TEST REPORT

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1. Report No : DRRFCC1708-0085(4)
2. Customer
   - Name : LG Electronics MobileComm USA, Inc.
   - Address : 1000 Sylvan Ave., Englewood Cliffs, New Jersey, United States, 07632
3. Use of Report : FCC Original Grant
4. Product Name / Model Name : Mobile Phone / LG-H930
   FCC ID : ZNFH930
5. Test Method Used : IEEE 1528-2013 , FCC SAR KDB Publications (Details in test report)
   Test Specification : CFR §2.1093
6. Date of Test : 2017-06-20 ~ 2017-08-17
7. Testing Environment : Refer to attached test report
8. Test Result : Refer to attached test report.

Affirmation	Tested by Name : HoSik Sim (Signature)	Technical Manager Name : HakMin Kim (Signature)

2017 . 08 . 29 .

DT&C Co., Ltd.

If this report is required to confirmation of authenticity, please contact to report@dtnc.net

Test Report Version

Test Report No.	Date	Description
DRRFCC1708-0085	Aug. 01, 2017	Initial issue
DRRFCC1708-0085(1)	Aug. 11, 2017	Added the contents to General Notes in Section 12.5.
DRRFCC1708-0085(2)	Aug. 21, 2017	Re-test some configurations
DRRFCC1708-0085(3)	Aug. 25, 2017	Include more simultaneous summation information
DRRFCC1708-0085(4)	Aug. 29, 2017	Added a note for LTE power

Table of Contents

1. DESCRIPTION OF DEVICE

Environmental evaluation measurements of specific absorption rate (SAR) distributions in emulated human head and body tissues exposed to radio frequency (RF) radiation from wireless portable devices for compliance with the rules and regulations of the U.S. Federal Communications Commission (FCC).

General Information

EUT type	Mobile Phone			
FCC ID	ZNFH930			
Equipment model name	LG-H930			
Equipment add model name	LG-H930DS, LG-H930K, LG-H930G ● 4 models are same mechanical, electrical and functional. ● The only difference is the model name, which are changed for marketing purpose.			
Equipment serial no.	Identical prototype			
Mode(s) of Operation	GSM 850, GSM 1900, WCDMA 850, WCDMA1900, LTE Band 12, 17, 5, 4, 7, 41, 46(RX Only), 2.4 G W-LAN (802.11b/g/n-HT20/ac-VHT20), 5 G W-LAN (802.11a/n-HT20/n-HT40/ac-VHT20/ac-VHT40/ac-VHT80), Bluetooth			
TX Frequency Range	**Band**	**Mode**	**Bandwidth**	**Frequency**
	GSM 850	GSM/GPRS	-	824.2 ~ 848.8 MHz
	GSM 1900	GSM/GPRS	-	1850.2 ~ 1909.8 MHz
	WCDMA850	WCDMA	-	826.4 ~ 846.6 MHz
	WCDM1900	WCDMA	-	1852.4 ~ 1907.6 MHz
	LTE Band 12	LTE	1.4/3/5/10MHz	699.7 ~ 715.3 MHz
	LTE Band 17	LTE	5/10MHz	706.5 ~ 713.5 MHz
	LTE Band 5	LTE	1.4/3/5/10MHz	824.7 ~ 848.3 MHz
	LTE Band 4	LTE	1.4/3/5/10/15/20MHz	1710.7 ~ 1754.3 MHz
	LTE Band 7	LTE	5/10/15/20MHz	2502.5 ~ 2567.5 MHz
	LTE Band 41	LTE	5/10/15/20MHz	2498.5 ~ 2687.5 MHz
	LTE Band 46	LTE	RX Only	RX Only
	2.4 GHz W-LAN	802.11b/g/n/ac	HT20/VHT20	2412 ~ 2462 MHz
	5.2 GHz W-LAN	802.11a/n/ac	HT20/VHT20	5180 ~ 5240 MHz
		802.11n/ac	HT40/VHT40	5190 ~ 5230 MHz
		802.11ac	VHT80	5210 MHz
	5.3 GHz W-LAN	802.11a/n/ac	HT20/VHT20	5260 ~ 5320 MHz
		802.11n/ac	HT40/VHT40	5270 ~ 5310 MHz
		802.11ac	VHT80	5290 MHz
	5.6 GHz W-LAN	802.11a/n/ac	HT20/VHT20	5500 ~ 5720 MHz
		802.11n/ac	HT40/VHT40	5510 ~ 5710 MHz
		802.11ac	VHT80	5530 ~ 5690 MHz
	5.8 GHz W-LAN	802.11a/n/ac	HT20/VHT20	5745 ~ 5825 MHz
		802.11n/ac	HT40/VHT40	5755 ~ 5795 MHz
		802.11ac	VHT80	5775 MHz
	Bluetooth	-	-	2402 ~ 2480 MHz
RX Frequency Range	GSM 850	GSM/GPRS/EDGE	-	869.2 ~ 893.8 MHz
	GSM 1900	GSM/GPRS/EDGE	-	1930.2 ~ 1989.8 MHz
	WCDMA850	WCDMA	-	871.4 ~ 891.6 MHz
	WCDM1900	WCDMA	-	1932.4 ~ 1987.6 MHz
	LTE Band 12	LTE	1.4/3/5/10MHz	729.7 ~ 745.3 MHz
	LTE Band 17	LTE	5/10MHz	736.5 ~ 743.5 MHz
	LTE Band 5	LTE	1.4/3/5/10MHz	869.7 ~ 893.3 MHz
	LTE Band 4	LTE	1.4/3/5/10/15/20MHz	2110.7 ~ 2154.3 MHz
	LTE Band 7	LTE	5/10/15/20MHz	2622.5 ~ 2687.5 MHz
	LTE Band 41	LTE	5/10/15/20MHz	2498.5 ~ 2687.5 MHz
	LTE Band 46	LTE	10/20MHz	5155.0 ~ 5920.0 MHz
	2.4 GHz W-LAN	802.11b/g/n/ac	HT20/VHT20	2412 ~ 2462 MHz
	5.2 GHz W-LAN	802.11a/n/ac	HT20/VHT20	5180 ~ 5240 MHz
		802.11n/ac	HT40/VHT40	5190 ~ 5230 MHz
		802.11ac	VHT80	5210 MHz
	5.3 GHz W-LAN	802.11a/n/ac	HT20/VHT200	5260 ~ 5320 MHz
		802.11n/ac	HT40/VHT40	5270 ~ 5310 MHz
		802.11ac	VHT80	5290 MHz
	5.6 GHz W-LAN	802.11a/n/ac	HT20/VHT20	5500 ~ 5720 MHz
		802.11n/ac	HT40/VHT40	5510 ~ 5710 MHz
		802.11ac	VHT80	5530 ~ 5690 MHz
	5.8 GHz W-LAN	802.11a/n/ac	HT20/VHT20	5745 ~ 5825 MHz
		802.11n/ac	HT40/VHT40	5755 ~ 5795 MHz
		802.11ac	VHT80	5775 MHz
	Bluetooth	-	-	2402 ~ 2480 MHz

Equipment Class	Band	Reported SAR			
		1g SAR (W/kg)			10g SAR (W/kg)
		Head	Body-Worn	Hotspot	Phablet
PCE	GSM 850	0.094	0.478	-	-
PCE	GPRS 850	0.142	0.568	0.568	-
PCE	GSM 1900	0.130	0.446	-	-
PCE	GPRS 1900	0.172	0.406	0.652	-
PCE	WCDMA 850	0.160	0.723	0.723	-
PCE	WCDMA 1900	0.169	0.611	1.072	-
PCE	LTE Band 12	0.113	0.497	0.497	-
PCE	LTE Band 17	0.124	0.536	0.536	-
PCE	LTE Band 5	0.196	0.507	0.507	-
PCE	LTE Band 4	0.282	0.955	0.955	-
PCE	LTE Band 7	0.122	0.950	1.090	-
PCE	LTE Band 41	0.080	0.279	0.279	-
DTS	2.4 GHz W-LAN	0.975	0.138	0.170	-
U-NII-1	5.2 GHz W-LAN	-	-	0.446	-
U-NII-2A	5.3 GHz W-LAN	1.189	0.484	-	1.526
U-NII-2C	5.6 GHz W-LAN	1.167	0.687	-	1.686
U-NII-3	5.8 GHz W-LAN	0.817	0.731	0.731	-
DSS	Bluetooth	N/A	0.373[Note]	0.373[Not]	N/A
Simultaneous SAR per KDB 690783 D01v01r03		1.550	1.576	1.576	-
FCC Equipment Class	Licensed Portable Transmitter Held to Ear (PCE) Part 15 Spread Spectrum Transmitter(DSS) Digital Transmission System(DTS) Unlicensed National Information Infrastructure (UNII)				
Date(s) of Tests	2017-06-19 ~ 2017-08-17				
Antenna Type	Internal Type Antenna				
Note	Bluetooth SAR was estimated.				
Functions	● GSM/GPRS(GPRS Class: 33) supported. * DTM not supported. ● BT(2.4GHz) / W-LAN(2.4GHz 802.11b/g/ n-HT20/ac-VHT20) supported. W-LAN(5GHz 802.11a/n-HT20/n-HT40/ac-VHT20/ac-VHT40/ac-VHT80) supported * No simultaneous transmission between BT & WLAN ● Simultaneous transmission between GSM, WCDMA voice & WLAN / GPRS, WCDMA & WLAN / LTE & WLAN. ● VoIP is supported. ● W-LAN 2.4GHz is supported Hotspot. ● W-LAN 5 GHz is supported Hotspot in UNII B1, B3.				

1.1 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01 (3G SAR Procedures)
- FCC KDB Publication 941225 D05v02r05 (SAR for LTE Devices)
- FCC KDB Publication 941225 D05Av01r02 (LTE Rel.10 KDB Inquiry Sheet)
- FCC KDB Publication 941225 D06v02r01(Hotspot Mode)
- FCC KDB Publication 248227 D01v02r02 (802.11 Wi-Fi SAR)
- FCC KDB Publication 447498 D01v06 (General RF Exposure Guidance)
- FCC KDB Publication 648474 D04v01r03 (Handset SAR)
- FCC KDB Publication 690783 D01v01r03 (SAR Listings on Grants)
- FCC KDB Publication 865664 D01v01r04 (SAR Measurement 100 MHz to 6 GHz)
- FCC KDB Publication 865664 D02v01r02 (RF Exposure Reporting)
- October 2013 TCB Workshop Notes (GPRS testing criteria)
- April 2015 TCB Workshop Notes (Simultaneous transmission summation clarified)

1.2 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS 850	Voice/Data	824.2 ~ 848.8 MHz
GSM/GPRS 1900	Voice/Data	1850.2 ~ 1909.8 MHz
WCDMA 850	Voice/Data	826.4 ~ 846.6 MHz
WCDMA 1900	Voice/Data	1852.4 ~ 1907.6 MHz
LTE Band 12	Voice/Data	699.7 ~ 715.3 MHz
LTE Band 17	Voice/Data	706.5 ~ 713.5 MHz
LTE Band 5	Voice/Data	824.7 ~ 848.3 MHz
LTE Band 4	Voice/Data	1710.7 ~ 1754.3 MHz
LTE Band 7	Voice/Data	2502.5 ~ 2567.5 MHz
LTE Band 41	Voice/Data	2498.5 ~ 2687.5 MHz
LTE Band 46	Voice/Data	5155.0 ~ 5920.0 MHz
2.4 GHz WLAN	Voice/Data	2412 ~ 2462 MHz
5.2 GHz WLAN (U-NII-1)	Voice/Data	5180 ~ 5240 MHz
5.3 GHz WLAN (U-NII-2A)	Voice/Data	5260 ~ 5320 MHz
5.6 GHz WLAN (U-NII-2C)	Voice/Data	5500 ~ 5720 MHz
5.8 GHz WLAN (U-NII-3)	Voice/Data	5745 ~ 5825 MHz
Bluetooth	Data	2402 ~ 2480 MHz
NFC	Data	13.56 MHz

1.3 Nominal and Maximum Output Power Specifications

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

(A) GSM/GPRS/EDGE 850/1900

Band & Mode		Voice [dBm]	Burst Average GMSK [dBm]				Burst Average 8-PSK [dBm]			
		1 TX Slot	1 TX Slot	2 TX Slot	3 TX Slot	4 TX Slot	1 TX Slot	2 TX Slot	3 TX Slot	4 TX Slot
GSM/GPRS/EDGE 850	Maximum	33.7	33.7	31.7	29.7	27.7	25.7	25.7	24.7	23.7
	Nominal	33.2	33.2	31.2	29.2	27.2	25.2	25.2	24.2	23.2
GSM/GPRS/EDGE 1900	Maximum	31.7	31.7	29.7	27.7	25.7	25.7	25.7	24.7	23.7
	Nominal	31.2	31.2	29.2	27.2	25.2	25.2	25.2	24.2	23.2

(B) WCDMA/HSDPA/HSUPA/DC-HSDPA

Band & Mode		Modulated Average [dBm]			
		3GPP WCDMA (Rel.99)	3GPP HSDPA	3GPP HSUPA	3GPP DC-HSDPA
WCDMA 850	Maximum	25.2	25.2	25.2	25.2
	Nominal	24.7	24.7	24.7	24.7
WCDMA 1900	Maximum	24.2	24.2	24.2	24.2
	Nominal	23.7	23.7	23.7	23.7

Note : This device supports HSUPA but the manufacturer declares on the tune-up procedure that the HSUPA transmitter's power will not exceed the R99 maximum transmit power in devices based on Qualcomm's HSPA chipset solution.

(C) LTE

Band & Mode		Modulated Average [dBm]
LTE Band 12	Maximum	25.2
	Nominal	24.7
LTE Band 17	Maximum	25.2
	Nominal	24.7
LTE Band 5(Cell)	Maximum	25.2
	Nominal	24.7
LTE Band 4(AWS)	Maximum	24.2
	Nominal	23.7
LTE Band 7	Maximum	23.2
	Nominal	22.7
LTE Band 41	Maximum	25.2
	Nominal	24.7

(D) 2.4G WLAN

Band (GHz)	Mode	Ch	Modulated Average[dBm]					
			Ant.1		Ant.2		MIMO(CDD/SDM)	
			Maximum	Nominal	Maximum	Nominal	Maximum	Nominal
2.4	802.11b	1~2	16.0	15.0	16.0	15.0	19.0	18.0
		3~9	16.0	15.0	16.0	15.0	19.0	18.0
		10~11	16.0	15.0	16.0	15.0	19.0	18.0
	802.11g	1~2	15.0	14.0	15.0	14.0	18.0	17.0
		3~9	15.0	14.0	15.0	14.0	18.0	17.0
		10~11	15.0	14.0	15.0	14.0	18.0	17.0
	802.11n	1~2	15.0	14.0	15.0	14.0	18.0	17.0
		3~9	15.0	14.0	15.0	14.0	18.0	17.0
		10~11	15.0	14.0	15.0	14.0	18.0	17.0
	802.11ac	1~2	15.0	14.0	15.0	14.0	18.0	17.0
		3~9	15.0	14.0	15.0	14.0	18.0	17.0
		10~11	15.0	14.0	15.0	14.0	18.0	17.0

(E) 5G WLAN

Band (GHz)	Mode	Ch	Modulated Average[dBm]					
			Ant.1		Ant.2		MIMO(CDD/SDM)	
			Maximum	Nominal	Maximum	Nominal	Maximum	Nominal
5	802.11a	36	16.0	15.0	16.0	15.0	19.0	18.0
		40-48	16.0	15.0	16.0	15.0	19.0	18.0
		52-60	16.0	15.0	16.0	15.0	19.0	18.0
		64	16.0	15.0	16.0	15.0	19.0	18.0
		100	16.0	15.0	16.0	15.0	19.0	18.0
		104-144	16.0	15.0	16.0	15.0	19.0	18.0
		149-161	16.0	15.0	16.0	15.0	19.0	18.0
		165	16.0	15.0	16.0	15.0	19.0	18.0
	802.11n/ac (20MHz)	36	15.0	14.0	15.0	14.0	18.0	17.0
		40-48	15.0	14.0	15.0	14.0	18.0	17.0
		52-60	15.0	14.0	15.0	14.0	18.0	17.0
		64	15.0	14.0	15.0	14.0	18.0	17.0
		100	15.0	14.0	15.0	14.0	18.0	17.0
		104-144	15.0	14.0	15.0	14.0	18.0	17.0
		149-161	15.0	14.0	15.0	14.0	18.0	17.0
		165	15.0	14.0	15.0	14.0	18.0	17.0
	802.11n/ac (40MHz)	38	15.0	14.0	15.0	14.0	18.0	17.0
		46	15.0	14.0	15.0	14.0	18.0	17.0
		54	15.0	14.0	15.0	14.0	18.0	17.0
		62	15.0	14.0	15.0	14.0	18.0	17.0
		102	15.0	14.0	15.0	14.0	18.0	17.0
		110	15.0	14.0	15.0	14.0	18.0	17.0
		134	15.0	14.0	15.0	14.0	18.0	17.0
		142	15.0	14.0	15.0	14.0	18.0	17.0
		151	15.0	14.0	15.0	14.0	18.0	17.0
		159	15.0	14.0	15.0	14.0	18.0	17.0
	802.11ac (80MHz)	42	15.0	14.0	15.0	14.0	18.0	17.0
		58	15.0	14.0	15.0	14.0	18.0	17.0
		106	15.0	14.0	15.0	14.0	18.0	17.0
		138	15.0	14.0	15.0	14.0	18.0	17.0
		155	15.0	14.0	15.0	14.0	18.0	17.0

(F) BT

Modulated Average[dBm]		
Bluetooth 1 Mbps	Maximum	12.5
	Nominal	11.5
Bluetooth 2 Mbps	Maximum	12.0
	Nominal	11.0
Bluetooth 3 Mbps	Maximum	12.0
	Nominal	11.0
Bluetooth LE	Maximum	2.5
	Nominal	1.5

1.4 DUT Antenna Locations

The overall dimensions of this device are > 9 x 5 cm. A diagram showing the location of the device of the device antenna can be found in ZNFH930_Antenna Location. Since the diagonal dimension of this device is > 160 mm and < 200 mm. it is considered a “phablet”.

Mode	Device Sides for SAR Testing					
	Top	Bottom	Front	Rear	Right	Left
GSM 850	X	O	O	O	O	O
GSM 1900	X	O	O	O	X	O
WCDMA 850	X	O	O	O	O	O
WCDMA 1900	X	O	O	O	X	O
LTE Band 12	X	O	O	O	O	O
LTE Band 17	X	O	O	O	O	O
LTE Band 5	X	O	O	O	O	O
LTE Band 4	X	O	O	O	X	O
LTE Band 7	X	O	O	O	X	O
LTE Band 41	X	O	O	O	X	O
2.4G W-LAN Ant.1	O	X	O	O	X	O
2.4G W-LAN Ant.2	O	X	O	O	X	O
2.4G W-LAN MIMO	O	X	O	O	X	O
5G W-LAN Ant.1	O	X	O	O	X	O
5G W-LAN Ant.2	O	X	O	O	X	O
5G W-LAN MIMO	O	X	O	O	X	O

Note 1: Particular DUT edges were not required to be evaluated for Hotspot SAR or Phablet SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 648474 D04v01r03.The antenna document shows the distances between the transmit antennas and the edges of the device.

Note 2: WLAN Hotspot UNII-1, 3 supported.

1.5 Near Field Communications (NFC) Antenna

This DUT has NFC operations. The NFC antenna is integrated into the back cover. The SAR tests were performed with the back cover with NFC antenna already incorporated. A diagram showing the location of the device of the device antenna can be found in ZNFH930_Antenna Location.

1.6 SAR Test Exclusions Applied

(A) WIFI & BT

Per FCC KDB 447498 D01v06, the SAR exclusion threshold for distances < 50 mm is defined by the following equation:

$$\frac{Max\ Power\ of\ Channel\ (mW)}{Test\ Separation\ Dist\ (mm)} * \sqrt{Frequency(GHz)} \leq 3.0$$

Table 1.1 SAR exclusion threshold for distances < 50 mm

Mode	Equation	Result	SAR exclusion threshold	Required SAR
Bluetooth	[(18/10)* √2.480]	2.8	3.0	X
Bluetooth LE	[(2/10)* √2.480]	0.3	3.0	X

Per KDB Publication 447498 D01v06, the maximum power of the channel was rounded to the nearest mW before calculation.

(B) Licensed Transmitter(s)

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

1.7 Power Reduction for SAR

There is no power reduction used for any band/mode implemented in this device for SAR purposes.

1.8 Device Serial Numbers

Band & Mode	Head Serial Number	Body Serial Number	Hotspot Serial Number	Phablet Serial Number
GSM/GPRS 850	FCC #1	FCC #1	FCC #1	FCC #1
GSM/GPRS 1900	FCC #1	FCC #1	FCC #1	FCC #1
WCDMA 850	FCC #1	FCC #1	FCC #1	FCC #1
WCDMA 1900	FCC #1	FCC #1	FCC #1	FCC #1
LTE Band 12	FCC #1	FCC #1	FCC #1	FCC #1
LTE Band 17	FCC #1	FCC #1	FCC #1	FCC #1
LTE Band 5	FCC #1	FCC #1	FCC #1	FCC #1
LTE Band 4	FCC #1	FCC #1	FCC #1	FCC #1
LTE Band 7	FCC #1	FCC #1	FCC #1	FCC #1
LTE Band 41	FCC #1	FCC #1	FCC #1	FCC #1
2.4 GHz WLAN	FCC #2	FCC #2	FCC #2	FCC #2
5 GHz WLAN	FCC #2	FCC #2	FCC #2	FCC #2

1.9 LTE Information

LTE Information					
FCC ID	**ZNFH930**				
Form Factor	Mobile Phone				
Frequency Range of each LTE transmission Band	LTE Band 12 (699.7 ~ 715.3 MHz) LTE Band 17 (706.5 ~ 713.5 MHz) LTE Band 5 (Cell) (824.7 ~ 848.3 MHz) LTE Band 4 (AWS) (1710.7 ~ 1754.3 MHz) LTE Band 7 (2502.5 ~ 2567.5 MHz) LTE Band 41 (2498.5 ~ 2687.5 MHz) LTE Band 46 (5150.0 ~ 5925.0 MHz) / RX Only				
Channel Bandwidths	LTE Band 12 (699.7 ~ 715.3 MHz): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz LTE Band 17 (706.5 ~ 713.5 MHz): 5 MHz, 10 MHz LTE Band 5: (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 41: 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 46: 10 MHz, 20 MHz / RX Only				
Channel Number and Frequencies(MHz)	Low	Low-Mid	Mid	Mid-High	High
LTE Band 12: 1.4 MHz	699.7 (23017)	N/A	707.5 (23095)	N/A	715.3 (23173)
LTE Band 12: 3 MHz	700.5 (23025)	N/A	707.5 (23095)	N/A	714.5 (23165)
LTE Band 12: 5 MHz	701.5 (23035)	N/A	707.5 (23095)	N/A	713.5 (23155)
LTE Band 12: 10 MHz	704.0 (23060)	N/A	707.5 (23095)Note1	N/A	711.0 (23130)
LTE Band 17: 5 MHz	706.5(23755)	N/A	710.0(23790)Note2	N/A	713.5(23825)
LTE Band 17: 10 MHz	709.0(23780)	N/A	710.0(23790)Note2	N/A	711.0(23800)
LTE Band 5 (Cell): 1.4 MHz	824.7 (20407)	N/A	836.5 (20525)	N/A	848.3 (20643)
LTE Band 5 (Cell): 3 MHz	825.5 (20415)	N/A	836.5 (20525)	N/A	847.5 (20635)
LTE Band 5 (Cell): 5 MHz	826.5 (20425)	N/A	836.5 (20525)	N/A	846.5 (20625)
LTE Band 5 (Cell): 10 MHz	829.0 (20450)	N/A	836.5 (20525)Note3	N/A	844.0 (20600)
LTE Band 4 (AWS): 1.4 MHz	1710.7 (19957)	N/A	1732.5 (20175)	N/A	1754.3 (20393)
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)	N/A	1732.5 (20175)	N/A	1753.5 (20385)
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)	N/A	1732.5 (20175)	N/A	1752.5 (20375)
LTE Band 4 (AWS): 10 MHz	1715.0 (20000)	N/A	1732.5 (20175)	N/A	1750.0 (20350)
LTE Band 4 (AWS): 15 MHz	1717.5 (20025)	N/A	1732.5 (20175)	N/A	1747.5 (20325)
LTE Band 4 (AWS): 20 MHz	1720.0 (20050)	N/A	1732.5 (20175)	N/A	1745.0 (20300)
LTE Band 7: 5 MHz	2502.5 (20775)	N/A	2535.0 (21100)	N/A	2567.5 (21425)
LTE Band 7: 10 MHz	2505.0 (20800)	N/A	2535.0 (21100)	N/A	2565.0 (21400)
LTE Band 7: 15 MHz	2507.5 (20825)	N/A	2535.0 (21100)	N/A	2562.5 (21375)
LTE Band 7: 20 MHz	2510.0 (20850)	N/A	2535.0 (21100)	N/A	2560.0 (21350)
LTE Band 41: 5 MHz	2498.5 (39675)	2545.8 (40148)	2593.0 (40620)	2640.3 (41093)	2687.5 (41565)
LTE Band 41: 10 MHz	2501.0 (39700)	2547.0 (40160)	2593.0 (40620)	2639.0 (41080)	2685.0 (41540)
LTE Band 41: 15 MHz	2503.5 (39725)	2548.3 (40173)	2593.0 (40620)	2637.8 (41068)	2682.5 (41515)
LTE Band 41: 20 MHz	2506.0 (39750)	2549.5 (40185)	2593.0 (40620)	2636.5 (41055)	2680.0 (41490)
LTE Band 46: 10 MHz / RX Only	5155.0 (46840)	N/A	5535.0 (50640)	N/A	5920.0 (54490)
LTE Band 46: 20 MHz / RX Only	5160.0 (46890)	N/A	5535.0 (50640)	N/A	5915.0 (54440)
UE Category	LTE Rel.11, Category 16 with only downlink carrier aggregation (not support uplink MIMO and uplink carrier aggregation)				
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?	LTE A-MPR is not supported.				
Power reduction explanation	This device doesn't implements power reduction.				
LTE Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations				
LTE Release 11 Additional Information	This device does not support full CA features on 3GPP Release 11. It supports a maximum of 3 carriers in the downlink. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. The following LTE Release 11 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, WIFI Offloading, MDH, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

Note(s)

1. LTE Band 12 at 10 MHz bandwidth does not support three non-overlapping channels.
   Per KDB 941225 D05v02r05, 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.
2. LTE Band 17 at 10 MHz/5 MHz bandwidth does not support three non-overlapping channels.
   Per KDB 941225 D05v02r05, 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.
3. LTE Band 5 (Cell) at 10 MHz bandwidth does not support three non-overlapping channels.
   Per KDB 941225 D05v02r05, 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.
4. LTE Band 4 (AWS) at 20 MHz bandwidth does not support three non-overlapping channels.
   Per KDB 941225 D05v02r05, 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.

2. INTROCUCTION

The FCC and Industry 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.

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices. 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. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave is used for guidance in measuring 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 National Council on Radiation Protection and Measurements (NCRP) in Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86 NCRP, 1986, Bethesda, MD 20814. 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.

SAR Definition

Specific Absorption Rate (SAR) 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 Fig. 2.1)

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

Fig. 2.1 SAR Mathematical Equation

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 relations 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.

3. DESCRIPTION OF TEST EQUIPMENT

3.1 SAR MEASUREMENT SETUP

Measurements are performed using the DASY5 automated dosimetric assessment system. The DASY5 is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland and consists of high precision robotics system (Staubli), robot controller, desktop computer, near-field probe, probe alignment sensor, and the generic twin phantom containing the brain equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF) (see Fig. 3.1).

A cell controller system contains the power supply, robot controller each pendant (Joystick), and a remote control used to drive the robot motors. The PC consists of the Intel Core i7-3770 3.40 GHz desktop computer with Windows 7 system and SAR Measurement Software DASY5,A/D interface card, monitor, mouse, and keyboard. The Staubli Robotis connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit that performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

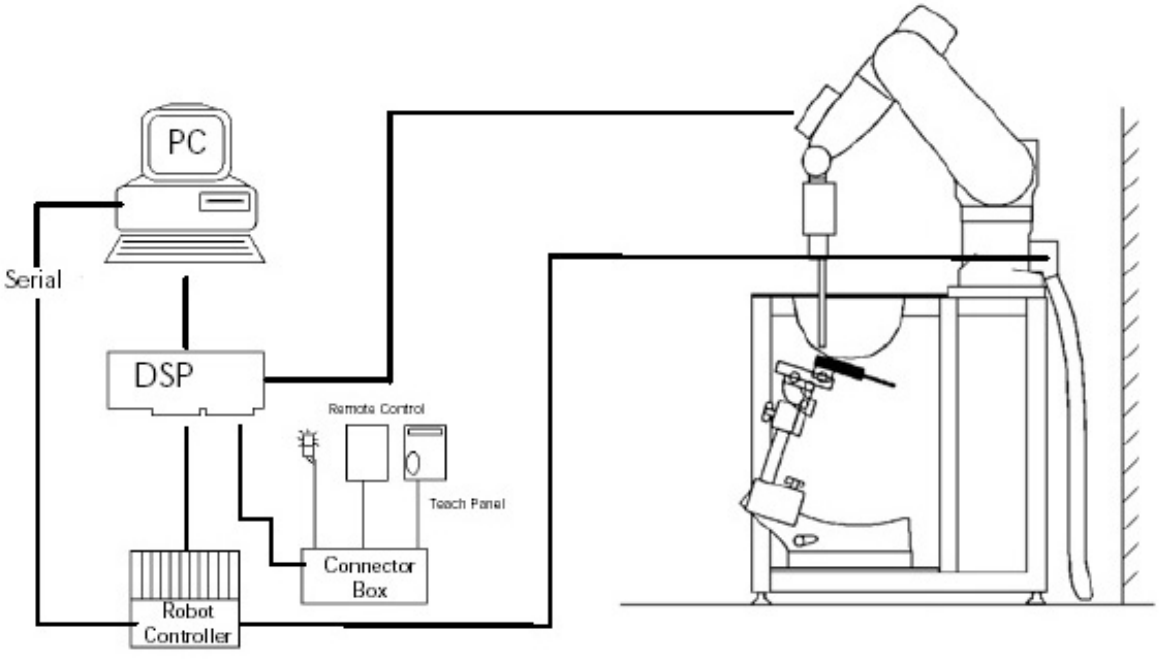


Figure 3.1 SAR Measurement System Setup

The DAE4 consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer. The system is described in detail.

3.2 EX3DV4Probe Specification

Calibration In air from 10 MHz to 6 GHz
In brain and muscle simulating tissue at Frequencies of
750 MHz, 835 MHz, 900 MHz, 1750 MHz, 1900 MHz, 2300 MHz, 2450 MHz, 2600 MHz,
3500 MHz, 5200 MHz, 5300 MHz, 5500 MHz, 5600 MHz, 5800 MHz

Frequency 10 MHz to 6 GHz

Linearity ± 0.2 dB(30 MHz to 6 GHz)

Dynamic 10 µW/g to > 100 mW/g

Range Linearity : ±0.2dB

Dimensions Overall length : 337 mm

Tip length 20 mm

Body diameter 12 mm

Tip diameter 2.5 mm

Distance from probe tip to sensor center 1.0 mm

Application SAR Dosimetry Testing
Compliance tests of mobile phones

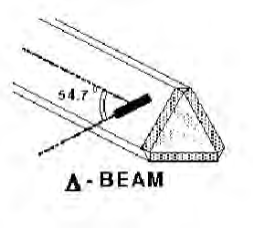


Figure 3.2 Triangular Probe Configurations

Figure 3.3 Probe Thick-Film Technique

DAE System

The SAR measurements were conducted with the dosimetric probe EX3DV4, designed in the classical triangular configuration(see Fig. 3.2) and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multitier line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY5 software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting. The approach is stopped at reaching the maximum.

3.3 Probe Calibration Process

3.3.1 E-Probe Calibration

Dosimetric Assessment Procedure

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than +/- 10%. The spherical isotropy was evaluated with the procedure and found to be better than +/-0.25dB. The sensitivity parameters (Norm X, Norm Y, Norm Z), the diode compression parameter (DCP) and the conversion factor (Conv F) of the probe is tested.

Free Space Assessment

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies below 1 GHz, and in a waveguide above 1GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity at the proper orientation with the field. The probe is then rotated 360 degrees.

Temperature Assessment *

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium, correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent the remits or based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

where:

Δt = exposure time (30 seconds),

C = heat capacity of tissue (brain or muscle),

ΔT = temperature increase due to RF exposure.

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

where:

σ = simulated tissue conductivity,

ρ = Tissue density (1.25 g/cm^3 for brain tissue)

SAR is proportional to ΔT / Δt , the initial rate of tissue heating, before thermal diffusion takes place. Now it's possible to quantify the electric field in the simulated tissue by equating the thermally derived SAR to the E- field;

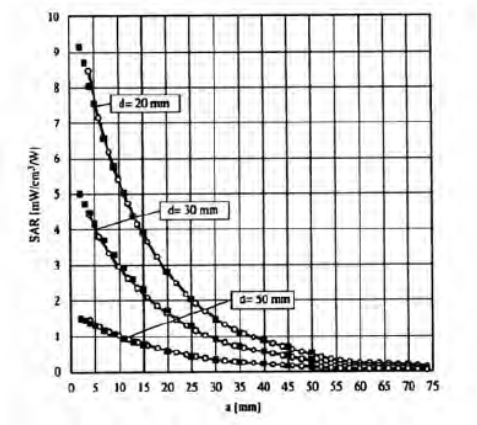


Figure 3.4 E-Field and Temperature Measurements at 900MHz

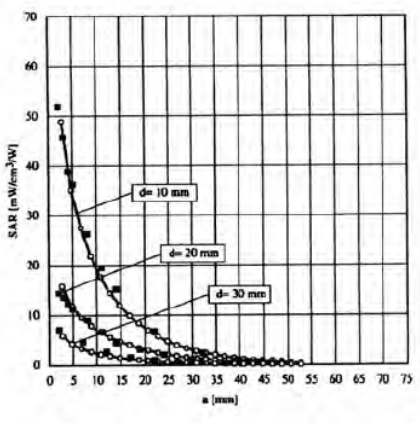


Figure 3.5 E-Field and Temperature Measurements at 1800MHz

3.4 Data Extrapolation

The DASY5 software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given like below;

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

with V_i = compensated signal of channel i (i=x,y,z)
U_i = input signal of channel i (i=x,y,z)
cf = crest factor of exciting field (DASY parameter)
dcp_i = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes:

$$E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

with V_i = compensated signal of channel i (i = x,y,z)
$Norm_i$ = sensor sensitivity of channel i (i = x,y,z)
$\mu V/(V/m)^2$ for E-field probes
ConvF = sensitivity of enhancement in solution
E_i = electric field strength of channel i in V/m

The RSS value of the field components gives the total field strength (Hermetian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1000}$$

with SAR = local specific absorption rate in W/g
E_{tot} = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm^3

The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = \frac{E_{tot}^2}{3770}$$

with P_{pwe} = equivalent power density of a plane wave in W/cm^2
E_{tot} = total electric field strength in V/m

3.5 SAM Twin PHANTOM

The SAM Twin Phantom V5.0 is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90% of all users. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents the evaporation of the liquid.

Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. (see Fig. 3.6)

Figure 3.6 SAM Twin Phantom

SAM Twin Phantom Specification:

Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot. Twin SAM V5.0 has the same shell geometry and is manufactured from the same material as Twin SAM V4.0, but has reinforced top structure.
Shell Thickness	2 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm Width: 500 mm Height: adjustable feet

Specific Anthropomorphic Mannequin (SAM) Specifications:

The phantom for handset SAR assessment testing is a low-loss dielectric shell, with shape and dimensions derived from the anthropometric data of the 90th percentile adult male head dimensions as tabulated by the US Army. The SAM Twin Phantom shell is bisected along the mid-sagittal plane into right and left halves (see Fig. 3.7). The perimeter sidewalls of each phantom halves are extended to allow filling with liquid to a depth that is sufficient to minimized reflections from the upper surface. The liquid depth is maintained at a minimum depth of 15cm to minimize reflections from the upper surface.

Figure 3.7 Sam Twin Phantom shell

3.6 Modular Flat PHANTOM

Modular Flat Phantom Specification:

Construction	Triple Modular Phantom consists of tree identical modules which can be installed and removed separately without emptying the liquid. It includes three reference points for phantom installation. Covers prevent evaporation of the liquid. Phantom material is resistant to DGBE based tissue simulating liquids. The MFP V5.1 will be delivered including wooden support only (non-standard SPEAG support). Applicable for system performance check from 800 MHz to 6 GHz and dosimetric evaluations for body-worn operation.
Shell Thickness	2 ± 0.2 mm(bottom plate
Filling Volume	Approx. 9.2 liters(per module)
Dimensions	Length: 830 mm Width: 500 mm

3.7 Device Holder for Transmitters

In combination with the Twin SAM Phantom V4.0/V4.0c, V5.0 or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Rotation point is the ear opening point. Transmitter devices can be easily and accurately positioned according to IEC, IEEE, FCC or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).

Note: A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produce infinite number of configurations. To produce the worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.

Figure 3.8 Mounting Device

3.8 Brain & Muscle Simulation Mixture Characterization

The brain and muscle mixtures consist of a viscous gel using hydrox-ethylcellulose (HEC) gelling agent and saline solution (see Table 3.1). Preservation with a bactericide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. The mixture characterizations used for the brain and muscle tissue simulating liquids are according to the data by C. Gabriel and G. Harts grove.

