127	0.578	0.883
	GSM/GPRS 1900	0.061	0.127	0.578	0.766
	UMTS 850	0.189	0.127	0.578	0.894
	UMTS 1900	0.138	0.127	0.578	0.843
	Cell. CDMA	0.194	0.127	0.578	0.899
	PCS CDMA	0.137	0.127	0.578	0.842
	LTE Band 12	0.155	0.127	0.578	0.860
	LTE Band 13	0.158	0.127	0.578	0.863
	LTE Band 5 (Cell)	0.188	0.127	0.578	0.893
	LTE Band 66 (AWS)	0.164	0.127	0.578	0.869
	LTE Band 2 (PCS)	0.141	0.127	0.578	0.846
	LTE Band 48	0.117	0.127	0.578	0.822
	NR Band n5 (Cell)	0.110	0.127	0.578	0.815
	NR Band n66 (AWS)	0.137	0.127	0.578	0.842
	NR Band n2 (PCS)	0.203	0.127	0.578	**0.908**

Table 12-6
Simultaneous Transmission Scenario with 5 GHz WLAN and Bluetooth (Held to Ear)

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2 +3	1+2+4	1+2+3+4
Head	GSM/GPRS 850	0.178	0.127	0.071	0.410	0.376	0.715	0.786
	GSM/GPRS 1900	0.061	0.127	0.071	0.410	0.259	0.598	0.669
	UMTS 850	0.189	0.127	0.071	0.410	0.387	0.726	0.797
	UMTS 1900	0.138	0.127	0.071	0.410	0.336	0.675	0.746
	Cell. CDMA	0.194	0.127	0.071	0.410	0.392	0.731	0.802
	PCS CDMA	0.137	0.127	0.071	0.410	0.335	0.674	0.745
	LTE Band 12	0.155	0.127	0.071	0.410	0.353	0.692	0.763
	LTE Band 13	0.158	0.127	0.071	0.410	0.356	0.695	0.766
	LTE Band 5 (Cell)	0.188	0.127	0.071	0.410	0.386	0.725	0.796
	LTE Band 66 (AWS)	0.164	0.127	0.071	0.410	0.362	0.701	0.772
	LTE Band 2 (PCS)	0.141	0.127	0.071	0.410	0.339	0.678	0.749
	LTE Band 48	0.117	0.127	0.071	0.410	0.315	0.654	0.725
	NR Band n5 (Cell)	0.110	0.127	0.071	0.410	0.308	0.647	0.718
	NR Band n66 (AWS)	0.137	0.127	0.071	0.410	0.335	0.674	0.745
	NR Band n2 (PCS)	0.203	0.127	0.071	0.410	0.401	0.740	**0.811**

12.4 Body-Worn Simultaneous Transmission Analysis

Table 12-7
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)			SPLSR		
		1	2	3	1+2	1+3	1+2+3	1+2	1+3	2+3
Body - Worn	GSM/GPRS 850	0.551	0.229	0.301	0.780	0.852	1.081	N/A	N/A	N/A
	GSM/GPRS 1900	0.567	0.229	0.301	0.796	0.868	1.097	N/A	N/A	N/A
	UMTS 850	0.586	0.229	0.301	0.815	0.887	1.116	N/A	N/A	N/A
	UMTS 1900	1.136	0.229	0.301	1.365	1.437	See Note 1	0.01	0.01	0.01
	Cell. CDMA	0.580	0.229	0.301	0.809	0.881	1.110	N/A	N/A	N/A
	PCS CDMA	1.060	0.229	0.301	1.289	1.361	**1.590**	N/A	N/A	N/A
	LTE Band 12	0.326	0.229	0.301	0.555	0.627	0.856	N/A	N/A	N/A
	LTE Band 13	0.469	0.229	0.301	0.698	0.770	0.999	N/A	N/A	N/A
	LTE Band 5 (Cell)	0.624	0.229	0.301	0.853	0.925	1.154	N/A	N/A	N/A
	LTE Band 66 (AWS)	0.963	0.229	0.301	1.192	1.264	1.493	N/A	N/A	N/A
	LTE Band 2 (PCS)	1.190	0.229	0.301	1.419	1.491	See Note 1	0.01	0.01	0.01
	LTE Band 48	0.348	0.229	0.301	0.577	0.649	0.878	N/A	N/A	N/A
	NR Band n5 (Cell)	0.495	0.229	0.301	0.724	0.796	1.025	N/A	N/A	N/A
	NR Band n66 (AWS)	0.328	0.229	0.301	0.557	0.629	0.858	N/A	N/A	N/A
	NR Band n2 (PCS)	0.544	0.229	0.301	0.773	0.845	1.074	N/A	N/A	N/A

Table 12-8
Simultaneous Transmission Scenario with 5 GHz WLAN (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Body - Worn	GSM/GPRS 850	0.551	0.248	0.356	0.799	0.907
	GSM/GPRS 1900	0.567	0.248	0.356	0.815	0.923
	UMTS 850	0.586	0.248	0.356	0.834	0.942
	UMTS 1900	1.136	0.248	0.356	1.384	1.492
	Cell. CDMA	0.580	0.248	0.356	0.828	0.936
	PCS CDMA	1.060	0.248	0.356	1.308	1.416
	LTE Band 12	0.326	0.248	0.356	0.574	0.682
	LTE Band 13	0.469	0.248	0.356	0.717	0.825
	LTE Band 5 (Cell)	0.624	0.248	0.356	0.872	0.980
	LTE Band 66 (AWS)	0.963	0.248	0.356	1.211	1.319
	LTE Band 2 (PCS)	1.190	0.248	0.356	1.438	**1.546**
	LTE Band 48	0.348	0.248	0.356	0.596	0.704
	NR Band n5 (Cell)	0.495	0.248	0.356	0.743	0.851
	NR Band n66 (AWS)	0.328	0.248	0.356	0.576	0.684
	NR Band n2 (PCS)	0.544	0.248	0.356	0.792	0.900

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body - Worn	GSM/GPRS 850	0.551	0.531	1.082	N/A
	GSM/GPRS 1900	0.567	0.531	1.098	N/A
	UMTS 850	0.586	0.531	1.117	N/A
	UMTS 1900	1.136	0.531	See Note 1	0.01
	Cell. CDMA	0.580	0.531	1.111	N/A
	PCS CDMA	1.060	0.531	**1.591**	N/A
	LTE Band 12	0.326	0.531	0.857	N/A
	LTE Band 13	0.469	0.531	1.000	N/A
	LTE Band 5 (Cell)	0.624	0.531	1.155	N/A
	LTE Band 66 (AWS)	0.963	0.531	1.494	N/A
	LTE Band 2 (PCS)	1.190	0.531	See Note 1	0.02
	LTE Band 48	0.348	0.531	0.879	N/A
	NR Band n5 (Cell)	0.495	0.531	1.026	N/A
	NR Band n66 (AWS)	0.328	0.531	0.859	N/A
	NR Band n2 (PCS)	0.544	0.531	1.075	N/A

