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# SAR TEST REPORT

<b>Applicant Name:</b> <b>SAMSUNG Electronics Co., Ltd.</b> 129, Samsung-ro, Yeongtong-gu, Suwon-Si, Gyeonggi-do, 16677 Rep. of Korea	<b>Date of Issue: Mar. 30, 2021</b> <b>Test Report No.: HCT-SR-2103-FC002</b> <b>Test Site: HCT CO., LTD.</b>
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**FCC ID:**

**A3LNP345XLA**

<b>Equipment Type:</b>	<b>Notebook Computer</b>
<b>Application Type</b>	<b>Certification</b>
<b>FCC Rule Part(s):</b>	<b>CFR §2.1093</b>
<b>Model Name:</b>	<b>NP345XLA</b>
<b>Date of Test:</b>	<b>Mar. 02. 2021 ~ Mar. 11. 2021</b>

This device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in FCC KDB procedures and had been tested in accordance with the measurement procedures specified in FCC KDB procedures.

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

Tested By

Reviewed By

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**REVISION HISTORY**

The revision history for this test report is shown in table.

<b>Revision No.</b>	<b>Date of Issue</b>	<b>Description</b>
0	Mar. 30, 2021	Initial Release

This test results were applied only to the test methods required by the standard.

The above Test Report is not related to the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA.

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### **Appendix**

Appendix A. DUT Ant. Information & Test SETUP PHOTO

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## 1. Test Regulations

The tests documented in this report were performed in accordance with FCC CFR § 2.1093, IEEE 1528-2013, ANSI C63.26-2015 the following FCC Published RF exposure KDB procedures:

- FCC KDB Publication 941225 D01 3G SAR Procedures v03r01
- FCC KDB Publication 941225 D05 SAR for LTE Devices v02r05
- FCC KDB Publication 941225 D05A LTE Rel.10 KDB Inquiry sheet v01r02
- FCC KDB Publication 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB Publication 447498 D01 General SAR Guidance v06
- FCC KDB Publication 616217 D04 SAR for Laptop and Tablets v01r02
- FCC KDB Publication 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- FCC KDB Publication 865664 D02 SAR Reporting v01r02
- FCC KDB Publication 616217 D04 v01r02 (Proximity Sensor)
- FCC KDB Publication 690783 D01 SAR Listings on Grants v01r03
- FCC KDB Publication 971168 D01 Power Meas License Digital Systems v03r01

In Addition to the above, the following information was used.

- October 2014 TCB Workshop Notes (Overlapping LTE Bands)
- April 2015 TCB Workshop Notes (Simultaneous transmission summation clarified)
- October 2016 TCB Workshop Notes (Bluetooth Duty Factor)
- November 2017 TCBC Workshop Notes (LTE Carrier Aggregation)
- April 2018 TCBC Workshop Notes (LTE DL CA SAR Test Exclusion)
- Oct 2016 TCB Workshop Notes (Device Holder Perturbations)

## 2. Test Location

### 2.1 Test Laboratory

<b>Company Name</b>	HCT Co., Ltd.
<b>Address</b>	74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA
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<b>Fax.</b>	031-645-6401

### 2.2 Test Facilities

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

<b>Korea</b>	National Radio Research Agency (Designation No. KR0032)
	KOLAS (Testing No. KT197)

## 3. Information of the EUT

### 3.1 General Information of the EUT

<b>Model Name</b>	NP345XLA
<b>Equipment Type</b>	Notebook Computer
<b>FCC ID</b>	A3LNP345XLA
<b>Application Type</b>	Certification
<b>Applicant</b>	SAMSUNG Electronics Co., Ltd.

### 3.2 Atestation of test result of device under test

Band	Tx. Frequency	Equipment Class	SAR (W/kg)
			Reported 1g Body SAR
UMTS 850	826.4 MHz ~ 846.6 MHz	PCB	0.94
UMTS 1700	1 712.4 MHz ~ 1 752.6 MHz	PCB	<b>1.37</b>
UMTS 1900	1 852.4 MHz ~ 1 907.6 MHz	PCB	1.21
LTE Band 2 (PCS)	1 850.7 MHz ~ 1 909.3 MHz	PCB	1.24
LTE Band 4 (AWS)	1 710.7 MHz ~ 1 754.3 MHz	PCB	N/A
LTE Band 5 (Cell)	824.7 MHz ~ 848.3 MHz	PCB	N/A
LTE Band 12	699.7 MHz ~ 715.3 MHz	PCB	0.91
LTE Band 13	779.5 MHz ~ 784.5 MHz	PCB	0.76
LTE Band 17	706.5 MHz ~ 713.5 MHz	PCB	N/A
LTE Band 26 (Cell)	814.7 MHz ~ 848.3 MHz	PCB	0.65
LTE Band 41	2 498.5 MHz ~ 2 687.5 MHz	PCB	0.92
LTE Band 66 (AWS)	1 710.7 MHz ~ 1 779.3 MHz	PCB	1.34
802.11b	2 412 MHz ~ 2 472 MHz	DTS	<b>0.37</b>
U-NII-1	5 180 MHz ~ 5 240 MHz	NII	N/A
U-NII-2A	5 260 MHz ~ 5 320 MHz	NII	0.42
U-NII-2C	5 500 MHz ~ 5 720 MHz	NII	<b>0.55</b>
U-NII-3	5 745 MHz ~ 5 825 MHz	NII	0.54
Bluetooth	2 402 MHz ~ 2 480 MHz	DSS	<b>0.26</b>
<b>Simultaneous SAR per KDB 690783 D01v01r03</b>			<b>1.598</b>
Date(s) of Tests:	<b>Mar. 02, 2021 ~ Mar. 11, 2021</b>		

## 4. Device Under Test Description

### 4.1 DUT specification

Device Wireless specification overview		
Band & Mode	Operating Mode	Tx Frequency
UMTS 850	Data	826.4 MHz ~ 846.6 MHz
UMTS 1700	Data	1 712.4 MHz ~ 1 752.6 MHz
UMTS 1900	Data	1 852.4 MHz ~ 1 907.6 MHz
LTE Band 2 (PCS)	Data	1 850.7 MHz ~ 1 909.3 MHz
LTE Band 4 (AWS)	Data	1 710.7 MHz ~ 1 754.3 MHz
LTE Band 5 (Cell)	Data	824.7 MHz ~ 848.3 MHz
LTE Band 12	Data	699.7 MHz ~ 715.3 MHz
LTE Band 13	Data	779.5 MHz ~ 784.5 MHz
LTE Band 17	Data	706.5 MHz ~ 713.5 MHz
LTE Band 26 (Cell)	Data	814.7 MHz ~ 848.3 MHz
LTE TDD Band 41	Data	2 498.5 MHz ~ 2 687.5 MHz
LTE Band 66 (AWS)	Data	1 710.7 MHz ~ 1 779.3 MHz
U-NII-1	Data	5 180 MHz ~ 5 240 MHz
U-NII-2A	Data	5 260 MHz ~ 5 320 MHz
U-NII-2C	Data	5 500 MHz ~ 5 720 MHz
U-NII-3	Data	5 745 MHz ~ 5 825 MHz
2.4 GHz WLAN	Data	2 412 MHz ~ 2 472 MHz
Bluetooth / LE 5.1	Data	2 402 MHz ~ 2 480 MHz

Device Description		
	Mode	Serial Number
Device Serial Numbers	UMTS 850/ UMTS 1700/ UMTS 1900 LTE B2/B4/B5/B12/B13/B17/B26/B41/B66	FCMR01R1400359
		FCMR01R1400369
		FCMR01R1400338
	2.4 GHz WLAN	FCMR01R1400343
	5 GHz WLAN / Bluetooth	FCMR01R1400361
The manufacturer has confirmed that the devices tested have the same physical, mechanical and thermal characteristics are within operational tolerances expected for production units.		

### 4.2 Power Reduction for SAR

This device utilizes a power reduction mechanism for some wireless modes and bands for SAR compliance under some conditions when the device is being used in close proximity to the user's Body. FCC KDB Publication 616217 D04v01r02 Sec.6 was used as a guideline for selection SAR test distances for device

The reduced powers for the power reduction mechanisms were conformed via conducted power measurements at the RF Port .

### 4.3 Nominal and Maximum Output Power Specifications

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

#### 4.3.1 Maximum PCE Output Power

Mode / Band		Modulated Average (dBm)			
		3GPP UMTS	3GPP HSDPA	3GPP HSUPA	DC-HSDPA
UMTS Band 5 (850 MHz)	Maximum	24.5	23.5	23.5	23.5
	Nominal	23.5	22.5	22.5	22.5
UMTS Band 4 (1700 MHz)	Maximum	23.5	22.5	22.5	22.5
	Nominal	22.5	21.5	21.5	21.5
UMTS Band 2 (1900 MHz)	Maximum	23.5	22.5	22.5	22.5
	Nominal	22.5	21.5	21.5	21.5

Mode / Band		Modulated Average (dBm)	
		Max	
LTE Band 2 (PCS)	Maximum	23.5	
	Nominal	22.5	
LTE Band 4 (AWS)	Maximum	23.5	
	Nominal	22.5	
LTE Band 5 (Cell)	Maximum	24.5	
	Nominal	23.5	
LTE Band 12	Maximum	24.5	
	Nominal	23.5	
LTE Band 13	Maximum	24.5	
	Nominal	23.5	
LTE Band 17	Maximum	24.5	
	Nominal	23.5	
LTE Band 26 (Cell)	Maximum	24.5	
	Nominal	23.5	
LTE TDD Band 41	Maximum	24.5	
	Nominal	23.5	
LTE Band 66 (AWS)	Maximum	23.5	
	Nominal	22.5	



### 4.3.2 Reduced Main Output Power – Proximity Sensor activated

Mode / Band		Modulated Average (dBm)			
		3GPP UMTS	3GPP HSDPA	3GPP HSUPA	DC-HSDPA
UMTS Band 5 (850 MHz)	Maximum	21.0	20.0	20.0	20.0
	Nominal	20.0	19.0	19.0	19.0
UMTS Band 4 (1700 MHz)	Maximum	15.0	14.0	14.0	14.0
	Nominal	14.0	13.0	13.0	13.0
UMTS Band 2 (1900 MHz)	Maximum	15.0	14.0	14.0	14.0
	Nominal	14.0	13.0	13.0	13.0

Mode / Band		Modulated Average (dBm)
		Max
LTE Band 2 (PCS)	Maximum	15.0
	Nominal	14.0
LTE Band 4 (AWS)	Maximum	15.0
	Nominal	14.0
LTE Band 5 (Cell)	Maximum	20.0
	Nominal	19.0
LTE Band 12	Maximum	20.0
	Nominal	19.0
LTE Band 13	Maximum	20.0
	Nominal	19.0
LTE Band 17	Maximum	20.0
	Nominal	19.0
LTE Band 26 (Cell)	Maximum	20.0
	Nominal	19.0
LTE TDD Band 41	Maximum	18.0
	Nominal	17.0
LTE Band 66(AWS)	Maximum	15.0
	Nominal	14.0

**4.3.3 Maximum 2.4 GHz, 5 GHz WIFI output power**

Mode / Band			Modulated Average (dBm)										
			SISO					MIMO					
			11a	11b	11g	11n	11ac	11a	11b	11g	11n	11ac	
2.4 GHz WIFI	2450 MHz	Maximum	N/A	1-5CH : 14 6CH : 15 7-11CH : 16	1CH : 15 2-11CH : 16	1CH : 15 2-11CH : 16	1CH : 15 2-11CH : 16	N/A	1-5CH : 17 6CH : 18 7-11CH : 19	1CH : 18 2-11CH : 19	1CH : 18 2-11CH : 19	1CH : 18 2-11CH : 19	
		Nominal	N/A	1-5CH : 13 6CH : 14 7-11CH : 15	1CH : 14 2-11CH : 15	1CH : 14 2-11CH : 15	1CH : 14 2-11CH : 15	N/A	1-5CH : 16 6CH : 17 7-11CH : 18	1CH : 17 2-11CH : 18	1CH : 17 2-11CH : 18	1CH : 17 2-11CH : 18	
2.4 GHz WIFI (CH12 when airplane mode ON)	2450 MHz	Maximum	N/A	4.0	4.0	4.0	4.0	N/A	7.0	7.0	7.0	7.0	
		Nominal	N/A	3.0	3.0	3.0	3.0	N/A	6.0	6.0	6.0	6.0	
2.4 GHz WIFI (CH13 when airplane mode ON)	2450 MHz	Maximum	N/A	-2.5	-2.5	-2.5	-2.5	N/A	0.5	0.5	0.5	0.5	
		Nominal	N/A	-3.5	-3.5	-3.5	-3.5	N/A	-0.5	-0.5	-0.5	-0.5	
5 GHz WIFI (20 MHz)	5200 MHz (U-NII-1)	Maximum	16.0	N/A	N/A	15.0	14.0	19.0	N/A	N/A	N/A	18.0	17.0
		Nominal	15.0	N/A	N/A	14.0	13.0	18.0	N/A	N/A	N/A	17.0	16.0
	5300 MHz (U-NII-2A)	Maximum	16.0	N/A	N/A	15.0	14.0	19.0	N/A	N/A	N/A	18.0	17.0
		Nominal	15.0	N/A	N/A	14.0	13.0	18.0	N/A	N/A	N/A	17.0	16.0
	5500 MHz (U-NII-2C)	Maximum	16.0 (100ch:14)	N/A	N/A	15.0	14.0	19.0 (100ch:17)	N/A	N/A	N/A	18.0	17.0
		Nominal	15.0 (100ch:13)	N/A	N/A	14.0	13.0	18.0 (100ch:16)	N/A	N/A	N/A	17.0	16.0
	5800 MHz (U-NII-3)	Maximum	16.0	N/A	N/A	15.0	14.0	19.0	N/A	N/A	N/A	18.0	17.0
		Nominal	15.0	N/A	N/A	14.0	13.0	18.0	N/A	N/A	N/A	17.0	16.0
5 GHz WIFI (40 MHz)	5200 MHz (U-NII-1)	Maximum	N/A	N/A	N/A	14.0	13.0	N/A	N/A	N/A	N/A	17.0	16.0
		Nominal	N/A	N/A	N/A	13.0	12.0	N/A	N/A	N/A	N/A	16.0	15.0
	5300 MHz (U-NII-2A)	Maximum	N/A	N/A	N/A	14.0	13.0	N/A	N/A	N/A	N/A	17.0	16.0
		Nominal	N/A	N/A	N/A	13.0	12.0	N/A	N/A	N/A	N/A	16.0	15.0
	5500 MHz (U-NII-2C)	Maximum	N/A	N/A	N/A	14.0	13.0	N/A	N/A	N/A	N/A	17.0	16.0
		Nominal	N/A	N/A	N/A	13.0	12.0	N/A	N/A	N/A	N/A	16.0	15.0
	5800 MHz (U-NII-3)	Maximum	N/A	N/A	N/A	14.0	13.0	N/A	N/A	N/A	N/A	17.0	16.0
		Nominal	N/A	N/A	N/A	13.0	12.0	N/A	N/A	N/A	N/A	16.0	15.0
5 GHz WIFI (80 MHz)	5200 MHz (U-NII-1)	Maximum	N/A	N/A	N/A	N/A	12.0	N/A	N/A	N/A	N/A	N/A	15.0
		Nominal	N/A	N/A	N/A	N/A	11.0	N/A	N/A	N/A	N/A	N/A	14.0
	5300 MHz (U-NII-2A)	Maximum	N/A	N/A	N/A	N/A	12.0	N/A	N/A	N/A	N/A	N/A	15.0
		Nominal	N/A	N/A	N/A	N/A	11.0	N/A	N/A	N/A	N/A	N/A	14.0
	5500 MHz (U-NII-2C)	Maximum	N/A	N/A	N/A	N/A	12.0	N/A	N/A	N/A	N/A	N/A	15.0
		Nominal	N/A	N/A	N/A	N/A	11.0	N/A	N/A	N/A	N/A	N/A	14.0
	5800 MHz (U-NII-3)	Maximum	N/A	N/A	N/A	N/A	12.0	N/A	N/A	N/A	N/A	N/A	15.0
		Nominal	N/A	N/A	N/A	N/A	11.0	N/A	N/A	N/A	N/A	N/A	14.0