Figure 3.9 Simulated Tissue

Table3.1 Composition of the Tissue Equivalent Matter

Ingredients (% by weight)	Frequency (MHz)							
	835		1900		2450		5200 ~ 5800	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body
Water	40.19	50.75	55.24	70.23	71.88	73.40	65.52	80.00
Salt (NaCl)	1.480	0.940	0.310	0.290	0.160	0.060	-	-
Sugar	57.90	48.21	-	-	-	-	-	-
HEC	0.250	-	-	-	-	-	-	-
Bactericide	0.180	0.100	-	-	-	-	-	-
Triton X-100	-	-	-	-	19.97	-	17.24	-
DGBE	-	-	44.45	29.48	7.990	26.54	-	-
Diethylene glycol hexyl ether	-	-	-	-	-	-	17.24	-
Polysorbate (Tween) 80	-	-	-	-	-	-		20.00
Target for Dielectric Constant	41.5	55.2	40.0	53.3	39.2	52.7	-	-
Target for Conductivity (S/m)	0.90	0.97	1.40	1.52	1.80	1.95	-	-

Salt:	99 % Pure Sodium Chloride	Sugar:	98 % Pure Sucrose
Water:	De-ionized, 16M resistivity	HEC:	Hydroxyethyl Cellulose
DGBE:	99 % Di(ethylene glycol) butyl ether,[2-(2-butoxyethoxy) ethanol]		
Triton X-100(ultra pure):	Polyethylene glycol mono[4-(1,1,3,3-tetramethylbutyl)phenyl] ether		

Table3.2 HSL/MSL750 (Head and Body liquids for 700 – 800 MHz)

Item	Head Tissue Simulation Liquids HSL750 Muscle (body) Tissue Simulation Liquids MSL750
Type No	SL AAH 075, SL AAM 075
Manufacturer	SPEAG
The item is composed of the following ingredients:	
H^2O	Water, 35 – 58%
Sucrose	Sucrose, 40 – 60%
NaCl	Sodium Chloride, 0 – 6%
Hydroxyethyl-cellulose	Medium Viscosity (CAS# 9004-62-0), < 0.3%
Preventol-D7	Preservative: aqueous preparation, (CAS# 55965-84-9), containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyyl-3(2H)-isothiazolone, 0.1 – 0.6%

Table3.3 HSL/MSL1750 (Head and Body liquids for 1700 – 1800 MHz)

Item	Head Tissue Simulation Liquids HSL1750 Muscle (body) Tissue Simulation Liquids MSL1750
Type No	SL AAH 175, SL AAM 175
Manufacturer	SPEAG
The item is composed of the following ingredients:	
H^2O	Water, 52 – 75%
C8H18O3	Diethylene glycol monobutyl ether (DGBE), 25 – 48%
NaCl	Sodium Chloride, < 1.0%

3.9 SAR TEST EQUIPMENT

Table 3.2 Test Equipment Calibration

	Type	Manufacturer	Model	Cal.Date	Next.Cal.Date	S/N
☒	SEMITEC Engineering	SEMITEC	N/A	N/A	N/A	Shield Room
☒	Robot	SCHMID	TX60L	N/A	N/A	F12/5LP5A1/A/01
☒	Robot Controller	SCHMID	CS8C	N/A	N/A	F12/5LP5A1/C/01
☒	Joystick	SCHMID	N/A	N/A	N/A	S-12030401
☒	IntelCorei7-3770 3.40 GHz Windows 7 Professional	N/A	N/A	N/A	N/A	N/A
☒	Probe Alignment Unit LB	N/A	N/A	N/A	N/A	SE UKS 030 AA
☒	Device Holder	SCHMID	Holder	N/A	N/A	SD000H01KA
☒	Twin SAM Phantom	SCHMID	QD000P40CD	N/A	N/A	1679
☒	Triple Modular Phantom	SCHMID	QD000P51CA	N/A	N/A	1147
☒	Data Acquisition Electronics	SCHMID	DAE4V1	2017-05-24	2018-05-24	1392
☒	Dosimetric E-Field Probe	SCHMID	EX3DV4	2017-05-31	2018-05-31	3866
☒	750MHz SAR Dipole	SCHMID	D750V3	2017-01-18	2019-01-18	1049
☒	835MHz SAR Dipole	SCHMID	D835V2	2016-09-28	2018-09-28	4d159
☒	1800MHz SAR Dipole	SCHMID	D1800V2	2017-05-23	2019-05-23	2d047
☒	1900MHz SAR Dipole	SCHMID	D1900V2	2016-09-28	2018-09-28	5d176
☒	2450MHz SAR Dipole	SCHMID	D2450V2	2016-09-23	2018-09-23	920
☒	2600MHz SAR Dipole	SCHMID	D2600V2	2017-03-23	2019-03-23	1016
☒	5GHz SAR Dipole	SCHMID	D5GHzV2	2017-03-17	2019-03-17	1103
☒	Network Analyzer	Agilent	E5071C	2016-12-02	2017-12-02	MY46111534
☒	Signal Generator	Agilent	E4438C	2016-09-09	2017-09-09	US41461520
☒	Amplifier	EMPOWER	BBS3Q7ELU	2016-09-08	2017-09-08	1020
☒	High Power RF Amplifier	EMPOWER	BBS3Q8CCJ	2016-10-18	2017-10-18	1005
☒	Power Meter	HP	EPM-442A	2017-01-04	2018-01-04	GB37170267
☒	Power Meter	HP	EPM-442A	2017-04-11	2018-04-11	GB37170413
☒	Power Sensor	HP	8481A	2017-01-04	2018-01-04	3318A96566
☒	Power Sensor	HP	8481A	2017-01-04	2018-01-04	2702A65976
☒	Power Sensor	HP	8481A	2017-04-11	2018-04-11	3318A96332
☒	Dual Directional Coupler	Agilent	778D-012	2017-01-05	2018-01-05	50228
☒	Directional Coupler	HP	772D	2016-07-26	2017-07-26	2889A01064
				2017-07-26	2018-07-26	
☒	Low Pass Filter 1.5GHz	Micro LAB	LA-15N	2017-01-04	2018-01-04	N/A
☒	Low Pass Filter 3.0GHz	Micro LAB	LA-30N	2016-09-08	2017-09-08	N/A
☒	Low Pass Filter 6.0GHz	Micro LAB	LA-60N	2017-01-04	2018-01-04	03942
☒	Attenuators(3 dB)	Agilent	8491B	2017-04-11	2018-04-11	MY39260700
☒	Attenuators(10 dB)	WEINSCHEL	23-10-34	2017-01-04	2018-01-04	BP4387
☒	Dielectric Probe kit	SCHMID	DAK-3.5	2016-11-17	2017-11-17	1092
☒	Dielectric Probe kit	SCHMID	DAK-3.5	2016-07-26	2017-07-26	1046
				2017-07-26	2018-07-26	
☒	8960 Series 10 Wireless Comms. Test Set	Agilent	E5515C	2016-09-09	2017-09-09	GB43461134
☒	Wideband Radio Communication Tester	Rohde Schwarz	CMW500	2016-09-09	2017-09-09	101414
☒	Wideband Radio Communication Tester	Rohde Schwarz	CMW500	2017-06-20	2018-06-20	102332
☒	Radio Communication Analyzer	KEYSIGHT	E7515A	2016-09-13	2017-09-13	MY55210201
☒	Radio Communication Analyzer	KEYSIGHT	E7515A	2017-07-19	2018-07-19	MY55340283
☒	Power Splitter	Anritsu	K241B	2017-01-11	2018-01-11	1301183
☒	Bluetooth Tester	TESCOM	TC-3000B	2017-01-04	2018-01-04	3000B770243

NOTE: The E-field probe was calibrated by SPEAG, by temperature measurement procedure. Dipole Verification measurement is performed by DT&Cbefore each test. The brain and muscle simulating material are calibrated byDT&C using the dielectric probe system and network analyzer to determine the conductivity and permittivity (dielectric constant) of the brain-equivalent material. Each equipment item was used solely within its respective calibration period.

4. TEST SYSTEM SPECIFICATIONS

Automated TEST SYSTEM SPECIFICATIONS:

Positioner

Robot	Stäubli Unimation Corp. Robot Model: TX60L
Repeatability	0.02 mm
No. of axis	6

Data Acquisition Electronic (DAE) System

Cell Controller

Processor	Intel Core i7-3770
Clock Speed	3.40 GHz
Operating System	Windows 7 Professional
Data Card	DASY5 PC-Board

Data Converter

Features	Signal, multiplexer, A/D converter. & control logic
Software	DASY5
Connecting Lines	Optical downlink for data and status info Optical uplink for commands and clock

PC Interface Card

Function	24 bit (64 MHz) DSP for real time processing Link to DAE 4 16 bit A/D converter for surface detection system serial link to robot direct emergency stop output for robot

E-Field Probes

Model	EX3DV4 S/N: 3866
Construction	Triangular core fiber optic detection system
Frequency	10 MHz to 6 GHz
Linearity	± 0.2 dB (30 MHz to 6 GHz)

Phantom

Phantom	SAM Twin Phantom (V5.0)
Shell Material	Composite
Thickness	2.0 ± 0.2 mm

Figure 4.1 DASY5 Test System

5. SAR MEASUREMENT PROCEDURE

5.1 Measurement Procedure

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

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 5.1) and IEEE1528-2013.

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.

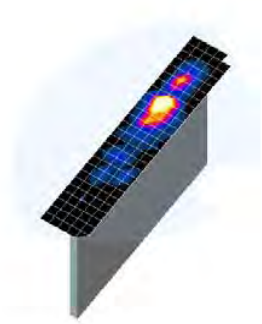


Figure 5.1
Sample SAR Area Scan

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 5.1) 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 5.1. 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.

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 mm ± 1 mm	$½ \cdot \delta \cdot \ln(2)$ mm ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ $1.5 \cdot \Delta z_{Zoom}(n-1)$ mm	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

Table 5.1 Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

6. DEFINITION OF REFERENCE POINTS

6.1 Ear Reference Point

Figure 6.1 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 ERPs are 15mm posterior to the entrance to the Ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 6.1. The plane Passing, through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck- Front) is perpendicular to the reference plane and passing through the RE (or LE) is called the Reference Pivoting Line (see Figure 6.1). 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.

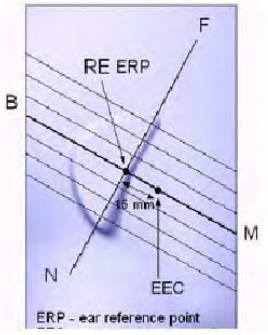


Figure 6.1
Close-up side view of ERP

6.2 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 "test device reference point" located along the "vertical centerline" on the front of the device aligned to the "ear reference point" (See Fig. 6.3). The "test device reference point" 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 it's 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 6.2 Front, back and side view SAM Twin Phantom

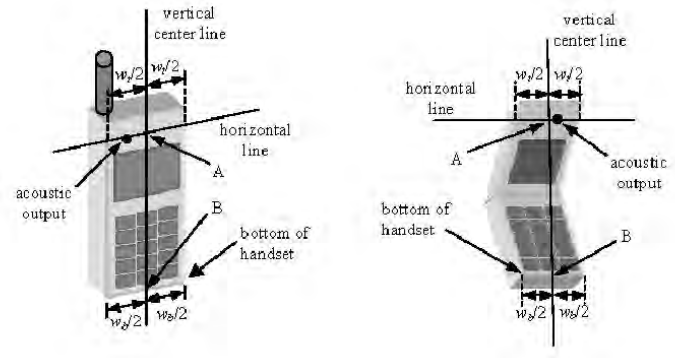


Figure 6.3 Handset Vertical Center & Horizontal Line Reference Points

7. TEST CONFIGURATION POSITIONS FOR HANDSETS

7.1 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.

7.2 Positioning for Cheek/Touch

1. The test device was positioned with the handset 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 7.1), 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 7.1 Front, Side and Top View of Cheek/Touch Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the ear.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the plane normal to MB-NF including the line MB (reference plane).
4. The phone was hen 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 phone contact with the ear, the handset was rotated about the line NF until any point on the handset made contact with a phantom point below the ear (cheek). (See Figure 7.2)

7.3 Positioning for Ear / 15 ° Tilt

With the test device aligned in the “Cheek/Touch 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 15degree.
2. The phone was then rotated around the horizontal line by 15 degree.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the phone touches 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. 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 7.3).

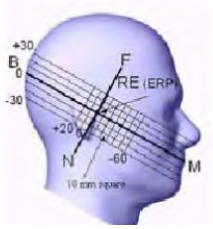


Figure 7.2 Side view w/relevant markings

Figure 7.3 Front, Side and Top View of Ear/15°Position

7.4 Body-Worn Accessory Configurations

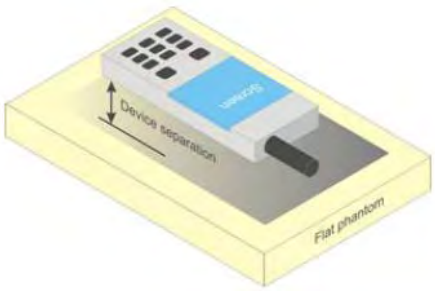


Figure 7.4 Sample Body-Worn Diagram

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 7.4). 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.

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.

7.5 Extremity Exposure Configurations

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

7.6 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 the front, rear 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 transmitter 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 KDB Publication 447498 D01v06 procedures. The “Portable Hotspot” feature on the handset was not activated during SAR assessment, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

8. RF EXPOSURE LIMITS

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.

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 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 8.1.SAR Human Exposure Specified in ANSI/IEEE C95.1-1992

	HUMAN EXPOSURE LIMITS	
	General Public Exposure (W/kg) or (mW/g)	Occupational Exposure (W/kg) or (mW/g)
SPATIAL PEAK SAR * (Brain)	1.60	8.00
SPATIAL AVERAGE SAR ** (Whole Body)	0.08	0.40
SPATIAL PEAK SAR *** (Hands / Feet / Ankle / Wrist)	4.00	20.0

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.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

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).

9. FCC MEASUREMENT PROCEDURES

Power measurements were performed using a base station simulator under digital average power.

9.1 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.

9.2 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D01v03r01.

The device was 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 were 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 was 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 deviated by more than 5%, the SAR test and drift measurements were repeated.

9.3 SAR Measurement Conditions for WCDMA (UMTS)

9.3.1 Output Power Verification

Maximum output power is measured on the High, Middle and Low channels for each applicable transmission band according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all “1s”.

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 (release 5), 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.

9.3.2 Head SAR Measurements for Handsets

SAR for head exposure configurations is measured using the 12.2 kbps RMC with TPC bits configured to all “1s”. SAR in AMR configurations is not required when the maximum average output of each RF channel for 12.2 kbps AMR is less than 0.25 dB higher than that measured in12.2 kbps RMC. Otherwise, SAR is measured on the maximum output channel in 12.2 AMR with a 3.4 kbps SRB (signaling radio bearer) using the exposure configuration that resulted in the highest SAR for that RF channel in the 12.2 kbps RMC mode.

9.3.3 Body SAR Measurements

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits all“1s”.

9.3.4 Release 5 HSDPA Data Devices

The following procedures are applicable to HSDPA data devices operating under 3GPP Release 5. SAR is required for devices in body-worn accessory and other body exposure conditions, including handsets and data modems operating in various electronic devices. HSDPA operates in conjunction with WCDMA and requires an active DPCCH. The default test configuration is to measure SAR in WCDMA with HSDPA remain inactive, to establish a radio link between the test device and a communication test set using a 12.2 kbps RMC configured in Test Loop Mode 1. SAR for HSDPA is selectively measured using the highest reported SAR configuration in WCDMA, with an FRC in H-set 1 and a 12.2 kbps RMC. SAR is selectively confirmed for other physical channel configurations (DPCCH & DPDCHn) according to exposure conditions, device operating capabilities and maximum output power specified for production units, including tune-up tolerance by applying the 3G SAR test reduction procedures. Maximum output power is verified according to the applicable versions of 3GPP TS 34.121. SAR must be measured based on these maximum output conditions and requirements in KDB Publication 447498, with respect to the UE Categories, and explained in the SAR report. When Maximum Power Reduction (MPR) applies, the implementations must be clearly identified in the SAR report to support test results according to Cubic Metric (CM) and, as appropriate, Enhanced MPR (E-MPR) requirements.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	CM (dB) (2)
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 (3)	15/15 (3)	64	12/15 (3)	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15.
Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Figure 9.1 Table 1

9.3.5 Release 6 HSUPA Data Devices

The following procedures are applicable to HSPA (HSUPA/HSDPA) data devices operating under 3GPP Release 6. SAR is required for devices in body-worn accessory and other body exposure conditions, including handsets and data modems operating in various electronic devices. HSUPA operates in conjunction with WCDMA and HSDPA. SAR is initially measured in WCDMA test configurations with HSPA remain inactive. The default test configuration is to establish a radio link between the test device and a communication test set to configure a 12.2 kbps RMC in Test Loop Mode 1. SAR for HSPA is selectively measured with HS-DPCCH, E-DPCCH and E-DPDCH, all enabled, along with a 12.2 kbps RMC using the highest reported SAR configuration in WCDMA with 12.2 kbps RMC only.
An FRC is configured according to HS-DPCCH Sub-test 1 using H-set 1 and QPSK. HSPA is configured according to E-DCH Sub-test 5 requirements. SAR for other HSPA sub-test configurations is confirmed selectively according to exposure conditions, E-DCH UE Category and maximum output power of production units, including tune-up tolerance by applying the 3G SAR test reduction procedure. Maximum output power is verified according to procedures in applicable versions of 3GPP TS 34.121. SAR must be measured based on these maximum output conditions and requirements in KDB Publication 447498, with respect to the UE Categories for HS-DPCCH and HSPA, and explained in the SAR report. When Maximum Power Reduction (MPR) applies, the implementations must be clearly identified in the SAR report to support test results according to Cubic Metric (CM) and, as appropriate, Enhanced MPR (E-MPR) requirements.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}(1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM(2) (dB)	MPR (dB)	AG(4) Index	E-TFCI
1	11/15(3)	15/15(3)	64	11/15(3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}: 47/15 β_{ed2}: 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15(4)	15/15(4)	64	15/15(4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 8 ⇔ $A_{hs} = \beta_{hs}/\beta_c$ = 30/15 ⇔ β_{hs}= 30/15 *β_c.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
Note 6: β_{ed} cannot be set directly; it is set by Absolute Grant Value.

Figure 9.2 Table 2

9.3.6 SAR Measurement Conditions for DC-HSDPA

In the following DB 941225 D01v03r01 procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

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

9.4 SAR Measurement Conditions for LTE

LTE modes were tested according to FCC KDB 941225 D05v02r05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR. The R&S CMW500 was used for LTE output power measurement 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).

9.4.1 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.

9.4.2 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.

9.4.3 A-MPR

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

9.4.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r05:

a. Per Section 4.2.1, 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 channel 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 4.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 4.2.1.

c. Per Section 4.2.3, 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 4.2.4 and 4.3, 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 4.2.1 through 4.2.3 is less than or equal to 0.5 dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is < 1.45 W/kg.

9.4.5 LTE TDD Consideration setup for SAR measurement

According to KDB 941225 D05 SAR for LTE Devices v02r05 for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

SAR was tested with the highest transmission duty factor (63.33 %) using Uplink-downlink configuration 0 and Special subframe configuration 6.

LTE TDD Band 41 supports 3GPP TS 36.211 section 4.2 for Type 2 Frame and Table 4.2-2 for uplink-downlink configuration and Table 4.2-1 for Special subframe configurations.

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			-	-	-
8	$24144 \cdot T_s$			-	-	-

Table 4.2-2: Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Calculated Duty Cycle = Extended cyclic prefix in uplink * (Ts) * # of S + # of U

Ts = 1/(15000 * 2048) seconds

Example for calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle = 5120 * [1/(15000 * 2048)] * 2 + 6 ms = 63.33 %

9.4.6 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 RCC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to specifications when downlink carrier aggregation is inactive on the PCC. For every supported combination of downlink only carrier aggregation, additional conducted output powers are measured with the downlink carrier aggregation active for 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 carrier aggregation configurations when the average output power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive.

9.4.6.1 Response to Inquiry to FCC (KDB Inquiry Tracking Number: 770988)

Note: This is a list of items that need consideration to complete the LTE DL/UL CA interim test guidance for SAR test reduction and exclusion. The list needs to be expanded to include certain explanations, details and examples or illustrations to provide the necessary guidance so that test labs would know how to do these (hopefully) with minimal ambiguity.

DL CA power measurement test reduction for UL SAR test exclusion:

1) This applies to devices using DL CA with multiple CCs in inter-band and intra-band configurations

2) For inter-band, it is based on the number of frequency bands and CCs involved

a) Based on the number of frequency bands and CCs used in each DL CA configurations, tabulate these in separate columns according to the number of frequency bands

i) For example, CA_2A-2A-5A (0), CA_2A-2A-5A-30A (0) and CA_2A-4A-5A-30A(0) would be listed in the columns corresponding to 2 bands & 3 CCs, 3 bands & 4CCs and 4 bands & 4 CCs

ii) Align the rows in these columns so that the frequency bands used by the lower number of frequency band and CC combinations are subsets of the larger number of frequency band and CC combinations as show in illustration below

2 bands / 2 CC	2 bands / 3 CC	3 bands / 4 CC	4 bands / 4 CC
CA_2A-5A (0)	CA_2A-2A-5A (0)	CA_2A-2A-5A-30A (0)	CA_2A-4A-5A-30A (0)
	CA_2A-2A-12A (0)	CA_2A-2A-12A-30A (0)	CA_2A-4A-12A-30A (0)
CA_4A-12B(0)		XXXXXX	
	XXXXX		XXXXX
		XXXXX	
XXXXX			XXXXX
Fill in the XXXXX with representative configurations to give a sufficient collection of combinations for illustration			

b) In applying the power measurement procedures of KDB 941225 D05A for DL CA to qualify for UL SAR test exclusion, power measurement is required only for the subset in each row with the largest combination of frequency bands and CCs (far right most configuration)

c) When a power measurement configuration does not qualify for SAR test exclusion, power measurement should be performed for the next lower order combination (column to the left) for the remain lower order subsets to qualify for SAR test exclusion to limit the number of SAR tests needed

3) For intra-band, contiguous and non-contiguous CA are considered separately by tabulating all applicable DL CA configurations in individual columns where all CA configurations for the same frequency band should be grouped in adjacent rows; e.g., CA_41A-41A (0)(1) … CA_41A-41C (0) for non-contiguous CC and CA_7B (0) … CA_7C(0)(1)(2) for contiguous CC configurations

a)In applying the power measurement procedures of KDB 941225 D05A for DL CA to qualify for UL SAR test exclusion, power measurement is required only for the CA configuration with the largest aggregated DL CA BW in each frequency band, independently for contiguous and non-contiguous CA; however, if the same frequency band is used for both contiguous and non-contiguous CA, power measurement may be performed using the configuration with the largest aggregated BW and maximum output power among contiguous and non-contiguous CA (Note: may want to insert a table below to illustrate)

b)The procedures in KDB 941225 D05A are applied to position the additional CCs in the frequency band to be adjacent to the PCC for contiguous CA or using the (largest) separation required by the KDB procedures for non-contiguous CA

i)For contiguous CA, the CCs should be added alternatively to either side of the PCC and previously added CCs

ii)For non-contiguous CA, the CCs should maintain the largest separation allowed and spread evenly (as much as possible) across the frequency band.

iii)The DL PCC channel and location are determined by the UL test channel and associated DL pairing requirements

iv)The DL SCC and subsequent CCs should use channel BW and RB configurations closest to that of the DL PCC

c) When a power measurement configuration does not qualify for SAR test exclusion, power measurement should be performed for the next largest aggregated CA BW to qualify for SAR test exclusion to limit the number of SAR tests needed

4) The DL CA configurations used in the power measurements should be highlighted in the tabulated CA configurations to facilitate review

9.5 SAR Testing with 802.11 Transmitters

The normal network operating configurations are not suitable for measuring the SAR of 802.11 b/g/n transmitters. 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 248227D01v02r02 for more details.

9.5.1 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. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

A periodic duty factor is required for current generation SAR systems to measure SAR. When 802.11 frame gaps are accounted for in the 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.

9.5.2 U-NII and U-NII-2A

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following, with respect to the highest reported SAR and maximum output power specified for production units. The procedures are applied independently to each exposure configuration; for example, head, body, hotspot mode etc.

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, each band is tested independently for SAR.
2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, each band is tested independently for SAR.

9.5.3 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 Rader (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. When band gap channels are disabled, each band is tested independently according to the normally required OFDM SAR measurements and probe calibration frequency points requirements.

9.5.4 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 position 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 position until the reported SAR result is ≤ 0.8 W/kg or all test position are measured.

9.5.5 2.4 GHz SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a 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 exposure configuration 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.

9.5.6 OFDM Transmission Mode and SAR Test Channel Selection

For the 2.4 GHz and 5 GHz bands, 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 and 802.11n 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 80211n or 802.11g then 802.11n is used for SAR measurement. When the maximum output power ware 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.

9.5.7 Initial Test Configuration Procedure

For OFDM, in both 2.4 and 5 GHz bands, 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 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, and lowest data rate. 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.

9.5.8 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 applicable. When the highest reported SAR for the initial test configuration, adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power is ≤ 1.2 W/kg, no additional SAR testing for the subsequent test configurations is required.

9.5.9 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.

10. RF CONDUCTED POWERS

10.1 GSM Conducted Powers

Band	Channel	Maximum Burst-Averaged Output Power(dBm)								
		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
		GSM CS 1 Slot	GPRS 1 TX Slot	GPRS 2 TX Slot	GPRS 3 TX Slot	GPRS 4 TX Slot	EDGE 1 TX Slot	EDGE 2 TX Slot	EDGE 3 TX Slot	EDGE 4 TX Slot
GSM850	128	33.67	33.70	31.65	29.64	27.65	25.46	25.32	24.48	23.61
	190	33.65	33.66	31.57	29.56	27.50	25.34	25.16	24.34	23.44
	251	33.61	33.63	31.54	29.53	27.70	25.60	25.52	24.53	23.60
PCS 1900	512	31.62	31.61	29.51	27.52	25.68	25.62	25.57	24.59	23.53
	661	31.68	31.70	29.50	27.48	25.44	25.52	25.51	24.55	23.38
	810	31.26	31.24	29.19	27.35	25.29	25.32	25.26	24.43	23.39
Band	**Channel**	**Calculated Maximum Frame-Averaged Output Power(dBm)**								
		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
		GSM CS 1 Slot	GPRS 1 TX Slot	GPRS 2 TX Slot	GPRS 3 TX Slot	GPRS 4 TX Slot	EDGE 1 TX Slot	EDGE 2 TX Slot	EDGE 3 TX Slot	EDGE 4 TX Slot
GSM850	128	24.64	24.67	**25.63**	25.38	24.64	16.43	19.30	20.22	20.60
	190	24.62	24.63	**25.55**	25.30	24.49	16.31	19.14	20.08	20.43
	251	24.58	24.60	**25.52**	25.27	24.69	16.57	19.50	20.27	20.59
PCS 1900	512	22.59	22.58	**23.49**	23.26	22.67	16.59	19.55	20.33	20.52
	661	22.65	22.67	**23.48**	23.22	22.43	16.49	19.49	20.29	20.37
	810	22.23	22.21	**23.17**	23.09	22.28	16.29	19.24	20.17	20.38
GSM850	**Frame Avg. Targets:**	24.17	24.17	**25.18**	24.94	24.19	16.17	19.18	19.94	20.19
PCS 1900		22.17	22.17	**23.18**	22.94	22.19	16.17	19.18	19.94	20.19

Table 10.1 GSM Conducted Power

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 (GMSK) output powers were measured with coding scheme setting of 1 (CS1) on the base station simulator. CS1 was configured to measure GPRS output power measurements and SAR to ensure GMSK modulation in the signal. Our Investigation has shown that CS1 - CS4 settings do not have any impact on the output levels or modulation in the GPRS modes.
3. EDGE (8-PSK) output powers were measured with MCS7 on the base station simulator. MCS7 coding scheme was used to measure the output powers for EDGE since investigation has shown that choosing MCS7 coding scheme will ensure 8-PSK modulation. It has been shown that MCS levels that produce 8PSK modulation do not have an impact on output power.

GPRS Multislot class: 33 (max 4 TX Uplink slots)
EDGE Multislot class: 33 (max 4 TX Uplink slots)
DTM Multislot Class: N/A

Figure 10.1 Power Measurement Setup

10.2 WCDMA Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band (dBm)			PCS Band (dBm)			3GPP MPR (dB)
			4132	4183	4233	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	24.94	25.13	25.08	24.11	24.19	24.18	-
99		12.2 kbps AMR	24.93	25.12	25.08	24.10	24.12	24.18	-
5	HSDPA	Subtest 1	24.95	25.13	25.09	24.13	24.13	24.19	0
5		Subtest 2	24.99	25.16	25.12	24.13	24.14	24.20	0
5		Subtest 3	24.50	24.66	24.63	23.61	23.65	23.69	0.5
5		Subtest 4	24.48	24.63	24.65	23.60	23.65	23.68	0.5
6	HSUPA	Subtest 1	24.84	25.05	24.99	24.02	24.03	24.09	0
6		Subtest 2	23.00	23.14	23.12	22.13	22.15	22.18	2
6		Subtest 3	23.97	24.16	24.11	23.09	23.13	23.20	1
6		Subtest 4	22.99	23.15	23.14	22.13	22.13	22.17	2
6		Subtest 5	24.98	25.14	25.13	24.11	24.14	24.14	0
8	DC-HSDPA	Subtest 1	24.94	25.12	25.07	24.10	24.11	24.10	0
8		Subtest 2	24.93	25.11	25.05	24.06	24.15	24.09	0
8		Subtest 3	24.46	24.64	24.61	23.59	23.61	23.62	0.5
8		Subtest 4	24.44	24.63	24.60	23.58	23.63	23.59	0.5

Table 10.2.1 WCDMA Conducted Power

WCDMA SAR was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.

The manufacturer declares that the HSUPA transmitter's power will not exceed the R99 maximum transmit power in devices based on Qualcomm's HSPA chipset solutions.

DC-HSDPA considerations

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

Figure 10.2 Power Measurement Setup

10.3 LTE Conducted Powers

1) LTE Band 12

LTE Band 12 Conducted Power– 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	**25.18**	0	0
	1	25	25.10		
	1	49	24.97		
	25	0	24.06	0-1	1
	25	12	**24.08**		
	25	25	24.07		
	50	0	24.01	0-1	1
16QAM	1	0	24.16	0-1	1
	1	25	24.16		
	1	49	24.20		
	25	0	22.98	0-2	2
	25	12	22.85		
	25	25	22.91		
	50	0	22.86	0-2	2
64QAM	1	0	23.29	0-2	2
	1	25	23.14		
	1	49	23.30		
	25	0	22.43	0-3	3
	25	12	22.40		
	25	25	22.28		
	50	0	22.41	0-3	3

Table 10.3.1 LTE Conducted Power

Note 1: LTE Band 12 at 10 MHz bandwidth does not support three non-overlapping channels.
Per KDB 941225 D05v02r05, 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.

Note 2: The LTE powers were measured after 1 minute worm-up time in order to get stable power. The power levels of the device always do not exceed allowed specifications thus no affecting SAR the user could or would experience even before the warm up time has ended.

Note 3: The applicant declared that MPR transmission power will not exceed the non MPR maximum transmit power in devices and this device is applied MPR based on 3GPP standard.

LTE Band 12 Conducted Power– 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			23035 (701.5 MHz)	23095 (707.5 MHz)	23155 (713.5 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	25.04	24.72	25.03	0	0
	1	12	25.02	24.97	24.72		
	1	24	24.65	25.12	24.86		
	12	0	24.01	23.79	24.00	0-1	1
	12	6	24.04	23.96	23.85		
	12	13	23.90	24.07	23.41		
	25	0	24.00	23.89	23.70	0-1	1
16QAM	1	0	24.11	24.17	24.15	0-1	1
	1	12	24.09	24.14	24.12		
	1	24	24.14	24.14	24.02		
	12	0	23.07	22.89	23.09	0-2	2
	12	6	23.06	23.03	22.96		
	12	13	22.96	23.19	22.55		
	25	0	23.06	23.02	22.86	0-2	2
64QAM	1	0	23.14	23.12	23.34	0-2	2
	1	12	23.19	23.13	23.12		
	1	24	23.05	23.15	22.94		
	12	0	22.33	21.89	22.35	0-3	3
	12	6	22.34	22.12	22.20		
	12	13	22.29	22.28	21.78		
	15	0	22.37	22.27	22.10	0-3	3

Table 10.3.2 LTE Conducted Power

LTE Band 12 Conducted Power– 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			23025 (700.5 MHz)	23095 (707.5 MHz)	23165 (714.5 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	25.04	24.81	24.92	0	0
	1	7	24.86	24.92	24.78		
	1	14	25.02	25.14	24.81		
	8	0	23.86	23.83	23.73	0-1	1
	8	4	23.73	23.98	23.49		
	8	7	23.76	24.02	23.26		
	15	0	23.73	23.92	23.45	0-1	1
16QAM	1	0	24.16	24.06	24.09	0-1	1
	1	7	24.10	24.10	24.20		
	1	14	24.17	24.17	24.19		
	8	0	23.17	22.95	22.88	0-2	2
	8	4	23.17	23.09	22.62		
	8	7	23.14	23.11	22.37		
	15	0	23.08	23.06	22.61	0-2	2
64QAM	1	0	23.33	23.23	23.28	0-2	2
	1	7	23.29	23.32	23.15		
	1	14	23.37	23.41	23.04		
	8	0	22.25	22.22	22.18	0-3	3
	8	4	22.12	22.36	21.89		
	8	7	22.10	22.33	21.70		
	15	0	22.08	22.34	21.85	0-3	3

Table 10.3.3 LTE Conducted Power

LTE Band 12 Conducted Power– 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			23017 (699.7 MHz)	23095 (707.5 MHz)	23173 (715.3 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	24.98	24.75	24.15	0	0
	1	2	25.09	25.05	24.08		
	1	5	25.02	24.90	23.84		
	3	0	24.98	24.69	24.05	0	0
	3	2	25.08	24.83	23.96		
	3	3	24.99	24.78	23.82		
	6	0	24.07	23.89	23.14	0-1	1
16QAM	1	0	24.04	24.20	23.42	0-1	1
	1	2	24.04	24.11	23.44		
	1	5	24.08	24.14	23.16		
	3	0	24.00	23.78	23.13	0-1	1
	3	2	24.11	23.92	23.11		
	3	3	24.03	23.90	22.96		
	6	0	23.20	23.06	22.27	0-2	2
64QAM	1	0	23.29	23.02	22.37	0-2	2
	1	2	23.27	23.09	22.39		
	1	5	23.04	23.02	22.31		
	3	0	23.17	23.01	22.45	0-2	2
	3	2	23.17	23.15	22.36		
	3	3	23.08	22.99	22.21		
	6	0	22.43	22.28	21.45	0-3	3

Table 10.3.4 LTE Conducted Power

2) LTE Band 17

LTE Band 17 Conducted Power– 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23790 (710.0 MHz) Conducted Power (dBm)	MPR Allowed Per 3GPP(dB)	MPR (dB)
QPSK	1	0	24.62	0	0
	1	25	**25.15**		
	1	49	24.78		
	25	0	23.92	0-1	1
	25	12	**24.05**		
	25	25	24.00		
	50	0	24.01	0-1	1
16QAM	1	0	23.74	0-1	1
	1	25	23.70		
	1	49	23.66		
	25	0	23.00	0-2	2
	25	12	23.13		
	25	25	23.04		
	50	0	23.09	0-2	2
64QAM	1	0	23.08	0-2	2
	1	25	23.03		
	1	49	23.14		
	25	0	22.34	0-3	3
	25	12	22.51		
	25	25	22.41		
	50	0	22.38	0-3	3

Table 10.3.5 LTE Conducted Power

Note: LTE Band 17 at 10 MHz bandwidth does not support three non-overlapping channels.
Per KDB 941225 D05v02r05, 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.

LTE Band 17 Conducted Power– 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23790 (710.0 MHz) Conducted Power (dBm)	MPR Allowed Per 3GPP(dB)	MPR (dB)
QPSK	1	0	24.84	0	0
	1	12	25.01		
	1	24	24.97		
	12	0	23.89	0-1	1
	12	6	23.97		
	12	13	23.92		
	25	0	23.87	0-1	1
16QAM	1	0	23.79	0-1	1
	1	12	23.70		
	1	24	23.78		
	12	0	22.95	0-2	2
	12	6	22.95		
	12	13	22.92		
	25	0	22.91	0-2	2
64QAM	1	0	23.13	0-2	2
	1	12	23.19		
	1	24	23.06		
	12	0	22.34	0-3	3
	12	6	22.30		
	12	13	22.30		
	25	0	22.21	0-3	3

Table 10.3.6 LTE Conducted Power

Note: LTE Band 17 at 5 MHz bandwidth does not support three non-overlapping channels.
Per KDB 941225 D05v02r05, 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.

3) LTE Band 5 (Cell)

LTE Band 5 (Cell) Conducted Power– 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	**25.11**	0	0
	1	25	24.94		
	1	49	25.09		
	25	0	23.82	0-1	1
	25	12	**23.94**		
	25	25	23.86		
	50	0	23.89	0-1	1
16QAM	1	0	24.12	0-1	1
	1	25	24.11		
	1	49	24.10		
	25	0	22.88	0-2	2
	25	12	23.00		
	25	25	22.94		
	50	0	22.97	0-2	2
64QAM	1	0	23.26	0-2	2
	1	25	23.38		
	1	49	23.23		
	25	0	22.22	0-3	3
	25	12	22.26		
	25	25	22.15		
	50	0	22.32	0-3	3

Table 10.3.7 LTE Conducted Power

Note: LTE Band 5(Cell) at 10 MHz bandwidth does not support three non-overlapping channels.
Per KDB 941225 D05v02r05, 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.