Table 12-9
Simultaneous Transmission Scenario with 2.4 GHz WLAN Ant 1 and 5 GHz WLAN Ant 2 (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Body - Worn	GSM/GPRS 850	0.551	0.229	0.356	1.136	N/A	N/A	N/A
	GSM/GPRS 1900	0.567	0.229	0.356	1.152	N/A	N/A	N/A
	UMTS 850	0.586	0.229	0.356	1.171	N/A	N/A	N/A
	UMTS 1900	1.136	0.229	0.356	See Note 1	0.01	0.01	0.02
	Cell. CDMA	0.580	0.229	0.356	1.165	N/A	N/A	N/A
	PCS CDMA	1.060	0.229	0.356	See Note 1	0.01	0.01	0.02
	LTE Band 12	0.326	0.229	0.356	0.911	N/A	N/A	N/A
	LTE Band 13	0.469	0.229	0.356	1.054	N/A	N/A	N/A
	LTE Band 5 (Cell)	0.624	0.229	0.356	1.209	N/A	N/A	N/A
	LTE Band 66 (AWS)	0.963	0.229	0.356	**1.548**	N/A	N/A	N/A
	LTE Band 2 (PCS)	1.190	0.229	0.356	See Note 1	0.01	0.01	0.02
	LTE Band 48	0.348	0.229	0.356	0.933	N/A	N/A	N/A
	NR Band n5 (Cell)	0.495	0.229	0.356	1.080	N/A	N/A	N/A
	NR Band n66 (AWS)	0.328	0.229	0.356	0.913	N/A	N/A	N/A
	NR Band n2 (PCS)	0.544	0.229	0.356	1.129	N/A	N/A	N/A

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

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body - Worn	GSM/GPRS 850	0.551	0.021	0.572
	GSM/GPRS 1900	0.567	0.021	0.588
	UMTS 850	0.586	0.021	0.607
	UMTS 1900	1.136	0.021	1.157
	Cell. CDMA	0.580	0.021	0.601
	PCS CDMA	1.060	0.021	1.081
	LTE Band 12	0.326	0.021	0.347
	LTE Band 13	0.469	0.021	0.490
	LTE Band 5 (Cell)	0.624	0.021	0.645
	LTE Band 66 (AWS)	0.963	0.021	0.984
	LTE Band 2 (PCS)	1.190	0.021	**1.211**
	LTE Band 48	0.348	0.021	0.369
	NR Band n5 (Cell)	0.495	0.021	0.516
	NR Band n66 (AWS)	0.328	0.021	0.349
	NR Band n2 (PCS)	0.544	0.021	0.565

Table 12-11
Simultaneous Transmission Scenario with 2.4 GHz WLAN Antenna 2 and Bluetooth (Body-Worn at 1.0 cm)

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	Bluetooth SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body - Worn	GSM/GPRS 850	0.551	0.021	0.301	0.873
	GSM/GPRS 1900	0.567	0.021	0.301	0.889
	UMTS 850	0.586	0.021	0.301	0.908
	UMTS 1900	1.136	0.021	0.301	1.458
	Cell. CDMA	0.580	0.021	0.301	0.902
	PCS CDMA	1.060	0.021	0.301	1.382
	LTE Band 12	0.326	0.021	0.301	0.648
	LTE Band 13	0.469	0.021	0.301	0.791
	LTE Band 5 (Cell)	0.624	0.021	0.301	0.946
	LTE Band 66 (AWS)	0.963	0.021	0.301	1.285
	LTE Band 2 (PCS)	1.190	0.021	0.301	**1.512**
	LTE Band 48	0.348	0.021	0.301	0.670
	NR Band n5 (Cell)	0.495	0.021	0.301	0.817
	NR Band n66 (AWS)	0.328	0.021	0.301	0.650
	NR Band n2 (PCS)	0.544	0.021	0.301	0.866

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

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	4	1+2+3	1+2+4
Body - Worn	GSM/GPRS 850	0.551	0.021	0.248	0.356	0.820	0.928
	GSM/GPRS 1900	0.567	0.021	0.248	0.356	0.836	0.944
	UMTS 850	0.586	0.021	0.248	0.356	0.855	0.963
	UMTS 1900	1.136	0.021	0.248	0.356	1.405	1.513
	Cell. CDMA	0.580	0.021	0.248	0.356	0.849	0.957
	PCS CDMA	1.060	0.021	0.248	0.356	1.329	1.437
	LTE Band 12	0.326	0.021	0.248	0.356	0.595	0.703
	LTE Band 13	0.469	0.021	0.248	0.356	0.738	0.846
	LTE Band 5 (Cell)	0.624	0.021	0.248	0.356	0.893	1.001
	LTE Band 66 (AWS)	0.963	0.021	0.248	0.356	1.232	1.340
	LTE Band 2 (PCS)	1.190	0.021	0.248	0.356	1.459	**1.567**
	LTE Band 48	0.348	0.021	0.248	0.356	0.617	0.725
	NR Band n5 (Cell)	0.495	0.021	0.248	0.356	0.764	0.872
	NR Band n66 (AWS)	0.328	0.021	0.248	0.356	0.597	0.705
	NR Band n2 (PCS)	0.544	0.021	0.248	0.356	0.813	0.921

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Body - Worn	GSM/GPRS 850	0.551	0.021	0.531	1.103	N/A	N/A	N/A
	GSM/GPRS 1900	0.567	0.021	0.531	1.119	N/A	N/A	N/A
	UMTS 850	0.586	0.021	0.531	1.138	N/A	N/A	N/A
	UMTS 1900	1.136	0.021	0.531	See Note 1	0.01	0.01	0.02
	Cell. CDMA	0.580	0.021	0.531	1.132	N/A	N/A	N/A
	PCS CDMA	1.060	0.021	0.531	See Note 1	0.01	0.01	0.02
	LTE Band 12	0.326	0.021	0.531	0.878	N/A	N/A	N/A
	LTE Band 13	0.469	0.021	0.531	1.021	N/A	N/A	N/A
	LTE Band 5 (Cell)	0.624	0.021	0.531	1.176	N/A	N/A	N/A
	LTE Band 66 (AWS)	0.963	0.021	0.531	**1.515**	N/A	N/A	N/A
	LTE Band 2 (PCS)	1.190	0.021	0.531	See Note 1	0.01	0.02	0.02
	LTE Band 48	0.348	0.021	0.531	0.900	N/A	N/A	N/A
	NR Band n5 (Cell)	0.495	0.021	0.531	1.047	N/A	N/A	N/A
	NR Band n66 (AWS)	0.328	0.021	0.531	0.880	N/A	N/A	N/A
	NR Band n2 (PCS)	0.544	0.021	0.531	1.096	N/A	N/A	N/A

Notes:
1. No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was not greater than 0.04 per FCC KDB 447498 D01v06. See Section 12.7 for detailed SPLS ratio analysis.