**4.3.4 Reduced 2.4 GHz, 5 GHz WIFI output power Proximity Sensor activated (Grip Sensor)**

Mode / Band			Modulated Average (dBm)										
			SISO					MIMO					
			11a	11b	11g	11n	11ac	11a	11b	11g	11n	11ac	
2.4 GHz WIFI	2450 MHz	Maximum	N/A	13.0	13.0	13.0	13.0	13.0	N/A	16.0	16.0	16.0	16.0
		Nominal	N/A	12.0	12.0	12.0	12.0	12.0	N/A	15.0	15.0	15.0	15.0
2.4 GHz WIFI (CH12 when airplane mode ON)	2450 MHz	Maximum	N/A	4.0	4.0	4.0	4.0	4.0	N/A	7.0	7.0	7.0	7.0
		Nominal	N/A	3.0	3.0	3.0	3.0	3.0	N/A	6.0	6.0	6.0	6.0
2.4 GHz WIFI (CH13 when airplane mode ON)	2450 MHz	Maximum	N/A	-2.5	-2.5	-2.5	-2.5	-2.5	N/A	0.5	0.5	0.5	0.5
		Nominal	N/A	-3.5	-3.5	-3.5	-3.5	-3.5	N/A	-0.5	-0.5	-0.5	-0.5
5 GHz WIFI (20 MHz)	5200 MHz (U-NII-1)	Maximum	11.0	N/A	N/A	11.0	11.0	11.0	14.0	N/A	N/A	14.0	14.0
		Nominal	10.0	N/A	N/A	10.0	10.0	10.0	13.0	N/A	N/A	13.0	13.0
	5300 MHz (U-NII-2A)	Maximum	11.0	N/A	N/A	11.0	11.0	11.0	14.0	N/A	N/A	14.0	14.0
		Nominal	10.0	N/A	N/A	10.0	10.0	10.0	13.0	N/A	N/A	13.0	13.0
	5500 MHz (U-NII-2C)	Maximum	11.0	N/A	N/A	11.0	11.0	11.0	14.0	N/A	N/A	14.0	14.0
		Nominal	10.0	N/A	N/A	10.0	10.0	10.0	13.0	N/A	N/A	13.0	13.0
	5800 MHz (U-NII-3)	Maximum	11.0	N/A	N/A	11.0	11.0	11.0	14.0	N/A	N/A	14.0	14.0
		Nominal	10.0	N/A	N/A	10.0	10.0	10.0	13.0	N/A	N/A	13.0	13.0
5 GHz WIFI (40 MHz)	5200 MHz (U-NII-1)	Maximum	N/A	N/A	N/A	11.0	11.0	11.0	N/A	N/A	N/A	14.0	14.0
		Nominal	N/A	N/A	N/A	10.0	10.0	10.0	N/A	N/A	N/A	13.0	13.0
	5300 MHz (U-NII-2A)	Maximum	N/A	N/A	N/A	11.0	11.0	11.0	N/A	N/A	N/A	14.0	14.0
		Nominal	N/A	N/A	N/A	10.0	10.0	10.0	N/A	N/A	N/A	13.0	13.0
	5500 MHz (U-NII-2C)	Maximum	N/A	N/A	N/A	11.0	11.0	11.0	N/A	N/A	N/A	14.0	14.0
		Nominal	N/A	N/A	N/A	10.0	10.0	10.0	N/A	N/A	N/A	13.0	13.0
	5800 MHz (U-NII-3)	Maximum	N/A	N/A	N/A	11.0	11.0	11.0	N/A	N/A	N/A	14.0	14.0
		Nominal	N/A	N/A	N/A	10.0	10.0	10.0	N/A	N/A	N/A	13.0	13.0
5 GHz WIFI (80 MHz)	5200 MHz (U-NII-1)	Maximum	N/A	N/A	N/A	N/A	11.0	11.0	N/A	N/A	N/A	N/A	14.0
		Nominal	N/A	N/A	N/A	N/A	10.0	10.0	N/A	N/A	N/A	N/A	13.0
	5300 MHz (U-NII-2A)	Maximum	N/A	N/A	N/A	N/A	11.0	11.0	N/A	N/A	N/A	N/A	14.0
		Nominal	N/A	N/A	N/A	N/A	10.0	10.0	N/A	N/A	N/A	N/A	13.0
	5500 MHz (U-NII-2C)	Maximum	N/A	N/A	N/A	N/A	11.0	11.0	N/A	N/A	N/A	N/A	14.0
		Nominal	N/A	N/A	N/A	N/A	10.0	10.0	N/A	N/A	N/A	N/A	13.0
	5800 MHz (U-NII-3)	Maximum	N/A	N/A	N/A	N/A	11.0	11.0	N/A	N/A	N/A	N/A	14.0
		Nominal	N/A	N/A	N/A	N/A	10.0	10.0	N/A	N/A	N/A	N/A	13.0

**4.3.5 Maximum Bluetooth Power**

Mode / Band		Modulated Average (dBm)
Bluetooth BR	Maximum	11.5
	Nominal	10.5
Bluetooth EDR	Maximum	9.5
	Nominal	8.5
Bluetooth LE	Maximum	4.0
	Nominal	3.0

### 4.4 LTE Information

Item.	Description	
Frequency Range	LTE Band 2 (PCS)	1 850.7 MHz ~ 1 909.3 MHz
	LTE Band 4 (AWS)	1 710.7 MHz ~ 1 754.3 MHz
	LTE Band 5 (Cell)	824.7 MHz ~ 848.3 MHz
	LTE Band 12	699.7 MHz ~ 715.3 MHz
	LTE Band 13	779.5 MHz ~ 784.5 MHz
	LTE Band 17	706.5 MHz ~ 713.5 MHz
	LTE Band 26 (Cell)	814.7 MHz ~ 848.3 MHz
	LTE TDD Band 41	2 498.5 MHz ~ 2 687.5 MHz
	LTE Band 66 (AWS)	1 710.7 MHz ~ 1 779.3 MHz
Channel Bandwidths	LTE Band 2 (PCS)	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz
	LTE Band 4 (AWS)	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz
	LTE Band 5 (Cell)	1.4 MHz, 3 MHz, 5 MHz, 10 MHz
	LTE Band 12	1.4 MHz, 3 MHz, 5 MHz, 10 MHz
	LTE Band 13	5 MHz, 10 MHz
	LTE Band 17	5 MHz, 10 MHz
	LTE Band 26 (Cell)	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz
	LTE TDD Band 41	5 MHz, 10 MHz, 15 MHz, 20 MHz
	LTE Band 66 (AWS)	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz

Ch. No.& Freq.(MHz)	Low	Mid	High	
LTE Band 2 (PCS)	1.4 MHz	1 850.7 (18607)	1 880.0 (18900)	1 909.3 (19193)
	3 MHz	1 851.5 (18615)	1 880.0 (18900)	1 908.5 (19185)
	5 MHz	1 852.5 (18625)	1 880.0 (18900)	1 907.5 (19175)
	10 MHz	1 855.0 (18650)	1 880.0 (18900)	1 905.0 (19150)
	15 MHz	1 857.5 (18675)	1 880.0 (18900)	1 902.5 (19125)
	20 MHz	1 860.0 (18700)	1 880.0 (18900)	1 900.0 (19100)
LTE Band 4 (AWS)	1.4 MHz	1 710.7 (19957)	1 732.5 (20175)	1 754.3 (20393)
	3 MHz	1 711.5 (19965)	1 732.5 (20175)	1 753.5 (20385)
	5 MHz	1 712.5 (19975)	1 732.5 (20175)	1 752.5 (20375)
	10 MHz	1 715.0 (20000)	1 732.5 (20175)	1 750.0 (20350)
	15 MHz	1 717.5 (20025)	1 732.5 (20175)	1 747.5 (20325)
	20 MHz	1 720.0 (20050)	1 732.5 (20175)	1 745.0 (20300)
LTE Band 5 (Cell)	1.4 MHz	824.7 (20407)	836.5 (20525)	848.3 (20643)
	3 MHz	825.5 (20415)	836.5 (20525)	847.5 (20635)
	5 MHz	826.5 (20425)	836.5 (20525)	846.5 (20625)
	10 MHz	829.0 (20450)	836.5 (20525)	844.0 (20600)
LTE Band 12	1.4 MHz	699.7 (23017)	707.5 (23095)	715.3 (23173)
	3 MHz	700.5 (23025)	707.5 (23095)	714.5 (23165)
	5 MHz	701.5 (23035)	707.5 (23095)	713.5 (23155)
	10 MHz	704.0 (23060)	707.5 (23095)	711.0 (23130)
LTE Band 13	5 MHz	779.5 (23205)	782 (23230)	784.5 (23255)
	10 MHz		782 (23230)	
LTE Band 17	5 MHz	706.5 (23755)	710.0 (23790)	713.5 (23825)
	10 MHz		710.0 (23790)	
LTE Band 26 (Cell)	1.4 MHz	814.7 (26697)	831.5 (26865)	848.3 (27033)
	3 MHz	815.5 (26705)	831.5 (26865)	847.5 (27025)
	5 MHz	816.5 (26715)	831.5 (26865)	846.5 (27015)
	10 MHz	819.0 (26740)	831.5 (26865)	844.0 (26990)
	15 MHz	821.5 (26765)	831.5 (26865)	841.5 (26965)

Ch. No.& Freq.(MHz)	Low		Mid		High	
LTE Band 66 (AWS)	1.4 MHz	1 710.7 (131979)		1 745 (132322)		1 779.3 (132665)
	3 MHz	1 711.5 (131987)		1 745 (132322)		1 778.5 (132657)
	5 MHz	1 712.5 (131997)		1 745 (132322)		1 777.5 (132647)
	10 MHz	1 715.0 (132022)		1 745 (132322)		1 775.0 (132622)
	15 MHz	1 717.5 (132047)		1 745 (132322)		1 772.5 (132597)
	20 MHz	1 720.0 (132072)		1 745 (132322)		1 770.0 (132572)
LTE TDD Band 41	5 MHz	2 506.0(39750)	2 549.5(40185)	2 593.0(40620)	2 636.5(41055)	2 680.0(41490)
	10 MHz	2 506.0(39750)	2 549.5(40185)	2 593.0(40620)	2 636.5(41055)	2 680.0(41490)
	15 MHz	2 506.0(39750)	2 549.5(40185)	2 593.0(40620)	2 636.5(41055)	2 680.0(41490)
	20 MHz	2 506.0(39750)	2 549.5(40185)	2 593.0(40620)	2 636.5(41055)	2 680.0(41490)
UE Category		LTE Rel. 12, DL: Category 11 , UL: Category 5				
Modulations Supported in UL		QPSK, 16QAM, 64QAM				
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3		Yes				
A-MPR disabled for SAR Testing.		Yes				
LTE Carrier Aggregation		Down-Link CA	This device supports DL-link Intra-band and Inter-band Carrier aggregations. The Technical Description includes all the possible carrier aggregation combinations.			
LTE Information		This device does not support full CA features on 3GPP Release 12. The following LTE Release 12 features are not supported. Relay, HetNet, Enhanced MIMO, eICI, WiFi offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA, Up link CA.				

Note:

1. LTE Band 41 test channels in accordance with Oct. 2014 TCB Workshop notes for all channels bandwidths

### 4.5 SAR Summation Scenario

According to FCC KDB 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 EUT are shown below paths and are mode in same rectangle to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.



Simultaneous transmission paths

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

Simultaneous Transmission Scenarios	
Applicable Combination	Body
UMTS + 2.4 GHz Wifi Antenna 1	Yes
UMTS + 2.4 GHz Wifi Antenna 2	Yes
UMTS + 2.4 GHz Wifi MIMO	Yes
LTE + 2.4 GHz Wifi Antenna 1	Yes
LTE + 2.4 GHz Wifi Antenna 2	Yes
LTE + 2.4 GHz Wifi MIMO	Yes
UMTS + 5 GHz WiFi Antenna 1	Yes
UMTS + 5 GHz WiFi Antenna 2	Yes
UMTS + 5 GHz WiFi MIMO	Yes
LTE + 5 GHz WiFi Antenna 1	Yes
LTE + 5 GHz WiFi Antenna 2	Yes
LTE + 5 GHz WiFi MIMO	Yes
UMTS + 2.4 GHz Bluetooth	Yes
LTE + 2.4 GHz Bluetooth	Yes
UMTS + 5 GHz WiFi MIMO + Bluetooth	Yes
LTE + 5 GHz WiFi MIMO + Bluetooth	Yes

1. Bluetooth cannot transmit simultaneously with 2.4 GHz WLAN.
2. 5 GHz WLAN can transmit simultaneously with Bluetooth
3. All Licensed modes cannot transmit simultaneously.

## 4.6 SAR Test Considerations

### 4.6.1 WiFi

Since U-NII-1 and U-NII-2A bands have the same maximum output power and the highest reported SAR for U-NII-2A is less than 1.2 W/kg for 1g SAR and is less than 3.0 W/kg for 10g SAR, SAR is not required for U-NII-1 band according to FCC KDB 248227D01v02r02.

This device supports IEEE 802.11 ac with the following features:

- a) Up to 80 MHz Bandwidth only
- b) No aggregate channel configurations
- c) 2Tx antenna output
- d) 256 QAM is supported
- e) TDWR channels are supported.
- f) Straddle channels are supported.

### 4.6.2 Licensed Transmitter(s)

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

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth; and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02r05.

This device supports LTE Carrier Aggregation (CA) in the downlink Per FCC KDB publication 941225 D05A v01r02, SAR for LTE DL CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

This device supports 64QAM on the uplink for LTE operations conducted powers for 64QAM uplink configurations were measured per sec.5.1 of FCC KDB 941225 D05v02r05. SAR was not required for 64QAM since the highest maximum output power for 64QAM is  $\leq 0.5$ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg, per sec.5.2.4 of FCC KDB 941225 D05v02r05.

This DUT supports LTE capabilities with overlapping transmission frequency ranges. When the supported frequency range of an LTE band falls completely within an LTE band with a larger transmission frequency range, both LTE bands have the same maximum target power. and both LTE bands share the same transmission path and signal characteristics, SAR was only assessed for the band with the larger transmission frequency range  
LTE Band 5 (824.7 MHz ~ 848.3 MHz) is covered by LTE Band 26 (814.7 MHz ~ 848.3 MHz),  
LTE Band 4 (1 710.7 MHz ~ 1 754.3 MHz) is covered by LTE Band 66 (1 710.7 MHz ~ 1 779.3 MHz)  
LTE Band 17 (706.5 MHz ~ 713.5 MHz) is covered by LTE Band 12 (699.7 MHz ~ 715.3 MHz) and each both LTE bands have the same target powers

Per FCC KDB 941225 D01v03r01, 12.2 kbps RMC is the primary mode and HSPA (HSUPA/HSDPA with RMC) is the secondary mode.

Per FCC KDB 941225 D01v03r01, The SAR test exclusion is applied to the secondary mode by the following equation.

$$\text{Adjusted SAR} = \text{Highest Reported SAR} * \frac{\text{Secondary Max tune - up (mW)}}{\text{Primary Max tune - up(mW)}} \leq 1.2 \text{ W/kg.}$$

Based on the highest Reported SAR, the secondary mode is not required.

Per FCC KDB 690783 1 D01 SAR Listings on Grants v01r03 and KDB 447498 D01 General RF Exposure Guidance v06 The SAR numbers listed must be consistent with the highest reported test results required by the published RF exposure KDB procedures. When the measured SAR is not at the maximum tune-up tolerance limit or maximum output power allowed for production units, the measured results are scaled to the maximum conditions to determine compliance; the scaled results are referred to as the reported SAR.

$$\text{The Reported SAR} = \text{The Measured SAR} * \frac{\text{Maximum tune-up (mW)}}{\text{Measured Conducted Power(mW)}}$$

The Reported SAR for WLAN and Bluetooth

$$\text{The Reported SAR} = \text{The Measured SAR} * \frac{\text{Maximum tune-up (mW)}}{\text{Measured Conducted Power(mW)}} * \text{Duty factor}$$

FCC KDB 447498 D01v06 General RF Exposure Guidance introduces a new formula for calculating the SAR a Peak Location Separation Ratio(SPLSR) between pairs of simultaneously transmitting antennas:

$$SPLSR_i = (SAR_1 + SAR_2)^{1.5} / R_i$$

Where:

$SAR_1$  is the highest measured or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

$SAR_2$  is the highest measured or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

$R_i$  is the separation distance between the pair of simultaneous transmitting antennas, When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of  $[(X_1 - X_2)^2 + (Y_1 - Y_2)^2 + (Z_1 - Z_2)^2]$

In order for a pair of simultaneous transmitting antennas with the sum 1-g of SAR > 1.6 W/kg and with the sum 10-g of SAR > 4W/Kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:

$$(SAR_1 + SAR_2)^{1.5} / R_i \leq 0.04 \text{ for 1g SAR and } (SAR_1 + SAR_2)^{1.5} / R_i \leq 0.1 \text{ for 10g SAR.}$$



## 5. Introduction

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. 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York 10017. The measurement procedure described in IEEE/ANSI C95.3-1992 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 of the incremental electromagnetic energy ( $dW$ ) absorbed by (dissipated in) an incremental mass ( $dm$ ) contained in a volume element ( $dV$ ) of a given density ( $r$ ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body.