LTE Band 5 (Cell) Conducted Power– 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			20425 (826.5 MHz)	20525 (836.5 MHz)	20625 (846.5 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	24.86	24.82	24.97	0	0
	1	12	24.97	24.98	24.88		
	1	24	24.79	24.90	24.68		
	12	0	23.84	23.88	23.90	0-1	1
	12	6	23.97	23.87	23.94		
	12	13	23.85	23.90	23.94		
	25	0	23.92	23.83	23.86	0-1	1
16QAM	1	0	24.08	24.03	24.16	0-1	1
	1	12	24.08	24.12	24.16		
	1	24	24.05	24.13	24.13		
	12	0	22.92	22.99	22.98	0-2	2
	12	6	22.98	22.97	22.95		
	12	13	22.89	22.95	22.96		
	25	0	22.93	22.94	22.96	0-2	2
64QAM	1	0	23.27	23.05	23.17	0-2	2
	1	12	23.31	23.21	23.21		
	1	24	23.22	23.12	23.17		
	12	0	22.25	22.18	22.23	0-3	3
	12	6	22.16	22.33	22.19		
	12	13	22.19	22.11	22.37		
	25	0	22.30	22.15	22.11	0-3	3

Table 10.3.8 LTE Conducted Power

LTE Band 5 (Cell) Conducted Power– 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			20415 (825.5 MHz)	20525 (836.5 MHz)	20635 (847.5 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	24.85	24.90	24.90	0	0
	1	7	24.79	24.89	24.97		
	1	14	24.85	24.86	24.82		
	8	0	23.77	23.92	23.88	0-1	1
	8	4	23.85	23.93	23.99		
	8	7	23.73	23.88	23.96		
	15	0	23.75	23.86	23.95	0-1	1
16QAM	1	0	23.43	23.53	23.53	0-1	1
	1	7	23.41	23.46	23.47		
	1	14	23.52	23.43	23.53		
	8	0	22.96	23.01	22.96	0-2	2
	8	4	22.94	23.01	23.11		
	8	7	22.91	22.99	23.03		
	15	0	22.96	23.01	23.04	0-2	2
64QAM	1	0	23.06	23.11	22.93	0-2	2
	1	7	23.00	23.06	23.08		
	1	14	23.06	23.05	23.21		
	8	0	22.20	22.40	22.35	0-3	3
	8	4	22.14	22.40	22.45		
	8	7	22.13	22.31	22.42		
	15	0	22.02	22.18	22.14	0-3	3

Table 10.3.9 LTE Conducted Power

LTE Band 5 (Cell) Conducted Power– 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			20407 (824.7 MHz)	20525 (836.5 MHz)	20643 (848.3 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	24.88	24.81	24.94	0	0
	1	2	24.99	24.92	24.91		
	1	5	24.83	24.84	24.76		
	3	0	24.93	24.91	24.89	0	0
	3	2	24.95	24.95	24.85		
	3	3	24.92	24.94	24.77		
	6	0	23.87	23.85	23.93	0-1	1
16QAM	1	0	23.56	23.45	23.57	0-1	1
	1	2	23.62	23.44	23.62		
	1	5	23.36	23.45	23.49		
	3	0	23.94	23.90	23.96	0-1	1
	3	2	23.93	23.93	23.98		
	3	3	23.94	23.89	23.90		
	6	0	23.01	23.03	23.05	0-2	2
64QAM	1	0	23.08	23.10	23.12	0-2	2
	1	2	23.21	23.05	23.05		
	1	5	23.12	23.06	23.15		
	3	0	23.12	23.11	23.06	0-2	2
	3	2	23.11	23.04	23.11		
	3	3	23.06	23.10	23.07		
	6	0	22.34	22.21	22.36	0-3	3

Table 10.3.10 LTE Conducted Power

4) LTE Band 4

LTE Band 4 (AWS) Conducted Power– 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20175 (1732.5 MHz) Conducted Power (dBm)	MPR Allowed Per 3GPP(dB)	MPR (dB)
QPSK	1	0	**24.13**	0	0
	1	50	23.70		
	1	99	23.74		
	50	0	**22.79**	0-1	1
	50	25	22.75		
	50	50	22.63		
	100	0	**22.73**	0-1	1
16QAM	1	0	22.92	0-1	1
	1	50	22.91		
	1	99	22.87		
	50	0	21.49	0-2	2
	50	25	21.45		
	50	50	21.31		
	100	0	21.34	0-2	2
64QAM	1	0	22.31	0-2	2
	1	50	22.03		
	1	99	22.07		
	50	0	20.91	0-3	3
	50	25	20.98		
	50	50	20.89		
	100	0	21.04	0-3	3

Table 10.3.11 LTE Conducted Power

LTE Band 4 (AWS) Conducted Power– 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			20025 (1717.5 MHz)	20175 (1732.5 MHz)	20325 (1747.5 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	24.16	24.07	24.07	0	0
	1	36	23.98	23.75	23.90		
	1	74	23.90	23.86	23.82		
	36	0	22.95	22.83	22.99	0-1	1
	36	18	22.93	22.71	22.90		
	36	37	22.96	22.73	22.81		
	75	0	22.95	22.72	22.81	0-1	1
16QAM	1	0	23.18	23.10	23.09	0-1	1
	1	36	23.02	22.72	22.95		
	1	74	23.00	22.82	22.91		
	36	0	21.61	21.47	21.74	0-2	2
	36	18	21.67	21.31	21.68		
	36	37	21.54	21.29	21.50		
	75	0	21.99	21.39	21.53	0-2	2
64QAM	1	0	22.29	22.44	22.35	0-2	2
	1	36	22.05	22.21	22.01		
	1	74	22.21	21.99	22.03		
	36	0	21.07	21.03	21.09	0-3	3
	36	18	20.93	20.98	20.99		
	36	37	21.07	20.95	20.85		
	75	0	21.06	21.06	20.91	0-3	3

Table 10.3.12 LTE Conducted Power

LTE Band 4 (AWS) Conducted Power– 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			20000 (1715.0 MHz)	20175 (1732.5 MHz)	20350 (1750.0 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	23.95	23.97	24.12	0	0
	1	25	23.92	23.77	23.94		
	1	49	23.90	23.74	23.90		
	25	0	22.83	22.82	22.91	0-1	1
	25	12	22.91	22.80	22.86		
	25	25	22.89	22.76	22.92		
	50	0	22.87	22.75	22.96	0-1	1
16QAM	1	0	23.00	23.02	23.16	0-1	1
	1	25	23.01	22.89	22.95		
	1	49	22.92	22.72	22.78		
	25	0	21.51	21.35	21.51	0-2	2
	25	12	21.48	21.36	21.38		
	25	25	21.56	21.33	21.47		
	50	0	21.46	21.33	21.49	0-2	2
64QAM	1	0	22.07	22.22	22.31	0-2	2
	1	25	21.98	22.02	22.07		
	1	49	22.02	21.95	22.05		
	25	0	20.91	21.01	20.98	0-3	3
	25	12	20.91	21.01	20.94		
	25	25	20.89	20.98	20.90		
	50	0	20.89	20.95	20.95	0-3	3

Table 10.3.13 LTE Conducted Power

LTE Band 4 (AWS) Conducted Power– 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			19975 (1712.5 MHz)	20175 (1732.5 MHz)	20375 (1752.5 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	23.90	23.96	23.82	0	0
	1	12	23.92	23.89	23.94		
	1	24	23.88	23.80	23.66		
	12	0	22.87	22.79	22.90	0-1	1
	12	6	22.84	22.79	22.85		
	12	13	22.87	22.72	22.69		
	25	0	22.78	22.78	22.84	0-1	1
16QAM	1	0	23.12	22.96	22.83	0-1	1
	1	12	23.17	22.92	22.93		
	1	24	23.15	22.87	22.65		
	12	0	21.74	21.46	21.43	0-2	2
	12	6	21.78	21.37	21.36		
	12	13	21.70	21.31	21.29		
	25	0	21.69	21.32	21.36	0-2	2
64QAM	1	0	22.23	22.14	21.98	0-2	2
	1	12	22.05	22.24	22.04		
	1	24	21.90	22.06	21.77		
	12	0	20.87	20.99	20.90	0-3	3
	12	6	20.88	21.01	20.88		
	12	13	20.87	20.99	20.72		
	25	0	20.91	21.00	20.90	0-3	3

Table 10.3.14 LTE Conducted Power

LTE Band 4 (AWS) Conducted Power– 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			19965 (1711.5 MHz)	20175 (1732.5 MHz)	20385 (1753.5 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	23.86	23.89	23.94	0	0
	1	7	23.85	23.79	23.79		
	1	14	23.81	23.79	23.68		
	8	0	22.82	22.74	22.88	0-1	1
	8	4	22.87	22.79	22.75		
	8	7	22.79	22.71	22.72		
	15	0	22.83	22.73	22.72	0-1	1
16QAM	1	0	23.13	23.14	23.17	0-1	1
	1	7	23.16	23.12	23.01		
	1	14	23.12	23.05	22.93		
	8	0	21.82	21.78	21.83	0-2	2
	8	4	21.86	21.80	21.75		
	8	7	21.85	21.75	21.66		
	15	0	21.85	21.71	21.67	0-2	2
64QAM	1	0	22.00	22.04	21.90	0-2	2
	1	7	21.92	21.97	21.86		
	1	14	21.87	21.99	21.86		
	8	0	20.93	21.03	21.01	0-3	3
	8	4	21.02	21.05	20.81		
	8	7	20.97	21.06	20.74		
	15	0	20.91	20.98	20.75	0-3	3

Table 10.3.15 LTE Conducted Power

LTE Band 4 (AWS) Conducted Power– 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			19957 (1710.7 MHz)	20175 (1732.5 MHz)	20393 (1754.3 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	23.77	23.76	23.69	0	0
	1	2	23.83	23.82	23.77		
	1	5	23.74	23.69	23.65		
	3	0	23.69	23.73	23.65	0	0
	3	2	23.71	23.75	23.68		
	3	3	23.75	23.70	23.65		
	6	0	22.74	22.70	22.66	0-1	1
16QAM	1	0	23.10	23.07	22.99	0-1	1
	1	2	23.18	23.16	23.04		
	1	5	23.08	23.06	22.95		
	3	0	22.67	22.65	22.52	0-1	1
	3	2	22.75	22.70	22.64		
	3	3	22.70	22.63	22.52		
	6	0	21.79	21.79	21.70	0-2	2
64QAM	1	0	22.10	21.98	21.84	0-2	2
	1	2	22.17	21.99	21.92		
	1	5	22.16	22.02	21.83		
	3	0	21.98	22.01	21.77	0-2	2
	3	2	21.86	22.13	21.86		
	3	3	21.81	22.12	21.81		
	6	0	20.80	20.84	20.64	0-3	3

Table 10.3.16 LTE Conducted Power

5) LTE Band 7

LTE Band 7 Conducted Power– 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20850 (2510.0 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21350 (2560.0 MHz)	MPR Allowed Per 3GPP(dB)	MPR (dB)
			Conducted Power (dBm)				
QPSK	1	0	**23.20**	**23.15**	**23.18**	0	0
	1	50	23.14	23.04	23.12		
	1	99	23.04	23.18	23.18		
	50	0	**22.20**	**22.13**	**22.18**	0-1	1
	50	25	22.13	22.12	22.18		
	50	50	22.14	22.12	22.14		
	100	0	**22.16**	**22.12**	**22.18**	0-1	1
16QAM	1	0	22.20	22.11	22.19	0-1	1
	1	50	22.12	22.05	22.08		
	1	99	22.03	22.17	22.07		
	50	0	21.20	21.15	21.15	0-2	2
	50	25	21.18	21.19	21.20		
	50	50	21.18	21.18	21.20		
	100	0	21.20	21.19	21.17	0-2	2
64QAM	1	0	21.52	21.64	21.65	0-2	2
	1	50	21.33	21.41	21.37		
	1	99	21.35	21.53	21.50		
	50	0	20.41	20.30	20.47	0-3	3
	50	25	20.47	20.47	20.40		
	50	50	20.50	20.42	20.40		
	100	0	20.56	20.55	20.40	0-3	3

Table 10.3.17 LTE Conducted Power

LTE Band 7 Conducted Power– 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			20825 (2507.5 MHz)	21100 (2535.0 MHz)	21375 (2562.5 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	23.17	23.09	23.17	0	0
	1	36	23.10	23.09	23.12		
	1	74	23.11	23.07	23.20		
	36	0	22.12	22.05	22.18	0-1	1
	36	18	22.12	22.12	22.12		
	36	37	22.10	22.08	22.18		
	75	0	22.15	22.13	22.18	0-1	1
16QAM	1	0	22.17	22.06	22.18	0-1	1
	1	36	22.07	22.05	22.15		
	1	74	22.10	22.07	22.18		
	36	0	21.19	21.13	21.18	0-2	2
	36	18	21.16	21.17	21.19		
	36	37	21.12	21.14	21.18		
	75	0	21.17	21.12	21.17	0-2	2
64QAM	1	0	21.31	21.29	21.58	0-2	2
	1	36	21.48	21.24	21.35		
	1	74	21.28	21.36	21.45		
	36	0	20.30	20.28	20.48	0-3	3
	36	18	20.34	20.37	20.40		
	36	37	20.30	20.38	20.28		
	75	0	20.38	20.42	20.43	0-3	3

Table 10.3.18 LTE Conducted Power

LTE Band 7 Conducted Power– 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			20800 (2505.0 MHz)	21100 (2535.0 MHz)	21400 (2565.0 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	23.15	23.04	23.17	0	0
	1	25	23.17	23.15	23.20		
	1	49	23.11	23.11	23.17		
	25	0	22.12	21.98	22.15	0-1	1
	25	12	22.12	22.13	22.19		
	25	25	22.04	22.10	22.13		
	50	0	22.04	22.10	22.19	0-1	1
16QAM	1	0	22.09	22.06	22.16	0-1	1
	1	25	22.05	22.11	22.08		
	1	49	22.09	22.04	22.12		
	25	0	21.15	21.12	21.19	0-2	2
	25	12	21.19	21.17	21.15		
	25	25	21.18	21.19	21.18		
	50	0	21.19	21.18	21.15	0-2	2
64QAM	1	0	21.43	21.30	21.34	0-2	2
	1	25	21.33	21.33	21.34		
	1	49	21.43	21.26	21.54		
	25	0	20.30	20.27	20.38	0-3	3
	25	12	20.39	20.34	20.38		
	25	25	20.33	20.29	20.31		
	50	0	20.33	20.21	20.37	0-3	3

Table 10.3.19 LTE Conducted Power

LTE Band 7 Conducted Power– 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP(dB)	MPR (dB)
			20775 (2502.5 MHz)	21100 (2535.0 MHz)	21425 (2567.5 MHz)		
			Conducted Power (dBm)				
QPSK	1	0	23.04	23.00	23.19	0	0
	1	12	23.16	23.12	23.19		
	1	24	23.04	23.05	23.16		
	12	0	22.01	22.07	22.15	0-1	1
	12	6	22.10	22.11	22.16		
	12	13	22.06	22.04	22.17		
	25	0	22.12	22.09	22.15	0-1	1
16QAM	1	0	22.12	22.02	22.08	0-1	1
	1	12	22.08	22.10	22.20		
	1	24	21.96	22.06	22.01		
	12	0	21.20	21.17	21.18	0-2	2
	12	6	21.18	21.17	21.17		
	12	13	21.10	21.14	21.18		
	25	0	21.13	21.19	21.19	0-2	2
64QAM	1	0	21.40	21.19	21.40	0-2	2
	1	12	21.47	21.32	21.50		
	1	24	21.31	21.25	21.36		
	12	0	20.23	20.27	20.45	0-3	3
	12	6	20.28	20.30	20.38		
	12	13	20.18	20.28	20.34		
	25	0	20.21	20.30	20.35	0-3	3

Table 10.3.20 LTE Conducted Power

6) LTE Band 41

LTE Band 41 Conducted Power– 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed Per 3GPP(dB)	MPR (dB)
			Conducted Power (dBm)						
QPSK	1	0	24.76	24.96	**25.14**	25.07	24.97	0	0
	1	50	24.67	24.87	24.99	24.99	24.89		
	1	99	24.73	24.93	25.00	24.90	24.80		
	50	0	23.70	23.90	24.02	24.01	24.01	0-1	1
	50	25	23.70	23.90	**24.04**	24.03	24.06		
	50	50	23.73	23.93	23.99	23.97	23.87		
	100	0	23.73	23.93	24.07	23.73	23.63	0-1	1
16QAM	1	0	24.19	24.39	24.20	24.30	24.20	0-1	1
	1	50	24.15	24.33	24.20	24.27	24.17		
	1	99	24.18	24.38	24.19	24.25	24.15		
	50	0	22.73	22.93	23.11	23.26	23.16	0-2	2
	50	25	22.68	22.88	22.98	23.15	23.05		
	50	50	22.72	22.92	22.99	23.07	22.97		
	100	0	22.78	22.98	23.01	23.00	22.90	0-2	2
64QAM	1	0	23.09	23.27	23.24	23.45	23.25	0-2	2
	1	50	22.88	23.08	23.23	23.35	23.13		
	1	99	23.17	23.12	23.20	23.30	23.18		
	50	0	22.13	22.20	22.47	22.34	22.32	0-3	3
	50	25	22.16	22.12	22.32	22.37	22.30		
	50	50	22.15	22.04	22.38	22.30	22.18		
	100	0	22.06	22.25	22.44	22.05	22.05	0-3	3

Table 10.3.21 LTE Conducted Power

LTE Band 41 Conducted Power– 15 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel 39725 (2503.5 MHz)	Low-Mid Channel 40173 (2548.3 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41068 (2637.8 MHz)	High Channel 41515 (2682.5 MHz)	MPR Allowed Per 3GPP(dB)	MPR (dB)
			Conducted Power (dBm)						
QPSK	1	0	24.73	24.88	25.02	25.01	25.01	0	0
	1	36	24.55	24.70	24.95	24.92	24.87		
	1	74	24.63	24.78	24.95	24.86	24.81		
	36	0	23.69	23.84	24.04	24.11	24.06	0-1	1
	36	18	23.66	23.81	24.02	24.04	23.99		
	36	37	23.61	23.76	23.99	23.92	23.87		
	75	0	23.70	23.85	23.99	24.00	23.95	0-1	1
16QAM	1	0	23.98	24.13	24.19	24.23	24.18	0-1	1
	1	36	23.78	23.93	24.16	24.25	24.20		
	1	74	23.87	24.01	24.12	24.05	24.00		
	36	0	22.73	22.88	22.99	23.09	23.04	0-2	2
	36	18	22.63	22.78	22.99	23.01	22.96		
	36	37	22.58	22.73	22.96	22.94	22.89		
	75	0	22.70	22.85	22.99	23.05	23.00	0-2	2
64QAM	1	0	23.00	23.25	23.36	23.42	23.23	0-2	2
	1	36	23.03	23.03	23.23	23.09	23.29		
	1	74	23.12	23.22	23.22	23.16	23.21		
	36	0	21.96	22.18	22.26	22.39	22.16	0-3	3
	36	18	21.84	22.24	22.19	22.41	22.21		
	36	37	21.86	22.21	22.22	22.36	22.17		
	75	0	21.88	22.19	22.16	22.48	22.24	0-3	3

Table 10.3.22 LTE Conducted Power

LTE Band 41 Conducted Power– 10 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel 39700 (2501.0 MHz)	Low-Mid Channel 40160 (2547.0 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41080 (2639.0 MHz)	High Channel 41540 (2685.0 MHz)	MPR Allowed Per 3GPP(dB)	MPR (dB)
			Conducted Power (dBm)						
QPSK	1	0	24.65	24.80	24.94	24.95	24.97	0	0
	1	25	24.59	24.74	24.94	24.87	24.77		
	1	49	24.53	24.68	24.91	24.93	24.83		
	25	0	23.63	23.78	23.98	23.99	23.89	0-1	1
	25	12	23.61	23.76	23.99	23.97	23.87		
	25	25	23.52	23.67	23.98	23.92	23.82		
	50	0	23.58	23.73	24.02	24.01	23.91	0-1	1
16QAM	1	0	23.92	24.07	24.19	24.28	24.18	0-1	1
	1	25	23.91	24.06	24.17	24.18	24.08		
	1	49	23.81	23.96	24.14	24.24	24.14		
	25	0	22.77	22.92	23.01	23.05	22.95	0-2	2
	25	12	22.70	22.85	23.08	23.03	22.93		
	25	25	22.64	22.79	23.02	23.00	22.90		
	50	0	22.64	22.79	23.06	23.06	22.96	0-2	2
64QAM	1	0	23.06	23.16	23.26	23.25	23.24	0-2	2
	1	25	22.95	23.18	23.22	23.35	23.15		
	1	49	22.78	23.10	23.13	23.41	23.19		
	25	0	21.73	22.20	22.22	22.32	22.19	0-3	3
	25	12	21.81	22.21	22.23	22.26	22.16		
	25	25	21.68	22.14	22.12	22.14	22.09		
	50	0	21.74	22.17	22.19	22.45	22.10	0-3	3

Table 10.3.23 LTE Conducted Power

LTE Band 41 Conducted Power– 5 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel 39675 (2498.5 MHz)	Low-Mid Channel 40148 (2545.8 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41093 (2640.3 MHz)	High Channel 41565 (2687.5 MHz)	MPR Allowed Per 3GPP(dB)	MPR (dB)
			Conducted Power (dBm)						
QPSK	1	0	24.70	24.80	24.93	24.87	24.77	0	0
	1	12	24.64	24.74	24.97	24.95	24.85		
	1	24	24.56	24.66	24.85	24.90	24.80		
	12	0	23.64	23.74	23.96	23.96	23.86	0-1	1
	12	6	23.65	23.75	23.95	23.98	23.88		
	12	13	23.60	23.70	23.92	23.97	23.87		
	25	0	23.59	23.69	23.97	23.99	23.89	0-1	1
16QAM	1	0	23.90	24.00	24.13	24.09	23.99	0-1	1
	1	12	23.93	24.03	24.16	24.17	24.07		
	1	24	23.82	23.92	24.18	24.08	23.98		
	12	0	22.71	22.81	23.06	23.00	22.90	0-2	2
	12	6	22.72	22.82	23.06	23.08	22.98		
	12	13	22.68	22.78	23.02	22.96	22.86		
	25	0	22.72	22.82	23.05	23.04	22.94	0-2	2
64QAM	1	0	22.96	23.18	22.96	23.22	23.13	0-2	2
	1	12	23.11	23.21	23.15	23.31	23.15		
	1	24	22.91	23.03	22.97	23.27	23.02		
	12	0	21.97	22.11	22.18	22.36	22.20	0-3	3
	12	6	21.97	22.07	22.20	22.28	22.17		
	12	13	21.94	22.08	22.18	22.24	22.13		
	25	0	21.90	22.04	22.16	22.36	22.17	0-3	3

Table 10.3.24 LTE Conducted Power

7) LTE DL Carrier Aggregation Conducted Powers

- **Below downlink CA configurations were determined based on Manufacturer's information.**

Table 10.3.25 Inter-band DL CA Configuration

2 bands / 2CC	2 bands / 3CC	2 bands / 4CC
CA_7A-46A (0)	CA_7A-46C (0)	CA_7A-46D (0) Table 10.3.28
CA_7A-46A (1)	CA_7A-46C (1)	CA_7A-46D (1) Table 10.3.28

Table 10.3.26 Intra-band (contiguous) DL CA Configuration

LTE B5	LTE B7	LTE B41
CA_5B (1)	CA_7B (0)	CA_41C (0)(1)(2)(3) Table 10.3.29
CA_5B (0) Table 10.3.29	CA_7C (0)(1)(2) Table 10.3.29	-

Table 10.3.27 Intra-band (non-contiguous) DL CA Configuration

LTE B7
CA_7A-7A (2)
CA_7A-7A (0)(1)(3) Table 10.3.30

CA BW Class

Class	ATBC		Maximum number of CC
	$N_{RB,agg}$	MHz	
A	N <= 100	20	1
B	25 < N <= 100	20	2
C	100 < N <= 200	40	2
D	200 < N <= 300	60	3
E	300 < N <= 400	80	4
F	400 < N <= 500	100	5
I	700 < N <= 800	160	8

Table 10.3.28 LTE DL Carrier Aggregation Conducted Power for Inter-band DL CA Configuration

PCC									SCC1				SCC2				SCC3				Power	
PCC Band	PCC BW (MHz)	PCC (UL) CH.	PCC (UL) Freq. (MHz)	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) CH.	PCC (DL) Freq. (MHz)	SCC Band	SCC BW (MHz)	SCC (DL) CH.	SCC (DL) Freq. (MHz)	SCC Band	SCC BW (MHz)	SCC (DL) CH.	SCC (DL) Freq. (MHz)	SCC Band	SCC BW (MHz)	SCC (DL) CH.	SCC (DL) Freq. (MHz)	LTE Tx. Power with DL CA Enabled (dBm)	LTE Single Carrier Tx. Power (dBm)
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B46	20	50665	5537.5	LTE B46	20	50863	5557.3	LTE B46	20	51061	5577.1	23.14 <	23.20
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B46	20	50665	5537.5	LTE B46	20	50863	5557.3	LTE B46	10	51007	5571.7	23.12 <	23.20
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B46	10	50665	5537.5	LTE B46	20	50809	5551.9	LTE B46	20	51007	5571.7	23.10 <	23.20

Table 10.3.29 LTE DL Carrier Aggregation Conducted Power for Intra-band (contiguous) DL CA Configuration

PCC									SCC				Power	
PCC Band	PCC BW (MHz)	PCC (UL) CH.	PCC (UL) Freq. (MHz)	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) CH.	PCC (DL) Freq. (MHz)	SCC Band	SCC BW (MHz)	SCC (DL) CH.	SCC (DL) Freq. (MHz)	LTE Tx. Power with DL CA Enabled (dBm)	LTE Single Carrier Tx. Power (dBm)
LTE B5	10	20525	836.5	QPSK	1	49	2525	881.5	LTE B5	10	2624	891.4	25.05 <	25.11
LTE B5	10	20525	836.5	QPSK	1	49	2525	881.5	LTE B5	5	2573	886.3	25.04 <	25.11
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B7	20	3048	2649.8	23.15 <	23.20
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B7	15	3021	2647.1	23.12 <	23.20
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B7	10	2994	2644.4	23.10 <	23.20
LTE B41	20	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	40818	2612.8	25.11 <	25.14
LTE B41	20	40620	2593	QPSK	1	0	40620	2593	LTE B41	15	40791	2610.1	25.09 <	25.14
LTE B41	20	40620	2593	QPSK	1	0	40620	2593	LTE B41	10	40764	2607.4	25.06 <	25.14
LTE B41	20	40620	2593	QPSK	1	0	40620	2593	LTE B41	5	40737	2604.7	25.02 <	25.14

Table 10.3.30 LTE DL Carrier Aggregation Conducted Power for Intra-band (non-contiguous) DL CA Configuration

PCC									SCC				Power	
PCC Band	PCC BW (MHz)	PCC (UL) CH.	PCC (UL) Freq. (MHz)	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) CH.	PCC (DL) Freq. (MHz)	SCC Band	SCC BW (MHz)	SCC (DL) CH.	SCC (DL) Freq. (MHz)	LTE Tx. Power with DL CA Enabled (dBm)	LTE Single Carrier Tx. Power (dBm)
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B7	20	3350	2680.0	23.16 <	23.20
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B7	15	3375	2682.5	23.14 <	23.20
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B7	10	3400	2685.0	23.11 <	23.20
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B7	5	3425	2687.5	23.09 <	23.20

Table 10.3.31 LTE DL Carrier Aggregation Conducted Powers for comparing B7 DL 4X4 MIMO and B7 DL Intra-band CA

LTE Band	Maximum DL 4X4 MIMO Power (dBm]	Maximum DL Intra-band Contiguous DL CA Power (dBm)	Maximum DL Intra-band Non-Contiguous DL CA Power (dBm)
B7	23.10 <	23.15	23.16

Note(s):

1. The device only supports downlink Carrier Aggregation. Uplink Carrier Aggregation is not supported. The DL carrier aggregation powers were measured according to the FCC interim LTE CA SAR test guidance (KDB Inquiry #770988) in section 9.4.6.1 of this test report. And Per KDB Inquiry #770988 and FCC KDB Publication 941225 D05Av01r02, **no further power measurements and SAR measurements are required for DL 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.
2. All control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
3. For downlink carrier aggregation combinations, PCC uplink channel was selected based on section C.3)b)ii) of KDB 941225 D05Av01r02. The downlink PCC channel was paired with the selected PCC uplink channel according to normal configurations without carrier aggregation.

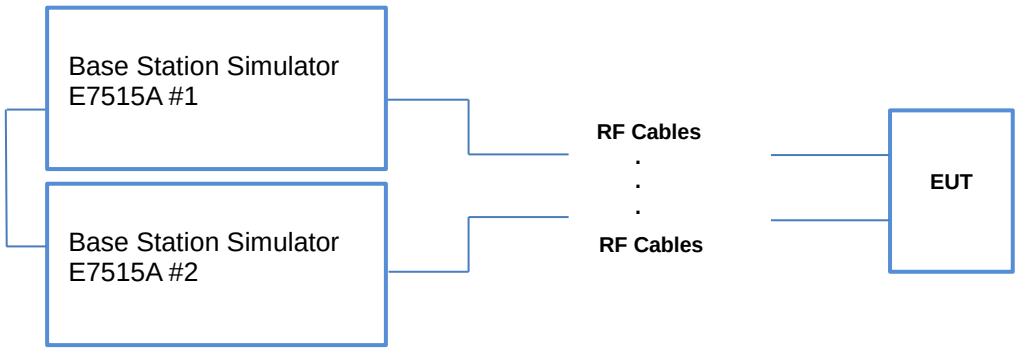


Figure 10.3 DL 4CA Power Measurement Setup

8) LTE 4x4 DL MIMO , LTE 4x4 DL MIMO with DL Carrier Aggregation Conducted Powers

- **Below DL MIMO and DL CA configurations were determined based on Manufacturer's information.**

Table 10.3.32 DL 4X4 MIMO Configuration

LTE B7
7A[4X4] Table 10.3.33

Table 10.3.33 LTE DL 4X4 MIMO Conducted Power

PCC / DL 4X4 MIMO									Power	
PCC Band	PCC BW (MHz)	PCC (UL) CH.	PCC (UL) Freq. (MHz)	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) CH.	PCC (DL) Freq. (MHz)	LTE Tx. Power with DL4X4 MIMO Enabled (dBm)	LTE Single Carrier Tx. Power (dBm)
LTE B7	20	20850	2510.0	QPSK	1	0	2850	2630.0	23.10 <	23.20
LTE B7	15	20825	2507.5	QPSK	1	0	2825	2627.5	23.03 <	23.17
LTE B7	10	21400	2565.0	QPSK	1	0	3400	2685.0	23.02 <	23.17
LTE B7	5	21425	2567.5	QPSK	1	0	3425	2687.5	23.05 <	23.19

Note(s):

1. The device supports downlink 4X4 MIMO. The 4X4 MIMO powers were measured applying the FCC interim LTE CA SAR test guidance (KDB Inquiry #770988) in section 9.4.6.1 of this test report. And Per KDB Inquiry #770988 and FCC KDB Publication 941225 D05Av01r02, **no further power measurements and SAR measurements are required for DL MIMO configurations** when the average output power with downlink MIMO active is **not more than 0.25 dB higher than** the average output power with downlink MIMO inactive.
2. PCC uplink channel was selected based on section C.3)b)ii) of KDB 941225 D05Av01r02.

Table 10.3.34 DL 4X4 MIMO with DL CA Configuration

2 bands / 2CC	2 bands / 3CC	2 bands / 4CC
7A[4X4]-46A (0)	7A[4X4]-46C (0)	7A[4X4]-46D (0)
7A[4X4]-46A (1)	7A[4X4]-46C (1)	7A[4X4]-46D (1)

Table 10.3.35 DL 4X4 MIMO with DL CA Conducted Power

PCC									SCC1				SCC2				SCC3				Power	
PCC Band	PCC BW (MHz)	PCC (UL) CH.	PCC (UL) Freq. (MHz)	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) CH.	PCC (DL) Freq. (MHz)	SCC Band	SCC BW (MHz)	SCC (DL) CH.	SCC (DL) Freq. (MHz)	SCC Band	SCC BW (MHz)	SCC (DL) CH.	SCC (DL) Freq. (MHz)	SCC Band	SCC BW (MHz)	SCC (DL) CH.	SCC (DL) Freq. (MHz)	LTE Tx. Power with DL 4X4MIMO & DL CA Enabled (dBm)	LTE Single Carrier Tx. Power (dBm)
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B46	20	50665	5537.5	LTE B46	20	50863	5557.3	LTE B46	20	51061	5577.1	23.14 <	23.20
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B46	20	50665	5537.5	LTE B46	20	50863	5557.3	LTE B46	10	51007	5571.7	23.12 <	23.20
LTE B7	20	20850	2510	QPSK	1	0	2850	2630	LTE B46	10	50665	5537.5	LTE B46	20	50809	5551.9	LTE B46	20	51007	5571.7	23.10 <	23.20

Note(s):

1. The device supports DL 4X4 MIMO with DL Carrier Aggregation. Uplink MIMO and Carrier Aggregation is not supported. The 4X4 MIMO with DL carrier aggregation powers were measured applying the FCC interim LTE CA SAR test guidance (KDB Inquiry #770988) in section 9.4.6.1 of this test report. And Per KDB Inquiry #770988 and FCC KDB Publication 941225 D05Av01r02, **no further power measurements and SAR measurements are required for DL 4X4 MIMO with DL carrier aggregation configurations** when the average output power with DL 4X4 MIMO with DL CA active is **not more than 0.25 dB higher than** the average output power with DL 4X4 MIMO with DL CA inactive.
2. All control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
3. For downlink carrier aggregation combinations, PCC uplink channel was selected based on section C.3)b)ii) of KDB 941225 D05Av01r02.
   The downlink PCC channel was paired with the selected PCC uplink channel according to normal configurations without carrier aggregation.