12.5 Hotspot SAR Simultaneous Transmission Analysis

Table 12-13
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot	GSM/GPRS 850	0.599	0.469	0.439	1.068	1.038	1.507
	GSM/GPRS 1900	1.020	0.469	0.439	1.489	1.459	See Table Below
	UMTS 850	0.586	0.469	0.439	1.055	1.025	1.494
	UMTS 1900	0.950	0.469	0.439	1.419	1.389	See Table Below
	Cell. CDMA	0.634	0.469	0.439	1.103	1.073	**1.542**
	PCS CDMA	0.778	0.469	0.439	1.247	1.217	See Table Below
	LTE Band 12	0.326	0.469	0.439	0.795	0.765	1.234
	LTE Band 13	0.469	0.469	0.439	0.938	0.908	1.377
	LTE Band 5 (Cell)	0.624	0.469	0.439	1.093	1.063	1.532
	LTE Band 66 (AWS)	0.909	0.469	0.439	1.378	1.348	See Table Below
	LTE Band 2 (PCS)	1.192	0.469	0.439	See Table Below	See Table Below	See Table Below
	LTE Band 48	0.348	0.469	0.439	0.817	0.787	1.256
	NR Band n5 (Cell)	0.495	0.469	0.439	0.964	0.934	1.403
	NR Band n66 (AWS)	0.892	0.469	0.439	1.361	1.331	See Table Below
	NR Band n2 (PCS)	1.194	0.469	0.439	See Table Below	See Table Below	See Table Below

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	Back	0.567	0.229	0.301	0.796	0.868	1.097
	Front	0.375	0.469*	0.439*	0.844	0.814	**1.283**
	Top	-	0.306	0.439	0.306	0.439	0.745
	Bottom	1.020	-	-	1.020	1.020	1.020
	Left	0.124	0.469	0.439*	0.593	0.563	1.032

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	Back	0.629	0.229	0.301	0.858	0.930	1.159
	Front	0.465	0.469*	0.439*	0.934	0.904	**1.373**
	Top	-	0.306	0.439	0.306	0.439	0.745
	Bottom	0.950	-	-	0.950	0.950	0.950
	Left	0.158	0.469	0.439*	0.627	0.597	1.066

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	Back	0.481	0.229	0.301	0.710	0.782	1.011
	Front	0.337	0.469*	0.439*	0.806	0.776	**1.245**
	Top	-	0.306	0.439	0.306	0.439	0.745
	Bottom	0.778	-	-	0.778	0.778	0.778
	Left	0.109	0.469	0.439*	0.578	0.548	1.017

Simult Tx	Configuration	LTE Band 66 (AWS) SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	Back	0.583	0.229	0.301	0.812	0.884	1.113
	Front	0.476	0.469*	0.439*	0.945	0.915	**1.384**
	Top	-	0.306	0.439	0.306	0.439	0.745
	Bottom	0.909	-	-	0.909	0.909	0.909
	Left	0.160	0.469	0.439*	0.629	0.599	1.068

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	Back	0.671	0.229	0.301	0.900	0.972	1.201
	Front	0.513	0.469*	0.439*	0.982	0.952	**1.421**
	Top	-	0.306	0.439	0.306	0.439	0.745
	Bottom	1.192	-	-	1.192	1.192	1.192
	Left	0.170	0.469	0.340*	0.639	0.510	0.979

Simult Tx	Configuration	NR Band n66 (AWS) SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	Back	0.328	0.229	0.301	0.557	0.629	0.858
	Front	0.255	0.469*	0.439*	0.724	0.694	**1.163**
	Top	-	0.306	0.439	0.306	0.439	0.745
	Right	0.892	-	-	0.892	0.892	0.892
	Left	-	0.469	0.439*	0.469	0.439	0.908

Simult Tx	Configuration	NR Band n2 (PCS) SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	Back	0.544	0.229	0.301	0.773	0.845	1.074
	Front	0.429	0.469*	0.439*	0.898	0.868	**1.337**
	Top	-	0.306	0.439	0.306	0.439	0.745
	Right	1.194	-	-	1.194	1.194	1.194
	Left	-	0.469	0.439*	0.469	0.439	0.908

Table 12-14
Simultaneous Transmission Scenario with 5 GHz WLAN (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot	GSM/GPRS 850	0.599	0.257	0.340	0.856	0.939	1.196
	GSM/GPRS 1900	1.020	0.257	0.340	1.277	1.360	See Table Below
	UMTS 850	0.586	0.257	0.340	0.843	0.926	1.183
	UMTS 1900	0.950	0.257	0.340	1.207	1.290	**1.547**
	Cell. CDMA	0.634	0.257	0.340	0.891	0.974	1.231
	PCS CDMA	0.778	0.257	0.340	1.035	1.118	1.375
	LTE Band 12	0.326	0.257	0.340	0.583	0.666	0.923
	LTE Band 13	0.469	0.257	0.340	0.726	0.809	1.066
	LTE Band 5 (Cell)	0.624	0.257	0.340	0.881	0.964	1.221
	LTE Band 66 (AWS)	0.909	0.257	0.340	1.166	1.249	1.506
	LTE Band 2 (PCS)	1.192	0.257	0.340	1.449	1.532	See Table Below
	LTE Band 48	0.348	0.257	0.340	0.605	0.688	0.945
	NR Band n5 (Cell)	0.495	0.257	0.340	0.752	0.835	1.092
	NR Band n66 (AWS)	0.892	0.257	0.340	1.149	1.232	1.489
	NR Band n2 (PCS)	1.194	0.257	0.340	1.451	1.534	See Table Below

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	Back	0.567	0.257	0.340	0.824	0.907	**1.164**
	Front	0.375	0.257*	0.340*	0.632	0.715	0.972
	Top	-	0.257*	0.340*	0.257	0.340	0.597
	Bottom	1.020	-	-	1.020	1.020	1.020
	Left	0.124	0.257*	0.340*	0.381	0.464	0.721

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	Back	0.671	0.257	0.340	0.928	1.011	**1.268**
	Front	0.513	0.257*	0.340*	0.770	0.853	1.110
	Top	-	0.257*	0.340*	0.257	0.340	0.597
	Bottom	1.192	-	-	1.192	1.192	1.192
	Left	0.170	0.257*	0.340*	0.427	0.510	0.767