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

Figure 1. SAR Mathematical Equation  
*SAR is expressed in units of Watts per Kilogram (W/kg)*

Where:

- = conductivity of the tissue-simulant material (S/m)
- = mass density of the tissue-simulant material (kg/m<sup>3</sup>)
- = 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.

## 6. Description of test equipment

### 6.1 SAR MEASUREMENT SETUP

These measurements are performed using the DASY4 automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Staubli), robot controller, Pentium III 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 Figure.2).

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The PC with Windows XP or Windows 7 is working with SAR Measurement system DASY4 & DASY5, A/D interface card, monitor, mouse, and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit 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.

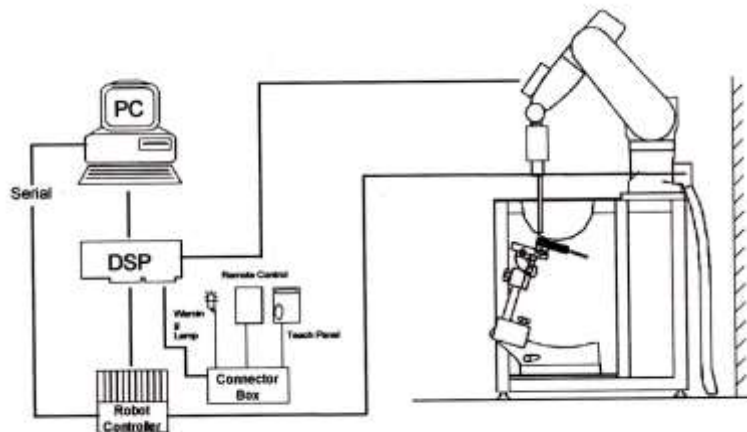


Figure 2. HCT SAR Lab. Test Measurement Set-up

The DAE 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 in.

## 7. SAR 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 more than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the DUT's head and body area and the horizontal grid resolution was depending on the FCC KDB 865664 D01v01r04 table 4-1 & IEEE 1528-2013.
2. Based on step, the area of the maximum absorption was determined by sophisticated interpolations routines implemented in DASY software. When an Area Scan has measured all reachable point. DASY system computes the field maximal found in the scanned are, within a range of the maximum. SAR at this fixed point was measured and used as a reference value.
3. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB 865664 D01v01r04 table 4-1 and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (reference from the DASY manual.)
  - a. The data at the surface were extrapolated, since the center of the dipoles is no more than 2.7 mm away from the tip of the probe (it is different from the probe type) and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
  - b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed using the 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 integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.
  - 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. If the value changed by more than 5 %, the SAR evaluation and drift measurements were repeated.

Area scan and zoom scan resolution setting follow KDB 865664 D01v01r04 quoted below.

		≤ 3 GHz	> 3 GHz	
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface		5±1 mm	$\delta \cdot \ln(2) \pm 0.5$ mm	
Maximum probe angle from probe axis to phantom surface normal at the measurement location		30°±1°	20°±1°	
Maximum area scan Spatial resolution: $\Delta x_{Area}, \Delta y_{Area}$		≤ 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: $\Delta x_{zoom}, \Delta y_{zoom}$		≤ 2 GHz: ≤8mm 2-3 GHz: ≤5mm*	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 1 <sup>st</sup> 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· $\Delta z_{zoom}(n-1)$	
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: $\delta$ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details. * When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB 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.				

## 8. Description of Test Position

### 8.1 Device Holder

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

### 8.2 Laptop host platform test requirements Per KDB Publication 616217 D04v01r02

The required minimum test separation distance for incorporating transmitters and antennas into laptop, notebook and netbook computer displays is determined with the display screen opened at an angle of 90° to the keyboard compartment.

According to FCC KDB 616217, after removing all the rubber feet of the laptop computer, the rear side of the laptop computer was placed in contact with the SAR Phantom, and the measurement was carried out.

Provided tablet use conditions are not supported by the laptop computer, SAR tests for bystander exposure from the edges of the keyboard and display screen of laptop computers are generally not required.

### 8.3 Proximity Sensor Considerations

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

When the sensor detects a user is touching the device on or near to the antenna the device reduces the maximum allowed output power. However, the proximity sensor is not active when the device is moved beyond the sensor triggering distance and the maximum output power is no longer limited. Therefore, an additional exposure condition is needed in the vicinity of the triggering distance to ensure SAR is compliant when the device is allowed to operate at a non-reduced output power level.

FCC KDB 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device at the exposure condition. The smallest separation distance determined by the sensor triggering, minus 1 mm, was used as the test separation distance for SAR testing. Sensor triggering distance evaluation is provided in a separate document.

Antenna Configuration	Wireless technologies	Position	§6.2 Triggering Distance	§6.3 Coverage	§6.4 Tilt Angle	Worst case distance for Body SAR
Main Ant.	UMTS B2/ B4/ B5, LTE B2/B4/B5/B12/B13/B17 B26/B41/B66	Rear	16 mm	N/A	N/A	15 mm
WLAN Ant. 1	2.4GHz/ 5GHz WLAN	Rear	7 mm	N/A	N/A	6 mm
WLAN Ant. 2	2.4GHz/ 5GHz WLAN	Rear	10 mm	N/A	N/A	9 mm

## 9. RF Exposure Limits

HUMAN EXPOSURE	UNCONTROLLED ENVIRONMENT General Population (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT Occupational (W/kg) or (mW/g)
SPATIAL PEAK SAR * (Partial Body)	1.6	8.0
SPATIAL AVERAGE SAR ** (Whole Body)	0.08	0.4
SPATIAL PEAK SAR *** (Hands / Feet / Ankle / Wrist)	4.0	20.0

**NOTES:**

\* The Spatial Peak value of the SAR averaged over any 1 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

\*\* The Spatial Average value of the SAR averaged over the whole-body.

\*\*\* The Spatial Peak value of the SAR averaged over any 10 g 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. 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 mad 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 Environments** are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e.as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

## 10. FCC SAR General Measurement Procedures

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

### 10.1 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.

### 10.2 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB 941225 D01v03r01-3G SAR Measurement Procedures. The handset was placed into a simulated call using a base station simulator in a shielded chamber. Such test signals offer a consistent means for testing SAR and are recommended for evaluation SAR measurements were taken with a fully charged battery. In order to verify that the device was tested and maintained at full power, this was configured with the base station simulator. The SAR measurement Software calculates a reference point at the start and end of the test to Check for power drifts. If conducted Power deviations of more than 5 % occurred, the tests were repeated.

### 10.3 SAR Measurement Conditions for UMTS

#### 10.3.1 Output Power Verification

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

#### 10.3.2 Body SAR measurements

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

#### 10.3.3 SAR Measurements with Rel. 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSDPA is measured using and FRC with H-SET 1 in Sub-test and a 12.2 kbps RMC without HSDPA. Handsets with both HSDPA and HSUPA are tested according to release 6 HSPA test procedures. 8.4.5 SAR Measurement with Rel.6 HSUPA The 3G SAR test Reduction Procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, Using H-Set 1 and QPSK for FRC and a 12.2kbps RMC configured in Test Loop Mode 1 and Power Control algorithm 2, according to the highest reported

body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing.

#### 10.3.4 SAR Measurements with Rel. 6 HSUPA

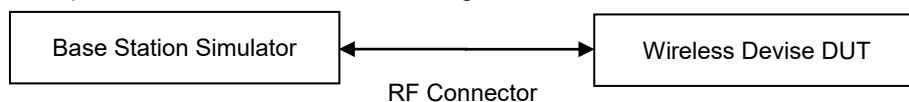
The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA.

#### 10.3.5 DC-HSDPA

SAR is required for Rel.8 DC-HSDPA when SAR is required for Rel.5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in table C.8.1.12 of 3GPP TS34.121-1 to determine SAR test reduction. Primary and secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

#### DC-HSDPA Configurations

- ◆ 3GPP specification TS 34.121-1 Release 8. was used for used for DC-HSDPA guidance.
- ◆ H-set 12(QPSK)was conformed to be used during DC-HSDPA measurements.





## 10.4 SAR Measurement Conditions for LTE

LTE modes are tested according to FCC KDB 941225 D05v02r05 publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluation SAR [4]. The R&S CMW500 or Anritsu MT8820C simulators are used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

### 10.4.1 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.

### 10.4.2 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.

### 10.4.3 A-MPR

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

### 10.4.4 Required RB Size and RB offsets for SAR testing

According to FCC KDB 941225 D05v02r05

- a. Per sec 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  $\leq 0.8$  W/Kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
  - iii. When the reported SAR for a required test channel is  $> 1.45$  W/kg, SAR is required for all RB offset configurations for that channel.
- b. Per Sec 4.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Sec 4.2.1.
- c. Per Sec. 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 Sec. 4.2.4 and 4.3, SAR test for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sec. 4.2.1 through 4.2.3 is less than or equal to 1/2 dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is  $< 1.45$  W/Kg.

### 10.4.5 Downlink Carrier Aggregation

Conducted power measurements with LTE Carrier aggregation (CA) downlink only active are made in accordance to KDB publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier (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 downlink carrier aggregation active for the configuration with highest measured maximum conducted power with the 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 0.25dB higher than the average output power with downlink only carrier aggregation inactive.

**10.4.6 LTE(TDD) Considerations**

According to KDB 941225 D05v02r05, 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 configurations and Table 4.2-1 for Special sub frame 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	$26336 \cdot T_s$			$7680 \cdot T_s$		
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-		
9	$13168 \cdot T_s$			-		

Calculated Duty Cycle – Extended cyclic prefix in uplink x (T<sub>s</sub>) x no of S + no of U

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

Example for calculated Duty Cycle for Uplink-Downlink Configuration 0:  
 Calculated Duty Cycle =  $(5120 \times (1/(15000 \times 2048))) \times 2 + 0.006/0.01 = 63.33 \%$   
 Where  
 $T_s = 1/(15000 \times 2048)$  seconds

### 10.4.7 The Call Box Setup for LTE(TDD)

When you Want to Test for LTE TDD, Please Change Frame Structure TDD and TDD Uplink Downlink Configuration 0 and Special Subframe Configuration 6.

## 10.5 SAR Testing with 802.11 Transmitters

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

### 10.5.1 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.

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

### 10.5.2 U-NII-1 and U-NII-2A

For devices that operate in both U-NII-1 and U-NII-2A bands, when the same maximum output power is specified for both bands, SAR measurement using OFDM SAR test procedures is not required for U-NII-1 unless the highest reported SAR for U-NII-2A is  $> 1.2$  W/kg for 1g SAR or  $> 3.0$  W/kg for 10g SAR. When different maximum output powers are specified for the bands, SAR measurement for the U-NII band with the lower maximum output power is not required unless the highest reported SAR for the U-NII band with the higher maximum output power, adjusted by the ratio of lower to higher specified maximum output power for the two bands, is  $> 1.2$  W/kg for 1g SAR or  $> 3.0$  W/kg for 10g SAR.

### 10.5.3 U-NII-2C and U-NII-3

The frequency range covered by U-NII-2C and U-NII-3 is 380 MHz (5.47 GHz – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, the channels at 5.60 GHz – 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.

### 10.5.4 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 positions in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is  $\leq 0.4$  W/kg for 1g SAR and  $\leq 1.0$  W/kg for 10g SAR, no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is  $\leq 0.8$  W/kg for 1g SAR and  $\leq 2.0$  W/kg for 10g SAR or all test positions are measured.

#### 10.5.5 2.4 GHz SAR test Requirements

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

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

channels require testing.

2.4 GHz 802.11 g/n/ac 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.

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

#### **10.5.7 Initial Test Configuration Procedure**

For OFDM, in both 2.4 GHz 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 power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, and lowest data rate. If the average RF output powers of the highest identical transmission modes are within 0.25 dB of each other, mid channel of the transmission mode with highest average RF output power is the initial test channel. Otherwise, the channel of the transmission mode with the highest average RF output conducted power will be the initial test configuration.

When the reported SAR is  $\leq 0.8$  W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is 1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurements.

#### **10.5.8 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 on procedure. When the highest reported SAR (for the initial test configuration), adjusted by the ratio of the specified maximum output power of the subsequent test configuration to initial test configuration, is  $\leq 1.2$  W/kg for 1g SAR and  $\leq 3.0$  W/kg for 10g SAR, no additional SAR tests for the subsequent test configurations are required.

#### **10.5.9 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.



## 11. Output Power Specifications

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

### Licensed bands

Test Description	Test Procedure Used
Conducted Output Power	- KDB 971168 D01 v03r01 - Section 5.2.4 - ANSI C63.26-2015 - Section 5.2.1 & 5.2.4.2

### Test Overview

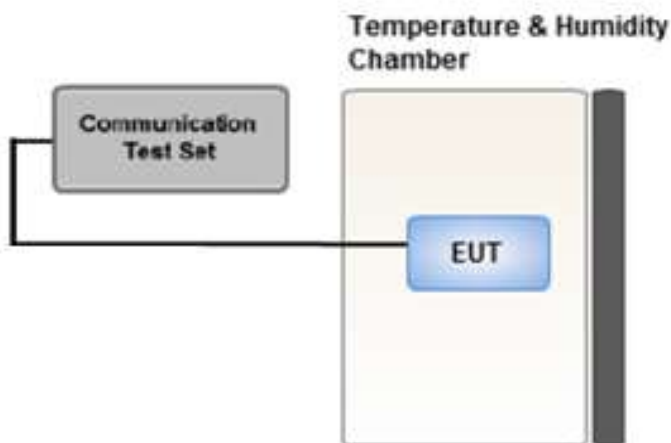
According to ANSI C63.26-2015 Section 5.2.1 when measuring the maximum RF output power from such devices, control over the EUT must be provided either through special test software (provided by manufacturer specifically for compliance testing, but not accessible by an end user) or through use of a base station emulator, communications test set, call box, or similar instrumentation that is capable of establishing a communications link with the EUT to enable control over variable parameters (e.g., output power, OBW, etc.).

In some cases, these instruments also include basic digital spectrum analyzer and/or power meter capabilities that can be utilized to measure the RF output power if the specified detectors and requirements can be realized and the measurement functions have been calibrated.

### Test Procedure

1. The RF port of the EUT was connected to the Communication Tester via an RF cable.
2. Conducted average power was measured using a calibrated Radio Communication Tester.

### Test setup



## 11.1 UMTS

### HSPA+

This DUT is only capable of QPSK HSPA+ in uplink. Therefore, the RF conducted power is not measured according to 941225 D01v03r01 3G SAR.

#### 11.1.1 UMTS Maximum Conducted Output Power

##### UMTS Band 5 Maximum Conducted Output Power

3GPP Release Version	Mode	3GPP 34.121	UMTS Band 5 [dBm]			3GPP MPR
		Subtest	UL 4132 DL 4357	UL 4183 DL 4408	UL 4233 DL 4458	
99	UMTS	12.2 kbps RMC	23.58	23.59	23.43	-
5	HSDPA	Subtest 1	22.45	22.43	22.35	0
5		Subtest 2	22.47	22.45	22.36	0
5		Subtest 3	21.95	21.94	21.84	0.5
5		Subtest 4	21.94	21.95	21.85	0.5
6	HSUPA	Subtest 1	22.45	22.44	22.34	0
6		Subtest 2	20.49	20.43	20.34	2
6		Subtest 3	21.46	21.45	21.36	1
6		Subtest 4	20.47	20.45	20.35	2
6		Subtest 5	22.47	22.46	22.34	0
8	DC-HSDPA	Subtest 1	22.49	22.52	22.44	0
8		Subtest 2	22.49	22.53	22.42	0
8		Subtest 3	22.03	22.03	21.94	0.5
8		Subtest 4	22.02	22.01	21.93	0.5

UMTS Average Conducted output powers

##### UMTS Band 4 Maximum Conducted Output Power

3GPP Release Version	Mode	3GPP 34.121	UMTS Band 4 [dBm]			3GPP MPR
		Subtest	UL 1312 DL 1537	UL 1412 DL 1637	UL 1513 DL 1738	
99	UMTS	12.2 kbps RMC	22.73	23.10	22.90	-
5	HSDPA	Subtest 1	20.78	21.01	20.77	0
5		Subtest 2	20.78	20.98	20.79	0
5		Subtest 3	21.18	21.51	21.29	0.5
5		Subtest 4	21.20	21.48	21.33	0.5
6	HSUPA	Subtest 1	20.76	21.49	20.87	0
6		Subtest 2	19.10	19.20	19.02	2
6		Subtest 3	19.74	19.87	19.86	1
6		Subtest 4	18.99	19.40	19.23	2
6		Subtest 5	20.48	20.67	20.39	0
8	DC-HSDPA	Subtest 1	20.66	20.98	20.61	0
8		Subtest 2	20.65	20.99	20.64	0
8		Subtest 3	20.81	21.06	20.88	0.5
8		Subtest 4	20.80	21.00	20.85	0.5

UMTS Average Conducted output powers

UMTS Band 2 Maximum Conducted Output Power

3GPP Release Version	Mode	3GPP 34.121	UMTS Band 2 [dBm]			3GPP MPR
		Subtest	UL 9262 DL 9662	UL 9400 DL 9800	UL 9538 DL 9938	
99	UMTS	12.2 kbps RMC	23.00	22.80	23.10	-
5	HSDPA	Subtest 1	21.54	21.82	22.09	0
5		Subtest 2	21.55	21.81	22.08	0
5		Subtest 3	21.03	21.33	21.59	0.5
5		Subtest 4	21.03	21.32	21.58	0.5
6	HSUPA	Subtest 1	21.54	21.80	22.07	0
6		Subtest 2	19.60	19.73	20.05	2
6		Subtest 3	20.50	20.78	21.05	1
6		Subtest 4	19.68	19.94	20.08	2
6		Subtest 5	21.34	21.46	21.68	0
8	DC-HSDPA	Subtest 1	21.33	21.60	22.01	0
8		Subtest 2	21.30	21.70	21.98	0
8		Subtest 3	20.75	21.00	21.10	0.5
8		Subtest 4	20.91	21.04	21.08	0.5

UMTS Average Conducted output powers

DC-HSDPA Configurations

- ◆ 3GPP specification TS 34.121-1 Release 8. was used for used for DC-HSDPA guidance.
- ◆ H-set 12(QPSK)was conformed to be used during DC-HSDPA measurements.