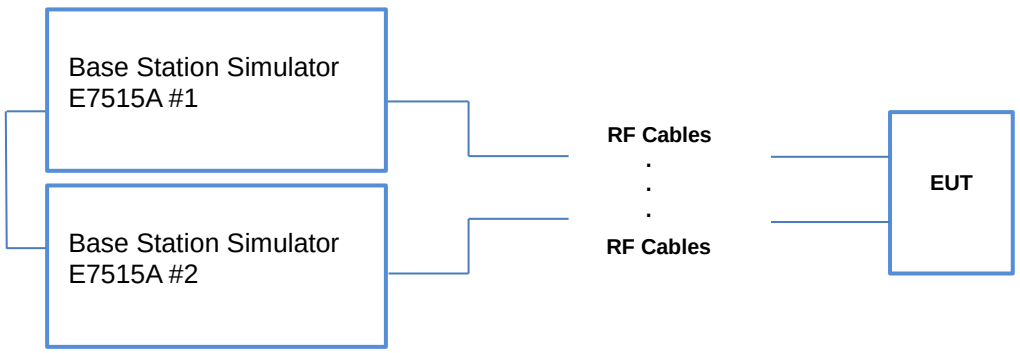


Figure 10.4 DL 4x4 MIMO, DL 4x4 MIMO with DL 4CA Power Measurement Setup

10.4 WLAN Conducted Powers

Mode	Freq.	Channel	IEEE 802.11 (2.4 GHz) Conducted Power
	(MHz)		(dBm)
802.11b	2412	1	15.43
	2437	6	**15.77**
	2462	11	15.57
802.11g	2412	1	14.22
	2437	6	14.66
	2462	11	14.21
802.11n (HT-20)	2412	1	13.37
	2437	6	13.65
	2462	11	13.48
802.11ac (VHT-20)	2412	1	13.12
	2437	6	13.56
	2462	11	13.22

Table 10.4.1 IEEE 802.11 Average RF Power (Ant.1)

Mode	Freq.	Channel	IEEE 802.11 (2.4 GHz) Conducted Power
	(MHz)		(dBm)
802.11b	2412	1	15.28
	2437	6	**15.64**
	2462	11	**15.56**
802.11g	2412	1	14.25
	2437	6	14.74
	2462	11	14.38
802.11n (HT-20)	2412	1	13.28
	2437	6	13.75
	2462	11	13.16
802.11ac (VHT-20)	2412	1	13.12
	2437	6	13.72
	2462	11	13.27

Table 10.4.2 IEEE 802.11 Average RF Power (Ant.2)

Mode	Freq.	Channel	IEEE 802.11 (2.4 GHz) Conducted Power	
	(MHz)		CDD(dBm)	SDM(dBm)
802.11b	2412	1	18.37	-
	2437	6	**18.72**	-
	2462	11	**18.58**	-
802.11g	2412	1	17.25	-
	2437	6	17.71	-
	2462	11	17.31	-
802.11n (HT-20)	2412	1	16.34	16.43
	2437	6	16.71	16.80
	2462	11	16.33	16.34
802.11ac (VHT-20)	2412	1	16.13	16.43
	2437	6	16.65	16.70
	2462	11	16.26	16.36

Table 10.4.3 IEEE 802.11 Average RF Power (MIMO)

Mode	Freq. (MHz)	Channel	IEEE 802.11a (5 GHz) Conducted Power (dBm)
802.11a	5180	36	15.15
	5200	40	**15.18**
	5220	44	15.06
	5240	48	14.89
	5260	52	**15.02**
	5280	56	**15.06**
	5300	60	14.97
	5320	64	14.79
	5500	100	14.48
	5580	116	14.84
	5660	132	**14.93**
	5720	144	14.78
	5745	149	**14.95**
	5785	157	14.73
	5825	165	14.38

Table 10.4.4 IEEE 802.11a Average RF Power (Ant.1)

Mode	Freq. (MHz)	Channel	IEEE 802.11a (5 GHz) Conducted Power (dBm)
802.11a	5180	36	15.16
	5200	40	**15.32**
	5220	44	15.27
	5240	48	15.26
	5260	52	15.17
	5280	56	15.22
	5300	60	**15.27**
	5320	64	14.98
	5500	100	**14.66**
	5580	116	**14.73**
	5660	132	14.62
	5720	144	14.52
	5745	149	**14.57**
	5785	157	**14.93**
	5825	165	14.56

Table 10.4.5 IEEE 802.11a Average RF Power (Ant.2)

Mode	Freq.	Channel	IEEE 802.11a (5 GHz) Conducted Power	
	(MHz)		CDD(dBm)	SDM(dBm)
802.11a	5180	36	18.17	-
	5200	40	**18.26**	-
	5220	44	18.18	-
	5240	48	18.09	-
	5260	52	18.11	-
	5280	56	**18.15**	-
	5300	60	**18.13**	-
	5320	64	17.90	-
	5500	100	17.58	-
	5580	116	**17.80**	-
	5660	132	**17.79**	-
	5720	144	17.66	-
	5745	149	17.77	-
	5785	157	**17.84**	-
	5825	165	17.48	-

Table 10.4.6 IEEE 802.11a Average RF Power (MIMO)

Mode	Freq.	Channel	IEEE 802.11n HT20 (5 GHz) Conducted Power
	(MHz)		(dBm)
802.11n (HT-20)	5180	36	13.96
	5200	40	14.28
	5220	44	14.02
	5240	48	14.03
	5260	52	14.18
	5280	56	14.15
	5300	60	13.90
	5320	64	13.76
	5500	100	13.90
	5580	116	14.09
	5660	132	14.05
	5720	144	13.87
	5745	149	13.89
	5785	157	14.15
	5825	165	13.53

Table 10.4.7 IEEE 802.11n HT20 Average RF Power (Ant.1)

Mode	Freq.	Channel	IEEE 802.11n HT20 (5 GHz) Conducted Power
	(MHz)		(dBm)
802.11n (HT-20)	5180	36	13.65
	5200	40	14.11
	5220	44	13.86
	5240	48	13.76
	5260	52	13.77
	5280	56	14.02
	5300	60	14.00
	5320	64	13.81
	5500	100	13.72
	5580	116	13.76
	5660	132	13.79
	5720	144	13.83
	5745	149	13.96
	5785	157	14.38
	5825	165	13.81

Table 10.4.8 IEEE 802.11n HT20 Average RF Power (Ant.2)

Mode	Freq.	Channel	IEEE 802.11n HT20 (5 GHz) Conducted Power	
	(MHz)		CDD(dBm)	SDM(dBm)
802.11n (HT-20)	5180	36	16.82	16.78
	5200	40	17.21	16.96
	5220	44	16.95	16.85
	5240	48	16.91	16.72
	5260	52	16.99	16.79
	5280	56	17.10	17.01
	5300	60	16.96	16.87
	5320	64	16.80	16.69
	5500	100	16.82	16.73
	5580	116	16.94	16.79
	5660	132	16.93	16.91
	5720	144	16.86	16.79
	5745	149	16.94	16.80
	5785	157	17.28	16.99
	5825	165	16.68	16.77

Table 10.4.9 IEEE 802.11n HT20 Average RF Power (MIMO)

Mode	Freq. (MHz)	Channel	IEEE 802.11ac VHT20 (5 GHz) Conducted Power (dBm)
802.11ac (VHT-20)	5180	36	13.93
	5200	40	14.05
	5220	44	13.92
	5240	48	13.97
	5260	52	14.26
	5280	56	14.23
	5300	60	14.18
	5320	64	14.25
	5500	100	13.96
	5580	116	14.07
	5660	132	14.16
	5720	144	13.95
	5745	149	14.08
	5785	157	14.13
	5825	165	13.80

Table 10.4.10 IEEE 802.11ac VHT20 Average RF Power (Ant.1)

Mode	Freq. (MHz)	Channel	IEEE 802.11ac VHT20 (5 GHz) Conducted Power (dBm)
802.11ac (VHT-20)	5180	36	13.81
	5200	40	13.97
	5220	44	13.92
	5240	48	13.86
	5260	52	13.96
	5280	56	14.05
	5300	60	14.09
	5320	64	13.86
	5500	100	13.94
	5580	116	13.97
	5660	132	13.88
	5720	144	13.93
	5745	149	13.98
	5785	157	14.46
	5825	165	13.91

Table 10.4.11 IEEE 802.11ac VHT20 Average RF Power (Ant.2)

Mode	Freq.	Channel	IEEE 802.11ac VHT20 (5 GHz) Conducted Power	
	(MHz)		CDD(dBm)	SDM(dBm)
802.11ac (VHT-20)	5180	36	16.88	16.76
	5200	40	17.02	16.95
	5220	44	16.93	16.84
	5240	48	16.93	16.74
	5260	52	17.12	16.69
	5280	56	17.15	16.95
	5300	60	17.15	16.93
	5320	64	17.07	16.65
	5500	100	16.96	16.70
	5580	116	17.03	16.87
	5660	132	17.03	16.78
	5720	144	16.95	16.69
	5745	149	17.04	16.73
	5785	157	17.31	16.84
	5825	165	16.87	16.51

Table 10.4.12 IEEE 802.11ac VHT20 Average RF Power (MIMO)

Mode	Freq.	Channel	IEEE 802.11n HT40 (5 GHz) Conducted Power
	(MHz)		(dBm)
802.11n (HT-40)	5190	38	13.47
	5230	46	14.70
	5270	54	14.98
	5310	62	12.53
	5510	102	13.20
	5550	110	14.69
	5670	134	14.58
	5710	142	14.25
	5755	151	14.78
	5795	159	14.40

Table 10.4.13 IEEE 802.11n HT40 Average RF Power (Ant.1)

Mode	Freq.	Channel	IEEE 802.11n HT40 (5 GHz) Conducted Power
	(MHz)		(dBm)
802.11n (HT-40)	5190	38	13.08
	5230	46	14.53
	5270	54	14.53
	5310	62	12.64
	5510	102	13.28
	5550	110	14.49
	5670	134	14.40
	5710	142	14.31
	5755	151	14.43
	5795	159	14.91

Table 10.4.14 IEEE 802.11n HT40 Average RF Power (Ant.2)

Mode	Freq.	Channel	IEEE 802.11n HT40 (5 GHz) Conducted Power
	(MHz)		SDM(dBm)
802.11n (HT-40)	5190	38	16.24
	5230	46	17.83
	5270	54	17.87
	5310	62	14.99
	5510	102	16.11
	5550	110	17.93
	5670	134	17.82
	5710	142	17.57
	5755	151	17.94
	5795	159	17.82

Table 10.4.15 IEEE 802.11n HT40 Average RF Power (MIMO)

Mode	Freq. (MHz)	Channel	IEEE 802.11ac VHT40 (5 GHz) Conducted Power (dBm)
802.11ac (VHT-40)	5190	38	13.38
	5230	46	14.61
	5270	54	14.83
	5310	62	12.48
	5510	102	13.31
	5550	110	14.64
	5670	134	14.50
	5710	142	14.22
	5755	151	14.69
	5795	159	14.31

Table 10.4.16 IEEE 802.11ac VHT40 Average RF Power (Ant.1)

Mode	Freq. (MHz)	Channel	IEEE 802.11ac VHT40 (5 GHz) Conducted Power (dBm)
802.11ac (VHT-40)	5190	38	13.33
	5230	46	14.57
	5270	54	14.58
	5310	62	12.30
	5510	102	13.17
	5550	110	14.45
	5670	134	14.46
	5710	142	14.28
	5755	151	14.37
	5795	159	14.90

Table 10.4.17 IEEE 802.11ac VHT40 Average RF Power (Ant.2)

Mode	Freq. (MHz)	Channel	IEEE 802.11ac VHT40 (5 GHz) Conducted Power SDM(dBm)
802.11ac (VHT-40)	5190	38	16.24
	5230	46	17.89
	5270	54	17.90
	5310	62	15.22
	5510	102	16.33
	5550	110	17.90
	5670	134	17.87
	5710	142	17.59
	5755	151	17.84
	5795	159	17.93

Table 10.4.18 IEEE 802.11ac VHT40 Average RF Power (MIMO)

Mode	Freq. (MHz)	Channel	IEEE 802.11ac VHT80 (5 GHz) Conducted Power (dBm)
802.11ac (VHT-80)	5210	42	13.47
	5290	58	12.21
	5530	106	12.13
	5690	138	14.27
	5775	155	14.45

Table 10.4.19 IEEE 802.11ac VHT80 Average RF Power (Ant.1)

Mode	Freq. (MHz)	Channel	IEEE 802.11ac VHT80 (5 GHz) Conducted Power (dBm)
802.11ac (VHT-80)	5210	42	13.15
	5290	58	11.95
	5530	106	11.84
	5690	138	14.45
	5775	155	14.50

Table 10.4.20 IEEE 802.11ac VHT80 Average RF Power (Ant.2)

Mode	Freq. (MHz)	Channel	IEEE 802.11ac VHT80 (5 GHz) Conducted Power SDM(dBm)
802.11ac (VHT-80)	5210	42	16.01
	5290	58	14.52
	5530	106	14.67
	5690	138	16.44
	5775	155	16.78

Table 10.4.21 IEEE 802.11ac VHT80 Average RF Power (MIMO)

Justification for reduced test configurations for WIFI channels 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, duo to an even number of channels, both channels were measured.
- Output Power and SAR is not required for 802.11 g/n HT20 channels when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjust SAR is ≤ 1.2 W/kg.
- The underlined data rate and channel above were tested for SAR.

The average output powers of this device were tested by below configuration.

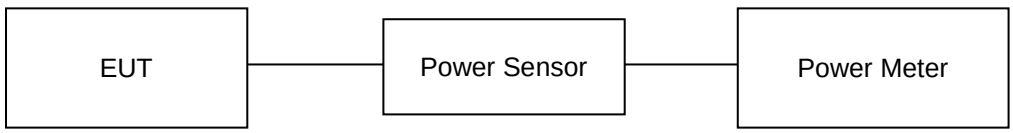


Figure 10.4 Power Measurement Setup

10.5 Bluetooth Conducted Powers

Channel	Frequency	Burst AVG Output Power (1Mbps)	Frame AVG Output Power (1Mbps)	Burst AVG Output Power (2Mbps)	Frame AVG Output Power (2Mbps)	Burst AVG Output Power (3Mbps)	Frame AVG Output Power (3Mbps)
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
Low	2402	9.72	8.46	8.87	7.81	8.89	7.77
Mid	2441	**11.01**	**9.88**	10.31	9.12	10.30	9.14
High	2480	10.02.	8.87	9.15	8.11	9.15	8.12

Table 10.5.1 Bluetooth Frame Average RF Power

Channel	Frequency	Burst AVG Output Power(LE / 1Mbps)	Frame AVG Output Power(LE / 1Mbps)	Burst AVG Output Power(LE / 2Mbps)	Frame AVG Output Power(LE / 2Mbps)
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Low	2402	-0.39	-1.18	-0.41	-2.91
Mid	2440	0.94	0.31	0.94	-1.41
High	2480	0.18	-0.5	0.19	-2.19

Table 10.5.2 Bluetooth LE Frame Average RF Power

- **Bluetooth Conducted Powers procedures**

1. Bluetooth (BDR, EDR)
   1) Enter DUT mode in EUT and operate it.
      When it operating, The EUT is transmitting at maximum power level and duty cycle fixed.
   2) Instruments and EUT were connected like Figure 10.4(A).
   3) The maximum output powers of BDR(1 Mbps), EDR(2, 3 Mbps) and each frequency were set by a Bluetooth Tester.
   4) Power levels were measured by a Power Meter.

2. Bluetooth (LE)
   1) Enter LE mode in EUT and operate it.
      When it operating, The EUT is transmitting at maximum power level and duty cycle fixed.
   2) Instruments and EUT were connected like Figure 10.4(B).
   3) The average conducted output powers of LE and each frequency can measurement according to setting program in EUT.
   4) Power levels were measured by a Power Meter.

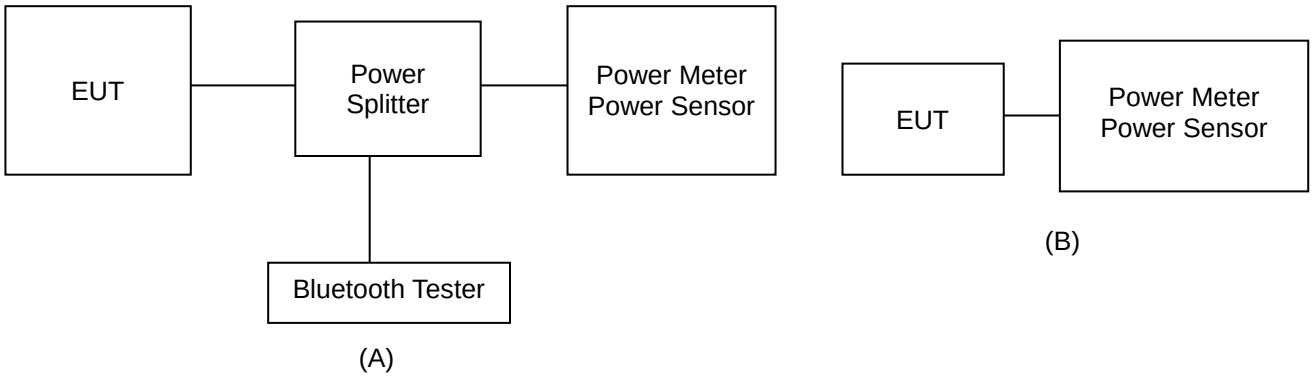


Figure 10.5 Average Power Measurement Setup

The average conducted output powers of Bluetooth were measured using above test setup and a wideband gated RF power meter when the EUT is transmitting at its maximum power level.

11. SYSTEM VERIFICATION

11.1 Tissue Verification

MEASURED TISSUE PARAMETERS										
Date(s)	Tissue Type	Ambient Temp.[°C]	Liquid Temp.[°C]	Measured Frequency [MHz]	Target Dielectric Constant, εr	Target Conductivity, σ (S/m)	Measured Dielectric Constant, εr	Measured Conductivity, σ (S/m)	Er Deviation [%]	σ Deviation [%]
Jul. 03. 2017	750 Head	21.8	22.5	707.5	42.130	0.887	42.874	0.872	1.77	-1.69
				710.0	42.110	0.887	42.835	0.874	1.72	-1.47
				750.0	41.900	0.890	42.282	0.910	0.91	2.25
Jul. 04. 2017	750 Body	21.6	22.0	707.5	55.700	0.960	55.857	0.928	0.28	-3.33
				710.0	55.690	0.960	55.831	0.931	0.25	-3.02
				750.0	55.530	0.963	55.428	0.969	-0.18	0.62
Jun. 28. 2017	835 Head	21.4	21.0	835.0	41.500	0.900	40.239	0.935	-3.04	3.89
				836.6	41.500	0.901	40.223	0.936	-3.08	3.88
Jun. 28. 2017	835 Body	21.4	21.3	835.0	55.200	0.970	53.437	1.003	-3.19	3.40
				836.6	55.200	0.971	53.420	1.004	-3.22	3.40
Jun. 20. 2017	835 Head	21.8	22.2	824.2	41.550	0.899	41.878	0.902	0.79	0.33
				835.0	41.500	0.900	41.774	0.912	0.66	1.33
				836.6	41.500	0.901	41.758	0.913	0.62	1.33
				848.8	41.500	0.914	41.629	0.924	0.31	1.09
Jun. 21. 2017	835 Body	21.9	22.4	824.2	55.240	0.969	53.739	0.998	-2.72	2.99
				835.0	55.200	0.970	53.620	1.007	-2.86	3.81
				836.6	55.200	0.971	53.601	1.008	-2.90	3.81
				848.8	55.160	0.986	53.463	1.018	-3.08	3.25
Jun. 26. 2017	835 Head	21.9	22.3	826.4	41.540	0.899	41.857	0.903	0.76	0.44
				835.0	41.500	0.900	41.777	0.911	0.67	1.22
				836.6	41.500	0.901	41.764	0.913	0.64	1.33
				846.6	41.500	0.912	41.655	0.922	0.37	1.10
Jun. 27. 2017	835 Body	21.8	22.3	826.4	55.240	0.969	53.551	0.996	-3.06	2.79
				835.0	55.200	0.970	53.461	1.004	-3.15	3.51
				836.6	55.200	0.971	53.440	1.005	-3.19	3.50
				846.6	55.170	0.984	53.343	1.014	-3.31	3.05
Jul. 30. 2017	1800 Head	21.5	21.7	1720.0	40.110	1.354	40.765	1.354	1.63	0.00
				1732.5	40.100	1.361	40.720	1.366	1.55	0.37
				1745.0	40.080	1.369	40.682	1.378	1.50	0.66
				1800.0	40.000	1.400	40.490	1.434	1.23	2.43
Jul. 30. 2017	1800 Body	21.5	21.3	1720.0	53.580	1.469	52.882	1.504	-1.30	2.38
				1732.5	53.560	1.477	52.856	1.515	-1.31	2.57
				1745.0	53.530	1.485	52.828	1.528	-1.31	2.90
				1800.0	53.300	1.520	52.686	1.582	-1.15	4.08
Jun. 22. 2017	1900 Head	21.3	21.9	1850.2	40.000	1.400	39.942	1.352	-0.15	-3.43
				1880.0	40.000	1.400	39.860	1.386	-0.35	-1.00
				1900.0	40.000	1.400	39.782	1.405	-0.55	0.36
				1909.8	40.000	1.400	39.741	1.415	-0.65	1.07
Jun. 23. 2017	1900 Body	21.7	22.2	1850.2	53.300	1.520	52.402	1.523	-1.68	0.20
				1880.0	53.300	1.520	52.307	1.555	-1.86	2.30
				1900.0	53.300	1.520	52.240	1.573	-1.99	3.49
				1909.8	53.300	1.520	52.208	1.582	-2.05	4.08
Jun. 29. 2017	1900 Head	21.3	21.5	1852.4	40.000	1.400	40.014	1.355	0.04	-3.21
				1880.0	40.000	1.400	39.937	1.386	-0.16	-1.00
				1900.0	40.000	1.400	39.861	1.405	-0.35	0.36
				1907.6	40.000	1.400	38.828	1.413	-2.93	0.93
Jun. 29. 2017	1900 Body	21.3	21.6	1852.4	53.300	1.520	52.433	1.527	-1.63	0.46
				1880.0	53.300	1.520	52.346	1.555	-1.79	2.30
				1900.0	53.300	1.520	52.279	1.574	-1.92	3.55
				1907.6	53.300	1.520	52.253	1.581	-1.96	4.01
Jul. 07. 2017	2450 Head	21.6	22.1	2412.0	39.270	1.766	39.238	1.809	-0.08	2.43
				2437.0	39.220	1.788	39.178	1.839	-0.11	2.85
				2450.0	39.200	1.800	39.144	1.853	-0.14	2.94
				2462.0	39.180	1.813	39.119	1.866	-0.16	2.92
Jul. 10. 2017	2450 Body	22.0	22.3	2412.0	52.750	1.914	52.457	1.878	-0.56	-1.88
				2437.0	52.720	1.938	52.375	1.906	-0.65	-1.65
				2450.0	52.700	1.950	52.329	1.921	-0.70	-1.49
				2462.0	52.680	1.967	52.301	1.934	-0.72	-1.68

MEASURED TISSUE PARAMETERS										
Date(s)	Tissue Type	Ambient Temp.[°C]	Liquid Temp.[°C]	Measured Frequ0ency [MH0z]	Target Dielectric Constant, εr	Target Conductivity, σ (S/m)	Measured Dielectric Constant, εr	Measured Conductivity, σ (S/m)	Er Deviation [%]	σ Deviation [%]
Jul. 05. 2017	2600 Head	21.8	22.1	2510.0	39.120	1.864	38.747	1.798	-0.95	-3.54
				2535.0	39.090	1.891	38.651	1.825	-1.12	-3.49
				2560.0	39.050	1.917	38.571	1.853	-1.23	-3.34
				2593.0	39.010	1.953	38.461	1.888	-1.41	-3.33
				2600.0	39.000	1.960	38.436	1.897	-1.45	-3.21
Jul. 06. 2017	2600 Body	21.6	21.9	2510.0	52.620	2.035	51.876	2.036	-1.41	0.05
				2535.0	52.590	2.071	51.806	2.067	-1.49	-0.19
				2560.0	52.560	2.106	51.743	2.098	-1.55	-0.38
				2593.0	52.520	2.153	51.648	2.138	-1.66	-0.70
				2600.0	52.510	2.163	51.629	2.146	-1.68	-0.79
Aug. 17. 2017	2600 Body	21.5	22.0	2510.0	52.620	2.035	52.078	2.000	-1.03	-1.72
				2535.0	52.590	2.071	52.008	2.029	-1.11	-2.03
				2560.0	52.560	2.106	51.947	2.059	-1.17	-2.23
				2593.0	52.520	2.153	51.860	2.095	-1.26	-2.69
				2600.0	52.510	2.163	51.843	2.103	-1.27	-2.77
Jul. 11. 2017	5200 Body	21.8	22.0	5180.0	49.040	5.276	47.791	5.270	-2.55	-0.11
				5190.0	49.030	5.288	47.771	5.283	-2.57	-0.09
				5200.0	49.010	5.299	47.747	5.297	-2.58	-0.04
				5220.0	48.990	5.323	47.710	5.327	-2.61	0.08
				5230.0	48.970	5.334	47.692	5.340	-2.61	0.11
				5240.0	48.960	5.346	47.673	5.354	-2.63	0.15
Jul. 12. 2017	5300 Head	21.7	22.0	5260.0	35.940	4.720	35.360	4.726	-1.61	0.13
				5270.0	35.930	4.730	35.342	4.738	-1.64	0.17
				5280.0	35.920	4.740	35.329	4.750	-1.65	0.21
				5300.0	35.900	4.760	35.300	4.769	-1.67	0.19
				5310.0	35.890	4.770	35.276	4.780	-1.71	0.21
				5320.0	35.880	4.780	35.256	4.792	-1.74	0.25
Jul. 13. 2017	5300 Body	21.6	22.1	5260.0	48.930	5.369	47.394	5.362	-3.14	-0.13
				5270.0	48.920	5.381	47.444	5.376	-3.02	-0.09
				5280.0	48.910	5.393	47.426	5.391	-3.03	-0.04
				5300.0	48.880	5.416	47.394	5.416	-3.04	0.00
				5310.0	48.860	5.428	47.371	5.430	-3.05	0.04
				5320.0	48.850	5.439	47.354	5.445	-3.06	0.11
Jul. 14. 2017	5600 Head	21.8	22.3	5500.0	35.650	4.965	35.703	4.969	0.15	0.08
				5510.0	35.640	4.976	35.691	4.979	0.14	0.06
				5550.0	35.580	5.018	35.624	5.027	0.12	0.18
				5580.0	35.530	5.049	35.574	5.059	0.12	0.20
				5600.0	35.500	5.070	35.536	5.083	0.10	0.26
				5660.0	35.440	5.130	35.442	5.152	0.01	0.43
				5670.0	35.430	5.140	35.427	5.162	-0.01	0.43
				5710.0	35.390	5.180	35.356	5.209	-0.10	0.56
				5720.0	35.380	5.190	35.345	5.220	-0.10	0.58
Jul. 17. 2017	5600 Body	21.5	22.0	5500.0	48.610	5.650	48.269	5.771	-0.70	2.14
				5510.0	48.590	5.661	48.258	5.783	-0.68	2.16
				5550.0	48.540	5.708	48.182	5.789	-0.74	1.42
				5580.0	48.500	5.743	48.120	5.879	-0.78	2.37
				5600.0	48.470	5.766	48.077	5.909	-0.81	2.48
				5660.0	48.390	5.836	47.976	5.990	-0.86	2.64
				5670.0	48.380	5.848	47.954	6.002	-0.88	2.63
				5710.0	48.320	5.895	47.871	6.062	-0.93	2.83
				5720.0	48.310	5.907	47.859	6.076	-0.93	2.86
Jul. 18. 2017	5800 Head	21.4	21.8	5745.0	35.360	5.215	35.773	5.310	1.17	1.82
				5755.0	35.350	5.225	35.755	5.323	1.15	1.88
				5785.0	35.320	5.255	35.709	5.355	1.10	1.90
				5795.0	35.310	5.265	36.690	5.366	3.91	1.92
				5800.0	35.300	5.270	35.681	5.372	1.08	1.94
				5825.0	35.280	5.296	35.638	5.403	1.01	2.02
Jul. 19. 2017	5800 Body	21.8	22.1	5745.0	48.270	5.936	47.760	6.094	-1.06	2.66
				5755.0	48.260	5.947	47.743	6.109	-1.07	2.72
				5785.0	48.220	5.982	47.686	6.147	-1.11	2.76
				5795.0	48.210	5.994	47.664	6.162	-1.13	2.80
				5800.0	48.200	6.000	47.654	6.169	-1.13	2.82
				5825.0	48.170	6.029	47.612	6.209	-1.16	2.99

MEASURED TISSUE PARAMETERS										
Date(s)	Tissue Type	Ambient Temp.[°C]	Liquid Temp.[°C]	Measured Frequ0ency [MH0z]	Target Dielectric Constant, εr	Target Conductivity, σ (S/m)	Measured Dielectric Constant, εr	Measured Conductivity, σ (S/m)	Er Deviation [%]	σ Deviation [%]
Aug. 16. 2017	5300 Body	21.2	21.7	5260.0	48.930	5.369	48.022	5.471	-1.86	1.90
				5270.0	48.920	5.381	47.999	5.484	-1.88	1.91
				5280.0	48.910	5.393	47.976	5.496	-1.91	1.91
				5300.0	48.880	5.416	47.937	5.522	-1.93	1.96
				5310.0	48.860	5.428	47.909	5.537	-1.95	2.01
				5320.0	48.850	5.439	47.885	5.552	-1.98	2.08
Aug. 17. 2017	5600 Body	21.5	22.0	5500.0	48.610	5.650	47.681	5.763	-1.91	2.00
				5510.0	48.590	5.661	47.673	5.776	-1.89	2.03
				5550.0	48.540	5.708	47.604	5.838	-1.93	2.28
				5580.0	48.500	5.743	47.547	5.879	-1.96	2.37
				5600.0	48.470	5.766	47.511	5.909	-1.98	2.48
				5660.0	48.390	5.836	47.419	5.997	-2.01	2.76
				5670.0	48.380	5.848	47.339	6.010	-2.15	2.77
				5710.0	48.320	5.895	47.320	6.068	-2.07	2.93
				5720.0	48.310	5.907	47.306	6.083	-2.08	2.98

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 865664 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.

Extremity SAR was tested using body-equivalent tissue dielectric parameters found in KDB Publication 648474D04v01r03.

Measurement Procedure for Tissue verification:

1) The network analyzer and probe system was configured and calibrated.
2) The probe was immersed in the sample which was placed in a nonmetallic container. Trapped air bubbles beneath the flange were minimized by placing the probe at a slight angle.
3) The complex admittance with respect to the probe aperture was measured
4) The complex relative permittivity , for example from the below equation (Pournaropoulos and Misra):

$$Y = \frac{j2\omega\varepsilon_r\varepsilon_0}{\left[\ln(b/a)\right]^2}\int_a^b\int_a^b\int_0^\pi \cos\phi' \frac{\exp\left[-j\omega r(\mu_0\varepsilon_r'\varepsilon_0)^{1/2}\right]}{r} d\phi' d\rho' d\rho$$

where Y is the admittance of the probe in contact with the sample, the primed and unprimed coordinates refer to source and observation points, respectively, $r^2 = \rho^2 + \rho'^2 - 2\rho\rho'\cos\phi'$, ω is the angular frequency, and $j = \sqrt{-1}$.

11.2 Test System Verification

Prior to assessment, the system is verified to the ± 10 % of the specifications at 750 MHz, 835 MHz, 1800 MHz, 1900 MHz, 2450 MHz, 2600 MHz and 5GHz by using the SAR Dipole kit(s). (Graphic Plots Attached)

Table 11.2.1 System Verification Results (1g)

SYSTEM DIPOLE VERIFICATION TARGET & MEASURED												
SAR System #	Freq. [MHz]	SAR Dipole kits	Date(s)	Tissue Type	Ambient Temp. [°C]	Liquid Temp. [°C]	Probe S/N	Input Power (mW)	1 W Target SAR_{1g} (W/kg)	Measured SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	Deviation [%]
A	750	D750V3, SN:1049	Jul. 03. 2017	Head	21.8	22.5	3866	250	8.51	2.22	8.88	4.35
A	750	D750V3, SN:1049	Jul. 04. 2017	Body	21.6	22.0	3866	250	8.63	2.10	8.40	-2.67
A	835	D835V2, SN:4d159	Jun. 28. 2017	Head	21.4	21.0	3866	250	9.33	2.45	9.80	5.04
A	835	D835V2, SN:4d159	Jun. 28. 2017	Body	21.4	21.3	3866	250	9.57	2.44	9.76	1.99
A	835	D835V2, SN:4d159	Jun. 20. 2017	Head	21.8	22.2	3866	250	9.33	2.44	9.76	4.61
A	835	D835V2, SN:4d159	Jun. 21. 2017	Body	21.9	22.4	3866	250	9.57	2.52	10.08	5.33
A	835	D835V2, SN:4d159	Jun. 26. 2017	Head	21.9	22.3	3866	250	9.33	2.46	9.84	5.47
A	835	D835V2, SN:4d159	Jun. 27. 2017	Body	21.8	22.3	3866	250	9.57	2.44	9.76	1.99
A	1800	D1800V2, SN:2d047	Jul. 30. 2017	Head	21.5	21.7	3866	250	39.9	10.40	41.60	4.26
A	1800	D1800V2, SN:2d047	Jul. 30. 2017	Body	21.5	21.3	3866	250	39.2	10.20	40.80	4.08
A	1900	D1900V2, SN:5d176	Jun. 22. 2017	Head	21.3	21.9	3866	250	40.9	10.60	42.40	3.67
A	1900	D1900V2, SN: 5d176	Jun. 23. 2017	Body	21.7	22.2	3866	250	39.3	10.30	41.20	4.83
A	1900	D1900V2, SN:5d176	Jun. 29. 2017	Head	21.3	21.5	3866	250	40.9	10.80	43.20	5.62
A	1900	D1900V2, SN: 5d176	Jun. 29. 2017	Body	21.3	21.6	3866	250	39.3	10.30	41.20	4.83
A	2450	D2450V2, SN: 920	Jul. 07. 2017	Head	21.6	22.1	3866	250	52.5	13.10	52.40	-0.19
A	2450	D2450V2, SN: 920	Jul. 10. 2017	Body	22.0	22.3	3866	250	51.0	13.30	53.20	4.31
A	2600	D2600V2, SN: 1016	Jul. 05. 2017	Head	21.8	22.1	3866	250	57.1	14.60	58.40	2.28
A	2600	D2600V2, SN: 1016	Jul. 06. 2017	Body	21.6	21.9	3866	250	54.2	13.40	53.60	-1.11
A	2600	D2600V2, SN: 1016	Aug. 17. 2017	Body	21.5	22.0	3866	250	54.2	14.70	58.80	8.49
A	5200	D5GHzV2, SN:1103	Jul. 11. 2017	Body	21.8	22.0	3866	100	74.1	7.72	77.20	4.18
A	5300	D5GHzV2, SN:1103	Jul. 12. 2017	Head	21.7	22.0	3866	100	84.1	7.93	79.30	-5.71
A	5300	D5GHzV2, SN:1103	Jul. 13. 2017	Body	21.6	22.1	3866	100	76.7	7.68	76.80	0.13
A	5600	D5GHzV2, SN:1103	Jul. 14. 2017	Head	21.8	22.3	3866	100	84.5	8.63	86.30	2.13
A	5600	D5GHzV2, SN:1103	Jul. 17. 2017	Body	21.5	22.0	3866	100	80.1	7.84	78.40	-2.12
A	5800	D5GHzV2, SN:1103	Jul. 18. 2017	Head	21.4	21.8	3866	100	81.1	7.79	77.90	-3.95
A	5800	D5GHzV2, SN:1103	Jul. 19. 2017	Body	21.8	22.1	3866	100	77.5	7.48	74.80	-3.48

Table 11.2.2 System Verification Results (10g)

SYSTEM DIPOLE VERIFICATION TARGET & MEASURED												
SAR System #	Freq. [MHz]	SAR Dipole kits	Date(s)	Tissue Type	Ambient Temp. [°C]	Liquid Temp. [°C]	Probe S/N	Input Power (mW)	1 W Target SAR_{10g} (W/kg)	Measured SAR_{10g} (W/kg)	1 W Normalized SAR_{10g} (W/kg)	Deviation [%]
A	5300	D5GHzV2, SN:1103	Aug. 16. 2017	Body	21.2	21.7	3866	100	21.6	2.26	22.60	4.63
A	5600	D5GHzV2, SN:1103	Aug. 17. 2017	Body	21.5	22.0	3866	100	22.4	2.25	22.50	0.45

Note1 : System Verification was measured with input 250 mW, 100 mW (5200-5800 MHz) and normalized to 1W.
Note2 : To confirm the proper SAR liquid depth, the z-axis plots from the system verifications were included since the system verifications were performed using the same liquid, probe and DAE as the SAR tests in the same time period.
Note3: Full system validation status and results can be found in Attachment 3.