Simult Tx	Configuration	NR Band n2 (PCS) SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	Back	0.544	0.257	0.340	0.801	0.884	1.141
	Front	0.429	0.257*	0.340*	0.686	0.769	1.026
	Top	-	0.257*	0.340*	0.257	0.340	0.597
	Right	1.194	-	-	1.194	1.194	**1.194**
	Left	-	0.257*	0.340*	0.257	0.340	0.597

Table 12-15
Simultaneous Transmission Scenario with 2.4 GHz WLAN Ant 1 and 5 GHz WLAN Ant 2 (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot	GSM/GPRS 850	0.599	0.469	0.340	1.408
	GSM/GPRS 1900	1.020	0.469	0.340	See Table Below
	UMTS 850	0.586	0.469	0.340	1.395
	UMTS 1900	0.950	0.469	0.340	See Table Below
	Cell. CDMA	0.634	0.469	0.340	1.443
	PCS CDMA	0.778	0.469	0.340	**1.587**
	LTE Band 12	0.326	0.469	0.340	1.135
	LTE Band 13	0.469	0.469	0.340	1.278
	LTE Band 5 (Cell)	0.624	0.469	0.340	1.433
	LTE Band 66 (AWS)	0.909	0.469	0.340	See Table Below
	LTE Band 2 (PCS)	1.192	0.469	0.340	See Table Below
	LTE Band 48	0.348	0.469	0.340	1.157
	NR Band n5 (Cell)	0.495	0.469	0.340	1.304
	NR Band n66 (AWS)	0.892	0.469	0.340	See Table Below
	NR Band n2 (PCS)	1.194	0.469	0.340	See Table Below

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.567	0.229	0.340	1.136
	Front	0.375	0.469*	0.340*	**1.184**
	Top	-	0.306	0.340*	0.646
	Bottom	1.020	-	-	1.020
	Left	0.124	0.469	0.340*	0.933

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.629	0.229	0.340	1.198
	Front	0.465	0.469*	0.340*	**1.274**
	Top	-	0.306	0.340*	0.646
	Bottom	0.950	-	-	0.950
	Left	0.158	0.469	0.340*	0.967

Simult Tx	Configuration	LTE Band 66 (AWS) SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.583	0.229	0.340	1.152
	Front	0.476	0.469*	0.340*	**1.285**
	Top	-	0.306	0.340*	0.646
	Bottom	0.909	-	-	0.909
	Left	0.160	0.469	0.340*	0.969

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.671	0.229	0.340	1.240
	Front	0.513	0.469*	0.340*	**1.322**
	Top	-	0.306	0.340*	0.646
	Bottom	1.192	-	-	1.192
	Left	0.170	0.469	0.340*	0.979

Simult Tx	Configuration	NR Band n66 (AWS) SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.328	0.229	0.340	0.897
	Front	0.255	0.469*	0.340*	**1.064**
	Top	-	0.306	0.340*	0.646
	Right	0.892	-	-	0.892
	Left	-	0.469	0.340*	0.809

Simult Tx	Configuration	NR Band n2 (PCS) SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.544	0.229	0.340	1.113
	Front	0.429	0.469*	0.340*	**1.238**
	Top	-	0.306	0.340*	0.646
	Right	1.194	-	-	1.194
	Left	-	0.469	0.340*	0.809

Table 12-16
Simultaneous Transmission Scenario with Bluetooth (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot	GSM/GPRS 850	0.599	0.048	0.647
	GSM/GPRS 1900	1.020	0.048	1.068
	UMTS 850	0.586	0.048	0.634
	UMTS 1900	0.950	0.048	0.998
	Cell. CDMA	0.634	0.048	0.682
	PCS CDMA	0.778	0.048	0.826
	LTE Band 12	0.326	0.048	0.374
	LTE Band 13	0.469	0.048	0.517
	LTE Band 5 (Cell)	0.624	0.048	0.672
	LTE Band 66 (AWS)	0.909	0.048	0.957
	LTE Band 2 (PCS)	1.192	0.048	1.240
	LTE Band 48	0.348	0.048	0.396
	NR Band n5 (Cell)	0.495	0.048	0.543
	NR Band n66 (AWS)	0.892	0.048	0.940
	NR Band n2 (PCS)	1.194	0.048	**1.242**

Table 12-17
Simultaneous Transmission Scenario with 2.4 GHz WLAN Antenna 2 and Bluetooth (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	Bluetooth SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot	GSM/GPRS 850	0.599	0.048	0.439	1.086
	GSM/GPRS 1900	1.020	0.048	0.439	**1.507**
	UMTS 850	0.586	0.048	0.439	1.073
	UMTS 1900	0.950	0.048	0.439	1.437
	Cell. CDMA	0.634	0.048	0.439	1.121
	PCS CDMA	0.778	0.048	0.439	1.265
	LTE Band 12	0.326	0.048	0.439	0.813
	LTE Band 13	0.469	0.048	0.439	0.956
	LTE Band 5 (Cell)	0.624	0.048	0.439	1.111
	LTE Band 66 (AWS)	0.909	0.048	0.439	1.396
	LTE Band 2 (PCS)	1.192	0.048	0.439	See Table Below
	LTE Band 48	0.348	0.048	0.439	0.835
	NR Band n5 (Cell)	0.495	0.048	0.439	0.982
	NR Band n66 (AWS)	0.892	0.048	0.439	1.379
	NR Band n2 (PCS)	1.194	0.048	0.439	See Table Below

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.671	0.021	0.301	0.993
	Front	0.513	0.021	0.439*	0.973
	Top	-	0.031	0.439	0.470
	Bottom	1.192	-	-	**1.192**
	Left	0.170	0.048	0.340*	0.558

Simult Tx	Configuration	NR Band n2 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Back	0.544	0.021	0.301	0.866
	Front	0.429	0.021	0.439*	0.889
	Top	-	0.031	0.439	0.470
	Right	1.194	-	-	**1.194**
	Left	-	0.048	0.439*	0.487