**11.1.2 UMTS Reduced Conducted Output Power – (Proximity Sensor Activated)**

UMTS Band 5 Grip Back-off Power

3GPP Release Version	Mode	3GPP 34.121	UMTS Band 5 [dBm]			3GPP MPR
		Subtest	UL 4132 DL 4357	UL 4183 DL 4408	UL 4233 DL 4458	
99	UMTS	12.2 kbps RMC	20.07	20.06	19.94	-
5	HSDPA	Subtest 1	18.92	18.93	18.82	0
5		Subtest 2	18.94	18.92	18.84	0
5		Subtest 3	18.44	18.42	18.32	0.5
5		Subtest 4	18.41	18.41	18.30	0.5
6	HSUPA	Subtest 1	18.93	18.92	18.83	0
6		Subtest 2	16.94	16.93	16.83	2
6		Subtest 3	17.93	17.92	17.84	1
6		Subtest 4	16.93	16.94	16.83	2
6		Subtest 5	18.94	18.95	18.84	0
8	DC-HSDPA	Subtest 1	18.99	18.97	18.90	0
8		Subtest 2	18.96	18.99	18.91	0
8		Subtest 3	18.46	18.49	18.41	0.5
8		Subtest 4	18.47	18.50	18.39	0.5

UMTS Average Conducted output powers

UMTS Band 4 Grip Back-off Power

3GPP Release Version	Mode	3GPP 34.121	UMTS Band 4 [dBm]			3GPP MPR
		Subtest	UL 1312 DL 1537	UL 1412 DL 1637	UL 1513 DL 1738	
99	UMTS	12.2 kbps RMC	13.87	13.92	13.77	-
5	HSDPA	Subtest 1	11.78	11.81	11.69	0
5		Subtest 2	11.79	11.84	11.70	0
5		Subtest 3	12.20	12.33	12.21	0.5
5		Subtest 4	12.21	12.35	12.22	0.5
6	HSUPA	Subtest 1	11.67	11.81	11.68	0
6		Subtest 2	9.76	9.82	9.67	2
6		Subtest 3	10.68	10.80	10.67	1
6		Subtest 4	9.79	9.81	9.69	2
6		Subtest 5	11.66	11.79	11.67	0
8	DC-HSDPA	Subtest 1	11.63	11.92	11.72	0
8		Subtest 2	11.61	11.93	11.74	0
8		Subtest 3	12.12	12.37	12.26	0.5
8		Subtest 4	12.13	12.38	12.25	0.5

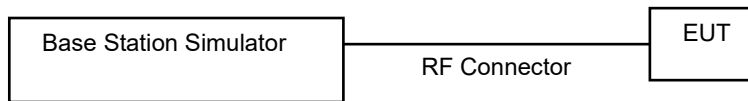
UMTS Average Conducted output power

UMTS Band 2 Grip Back-off Power

3GPP Release Version	Mode	3GPP 34.121	UMTS Band 2 [dBm]			3GPP MPR
		Subtest	DL 9662 UL 9262	DL 9800 UL 9400	DL 9938 UL 9538	
99	UMTS	12.2 kbps RMC	14.15	14.19	14.08	-
5	HSDPA	Subtest 1	13.07	13.15	13.04	0
5		Subtest 2	13.09	13.16	13.08	0
5		Subtest 3	12.58	12.68	12.57	0.5
5		Subtest 4	12.57	12.65	12.58	0.5
6	HSUPA	Subtest 1	13.04	13.13	13.05	0
6		Subtest 2	11.06	11.14	11.05	2
6		Subtest 3	12.05	12.14	12.07	1
6		Subtest 4	11.04	11.13	11.06	2
6		Subtest 5	13.06	13.12	13.02	0
8	DC-HSDPA	Subtest 1	12.73	12.90	12.77	0
8		Subtest 2	12.76	12.91	12.79	0
8		Subtest 3	12.25	12.40	12.30	0.5
8		Subtest 4	12.24	12.43	12.31	0.5

UMTS Average Conducted output powers

- ◆ 3GPP specification TS 34.121-1 Release 8. was used for used for DC-HSDPA guidance.
- ◆ H-set 12(QPSK) was conformed to be used during DC-HSDPA measurements.



## 11.2 LTE Maximum Output Power

LTE B4/5/12/13/17/26/66 at 10 MHz/ 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 mid channel of the group of overlapping channels should be selected for testing.

### 11.2.1 LTE Maximum Conducted Power

#### [ LTE Band 2 Conducted Power ]

LTE Band 2 \_ 1.4 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				18607 Ch. 1850.7 MHz	18900 Ch. 1880 MHz	19193 Ch. 1909.3 MHz		
1.4 MHz	QPSK	1	0	21.94	22.32	22.53	0	0
		1	3	22.03	22.45	22.58	0	0
		1	5	21.94	22.41	22.53	0	0
		3	0	21.99	22.38	22.58	0	0
		3	1	22.04	22.42	22.56	0	0
		3	3	21.99	22.37	22.56	0	0
	16QAM	6	0	21.02	21.34	21.57	0-1	1
		1	0	21.41	21.69	21.93	0-1	1
		1	3	21.52	21.82	21.97	0-1	1
		1	5	21.40	21.73	21.85	0-1	1
		3	0	21.17	21.47	21.71	0-1	1
		3	1	21.20	21.52	21.66	0-1	1
	64QAM	3	3	21.16	21.49	21.64	0-1	1
		6	0	20.23	20.52	20.71	0-2	2
		1	0	20.33	20.70	20.82	0-2	2
		1	3	20.45	20.77	20.92	0-2	2
		1	5	20.33	20.61	20.82	0-2	2
		3	0	20.28	20.59	20.81	0-2	2
		3	1	20.34	20.67	20.86	0-2	2
		3	3	20.22	20.62	20.83	0-2	2
		6	0	19.13	19.43	19.65	0-3	3

LTE Band 2\_ 3 Mhz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				18615 Ch. 1851.5 MHz	18900 Ch. 1880 MHz	19185 Ch. 1908.5 MHz		
3 Mhz	QPSK	1	0	22.01	22.41	22.59	0	0
		1	7	22.14	22.51	22.74	0	0
		1	14	22.03	22.37	22.57	0	0
		8	0	21.05	21.39	21.60	0-1	1
		8	3	21.09	21.42	21.65	0-1	1
		8	7	21.07	21.43	21.60	0-1	1
	16QAM	15	0	21.02	21.38	21.62	0-1	1
		1	0	21.47	21.80	21.90	0-1	1
		1	7	21.58	21.90	22.14	0-1	1
		1	14	21.40	21.82	21.96	0-1	1
		8	0	20.23	20.59	20.85	0-2	2
		8	3	20.29	20.62	20.80	0-2	2
	64QAM	8	7	20.24	20.57	20.78	0-2	2
		15	0	20.16	20.53	20.70	0-2	2
		1	0	20.31	20.70	20.94	0-2	2
		1	7	20.46	20.80	20.99	0-2	2
		1	14	20.30	20.75	20.86	0-2	2
		8	0	19.31	19.55	19.84	0-3	3
	8	3	19.27	19.61	19.82	0-3	3	
	8	7	19.22	19.55	19.77	0-3	3	
	15	0	19.18	19.51	19.73	0-3	3	

LTE Band 2\_ 5 Mhz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				18625 Ch. 1852.5 MHz	18900 Ch. 1880 MHz	19175 Ch. 1907.5 MHz		
5 Mhz	QPSK	1	0	22.02	22.39	22.59	0	0
		1	12	22.02	22.43	22.60	0	0
		1	24	21.98	22.44	22.58	0	0
		12	0	21.05	21.38	21.64	0-1	1
		12	6	21.12	21.45	21.66	0-1	1
		12	11	21.04	21.42	21.62	0-1	1
	16QAM	25	0	21.07	21.40	21.61	0-1	1
		1	0	21.43	21.75	21.92	0-1	1
		1	12	21.44	21.83	21.98	0-1	1
		1	24	21.24	21.79	21.86	0-1	1
		12	0	20.21	20.54	20.77	0-2	2
		12	6	20.18	20.55	20.77	0-2	2
	64QAM	12	11	20.18	20.50	20.73	0-2	2
		25	0	20.18	20.52	20.70	0-2	2
		1	0	20.37	20.70	20.89	0-2	2
		1	12	20.39	20.78	20.84	0-2	2
		1	24	20.35	20.67	20.85	0-2	2
		12	0	19.24	19.58	19.79	0-3	3
	12	6	19.27	19.60	19.86	0-3	3	
	12	11	19.25	19.60	19.77	0-3	3	
	25	0	19.21	19.50	19.73	0-3	3	

LTE Band 2 \_ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				18650 Ch. 1855 MHz	18900 Ch. 1880 MHz	19150 Ch. 1905 MHz		
10 MHz	QPSK	1	0	22.07	22.45	22.47	0	0
		1	24	22.02	22.42	22.62	0	0
		1	49	22.15	22.45	22.61	0	0
		25	0	21.06	21.38	21.51	0-1	1
		25	12	21.07	21.41	21.57	0-1	1
		25	24	21.19	21.41	21.62	0-1	1
	16QAM	50	0	21.17	21.40	21.53	0-1	1
		1	0	21.40	21.74	21.91	0-1	1
		1	24	21.44	21.86	21.94	0-1	1
		1	49	21.48	21.89	22.05	0-1	1
		25	0	20.17	20.55	20.63	0-2	2
		25	12	20.18	20.57	20.64	0-2	2
	64QAM	25	24	20.33	20.52	20.76	0-2	2
		50	0	20.31	20.56	20.63	0-2	2
		1	0	20.50	20.71	20.82	0-2	2
		1	24	20.39	20.78	20.91	0-2	2
		1	49	20.48	20.76	20.96	0-2	2
		25	0	19.18	19.54	19.62	0-3	3
	25	12	19.25	19.53	19.68	0-3	3	
		24	19.30	19.55	19.77	0-3	3	
	25	24	19.30	19.55	19.77	0-3	3	
	50	0	19.31	19.54	19.68	0-3	3	

LTE Band 2 \_ 15 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				18675 Ch. 1857.5 MHz	18900 Ch. 1880 MHz	19125 Ch. 1902.5 MHz		
15 MHz	QPSK	1	0	22.06	22.43	22.51	0	0
		1	36	22.01	22.35	22.48	0	0
		1	74	22.16	22.49	22.63	0	0
		36	0	21.05	21.43	21.52	0-1	1
		36	18	21.20	21.46	21.59	0-1	1
		36	39	21.15	21.44	21.57	0-1	1
		75	0	21.17	21.40	21.51	0-1	1
	16QAM	1	0	21.44	21.67	21.75	0-1	1
		1	36	21.37	21.76	21.88	0-1	1
		1	74	21.48	21.88	21.99	0-1	1
		36	0	20.17	20.56	20.64	0-2	2
		36	18	20.29	20.54	20.66	0-2	2
		36	39	20.29	20.56	20.63	0-2	2
		75	0	20.24	20.54	20.62	0-2	2
	64QAM	1	0	20.43	20.65	20.72	0-2	2
		1	36	20.29	20.73	20.78	0-2	2
		1	74	20.43	20.79	20.99	0-2	2
		36	0	19.21	19.55	19.63	0-3	3
		36	18	19.32	19.60	19.69	0-3	3
		36	39	19.29	19.59	19.69	0-3	3
		75	0	19.30	19.53	19.69	0-3	3

LTE Band 2\_ 20 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				18700 Ch. 1860 MHz	18900 Ch. 1880 MHz	19100 Ch. 1900 MHz		
20 MHz	QPSK	1	0	22.12	22.65	22.45	0	0
		1	49	22.11	22.37	22.25	0	0
		1	99	21.99	22.47	22.38	0	0
		50	0	21.21	21.60	21.59	0-1	1
		50	25	21.15	21.42	21.43	0-1	1
		50	49	21.18	21.41	21.39	0-1	1
		100	0	21.40	21.52	21.15	0-1	1
	16QAM	1	0	21.47	21.60	21.69	0-1	1
		1	49	21.54	21.69	21.76	0-1	1
		1	99	21.49	21.80	22.04	0-1	1
		50	0	20.29	20.54	20.54	0-2	2
		50	25	20.27	20.57	20.64	0-2	2
		50	49	20.26	20.52	20.66	0-2	2
		100	0	20.20	20.48	20.67	0-2	2
	64QAM	1	0	20.39	20.60	20.70	0-2	2
		1	49	20.42	20.76	20.63	0-2	2
		1	99	20.45	20.86	20.87	0-2	2
		50	0	19.27	19.54	19.54	0-3	3
		50	25	19.26	19.55	19.68	0-3	3
		50	49	19.26	19.55	19.67	0-3	3
		100	0	19.29	19.52	19.65	0-3	3

**[ LTE Band 4 Conducted Power ]**

LTE Band 4 \_ 1.4 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				19957 Ch. 1710.7 MHz	20175 Ch. 1732.5 MHz	20393 Ch. 1754.3 MHz		
1.4 MHz	QPSK	1	0	22.42	22.46	22.27	0	0
		1	3	22.44	22.53	22.35	0	0
		1	5	22.36	22.47	22.27	0	0
		3	0	22.40	22.52	22.29	0	0
		3	1	22.43	22.52	22.33	0	0
		3	3	22.37	22.45	22.28	0	0
		6	0	21.39	21.49	21.28	0-1	1
	16QAM	1	0	21.75	21.93	21.56	0-1	1
		1	3	21.80	21.87	21.65	0-1	1
		1	5	21.71	21.77	21.63	0-1	1
		3	0	21.56	21.63	21.42	0-1	1
		3	1	21.51	21.71	21.38	0-1	1
		3	3	21.48	21.56	21.36	0-1	1
		6	0	20.58	20.68	20.49	0-2	2
	64QAM	1	0	20.71	20.78	20.53	0-2	2
		1	3	20.78	20.76	20.64	0-2	2
		1	5	20.62	20.78	20.58	0-2	2
		3	0	20.62	20.71	20.55	0-2	2
		3	1	20.68	20.78	20.60	0-2	2
		3	3	20.67	20.75	20.53	0-2	2
		6	0	19.49	19.57	19.44	0-3	3

LTE Band 4 \_ 3 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				19965 Ch. 1711.5 MHz	20175 Ch. 1732.5 MHz	20385 Ch. 1753.5 MHz		
3 MHz	QPSK	1	0	22.47	22.55	22.35	0	0
		1	7	22.51	22.66	22.41	0	0
		1	14	22.35	22.54	22.34	0	0
		8	0	21.45	21.59	21.35	0-1	1
		8	3	21.44	21.61	21.40	0-1	1
		8	7	21.41	21.55	21.39	0-1	1
		15	0	21.47	21.57	21.40	0-1	1
	16QAM	1	0	21.86	21.90	21.66	0-1	1
		1	7	21.91	21.98	21.92	0-1	1
		1	14	21.73	21.85	21.77	0-1	1
		8	0	20.60	20.78	20.54	0-2	2
		8	3	20.64	20.81	20.55	0-2	2
		8	7	20.57	20.71	20.51	0-2	2
		15	0	20.57	20.65	20.50	0-2	2
	64QAM	1	0	20.75	20.83	20.63	0-2	2
		1	7	20.80	20.97	20.73	0-2	2
		1	14	20.73	20.77	20.68	0-2	2
		8	0	19.60	19.72	19.55	0-3	3
		8	3	19.63	19.75	19.58	0-3	3
		8	7	19.62	19.75	19.56	0-3	3
		15	0	19.54	19.69	19.52	0-3	3