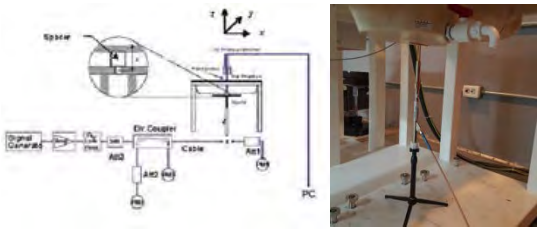


Figure 11.1 Dipole Verification Test Setup Diagram & Photo

12. SAR TEST RESULTS

12.1 Head SAR Results

Table 12.1.1 GSM/GPRS 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	# of Time Slots	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch													
836.6	190	GSM850	GSM	33.7	33.65	0.030	Left Touch	FCC #1	1	1:8.3	0.093	1.012	**0.094**	A1
836.6	190	GSM850	GSM	33.7	33.65	0.050	Right Touch	FCC #1	1	1:8.3	0.078	1.012	0.079	
836.6	190	GSM850	GSM	33.7	33.65	-0.010	Left Tilt	FCC #1	1	1:8.3	0.044	1.012	0.045	
836.6	190	GSM850	GSM	33.7	33.65	-0.030	Right Tilt	FCC #1	1	1:8.3	0.044	1.012	0.045	
836.6	190	GSM850	GPRS	31.7	31.57	-0.020	Left Touch	FCC #1	2	1:4.15	0.138	1.030	**0.142**	A2
836.6	190	GSM850	GPRS	31.7	31.57	0.070	Right Touch	FCC #1	2	1:4.15	0.092	1.030	0.095	
836.6	190	GSM850	GPRS	31.7	31.57	0.020	Left Tilt	FCC #1	2	1:4.15	0.059	1.030	0.061	
836.6	190	GSM850	GPRS	31.7	31.57	0.050	Right Tilt	FCC #1	2	1:4.15	0.068	1.030	0.070	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Head 1.6 W/kg (mW/g) averaged over 1 gram**						

Table 12.1.2 PCS/GPRS 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	# of Time Slots	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch													
1880.0	661	PCS1900	PCS	31.7	31.68	-0.090	Left Touch	FCC #1	1	1:8.3	0.129	1.005	**0.130**	A3
1880.0	661	PCS1900	PCS	31.7	31.68	0.010	Right Touch	FCC #1	1	1:8.3	0.068	1.005	0.068	
1880.0	661	PCS1900	PCS	31.7	31.68	-0.060	Left Tilt	FCC #1	1	1:8.3	0.073	1.005	0.073	
1880.0	661	PCS1900	PCS	31.7	31.68	0.020	Right Tilt	FCC #1	1	1:8.3	0.048	1.005	0.048	
1880.0	661	PCS1900	GPRS	29.7	29.50	0.120	Left Touch	FCC #1	2	1:4.15	0.164	1.047	**0.172**	A4
1880.0	661	PCS1900	GPRS	29.7	29.50	0.090	Right Touch	FCC #1	2	1:4.15	0.102	1.047	0.107	
1880.0	661	PCS1900	GPRS	29.7	29.50	0.040	Left Tilt	FCC #1	2	1:4.15	0.098	1.047	0.103	
1880.0	661	PCS1900	GPRS	29.7	29.50	0.030	Right Tilt	FCC #1	2	1:4.15	0.062	1.047	0.065	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Head 1.6 W/kg (mW/g) averaged over 1 gram**						

Table 12.1.3 WCDMA 850 Head SAR

MEASUREMENT RESULTS													
FREQUENCY		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch												
836.6	4183	WCDMA 850	RMC	25.2	25.13	0.010	Left Touch	FCC #1	1:1	0.157	1.016	**0.160**	A5
836.6	4183	WCDMA 850	RMC	25.2	25.13	0.120	Right Touch	FCC #1	1:1	0.120	1.016	0.122	
836.6	4183	WCDMA 850	RMC	25.2	25.13	0.040	Left Tilt	FCC #1	1:1	0.075	1.016	0.076	
836.6	4183	WCDMA 850	RMC	25.2	25.13	0.110	Right Tilt	FCC #1	1:1	0.072	1.016	0.073	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Head 1.6 W/kg (mW/g) **averaged over 1 gram					

Table 12.1.4 WCDMA 1900 Head SAR

MEASUREMENT RESULTS													
FREQUENCY		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch												
1880.0	9400	WCDMA 1900	RMC	24.2	24.19	0.190	Left Touch	FCC #1	1:1	0.169	1.002	**0.169**	A6
1880.0	9400	WCDMA 1900	RMC	24.2	24.19	-0.010	Right Touch	FCC #1	1:1	0.142	1.002	0.142	
1880.0	9400	WCDMA 1900	RMC	24.2	24.19	0.090	Left Tilt	FCC #1	1:1	0.106	1.002	0.106	
1880.0	9400	WCDMA 1900	RMC	24.2	24.19	-0.000	Right Tilt	FCC #1	1:1	0.052	1.002	0.052	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Head 1.6 W/kg (mW/g) **averaged over 1 gram					

Note: Indicates a repeat measurement of the extended battery

Table 12.1.5 LTE Band 12 Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
707.5	23095	LTE B12	10	25.2	25.18	0.160	0	Left Touch	FCC #1	QPSK	1	0	1:1	0.112	1.005	**0.113**	A7
707.5	23095	LTE B12	10	24.2	24.08	0.190	1	Left Touch	FCC #1	QPSK	25	12	1:1	0.101	1.028	0.104	
707.5	23095	LTE B12	10	25.2	25.18	0.130	0	Right Touch	FCC #1	QPSK	1	0	1:1	0.086	1.005	0.086	
707.5	23095	LTE B12	10	24.2	24.08	0.100	1	Right Touch	FCC #1	QPSK	25	12	1:1	0.074	1.028	0.076	
707.5	23095	LTE B12	10	25.2	25.18	0.150	0	Left Tilt	FCC #1	QPSK	1	0	1:1	0.066	1.005	0.066	
707.5	23095	LTE B12	10	24.2	24.08	-0.100	1	Left Tilt	FCC #1	QPSK	25	12	1:1	0.049	1.028	0.050	
707.5	23095	LTE B12	10	25.2	25.18	0.190	0	Right Tilt	FCC #1	QPSK	1	0	1:1	0.053	1.005	0.053	
707.5	23095	LTE B12	10	24.2	24.08	0.160	1	Right Tilt	FCC #1	QPSK	25	12	1:1	0.045	1.028	0.046	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure									**Head 1.6 W/kg (mW/g) **averaged over 1 gram							

Table 12.1.6 LTE Band 17 Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
710.0	23790	LTE B17	10	25.2	25.15	0.160	0	Left Touch	FCC #1	QPSK	1	25	1:1	0.123	1.012	**0.124**	A8
710.0	23790	LTE B17	10	24.2	24.05	0.100	1	Left Touch	FCC #1	QPSK	25	12	1:1	0.097	1.035	0.100	
710.0	23790	LTE B17	10	25.2	25.15	-0.070	0	Right Touch	FCC #1	QPSK	1	25	1:1	0.083	1.012	0.084	
710.0	23790	LTE B17	10	24.2	24.05	-0.180	1	Right Touch	FCC #1	QPSK	25	12	1:1	0.071	1.035	0.073	
710.0	23790	LTE B17	10	25.2	25.15	0.050	0	Left Tilt	FCC #1	QPSK	1	25	1:1	0.057	1.012	0.058	
710.0	23790	LTE B17	10	24.2	24.05	0.130	1	Left Tilt	FCC #1	QPSK	25	12	1:1	0.026	1.035	0.027	
710.0	23790	LTE B17	10	25.2	25.15	0.170	0	Right Tilt	FCC #1	QPSK	1	25	1:1	0.056	1.012	0.057	
710.0	23790	LTE B17	10	24.2	24.05	0.130	1	Right Tilt	FCC #1	QPSK	25	12	1:1	0.041	1.035	0.042	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure									**Head 1.6 W/kg (mW/g) averaged over 1 gram**								

Table 12.1.7 LTE Band 5 (Cell) Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
836.5	20525	LTE B5	10	25.2	25.11	0.140	0	Left Touch	FCC #1	QPSK	1	0	1:1	0.192	1.021	**0.196**	A9
836.5	20525	LTE B5	10	24.2	23.94	0.170	1	Left Touch	FCC #1	QPSK	25	12	1:1	0.153	1.062	0.162	
836.5	20525	LTE B5	10	25.2	25.11	0.180	0	Right Touch	FCC #1	QPSK	1	0	1:1	0.142	1.021	0.145	
836.5	20525	LTE B5	10	24.2	23.94	0.170	1	Right Touch	FCC #1	QPSK	25	12	1:1	0.106	1.062	0.113	
836.5	20525	LTE B5	10	25.2	25.11	0.140	0	Left Tilt	FCC #1	QPSK	1	0	1:1	0.074	1.021	0.076	
836.5	20525	LTE B5	10	24.2	23.94	0.090	1	Left Tilt	FCC #1	QPSK	25	12	1:1	0.053	1.062	0.056	
836.5	20525	LTE B5	10	25.2	25.11	0.100	0	Right Tilt	FCC #1	QPSK	1	0	1:1	0.100	1.021	0.102	
836.5	20525	LTE B5	10	24.2	23.94	0.160	1	Right Tilt	FCC #1	QPSK	25	12	1:1	0.073	1.062	0.078	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure									**Head 1.6 W/kg (mW/g) averaged over 1 gram**								

Table 12.1.8 LTE Band 4 (AWS) Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
1732.5	20175	LTE B4	20	24.2	24.13	0.010	0	Left Touch	FCC #1	QPSK	1	0	1:1	0.278	1.016	**0.282**	A10
1732.5	20175	LTE B4	20	23.2	22.79	0.190	1	Left Touch	FCC #1	QPSK	50	0	1:1	0.231	1.099	0.254	
1732.5	20175	LTE B4	20	24.2	24.13	-0.060	0	Right Touch	FCC #1	QPSK	1	0	1:1	0.266	1.016	0.270	
1732.5	20175	LTE B4	20	23.2	22.79	-0.090	1	Right Touch	FCC #1	QPSK	50	0	1:1	0.209	1.099	0.230	
1732.5	20175	LTE B4	20	24.2	24.13	0.030	0	Left Tilt	FCC #1	QPSK	1	0	1:1	0.114	1.016	0.116	
1732.5	20175	LTE B4	20	23.2	22.79	0.040	1	Left Tilt	FCC #1	QPSK	50	0	1:1	0.096	1.099	0.106	
1732.5	20175	LTE B4	20	24.2	24.13	0.100	0	Right Tilt	FCC #1	QPSK	1	0	1:1	0.109	1.016	0.111	
1732.5	20175	LTE B4	20	23.2	22.79	0.060	1	Right Tilt	FCC #1	QPSK	50	0	1:1	0.090	1.099	0.099	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure									**Head 1.6 W/kg (mW/g) averaged over 1 gram**								

Table 12.1.9 LTE Band 7 Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
2510.0	20850	LTE B7	20	23.2	23.20	0.050	0	Left Touch	FCC #1	QPSK	1	0	1:1	0.096	1.000	0.096	
2510.0	20850	LTE B7	20	22.2	22.20	0.140	1	Left Touch	FCC #1	QPSK	50	0	1:1	0.069	1.000	0.069	
2510.0	20850	LTE B7	20	23.2	23.20	0.060	0	Right Touch	FCC #1	QPSK	1	0	1:1	0.122	1.000	**0.122**	A11
2510.0	20850	LTE B7	20	22.2	22.20	-0.050	1	Right Touch	FCC #1	QPSK	50	0	1:1	0.091	1.000	0.091	
2510.0	20850	LTE B7	20	23.2	23.20	-0.140	0	Left Tilt	FCC #1	QPSK	1	0	1:1	0.061	1.000	0.061	
2510.0	20850	LTE B7	20	22.2	22.20	-0.130	1	Left Tilt	FCC #1	QPSK	50	0	1:1	0.041	1.000	0.041	
2510.0	20850	LTE B7	20	23.2	23.20	0.190	0	Right Tilt	FCC #1	QPSK	1	0	1:1	0.025	1.000	0.025	
2510.0	20850	LTE B7	20	22.2	22.20	0.050	1	Right Tilt	FCC #1	QPSK	50	0	1:1	0.020	1.000	0.020	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure									**Head 1.6 W/kg (mW/g) averaged over 1 gram**								

Table 12.1.10 LTE Band 41 Head SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
2593.0	40620	LTE B41	20	25.2	25.14	0.030	0	Left Touch	FCC #1	QPSK	1	0	1:1.58	0.050	1.014	0.051	
2593.0	40620	LTE B41	20	24.2	24.04	0.000	1	Left Touch	FCC #1	QPSK	50	25	1:1.58	0.048	1.038	0.050	
2593.0	40620	LTE B41	20	25.2	25.14	-0.150	0	Right Touch	FCC #1	QPSK	1	0	1:1.58	0.079	1.014	**0.080**	A12
2593.0	40620	LTE B41	20	24.2	24.04	0.000	1	Right Touch	FCC #1	QPSK	50	25	1:1.58	0.048	1.038	0.050	
2593.0	40620	LTE B41	20	25.2	25.14	-0.120	0	Left Tilt	FCC #1	QPSK	1	0	1:1.58	0.025	1.014	0.025	
2593.0	40620	LTE B41	20	24.2	24.04	-0.030	1	Left Tilt	FCC #1	QPSK	50	25	1:1.58	0.016	1.038	0.017	
2593.0	40620	LTE B41	20	25.2	25.14	0.040	0	Right Tilt	FCC #1	QPSK	1	0	1:1.58	0.013	1.014	0.013	
2593.0	40620	LTE B41	20	24.2	24.04	0.140	1	Right Tilt	FCC #1	QPSK	50	25	1:1.58	0.00958	1.038	0.010	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure									**Head 1.6 W/kg (mW/g) averaged over 1 gram**								

Table 12.1.11 DTS Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode (Antenna)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
2437	6	802.11b (Ant.1)	16.0	15.77	0.110	Left Touch	FCC #2	0.121	1	99.0	0.115	1.054	1.010	0.122	
2437	6	802.11b (Ant.1)	16.0	15.77	-0.020	Right Touch	FCC #2	0.430	1	99.0	0.435	1.054	1.010	**0.463**	A13
2437	6	802.11b (Ant.1)	16.0	15.77	0.080	Left Tilt	FCC #2	0.070	1	99.0	0.066	1.054	1.010	0.070	
2437	6	802.11b (Ant.1)	16.0	15.77	0.030	Right Tilt	FCC #2	0.150	1	99.0	0.149	1.054	1.010	0.159	
2437	6	802.11b (Ant.2)	16.0	15.64	0.120	Left Touch	FCC #2	0.522	1	99.0	0.524	1.086	1.010	0.575	
2437	6	802.11b (Ant.2)	16.0	15.64	0.090	Right Touch	FCC #2	0.950	1	99.0	0.889	1.086	1.010	**0.975**	A14
2462	11	802.11b (Ant.2)	16.0	15.56	-0.170	Right Touch	FCC #2	0.711	1	99.0	0.803	1.107	1.010	0.898	
2437	6	802.11b (Ant.2)	16.0	15.64	0.070	Left Tilt	FCC #2	0.554	1	99.0	0.581	1.086	1.010	0.637	
2437	6	802.11b (Ant.2)	16.0	15.64	0.180	Right Tilt	FCC #2	0.767	1	99.0	0.885	1.086	1.010	0.971	
2462	11	802.11b (Ant.2)	16.0	15.56	0.070	Right Tilt	FCC #2	0.750	1	99.0	0.810	1.107	1.010	0.906	
2437	6	802.11b (MIMO)	19.0	18.72	0.050	Left Touch	FCC #2	0.461	1	99.0	0.480	1.107	1.010	0.537	
2437	6	802.11b (MIMO)	19.0	18.72	0.120	Right Touch	FCC #2	0.932	1	99.0	0.856	1.107	1.010	**0.957**	A15
2462	11	802.11b (MIMO)	19.0	18.58	-0.040	Right Touch	FCC #2	0.743	1	99.0	0.792	1.107	1.010	0.886	
2437	6	802.11b (MIMO)	19.0	18.72	0.050	Left Tilt	FCC #2	0.697	1	99.0	0.692	1.107	1.010	0.774	
2437	6	802.11b (MIMO)	19.0	18.72	-0.110	Right Tilt	FCC #2	0.728	1	99.0	0.826	1.107	1.010	0.924	
2462	11	802.11b (MIMO)	19.0	18.58	0.100	Right Tilt	FCC #2	0.715	1	99.0	0.810	1.107	1.010	0.906	
2437	6	802.11b (Ant.2)	16.0	15.64	-0.100	Right Touch	FCC #2	0.748	1	99.0	0.838	1.086	1.010	0.919	
2437	6	802.11b (MIMO)	19.0	18.72	0.050	Right Touch	FCC #2	0.898	1	99.0	0.852	1.107	1.010	0.953	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Head 1.6 W/kg (mW/g) averaged over 1 gram**							

Note(s):
1. Highest reported SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is > 0.4 W/kg. Due to the highest reported SAR for this test position, other test position is Head exposure condition were evaluated until a SAR ≤ 0.8 W/kg was reported.
3. Highest reported SAR is > 0.8 W/kg. SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
4. Blue entries represent variability measurements.

Adjusted SAR results for OFDM SAR												
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm	Ratio of OFDM to DSSS	1g Adjusted SAR (W/kg)	Determine OFDM SAR
MHz	Ch											
2437	6	802.11b (Ant.1)	DSSS	16.0	0.463	2437	802.11g	OFDM	15.0	0.794	**0.368**	X
2437	6	802.11b (Ant.1)	DSSS	16.0	0.463	2437	802.11n	OFDM	15.0	0.794	**0.368**	X
2437	6	802.11b (Ant.1)	DSSS	16.0	0.463	2437	802.11ac	OFDM	15.0	0.794	**0.368**	X
2437	6	802.11b (Ant.2)	DSSS	16.0	0.975	2437	802.11g	OFDM	15.0	0.794	**0.774**	X
2437	6	802.11b (Ant.2)	DSSS	16.0	0.975	2437	802.11n	OFDM	15.0	0.794	**0.774**	X
2437	6	802.11b (Ant.2)	DSSS	16.0	0.975	2437	802.11ac	OFDM	15.0	0.794	**0.774**	X
2437	6	802.11b (MIMO)	DSSS	19.0	0.957	2437	802.11g	OFDM	18.0	0.794	**0.760**	X
2437	6	802.11b (MIMO)	DSSS	19.0	0.957	2437	802.11n	OFDM	18.0	0.794	**0.760**	X
2437	6	802.11b (MIMO)	DSSS	19.0	0.957	2437	802.11ac	OFDM	18.0	0.794	**0.760**	X
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure						**Head 1.6 W/kg (mW/g) averaged over 1 gram**						

Note: SAR is not required for the following 2.4 GHz OFDM conditions. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

Table 12.1.12 UNII Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode (Antenna)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5280	56	802.11a (Ant.1)	16.0	15.06	-0.110	Left Touch	FCC #2	0.451	6	94.5	0.302	1.242	1.059	0.397	
5260	52	802.11a (Ant.1)	16.0	15.02	0.030	Right Touch	FCC #2	0.663	6	94.5	0.675	1.253	1.059	0.896	
5280	56	802.11a (Ant.1)	16.0	15.06	0.000	Right Touch	FCC #2	0.759	6	94.5	0.763	1.242	1.059	1.004	
5280	56	802.11a (Ant.1)	16.0	15.06	0.060	Left Tilt	FCC #2	0.380	6	94.5	0.327	1.242	1.059	0.430	
5260	52	802.11a (Ant.1)	16.0	15.02	0.000	Right Tilt	FCC #2	0.821	6	94.5	0.837	1.253	1.059	1.111	
5280	56	802.11a (Ant.1)	16.0	15.06	0.050	Right Tilt	FCC #2	0.925	6	94.5	0.904	1.242	1.059	**1.189**	A16
5300	60	802.11a (Ant.2)	16.0	15.27	-0.060	Left Touch	FCC #2	0.271	6	94.5	0.219	1.183	1.059	0.274	
5300	60	802.11a (Ant.2)	16.0	15.27	-0.040	Right Touch	FCC #2	0.306	6	94.5	0.260	1.183	1.059	0.326	
5300	60	802.11a (Ant.2)	16.0	15.27	0.030	Left Tilt	FCC #2	0.258	6	94.5	0.233	1.183	1.059	0.292	
5300	60	802.11a (Ant.2)	16.0	15.27	0.100	Right Tilt	FCC #2	0.251	6	94.5	0.274	1.183	1.059	**0.343**	A17
5280	56	802.11a (MIMO)	19.0	18.15	0.090	Left Touch	FCC #2	0.089	6	94.5	0.114	1.253	1.059	0.151	
5280	56	802.11a (MIMO)	19.0	18.15	0.110	Right Touch	FCC #2	0.632	6	94.5	0.645	1.253	1.059	0.856	
5300	60	802.11a (MIMO)	19.0	18.13	0.070	Right Touch	FCC #2	0.299	6	94.5	0.335	1.253	1.059	0.445	
5280	56	802.11a (MIMO)	19.0	18.15	0.130	Left Tilt	FCC #2	0.060	6	94.5	0.114	1.253	1.059	0.151	
5280	56	802.11a (MIMO)	19.0	18.15	0.060	Right Tilt	FCC #2	0.772	6	94.5	0.742	1.253	1.059	**0.985**	A18
5300	60	802.11a (MIMO)	19.0	18.13	0.110	Right Tilt	FCC #2	0.306	6	94.5	0.408	1.253	1.059	0.541	
5280	56	802.11a (Ant.1)	16.0	15.06	0.050	Right Tilt	FCC #2	0.925	6	94.5	0.901	1.242	1.059	1.185	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Head 1.6 W/kg (mW/g) averaged over 1 gram**							

Note(s):
1. Highest reported SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is > 0.4 W/kg. Due to the highest reported SAR for this test position, other test position is Head exposure condition were evaluated until a SAR ≤ 0.8 W/kg was reported.
3. Highest reported SAR is > 0.8 W/kg. SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
4. Blue entries represent variability measurements.

Adjusted SAR results for UNII-1 and UNII-2A SAR												
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm	Adjusted Factor	1g Adjusted SAR (W/kg)	SAR for the band with lower maximum output power
MHz	Ch											
5280	56	802.11a (Ant.1)	OFDM	16.0	1.189	5280	802.11a	OFDM	15.0	0.794	0.944	X
5300	60	802.11a (Ant.2)	OFDM	16.0	0.343	5300	802.11a	OFDM	15.0	0.794	0.272	X
5280	56	802.11a (MIMO)	OFDM	19.0	0.985	5280	802.11a	OFDM	18.0	0.794	0.782	X
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure						**Head 1.6 W/kg (mW/g) averaged over 1 gram**						

Note(s):
1. U-NII-1 and U-NII-2A Bands: When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration.

Table 12.1.13 UNII Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode (Antenna)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5660	132	802.11a (Ant.1)	16.0	14.93	-0.130	Left Touch	FCC #2	0.172	6	94.5	0.100	1.279	1.059	0.135	
5660	132	802.11a (Ant.1)	16.0	14.93	0.170	Right Touch	FCC #2	0.302	6	94.5	0.224	1.279	1.059	0.303	
5660	132	802.11a (Ant.1)	16.0	14.93	0.100	Left Tilt	FCC #2	0.182	6	94.5	0.129	1.279	1.059	0.175	
5660	132	802.11a (Ant.1)	16.0	14.93	-0.020	Right Tilt	FCC #2	0.241	6	94.5	0.244	1.279	1.059	**0.330**	A19
5580	116	802.11a (Ant.2)	16.0	14.73	0.140	Left Touch	FCC #2	0.604	6	94.5	0.548	1.340	1.059	0.778	
5580	116	802.11a (Ant.2)	16.0	14.73	0.080	Right Touch	FCC #2	0.459	6	94.5	0.458	1.340	1.059	0.650	
5500	100	802.11a (Ant.2)	16.0	14.66	0.110	Left Tilt	FCC #2	0.606	6	94.5	0.515	1.361	1.059	0.742	
5580	116	802.11a (Ant.2)	16.0	14.73	0.150	Left Tilt	FCC #2	0.699	6	94.5	0.606	1.340	1.059	**0.860**	A20
5580	116	802.11a (Ant.2)	16.0	14.73	0.040	Right Tilt	FCC #2	0.436	6	94.5	0.498	1.340	1.059	0.707	
5580	116	802.11a (MIMO)	19.0	17.80	-0.170	Left Touch	FCC #2	0.507	6	94.5	0.381	1.361	1.059	0.549	
5580	116	802.11a (MIMO)	19.0	17.80	0.170	Right Touch	FCC #2	0.922	6	94.5	0.790	1.361	1.059	1.139	
5660	132	802.11a (MIMO)	19.0	17.79	0.100	Right Touch	FCC #2	0.667	6	94.5	0.725	1.361	1.059	1.045	
5580	116	802.11a (MIMO)	19.0	17.80	-0.140	Left Tilt	FCC #2	0.576	6	94.5	0.408	1.361	1.059	0.588	
5580	116	802.11a (MIMO)	19.0	17.80	0.170	Right Tilt	FCC #2	1.020	6	94.5	0.810	1.361	1.059	**1.167**	A21
5660	132	802.11a (MIMO)	19.0	17.79	-0.170	Right Tilt	FCC #2	0.885	6	94.5	0.770	1.361	1.059	1.110	
5580	116	802.11a (MIMO)	19.0	17.80	0.170	Right Tilt	FCC #2	1.020	6	94.5	0.800	1.361	1.059	1.153	
5745	149	802.11a (Ant.1)	16.0	14.95	0.090	Left Touch	FCC #2	0.147	6	94.5	0.093	1.274	1.059	0.125	
5745	149	802.11a (Ant.1)	16.0	14.95	0.170	Right Touch	FCC #2	0.357	6	94.5	0.332	1.274	1.059	**0.448**	A22
5745	149	802.11a (Ant.1)	16.0	14.95	0.070	Left Tilt	FCC #2	0.176	6	94.5	0.117	1.274	1.059	0.158	
5745	149	802.11a (Ant.1)	16.0	14.95	0.070	Right Tilt	FCC #2	0.285	6	94.5	0.294	1.274	1.059	0.397	
5785	157	802.11a (Ant.2)	16.0	14.93	0.150	Left Touch	FCC #2	0.504	6	94.5	0.448	1.279	1.059	0.607	
5745	149	802.11a (Ant.2)	16.0	14.57	0.030	Right Touch	FCC #2	0.577	6	94.5	0.545	1.390	1.059	0.802	
5785	157	802.11a (Ant.2)	16.0	14.93	0.040	Right Touch	FCC #2	0.635	6	94.5	0.603	1.279	1.059	**0.817**	A23
5785	157	802.11a (Ant.2)	16.0	14.93	0.140	Left Tilt	FCC #2	0.536	6	94.5	0.485	1.279	1.059	0.657	
5785	157	802.11a (Ant.2)	16.0	14.93	-0.010	Right Tilt	FCC #2	0.378	6	94.5	0.394	1.279	1.059	0.534	
5785	157	802.11a (MIMO)	19.0	17.84	0.150	Left Touch	FCC #2	0.099	6	94.5	0.197	1.390	1.059	0.290	
5785	157	802.11a (MIMO)	19.0	17.84	0.150	Right Touch	FCC #2	0.539	6	94.5	0.487	1.390	1.059	0.717	
5785	157	802.11a (MIMO)	19.0	17.84	-0.020	Left Tilt	FCC #2	0.190	6	94.5	0.171	1.390	1.059	0.252	
5785	157	802.11a (MIMO)	19.0	17.84	0.170	Right Tilt	FCC #2	0.481	6	94.5	0.535	1.390	1.059	**0.788**	A24
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Head 1.6 W/kg (mW/g) averaged over 1 gram**							

Note(s):
1. Highest reported SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is > 0.4 W/kg. Due to the highest reported SAR for this test position, other test position is Head exposure condition were evaluated until a SAR ≤ 0.8 W/kg was reported.
3. Highest reported SAR is > 0.8 W/kg. SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
4. Blue entries represent variability measurements.

12.2 Standalone Body-Worn SAR Worn SAR Results

Table 12.2.1 GSM/PCS/GPRS/WCDMA Body-Worn SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Spacing [Side]	Device Serial Number	# of Time Slots	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch													
836.6	190	GSM850	GSM	33.7	33.65	0.030	10 mm [Front]	FCC #1	1	1:8.3	0.419	1.012	0.424	
836.6	190	GSM850	GSM	33.7	33.65	0.000	10 mm [Rear]	FCC #1	1	1:8.3	0.472	1.012	**0.478**	A25
836.6	190	GSM850	GPRS	31.7	31.57	0.090	10 mm [Front]	FCC #1	2	1:4.15	0.494	1.030	0.509	
836.6	190	GSM850	GPRS	31.7	31.57	0.070	10 mm [Rear]	FCC #1	2	1:4.15	0.551	1.030	**0.568**	A26
1880.0	661	PCS1900	PCS	31.7	31.68	-0.010	10 mm [Front]	FCC #1	1	1:8.3	0.444	1.005	**0.446**	A27
1880.0	661	PCS1900	PCS	31.7	31.68	-0.000	10 mm [Rear]	FCC #1	1	1:8.3	0.413	1.005	0.415	
1880.0	661	PCS1900	GPRS	29.7	29.50	-0.050	10 mm [Front]	FCC #1	2	1:4.15	0.388	1.047	**0.406**	A28
1880.0	661	PCS1900	GPRS	29.7	29.50	0.010	10 mm [Rear]	FCC #1	2	1:4.15	0.381	1.047	0.399	
836.6	4183	WCDMA 850	RMC	25.2	25.13	-0.010	10 mm [Front]	FCC #1	N/A	1:1	0.660	1.016	0.671	
836.6	4183	WCDMA 850	RMC	25.2	25.13	-0.010	10 mm [Rear]	FCC #1	N/A	1:1	0.712	1.016	**0.723**	A29
1880.0	9400	WCDMA 1900	RMC	24.2	24.19	0.040	10 mm [Front]	FCC #1	N/A	1:1	0.534	1.002	0.535	
1880.0	9400	WCDMA 1900	RMC	24.2	24.19	0.050	10 mm [Rear]	FCC #1	N/A	1:1	0.610	1.002	**0.611**	A30
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Body 1.6 W/kg (mW/g) averaged over 1 gram**						

Table 12.2.2 LTE B12, LTE B17, LTE B5, LTE B4 Body-Worn SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
707.5	23095	LTE B12	10	25.2	25.18	0.020	0	10 mm [Front]	FCC #1	QPSK	1	0	1:1	0.415	1.005	0.417	
707.5	23095	LTE B12	10	24.2	24.08	0.020	1	10 mm [Front]	FCC #1	QPSK	25	12	1:1	0.361	1.028	0.371	
707.5	23095	LTE B12	10	25.2	25.18	-0.030	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.495	1.005	**0.497**	A31
707.5	23095	LTE B12	10	24.2	24.08	0.000	1	10 mm [Rear]	FCC #1	QPSK	25	12	1:1	0.429	1.028	0.441	
710.0	23790	LTE B17	10	25.2	25.15	0.010	0	10 mm [Front]	FCC #1	QPSK	1	25	1:1	0.469	1.012	0.475	
710.0	23790	LTE B17	10	24.2	24.05	0.010	1	10 mm [Front]	FCC #1	QPSK	25	12	1:1	0.385	1.035	0.398	
710.0	23790	LTE B17	10	25.2	25.15	0.010	0	10 mm [Rear]	FCC #1	QPSK	1	25	1:1	0.530	1.012	**0.536**	A32
710.0	23790	LTE B17	10	24.2	24.05	0.020	1	10 mm [Rear]	FCC #1	QPSK	25	12	1:1	0.446	1.035	0.462	
836.5	20525	LTE B5	10	25.2	25.11	0.140	0	10 mm [Front]	FCC #1	QPSK	1	0	1:1	0.457	1.021	0.467	
836.5	20525	LTE B5	10	24.2	23.94	0.020	1	10 mm [Front]	FCC #1	QPSK	25	12	1:1	0.433	1.062	0.460	
836.5	20525	LTE B5	10	25.2	25.11	0.030	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.497	1.021	**0.507**	A33
836.5	20525	LTE B5	10	24.2	23.94	0.020	1	10 mm [Rear]	FCC #1	QPSK	25	12	1:1	0.471	1.062	0.500	
1732.5	20175	LTE B4	20	24.2	24.13	0.050	0	10 mm [Front]	FCC #1	QPSK	1	0	1:1	0.940	1.016	**0.955**	A34
1732.5	20175	LTE B4	20	23.2	22.79	0.040	1	10 mm [Front]	FCC #1	QPSK	50	0	1:1	0.763	1.099	0.839	
1732.5	20175	LTE B4	20	23.2	22.73	0.020	1	10 mm [Front]	FCC #1	QPSK	100	0	1:1	0.770	1.114	0.858	
1732.5	20175	LTE B4	20	24.2	24.13	-0.020	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.825	1.016	0.838	
1732.5	20175	LTE B4	20	23.2	22.79	0.010	1	10 mm [Rear]	FCC #1	QPSK	50	0	1:1	0.651	1.099	0.715	
1732.5	20175	LTE B4	20	23.2	22.73	0.050	1	10 mm [Rear]	FCC #1	QPSK	100	0	1:1	0.509	1.114	0.567	
1732.5	20175	LTE B4	20	24.2	24.13	0.050	0	10 mm [Front]	FCC #1	QPSK	1	0	1:1	0.902	1.016	0.916	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure										**Body 1.6 W/kg (mW/g) averaged over 1 gram**							

Note(s):
1. Blue entries represent variability measurements.

Table 12.2.3 LTE B7, LTE B41 Body-Worn SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
2510.0	20850	LTE B7	20	23.2	23.20	-0.080	0	10 mm [Front]	FCC #1	QPSK	1	0	1:1	0.753	1.000	0.753	
2510.0	20850	LTE B7	20	22.2	22.20	0.010	1	10 mm [Front]	FCC #1	QPSK	50	0	1:1	0.606	1.000	0.606	
2510.0	20850	LTE B7	20	23.2	23.20	0.040	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.950	1.000	**0.950**	A35
2535.0	21100	LTE B7	20	23.2	23.15	0.020	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.887	1.012	0.898	
2560.0	21350	LTE B7	20	23.2	23.18	0.000	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.863	1.005	0.867	
2535.0	21100	LTE B7	20	22.2	22.20	0.010	1	10 mm [Rear]	FCC #1	QPSK	50	0	1:1	0.681	1.000	0.681	
2560.0	21350	LTE B7	20	22.2	22.16	0.020	1	10 mm [Rear]	FCC #1	QPSK	100	0	1:1	0.722	1.009	0.728	
2510.0	20850	LTE B7	20	23.2	23.20	0.050	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.948	1.000	0.948	
2593.0	40620	LTE B41	20	25.2	25.14	-0.000	0	10 mm [Front]	FCC #1	QPSK	1	0	1:1.58	0.238	1.014	0.241	
2593.0	40620	LTE B41	20	24.2	24.04	0.020	1	10 mm [Front]	FCC #1	QPSK	50	25	1:1.58	0.199	1.038	0.207	
2593.0	40620	LTE B41	20	25.2	25.14	-0.130	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1.58	0.275	1.014	**0.279**	A36
2593.0	40620	LTE B41	20	24.2	24.04	-0.000	1	10 mm [Rear]	FCC #1	QPSK	50	25	1:1.58	0.213	1.038	0.221	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure									**Body 1.6 W/kg (mW/g) averaged over 1 gram**								

Note(s):
1. Blue entries represent variability measurements.

Table 12.2.4 DTS Body-Worn SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	SAR (W/kg)	Plots #
MHz	Ch														
2437	6	802.11b (Ant.1)	16.0	15.77	0.060	10 mm [Front]	FCC #2	0.102	1	99.0	0.104	1.054	1.010	0.111	
2437	6	802.11b (Ant.1)	16.0	15.77	0.050	10 mm [Rear]	FCC #2	0.118	1	99.0	0.115	1.054	1.010	**0.122**	A37
2437	6	802.11b (Ant.2)	16.0	15.64	0.160	10 mm [Front]	FCC #2	0.115	1	99.0	0.119	1.086	1.010	0.131	
2437	6	802.11b (Ant.2)	16.0	15.64	0.120	10 mm [Rear]	FCC #2	0.125	1	99.0	0.126	1.086	1.010	**0.138**	A38
2437	6	802.11b (MIMO)	19.0	18.72	0.180	10 mm [Front]	FCC #2	0.085	1	99.0	0.080	1.107	1.010	0.089	
2437	6	802.11b (MIMO)	19.0	18.72	0.040	10 mm [Rear]	FCC #2	0.093	1	99.0	0.094	1.107	1.010	**0.105**	A39
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Body 1.6 W/kg (mW/g) averaged over 1 gram**							

Note(s):
1. Highest reported SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.

Adjusted SAR results for OFDM SAR											
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm	Ratio of OFDM to DSSS	1g Adjusted SAR (W/kg)	Determine OFDM SAR
MHz	Ch											
2437	6	802.11b (Ant.1)	DSSS	16.0	0.122	2437	802.11g	OFDM	15.0	0.794	**0.097**	X
2437	6	802.11b (Ant.1)	DSSS	16.0	0.122	2437	802.11n	OFDM	15.0	0.794	**0.097**	X
2437	6	802.11b (Ant.1)	DSSS	16.0	0.122	2437	802.11ac	OFDM	15.0	0.794	**0.097**	X
2437	6	802.11b (Ant.2)	DSSS	16.0	0.138	2437	802.11g	OFDM	15.0	0.794	**0.110**	X
2437	6	802.11b (Ant.2)	DSSS	16.0	0.138	2437	802.11n	OFDM	15.0	0.794	**0.110**	X
2437	6	802.11b (Ant.2)	DSSS	16.0	0.138	2437	802.11ac	OFDM	15.0	0.794	**0.110**	X
2437	6	802.11b (MIMO)	DSSS	19.0	0.105	2437	802.11g	OFDM	18.0	0.794	**0.083**	X
2437	6	802.11b (MIMO)	DSSS	19.0	0.105	2437	802.11n	OFDM	18.0	0.794	**0.083**	X
2437	6	802.11b (MIMO)	DSSS	19.0	0.105	2437	802.11ac	OFDM	18.0	0.794	**0.083**	X
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure						**Body 1.6 W/kg (mW/g) averaged over 1 gram**						

Note: SAR is not required for the following 2.4 GHz OFDM conditions. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

Table 12.2.5 UNII Body-Worn SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5280	56	802.11a (Ant.1)	16.0	15.06	0.170	10 mm [Front]	FCC #2	0.083	6	94.5	0.048	1.242	1.059	0.063	
5280	56	802.11a (Ant.1)	16.0	15.06	0.130	10 mm [Rear]	FCC #2	0.370	6	94.5	0.368	1.242	1.059	**0.484**	A40
5300	60	802.11a (Ant.2)	16.0	15.27	0.190	10 mm [Front]	FCC #2	0.030	6	94.5	0.031	1.183	1.059	0.039	
5300	60	802.11a (Ant.2)	16.0	15.27	0.090	10 mm [Rear]	FCC #2	0.352	6	94.5	0.355	1.183	1.059	**0.445**	A41
5280	56	802.11a (MIMO)	19.0	18.15	0.030	10 mm [Front]	FCC #2	0.092	6	94.5	0.054	1.253	1.059	0.072	
5280	56	802.11a (MIMO)	19.0	18.15	-0.050	10 mm [Rear]	FCC #2	0.284	6	94.5	0.280	1.253	1.059	**0.372**	A42
ANSI / IEEE C95.1-2005– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure							**Body 1.6 W/kg (mW/g) averaged over 1 gram**								

Note(s):
1. Highest reported SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is > 0.4 W/kg. Due to the highest reported SAR for this test position, other test position is Head exposure condition were evaluated until a SAR ≤ 0.8 W/kg was reported.

Adjusted SAR results for UNII-1 and UNII-2A SAR												
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm	Adjusted Factor	1g Adjusted SAR (W/kg)	**SAR for** the band with lower maximum output power
MHz	Ch											
5280	56	802.11a (Ant.1)	OFDM	16.0	0.484	5280	802.11a	OFDM	15.0	0.794	0.384	X
5300	60	802.11a (Ant.2)	OFDM	16.0	0.445	5300	802.11a	OFDM	15.0	0.794	0.353	X
5280	56	802.11a (MIMO)	OFDM	19.0	0.372	5280	802.11a	OFDM	18.0	0.794	0.295	X
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure						**Body 1.6 W/kg (mW/g) averaged over 1 gram**						

Note(s):
1. U-NII-1 and U-NII-2A Bands: When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration.