Table 12-18
Simultaneous Transmission Scenario with 5 GHz WLAN and Bluetooth (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G /5G SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Hotspot	GSM/GPRS 850	0.599	0.048	0.257	0.340	0.904	0.987	1.244
	GSM/GPRS 1900	1.020	0.048	0.257	0.340	1.325	1.408	See Table Below
	UMTS 850	0.586	0.048	0.257	0.340	0.891	0.974	1.231
	UMTS 1900	0.950	0.048	0.257	0.340	1.255	1.338	See Table Below
	Cell. CDMA	0.634	0.048	0.257	0.340	0.939	1.022	1.279
	PCS CDMA	0.778	0.048	0.257	0.340	1.083	1.166	1.423
	LTE Band 12	0.326	0.048	0.257	0.340	0.631	0.714	0.971
	LTE Band 13	0.469	0.048	0.257	0.340	0.774	0.857	1.114
	LTE Band 5 (Cell)	0.624	0.048	0.257	0.340	0.929	1.012	1.269
	LTE Band 66 (AWS)	0.909	0.048	0.257	0.340	1.214	1.297	1.554
	LTE Band 2 (PCS)	1.192	0.048	0.257	0.340	1.497	1.580	See Table Below
	LTE Band 48	0.348	0.048	0.257	0.340	0.653	0.736	0.993
	NR Band n5 (Cell)	0.495	0.048	0.257	0.340	0.800	0.883	1.140
	NR Band n66 (AWS)	0.892	0.048	0.257	0.340	1.197	1.280	1.537
	NR Band n2 (PCS)	1.194	0.048	0.257	0.340	1.499	**1.582**	See Table Below

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Hotspot SAR	Back	0.567	0.021	0.257	0.340	**1.185**
	Front	0.375	0.021	0.257*	0.340*	0.993
	Top	-	0.031	0.257*	0.340*	0.628
	Bottom	1.020	-	-	-	1.020
	Left	0.124	0.048	0.257*	0.340*	0.769

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Hotspot SAR	Back	0.629	0.021	0.257	0.340	**1.247**
	Front	0.465	0.021	0.257*	0.340*	1.083
	Top	-	0.031	0.257*	0.340*	0.628
	Bottom	0.950	-	-	-	0.950
	Left	0.158	0.048	0.257*	0.340*	0.803

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Hotspot SAR	Back	0.671	0.021	0.257	0.340	**1.289**
	Front	0.513	0.021	0.257*	0.340*	1.131
	Top	-	0.031	0.257*	0.340*	0.628
	Bottom	1.192	-	-	-	1.192
	Left	0.170	0.048	0.257*	0.340*	0.815

Simult Tx	Configuration	NR Band 2 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Hotspot SAR	Back	0.544	0.021	0.257	0.340	1.162
	Front	0.429	0.021	0.257*	0.340*	1.047
	Top	-	0.031	0.257*	0.340*	0.628
	Bottom	0.050	-	-	-	0.050
	Right	1.194	-	-	-	**1.194**
	Left	-	0.048	0.257*	0.340*	0.645

12.6 Phablet Simultaneous Transmission Analysis

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

For SAR summation, the highest reported SAR across all test distances was used as the most conservative evaluation for simultaneous transmission analysis for each device edge.

Table 12-19
Simultaneous Transmission Scenario with 5 GHz WLAN (Phablet)

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Phablet SAR	Back	2.456	1.116	0.707	**3.572**	3.163
	Front	2.880	0.166	0.262	3.046	3.142
	Top	-	1.116*	0.707*	1.116	0.707
	Bottom	2.515	-	-	2.515	2.515
	Left	0.886	0.246	0.707*	1.132	1.593

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Phablet SAR	Back	2.220	1.116	0.707	**3.336**	2.927
	Front	2.290	0.166	0.262	2.456	2.552
	Top	-	1.116*	0.707*	1.116	0.707
	Bottom	2.470	-	-	2.470	2.470
	Left	0.719	0.246	0.707*	0.965	1.426

Simult Tx	Configuration	LTE Band 66 (AWS) SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Phablet SAR	Back	2.475	1.116	0.707	**3.591**	3.182
	Front	2.293	0.166	0.262	2.459	2.555
	Top	-	1.116*	0.707*	1.116	0.707
	Bottom	2.511	-	-	2.511	2.511
	Left	0.573	0.246	0.707*	0.819	1.280

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Phablet SAR	Back	2.473	1.116	0.707	**3.589**	3.180
	Front	2.551	0.166	0.262	2.717	2.813
	Top	-	1.116*	0.707*	1.116	0.707
	Bottom	2.964	-	-	2.964	2.964
	Left	0.779	0.246	0.707*	1.025	1.486

Simult Tx	Configuration	NR Band n2 (PCS) SAR (W/kg)	5 GHz WLAN Ant 1 SAR (W/kg)	5 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Phablet SAR	Back	-	1.116	0.707	1.116	0.707
	Front	-	0.166	0.262	0.166	0.262
	Top	-	1.116*	0.707*	1.116	0.707
	Right	3.094	-	-	3.094	**3.094**
	Left	-	0.246	0.707*	0.246	0.707

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Phablet SAR	Back	2.456	1.466	**3.922**
	Front	2.880	0.333	3.213
	Top	-	1.466*	1.466
	Bottom	2.515	-	2.515
	Right	-	0.070	0.070
	Left	0.886	0.277	1.163

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Phablet SAR	Back	2.220	1.466	**3.686**
	Front	2.290	0.333	2.623
	Top	-	1.466*	1.466
	Bottom	2.470	-	2.470
	Right	-	0.070	0.070
	Left	0.719	0.277	0.996

Simult Tx	Configuration	LTE Band 66 (AWS) SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Phablet SAR	Back	2.475	1.466	**3.941**
	Front	2.293	0.333	2.626
	Top	-	1.466*	1.466
	Bottom	2.511	-	2.511
	Right	-	0.070	0.070
	Left	0.573	0.277	0.850

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Phablet SAR	Back	2.473	1.466	**3.939**
	Front	2.551	0.333	2.884
	Top	-	1.466*	1.466
	Bottom	2.964	-	2.964
	Right	-	0.070	0.070
	Left	0.779	0.277	1.056

Simult Tx	Configuration	NR Band n2 (PCS) SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Phablet SAR	Back	-	1.466	1.466
	Front	-	0.333	0.333
	Top	-	1.466*	1.466
	Right	3.094	0.070	**3.164**
	Left	-	0.277	0.277

12.7 SPLSR Evaluation and Analysis

Per FCC KDB Publication 447498 D01v06, when the sum of the standalone transmitters is more than 1.6 W/kg for 1g, the SAR sum to peak locations can be analyzed to determine SAR distribution overlaps. When the SAR peak to location ratio (shown below) for each pair of antennas is ≤0.04 for 1g, simultaneous SAR evaluation is not required. The distance between the transmitters was calculated using the following formula.