LTE Band 4 \_ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				19975 Ch. 1712.5 MHz	20175 Ch. 1732.5 MHz	20375 Ch. 1752.5 MHz		
5 MHz	QPSK	1	0	22.49	22.59	22.43	0	0
		1	12	22.42	22.55	22.41	0	0
		1	24	22.45	22.53	22.32	0	0
		12	0	21.45	21.59	21.39	0-1	1
		12	6	21.44	21.62	21.48	0-1	1
		12	11	21.43	21.58	21.42	0-1	1
		25	0	21.45	21.60	21.43	0-1	1
	16QAM	1	0	21.90	21.92	21.77	0-1	1
		1	12	21.90	21.89	21.79	0-1	1
		1	24	21.75	21.93	21.79	0-1	1
		12	0	20.56	20.73	20.54	0-2	2
		12	6	20.55	20.76	20.55	0-2	2
		12	11	20.53	20.65	20.50	0-2	2
		25	0	20.52	20.68	20.51	0-2	2
	64QAM	1	0	20.81	20.92	20.68	0-2	2
		1	12	20.78	20.88	20.62	0-2	2
		1	24	20.71	20.85	20.69	0-2	2
		12	0	19.65	19.80	19.57	0-3	3
		12	6	19.63	19.79	19.62	0-3	3
		12	11	19.60	19.73	19.59	0-3	3
25		0	19.56	19.68	19.55	0-3	3	

LTE Band 4 \_ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20000 Ch. 1715 MHz	20175 Ch. 1732.5 MHz	20350 Ch. 1750 MHz		
10 MHz	QPSK	1	0	22.50	22.62	22.43	0	0
		1	24	22.43	22.56	22.36	0	0
		1	49	22.48	22.53	22.33	0	0
		25	0	21.48	21.64	21.45	0-1	1
		25	12	21.54	21.61	21.42	0-1	1
		25	24	21.51	21.59	21.38	0-1	1
		50	0	21.56	21.63	21.44	0-1	1
	16QAM	1	0	21.84	21.97	21.86	0-1	1
		1	24	21.72	21.93	21.62	0-1	1
		1	49	21.78	21.83	21.81	0-1	1
		25	0	20.57	20.77	20.50	0-2	2
		25	12	20.66	20.75	20.53	0-2	2
		25	24	20.61	20.69	20.51	0-2	2
		50	0	20.61	20.70	20.51	0-2	2
	64QAM	1	0	20.81	20.90	20.72	0-2	2
		1	24	20.69	20.90	20.63	0-2	2
		1	49	20.78	20.77	20.70	0-2	2
		25	0	19.64	19.75	19.58	0-3	3
		25	12	19.69	19.72	19.55	0-3	3
		25	24	19.65	19.68	19.52	0-3	3
50		0	19.68	19.77	19.52	0-3	3	



LTE Band 4 \_ 15 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20025 Ch. 1717.5 MHz	20175 Ch. 1732.5 MHz	20325 Ch. 1747.5 MHz		
15 MHz	QPSK	1	0	22.68	22.75	22.61	0	0
		1	36	22.61	22.61	22.38	0	0
		1	74	22.58	22.59	22.42	0	0
		36	0	21.73	21.68	21.60	0-1	1
		36	18	21.69	21.65	21.43	0-1	1
		36	39	21.63	21.60	21.41	0-1	1
	16QAM	75	0	21.66	21.63	21.56	0-1	1
		1	0	22.08	22.12	21.93	0-1	1
		1	36	21.89	21.89	21.66	0-1	1
		1	74	22.01	21.94	21.81	0-1	1
		36	0	20.83	20.76	20.69	0-2	2
		36	18	20.82	20.73	20.58	0-2	2
	64QAM	36	39	20.76	20.68	20.55	0-2	2
		75	0	20.76	20.76	20.67	0-2	2
		1	0	20.94	21.09	20.91	0-2	2
		1	36	20.85	20.86	20.65	0-2	2
		1	74	20.89	20.82	20.70	0-2	2
		36	0	19.91	19.83	19.72	0-3	3
	36	18	19.81	19.78	19.57	0-3	3	
	36	39	19.80	19.73	19.55	0-3	3	
	75	0	19.78	19.71	19.65	0-3	3	

LTE Band 4 \_ 20 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]	MPR Allowed Per 3GPP [dB]	MPR [dB]
				20175 Ch. 1732.5 MHz		
20 MHz	QPSK	1	0	22.65	0	0
		1	49	22.57	0	0
		1	99	22.54	0	0
		50	0	21.71	0-1	1
		50	25	21.62	0-1	1
		50	49	21.58	0-1	1
	16QAM	100	0	21.66	0-1	1
		1	0	22.05	0-1	1
		1	49	21.94	0-1	1
		1	99	21.80	0-1	1
		50	0	20.81	0-2	2
		50	25	20.75	0-2	2
	64QAM	50	49	20.71	0-2	2
		100	0	20.70	0-2	2
		1	0	20.99	0-2	2
		1	49	20.84	0-2	2
		1	99	20.76	0-2	2
		50	0	19.85	0-3	3
	50	25	19.80	0-3	3	
	50	49	19.70	0-3	3	
	100	0	19.75	0-3	3	

**[ LTE Band 5 Conducted Power ]**

LTE Band 5 \_ 1.4 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]	
				20407 Ch. 824.7 MHz	20525 Ch. 836.5 MHz	20643 Ch. 848.3 MHz			
1.4 MHz	QPSK	1	0	22.93	22.80	22.66	0	0	
		1	3	22.97	22.87	22.76	0	0	
		1	5	22.91	22.78	22.70	0	0	
		3	0	22.93	22.82	22.71	0	0	
		3	1	22.99	22.89	22.74	0	0	
		3	3	22.91	22.80	22.68	0	0	
	16QAM	1	0	21.99	22.15	21.84	0-1	1	
		1	3	22.05	22.29	21.83	0-1	1	
		1	5	21.91	22.20	21.74	0-1	1	
		3	0	21.85	21.81	21.76	0-1	1	
		3	1	21.86	21.82	21.80	0-1	1	
		3	3	21.83	21.75	21.76	0-1	1	
	64QAM	1	0	20.93	20.69	20.96	0-2	2	
		1	3	21.01	20.73	21.00	0-2	2	
		1	5	20.95	20.68	20.96	0-2	2	
		3	0	21.00	20.96	20.87	0-2	2	
		3	1	21.06	21.03	20.93	0-2	2	
		3	3	21.01	20.95	20.86	0-2	2	
			6	0	20.12	19.90	19.65	0-3	3

LTE Band 5 \_ 3 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20415 Ch. 825.5 MHz	20525 Ch. 836.5 MHz	20635 Ch. 847.5 MHz		
3 MHz	QPSK	1	0	22.89	22.84	22.83	0	0
		1	7	23.00	22.94	22.92	0	0
		1	14	22.85	22.83	22.78	0	0
		8	0	21.99	21.94	21.82	0-1	1
		8	3	22.01	21.92	21.82	0-1	1
		8	7	22.00	21.88	21.81	0-1	1
		15	0	22.00	21.99	21.82	0-1	1
	16QAM	1	0	22.11	22.20	21.96	0-1	1
		1	7	22.16	22.29	22.06	0-1	1
		1	14	22.08	22.15	21.92	0-1	1
		8	0	21.04	20.99	20.76	0-2	2
		8	3	21.09	21.03	20.75	0-2	2
		8	7	21.01	21.00	20.71	0-2	2
		15	0	21.01	20.98	20.87	0-2	2
	64QAM	1	0	21.04	21.07	20.88	0-2	2
		1	7	21.13	21.14	20.99	0-2	2
		1	14	20.97	21.00	20.99	0-2	2
		8	0	19.97	19.97	19.84	0-3	3
		8	3	19.99	20.01	19.88	0-3	3
		8	7	19.98	19.94	19.83	0-3	3
		15	0	20.08	20.03	19.90	0-3	3

LTE Band 5 \_ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20425 Ch. 826.5 MHz	20525 Ch. 836.5 MHz	20625 Ch. 846.5 MHz		
5 MHz	QPSK	1	0	22.97	22.97	22.81	0	0
		1	12	22.96	22.91	22.73	0	0
		1	24	22.89	22.85	22.59	0	0
		12	0	22.00	21.92	21.85	0-1	1
		12	6	22.00	21.95	21.83	0-1	1
		12	11	21.98	21.89	21.82	0-1	1
		25	0	21.98	21.90	21.86	0-1	1
	16QAM	1	0	22.10	22.01	21.78	0-1	1
		1	12	22.05	21.97	21.72	0-1	1
		1	24	22.04	21.95	21.63	0-1	1
		12	0	21.06	20.93	20.84	0-2	2
		12	6	21.06	20.94	20.86	0-2	2
		12	11	21.07	20.92	20.83	0-2	2
		25	0	21.07	20.95	20.83	0-2	2
	64QAM	1	0	21.23	21.07	21.10	0-2	2
		1	12	21.20	21.15	21.06	0-2	2
		1	24	21.14	21.09	20.99	0-2	2
		12	0	20.10	20.03	19.94	0-3	3
		12	6	20.14	20.02	19.91	0-3	3
		12	11	20.12	20.04	19.83	0-3	3
25		0	20.05	19.92	19.81	0-3	3	

LTE Band 5 \_ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]	MPR Allowed Per 3GPP [dB]	MPR [dB]
				20525 Ch. 836.5 MHz		
10 MHz	QPSK	1	0	22.97	0	0
		1	24	22.91	0	0
		1	49	22.83	0	0
		25	0	21.95	0-1	1
		25	12	21.95	0-1	1
		25	24	21.90	0-1	1
		50	0	21.95	0-1	1
	16QAM	1	0	22.31	0-1	1
		1	24	22.24	0-1	1
		1	49	22.24	0-1	1
		25	0	20.56	0-2	2
		25	12	20.52	0-2	2
		25	24	20.48	0-2	2
		50	0	20.50	0-2	2
	64QAM	1	0	21.24	0-2	2
		1	24	21.17	0-2	2
		1	49	21.11	0-2	2
		25	0	20.56	0-3	3
		25	12	20.58	0-3	3
		25	24	20.51	0-3	3
50		0	20.53	0-3	3	

**[LTE Band 12 Conducted Power]**

LTE Band 12\_ 1.4 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				23017 Ch. 699.7 MHz	23095 Ch. 707.5 MHz	23173 Ch. 715.3 MHz		
1.4 MHz	QPSK	1	0	23.12	23.06	22.85	0	0
		1	3	23.20	23.14	22.90	0	0
		1	5	23.07	23.03	22.79	0	0
		3	0	23.14	23.02	22.80	0	0
		3	1	23.18	23.08	22.82	0	0
		3	3	23.11	23.04	22.77	0	0
	16QAM	1	0	22.09	22.42	21.81	0-1	1
		1	3	22.15	22.54	21.92	0-1	1
		1	5	22.06	22.42	21.88	0-1	1
		3	0	22.22	22.11	21.80	0-1	1
		3	1	22.27	22.16	21.90	0-1	1
		3	3	22.19	22.12	21.85	0-1	1
	64QAM	6	0	21.21	21.29	20.93	0-2	2
		1	0	21.45	21.33	21.02	0-2	2
		1	3	21.50	21.36	21.11	0-2	2
		1	5	21.39	21.29	21.01	0-2	2
		3	0	21.33	21.23	20.88	0-2	2
		3	1	21.29	21.20	20.96	0-2	2
		3	3	21.26	21.20	20.89	0-2	2
		6	0	20.22	20.10	19.98	0-3	3

LTE Band 12\_ 3 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				23025 Ch. 700.5 MHz	23095 Ch. 707.5 MHz	23165 Ch. 714.5 MHz		
3 MHz	QPSK	1	0	23.02	23.05	22.83	0	0
		1	7	23.13	23.14	22.98	0	0
		1	14	22.99	23.03	22.92	0	0
		8	0	22.06	22.10	21.86	0-1	1
		8	3	22.08	22.14	21.84	0-1	1
		8	7	22.05	22.08	21.86	0-1	1
		15	0	22.10	22.16	21.88	0-1	1
	16QAM	1	0	22.44	22.41	22.01	0-1	1
		1	7	22.49	22.57	22.12	0-1	1
		1	14	22.22	22.54	22.06	0-1	1
		8	0	21.20	21.20	20.81	0-2	2
		8	3	21.19	21.25	20.84	0-2	2
		8	7	21.12	21.22	20.84	0-2	2
	64QAM	15	0	21.14	21.18	20.88	0-2	2
		1	0	21.16	21.28	20.94	0-2	2
		1	7	21.25	21.39	21.06	0-2	2
		1	14	21.15	21.28	21.14	0-2	2
		8	0	20.11	20.16	19.92	0-3	3
		8	3	20.11	20.21	19.98	0-3	3
		8	7	20.06	20.16	19.96	0-3	3
		15	0	20.20	20.23	19.97	0-3	3

LTE Band 12\_ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]	
				23035 Ch. 701.5 MHz	23095 Ch. 707.5 MHz	23155 Ch. 713.5 MHz			
5 MHz	QPSK	1	0	23.05	23.08	22.83	0	0	
		1	12	23.06	23.11	22.78	0	0	
		1	24	23.16	23.10	22.74	0	0	
		12	0	22.08	22.12	21.95	0-1	1	
		12	6	22.10	22.14	21.89	0-1	1	
		12	11	22.08	22.14	21.87	0-1	1	
	16QAM	25	0	22.20	22.08	21.98	0-1	1	
		1	0	22.20	22.27	21.98	0-1	1	
		1	12	22.24	22.28	21.90	0-1	1	
		1	24	22.31	22.25	21.90	0-1	1	
		12	0	21.15	21.13	20.97	0-2	2	
		12	6	21.21	21.17	20.88	0-2	2	
	64QAM	12	11	21.17	21.15	20.89	0-2	2	
		25	0	21.29	21.09	21.00	0-2	2	
		1	0	21.36	21.35	20.99	0-2	2	
		1	12	21.36	21.37	20.89	0-2	2	
		1	24	21.46	21.40	20.90	0-2	2	
		12	0	20.23	20.18	19.98	0-3	3	
		64QAM	12	6	20.29	20.19	19.91	0-3	3
			12	11	20.24	20.18	19.87	0-3	3
		25	0	20.19	20.20	20.00	0-3	3	

LTE Band 12\_ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]	MPR Allowed Per 3GPP [dB]	MPR [dB]	
				23095 Ch. 707.5 MHz			
10 MHz	QPSK	1	0	22.96	0	0	
		1	24	23.05	0	0	
		1	49	23.06	0	0	
		25	0	23.15	0-1	1	
		25	12	23.17	0-1	1	
		25	24	23.19	0-1	1	
	16QAM	50	0	22.93	0-1	1	
		1	0	22.45	0-1	1	
		1	24	22.59	0-1	1	
		1	49	22.55	0-1	1	
		25	0	22.12	0-2	2	
		25	12	22.13	0-2	2	
	64QAM	25	24	22.11	0-2	2	
		50	0	22.43	0-2	2	
		1	0	20.88	0-2	2	
		1	24	21.02	0-2	2	
		1	49	21.01	0-2	2	
		25	0	21.19	0-3	3	
		64QAM	25	12	21.26	0-3	3
			25	24	21.24	0-3	3
		50	0	21.10	0-3	3	

**[LTE Band 13 Conducted Power ]**

LTE Band 13 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]	MPR Allowed Per 3GPP [dB]	MPR [dB]
				23230 Ch. 782 MHz		
5 MHz	QPSK	1	0	23.01	0	0
		1	24	23.04	0	0
		1	49	23.01	0	0
		25	0	22.05	0-1	1
		25	12	22.05	0-1	1
		25	24	22.05	0-1	1
	50	0	22.06	0-1	1	
	16QAM	1	0	22.42	0-1	1
		1	24	22.44	0-1	1
		1	49	22.45	0-1	1
		25	0	21.11	0-2	2
		25	12	21.09	0-2	2
		25	24	21.07	0-2	2
	50	0	21.07	0-2	2	
	64QAM	1	0	21.18	0-2	2
		1	24	21.13	0-2	2
		1	49	21.19	0-2	2
		25	0	20.10	0-3	3
25		12	20.18	0-3	3	
25		24	20.13	0-3	3	
50	0	20.14	0-3	3		