Table 12.2.6 UNII Body-Worn SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5660	132	802.11a (Ant.1)	16.0	14.93	-0.040	10 mm [Front]	FCC #2	0.143	6	94.5	0.090	1.279	1.059	0.122	
5660	132	802.11a (Ant.1)	16.0	14.93	0.110	10 mm [Rear]	FCC #2	0.490	6	94.5	0.492	1.279	1.059	**0.666**	A43
5580	116	802.11a (Ant.2)	16.0	14.73	0.020	10 mm [Front]	FCC #2	0.139	6	94.5	0.079	1.340	1.059	0.112	
5580	116	802.11a (Ant.2)	16.0	14.73	0.030	10 mm [Rear]	FCC #2	0.339	6	94.5	0.333	1.340	1.059	**0.473**	A44
5580	116	802.11a (MIMO)	19.0	17.80	-0.010	10 mm [Front]	FCC #2	0.077	6	94.5	0.069	1.361	1.059	0.099	
5580	116	802.11a (MIMO)	19.0	17.80	-0.000	10 mm [Rear]	FCC #2	0.488	6	94.5	0.477	1.361	1.059	**0.687**	A45
5745	149	802.11a (Ant.1)	16.0	14.95	0.030	10 mm [Front]	FCC #2	0.032	6	94.5	0.055	1.274	1.059	0.074	
5745	149	802.11a (Ant.1)	16.0	14.95	0.000	10 mm [Rear]	FCC #2	0.323	6	94.5	0.323	1.274	1.059	**0.436**	A46
5785	157	802.11a (Ant.2)	16.0	14.93	0.090	10 mm [Front]	FCC #2	0.134	6	94.5	0.109	1.279	1.059	0.148	
5785	157	802.11a (Ant.2)	16.0	14.93	-0.050	10 mm [Rear]	FCC #2	0.649	6	94.5	0.540	1.279	1.059	**0.731**	A47
5785	157	802.11a (MIMO)	19.0	17.84	-0.020	10 mm [Front]	FCC #2	0.036	6	94.5	0.062	1.390	1.059	0.091	
5785	157	802.11a (MIMO)	19.0	17.84	-0.150	10 mm [Rear]	FCC #2	0.422	6	94.5	0.419	1.390	1.059	**0.617**	A48
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Body 1.6 W/kg (mW/g) averaged over 1 gram**							

Note(s):
1. Highest reported SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is > 0.4 W/kg. Due to the highest reported SAR for this test position, other test position is Head exposure condition were evaluated until a SAR ≤ 0.8 W/kg was reported.
3. Highest reported SAR is > 0.8 W/kg. SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

12.3 Standalone Hotspot SAR Results

Table 12.3.1 GPRS/WCDMA Hotspot SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/ Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Spacing [Side]	Device Serial Number	# of Time Slots	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch													
836.6	190	GSM850	GPRS	31.7	31.57	-0.050	10 mm [Bottom]	FCC #1	2	1:4.15	0.297	1.030	0.306	
836.6	190	GSM850	GPRS	31.7	31.57	0.090	10 mm [Front]	FCC #1	2	1:4.15	0.494	1.030	0.509	
836.6	190	GSM850	GPRS	31.7	31.57	0.070	10 mm [Rear]	FCC #1	2	1:4.15	0.551	1.030	**0.568**	A26
836.6	190	GSM850	GPRS	31.7	31.57	0.060	10 mm [Right]	FCC #1	2	1:4.15	0.104	1.030	0.107	
836.6	190	GSM850	GPRS	31.7	31.57	0.060	10 mm [Left]	FCC #1	2	1:4.15	0.209	1.030	0.215	
1880.0	661	PCS1900	GPRS	29.7	29.50	0.090	10 mm [Bottom]	FCC #1	2	1:4.15	0.623	1.047	**0.652**	A49
1880.0	661	PCS1900	GPRS	29.7	29.50	-0.050	10 mm [Front]	FCC #1	2	1:4.15	0.388	1.047	0.406	
1880.0	661	PCS1900	GPRS	29.7	29.50	0.010	10 mm [Rear]	FCC #1	2	1:4.15	0.381	1.047	0.399	
1880.0	661	PCS1900	GPRS	29.7	29.50	0.010	10 mm [Left]	FCC #1	2	1:4.15	0.195	1.047	0.204	
836.6	4183	WCDMA 850	RMC	25.2	25.13	-0.160	10 mm [Bottom]	FCC #1	N/A	1:1	0.379	1.016	0.385	
836.6	4183	WCDMA 850	RMC	25.2	25.13	-0.010	10 mm [Front]	FCC #1	N/A	1:1	0.660	1.016	0.671	
836.6	4183	WCDMA 850	RMC	25.2	25.13	-0.010	10 mm [Rear]	FCC #1	N/A	1:1	0.712	1.016	**0.723**	A29
836.6	4183	WCDMA 850	RMC	25.2	25.13	-0.070	10 mm [Right]	FCC #1	N/A	1:1	0.165	1.016	0.168	
836.6	4183	WCDMA 850	RMC	25.2	25.13	-0.050	10 mm [Left]	FCC #1	N/A	1:1	0.242	1.016	0.246	
1852.4	9262	WCDMA 1900	RMC	24.2	24.11	-0.000	10 mm [Bottom]	FCC #1	N/A	1:1	1.050	1.021	**1.072**	A50
1880.0	9400	WCDMA 1900	RMC	24.2	24.19	0.040	10 mm [Bottom]	FCC #1	N/A	1:1	1.030	1.002	1.032	
1907.6	9538	WCDMA 1900	RMC	24.2	24.18	0.030	10 mm [Bottom]	FCC #1	N/A	1:1	0.892	1.005	0.896	
1880.0	9400	WCDMA 1900	RMC	24.2	24.19	0.040	10 mm [Front]	FCC #1	N/A	1:1	0.534	1.002	0.535	
1880.0	9400	WCDMA 1900	RMC	24.2	24.19	0.050	10 mm [Rear]	FCC #1	N/A	1:1	0.610	1.002	0.611	
1880.0	9400	WCDMA 1900	RMC	24.2	24.19	-0.110	10 mm [Left]	FCC #1	N/A	1:1	0.191	1.002	0.191	
1852.4	9262	WCDMA 1900	RMC	24.2	24.11	-0.000	10 mm [Bottom]	FCC #1	N/A	1:1	1.000	1.021	1.021	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Body 1.6 W/kg (mW/g) averaged over 1 gram**						

Note(s):
1. Blue entries represent variability measurements.

Table 12.2.2 LTE B12, LTE B17, LTE B5 Hotspot SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
707.5	23095	LTE B12	10	25.2	25.18	-0.010	0	10 mm [Bottom]	FCC #1	QPSK	1	0	1:1	0.230	1.005	0.231	
707.5	23095	LTE B12	10	24.2	24.08	-0.010	1	10 mm [Bottom]	FCC #1	QPSK	25	12	1:1	0.201	1.028	0.207	
707.5	23095	LTE B12	10	25.2	25.18	0.020	0	10 mm [Front]	FCC #1	QPSK	1	0	1:1	0.415	1.005	0.417	
707.5	23095	LTE B12	10	24.2	24.08	0.020	1	10 mm [Front]	FCC #1	QPSK	25	12	1:1	0.361	1.028	0.371	
707.5	23095	LTE B12	10	25.2	25.18	-0.030	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.495	1.005	**0.497**	A31
707.5	23095	LTE B12	10	24.2	24.08	0.000	1	10 mm [Rear]	FCC #1	QPSK	25	12	1:1	0.429	1.028	0.441	
707.5	23095	LTE B12	10	25.2	25.18	-0.010	0	10 mm [Right]	FCC #1	QPSK	1	0	1:1	0.179	1.005	0.180	
707.5	23095	LTE B12	10	24.2	24.08	-0.020	1	10 mm [Right]	FCC #1	QPSK	25	12	1:1	0.164	1.028	0.169	
707.5	23095	LTE B12	10	25.2	25.18	0.030	0	10 mm [Left]	FCC #1	QPSK	1	0	1:1	0.114	1.005	0.115	
707.5	23095	LTE B12	10	24.2	24.08	0.040	1	10 mm [Left]	FCC #1	QPSK	25	12	1:1	0.103	1.028	0.106	
710.0	23790	LTE B17	10	25.2	25.15	0.030	0	10 mm [Bottom]	FCC #1	QPSK	1	0	1:1	0.268	1.012	0.271	
710.0	23790	LTE B17	10	24.2	24.05	-0.050	1	10 mm [Bottom]	FCC #1	QPSK	25	0	1:1	0.222	1.035	0.230	
710.0	23790	LTE B17	10	25.2	25.15	0.010	0	10 mm [Front]	FCC #1	QPSK	1	0	1:1	0.469	1.012	0.475	
710.0	23790	LTE B17	10	24.2	24.05	0.010	1	10 mm [Front]	FCC #1	QPSK	25	0	1:1	0.385	1.035	0.398	
710.0	23790	LTE B17	10	25.2	25.15	0.010	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.530	1.012	**0.536**	A32
710.0	23790	LTE B17	10	24.2	24.05	0.020	1	10 mm [Rear]	FCC #1	QPSK	25	0	1:1	0.446	1.035	0.462	
710.0	23790	LTE B17	10	25.2	25.15	0.050	0	10 mm [Right]	FCC #1	QPSK	1	0	1:1	0.230	1.012	0.233	
710.0	23790	LTE B17	10	24.2	24.05	0.000	1	10 mm [Right]	FCC #1	QPSK	25	0	1:1	0.189	1.035	0.196	
710.0	23790	LTE B17	10	25.2	25.15	0.040	0	10 mm [Left]	FCC #1	QPSK	1	0	1:1	0.063	1.012	0.064	
710.0	23790	LTE B17	10	24.2	24.05	0.050	1	10 mm [Left]	FCC #1	QPSK	25	0	1:1	0.062	1.035	0.064	
836.5	20525	LTE B5	10	25.2	25.11	-0.040	0	10 mm [Bottom]	FCC #1	QPSK	1	0	1:1	0.377	1.021	0.385	
836.5	20525	LTE B5	10	24.2	23.94	-0.160	1	10 mm [Bottom]	FCC #1	QPSK	25	0	1:1	0.311	1.062	0.330	
836.5	20525	LTE B5	10	25.2	25.11	0.140	0	10 mm [Front]	FCC #1	QPSK	1	0	1:1	0.457	1.021	0.467	
836.5	20525	LTE B5	10	24.2	23.94	0.020	1	10 mm [Front]	FCC #1	QPSK	25	0	1:1	0.433	1.062	0.460	
836.5	20525	LTE B5	10	25.2	25.11	0.030	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.497	1.021	**0.507**	A33
836.5	20525	LTE B5	10	24.2	23.94	0.020	1	10 mm [Rear]	FCC #1	QPSK	25	0	1:1	0.471	1.062	0.500	
836.5	20525	LTE B5	10	25.2	25.11	0.100	0	10 mm [Right]	FCC #1	QPSK	1	0	1:1	0.136	1.021	0.139	
836.5	20525	LTE B5	10	24.2	23.94	0.140	1	10 mm [Right]	FCC #1	QPSK	25	0	1:1	0.114	1.062	0.121	
836.5	20525	LTE B5	10	25.2	25.11	0.070	0	10 mm [Left]	FCC #1	QPSK	1	0	1:1	0.186	1.021	0.190	
836.5	20525	LTE B5	10	24.2	23.94	-0.160	1	10 mm [Left]	FCC #1	QPSK	25	0	1:1	0.185	1.062	0.196	

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

Table 12.2.3 LTE B4 Hotspot SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
1732.5	20175	LTE B4	20	24.2	24.13	0.050	0	10 mm [Bottom]	FCC #1	QPSK	1	0	1:1	0.881	1.016	0.895	
1732.5	20175	LTE B4	20	23.2	22.79	0.080	1	10 mm [Bottom]	FCC #1	QPSK	50	0	1:1	0.723	1.099	0.795	
1732.5	20175	LTE B4	20	23.2	22.73	0.080	1	10 mm [Bottom]	FCC #1	QPSK	100	0	1:1	0.795	1.114	0.886	
1732.5	20175	LTE B4	20	24.2	24.13	0.050	0	10 mm [Front]	FCC #1	QPSK	1	0	1:1	0.940	1.016	**0.955**	A34
1732.5	20175	LTE B4	20	23.2	22.79	0.040	1	10 mm [Front]	FCC #1	QPSK	50	0	1:1	0.763	1.099	0.839	
1732.5	20175	LTE B4	20	23.2	22.73	0.020	1	10 mm [Front]	FCC #1	QPSK	100	0	1:1	0.770	1.114	0.858	
1732.5	20175	LTE B4	20	24.2	24.13	-0.020	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.825	1.016	0.838	
1732.5	20175	LTE B4	20	23.2	22.79	0.010	1	10 mm [Rear]	FCC #1	QPSK	50	0	1:1	0.651	1.099	0.715	
1732.5	20175	LTE B4	20	23.2	22.73	0.050	1	10 mm [Rear]	FCC #1	QPSK	100	0	1:1	0.509	1.114	0.567	
1732.5	20175	LTE B4	20	24.2	24.13	0.040	0	10 mm [Left]	FCC #1	QPSK	1	0	1:1	0.471	1.016	0.479	
1732.5	20175	LTE B4	20	23.2	22.79	0.020	1	10 mm [Left]	FCC #1	QPSK	50	0	1:1	0.376	1.099	0.413	
1732.5	20175	LTE B4	20	24.2	24.13	0.050	0	10 mm [Front]	FCC #1	QPSK	1	0	1:1	0.902	1.016	0.916	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure										**Body 1.6 W/kg (mW/g) averaged over 1 gram**							

Note(s):
1. Blue entries represent variability measurements.

Table 12.3.4 LTE B7 Hotspot SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
2510.0	20850	LTE B7	20	23.2	23.20	-0.070	0	10 mm [Bottom]	FCC #1	QPSK	1	0	1:1	1.090	1.000	**1.090**	A51
2535.0	21100	LTE B7	20	23.2	23.15	-0.160	0	10 mm [Bottom]	FCC #1	QPSK	1	0	1:1	0.995	1.012	1.007	
2560.0	21350	LTE B7	20	23.2	23.18	-0.170	0	10 mm [Bottom]	FCC #1	QPSK	1	0	1:1	0.851	1.005	0.855	
2510.0	20850	LTE B7	20	22.2	22.20	0.000	1	10 mm [Bottom]	FCC #1	QPSK	50	0	1:1	0.818	1.000	0.818	
2535.0	21100	LTE B7	20	22.2	22.13	-0.070	1	10 mm [Bottom]	FCC #1	QPSK	50	0	1:1	0.760	1.016	0.772	
2560.0	21350	LTE B7	20	22.2	22.18	-0.140	1	10 mm [Bottom]	FCC #1	QPSK	50	0	1:1	0.617	1.005	0.620	
2510.0	20850	LTE B7	20	22.2	21.16	-0.100	1	10 mm [Bottom]	FCC #1	QPSK	100	0	1:1	0.798	1.271	1.014	
2535.0	21100	LTE B7	20	22.2	22.12	-0.040	1	10 mm [Bottom]	FCC #1	QPSK	100	0	1:1	0.740	1.019	0.754	
2560.0	21350	LTE B7	20	22.2	22.18	-0.150	1	10 mm [Bottom]	FCC #1	QPSK	100	0	1:1	0.555	1.005	0.558	
2510.0	20850	LTE B7	20	23.2	23.20	-0.080	0	10 mm [Front]	FCC #1	QPSK	1	0	1:1	0.753	1.000	0.753	
2510.0	20850	LTE B7	20	22.2	22.20	0.010	1	10 mm [Front]	FCC #1	QPSK	50	0	1:1	0.606	1.000	0.606	
2510.0	20850	LTE B7	20	23.2	23.20	0.040	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.950	1.000	0.950	
2535.0	21100	LTE B7	20	23.2	23.15	0.020	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.887	1.012	0.898	
2560.0	21350	LTE B7	20	23.2	23.18	0.000	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.863	1.005	0.867	
2510.0	20850	LTE B7	20	22.2	22.20	0.010	1	10 mm [Rear]	FCC #1	QPSK	50	0	1:1	0.681	1.000	0.681	
2510.0	20850	LTE B7	20	22.2	22.16	0.020	1	10 mm [Rear]	FCC #1	QPSK	100	0	1:1	0.722	1.009	0.728	
2510.0	20850	LTE B7	20	23.2	23.20	0.020	0	10 mm [Left]	FCC #1	QPSK	1	0	1:1	0.153	1.000	0.153	
2510.0	20850	LTE B7	20	22.2	22.20	-0.020	1	10 mm [Left]	FCC #1	QPSK	50	0	1:1	0.111	1.000	0.111	
2510.0	20850	LTE B7	20	23.2	23.20	-0.190	0	10 mm [Bottom]	FCC #1	QPSK	1	0	1:1	1.090	1.000	1.090	
2510.0	20850	LTE B7	20	23.2	23.20	0.050	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1	0.948	1.000	0.948	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure														**Body 1.6 W/kg (mW/g) **averaged over 1 gram			

Note(s):
1. Blue entries represent variability measurements.

Table 12.3.5 LTE B41 Hotspot SAR

MEASUREMENT RESULTS																
FREQUENCY		Mode/ Band	BW [MHz]	Max Allowed Power [dBm]	Cond. PWR [dBm]	Drift Power [dB]	MPR	Position	Device Serial Number	Mod.	RB Size	RB Offs.	Duty Cycle	1g SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plots #
MHz	Ch																
2593.0	40620	LTE B41	20	25.2	25.14	0.010	0	10 mm [Bottom]	FCC #1	QPSK	1	0	1:1.58	0.258	1.014	0.262	
2593.0	40620	LTE B41	20	24.2	24.04	-0.100	1	10 mm [Bottom]	FCC #1	QPSK	50	25	1:1.58	0.214	1.038	0.222	
2593.0	40620	LTE B41	20	25.2	25.14	-0.000	0	10 mm [Front]	FCC #1	QPSK	1	0	1:1.58	0.238	1.014	0.241	
2593.0	40620	LTE B41	20	24.2	24.04	0.020	1	10 mm [Front]	FCC #1	QPSK	50	25	1:1.58	0.199	1.038	0.207	
2593.0	40620	LTE B41	20	25.2	25.14	-0.130	0	10 mm [Rear]	FCC #1	QPSK	1	0	1:1.58	0.275	1.014	**0.279**	A36
2593.0	40620	LTE B41	20	24.2	24.04	-0.000	1	10 mm [Rear]	FCC #1	QPSK	50	25	1:1.58	0.213	1.038	0.221	
2593.0	40620	LTE B41	20	25.2	25.14	0.150	0	10 mm [Left]	FCC #1	QPSK	1	0	1:1.58	0.064	1.014	0.065	
2593.0	40620	LTE B41	20	24.2	24.04	-0.120	1	10 mm [Left]	FCC #1	QPSK	50	25	1:1.58	0.047	1.038	0.049	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure										**Body 1.6 W/kg (mW/g) averaged over 1 gram**							

Table 12.3.6 DTS Hotspot SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	SAR (W/kg)	Plots #
MHz	Ch														
2437	6	802.11b (Ant.1)	16.0	15.77	0.010	10 mm [Top]	FCC #2	0.037	1	99.0	0.035	1.054	1.010	0.037	
2437	6	802.11b (Ant.1)	16.0	15.77	0.060	10 mm [Front]	FCC #2	0.102	1	99.0	0.104	1.054	1.010	0.111	
2437	6	802.11b (Ant.1)	16.0	15.77	0.050	10 mm [Rear]	FCC #2	0.118	1	99.0	0.115	1.054	1.010	**0.122**	A37
2437	6	802.11b (Ant.1)	16.0	15.77	-0.080	10 mm [Left]	FCC #2	0.034	1	99.0	0.032	1.054	1.010	0.034	
2437	6	802.11b (Ant.2)	16.0	15.64	0.120	10 mm [Top]	FCC #2	0.157	1	99.0	0.155	1.086	1.010	**0.170**	A52
2437	6	802.11b (Ant.2)	16.0	15.64	0.160	10 mm [Front]	FCC #2	0.115	1	99.0	0.119	1.086	1.010	0.131	
2437	6	802.11b (Ant.2)	16.0	15.64	0.120	10 mm [Rear]	FCC #2	0.125	1	99.0	0.126	1.086	1.010	0.138	
2437	6	802.11b (Ant.2)	16.0	15.64	0.000	10 mm [Left]	FCC #2	0.013	1	99.0	0.011	1.086	1.010	0.012	
2437	6	802.11b (MIMO)	19.0	18.72	0.070	10 mm [Top]	FCC #2	0.129	1	99.0	0.129	1.107	1.010	**0.144**	A53
2437	6	802.11b (MIMO)	19.0	18.72	0.180	10 mm [Front]	FCC #2	0.085	1	99.0	0.080	1.107	1.010	0.089	
2437	6	802.11b (MIMO)	19.0	18.72	0.040	10 mm [Rear]	FCC #2	0.093	1	99.0	0.094	1.107	1.010	0.105	
2437	6	802.11b (MIMO)	19.0	18.72	-0.010	10 mm [Left]	FCC #2	0.082	1	99.0	0.085	1.107	1.010	0.095	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Body 1.6 W/kg (mW/g) averaged over 1 gram**							

Note(s):
1. Highest reported SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.

Adjusted SAR results for OFDM SAR											
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm	Ratio of OFDM to DSSS	1g Adjusted SAR (W/kg)	Determine OFDM SAR
MHz	Ch											
2437	6	802.11b (Ant.1)	DSSS	16.0	0.122	2437	802.11g	OFDM	15.0	0.794	**0.097**	X
2437	6	802.11b (Ant.1)	DSSS	16.0	0.122	2437	802.11n	OFDM	15.0	0.794	**0.097**	X
2437	6	802.11b (Ant.1)	DSSS	16.0	0.122	2437	802.11ac	OFDM	15.0	0.794	**0.097**	X
2437	6	802.11b (Ant.2)	DSSS	16.0	0.170	2437	802.11g	OFDM	15.0	0.794	**0.135**	X
2437	6	802.11b (Ant.2)	DSSS	16.0	0.170	2437	802.11n	OFDM	15.0	0.794	**0.135**	X
2437	6	802.11b (Ant.2)	DSSS	16.0	0.170	2437	802.11ac	OFDM	15.0	0.794	**0.135**	X
2437	6	802.11b (MIMO)	DSSS	19.0	0.144	2437	802.11g	OFDM	18.0	0.794	**0.114**	X
2437	6	802.11b (MIMO)	DSSS	19.0	0.144	2437	802.11n	OFDM	18.0	0.794	**0.114**	X
2437	6	802.11b (MIMO)	DSSS	19.0	0.144	2437	802.11ac	OFDM	18.0	0.794	**0.114**	X
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Body 1.6 W/kg (mW/g) averaged over 1 gram**				

Note: SAR is not required for the following 2.4 GHz OFDM conditions. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

Table 12.3.7 UNII Hotspot SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5200	40	802.11a (Ant.1)	16.0	15.18	0.150	10 mm [Top]	FCC #2	0.134	6	94.5	0.119	1.208	1.059	0.152	
5200	40	802.11a (Ant.1)	16.0	15.18	0.170	10 mm [Front]	FCC #2	0.079	6	94.5	0.045	1.208	1.059	0.058	
5200	40	802.11a (Ant.1)	16.0	15.18	0.130	10 mm [Rear]	FCC #2	0.353	6	94.5	0.349	1.208	1.059	**0.446**	A54
5200	40	802.11a (Ant.1)	16.0	15.18	-0.180	10 mm [Left]	FCC #2	0.115	6	94.5	0.096	1.208	1.059	0.123	
5200	40	802.11a (Ant.2)	16.0	15.32	0.190	10 mm [Top]	FCC #2	0.128	6	94.5	0.101	1.169	1.059	0.125	
5200	40	802.11a (Ant.2)	16.0	15.32	0.190	10 mm [Front]	FCC #2	0.028	6	94.5	0.029	1.169	1.059	0.036	
5200	40	802.11a (Ant.2)	16.0	15.32	0.090	10 mm [Rear]	FCC #2	0.333	6	94.5	0.333	1.169	1.059	**0.412**	A55
5200	40	802.11a (Ant.2)	16.0	15.32	0.020	10 mm [Left]	FCC #2	0.148	6	94.5	0.142	1.169	1.059	0.176	
5200	40	802.11a (MIMO)	19.0	18.26	-0.130	10 mm [Top]	FCC #2	0.104	6	94.5	0.088	1.208	1.059	0.113	
5200	40	802.11a (MIMO)	19.0	18.26	0.030	10 mm [Front]	FCC #2	0.088	6	94.5	0.051	1.208	1.059	0.065	
5200	40	802.11a (MIMO)	19.0	18.26	-0.050	10 mm [Rear]	FCC #2	0.271	6	94.5	0.266	1.208	1.059	**0.340**	A56
5200	40	802.11a (MIMO)	19.0	18.26	-0.130	10 mm [Left]	FCC #2	0.124	6	94.5	0.059	1.208	1.059	0.075	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Body 1.6 W/kg (mW/g) averaged over 1 gram**							

Note(s):
1. Highest reported SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is > 0.4 W/kg. Due to the highest reported SAR for this test position, other test position is Head exposure condition were evaluated until a SAR ≤ 0.8 W/kg was reported.

Table 12.3.8 UNII Hotspot SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5745	149	802.11a (Ant.1)	16.0	14.95	-0.060	10 mm [Top]	FCC #2	0.115	6	94.5	0.086	1.274	1.059	0.116	
5745	149	802.11a (Ant.1)	16.0	14.95	0.030	10 mm [Front]	FCC #2	0.032	6	94.5	0.055	1.274	1.059	0.074	
5745	149	802.11a (Ant.1)	16.0	14.95	0.000	10 mm [Rear]	FCC #2	0.323	6	94.5	0.323	1.274	1.059	**0.436**	A46
5745	149	802.11a (Ant.1)	16.0	14.95	0.050	10 mm [Left]	FCC #2	0.115	6	94.5	0.065	1.274	1.059	0.088	
5785	157	802.11a (Ant.2)	16.0	14.93	-0.120	10 mm [Top]	FCC #2	0.306	6	94.5	0.281	1.279	1.059	0.381	
5785	157	802.11a (Ant.2)	16.0	14.93	0.090	10 mm [Front]	FCC #2	0.134	6	94.5	0.109	1.279	1.059	0.148	
5785	157	802.11a (Ant.2)	16.0	14.93	-0.050	10 mm [Rear]	FCC #2	0.649	6	94.5	0.540	1.279	1.059	**0.731**	A47
5785	157	802.11a (Ant.2)	16.0	14.93	0.110	10 mm [Left]	FCC #2	0.553	6	94.5	0.555	1.279	1.059	0.752	
5785	157	802.11a (MIMO)	19.0	17.84	0.090	10 mm [Top]	FCC #2	0.131	6	94.5	0.082	1.390	1.059	0.121	
5785	157	802.11a (MIMO)	19.0	17.84	-0.020	10 mm [Front]	FCC #2	0.036	6	94.5	0.062	1.390	1.059	0.091	
5785	157	802.11a (MIMO)	19.0	17.84	-0.150	10 mm [Rear]	FCC #2	0.422	6	94.5	0.419	1.390	1.059	**0.617**	A48
5785	157	802.11a (MIMO)	19.0	17.84	0.100	10 mm [Left]	FCC #2	0.164	6	94.5	0.116	1.390	1.059	0.171	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Body 1.6 W/kg (mW/g) averaged over 1 gram**							

Note(s):
1. Highest reported SAR is ≤ 0.4 W/kg. Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is > 0.4 W/kg. Due to the highest reported SAR for this test position, other test position is Head exposure condition were evaluated until a SAR ≤ 0.8 W/kg was reported.
3. Highest reported SAR is > 0.8 W/kg. SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

12.4 Standalone Phablet SAR Results

Per FCC KDB Publication 648474 D04 Handset SAR, Phablet SAR tests were not required of Hotspot 1g SAR scaled to maximum output power, including tolerance) < 1.2 W/kg.

Table 12.4.1 UNII Phablet SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	10g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	10g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5280	56	802.11a (Ant.1)	16.0	15.06	-0.020	0 mm [Top]	FCC #2	0.100	6	94.5	0.092	1.242	1.059	0.121	
5280	56	802.11a (Ant.1)	16.0	15.06	0.050	0 mm [Front]	FCC #2	0.219	6	94.5	0.230	1.242	1.059	0.303	
5280	56	802.11a (Ant.1)	16.0	15.06	0.010	0 mm [Rear]	FCC #2	1.190	6	94.5	1.160	1.242	1.059	**1.526**	A57
5280	56	802.11a (Ant.1)	16.0	15.06	0.030	0 mm [Left]	FCC #2	0.257	6	94.5	0.261	1.242	1.059	0.343	
5300	60	802.11a (Ant.2)	16.0	15.27	0.060	0 mm [Top]	FCC #2	0.579	6	94.5	0.587	1.183	1.059	0.735	
5300	60	802.11a (Ant.2)	16.0	15.27	0.090	0 mm [Front]	FCC #2	0.252	6	94.5	0.252	1.183	1.059	0.316	
5300	60	802.11a (Ant.2)	16.0	15.27	0.140	0 mm [Rear]	FCC #2	0.669	6	94.5	0.669	1.183	1.059	**0.838**	A58
5300	60	802.11a (Ant.2)	16.0	15.27	0.070	0 mm [Left]	FCC #2	0.264	6	94.5	0.272	1.183	1.059	0.341	
5280	56	802.11a (MIMO)	19.0	18.15	0.090	0 mm [Top]	FCC #2	0.089	6	94.5	0.083	1.253	1.059	0.110	
5280	56	802.11a (MIMO)	19.0	18.15	0.160	0 mm [Front]	FCC #2	0.053	6	94.5	0.043	1.253	1.059	0.057	
5280	56	802.11a (MIMO)	19.0	18.15	-0.150	0 mm [Rear]	FCC #2	0.916	6	94.5	0.881	1.253	1.059	**1.169**	A59
5280	56	802.11a (MIMO)	19.0	18.15	0.130	0 mm [Left]	FCC #2	0.534	6	94.5	0.571	1.253	1.059	0.758	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Hand 4.0 W/kg (mW/g) averaged over 10 gram**							

Table 12.4.2 UNII Phablet SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	10g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	10g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5660	132	802.11a (Ant.1)	16.0	14.93	0.110	0 mm [Top]	FCC #2	0.444	6	94.5	0.462	1.279	1.059	0.626	
5660	132	802.11a (Ant.1)	16.0	14.93	0.150	0 mm [Front]	FCC #2	0.497	6	94.5	0.437	1.279	1.059	0.592	
5660	132	802.11a (Ant.1)	16.0	14.93	0.080	0 mm [Rear]	FCC #2	0.902	6	94.5	1.240	1.279	1.059	**1.680**	A60
5660	132	802.11a (Ant.1)	16.0	14.93	0.070	0 mm [Left]	FCC #2	0.773	6	94.5	0.821	1.279	1.059	1.112	
5580	116	802.11a (Ant.2)	16.0	14.73	0.100	0 mm [Top]	FCC #2	0.217	6	94.5	0.215	1.340	1.059	0.305	
5580	116	802.11a (Ant.2)	16.0	14.73	0.110	0 mm [Front]	FCC #2	0.185	6	94.5	0.188	1.340	1.059	0.267	
5580	116	802.11a (Ant.2)	16.0	14.73	0.020	0 mm [Rear]	FCC #2	1.020	6	94.5	1.160	1.340	1.059	**1.646**	A61
5580	116	802.11a (Ant.2)	16.0	14.73	0.090	0 mm [Left]	FCC #2	0.312	6	94.5	0.327	1.340	1.059	0.464	
5580	116	802.11a (MIMO)	19.0	17.80	0.060	0 mm [Top]	FCC #2	0.182	6	94.5	0.180	1.361	1.059	0.259	
5580	116	802.11a (MIMO)	19.0	17.80	0.140	0 mm [Front]	FCC #2	0.118	6	94.5	0.111	1.361	1.059	0.160	
5580	116	802.11a (MIMO)	19.0	17.80	0.050	0 mm [Rear]	FCC #2	0.709	6	94.5	1.170	1.361	1.059	**1.686**	A62
5580	116	802.11a (MIMO)	19.0	17.80	0.090	0 mm [Left]	FCC #2	0.627	6	94.5	0.677	1.361	1.059	0.976	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Hand 4.0 W/kg (mW/g) averaged over 10 gram**							

12.5 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. A standard battery was used for all SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 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.
7. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported boy-worn SAR was not > 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were performed.
8. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for charity. Please see Section 14 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated.
10. SAR measurements were performed using the DASY5 automated system. The procedure for spatial peak SAR evaluation has been implemented according to the IEEE 1528 standard. During a maximum search, global and local maxima searches are automatically performed in 2-D after each area scan measurement. The algorithm will find the global maximum and all local maxima within 2 dB of the global maxima for all SAR distributions. All local maxima within 2 dB of the global maximum were searched and passed for the Zoom Scan measurement.

GSM Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. This device supports GSM VOIP in the head and body-worn configurations; therefore GPRS was additionally evaluated for head and body-worn compliance.
3. Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October2013 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.
4. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). Since the maximum output power variation across the required test channels is not > ½ dB, the middle channel was used for testing.

WCDMA (UMTS) Notes:

1. WCDMA (UMTS) mode in was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. AMR and HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.
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 then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r05. The general test procedures used for testing can be found in Section 5.
2. According to FCC KDB 941225 D05v02r05.
   When the reported SAR is ≤ 0.8 W/kg, testing of the 100% RB allocation and required test channels is not required.
   Otherwise, SAR is required for the remaining required test channels using the 1 RB, 50% RB and 100% RB allocation with highest output power for that channel.
   Only one channel, and as reported SAR values for 1 RB allocation and 50% RB allocation were less than 1.45 W/kg only the highest power RB offset for each allocation was required.
3. 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.
4. A-MPR was disabled for all SAR tests by setting NS=1 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).
5. Per KDB Publication 941225 D05Av01r02, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was > 0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.
6. TDD LTE was tested using UL-DL configuration 0 with 6 UL sub frames and 2S sub frames using extended cyclic prefix only and special sub frame configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Sec. 4, the duty factor using extended cyclic prefix is 0.633 (cf=1.58).
7. SAR test reduction is applied using the following criteria:
   Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is > 0.8 W/kg, testing for other channels is performed at the highest output power level for 1 RB, and 50% RB configuration for that channel. Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High channel when the highest reported SAR for 1 RB and 50% RB are > 0.8 W/kg, Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg. Testing for 16QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/kg and its output power is not more than 0.5 dB higher than that a QPSK. Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

WLAN Notes:

1. The initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n) was not required duo to the maximum allowed powers and the highest reported DSSS SAR when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output and the adjust SAR is ≤ 1.2 W/kg.
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.
4. When the maximum reported 1g averaged SAR ≤ 0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg or all test channels were measured**.**
5. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor to determine compliance.
6. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D01v06.

13. FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

13.1 Introduction

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

13.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 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 sum 1-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤ 1.6 W/kg. The different test positon in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1-g or 10-g SAR.

$$\text{Estimated SAR} = \frac{\sqrt{f(GHz)}}{7.5} * \frac{(\text{Max Power of channel, mW})}{\text{Min. Separation Distance, mm}}$$

Table 13.2.1 Estimated SAR (Held to Ear)

Mode	Frequency	Maximum Allowed Power		Separation Distance (Body)	Estimated SAR (Body)
	[MHz]	[dBm]	[mW]	[mm]	[W/kg]
Bluetooth	2480	12.5	18	5	0.747

Table 13.2.2 Estimated SAR (Body-Worn at 10 mm)

Mode	Frequency	Maximum Allowed Power		Separation Distance (Body)	Estimated SAR (Body)
	[MHz]	[dBm]	[mW]	[mm]	[W/kg]
Bluetooth	2480	12.5	18	10	0.373

13.3 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the DUT are shown in Figure 13.1 and are color-coded to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

Figure 13.1 Simultaneous Transmission Paths

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

Table 13.3.1 Simultaneous Transmission Scenarios

No.	Capable TX Configuration	GSM 850/1900	GSM 850/1900	WCDMA 850 Voice	WCDMA 850 Data	LTE B4,B5,B7,B12, B17,B41	WIFI 2.4GHz	WIFI 5GHz	Bluetooth 2.4GHz
1	GSM 850/1900		No	No	No	No	Yes	Yes	Yes
2	GSM 850/1900	No		No	No	No	Yes	Yes	Yes
3	WCDMA 850 Voice	No	No		No	No	Yes	Yes	Yes
4	WCDMA 850 Data	No	No	No		No	Yes	Yes	Yes
5	LTE B4,B5,B7,B12, B17,B41	No	No	No	No		Yes	Yes	Yes
6	WIFI 2.4GHz	Yes	Yes	Yes	Yes	Yes		Yes	No
7	WIFI 5GHz	Yes	Yes	Yes	Yes	Yes	Yes		No
8	Bluetooth 2.4GHz	Yes	Yes	Yes	Yes	Yes	No	No	

Table 13.3.2 Simultaneous SAR Cases

No.	Capable Transmit Configuration	Head SAR	Body-Worn SAR	Hotspot SAR	Note
1	GSM Voice + Wi-Fi 2.4 GHz	Yes	Yes	N/A	
2	GSM Voice + Wi-Fi 5 GHz	Yes	Yes	N/A	
3	GSM Voice + Bluetooth 2.4 GHz	Yes	Yes	N/A	
4	GSM Voice + Wi-Fi 2.4 GHz MIMO	Yes	Yes	N/A	
5	GSM Voice + Wi-Fi 5 GHz MIMO	Yes	Yes	N/A	
6	GSM Voice + Wi-Fi 2.4 GHz + Wi-Fi 5GHz	Yes	Yes	N/A	
7	WCDMA + Wi-Fi 2.4 GHz	Yes	Yes	Yes	
8	WCDMA + Wi-Fi 5 GHz	Yes	Yes	Yes	
9	WCDMA + Bluetooth 2.4 GHz	Yes	Yes	Yes	
10	WCDMA + Wi-Fi 2.4 GHz MIMO	Yes	Yes	Yes	
11	WCDMA + Wi-Fi 5 GHz MIMO	Yes	Yes	Yes	
12	WCMDA + Wi-Fi 2.4 GHz + Wi-Fi 5GHz	Yes	Yes	Yes	
13	LTE + Wi-Fi 2.4 GHz	Yes	Yes	Yes	
14	LTE + Wi-Fi 5 GHz	Yes	Yes	Yes	
15	LTE + Bluetooth 2.4 GHz	Yes	Yes	Yes	
16	LTE + Wi-Fi 2.4 GHz MIMO	Yes	Yes	Yes	
17	LTE + Wi-Fi 5 GHz MIMO	Yes	Yes	Yes	
18	LTE + Wi-Fi 2.4 GHz + Wi-Fi 5GHz	Yes	Yes	Yes	
19	GPRS/EDGE + Wi-Fi 2.4 GHz	Yes	Yes *	Yes	* Pre-installed VOIP applications are considered
20	GPRS/EDGE + Wi-Fi 5 GHz	Yes	Yes *	Yes	* Pre-installed VOIP applications are considered
21	GPRS/EDGE + Bluetooth 2.4 GHz	Yes	Yes *	Yes	* Pre-installed VOIP applications are considered
22	GPRS/EDGE + Wi-Fi 2.4 GHz MIMO	Yes	Yes *	Yes	* Pre-installed VOIP applications are considered
23	GPRS/EDGE + Wi-Fi 5 GHz MIMO	Yes	Yes *	Yes	* Pre-installed VOIP applications are considered
24	GPRS/EDGE + Wi-Fi 2.4 GHz + Wi-Fi 5GHz	Yes	Yes *	Yes	* Pre-installed VOIP applications are considered

Notes:

1. WiFi 2.4Ghz is supported Hotspot and WiFi-Direct(GO/GC).
2. WiFi 5GHz is supported Hotspot in UNII B1,B3 and WiFi-Direct(GO/GC) in UNII B1,B3.
3. WiFi 2.Ghz and 5Ghz are supported in the same time(DBS)
4. LTE, WCDMA, GPRS/EDGE is supported Hotspot.
5. VoIP is supported in LTE, WCDMA, GSM
6. Bluetooth and WiFi can not transmit simultaneously at 2.4G band.
7. GSM, WCDMA and LTE can not transmit simultaneously since they share the same chip.
8. 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.
9. Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, there are no simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table.

13.4 Head SAR Simultaneous Transmission Analysis

Table 13.4.1 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.079	0.463	0.542
	GPRS 850	0.095	0.463	0.558
	GSM 1900	0.068	0.463	0.531
	GPRS 1900	0.107	0.463	0.570
	WCDMA 850	0.122	0.463	0.585
	WCDMA 1900	0.142	0.463	0.605
	LTE Band 12	0.086	0.463	0.549
	LTE Band 17	0.084	0.463	0.547
	LTE Band 5	0.145	0.463	0.608
	LTE Band 4	0.270	0.463	**0.733**
	LTE Band 7	0.122	0.463	0.585
	LTE Band 41	0.080	0.463	0.543

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	Left Touch	0.282	0.122	0.404
	Right Touch	0.270	0.463	**0.733**
	Left Tilt	0.116	0.070	0.186
	Right Tilt	0.111	0.159	0.270

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN Ant1 simultaneous case for held to ear.