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

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

12.7.1 Body Worn Back Side SPLSR Evaluation and Analysis

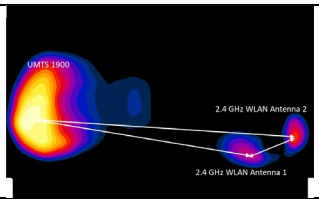
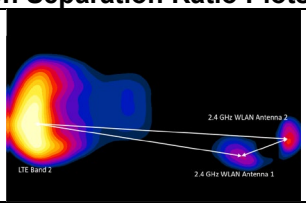
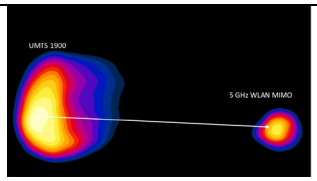
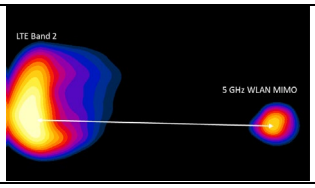
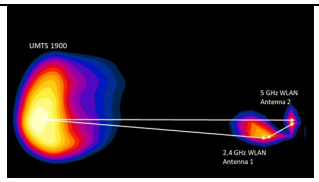
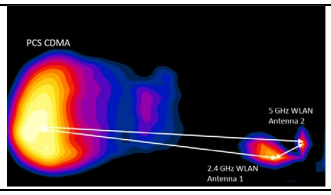
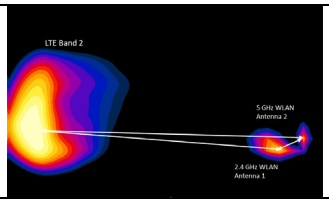
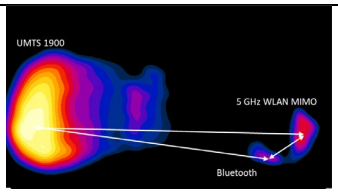
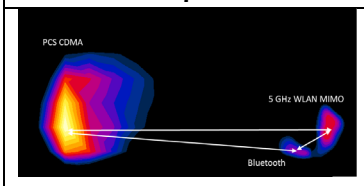
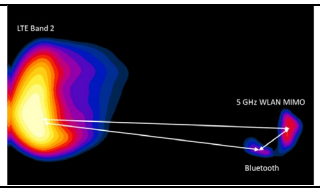
Table 12-20
Peak SAR Locations for Back Side

Mode/Band	x (mm)	y (mm)	Reported SAR (W/kg)
2.4 GHz WLAN Ant 1	8.60	55.20	0.229
2.4 GHz WLAN Ant 2	-7.00	81.60	0.301
Bluetooth	7.40	52.80	0.021
5 GHz WLAN Ant 2	-3.00	71.00	0.356
5 GHz WLAN MIMO	-7.00	65.00	0.531
UMTS 1900	-13.00	-84.00	1.136
PCS CDMA	-11.50	-73.50	1.060
LTE Band 2 (PCS)	-6.50	-78.00	1.190

Table 12-21
Back Side SAR to Peak Location Separation Ratio Calculations

Antenna Pair		Standalone SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio	Plot Number
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$	
UMTS 1900	2.4 GHz WLAN Ant 1	1.136	0.229	1.365	140.87	0.01	1
UMTS 1900	2.4 GHz WLAN Ant 2	1.136	0.301	1.437	165.71	0.01	
2.4 GHz WLAN Ant 1	2.4 GHz WLAN Ant 2	0.229	0.301	0.53	30.66	0.01	
LTE Band 2 (PCS)	2.4 GHz WLAN Ant 1	1.190	0.229	1.419	134.05	0.01	2
LTE Band 2 (PCS)	2.4 GHz WLAN Ant 2	1.190	0.301	1.491	159.60	0.01	
2.4 GHz WLAN Ant 1	2.4 GHz WLAN Ant 2	0.229	0.301	0.53	30.66	0.01	
UMTS 1900	5 GHz WLAN MIMO	1.136	0.531	1.667	149.12	0.01	3
LTE Band 2 (PCS)	5 GHz WLAN MIMO	1.190	0.531	1.721	143.00	0.02	4
UMTS 1900	2.4 GHz WLAN Ant 1	1.136	0.229	1.365	140.87	0.01	5
UMTS 1900	5 GHz WLAN Ant 2	1.136	0.356	1.492	155.32	0.01	
2.4 GHz WLAN Ant 1	5 GHz WLAN Ant 2	0.229	0.356	0.585	19.60	0.02	
PCS CDMA	2.4 GHz WLAN Ant 1	1.060	0.229	1.289	130.26	0.01	6
PCS CDMA	5 GHz WLAN Ant 2	1.060	0.356	1.416	144.75	0.01	
2.4 GHz WLAN Ant 1	5 GHz WLAN Ant 2	0.229	0.356	0.585	19.60	0.02	
LTE Band 2 (PCS)	2.4 GHz WLAN Ant 1	1.190	0.229	1.419	134.05	0.01	7
LTE Band 2 (PCS)	5 GHz WLAN Ant 2	1.190	0.356	1.546	149.04	0.01	
2.4 GHz WLAN Ant 1	5 GHz WLAN Ant 2	0.229	0.356	0.585	19.60	0.02	
UMTS 1900	Bluetooth	1.136	0.021	1.157	138.31	0.01	8
UMTS 1900	5 GHz WLAN MIMO	1.136	0.531	1.667	149.12	0.01	
Bluetooth	5 GHz WLAN MIMO	0.021	0.531	0.552	18.87	0.02	
PCS CDMA	Bluetooth	1.060	0.021	1.081	127.71	0.01	9
PCS CDMA	5 GHz WLAN MIMO	1.060	0.531	1.591	138.57	0.01	
Bluetooth	5 GHz WLAN MIMO	0.021	0.531	0.552	18.87	0.02	
LTE Band 2 (PCS)	Bluetooth	1.190	0.021	1.211	131.54	0.01	10
LTE Band 2 (PCS)	5 GHz WLAN MIMO	1.190	0.531	1.721	143.00	0.02	
Bluetooth	5 GHz WLAN MIMO	0.021	0.531	0.552	18.87	0.02	

Table 12-22
Back Side SAR to Peak Location Separation Ratio Plots

	
1	2
	
3	4
	
5	6
	
7	8
	
9	10

12.8 Simultaneous Transmission Conclusion

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

13 SAR MEASUREMENT VARIABILITY

13.1 Measurement Variability

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

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

1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 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 13-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS														
Band	FREQUENCY		Mode	Service	Side	Spacing	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.					(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1750	1770.00	132572	LTE Band 66 (AWS), 20 MHz Bandwidth	QPSK, 1 RB, 50 RB Offset	back	10 mm	0.930	0.893	1.04	N/A	N/A	N/A	N/A
1900	1860.00	18700	LTE Band 2 (PCS), 20 MHz Bandwidth	QPSK, 1 RB, 50 RB Offset	back	10 mm	1.150	1.100	1.05	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Body 1.6 W/kg (mW/g) averaged over 1 gram							

Table 13-2
Phablet SAR Measurement Variability Results

PHABLET VARIABILITY RESULTS													
Band	FREQUENCY		Mode	Service	Side	Spacing	Measured SAR (10g)	1st Repeated SAR (10g)	Ratio	2nd Repeated SAR (10g)	Ratio	3rd Repeated SAR (10g)	Ratio
	MHz	Ch.					(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1750	1770.00	132572	LTE Band 66 (AWS), 20 MHz Bandwidth	QPSK, 50 RB, 25 RB Offset	bottom	0 mm	2.210	2.170	1.02	N/A	N/A	N/A	N/A
1900	1880.00	376000	NR Band n2 (PCS), 20 MHz Bandwidth	DFT-S-OFDM QPSK, 1 RB, 53 RB Offset	Right	0 mm	2.900	2.870	1.01	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Phablet 4.0 W/kg (mW/g) averaged over 10 grams						

13.2 Measurement Uncertainty

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

14 ADDITIONAL TESTING PER FCC GUIDANCE

14.1 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. Per FCC Guidance, during NR testing the device was configured with the tuner state selected by the device in LTE mode with auto-tune active at the same frequency. 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 32 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 reported 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 32 states.