LTE Band 13 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]	MPR Allowed Per 3GPP [dB]	MPR [dB]
				23230 Ch. 782 MHz		
10 MHz	QPSK	1	0	23.01	0	0
		1	24	23.04	0	0
		1	49	23.03	0	0
		25	0	22.07	0-1	1
		25	12	22.09	0-1	1
		25	24	22.06	0-1	1
	50	0	22.06	0-1	1	
	16QAM	1	0	22.04	0-1	1
		1	24	22.13	0-1	1
		1	49	22.11	0-1	1
		25	0	21.15	0-2	2
		25	12	21.13	0-2	2
		25	24	21.07	0-2	2
	50	0	21.13	0-2	2	
	64QAM	1	0	21.17	0-2	2
		1	24	21.33	0-2	2
		1	49	21.28	0-2	2
		25	0	20.06	0-3	3
25		12	20.04	0-3	3	
25		24	20.05	0-3	3	
50	0	20.13	0-3	3		

**[ LTE Band 17 conducted Power ]**

LTE Band 17\_ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]	
				23755 Ch. 706.5 MHz	23790 Ch. 710.0 MHz	23825 Ch. 713.5 MHz			
5 MHz	QPSK	1	0		23.03		0	0	
		1	12		23.00		0	0	
		1	24		23.00		0	0	
		12	0		22.11		0-1	1	
		12	6		22.11		0-1	1	
		12	11		22.06		0-1	1	
	16QAM	25	0		22.11		0-1	1	
		1	0		22.53		0-1	1	
		1	12		22.56		0-1	1	
		1	24		22.57		0-1	1	
		12	0		21.11		0-2	2	
		12	6		21.18		0-2	2	
	64QAM	12	11		21.18		0-2	2	
		25	0		21.12		0-2	2	
		1	0		21.26		0-2	2	
		1	12		21.24		0-2	2	
		1	24		21.31		0-2	2	
		12	0		20.24		0-3	3	
		64QAM	12	6		20.24		0-3	3
			12	11		20.24		0-3	3
		25	0		20.18		0-3	3	

LTE Band 17\_ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]	MPR Allowed Per 3GPP [dB]	MPR [dB]	
				23790 Ch. 710.0 MHz			
10 MHz	QPSK	1	0	23.11	0	0	
		1	24	23.12	0	0	
		1	49	23.10	0	0	
		25	0	22.10	0-1	1	
		25	12	22.12	0-1	1	
		25	24	22.12	0-1	1	
	16QAM	50	0	22.05	0-1	1	
		1	0	22.19	0-1	1	
		1	24	22.12	0-1	1	
		1	49	22.05	0-1	1	
		25	0	21.16	0-2	2	
		25	12	21.16	0-2	2	
	64QAM	25	24	21.16	0-2	2	
		50	0	21.19	0-2	2	
		1	0	21.39	0-2	2	
		1	24	21.41	0-2	2	
		1	49	21.42	0-2	2	
		25	0	20.11	0-3	3	
		64QAM	25	12	20.16	0-3	3
			25	24	20.13	0-3	3
		50	0	20.17	0-3	3	

**[ LTE Band 26 Conducted Power ]**

LTE Band 26\_ 1.4 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				26697 Ch. 814.7 MHz	26865 Ch. 831.5 MHz	27033 Ch. 848.3 MHz		
1.4 MHz	QPSK	1	0	22.77	22.87	22.74	0	0
		1	3	22.84	22.85	22.82	0	0
		1	5	22.75	22.76	22.79	0	0
		3	0	22.88	22.88	22.85	0	0
		3	1	22.93	22.89	22.88	0	0
		3	3	22.85	22.86	22.83	0	0
	16QAM	6	0	21.95	21.93	21.86	0-1	1
		1	0	22.20	21.82	21.98	0-1	1
		1	3	22.23	21.86	22.04	0-1	1
		1	5	22.24	21.83	21.93	0-1	1
		3	0	21.96	21.96	21.92	0-1	1
		3	1	22.00	22.03	21.96	0-1	1
	64QAM	3	3	21.95	21.93	21.89	0-1	1
		6	0	21.05	20.91	20.92	0-2	2
		1	0	21.04	21.19	21.10	0-2	2
		1	3	21.09	21.22	21.17	0-2	2
		1	5	21.05	21.08	21.09	0-2	2
		3	0	21.19	21.08	21.05	0-2	2
		3	1	21.21	21.15	21.07	0-2	2
		3	3	21.17	21.04	21.00	0-2	2
		6	0	19.97	19.97	19.95	0-3	3

LTE Band 26\_ 3 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				26705 Ch. 815.5 MHz	26865 Ch. 831.5 MHz	27025 Ch. 847.5 MHz		
3 MHz	QPSK	1	0	22.96	22.96	22.90	0	0
		1	7	23.02	22.97	22.98	0	0
		1	14	22.96	22.87	22.90	0	0
		8	0	21.98	21.92	21.92	0-1	1
		8	3	22.01	21.96	21.96	0-1	1
		8	7	21.95	21.87	21.92	0-1	1
		15	0	21.99	21.92	21.96	0-1	1
	16QAM	1	0	21.99	22.44	22.13	0-1	1
		1	7	22.08	22.45	22.29	0-1	1
		1	14	21.97	22.32	22.24	0-1	1
		8	0	20.98	21.00	20.99	0-2	2
		8	3	21.00	21.01	21.01	0-2	2
		8	7	20.97	20.97	20.99	0-2	2
		15	0	21.00	21.03	21.02	0-2	2
	64QAM	1	0	21.15	20.79	21.22	0-2	2
		1	7	21.26	20.88	21.32	0-2	2
		1	14	21.14	20.79	21.15	0-2	2
		8	0	20.05	20.06	19.99	0-3	3
		8	3	20.08	20.08	20.02	0-3	3
		8	7	20.02	20.02	19.94	0-3	3
		15	0	19.94	20.04	20.02	0-3	3



LTE Band 26\_ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				26715 Ch. 816.5 MHz	26865 Ch. 831.5 MHz	27015 Ch. 846.5 MHz		
5 MHz	QPSK	1	0	22.91	22.87	22.99	0	0
		1	12	22.90	22.82	22.94	0	0
		1	24	22.87	22.76	22.94	0	0
		12	0	21.95	21.96	21.98	0-1	1
		12	6	21.95	22.00	21.99	0-1	1
		12	11	21.92	21.93	21.96	0-1	1
		25	0	21.97	22.01	21.98	0-1	1
	16QAM	1	0	22.07	22.26	22.14	0-1	1
		1	12	22.08	22.35	22.13	0-1	1
		1	24	22.06	22.33	22.10	0-1	1
		12	0	20.99	21.01	20.94	0-2	2
		12	6	21.01	21.01	20.94	0-2	2
		12	11	20.98	21.00	20.89	0-2	2
		25	0	21.05	20.97	20.98	0-2	2
	64QAM	1	0	21.03	21.12	21.32	0-2	2
		1	12	21.02	21.08	21.25	0-2	2
		1	24	20.98	21.06	21.18	0-2	2
		12	0	20.02	20.00	19.97	0-3	3
		12	6	20.03	20.03	20.02	0-3	3
		12	11	19.99	19.97	19.98	0-3	3
		25	0	19.99	20.00	20.00	0-3	3

LTE Band 26\_ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				26740 Ch. 819 MHz	26865 Ch. 831.5 MHz	26990 Ch. 844 MHz		
10 MHz	QPSK	1	0	22.92	22.93	22.85	0	0
		1	24	22.95	22.94	22.84	0	0
		1	49	22.95	22.98	22.80	0	0
		25	0	22.05	21.97	21.96	0-1	1
		25	12	22.04	21.98	21.95	0-1	1
		25	24	22.00	21.92	21.98	0-1	1
		50	0	22.03	21.98	21.90	0-1	1
	16QAM	1	0	22.08	21.99	21.89	0-1	1
		1	24	22.14	21.95	21.91	0-1	1
		1	49	22.11	22.06	21.81	0-1	1
		25	0	21.12	21.02	20.97	0-2	2
		25	12	21.10	20.99	20.95	0-2	2
		25	24	21.06	20.90	20.99	0-2	2
		50	0	21.03	20.97	20.94	0-2	2
	64QAM	1	0	21.21	21.14	21.22	0-2	2
		1	24	21.23	21.19	21.13	0-2	2
		1	49	21.21	21.20	20.95	0-2	2
		25	0	20.10	19.99	19.95	0-3	3
		25	12	20.10	20.00	19.92	0-3	3
		25	24	20.04	19.96	20.00	0-3	3
		50	0	20.06	20.05	19.92	0-3	3

LTE Band 26\_ 15 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]	MPR Allowed Per 3GPP [dB]	MPR [dB]
				26865 Ch. 831.5 MHz		
15 MHz	QPSK	1	0	22.88	0	0
		1	36	22.82	0	0
		1	74	22.89	0	0
		36	0	22.01	0-1	1
		36	18	21.99	0-1	1
		36	39	21.92	0-1	1
		75	0	21.95	0-1	1
	16QAM	1	0	22.30	0-1	1
		1	36	22.30	0-1	1
		1	74	22.28	0-1	1
		36	0	21.00	0-2	2
		36	18	20.97	0-2	2
		36	39	20.92	0-2	2
		75	0	20.96	0-2	2
	64QAM	1	0	21.17	0-2	2
		1	36	21.13	0-2	2
		1	74	21.14	0-2	2
		36	0	20.05	0-3	3
		36	18	20.04	0-3	3
		36	39	19.96	0-3	3
		75	0	19.97	0-3	3

[ LTE Band 41 Conducted Power ]

LTE Band 41\_ 5 MHz Bandwidth

Band width	Modulation	RB Size	RB Offset	Max. Average Power [dBm]					MPR Allowed Per GPP [dB]	MPR [dB]
				39750 Ch. 2506.0 MHz	40185 Ch. 2549.5 MHz	40620 Ch. 2593.0 MHz	41055 Ch. 2636.5 MHz	41490 Ch. 2680.0 MHz		
5 MHz	QPSK	1	0	23.33	23.31	23.16	23.35	23.10	0	0
		1	12	23.32	23.32	23.18	23.32	23.07	0	0
		1	24	23.27	23.30	23.14	23.36	22.99	0	0
		12	0	22.35	22.36	22.23	22.33	22.07	0-1	1
		12	6	22.37	22.36	22.25	22.34	22.08	0-1	1
		12	11	22.35	22.36	22.25	22.29	22.06	0-1	1
		25	0	22.36	22.33	22.24	22.33	22.04	0-1	1
	16QAM	1	0	22.42	22.41	22.35	22.40	22.20	0-1	1
		1	12	22.39	22.39	22.34	22.38	22.21	0-1	1
		1	24	22.41	22.39	22.33	22.43	22.12	0-1	1
		12	0	21.42	21.44	21.27	21.37	21.16	0-2	2
		12	6	21.44	21.42	21.33	21.38	21.14	0-2	2
		12	11	21.44	21.41	21.31	21.34	21.10	0-2	2
		25	0	21.48	21.42	21.35	21.40	21.20	0-2	2
	64QAM	1	0	21.21	21.18	21.12	21.16	20.97	0-2	2
		1	12	21.23	21.17	21.11	21.18	20.95	0-2	2
		1	24	21.16	21.17	21.10	21.20	20.86	0-2	2
		12	0	20.50	20.48	20.38	20.43	20.23	0-3	3
		12	6	20.50	20.48	20.39	20.44	20.21	0-3	3
		12	11	20.50	20.46	20.38	20.41	20.18	0-3	3
		25	0	20.50	20.52	20.40	20.45	20.22	0-3	3

LTE Band 41\_ 10 MHz Bandwidth

Band width	Modulation	RB Size	RB Offset	Max. Average Power [dBm]					MPR Allowed Per 3GPP [dB]	MPR [dB]
				39750 Ch. 2506.0 MHz	40185 Ch. 2549.5 MHz	40620 Ch. 2593.0 MHz	41055 Ch. 2636.5 MHz	41490 Ch. 2680.0 MHz		
10 MHz	QPSK	1	0	23.39	23.36	23.29	23.36	23.25	0	0
		1	24	23.36	23.30	23.29	23.26	23.15	0	0
		1	49	23.30	23.32	23.24	23.34	23.08	0	0
		25	0	22.43	22.38	22.26	22.37	22.15	0-1	1
		25	12	22.44	22.38	22.30	22.39	22.14	0-1	1
		25	24	22.40	22.38	22.28	22.35	22.06	0-1	1
		50	0	22.41	22.41	22.31	22.36	22.16	0-1	1
	16QAM	1	0	22.51	22.47	22.41	22.51	22.38	0-1	1
		1	24	22.43	22.46	22.37	22.42	22.25	0-1	1
		1	49	22.40	22.39	22.31	22.46	22.15	0-1	1
		25	0	21.52	21.46	21.40	21.46	21.27	0-2	2
		25	12	21.53	21.50	21.39	21.48	21.26	0-2	2
		25	24	21.50	21.46	21.40	21.43	21.21	0-2	2
		50	0	21.51	21.48	21.39	21.45	21.28	0-2	2
	64QAM	1	0	21.27	21.21	21.16	21.24	21.12	0-2	2
		1	24	21.23	21.17	21.12	21.20	21.06	0-2	2
		1	49	21.14	21.12	21.04	21.23	20.88	0-2	2
		25	0	20.57	20.49	20.42	20.47	20.33	0-3	3
		25	12	20.59	20.56	20.41	20.48	20.31	0-3	3
		25	24	20.52	20.50	20.43	20.45	20.25	0-3	3
		50	0	20.54	20.49	20.39	20.45	20.28	0-3	3

LTE Band 41 \_ 15 MHz Bandwidth

Band width	Modulation	RB Size	RB Offset	Max. Average Power [dBm]					MPR Allowed Per 3GPP [dB]	MPR [dB]
				39750 Ch. 2506.0 MHz	40185 Ch. 2549.5 MHz	40620 Ch. 2593.0 MHz	41055 Ch. 2636.5 MHz	41490 Ch. 2680.0 MHz		
15 MHz	QPSK	1	0	23.40	23.39	23.28	23.30	23.23	0	0
		1	36	23.33	23.32	23.22	23.25	23.12	0	0
		1	74	23.29	23.29	23.23	23.31	23.03	0	0
		36	0	22.38	22.37	22.26	22.36	22.12	0-1	1
		36	18	22.38	22.38	22.28	22.36	22.18	0-1	1
		36	39	22.35	22.36	22.21	22.33	22.11	0-1	1
	16QAM	75	0	22.40	22.39	22.30	22.35	22.10	0-1	1
		1	0	22.52	22.45	22.42	22.46	22.29	0-1	1
		1	36	22.45	22.43	22.38	22.44	22.23	0-1	1
		1	74	22.41	22.45	22.33	22.45	22.14	0-1	1
		36	0	21.44	21.43	21.32	21.40	21.17	0-2	2
		36	18	21.44	21.45	21.36	21.43	21.23	0-2	2
	64QAM	36	39	21.39	21.43	21.30	21.37	21.18	0-2	2
		75	0	21.53	21.51	21.44	21.47	21.22	0-2	2
		1	0	21.24	21.21	21.14	21.25	21.07	0-2	2
		1	36	21.20	21.18	21.13	21.19	21.04	0-2	2
		1	74	21.18	21.18	21.11	21.23	20.87	0-2	2
		36	0	20.49	20.45	20.37	20.49	20.26	0-3	3
	64QAM	36	18	20.50	20.47	20.39	20.46	20.32	0-3	3
		36	39	20.47	20.45	20.37	20.39	20.21	0-3	3
		75	0	20.54	20.49	20.42	20.45	20.25	0-3	3

LTE Band 41 \_ 20 MHz Bandwidth

Band width	Modulation	RB Size	RB Offset	Max. Average Power [dBm]					MPR Allowed Per 3GPP [dB]	MPR [dB]
				39750 Ch. 2506.0 MHz	40185 Ch. 2549.5 MHz	40620 Ch. 2593.0 MHz	41055 Ch. 2636.5 MHz	41490 Ch. 2680.0 MHz		
20 MHz	QPSK	1	0	23.28	23.31	23.24	23.32	23.25	0	0
		1	49	23.25	23.35	23.27	23.25	23.20	0	0
		1	99	23.19	23.29	23.24	23.28	23.00	0	0
		50	0	22.40	22.36	22.31	22.39	22.19	0-1	1
		50	25	22.37	22.39	22.30	22.37	22.15	0-1	1
		50	49	22.35	22.34	22.25	22.34	22.15	0-1	1
	16QAM	100	0	22.45	22.43	22.36	22.40	22.17	0-1	1
		1	0	22.55	22.42	22.44	22.48	22.35	0-1	1
		1	49	22.43	22.43	22.40	22.44	22.34	0-1	1
		1	99	22.37	22.37	22.33	22.41	22.11	0-1	1
		50	0	21.50	21.48	21.39	21.49	21.31	0-2	2
		50	25	21.50	21.50	21.41	21.45	21.24	0-2	2
	64QAM	50	49	21.48	21.44	21.36	21.44	21.24	0-2	2
		100	0	21.52	21.49	21.44	21.47	21.27	0-2	2
		1	0	21.23	21.16	21.14	21.21	21.09	0-2	2
		1	49	21.20	21.16	21.14	21.23	21.09	0-2	2
		1	99	21.15	21.12	21.11	21.19	20.85	0-2	2
		50	0	20.48	20.47	20.40	20.46	20.34	0-3	3
	64QAM	50	25	20.51	20.48	20.41	20.49	20.25	0-3	3
		50	49	20.45	20.43	20.38	20.41	20.24	0-3	3
		100	0	20.55	20.53	20.46	20.48	20.25	0-3	3

Note; LTE Band 41 has 5 required test channels per FCC KDB 447498 D01v06.