Table 13.4.2 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.079	0.975	1.054
	GPRS 850	0.095	0.975	1.070
	GSM 1900	0.068	0.975	1.043
	GPRS 1900	0.107	0.975	1.082
	WCDMA 850	0.122	0.975	1.097
	WCDMA 1900	0.142	0.975	1.117
	LTE Band 12	0.086	0.975	1.061
	LTE Band 17	0.084	0.975	1.059
	LTE Band 5	0.145	0.975	1.120
	LTE Band 4	0.270	0.975	**1.245**
	LTE Band 7	0.122	0.975	1.097
	LTE Band 41	0.080	0.975	1.055

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	2.4G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	Left Touch	0.282	0.575	0.857
	Right Touch	0.270	0.975	**1.245**
	Left Tilt	0.116	0.637	0.753
	Right Tilt	0.111	0.971	1.082

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN Ant2 simultaneous case for held to ear.

Table 13.4.3 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.079	0.957	1.036
	GPRS 850	0.095	0.957	1.052
	GSM 1900	0.068	0.957	1.025
	GPRS 1900	0.107	0.957	1.064
	WCDMA 850	0.122	0.957	1.079
	WCDMA 1900	0.142	0.957	1.099
	LTE Band 12	0.086	0.957	1.043
	LTE Band 17	0.084	0.957	1.041
	LTE Band 5	0.145	0.957	1.102
	LTE Band 4	0.270	0.957	**1.227**
	LTE Band 7	0.122	0.957	1.079
	LTE Band 41	0.080	0.957	1.037

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	2.4G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	Left Touch	0.282	0.537	0.819
	Right Touch	0.270	0.957	**1.227**
	Left Tilt	0.116	0.774	0.890
	Right Tilt	0.111	0.924	1.035

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN MIMO simultaneous case for held to ear.

Table 13.4.4 Simultaneous Transmission Scenario for 2G/3G/4G with 5.3 GHz W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.3G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.045	1.189	1.234
	GPRS 850	0.070	1.189	1.259
	GSM 1900	0.048	1.189	1.237
	GPRS 1900	0.065	1.189	1.254
	WCDMA 850	0.073	1.189	1.262
	WCDMA 1900	0.052	1.189	1.241
	LTE Band 12	0.053	1.189	1.242
	LTE Band 17	0.057	1.189	1.246
	LTE Band 5	0.102	1.189	1.291
	LTE Band 4	0.111	1.189	**1.300**
	LTE Band 7	0.025	1.189	1.214
	LTE Band 41	0.013	1.189	1.202

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	5.3G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	Left Touch	0.282	0.397	0.679
	Right Touch	0.270	1.004	1.274
	Left Tilt	0.116	0.430	0.546
	Right Tilt	0.111	1.189	**1.300**

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.3G WLAN Ant1 simultaneous case for held to ear.

Table 13.4.5 Simultaneous Transmission Scenario for 2G/3G/4G with 5.3 GHz W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.079	0.326	0.405
	GPRS 850	0.095	0.326	0.421
	GSM 1900	0.130	0.274	0.404
	GPRS 1900	0.172	0.274	0.446
	WCDMA 850	0.122	0.326	0.448
	WCDMA 1900	0.142	0.326	0.468
	LTE Band 12	0.086	0.326	0.412
	LTE Band 17	0.084	0.326	0.410
	LTE Band 5	0.145	0.326	0.471
	LTE Band 4	0.270	0.326	**0.596**
	LTE Band 7	0.122	0.326	0.448
	LTE Band 41	0.080	0.326	0.406

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	Left Touch	0.282	0.274	0.556
	Right Touch	0.270	0.326	**0.596**
	Left Tilt	0.116	0.292	0.408
	Right Tilt	0.111	0.343	0.454

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.3G WLAN Ant2 simultaneous case for held to ear.

Table 13.4.6 Simultaneous Transmission Scenario for 2G/3G/4G with 5.3 GHz W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.3G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.045	0.985	1.030
	GPRS 850	0.070	0.985	1.055
	GSM 1900	0.048	0.985	1.033
	GPRS 1900	0.065	0.985	1.050
	WCDMA 850	0.073	0.985	1.058
	WCDMA 1900	0.052	0.985	1.037
	LTE Band 12	0.053	0.985	1.038
	LTE Band 17	0.057	0.985	1.042
	LTE Band 5	0.102	0.985	1.087
	LTE Band 4	0.270	0.856	**1.126**
	LTE Band 7	0.025	0.985	1.010
	LTE Band 41	0.013	0.985	0.998

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	5.3G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	Left Touch	0.282	0.151	0.433
	Right Touch	0.270	0.856	**1.126**
	Left Tilt	0.116	0.151	0.267
	Right Tilt	0.111	0.985	1.096

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.3G WLAN MIMO simultaneous case for held to ear.

Table 13.4.7 Simultaneous Transmission Scenario for 2G/3G/4G with 5.6 GHz W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.6G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.079	0.303	0.382
	GPRS 850	0.070	0.330	0.400
	GSM 1900	0.048	0.330	0.378
	GPRS 1900	0.107	0.303	0.410
	WCDMA 850	0.122	0.303	0.425
	WCDMA 1900	0.142	0.303	0.445
	LTE Band 12	0.086	0.303	0.389
	LTE Band 17	0.084	0.303	0.387
	LTE Band 5	0.145	0.303	0.448
	LTE Band 4	0.270	0.303	**0.573**
	LTE Band 7	0.122	0.303	0.425
	LTE Band 41	0.080	0.303	0.383

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	5.6G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	Left Touch	0.282	0.135	0.417
	Right Touch	0.270	0.303	**0.573**
	Left Tilt	0.116	0.175	0.291
	Right Tilt	0.111	0.330	0.441

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.6G WLAN Ant1 simultaneous case for held to ear.

Table 13.4.8 Simultaneous Transmission Scenario for 2G/3G/4G with 5.6 GHz W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.045	0.860	0.905
	GPRS 850	0.061	0.860	0.921
	GSM 1900	0.073	0.860	0.933
	GPRS 1900	0.103	0.860	0.963
	WCDMA 850	0.160	0.778	0.938
	WCDMA 1900	0.106	0.860	0.966
	LTE Band 12	0.066	0.860	0.926
	LTE Band 17	0.058	0.860	0.918
	LTE Band 5	0.196	0.778	0.974
	LTE Band 4	0.282	0.778	**1.060**
	LTE Band 7	0.061	0.860	0.921
	LTE Band 41	0.025	0.860	0.885

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	**Left Touch**	0.282	0.778	**1.060**
	Right Touch	0.270	0.650	0.920
	Left Tilt	0.116	0.860	0.976
	Right Tilt	0.111	0.707	0.818

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.6G WLAN Ant2 simultaneous case for held to ear.

Table 13.4.9 Simultaneous Transmission Scenario for 2G/3G/4G with 5.6 GHz W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.6G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.079	1.139	1.218
	GPRS 850	0.070	1.167	1.237
	GSM 1900	0.048	1.167	1.215
	GPRS 1900	0.107	1.139	1.246
	WCDMA 850	0.122	1.139	1.261
	WCDMA 1900	0.142	1.139	1.281
	LTE Band 12	0.086	1.139	1.225
	LTE Band 17	0.057	1.167	1.224
	LTE Band 5	0.145	1.139	1.284
	LTE Band 4	0.270	1.139	**1.409**
	LTE Band 7	0.122	1.139	1.261
	LTE Band 41	0.080	1.139	1.219

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	5.6G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	Left Touch	0.282	0.549	0.831
	Right Touch	0.270	1.139	**1.409**
	Left Tilt	0.116	0.588	0.704
	Right Tilt	0.111	1.167	1.278

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.6G WLAN MIMO simultaneous case for held to ear.

Table 13.4.10 Simultaneous Transmission Scenario for 2G/3G/4G with 5.8 GHz W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.8G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.079	0.448	0.527
	GPRS 850	0.095	0.448	0.543
	GSM 1900	0.068	0.448	0.516
	GPRS 1900	0.107	0.448	0.555
	WCDMA 850	0.122	0.448	0.570
	WCDMA 1900	0.142	0.448	0.590
	LTE Band 12	0.086	0.448	0.534
	LTE Band 17	0.084	0.448	0.532
	LTE Band 5	0.145	0.448	0.593
	LTE Band 4	0.270	0.448	**0.718**
	LTE Band 7	0.122	0.448	0.570
	LTE Band 41	0.080	0.448	0.528

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	5.8G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	Left Touch	0.282	0.125	0.407
	Right Touch	0.270	0.448	**0.718**
	Left Tilt	0.116	0.158	0.274
	Right Tilt	0.111	0.397	0.508

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.8G WLAN Ant1 simultaneous case for held to ear.

Table 13.4.11 Simultaneous Transmission Scenario for 2G/3G/4G with 5.8 GHz W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.079	0.817	0.896
	GPRS 850	0.095	0.817	0.912
	GSM 1900	0.068	0.817	0.885
	GPRS 1900	0.107	0.817	0.924
	WCDMA 850	0.122	0.817	0.939
	WCDMA 1900	0.142	0.817	0.959
	LTE Band 12	0.086	0.817	0.903
	LTE Band 17	0.084	0.817	0.901
	LTE Band 5	0.145	0.817	0.962
	LTE Band 4	0.270	0.817	**1.087**
	LTE Band 7	0.122	0.817	0.939
	LTE Band 41	0.080	0.817	0.897

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	Left Touch	0.282	0.607	0.889
	Right Touch	0.270	0.817	**1.087**
	Left Tilt	0.116	0.657	0.773
	Right Tilt	0.111	0.534	0.645

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.8G WLAN Ant2 simultaneous case for held to ear.

Table 13.4.12 Simultaneous Transmission Scenario for 2G/3G/4G with 5.8 GHz W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.8G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.045	0.788	0.833
	GPRS 850	0.070	0.788	0.858
	GSM 1900	0.048	0.788	0.836
	GPRS 1900	0.065	0.788	0.853
	WCDMA 850	0.073	0.788	0.861
	WCDMA 1900	0.142	0.717	0.859
	LTE Band 12	0.053	0.788	0.841
	LTE Band 17	0.057	0.788	0.845
	LTE Band 5	0.102	0.788	0.890
	LTE Band 4	0.270	0.717	**0.987**
	LTE Band 7	0.122	0.717	0.839
	LTE Band 41	0.013	0.788	0.801

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	5.8G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	Left Touch	0.282	0.290	0.572
	Right Touch	0.270	0.717	**0.987**
	Left Tilt	0.116	0.252	0.368
	Right Tilt	0.111	0.788	0.899

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.8G WLAN MIMO simultaneous case for held to ear.

Table 13.4.13 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz Ant.1 and 5.3 GHz Ant.2 W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM 850	0.079	0.463	0.326	0.542	0.405	0.868
	GPRS 850	0.095	0.463	0.326	0.558	0.421	0.884
	GSM 1900	0.068	0.463	0.326	0.531	0.394	0.857
	GPRS 1900	0.107	0.463	0.326	0.57	0.433	0.896
	WCDMA 850	0.122	0.463	0.326	0.585	0.448	0.911
	WCDMA 1900	0.142	0.463	0.326	0.605	0.468	0.931
	LTE Band 12	0.086	0.463	0.326	0.549	0.412	0.875
	LTE Band 17	0.084	0.463	0.326	0.547	0.410	0.873
	LTE Band 5	0.145	0.463	0.326	0.608	0.471	0.934
	LTE Band 4	0.270	0.463	0.326	0.733	0.596	**1.059**
	LTE Band 7	0.122	0.463	0.326	0.585	0.448	0.911
	LTE Band 41	0.080	0.463	0.326	0.543	0.406	0.869

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	Left Touch	0.282	0.122	0.274	0.404	0.556	0.678
	Right Touch	0.270	0.463	0.326	0.733	0.596	**1.059**
	Left Tilt	0.116	0.070	0.292	0.186	0.408	0.478
	Right Tilt	0.111	0.159	0.343	0.270	0.454	0.613

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN Ant1 + 5.3G WLAN Ant2 simultaneous case for held to ear.

Table 13.4.14 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz Ant.1 and 5.6 GHz Ant.2 W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM 850	0.079	0.463	0.650	0.542	0.729	1.192
	GPRS 850	0.095	0.463	0.650	0.558	0.745	1.208
	GSM 1900	0.068	0.463	0.650	0.531	0.718	1.181
	GPRS 1900	0.107	0.463	0.650	0.570	0.757	1.220
	WCDMA 850	0.122	0.463	0.650	0.585	0.772	1.235
	WCDMA 1900	0.142	0.463	0.650	0.605	0.792	1.255
	LTE Band 12	0.086	0.463	0.650	0.549	0.736	1.199
	LTE Band 17	0.084	0.463	0.650	0.547	0.734	1.197
	LTE Band 5	0.145	0.463	0.650	0.608	0.795	1.258
	LTE Band 4	0.270	0.463	0.650	0.733	0.920	**1.383**
	LTE Band 7	0.122	0.463	0.650	0.585	0.772	1.235
	LTE Band 41	0.080	0.463	0.650	0.543	0.730	1.193

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	Left Touch	0.282	0.122	0.778	0.404	1.060	1.182
	Right Touch	0.270	0.463	0.650	0.733	0.920	**1.383**
	Left Tilt	0.116	0.070	0.860	0.186	0.976	1.046
	Right Tilt	0.111	0.159	0.707	0.270	0.818	0.977

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN Ant1 + 5.6G WLAN Ant2 simultaneous case for held to ear.

Table 13.4.14 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz Ant.1 and 5.8 GHz Ant.2 W-LAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM 850	0.079	0.463	0.817	0.542	0.896	1.359
	GPRS 850	0.095	0.463	0.817	0.558	0.912	1.375
	GSM 1900	0.068	0.463	0.817	0.531	0.885	1.348
	GPRS 1900	0.107	0.463	0.817	0.570	0.924	1.387
	WCDMA 850	0.122	0.463	0.817	0.585	0.939	1.402
	WCDMA 1900	0.142	0.463	0.817	0.605	0.959	1.422
	LTE Band 12	0.086	0.463	0.817	0.549	0.903	1.366
	LTE Band 17	0.084	0.463	0.817	0.547	0.901	1.364
	LTE Band 5	0.145	0.463	0.817	0.608	0.962	1.425
	LTE Band 4	0.270	0.463	0.817	0.733	1.087	**1.550**
	LTE Band 7	0.122	0.463	0.817	0.585	0.939	1.402
	LTE Band 41	0.080	0.463	0.817	0.543	0.897	1.360

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	Left Touch	0.282	0.122	0.607	0.404	0.889	1.011
	Right Touch	0.270	0.463	0.817	0.733	1.087	**1.550**
	Left Tilt	0.116	0.070	0.657	0.186	0.773	0.843
	Right Tilt	0.111	0.159	0.534	0.270	0.645	0.804

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN Ant1 + 5.8G WLAN Ant2 simultaneous case for held to ear.

Table 13.4.15 Simultaneous Transmission Scenario for 2.4 GHz Ant.1 and 5 GHz Ant.2 W-LAN (Held to Ear)

Simul Tx	Configuration	2.4G W-LAN Ant.1 SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	Left Touch	0.122	0.274	0.396
	Right Touch	0.463	0.326	**0.789**
	Left Tilt	0.070	0.292	0.362
	Right Tilt	0.159	0.343	0.502

Simul Tx	Configuration	2.4G W-LAN Ant.1 SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	Left Touch	0.122	0.778	0.900
	Right Touch	0.463	0.650	**1.113**
	Left Tilt	0.070	0.860	0.930
	Right Tilt	0.159	0.707	0.866

Simul Tx	Configuration	2.4G W-LAN Ant.1 SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	Left Touch	0.122	0.607	0.729
	Right Touch	0.463	0.817	**1.280**
	Left Tilt	0.070	0.657	0.727
	Right Tilt	0.159	0.534	0.693

Note : The above simultaneous result is the worst case result for 2.4G WLAN Ant1 + 5G WLAN Ant2 simultaneous case for held to ear.

Table 13.4.16 Simultaneous Transmission Scenario for2G/3G/4G with Bluetooth (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.094	0.747	0.841
	GPRS 850	0.142	0.747	0.889
	GSM 1900	0.130	0.747	0.877
	GPRS 1900	0.172	0.747	0.919
	WCDMA 850	0.160	0.747	0.907
	WCDMA 1900	0.169	0.747	0.916
	LTE Band 12	0.113	0.747	0.860
	LTE Band 17	0.124	0.747	0.871
	LTE Band 5	0.196	0.747	0.943
	LTE Band 4	0.282	0.747	**1.029**
	LTE Band 7	0.122	0.747	0.869
	LTE Band 41	0.080	0.747	0.827

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	Bluetooth SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Head SAR	**Left Touch**	**0.282**	**0.747**	**1.029**
	Right Touch	0.270	0.747	1.017
	Left Tilt	0.116	0.747	0.863
	Right Tilt	0.111	0.747	0.858

Note : The above simultaneous result is the worst case result for 2G/3G/4G + Bluetooth simultaneous case for held to ear.

13.5 Body-Worn Simultaneous Transmission Analysis

Table 13.5.1 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.1. SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	GSM 850	0.478	0.122	0.600
	GPRS 850	0.568	0.122	0.690
	GSM 1900	0.446	0.111	0.557
	GPRS 1900	0.399	0.122	0.521
	WCDMA 850	0.723	0.122	0.845
	WCDMA 1900	0.611	0.122	0.733
	LTE Band 12	0.497	0.122	0.619
	LTE Band 17	0.536	0.122	0.658
	LTE Band 5	0.507	0.122	0.629
	LTE Band 4	0.955	0.111	1.066
	LTE Band 7	0.950	0.122	**1.072**
	LTE Band 41	0.279	0.122	0.401

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	2.4G W-LAN Ant.1. SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.753	0.111	0.864
	Rear	0.950	0.122	**1.072**

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN Ant1 simultaneous case for body worn.

Table 13.5.2 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.2. SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	GSM 850	0.478	0.138	0.616
	GPRS 850	0.568	0.138	0.706
	GSM 1900	0.446	0.131	0.577
	GPRS 1900	0.399	0.138	0.537
	WCDMA 850	0.723	0.138	0.861
	WCDMA 1900	0.611	0.138	0.749
	LTE Band 12	0.497	0.138	0.635
	LTE Band 17	0.536	0.138	0.674
	LTE Band 5	0.507	0.138	0.645
	LTE Band 4	0.955	0.131	1.086
	LTE Band 7	0.950	0.138	**1.088**
	LTE Band 41	0.279	0.138	0.417

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	2.4G W-LAN Ant.2. SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.753	0.131	0.884
	Rear	0.950	0.138	**1.088**

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN Ant2 simultaneous case for body worn.

Table 13.5.3 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	GSM 850	0.478	0.105	0.583
	GPRS 850	0.568	0.105	0.673
	GSM 1900	0.446	0.089	0.535
	GPRS 1900	0.399	0.105	0.504
	WCDMA 850	0.723	0.105	0.828
	WCDMA 1900	0.611	0.105	0.716
	LTE Band 12	0.497	0.105	0.602
	LTE Band 17	0.536	0.105	0.641
	LTE Band 5	0.507	0.105	0.612
	LTE Band 4	0.955	0.089	1.044
	LTE Band 7	0.950	0.105	**1.055**
	LTE Band 41	0.279	0.105	0.384

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	2.4G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.753	0.089	0.842
	Rear	0.950	0.105	**1.055**

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN MIMO simultaneous case for body worn.

Table 13.5.4 Simultaneous Transmission Scenario for 2G/3G/4G with 5.3 GHz W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.3G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	GSM 850	0.478	0.484	0.962
	GPRS 850	0.568	0.484	1.052
	GSM 1900	0.415	0.484	0.899
	GPRS 1900	0.399	0.484	0.883
	WCDMA 850	0.723	0.484	1.207
	WCDMA 1900	0.611	0.484	1.095
	LTE Band 12	0.497	0.484	0.981
	LTE Band 17	0.536	0.484	1.020
	LTE Band 5	0.507	0.484	0.991
	LTE Band 4	0.838	0.484	1.322
	LTE Band 7	0.950	0.484	**1.434**
	LTE Band 41	0.279	0.484	0.763

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.3G W-LAN Ant.1. SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.753	0.063	0.816
	Rear	0.950	0.484	**1.434**

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.3G WLAN Ant1 simultaneous case for body worn.

Table 13.5.5 Simultaneous Transmission Scenario for 2G/3G/4G with 5.3 GHz W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	GSM 850	0.478	0.445	0.923
	GPRS 850	0.568	0.445	1.013
	GSM 1900	0.415	0.445	0.860
	GPRS 1900	0.399	0.445	0.844
	WCDMA 850	0.723	0.445	1.168
	WCDMA 1900	0.611	0.445	1.056
	LTE Band 12	0.497	0.445	0.942
	LTE Band 17	0.536	0.445	0.981
	LTE Band 5	0.507	0.445	0.952
	LTE Band 4	0.838	0.445	1.283
	LTE Band 7	0.950	0.445	**1.395**
	LTE Band 41	0.279	0.445	0.724

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.3G W-LAN Ant.2. SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.753	0.039	0.792
	Rear	0.950	0.445	**1.39**5

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.3G WLAN Ant2 simultaneous case for body worn.

Table 13.5.6 Simultaneous Transmission Scenario for 2G/3G/4G with 5.3 GHz W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.3G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	GSM 850	0.478	0.372	0.850
	GPRS 850	0.568	0.372	0.940
	GSM 1900	0.415	0.372	0.787
	GPRS 1900	0.399	0.372	0.771
	WCDMA 850	0.723	0.372	1.095
	WCDMA 1900	0.611	0.372	0.983
	LTE Band 12	0.497	0.372	0.869
	LTE Band 17	0.536	0.372	0.908
	LTE Band 5	0.507	0.372	0.879
	LTE Band 4	0.838	0.372	1.210
	LTE Band 7	0.950	0.372	**1.322**
	LTE Band 41	0.279	0.372	0.651

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.3G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.753	0.072	0.825
	Rear	0.950	0.372	**1.322**

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.3G WLAN MIMO simultaneous case for body worn.

Table 13.5.7 Simultaneous Transmission Scenario for 2G/3G/4G with 5.6 GHz W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.6G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body-Worn SAR	GSM 850	0.478	0.666	1.144	N/A
	GPRS 850	0.568	0.666	1.234	N/A
	GSM 1900	0.415	0.666	1.081	N/A
	GPRS 1900	0.399	0.666	1.065	N/A
	WCDMA 850	0.723	0.666	1.389	N/A
	WCDMA 1900	0.611	0.666	1.277	N/A
	LTE Band 12	0.497	0.666	1.163	N/A
	LTE Band 17	0.536	0.666	1.202	N/A
	LTE Band 5	0.507	0.666	1.173	N/A
	LTE Band 4	0.838	0.666	1.504	N/A
	LTE Band 7	0.950	0.666	See Additional Note 1	0.01
	LTE Band 41	0.279	0.666	0.945	N/A

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.6G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.753	0.122	0.875
	Rear	0.950	0.666	See Additional Note 1

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.6G WLAN Ant1 simultaneous case for body worn.

Table 13.5.8 Simultaneous Transmission Scenario for 2G/3G/4G with 5.6 GHz W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	GSM 850	0.478	0.473	0.951
	GPRS 850	0.568	0.473	1.041
	GSM 1900	0.415	0.473	0.888
	GPRS 1900	0.399	0.473	0.872
	WCDMA 850	0.723	0.473	1.196
	WCDMA 1900	0.611	0.473	1.084
	LTE Band 12	0.497	0.473	0.970
	LTE Band 17	0.536	0.473	1.009
	LTE Band 5	0.507	0.473	0.980
	LTE Band 4	0.838	0.473	1.311
	LTE Band 7	0.950	0.473	**1.423**
	LTE Band 41	0.279	0.473	0.752

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.753	0.112	0.865
	Rear	0.950	0.473	**1.423**

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.6G WLAN Ant2 simultaneous case for body worn.

Table 13.5.9 Simultaneous Transmission Scenario for 2G/3G/4G with 5.6 GHz W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.6G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body-Worn SAR	GSM 850	0.478	0.687	1.165	N/A
	GPRS 850	0.568	0.687	1.255	N/A
	GSM 1900	0.415	0.687	1.102	N/A
	GPRS 1900	0.399	0.687	1.086	N/A
	WCDMA 850	0.723	0.687	1.410	N/A
	WCDMA 1900	0.611	0.687	1.298	N/A
	LTE Band 12	0.497	0.687	1.184	N/A
	LTE Band 17	0.536	0.687	1.223	N/A
	LTE Band 5	0.507	0.687	1.194	N/A
	LTE Band 4	0.838	0.687	1.525	N/A
	LTE Band 7	0.950	0.687	See Additional Note 1	0.02
	LTE Band 41	0.279	0.687	0.966	N/A

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.6G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.753	0.099	0.852
	Rear	0.950	0.687	See Additional Note 1

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.6G WLAN MIMO simultaneous case for body worn.

Table 13.5.10 Simultaneous Transmission Scenario for 2G/3G/4G with 5.8 GHz W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.8G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	GSM 850	0.478	0.436	0.914
	GPRS 850	0.568	0.436	1.004
	GSM 1900	0.415	0.436	0.851
	GPRS 1900	0.399	0.436	0.835
	WCDMA 850	0.723	0.436	1.159
	WCDMA 1900	0.611	0.436	1.047
	LTE Band 12	0.497	0.436	0.933
	LTE Band 17	0.536	0.436	0.972
	LTE Band 5	0.507	0.436	0.943
	LTE Band 4	0.838	0.436	1.274
	LTE Band 7	0.950	0.436	**1.386**
	LTE Band 41	0.279	0.436	0.715

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.8G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.753	0.074	0.827
	Rear	0.950	0.436	**1.386**

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.8G WLAN Ant1 simultaneous case for body worn.

Table 13.5.11 Simultaneous Transmission Scenario for 2G/3G/4G with 5.8 GHz W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)	SPLSR
		1	2	1+2	1+2
Body-Worn SAR	GSM 850	0.478	0.731	1.209	N/A
	GPRS 850	0.568	0.731	1.299	N/A
	GSM 1900	0.415	0.731	1.146	N/A
	GPRS 1900	0.399	0.731	1.130	N/A
	WCDMA 850	0.723	0.731	1.454	N/A
	WCDMA 1900	0.611	0.731	1.342	N/A
	LTE Band 12	0.497	0.731	1.228	N/A
	LTE Band 17	0.536	0.731	1.267	N/A
	LTE Band 5	0.507	0.731	1.238	N/A
	LTE Band 4	0.838	0.731	**1.569**	N/A
	LTE Band 7	0.950	0.731	See Additional Note 1	0.02
	LTE Band 41	0.279	0.731	1.010	N/A

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.753	0.148	0.901
	Rear	0.950	0.731	See Additional Note 1

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.8G WLAN Ant2 simultaneous case for body worn.

Table 13.5.12 Simultaneous Transmission Scenario for 2G/3G/4G with 5.8 GHz W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.8G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	GSM 850	0.478	0.617	1.095
	GPRS 850	0.568	0.617	1.185
	GSM 1900	0.415	0.617	1.032
	GPRS 1900	0.399	0.617	1.016
	WCDMA 850	0.723	0.617	1.340
	WCDMA 1900	0.611	0.617	1.228
	LTE Band 12	0.497	0.617	1.114
	LTE Band 17	0.536	0.617	1.153
	LTE Band 5	0.507	0.617	1.124
	LTE Band 4	0.838	0.617	1.455
	LTE Band 7	0.950	0.617	**1.567**
	LTE Band 41	0.279	0.617	0.896

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.8G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.753	0.091	0.844
	Rear	0.950	0.617	**1.567**

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.8G WLAN MIMO simultaneous case for body worn.

Table 13.5.13 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz Ant.1 and 5.3 GHz Ant.2 W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn SAR	GSM 850	0.478	0.122	0.445	0.600	0.923	1.045
	GPRS 850	0.568	0.122	0.445	0.690	1.013	1.135
	GSM 1900	0.415	0.122	0.445	0.537	0.86	0.982
	GPRS 1900	0.399	0.122	0.445	0.521	0.844	0.966
	WCDMA 850	0.723	0.122	0.445	0.845	1.168	1.290
	WCDMA 1900	0.611	0.122	0.445	0.733	1.056	1.178
	LTE Band 12	0.497	0.122	0.445	0.619	0.942	1.064
	LTE Band 17	0.536	0.122	0.445	0.658	0.981	1.103
	LTE Band 5	0.507	0.122	0.445	0.629	0.952	1.074
	LTE Band 4	0.838	0.122	0.445	0.960	1.283	1.405
	LTE Band 7	0.950	0.122	0.445	1.072	1.397	**1.517**
	LTE Band 41	0.279	0.122	0.445	0.401	0.724	0.846

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	3	1+2+3
Body-Worn SAR	Front	0.753	0.111	0.039	0.903
	Rear	0.950	0.122	0.445	**1.517**

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN Ant1 + 5.3G WLAN Ant2 simultaneous case for body worn.

Table 13.5.14 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz Ant.1 and 5.6 GHz Ant.2 W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn SAR	GSM 850	0.478	0.122	0.473	0.600	0.951	1.073
	GPRS 850	0.568	0.122	0.473	0.69	1.041	1.163
	GSM 1900	0.415	0.122	0.473	0.537	0.888	1.010
	GPRS 1900	0.399	0.122	0.473	0.521	0.872	0.994
	WCDMA 850	0.723	0.122	0.473	0.845	1.196	1.318
	WCDMA 1900	0.611	0.122	0.473	0.733	1.084	1.206
	LTE Band 12	0.497	0.122	0.473	0.619	0.970	1.092
	LTE Band 17	0.536	0.122	0.473	0.658	1.009	1.131
	LTE Band 5	0.507	0.122	0.473	0.629	0.980	1.102
	LTE Band 4	0.838	0.122	0.473	0.960	1.311	1.433
	LTE Band 7	0.950	0.122	0.473	1.074	1.423	**1.545**
	LTE Band 41	0.279	0.122	0.473	0.401	0.752	0.874

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	3	1+2+3
Body-Worn SAR	Front	0.753	0.111	0.112	0.976
	Rear	0.950	0.122	0.473	**1.545**

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN Ant1 + 5.6G WLAN Ant2 simultaneous case for body worn.

Table 13.5.15 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz Ant.1 and 5.8 GHz Ant.2 W-LAN (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)			SPLSR		
		1	2	3	1+2	1+3	1+2+3	1+2	1+3	2+3
Body-Worn SAR	GSM 850	0.478	0.122	0.731	0.600	1.209	1.331	N/A	N/A	N/A
	GPRS 850	0.568	0.122	0.731	0.690	1.299	1.421	N/A	N/A	N/A
	GSM 1900	0.415	0.122	0.731	0.537	1.146	1.268	N/A	N/A	N/A
	GPRS 1900	0.399	0.122	0.731	0.521	1.130	1.252	N/A	N/A	N/A
	WCDMA 850	0.723	0.122	0.731	0.845	1.454	**1.576**	N/A	N/A	N/A
	WCDMA 1900	0.611	0.122	0.731	0.733	1.342	1.464	N/A	N/A	N/A
	LTE Band 12	0.497	0.122	0.731	0.619	1.228	1.350	N/A	N/A	N/A
	LTE Band 17	0.536	0.122	0.731	0.658	1.267	1.389	N/A	N/A	N/A
	LTE Band 5	0.507	0.122	0.731	0.629	1.238	1.360	N/A	N/A	N/A
	LTE Band 4	0.838	0.122	0.731	See Additional Note 1	See Additional Note 1	See Additional Note 1	0.01	0.02	0.03
	LTE Band 7	0.950	0.122	0.731	See Additional Note 1	See Additional Note 1	See Additional Note 1	0.01	0.02	0.03
	LTE Band 41	0.279	0.122	0.731	0.401	1.01	1.132	N/A	N/A	N/A

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	3	1+2+3
Body-Worn SAR	Front	0.955	0.111	0.148	1.214
	Rear	0.838	0.122	0.731	See Additional Note 1

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	3	1+2+3
Body-Worn SAR	Front	0.753	0.111	0.148	1.012
	Rear	0.950	0.122	0.731	See Additional Note 1

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN Ant1 + 5.8G WLAN Ant2 simultaneous case for body worn.

Table 13.5.16 Simultaneous Transmission Scenario for 2.4 GHz Ant.1 and 5 GHz Ant.2 W-LAN (Body-Worn at 10 mm)

Simul Tx	Configuration	2.4G W-LAN Ant.1 SAR (W/kg)	5.3G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.111	0.039	0.150
	Rear	0.122	0.445	**0.567**

Simul Tx	Configuration	2.4G W-LAN Ant.1 SAR (W/kg)	5.6G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.111	0.112	0.223
	Rear	0.122	0.473	**0.595**

Simul Tx	Configuration	2.4G W-LAN Ant.1 SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	Front	0.111	0.148	0.259
	Rear	0.122	0.731	**0.853**

Note : The above simultaneous result is the worst case result for 2.4G WLAN Ant1 + 5G WLAN Ant2 simultaneous case for body worn.

Table 13.5.17 Simultaneous Transmission Scenario for 2G/3G/4G with Bluetooth (Body-Worn at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	GSM 850	0.478	0.373	0.851
	GPRS 850	0.568	0.373	0.941
	GSM 1900	0.446	0.373	0.819
	GPRS 1900	0.406	0.373	0.779
	WCDMA 850	0.723	0.373	1.096
	WCDMA 1900	0.611	0.373	0.984
	LTE Band 12	0.497	0.373	0.870
	LTE Band 17	0.536	0.373	0.909
	LTE Band 5	0.507	0.373	0.880
	LTE Band 4	0.955	0.373	**1.328**
	LTE Band 7	0.950	0.373	1.323
	LTE Band 41	0.279	0.373	0.652

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	Bluetooth SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	**Front**	0.955	0.373	**1.328**
	Rear	0.838	0.373	1.211

Note : The above simultaneous result is the worst case result for 2G/3G/4G + Bluetooth simultaneous case for body worn.

Additional Note(s):

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 D01v05. See Section 13.8 for detailed SPLS ratio analysis.
2. Bluetooth SAR was not required to be measured per FCC KDB 447498 D01v06. Estimated SAR results were used in the above table to determine simultaneous transmission SAR test exclusion.

13.6 Hotspot SAR Simultaneous Transmission Analysis

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

Table 13.6.1 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz W-LAN (Hotspot at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.568	0.122	0.690
	GPRS 1900	0.652	-	0.652
	WCDMA 850	0.723	0.122	0.845
	WCDMA 1900	1.072	-	1.072
	LTE Band 12	0.497	0.122	0.619
	LTE Band 17	0.536	0.122	0.658
	LTE Band 5	0.507	0.122	0.629
	LTE Band 4	0.955	0.111	1.066
	LTE Band 7	1.090	-	**1.090**
	LTE Band 41	0.279	0.122	0.401

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	Top	-	0.037	0.037
	Bottom	1.090	-	**1.090**
	Front	0.753	0.111	0.864
	Rear	0.950	0.122	1.072
	Right	-	-	-
	Left	0.153	0.034	0.187

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN Ant1 simultaneous case for Hotspot.

Table 13.6.1 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz W-LAN (Hotspot at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.568	0.138	0.706
	GPRS 1900	0.652	-	0.652
	WCDMA 850	0.723	0.138	0.861
	WCDMA 1900	1.072	-	1.072
	LTE Band 12	0.497	0.138	0.635
	LTE Band 17	0.536	0.138	0.674
	LTE Band 5	0.507	0.138	0.645
	LTE Band 4	0.955	0.131	1.086
	LTE Band 7	1.090	-	**1.090**
	LTE Band 41	0.279	0.138	0.417

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	2.4G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	Top	-	0.170	0.170
	Bottom	1.090	-	**1.090**
	Front	0.753	0.131	0.884
	Rear	0.950	0.138	1.088
	Right	-	-	-
	Left	0.153	0.012	0.165

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN Ant2 simultaneous case for Hotspot.

Table 13.6.3 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz W-LAN (Hotspot at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.568	0.105	0.673
	GPRS 1900	0.652	-	0.652
	WCDMA 850	0.723	0.105	0.828
	WCDMA 1900	1.072	-	1.072
	LTE Band 12	0.497	0.105	0.602
	LTE Band 17	0.536	0.105	0.641
	LTE Band 5	0.507	0.105	0.612
	LTE Band 4	0.955	0.089	1.044
	LTE Band 7	1.090	-	**1.090**
	LTE Band 41	0.279	0.105	0.384

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	2.4G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	Top	-	0.144	0.144
	Bottom	1.090	-	**1.090**
	Front	0.753	0.089	0.842
	Rear	0.950	0.105	1.055
	Right	-	-	-
	Left	0.153	0.095	0.248

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN MIMO simultaneous case for Hotspot.

Table 13.6.4 Simultaneous Transmission Scenario for 2G/3G/4G with 5.2 GHz W-LAN (Hotspot at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.2G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.568	0.446	1.014
	GPRS 1900	0.399	0.446	0.845
	WCDMA 850	0.723	0.446	1.169
	WCDMA 1900	1.072	-	1.072
	LTE Band 12	0.497	0.446	0.943
	LTE Band 17	0.536	0.446	0.982
	LTE Band 5	0.507	0.446	0.953
	LTE Band 4	0.838	0.446	1.284
	LTE Band 7	0.950	0.446	**1.396**
	LTE Band 41	0.279	0.446	0.725

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.2G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	Top	-	0.152	0.152
	Bottom	1.090	-	1.090
	Front	0.753	0.058	0.811
	Rear	0.950	0.446	**1.396**
	Right	-	-	-
	Left	0.153	0.123	0.276

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.2G WLAN Ant1 simultaneous case for Hotspot.