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

Table 14-1
UMTS/CDMA Supplemental Head SAR Data

Supplemental Head SAR Data			
UMTS B5		CDMA BC0	
RMC		CDMA	
Test Position	Left Cheek	Test Position	Left Cheek
Frequency (MHz)	836.6	Frequency (MHz)	836.52
Channel	4183	Channel	384
Measured 1g SAR (W/kg)	0.189	Measured 1g SAR (W/kg)	0.191
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 32)	0.249	Auto-tune (State 17)	0.229
Default (State 17)	0.247	Default (State 17)	0.227
State 1	0.038	State 17	0.227
State 5	0.061	State 21	0.104
State 9	0.025	State 24	0.115
State 32	0.247	State 27	0.218

Table 14-2
LTE/NR Supplemental Head SAR Data

Supplemental Head SAR Data							
LTE B12		LTE B13		LTE B5		NR Band n5	
QPSK, 10 MHz Bandwidth, 1 RB, 25 RB Offset		QPSK, 10 MHz Bandwidth, 1 RB, 25 RB Offset		QPSK, 10 MHz Bandwidth, 1 RB, 25 RB Offset		DFT-s-OFDM QPSK, 20 MHz Bandwidth, 1 RB, 1 RB Offset	
Test Position	Left Cheek	Test Position	Right Cheek	Test Position	Left Cheek	Test Position	Left Cheek
Frequency (MHz)	707.5	Frequency (MHz)	782.0	Frequency (MHz)	836.5	Frequency (MHz)	836.5
Channel	23095	Channel	23230	Channel	20525	Channel	167300
Measured 1g SAR (W/kg)	0.150	Measured 1g SAR (W/kg)	0.155	Measured 1g SAR (W/kg)	0.159	Measured 1g SAR (W/kg)	0.101
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 11)	0.179	Auto-tune (State 24)	0.203	Auto-tune (State 17)	0.209	Auto-tune (State 17)	0.124
Default (State 12)	0.175	Default (State 24)	0.202	Default (State 17)	0.200	Default (State 17)	0.124
State 11	0.181	State 6	0.116	State 3	0.049	State 17	0.124
State 26	0.034	State 11	0.059	State 7	0.114	State 22	0.068
State 28	0.020	State 15	0.118	State 10	0.028	State 25	0.088
State 32	0.019	State 24	0.202	State 17	0.200	State 30	0.127

Table 14-3
UMTS/CDMA Supplemental Body SAR Data

Supplemental Body SAR Data			
UMTS B5		CDMA BC0	
RMC		EVDO	
Test Position	Back	Test Position	Front
Spacing	10 mm	Spacing	10 mm
Frequency (MHz)	836.6	Frequency (MHz)	836.52
Channel	4183	Channel	384
Measured 1g SAR (W/kg)	0.586	Measured 1g SAR (W/kg)	0.621
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 17)	0.806	Auto-tune (State 17)	0.882
Default (State 17)	0.785	Default (State 17)	0.876
State 4	0.202	State 17	0.876
State 12	0.147	State 19	0.356
State 17	0.785	State 23	0.439
State 18	0.355	State 31	0.856

Table 14-4
LTE/NR Supplemental Body SAR Data

Supplemental Body SAR Data							
LTE B12		LTE B13		LTE B5		NR Band n5	
QPSK, 10 MHz Bandwidth, 1 RB, 25 RB Offset		QPSK, 10 MHz Bandwidth, 1 RB, 25 RB Offset		QPSK, 10 MHz Bandwidth, 1 RB, 25 RB Offset		DFT-s-OFDM QPSK, 20 MHz Bandwidth, 50 RB, 28 RB Offset	
Test Position	Back	Test Position	Back	Test Position	Back	Test Position	Back
Spacing	10 mm	Spacing	10 mm	Spacing	10 mm	Spacing	10 mm
Frequency (MHz)	707.5	Frequency (MHz)	782.0	Frequency (MHz)	836.5	Frequency (MHz)	836.5
Channel	23095	Channel	23230	Channel	20525	Channel	167300
Measured 1g SAR (W/kg)	0.353	Measured 1g SAR (W/kg)	0.459	Measured 1g SAR (W/kg)	0.574	Measured 1g SAR (W/kg)	0.429
Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)		Average Value of Time Sweep (W/kg)	
Auto-tune (State 12)	0.519	Auto-tune (State 24)	0.660	Auto-tune (State 17)	0.862	Auto-tune (State 17)	0.642
Default (State 12)	0.550	Default (State 24)	0.681	Default (State 17)	0.855	Default (State 17)	0.642
State 2	0.540	State 14	0.376	State 3	0.228	State 16	0.297
State 8	0.338	State 20	0.634	State 11	0.153	State 17	0.642
State 12	0.550	State 24	0.681	State 17	0.855	State 20	0.209
State 13	0.523	State 29	0.495	State 18	0.268	State 25	0.325