**[LTE Band 66 Conducted Power]**

LTE Band 66 \_ 1.4 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				131979Ch. 1710.7 MHz	132322 Ch. 1745 MHz	132665 Ch. 1779.3 MHz		
1.4 MHz	QPSK	1	0	22.42	22.34	21.75	0	0
		1	3	22.46	22.46	21.88	0	0
		1	5	22.39	22.32	21.73	0	0
		3	0	22.43	22.37	21.78	0	0
		3	1	22.44	22.39	21.82	0	0
		3	3	22.42	22.41	21.81	0	0
	16QAM	6	0	21.47	21.41	20.78	0-1	1
		1	0	21.77	21.76	21.23	0-1	1
		1	3	21.88	21.73	21.22	0-1	1
		1	5	21.76	21.71	21.21	0-1	1
		3	0	21.52	21.53	20.96	0-1	1
		3	1	21.59	21.50	20.94	0-1	1
	64QAM	3	3	21.57	21.51	20.87	0-1	1
		6	0	20.63	20.52	19.98	0-2	2
		1	0	20.78	20.61	20.12	0-2	2
		1	3	20.78	20.73	20.21	0-2	2
		1	5	20.70	20.69	20.12	0-2	2
		3	0	20.67	20.57	20.04	0-2	2
	3	1	20.75	20.65	20.10	0-2	2	
	3	3	20.68	20.62	20.11	0-2	2	
	6	0	19.59	19.48	18.89	0-3	3	

LTE Band 66 \_ 3 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				131987 Ch. 1711.5 MHz	132322 Ch. 1745 MHz	132657 Ch. 1778.5 MHz		
3 MHz	QPSK	1	0	22.47	22.46	21.85	0	0
		1	7	22.57	22.53	21.95	0	0
		1	14	22.47	22.42	21.87	0	0
		8	0	21.51	21.43	20.82	0-1	1
		8	3	21.49	21.44	20.88	0-1	1
		8	7	21.53	21.46	20.87	0-1	1
	16QAM	15	0	21.52	21.45	20.88	0-1	1
		1	0	21.83	21.86	21.28	0-1	1
		1	7	21.94	21.82	21.29	0-1	1
		1	14	21.74	21.74	21.26	0-1	1
		8	0	20.65	20.64	20.03	0-2	2
		8	3	20.70	20.63	20.06	0-2	2
	64QAM	8	7	20.63	20.61	20.04	0-2	2
		15	0	20.66	20.58	20.01	0-2	2
		1	0	20.78	20.67	20.15	0-2	2
		1	7	20.87	20.80	20.24	0-2	2
		1	14	20.80	20.67	20.20	0-2	2
		8	0	19.70	19.60	19.01	0-3	3
	8	3	19.70	19.63	19.08	0-3	3	
	8	7	19.70	19.63	19.01	0-3	3	
	15	0	19.64	19.54	18.98	0-3	3	

LTE Band 66 \_ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				131997 Ch. 1712.5 MHz	132322Ch. 1745 MHz	132647 Ch. 1777.5 MHz		
5 MHz	QPSK	1	0	22.53	22.50	21.98	0	0
		1	12	22.47	22.39	21.84	0	0
		1	24	22.44	22.43	21.90	0	0
		12	0	21.54	21.46	21.00	0-1	1
		12	6	21.56	21.47	20.99	0-1	1
		12	11	21.52	21.49	20.90	0-1	1
	16QAM	25	0	21.51	21.46	21.01	0-1	1
		1	0	21.83	21.92	21.41	0-1	1
		1	12	21.91	21.76	21.24	0-1	1
		1	24	21.88	21.77	21.25	0-1	1
		12	0	20.66	20.61	20.11	0-2	2
		12	6	20.65	20.64	20.11	0-2	2
	64QAM	12	11	20.63	20.57	20.00	0-2	2
		25	0	20.61	20.58	20.08	0-2	2
		1	0	20.85	20.74	20.31	0-2	2
		1	12	20.73	20.77	20.20	0-2	2
		1	24	20.80	20.75	20.22	0-2	2
		12	0	19.69	19.66	19.13	0-3	3
		12	6	19.72	19.63	19.21	0-3	3
		12	11	19.69	19.64	19.02	0-3	3
	25	0	19.64	19.56	19.10	0-3	3	

LTE Band 66 \_ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				132022 Ch. 1715 MHz	132322 Ch. 1745 MHz	132622 Ch. 1775 MHz		
10 MHz	QPSK	1	0	22.57	22.52	22.17	0	0
		1	24	22.43	22.45	21.97	0	0
		1	49	22.55	22.34	21.87	0	0
		25	0	21.55	21.54	21.12	0-1	1
		25	12	21.55	21.53	21.01	0-1	1
		25	24	21.59	21.50	21.03	0-1	1
		50	0	21.64	21.56	21.02	0-1	1
	16QAM	1	0	21.91	21.96	21.56	0-1	1
		1	24	21.78	21.83	21.28	0-1	1
		1	49	22.03	21.66	21.33	0-1	1
		25	0	20.68	20.63	20.27	0-2	2
		25	12	20.65	20.60	20.10	0-2	2
		25	24	20.70	20.58	20.15	0-2	2
		50	0	20.74	20.64	20.14	0-2	2
	64QAM	1	0	20.86	20.89	20.39	0-2	2
		1	24	20.84	20.72	20.31	0-2	2
		1	49	20.81	20.67	20.21	0-2	2
		25	0	19.73	19.66	19.21	0-3	3
		25	12	19.68	19.68	19.17	0-3	3
		25	24	19.74	19.65	19.14	0-3	3
		50	0	19.76	19.62	19.16	0-3	3

LTE Band 66 \_ 15 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				132047 Ch. 1717.5 MHz	132322 Ch. 1745 MHz	132597 Ch. 1772.5 MHz		
15 MHz	QPSK	1	0	22.54	22.56	22.15	0	0
		1	36	22.44	22.47	22.01	0	0
		1	74	22.62	22.42	21.91	0	0
		36	0	21.59	21.58	21.13	0-1	1
		36	18	21.70	21.60	21.17	0-1	1
		36	39	21.64	21.57	21.11	0-1	1
		75	0	21.67	21.61	21.21	0-1	1
	16QAM	1	0	21.98	21.89	21.56	0-1	1
		1	36	21.80	21.89	21.34	0-1	1
		1	74	21.93	21.77	21.41	0-1	1
		36	0	20.69	20.70	20.30	0-2	2
		36	18	20.76	20.69	20.28	0-2	2
		36	39	20.71	20.66	20.18	0-2	2
		75	0	20.80	20.69	20.29	0-2	2
	64QAM	1	0	20.84	20.83	20.39	0-2	2
		1	36	20.83	20.81	20.34	0-2	2
		1	74	20.92	20.69	20.26	0-2	2
		36	0	19.72	19.74	19.32	0-3	3
		36	18	19.85	19.74	19.34	0-3	3
		36	39	19.80	19.72	19.21	0-3	3
		75	0	19.83	19.72	19.33	0-3	3

LTE Band 66 \_ 20 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				132072 Ch. 1720 MHz	132322 Ch. 1745 MHz	132572 Ch. 1770 MHz		
20 MHz	QPSK	1	0	22.58	22.55	22.68	0	0
		1	49	22.27	22.52	22.18	0	0
		1	99	22.54	22.30	21.95	0	0
		50	0	21.70	21.66	21.74	0-1	1
		50	25	21.32	21.62	21.21	0-1	1
		50	49	21.61	21.60	21.13	0-1	1
		100	0	21.32	21.61	21.66	0-1	1
	16QAM	1	0	21.87	21.90	21.60	0-1	1
		1	49	21.98	21.91	21.47	0-1	1
		1	99	21.99	21.68	21.41	0-1	1
		50	0	20.85	20.72	20.39	0-2	2
		50	25	20.80	20.68	20.31	0-2	2
		50	49	20.77	20.70	20.22	0-2	2
		100	0	20.80	20.66	20.31	0-2	2
	64QAM	1	0	20.90	20.70	20.58	0-2	2
		1	49	20.97	20.85	20.49	0-2	2
		1	99	20.84	20.64	20.24	0-2	2
		50	0	19.84	19.79	19.41	0-3	3
		50	25	19.82	19.76	19.38	0-3	3
		50	49	19.77	19.71	19.24	0-3	3
		100	0	19.79	19.76	19.38	0-3	3

### 11.2.2 LTE Reduced Conducted Power

[ LTE Band 2 Conducted Power ]

LTE Band 2 \_ 1.4 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				18607 Ch. 1850.7 MHz	18900 Ch. 1880 MHz	19193 Ch. 1909.3 MHz		
1.4 MHz	QPSK	1	0	13.25	13.36	13.29	0	0
		1	3	13.32	13.41	13.33	0	0
		1	5	13.24	13.36	13.25	0	0
		3	0	13.27	13.42	13.28	0-1	0
		3	1	13.31	13.48	13.32	0-1	0
		3	3	13.26	13.45	13.24	0-1	0
	6	0	13.26	13.52	13.29	0-1	0	
	16QAM	1	0	13.74	13.54	13.41	0-1	0
		1	3	13.80	13.64	13.46	0-1	0
		1	5	13.75	13.55	13.27	0-1	0
		3	0	13.35	13.44	13.43	0-2	0
		3	1	13.43	13.48	13.45	0-2	0
		3	3	13.36	13.40	13.37	0-2	0
	64QAM	6	0	13.36	13.59	13.32	0-2	0
		1	0	13.57	13.57	13.63	0-2	0
		1	3	13.61	13.57	13.73	0-2	0
		1	5	13.52	13.50	13.63	0-2	0
		3	0	13.47	13.60	13.56	0-3	0
3		1	13.52	13.63	13.60	0-3	0	
	3	3	13.49	13.61	13.57	0-3	0	
	6	0	13.38	13.57	13.35	0-3	0	

LTE Band 2 \_ 3 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				18615 Ch. 1851.5 MHz	18900 Ch. 1880 MHz	19185 Ch. 1908.5 MHz		
3 MHz	QPSK	1	0	13.31	13.44	13.28	0	0
		1	7	13.48	13.60	13.44	0	0
		1	14	13.31	13.40	13.27	0	0
		8	0	13.35	13.50	13.33	0-1	0
		8	3	13.39	13.54	13.37	0-1	0
		8	7	13.33	13.49	13.34	0-1	0
		15	0	13.39	13.49	13.35	0-1	0
	16QAM	1	0	13.50	13.77	13.80	0-1	0
		1	7	13.66	13.84	13.95	0-1	0
		1	14	13.51	13.69	13.76	0-1	0
		8	0	13.44	13.64	13.49	0-2	0
		8	3	13.50	13.67	13.51	0-2	0
		8	7	13.44	13.62	13.44	0-2	0
		15	0	13.39	13.59	13.50	0-2	0
	64QAM	1	0	13.64	13.66	13.29	0-2	0
		1	7	13.77	13.79	13.39	0-2	0
		1	14	13.62	13.60	13.29	0-2	0
		8	0	13.45	13.59	13.55	0-3	0
		8	3	13.48	13.61	13.58	0-3	0
		8	7	13.44	13.55	13.54	0-3	0
		15	0	13.47	13.73	13.49	0-3	0



LTE Band 2\_ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				18625 Ch. 1852.5 MHz	18900 Ch. 1880 MHz	19175 Ch. 1907.5 MHz		
5 MHz	QPSK	1	0	13.36	13.50	13.31	0	0
		1	12	13.39	13.53	13.33	0	0
		1	24	13.36	13.44	13.26	0	0
		12	0	13.42	13.56	13.38	0-1	0
		12	6	13.41	13.53	13.42	0-1	0
		12	11	13.38	13.52	13.38	0-1	0
		25	0	13.35	13.52	13.39	0-1	0
	16QAM	1	0	13.66	13.99	13.73	0-1	0
		1	12	13.62	14.05	13.75	0-1	0
		1	24	13.52	13.94	13.71	0-1	0
		12	0	13.39	13.64	13.41	0-2	0
		12	6	13.43	13.69	13.44	0-2	0
		12	11	13.37	13.63	13.40	0-2	0
		25	0	13.43	13.67	13.42	0-2	0
	64QAM	1	0	13.49	13.86	13.71	0-2	0
		1	12	13.54	13.89	13.62	0-2	0
		1	24	13.45	13.79	13.58	0-2	0
		12	0	13.47	13.74	13.47	0-3	0
		12	6	13.47	13.77	13.51	0-3	0
		12	11	13.43	13.71	13.48	0-3	0
		25	0	13.43	13.64	13.48	0-3	0

LTE Band 2\_ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				18650 Ch. 1855 MHz	18900 Ch. 1880 MHz	19150 Ch. 1905 MHz		
10 MHz	QPSK	1	0	13.47	13.67	13.54	0	0
		1	24	13.42	13.55	13.44	0	0
		1	49	13.40	13.56	13.44	0	0
		25	0	13.42	13.57	13.40	0-1	0
		25	12	13.46	13.60	13.41	0-1	0
		25	24	13.39	13.57	13.38	0-1	0
		50	0	13.40	13.54	13.40	0-1	0
	16QAM	1	0	13.45	13.81	13.62	0-1	0
		1	24	13.41	13.73	13.64	0-1	0
		1	49	13.37	13.75	13.57	0-1	0
		25	0	13.49	13.62	13.51	0-2	0
		25	12	13.51	13.61	13.53	0-2	0
		25	24	13.46	13.57	13.49	0-2	0
		50	0	13.46	13.64	13.44	0-2	0
	64QAM	1	0	13.81	13.92	13.60	0-2	0
		1	24	13.75	13.93	13.63	0-2	0
		1	49	13.74	13.88	13.57	0-2	0
		25	0	13.44	13.68	13.49	0-3	0
		25	12	13.45	13.72	13.51	0-3	0
		25	24	13.40	13.66	13.50	0-3	0
		50	0	13.48	13.64	13.51	0-3	0

LTE Band 2 \_ 15 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				18675 Ch. 1857.5 MHz	18900 Ch. 1880 MHz	19125 Ch. 1902.5 MHz		
15 MHz	QPSK	1	0	13.42	13.65	13.39	0	0
		1	36	13.30	13.59	13.31	0	0
		1	74	13.30	13.55	13.28	0	0
		36	0	13.49	13.61	13.49	0-1	0
		36	18	13.47	13.62	13.46	0-1	0
		36	39	13.37	13.59	13.39	0-1	0
		75	0	13.40	13.58	13.42	0-1	0
	16QAM	1	0	13.99	13.85	13.60	0-1	0
		1	36	13.86	13.79	13.59	0-1	0
		1	74	13.84	13.80	13.54	0-1	0
		36	0	13.52	13.67	13.51	0-2	0
		36	18	13.55	13.65	13.52	0-2	0
		36	39	13.49	13.59	13.48	0-2	0
		75	0	13.50	13.65	13.49	0-2	0
	64QAM	1	0	13.39	13.80	13.45	0-2	0
		1	36	13.23	13.68	13.49	0-2	0
		1	74	13.22	13.71	13.48	0-2	0
		36	0	13.60	13.68	13.51	0-3	0
		36	18	13.56	13.69	13.52	0-3	0
		36	39	13.51	13.64	13.47	0-3	0
		75	0	13.50	13.63	13.52	0-3	0