Table 13.6.5 Simultaneous Transmission Scenario for 2G/3G/4G with 5.2 GHz W-LAN (Hotspot at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.2G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.568	0.412	0.980
	GPRS 1900	0.399	0.412	0.811
	WCDMA 850	0.723	0.412	1.135
	WCDMA 1900	1.072	-	1.072
	LTE Band 12	0.497	0.412	0.909
	LTE Band 17	0.536	0.412	0.948
	LTE Band 5	0.507	0.412	0.919
	LTE Band 4	0.838	0.412	1.250
	LTE Band 7	0.950	0.412	**1.362**
	LTE Band 41	0.279	0.412	0.691

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.2G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	Top	-	0.125	0.125
	Bottom	1.090	-	1.090
	Front	0.753	0.036	0.789
	Rear	0.950	0.412	**1.362**
	Right	-	-	-
	Left	0.153	0.176	0.329

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.2G WLAN Ant2 simultaneous case for Hotspot.

Table 13.6.6 Simultaneous Transmission Scenario for 2G/3G/4G with 5.2 GHz W-LAN (Hotspot at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.2G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.568	0.340	0.908
	GPRS 1900	0.399	0.340	0.739
	WCDMA 850	0.723	0.340	1.063
	WCDMA 1900	1.072	-	1.072
	LTE Band 12	0.497	0.340	0.837
	LTE Band 17	0.536	0.340	0.876
	LTE Band 5	0.507	0.340	0.847
	LTE Band 4	0.838	0.340	1.178
	LTE Band 7	0.950	0.340	**1.290**
	LTE Band 41	0.279	0.340	0.619

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.2G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	Top	-	0.113	0.113
	Bottom	1.090	-	1.090
	Front	0.753	0.065	0.818
	Rear	0.950	0.340	**1.290**
	Right	-	-	-
	Left	0.153	0.075	0.228

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.2G WLAN MIMO simultaneous case for Hotspot.

Table 13.6.7 Simultaneous Transmission Scenario for 2G/3G/4G with 5.8 GHz W-LAN (Hotspot at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.8G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.568	0.436	1.004
	GPRS 1900	0.399	0.436	0.835
	WCDMA 850	0.723	0.436	1.159
	WCDMA 1900	1.072	-	1.072
	LTE Band 12	0.497	0.436	0.933
	LTE Band 17	0.536	0.436	0.972
	LTE Band 5	0.507	0.436	0.943
	LTE Band 4	0.838	0.436	1.274
	LTE Band 7	0.950	0.436	**1.386**
	LTE Band 41	0.279	0.436	0.715

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.8G W-LAN Ant.1 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	Top	-	0.116	0.116
	Bottom	1.090	-	1.090
	Front	0.753	0.074	0.827
	Rear	0.950	0.436	**1.386**
	Right	-	-	-
	Left	0.153	0.088	0.241

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.8G WLAN Ant1 simultaneous case for Hotspot.

Table 13.6.8 Simultaneous Transmission Scenario for 2G/3G/4G with 5.8 GHz W-LAN (Hotspot at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)	SPLSR
		1	2	1+2	1+2
Hotspot SAR	GPRS 850	0.568	0.731	1.299	N/A
	GPRS 1900	0.399	0.731	1.130	N/A
	WCDMA 850	0.723	0.731	1.454	N/A
	WCDMA 1900	0.611	0.731	1.342	N/A
	LTE Band 12	0.497	0.731	1.228	N/A
	LTE Band 17	0.536	0.731	1.267	N/A
	LTE Band 5	0.507	0.731	1.238	N/A
	LTE Band 4	0.838	0.731	**1.569**	N/A
	LTE Band 7	0.950	0.731	See Additional Note 1	0.02
	LTE Band 41	0.279	0.731	1.010	N/A

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	Top	-	0.381	0.381
	Bottom	1.090	-	1.090
	Front	0.753	0.148	0.901
	Rear	0.950	0.731	See Additional Note 1
	Right	-	-	-
	Left	0.153	0.752	0.905

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.8G WLAN Ant2 simultaneous case for Hotspot.

Table 13.6.9 Simultaneous Transmission Scenario for 2G/3G/4G with 5.8 GHz W-LAN (Hotspot at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5.8G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.568	0.617	1.185
	GPRS 1900	0.399	0.617	1.016
	WCDMA 850	0.723	0.617	1.340
	WCDMA 1900	0.611	0.617	1.228
	LTE Band 12	0.497	0.617	1.114
	LTE Band 17	0.536	0.617	1.153
	LTE Band 5	0.507	0.617	1.124
	LTE Band 4	0.838	0.617	1.455
	LTE Band 7	0.950	0.617	**1.567**
	LTE Band 41	0.279	0.617	0.896

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	5.8G W-LAN MIMO SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	Top	-	0.121	0.121
	Bottom	1.090	-	1.090
	Front	0.753	0.091	0.844
	Rear	0.950	0.617	**1.567**
	Right	-	-	-
	Left	0.153	0.171	0.324

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 5.8G WLAN MIMO simultaneous case for Hotspot.

Table 13.6.10 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz Ant.1 and 5.2 GHz Ant.2 W-LAN (Hotspot at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	0.568	0.122	0.412	0.690	0.980	1.102
	GPRS 1900	0.399	0.122	0.412	0.521	0.811	0.933
	WCDMA 850	0.723	0.122	0.412	0.845	1.135	1.257
	WCDMA 1900	0.611	0.122	0.412	0.733	1.023	1.145
	LTE Band 12	0.497	0.122	0.412	0.619	0.909	1.031
	LTE Band 17	0.536	0.122	0.412	0.658	0.948	1.070
	LTE Band 5	0.507	0.122	0.412	0.629	0.919	1.041
	LTE Band 4	0.838	0.122	0.412	0.960	1.250	1.372
	LTE Band 7	0.950	0.122	0.412	1.074	1.362	**1.484**
	LTE Band 41	0.279	0.122	0.412	0.401	0.691	0.813

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.2G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Top	-	0.037	0.125	0.162
	Bottom	1.090	-	-	1.090
	Front	0.753	0.111	0.036	0.900
	Rear	0.950	0.122	0.412	**1.484**
	Right	-	-	-	-
	Left	0.153	0.034	0.176	0.363

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN Ant1 + 5.2G WLAN Ant2 simultaneous case for Hotspot.

Table 13.6.11 Simultaneous Transmission Scenario for 2G/3G/4G with 2.4 GHz Ant.1 and 5.8 GHz Ant.2 W-LAN (Hotspot at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)			SPLSR		
		1	2	3	1+2	1+3	1+2+3	1+2	1+3	2+3
Hotspot SAR	GPRS 850	0.568	0.122	0.731	0.69	1.299	1.421	N/A	N/A	N/A
	GPRS 1900	0.399	0.122	0.731	0.521	1.130	1.252	N/A	N/A	N/A
	WCDMA 850	0.723	0.122	0.731	0.845	1.454	**1.576**	N/A	N/A	N/A
	WCDMA 1900	0.611	0.122	0.731	0.733	1.342	1.464	N/A	N/A	N/A
	LTE Band 12	0.497	0.122	0.731	0.619	1.228	1.350	N/A	N/A	N/A
	LTE Band 17	0.536	0.122	0.731	0.658	1.267	1.389	N/A	N/A	N/A
	LTE Band 5	0.507	0.122	0.731	0.629	1.238	1.360	N/A	N/A	N/A
	LTE Band 4	0.838	0.122	0.731	See Additional Note 1	See Additional Note 1	See Additional Note 1	0.01	0.02	0.03
	LTE Band 7	0.950	0.122	0.731	See Additional Note 1	See Additional Note 1	See Additional Note 1	0.01	0.02	0.03
	LTE Band 41	0.279	0.122	0.731	0.401	1.01	1.132	N/A	N/A	N/A

Simul Tx	Configuration	LTE Band 4 SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Top	-	0.037	0.381	0.418
	Bottom	0.895	-	-	0.895
	Front	0.955	0.111	0.148	1.214
	Rear	0.838	0.122	0.731	See Additional Note 1
	Right	-	-	-	-
	Left	0.479	0.034	0.752	1.265

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	2.4G W-LAN Ant.1 SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	Top	-	0.037	0.381	0.418
	Bottom	1.090	-	-	1.090
	Front	0.753	0.111	0.148	1.012
	Rear	0.950	0.122	0.731	See Additional Note 1
	Right	-	-	-	-
	Left	0.153	0.034	0.752	0.939

Note : The above simultaneous result is the worst case result for 2G/3G/4G + 2.4G WLAN Ant1 + 5.8G WLAN Ant2 simultaneous case for Hotspot.

Additional Note(s):

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 D01v05. See Section 13.8 for detailed SPLS ratio analysis.

Table 13.6.12 Simultaneous Transmission Scenario for 2.4 GHz Ant.1 and 5 GHz Ant.2 W-LAN (Hotspot at 10 mm)

Simul Tx	Configuration	2.4G W-LAN Ant.1 SAR (W/kg)	5.2G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	Top	0.037	0.125	0.162
	Bottom	-	-	-
	Front	0.111	0.036	0.147
	Rear	0.122	0.412	**0.534**
	Right	-	-	-
	Left	0.034	0.176	0.210

Simul Tx	Configuration	2.4G W-LAN Ant.1 SAR (W/kg)	5.8G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	Top	0.037	0.381	0.418
	Bottom	-	-	-
	Front	0.111	0.148	0.259
	Rear	0.122	0.731	**0.853**
	Right	-	-	-
	Left	0.034	0.752	0.786

Note : The above simultaneous result is the worst case result for 2.4 G WLAN Ant1 + 5 G WLAN Ant2 simultaneous case for Hotspot.

Table 13.5.13 Simultaneous Transmission Scenario for 2G/3G/4G with Bluetooth (Hotspot at 10 mm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	ΣSAR (W/kg)
		1	2	1+2
Body-Worn SAR	GSM 1900	0.568	0.373	0.941
	GPRS 1900	0.652	0.373	1.025
	WCDMA 850	0.723	0.373	1.096
	WCDMA 1900	1.072	0.373	1.445
	LTE Band 12	0.497	0.373	0.870
	LTE Band 17	0.536	0.373	0.909
	LTE Band 5	0.507	0.373	0.880
	LTE Band 4	0.955	0.373	1.328
	LTE Band 7	1.090	0.373	**1.463**
	LTE Band 41	0.279	0.373	0.652

Simul Tx	Configuration	LTE Band 7 SAR (W/kg)	Bluetooth SAR (W/kg	ΣSAR (W/kg)
		1	2	1+2
Hotspot SAR	Top	-	0.373	0.373
	Bottom	1.090	0.373	**1.463**
	Front	0.753	0.373	1.126
	Rear	0.950	0.373	1.323
	Right	-	0.373	0.373
	Left	0.153	0.373	0.526

Note : The above simultaneous result is the worst case result for 2G/3G/4G + Bluetooth simultaneous case for Hotspot.

13.7 Phablet SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 648474 D04 Handset SAR, Phablet SAR tests were not required of Hotspot 1g SAR scaled to maximum output power, including tolerance) < 1.2 W/kg. Therefore no further analysis was required to for Phablet Simultaneous Transmission Analysis.

13.8 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 antennas is ≤ 0.04 for 1g, simultaneous SAR evaluation is not required. The distance between the transmitters was calculated using the following formula.

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

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

13.8.1 Body-Worn SPLSR Evaluation and Analysis

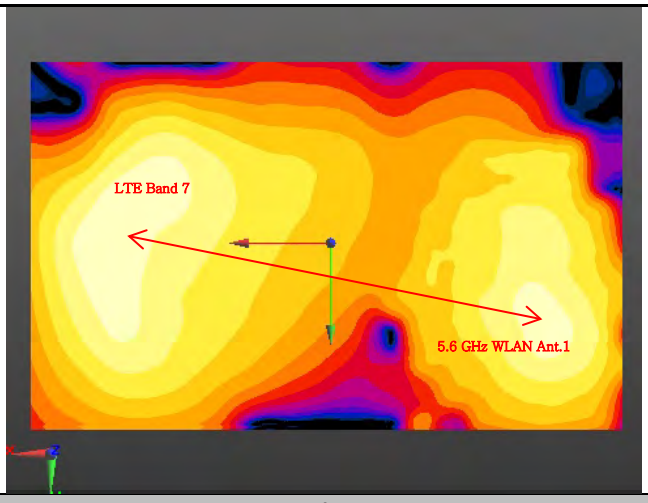
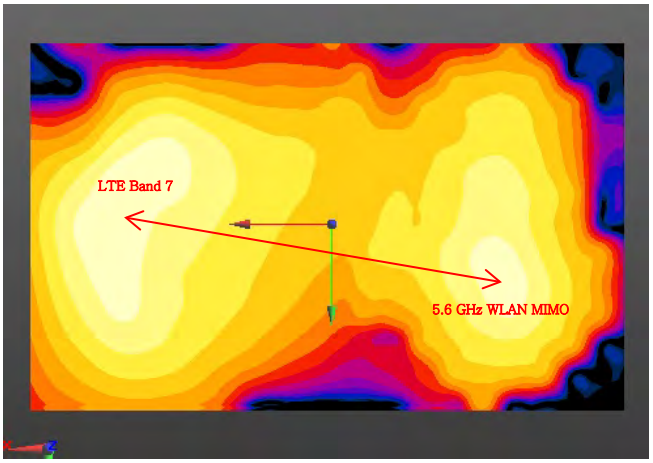
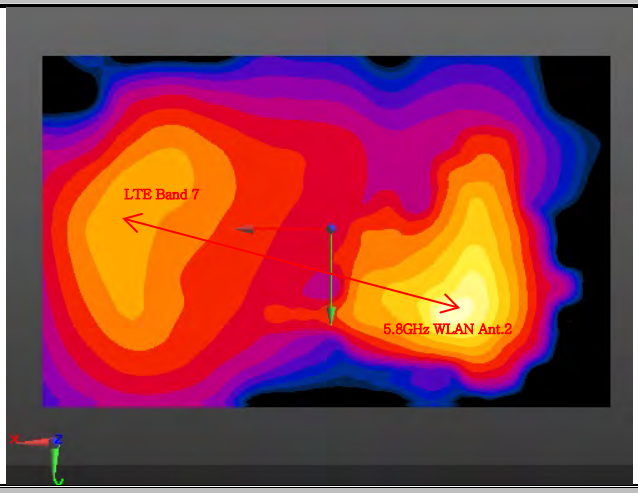
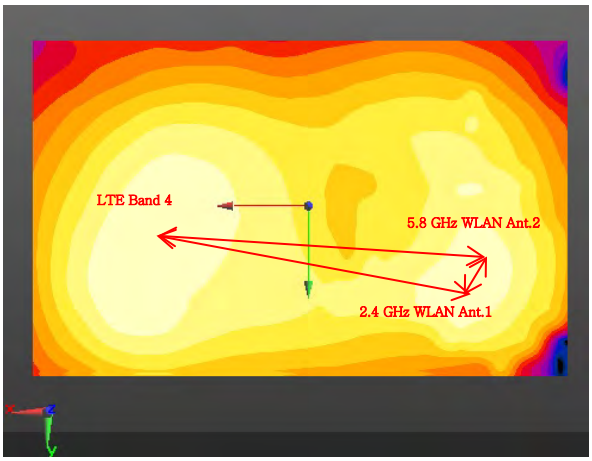
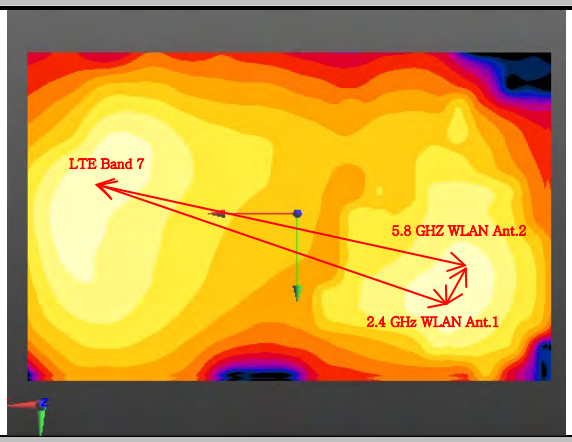
Table 13.7.1 Peak SAR Locations for Body-Worn

Mode/Band	X (cm)	Y (cm)	Reported SAR(W/kg)
LTE Band 4	7.18	2.70	0.838
LTE Band 7	7.34	-0.41	0.950
2.4 GHz WLAN Ant.1	-6.38	0.10	0.122
5.6 GHz WLAN Ant.1	-7.18	2.88	0.666
5.6 GHz WLAN MIMO	-5.80	2.06	0.687
5.8 GHz WLAN Ant.2	-5.56	2.98	0.731

Table 13.7.2 Body-Worn SAR to Peak Location Separation Ratio Calculations

Antenna Pair		Standalone 1g 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}	$(a+b)^{1.5}/ D_{a-b}$	
LTE Band 7	5.6 GHz WLAN Ant.1	0.950	0.666	1.616	148.9	**0.01**	1
LTE Band 7	5.6 GHz WLAN MIMO	0.950	0.687	1.637	133.7	**0.02**	2
LTE Band 7	5.8 GHz WLAN Ant.2	0.950	0.731	1.681	133.4	**0.02**	3
LTE Band 4	2.4 GHz WLAN Ant.1	0.838	0.122	0.960	138.1	0.01	4
LTE Band 4	5.8 GHz WLAN Ant.2	0.838	0.731	1.569	127.4	0.02	
2.4 GHz WLAN Ant.1	5.8 GHz WLAN Ant.2	0.122	0.731	0.853	29.9	**0.03**	
LTE Band 7	2.4 GHz WLAN Ant.1	0.950	0.122	1.072	137.3	0.01	5
LTE Band 7	5.8 GHz WLAN Ant.2	0.950	0.731	1.681	133.4	0.02	
2.4 GHz WLAN Ant.1	5.8 GHz WLAN Ant.2	0.122	0.731	0.853	29.9	**0.03**	

Table 13.7.3 Body-Worn SAR to Peak Location Separation Ratio Plot

	
1	2
	
3	4
	N/A
5	N/A

13.8.2 Hotspot SPLSR Evaluation and Analysis

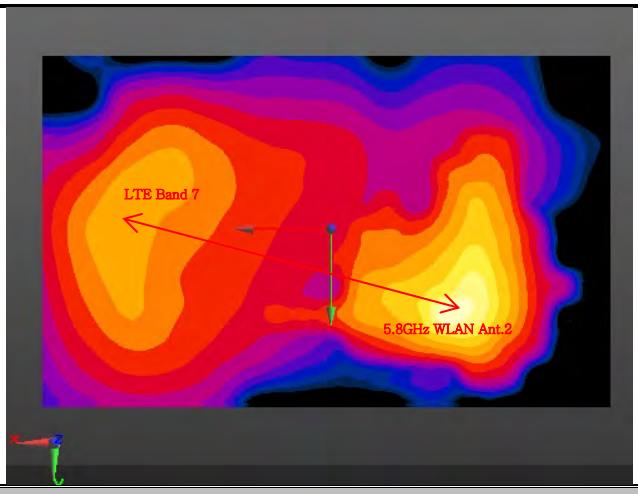
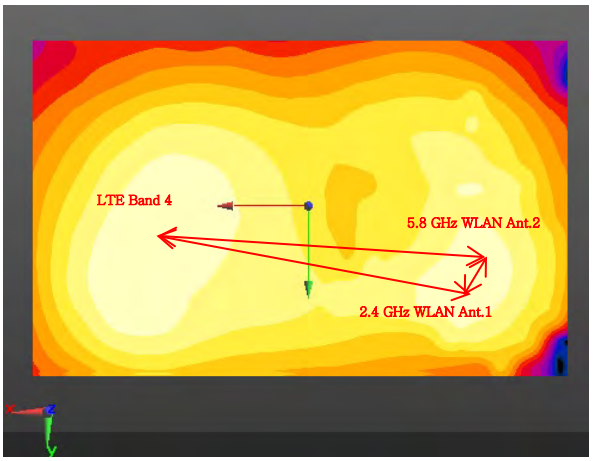
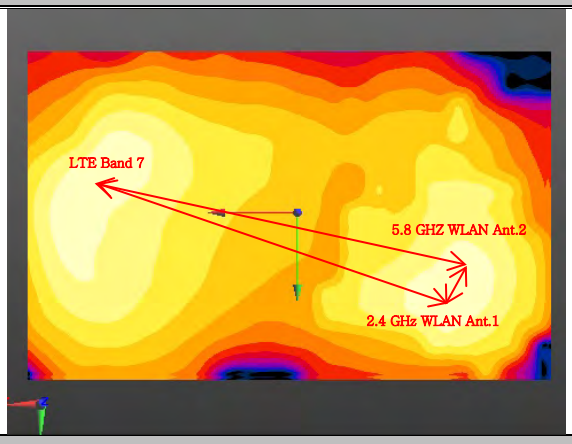
Table 13.7.1 Peak SAR Locations for Body-Worn

Mode/Band	X (cm)	Y (cm)	Reported SAR(W/kg)
LTE Band 4	7.18	2.70	0.838
LTE Band 7	7.34	-0.41	0.950
2.4 GHz WLAN Ant.1	-6.38	0.10	0.122
5.8 GHz WLAN Ant.2	-5.56	2.98	0.731

Table 13.7.2 Hotspot SAR to Peak Location Separation Ratio Calculations

Antenna Pair		Standalone 1g 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}	$(a+b)^{1.5}/ D_{a-b}$	
LTE Band 7	5.8 GHz WLAN Ant.2	0.950	0.731	1.681	133.4	**0.02**	1
LTE Band 4	2.4 GHz WLAN Ant.1	0.838	0.122	0.960	138.1	0.01	2
LTE Band 4	5.8 GHz WLAN Ant.2	0.838	0.731	1.569	127.4	0.02	
2.4 GHz WLAN Ant.1	5.8 GHz WLAN Ant.2	0.122	0.731	0.853	29.9	**0.03**	
LTE Band 7	2.4 GHz WLAN Ant.1	0.950	0.122	1.072	137.3	0.01	3
LTE Band 7	5.8 GHz WLAN Ant.2	0.950	0.731	1.681	133.4	0.02	
2.4 GHz WLAN Ant.1	5.8 GHz WLAN Ant.2	0.122	0.731	0.853	29.9	**0.03**	

Table 13.7.3 Body-Worn SAR to Peak Location Separation Ratio Plot

	
1	2
	N/A
3	N/A

13.9 Simultaneous Transmission Conclusion

The above numerical summed SAR results and SPLAR 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.

14. SAR MEASUREMENT VARIABILITY

14.1 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 1-g SAR limit).
3. A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.
4. Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

Table 14.1 Head SAR Measurement Variability Results

Frequency		Mode	Service	# of Time Slots	Spacing [Side]	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)	
2437	6	802.11b (Ant.2)	DSSS	-	Right Touch	0.889	0.838	1.06	-	-	-	-
2437	6	802.11b (MIMO)	DSSS	-	Right Touch	0.856	0.852	1.00	-	-	-	-
5280	56	802.11a (Ant.1)	OFDM	-	Right Tilt	0.904	0.901	1.00	-	-	-	-
5580	116	802.11a (MIMO)	OFDM	-	Right Tilt	0.810	0.800	1.01	-	-	-	-
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure							**Head 1.6 W/kg (mW/g) averaged over 1 gram**					

Table 14.2 Body-Worn SAR Measurement Variability Results

Frequency		Mode	Service	# of Time Slots	Spacing [Side]	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)	
1732.5	20175	LTE B4	-	-	10 mm [Front]	0.940	0.902	1.04	-	-	-	-
2510.0	20850	LTE B7	-	-	10 mm [Rear]	0.950	0.948	1.00	-	-	-	-
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure							**Body 1.6 W/kg (mW/g) averaged over 1 gram**					

Table 14.3 Hotspot SAR Measurement Variability Results

Frequency		Mode	Service	# of Time Slots	Spacing [Side]	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)	
1852.4	9262	WCDMA 1900	RMC	-	10 mm [Bottom]	1.050	1.000	1.05	-	-	-	-
1732.5	20175	LTE B4	-	-	10 mm [Front]	0.940	0.902	1.04	-	-	-	-
2510.0	20850	LTE B7	-	-	10 mm [Bottom]	1.090	1.090	1.00				
2510.0	20850	LTE B7	-	-	10 mm [Rear]	0.950	0.948	1.00	-	-	-	-
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure							**Body 1.6 W/kg (mW/g) **averaged over 1 gram					

15. IEEE Std 1528 –MEASUREMENT UNCERTAINTIES

750 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.0	Normal	1	1	± 6.0 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 4.2	Normal	1	0.64	± 4.2 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 4.1	Normal	1	0.6	± 4.1 %	∞
Temp. unc. - Conductivity	± 1.9	Rectangular	√3	0.78	± 1.1 %	∞
Temp. unc. - Permittivity	± 2.0	Rectangular	√3	0.23	± 1.2 %	∞
Combined Standard Uncertainty					**± 12 %**	330
Expanded Uncertainty (k=2)					**± 24 %**	

The above measurement uncertainties are according to IEEE Std 1528

750 MHz Body

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.0	Normal	1	1	± 6.0 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 4.3	Normal	1	0.64	± 4.3 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 4.0	Normal	1	0.6	± 4.0 %	∞
Temp. unc. - Conductivity	± 1.9	Rectangular	√3	0.78	± 1.1 %	∞
Temp. unc. - Permittivity	± 1.9	Rectangular	√3	0.23	± 1.1 %	∞
Combined Standard Uncertainty					**± 12 %**	330
Expanded Uncertainty (k=2)					**± 24 %**	

The above measurement uncertainties are according to IEEE Std 1528

835 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.0	Normal	1	1	± 6.0 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 3.8	Normal	1	0.64	± 3.8 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 4.0	Normal	1	0.6	± 4.0 %	∞
Temp. unc. - Conductivity	± 1.8	Rectangular	√3	0.78	± 1.0 %	∞
Temp. unc. - Permittivity	± 1.9	Rectangular	√3	0.23	± 1.1 %	∞
Combined Standard Uncertainty					**± 12 %**	330
Expanded Uncertainty (k=2)					**± 24 %**	

The above measurement uncertainties are according to IEEE Std 1528

835 MHz Body

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.0	Normal	1	1	± 6.0 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 4.1	Normal	1	0.64	± 4.1 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 4.0	Normal	1	0.6	± 4.0 %	∞
Temp. unc. - Conductivity	± 1.7	Rectangular	√3	0.78	± 1.0 %	∞
Temp. unc. - Permittivity	± 1.9	Rectangular	√3	0.23	± 1.1 %	∞
Combined Standard Uncertainty					**± 12 %**	330
Expanded Uncertainty (k=2)					**± 24 %**	

The above measurement uncertainties are according to IEEE Std 1528

1800 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.0	Normal	1	1	± 6.0 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 4.1	Normal	1	0.64	± 4.1 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 3.8	Normal	1	0.6	± 3.8 %	∞
Temp. unc. - Conductivity	± 1.9	Rectangular	√3	0.78	± 1.1 %	∞
Temp. unc. - Permittivity	± 1.9	Rectangular	√3	0.23	± 1.1 %	∞
Combined Standard Uncertainty					**± 12 %**	330
Expanded Uncertainty (k=2)					**± 24 %**	

The above measurement uncertainties are according to IEEE Std 1528

1800 MHz Body

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.0	Normal	1	1	± 6.0 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 4.2	Normal	1	0.64	± 4.2 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 4.0	Normal	1	0.6	± 4.0 %	∞
Temp. unc. - Conductivity	± 1.9	Rectangular	√3	0.78	± 1.1 %	∞
Temp. unc. - Permittivity	± 1.9	Rectangular	√3	0.23	± 1.1 %	∞
Combined Standard Uncertainty					**± 12 %**	330
Expanded Uncertainty (k=2)					**± 24 %**	

The above measurement uncertainties are according to IEEE Std 1528

1900 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.0	Normal	1	1	± 6.0 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 3.7	Normal	1	0.64	± 3.7 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 4.3	Normal	1	0.6	± 4.3 %	∞
Temp. unc. - Conductivity	± 1.7	Rectangular	√3	0.78	± 1.0 %	∞
Temp. unc. - Permittivity	± 1.9	Rectangular	√3	0.23	± 1.1 %	∞
Combined Standard Uncertainty					**± 12 %**	330
Expanded Uncertainty (k=2)					**± 24 %**	

The above measurement uncertainties are according to IEEE Std 1528

1900 MHz Body

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.0	Normal	1	1	± 6.0 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 4.1	Normal	1	0.64	± 4.1 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 3.9	Normal	1	0.6	± 3.9 %	∞
Temp. unc. - Conductivity	± 1.9	Rectangular	√3	0.78	± 1.1 %	∞
Temp. unc. - Permittivity	± 1.8	Rectangular	√3	0.23	± 1.0 %	∞
Combined Standard Uncertainty					**± 12 %**	330
Expanded Uncertainty (k=2)					**± 24 %**	

The above measurement uncertainties are according to IEEE Std 1528

2450 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.0	Normal	1	1	± 6.0 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 3.8	Normal	1	0.64	± 3.8 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 4.0	Normal	1	0.6	± 4.0 %	∞
Temp. unc. - Conductivity	± 1.8	Rectangular	√3	0.78	± 1.0 %	∞
Temp. unc. - Permittivity	± 1.9	Rectangular	√3	0.23	± 1.1 %	∞
Combined Standard Uncertainty					**± 12 %**	330
Expanded Uncertainty (k=2)					**± 24 %**	

The above measurement uncertainties are according to IEEE Std 1528

2450 MHz Body

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.0	Normal	1	1	± 6.0 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 4.1	Normal	1	0.64	± 4.1 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 4.2	Normal	1	0.6	± 4.2 %	∞
Temp. unc. - Conductivity	± 1.8	Rectangular	√3	0.78	± 1.0 %	∞
Temp. unc. - Permittivity	± 1.8	Rectangular	√3	0.23	± 1.0 %	∞
Combined Standard Uncertainty					**± 12 %**	330
Expanded Uncertainty (k=2)					**± 24 %**	

The above measurement uncertainties are according to IEEE Std 1528

2600 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.0	Normal	1	1	± 6.0 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 4.1	Normal	1	0.64	± 4.1 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 4.3	Normal	1	0.6	± 4.3 %	∞
Temp. unc. - Conductivity	± 1.9	Rectangular	√3	0.78	± 1.1 %	∞
Temp. unc. - Permittivity	± 1.8	Rectangular	√3	0.23	± 1.0 %	∞
Combined Standard Uncertainty					**± 12 %**	330
Expanded Uncertainty (k=2)					**± 24 %**	

The above measurement uncertainties are according to IEEE Std 1528

2600 MHz Body

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.0	Normal	1	1	± 6.0 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 3.7	Normal	1	0.64	± 3.7 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 3.9	Normal	1	0.6	± 3.9 %	∞
Temp. unc. - Conductivity	± 1.8	Rectangular	√3	0.78	± 1.0 %	∞
Temp. unc. - Permittivity	± 2.0	Rectangular	√3	0.23	± 1.2 %	∞
Combined Standard Uncertainty					**± 12 %**	330
Expanded Uncertainty (k=2)					**± 24 %**	

The above measurement uncertainties are according to IEEE Std 1528

5200 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.55	Normal	1	1	± 6.6 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 4.0	Normal	1	0.64	± 4.0 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 3.9	Normal	1	0.6	± 3.9 %	∞
Temp. unc. - Conductivity	± 1.8	Rectangular	√3	0.78	± 1.0 %	∞
Temp. unc. - Permittivity	± 1.8	Rectangular	√3	0.23	± 1.0 %	∞
Combined Standard Uncertainty					**± 13 %**	330
Expanded Uncertainty (k=2)					**± 26 %**	

The above measurement uncertainties are according to IEEE Std 1528

5200 MHz Body

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.55	Normal	1	1	± 6.6 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 4.1	Normal	1	0.64	± 4.1 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 4.0	Normal	1	0.6	± 4.0 %	∞
Temp. unc. - Conductivity	± 1.9	Rectangular	√3	0.78	± 1.1 %	∞
Temp. unc. - Permittivity	± 1.7	Rectangular	√3	0.23	± 1.0 %	∞
Combined Standard Uncertainty					**± 13 %**	330
Expanded Uncertainty (k=2)					**± 26 %**	

The above measurement uncertainties are according to IEEE Std 1528

5300 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.55	Normal	1	1	± 6.6 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 4.0	Normal	1	0.64	± 4.0 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 3.9	Normal	1	0.6	± 3.9 %	∞
Temp. unc. - Conductivity	± 1.8	Rectangular	√3	0.78	± 1.0 %	∞
Temp. unc. - Permittivity	± 1.9	Rectangular	√3	0.23	± 1.1 %	∞
Combined Standard Uncertainty					**± 13 %**	330
Expanded Uncertainty (k=2)					**± 26 %**	

The above measurement uncertainties are according to IEEE Std 1528

5300 MHz Body

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.55	Normal	1	1	± 6.6 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
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Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
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Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 3.8	Normal	1	0.64	± 3.8 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 4.0	Normal	1	0.6	± 4.0 %	∞
Temp. unc. - Conductivity	± 1.8	Rectangular	√3	0.78	± 1.0 %	∞
Temp. unc. - Permittivity	± 1.9	Rectangular	√3	0.23	± 1.1 %	∞
Combined Standard Uncertainty					**± 13 %**	330
Expanded Uncertainty (k=2)					**± 26 %**	

The above measurement uncertainties are according to IEEE Std 1528

5500 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.55	Normal	1	1	± 6.6 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
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Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
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Liquid conductivity (Meas.)	± 3.9	Normal	1	0.64	± 3.9 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 3.8	Normal	1	0.6	± 3.8 %	∞
Temp. unc. - Conductivity	± 1.7	Rectangular	√3	0.78	± 1.0 %	∞
Temp. unc. - Permittivity	± 1.8	Rectangular	√3	0.23	± 1.0 %	∞
Combined Standard Uncertainty					**± 13 %**	330
Expanded Uncertainty (k=2)					**± 26 %**	

The above measurement uncertainties are according to IEEE Std 1528

5500 MHz Body

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.55	Normal	1	1	± 6.6 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
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Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 3.7	Normal	1	0.64	± 3.7 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 3.9	Normal	1	0.6	± 3.9 %	∞
Temp. unc. - Conductivity	± 1.8	Rectangular	√3	0.78	± 1.0 %	∞
Temp. unc. - Permittivity	± 1.8	Rectangular	√3	0.23	± 1.0 %	∞
Combined Standard Uncertainty					**± 13 %**	330
Expanded Uncertainty (k=2)					**± 26 %**	

The above measurement uncertainties are according to IEEE Std 1528

5600 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.55	Normal	1	1	± 6.6 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 4.0	Normal	1	0.64	± 4.0 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 3.8	Normal	1	0.6	± 3.8 %	∞
Temp. unc. - Conductivity	± 1.9	Rectangular	√3	0.78	± 1.1 %	∞
Temp. unc. - Permittivity	± 1.8	Rectangular	√3	0.23	± 1.0 %	∞
Combined Standard Uncertainty					**± 13 %**	330
Expanded Uncertainty (k=2)					**± 26 %**	

The above measurement uncertainties are according to IEEE Std 1528

5600 MHz Body

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.55	Normal	1	1	± 6.6 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 3.8	Normal	1	0.64	± 3.8 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 4.0	Normal	1	0.6	± 4.0 %	∞
Temp. unc. - Conductivity	± 1.9	Rectangular	√3	0.78	± 1.1 %	∞
Temp. unc. - Permittivity	± 2.0	Rectangular	√3	0.23	± 1.2 %	∞
Combined Standard Uncertainty					**± 13 %**	330
Expanded Uncertainty (k=2)					**± 26 %**	

The above measurement uncertainties are according to IEEE Std 1528

5800 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.55	Normal	1	1	± 6.6 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 4.0	Normal	1	0.64	± 4.0 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 3.9	Normal	1	0.6	± 3.9 %	∞
Temp. unc. - Conductivity	± 1.7	Rectangular	√3	0.78	± 1.0 %	∞
Temp. unc. - Permittivity	± 1.8	Rectangular	√3	0.23	± 1.0 %	∞
Combined Standard Uncertainty					**± 13 %**	330
Expanded Uncertainty (k=2)					**± 26 %**	

The above measurement uncertainties are according to IEEE Std 1528

5800 MHz Body

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	Standard (1g)	vi 2 or Veff
Measurement System						
Probe calibration	± 6.55	Normal	1	1	± 6.6 %	∞
Axial isotropy	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 9.6	Rectangular	√3	1	± 5.5 %	∞
Boundary Effects	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Probe Linearity	± 4.7	Rectangular	√3	1	± 2.7 %	∞
Probe modulation response	± 2.4	Rectangular	√3	1	± 1.4 %	∞
Detection limits	± 0.25	Rectangular	√3	1	± 0.14 %	∞
Readout Electronics	± 1.0	Normal	1	1	± 1.0 %	∞
Response time	± 0.8	Rectangular	√3	1	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.23 %	∞
Probe Positioning	± 2.9	Rectangular	√3	1	± 1.7 %	∞
Algorithms for Max. SAR Eval.	± 1.0	Rectangular	√3	1	± 0.58 %	∞
Test Sample Related						
Device Positioning	± 2.9	Normal	1	1	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	± 2.9 %	∞
SAR Scaling	± 2.0	Rectangular	√3	1	± 1.2 %	∞
Physical Parameters						
Phantom Shell	± 4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	± 2.9 %	∞
Liquid conductivity (Meas.)	± 3.8	Normal	1	0.64	± 3.8 %	∞
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.6	± 2.9 %	∞
Liquid permittivity (Meas.)	± 4.1	Normal	1	0.6	± 4.1 %	∞
Temp. unc. - Conductivity	± 1.9	Rectangular	√3	0.78	± 1.1 %	∞
Temp. unc. - Permittivity	± 1.9	Rectangular	√3	0.23	± 1.1 %	∞
Combined Standard Uncertainty					**± 13 %**	330
Expanded Uncertainty (k=2)					**± 26 %**	

The above measurement uncertainties are according to IEEE Std 1528

16. CONCLUSION

Measurement Conclusion

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the FCC. These measurements are taken to simulate the RF effects exposure under the worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The tested device complies with the requirements in respect to all parameters subject to the test. The test results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are every 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 impossible biological effect 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 innumerable factors may interact to determine the specific biological outcome of an exposure to electromagnetic fields, any protection guide shall consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables.

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