15 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	85033E	3.5mm Standard Calibration Kit	6/6/2020	Annual	6/6/2021	MY53402352
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	8648D	(9kHz-4GHz) Signal Generator	CBT	N/A	CBT	3629U00687
Agilent	8753ES	Network Analyzer	3/5/2020	Annual	3/5/2021	MY40001472
Keysight Technologies	N9030A	PXA Signal Analyzer	9/13/2019	Annual	9/13/2020	MY54490576
Agilent	8753ES	S-Parameter Network Analyzer	8/26/2019	Annual	8/26/2020	MY40000670
Agilent	8753ES	S-Parameter Vector Network Analyzer	9/19/2019	Annual	9/19/2020	MY40003841
Agilent	E4432B	ESG-D Series Signal Generator	7/14/2019	Annual	7/14/2020	US40053896
Agilent	E4438C	ESG Vector Signal Generator	3/11/2019	Biennial	3/11/2021	MY45090700
Agilent	E5515C	8960 Series 10 Wireless Communications Test Set	2/10/2020	Annual	2/10/2021	GB42230325
Agilent	E5515C	Wireless Communications Test Set	3/29/2018	Triennial	3/29/2021	GB43163447
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Agilent	N5182A	MXG Vector Signal Generator	2/19/2020	Annual	2/19/2021	MY47420651
Agilent	N5182A	MXG Vector Signal Generator	5/13/2020	Annual	5/13/2021	MY47420603
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	353468
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	353469
Anritsu	MA24106A	USB Power Sensor	8/5/2019	Annual	8/5/2020	1827527
Anritsu	MA24106A	USB Power Sensor	10/10/2019	Annual	10/10/2020	1344545
Anritsu	MA2411B	Pulse Power Sensor	8/8/2019	Annual	8/8/2020	1339008
Anritsu	MA2411B	Pulse Power Sensor	12/4/2019	Annual	12/4/2020	1126066
Anritsu	ML2495A	Power Meter	11/15/2019	Annual	11/15/2020	1039008
Anritsu	ML2495A	Power Meter	12/17/2019	Annual	12/17/2020	941001
Anritsu	MT8820C	Radio Communication Analyzer	7/25/2019	Annual	7/25/2020	6201240328
Anritsu	MT8821C	Radio Communication Analyzer	8/16/2019	Annual	8/16/2020	6201144418
Anritsu	MT8821C	Radio Communication Analyzer	10/2/2019	Annual	10/2/2020	6201664756
Anritsu	MT8821C	Radio Communication Analyzer	11/22/2019	Annual	11/22/2020	6262044715
Anritsu	MT8821C	Radio Communication Analyzer	2/22/2020	Annual	2/22/2021	6261895213
Anritsu	MT8821C	Radio Communication Analyzer	3/10/2020	Annual	3/10/2021	6200901190
Anritsu	MT8862A	Wireless Connectivity Test Set	8/8/2019	Annual	8/8/2020	6261782395
Control Company	4040	Therm./ Clock/ Humidity Monitor	10/9/2018	Biennial	10/9/2020	181647811
Control Company	4040	Therm./ Clock/ Humidity Monitor	10/9/2018	Biennial	10/9/2020	181647802
Control Company	4352	Long Stem Thermometer	6/26/2019	Biennial	6/26/2021	192282744
Control Company	4352	Long Stem Thermometer	6/26/2019	Biennial	6/26/2021	192282739
Control Company	4352	Ultra Long Stem Thermometer	8/2/2018	Biennial	8/2/2020	181292054
Control Company	4352	Ultra Long Stem Thermometer	8/2/2018	Biennial	8/2/2020	181292061
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	AT/N6705B	DC Power Supply	CBT	N/A	CBT	MY53001315
Keysight Technologies	N6705B	DC Power Analyzer	4/27/2019	Biennial	4/27/2021	MY53004059
Keysigntt Technologies	U3401A	Digital Multimeter	5/14/2020	Biennial	5/14/2022	MY57201470
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMW500	Radio Communication Tester	10/15/2019	Annual	10/15/2020	109366
Rohde & Schwarz	CMW500	Radio Communication Tester	8/20/2019	Annual	8/20/2020	106578
Rohde & Schwarz	ZNLE6	Vector Network Analyzer	10/11/2019	Annual	10/11/2020	101307
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	7/18/2019	Annual	7/18/2020	N/A
SPEAG	DAK-12	Dielectric Assessment Kit (10MHz - 3GHz)	11/12/2019	Annual	11/12/2020	1121
SPEAG	D750V3	750 MHz Dipole	3/11/2020	Annual	3/11/2021	1054
SPEAG	D835V2	835 MHz SAR Dipole	1/13/2020	Annual	1/13/2021	4d132
SPEAG	D1750V2	1750 MHz SAR Dipole	10/22/2018	Biennial	10/22/2020	1150
SPEAG	D1900V2	1900 MHz SAR Dipole	2/21/2019	Biennial	2/21/2021	5d148
SPEAG	D2450V2	2450 MHz SAR Dipole	8/16/2018	Biennial	8/16/2020	981
SPEAG	D3500V2	3500 MHz SAR Dipole	1/11/2018	Triennial	1/11/2021	1059
SPEAG	D5GHzV2	5 GHz SAR Dipole	1/16/2018	Triennial	1/16/2021	1057
SPEAG	D750V3	750 MHz SAR Dipole	3/16/2020	Annual	3/16/2021	1003
SPEAG	D835V2	835 MHz SAR Dipole	3/13/2019	Biennial	3/13/2021	4d047
SPEAG	D1750V2	1750 MHz SAR Dipole	5/12/2020	Annual	5/12/2021	1148
SPEAG	D1900V2	1900 MHz SAR Dipole	10/23/2018	Biennial	10/23/2020	5d080
SPEAG	D1900V2	1900 MHz SAR Dipole	10/23/2018	Biennial	10/23/2020	5d149
SPEAG	D2450V2	2450 MHz SAR Dipole	8/14/2019	Annual	8/14/2020	719
SPEAG	D5GHzV2	5 GHz SAR Dipole	9/17/2019	Annual	9/17/2020	1191
SPEAG	D5GHzV2	5 GHz SAR Dipole	8/10/2018	Biennial	8/10/2020	1237
SPEAG	EX3DV4	SAR Probe	1/21/2020	Annual	1/21/2021	3589
SPEAG	EX3DV4	SAR Probe	9/19/2019	Annual	9/19/2020	7551
SPEAG	EX3DV4	SAR Probe	7/16/2019	Annual	7/16/2020	7410
SPEAG	EX3DV4	SAR Probe	1/21/2020	Annual	1/21/2021	7488
SPEAG	EX3DV4	SAR Probe	4/21/2020	Annual	4/21/2021	7357
SPEAG	EX3DV4	SAR Probe	12/11/2019	Annual	12/11/2020	7571
SPEAG	EX3DV4	SAR Probe	7/15/2019	Annual	7/15/2020	7547
SPEAG	EX3DV4	SAR Probe	5/18/2020	Annual	5/18/2021	7538
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/13/2020	Annual	1/13/2021	1558
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/17/2019	Annual	9/17/2020	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/11/2019	Annual	7/11/2020	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/13/2020	Annual	1/13/2021	1530
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/15/2020	Annual	4/15/2021	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/11/2019	Annual	7/11/2020	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/20/2020	Annual	5/20/2021	728
SPEAG	DAE4	Dasy Data Acquisition Electronics	12/5/2019	Annual	12/5/2020	1533

Note: Equipment was solely used during its 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.

16 MEASUREMENT UNCERTAINTIES

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

17 CONCLUSION

17.1 Measurement Conclusion

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

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

18 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.