LTE Band 2 \_ 20 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				18700 Ch. 1860 MHz	18900 Ch. 1880 MHz	19100 Ch. 1900 MHz		
20 MHz	QPSK	1	0	13.41	13.62	13.34	0	0
		1	49	13.37	13.59	13.33	0	0
		1	99	13.36	13.40	13.30	0	0
		50	0	13.55	13.62	13.46	0-1	0
		50	25	13.43	13.61	13.45	0-1	0
		50	49	13.51	13.57	13.44	0-1	0
		100	0	13.50	13.51	13.31	0-1	0
	16QAM	1	0	13.88	13.65	13.52	0-1	0
		1	49	13.73	13.61	13.57	0-1	0
		1	99	13.82	13.54	13.54	0-1	0
		50	0	13.54	13.74	13.42	0-2	0
		50	25	13.47	13.73	13.47	0-2	0
		50	49	13.53	13.66	13.48	0-2	0
		100	0	13.54	13.60	13.36	0-2	0
	64QAM	1	0	13.69	14.05	13.69	0-2	0
		1	49	13.63	13.96	13.73	0-2	0
		1	99	13.58	13.84	13.70	0-2	0
		50	0	13.51	13.70	13.46	0-3	0
		50	25	13.48	13.71	13.52	0-3	0
		50	49	13.57	13.65	13.52	0-3	0
		100	0	13.56	13.65	13.34	0-3	0

**[ LTE Band 4 Conducted Power ]**

LTE Band 4 \_ 1.4 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				19957 Ch. 1710.7 MHz	20175 Ch. 1732.5 MHz	20393 Ch. 1754.3 MHz		
1.4 MHz	QPSK	1	0	13.04	13.30	13.28	0	0
		1	3	13.09	13.36	13.36	0	0
		1	5	13.02	13.35	13.27	0	0
		3	0	13.07	13.33	13.32	0	0
		3	1	13.09	13.37	13.35	0	0
		3	3	13.04	13.35	13.31	0	0
		6	0	13.11	13.33	13.32	0-1	0
	16QAM	1	0	13.16	13.86	13.60	0-1	0
		1	3	13.22	13.92	13.84	0-1	0
		1	5	13.15	13.87	13.76	0-1	0
		3	0	13.06	13.35	13.41	0-1	0
		3	1	13.12	13.39	13.48	0-1	0
		3	3	13.06	13.34	13.42	0-1	0
		6	0	13.23	13.45	13.54	0-2	0
	64QAM	1	0	13.34	13.33	13.62	0-2	0
		1	3	13.43	13.38	13.67	0-2	0
		1	5	13.32	13.25	13.61	0-2	0
		3	0	13.19	13.54	13.53	0-2	0
		3	1	13.24	13.62	13.64	0-2	0
		3	3	13.20	13.51	13.52	0-2	0
		6	0	13.27	13.47	13.38	0-3	0

LTE Band 4 \_ 3 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				19965 Ch. 1711.5 MHz	20175 Ch. 1732.5 MHz	20385 Ch. 1753.5 MHz		
3 MHz	QPSK	1	0	13.09	13.33	13.43	0	0
		1	7	13.17	13.45	13.53	0	0
		1	14	13.02	13.30	13.37	0	0
		8	0	13.12	13.43	13.42	0-1	0
		8	3	13.14	13.43	13.41	0-1	0
		8	7	13.14	13.43	13.35	0-1	0
		15	0	13.15	13.41	13.43	0-1	0
	16QAM	1	0	13.31	13.91	13.67	0-1	0
		1	7	13.37	14.00	13.71	0-1	0
		1	14	13.31	13.85	13.61	0-1	0
		8	0	13.22	13.55	13.42	0-2	0
		8	3	13.29	13.59	13.47	0-2	0
		8	7	13.20	13.55	13.47	0-2	0
		15	0	13.18	13.51	13.37	0-2	0
	64QAM	1	0	13.24	13.67	13.78	0-2	0
		1	7	13.31	13.73	13.84	0-2	0
		1	14	13.23	13.60	13.74	0-2	0
		8	0	13.22	13.56	13.55	0-3	0
		8	3	13.23	13.58	13.57	0-3	0
		8	7	13.20	13.50	13.54	0-3	0
		15	0	13.13	13.59	13.53	0-3	0

LTE Band 4 \_ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				19975 Ch. 1712.5 MHz	20175 Ch. 1732.5 MHz	20375 Ch. 1752.5 MHz		
5 MHz	QPSK	1	0	13.19	13.48	13.34	0	0
		1	12	13.15	13.42	13.26	0	0
		1	24	13.13	13.38	13.23	0	0
		12	0	13.20	13.46	13.43	0-1	0
		12	6	13.15	13.48	13.44	0-1	0
		12	11	13.12	13.44	13.41	0-1	0
		25	0	13.17	13.44	13.40	0-1	0
	16QAM	1	0	13.36	13.59	13.43	0-1	0
		1	12	13.31	13.54	13.41	0-1	0
		1	24	13.25	13.54	13.38	0-1	0
		12	0	13.28	13.54	13.53	0-2	0
		12	6	13.25	13.51	13.53	0-2	0
		12	11	13.21	13.46	13.45	0-2	0
		25	0	13.26	13.42	13.47	0-2	0
	64QAM	1	0	13.46	13.78	13.56	0-2	0
		1	12	13.42	13.75	13.47	0-2	0
		1	24	13.40	13.70	13.48	0-2	0
		12	0	13.30	13.63	13.47	0-3	0
		12	6	13.31	13.63	13.47	0-3	0
		12	11	13.32	13.56	13.45	0-3	0
		25	0	13.14	13.50	13.47	0-3	0

LTE Band 4 \_ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20000 Ch. 1715 MHz	20175 Ch. 1732.5 MHz	20350 Ch. 1750 MHz		
10 MHz	QPSK	1	0	13.22	13.45	13.45	0	0
		1	24	13.09	13.36	13.30	0	0
		1	49	13.19	13.34	13.27	0	0
		25	0	13.18	13.51	13.49	0-1	0
		25	12	13.27	13.48	13.46	0-1	0
		25	24	13.22	13.42	13.38	0-1	0
		50	0	13.27	13.47	13.46	0-1	0
	16QAM	1	0	13.66	13.72	13.98	0-1	0
		1	24	13.56	13.59	13.85	0-1	0
		1	49	13.69	13.56	13.81	0-1	0
		25	0	13.28	13.60	13.56	0-2	0
		25	12	13.35	13.57	13.54	0-2	0
		25	24	13.35	13.51	13.50	0-2	0
		50	0	13.34	13.54	13.56	0-2	0
	64QAM	1	0	13.47	13.68	13.41	0-2	0
		1	24	13.39	13.52	13.31	0-2	0
		1	49	13.49	13.55	13.34	0-2	0
		25	0	13.30	13.55	13.63	0-3	0
		25	12	13.38	13.52	13.58	0-3	0
		25	24	13.32	13.48	13.52	0-3	0
		50	0	13.33	13.56	13.52	0-3	0

LTE Band 4 \_ 15 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20025 Ch. 1717.5 MHz	20175 Ch. 1732.5 MHz	20325 Ch. 1747.5 MHz		
15 MHz	QPSK	1	0	13.40	13.58	13.51	0	0
		1	36	13.33	13.38	13.35	0	0
		1	74	13.32	13.39	13.30	0	0
		36	0	13.43	13.52	13.48	0-1	0
		36	18	13.36	13.45	13.43	0-1	0
		36	39	13.33	13.39	13.37	0-1	0
		75	0	13.36	13.47	13.45	0-1	0
	16QAM	1	0	13.81	13.75	14.01	0-1	0
		1	36	13.69	13.58	13.85	0-1	0
		1	74	13.66	13.51	13.79	0-1	0
		36	0	13.47	13.60	13.54	0-2	0
		36	18	13.47	13.53	13.48	0-2	0
		36	39	13.41	13.45	13.42	0-2	0
		75	0	13.45	13.47	13.47	0-2	0
	64QAM	1	0	13.77	13.90	13.78	0-2	0
		1	36	13.71	13.77	13.63	0-2	0
		1	74	13.64	13.72	13.57	0-2	0
		36	0	13.53	13.62	13.61	0-3	0
		36	18	13.46	13.60	13.58	0-3	0
		36	39	13.37	13.55	13.46	0-3	0
		75	0	13.48	13.50	13.48	0-3	0

LTE Band 4 \_ 20 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]	MPR Allowed Per 3GPP [dB]	MPR [dB]
				20175 Ch. 1732.5 MHz		
20 MHz	QPSK	1	0	13.45	0	0
		1	49	13.36	0	0
		1	99	13.23	0	0
		50	0	13.55	0-1	0
		50	25	13.49	0-1	0
		50	49	13.41	0-1	0
		100	0	13.49	0-1	0
	16QAM	1	0	13.98	0-1	0
		1	49	13.85	0-1	0
		1	99	13.79	0-1	0
		50	0	13.62	0-2	0
		50	25	13.56	0-2	0
		50	49	13.47	0-2	0
		100	0	13.54	0-2	0
	64QAM	1	0	13.81	0-2	0
		1	49	13.68	0-2	0
		1	99	13.57	0-2	0
		50	0	13.69	0-3	0
		50	25	13.60	0-3	0
		50	49	13.56	0-3	0
		100	0	13.58	0-3	0

**[ LTE Band 5 Conducted Power ]**

LTE Band 5\_ 1.4 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20407 Ch. 824.7 MHz	20525 Ch. 836.5 MHz	20643 Ch. 848.3 MHz		
1.4 MHz	QPSK	1	0	18.41	18.37	18.07	0	0
		1	3	18.49	18.40	18.12	0	0
		1	5	18.39	18.32	18.03	0	0
		3	0	18.41	18.35	18.14	0	0
		3	1	18.44	18.34	18.15	0	0
		3	3	18.36	18.31	18.16	0	0
		6	0	18.42	18.34	18.24	0-1	0
	16QAM	1	0	18.54	18.51	18.19	0-1	0
		1	3	18.64	18.54	18.25	0-1	0
		1	5	18.54	18.49	18.21	0-1	0
		3	0	18.51	18.45	18.11	0-1	0
		3	1	18.51	18.49	18.15	0-1	0
		3	3	18.48	18.42	18.11	0-1	0
		6	0	18.45	18.51	18.28	0-2	0
	64QAM	1	0	18.74	18.59	18.26	0-2	0
		1	3	18.80	18.66	18.28	0-2	0
		1	5	18.75	18.61	18.22	0-2	0
		3	0	18.64	18.49	18.25	0-2	0
		3	1	18.70	18.52	18.31	0-2	0
		3	3	18.68	18.46	18.28	0-2	0
		6	0	18.50	18.54	18.28	0-3	0

LTE Band 5\_ 3 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20415 Ch. 825.5 MHz	20525 Ch. 836.5 MHz	20635 Ch. 847.5 MHz		
3 MHz	QPSK	1	0	18.40	18.39	18.20	0	0
		1	7	18.50	18.43	18.29	0	0
		1	14	18.35	18.31	18.14	0	0
		8	0	18.41	18.37	18.22	0-1	0
		8	3	18.46	18.44	18.24	0-1	0
		8	7	18.43	18.40	18.24	0-1	0
		15	0	18.46	18.41	18.26	0-1	0
	16QAM	1	0	18.93	18.63	18.77	0-1	0
		1	7	19.00	18.72	18.85	0-1	0
		1	14	18.87	18.62	18.73	0-1	0
		8	0	18.55	18.42	18.33	0-2	0
		8	3	18.58	18.40	18.34	0-2	0
		8	7	18.52	18.36	18.29	0-2	0
		15	0	18.54	18.49	18.31	0-2	0
	64QAM	1	0	18.75	18.52	18.37	0-2	0
		1	7	18.76	18.64	18.47	0-2	0
		1	14	18.44	18.47	18.30	0-2	0
		8	0	18.62	18.50	18.30	0-3	0
		8	3	18.59	18.49	18.30	0-3	0
		8	7	18.60	18.44	18.25	0-3	0
		15	0	18.57	18.42	18.42	0-3	0

LTE Band 5 \_ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20425 Ch. 826.5 MHz	20525 Ch. 836.5 MHz	20625 Ch. 846.5 MHz		
5 MHz	QPSK	1	0	18.50	18.43	18.29	0	0
		1	12	18.41	18.36	18.24	0	0
		1	24	18.34	18.37	18.23	0	0
		12	0	18.48	18.44	18.27	0-1	0
		12	6	18.48	18.43	18.29	0-1	0
		12	11	18.43	18.37	18.24	0-1	0
		25	0	18.47	18.43	18.31	0-1	0
	16QAM	1	0	18.84	18.61	18.81	0-1	0
		1	12	18.80	18.55	18.73	0-1	0
		1	24	18.75	18.50	18.65	0-1	0
		12	0	18.54	18.52	18.39	0-2	0
		12	6	18.48	18.49	18.37	0-2	0
		12	11	18.46	18.49	18.33	0-2	0
		25	0	18.48	18.45	18.31	0-2	0
	64QAM	1	0	18.85	18.79	18.57	0-2	0
		1	12	18.81	18.72	18.54	0-2	0
		1	24	18.73	18.66	18.51	0-2	0
		12	0	18.55	18.59	18.47	0-3	0
		12	6	18.56	18.60	18.47	0-3	0
		12	11	18.51	18.59	18.42	0-3	0
25		0	18.54	18.43	18.39	0-3	0	

LTE Band 5 \_ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]	MPR Allowed Per 3GPP [dB]	MPR [dB]
				20525 Ch. 836.5 MHz		
10 MHz	QPSK	1	0	18.32	0	0
		1	24	18.29	0	0
		1	49	18.25	0	0
		25	0	18.47	0-1	0
		25	12	18.43	0-1	0
		25	24	18.38	0-1	0
		50	0	18.44	0-1	0
	16QAM	1	0	18.55	0-1	0
		1	24	18.52	0-1	0
		1	49	18.43	0-1	0
		25	0	18.51	0-2	0
		25	12	18.48	0-2	0
		25	24	18.44	0-2	0
		50	0	18.46	0-2	0
	64QAM	1	0	18.55	0-2	0
		1	24	18.47	0-2	0
		1	49	18.44	0-2	0
		25	0	18.50	0-3	0
		25	12	18.51	0-3	0
		25	24	18.45	0-3	0
50		0	18.50	0-3	0	

**[LTE Band 12 Conducted Power]**

LTE Band 12\_ 1.4 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				23017 Ch. 699.7 MHz	23095 Ch. 707.5 MHz	23173 Ch. 715.3 MHz		
1.4 MHz	QPSK	1	0	18.55	18.42	18.27	0	0
		1	3	18.61	18.49	18.37	0	0
		1	5	18.54	18.41	18.29	0	0
		3	0	18.59	18.46	18.20	0	0
		3	1	18.64	18.52	18.25	0	0
		3	3	18.59	18.45	18.23	0	0
	16QAM	6	0	18.57	18.51	18.25	0-1	0
		1	0	18.73	18.92	18.48	0-1	0
		1	3	18.85	19.00	18.59	0-1	0
		1	5	18.77	18.92	18.50	0-1	0
		3	0	18.70	18.53	18.30	0-1	0
		3	1	18.70	18.60	18.32	0-1	0
	64QAM	3	3	18.64	18.53	18.29	0-1	0
		6	0	18.68	18.59	18.46	0-2	0
		1	0	18.65	18.67	18.56	0-2	0
		1	3	18.74	18.74	18.63	0-2	0
		1	5	18.67	18.68	18.59	0-2	0
		3	0	18.57	18.78	18.47	0-2	0
		3	1	18.57	18.80	18.51	0-2	0
		3	3	18.50	18.79	18.46	0-2	0
		6	0	18.63	18.57	18.30	0-3	0

LTE Band 12\_ 3 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				23025 Ch. 700.5 MHz	23095 Ch. 707.5 MHz	23165 Ch. 714.5 MHz		
3 MHz	QPSK	1	0	18.56	18.57	18.19	0	0
		1	7	18.65	18.65	18.28	0	0
		1	14	18.53	18.58	18.21	0	0
		8	0	18.59	18.60	18.27	0-1	0
		8	3	18.59	18.65	18.29	0-1	0
		8	7	18.53	18.58	18.27	0-1	0
		15	0	18.57	18.58	18.32	0-1	0
	16QAM	1	0	18.65	18.65	18.26	0-1	0
		1	7	18.76	18.81	18.34	0-1	0
		1	14	18.69	18.71	18.26	0-1	0
		8	0	18.74	18.66	18.46	0-2	0
		8	3	18.75	18.68	18.48	0-2	0
		8	7	18.69	18.65	18.42	0-2	0
		15	0	18.77	18.60	18.36	0-2	0
	64QAM	1	0	18.85	18.83	18.36	0-2	0
		1	7	18.95	18.93	18.45	0-2	0
		1	14	18.84	18.83	18.38	0-2	0
		8	0	18.68	18.70	18.37	0-3	0
		8	3	18.62	18.70	18.43	0-3	0
		8	7	18.57	18.68	18.39	0-3	0
		15	0	18.63	18.55	18.39	0-3	0



LTE Band 12\_ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]	
				23035 Ch. 701.5 MHz	23095 Ch. 707.5 MHz	23155 Ch. 713.5 MHz			
5 MHz	QPSK	1	0	18.53	18.55	18.37	0	0	
		1	12	18.50	18.53	18.30	0	0	
		1	24	18.61	18.54	18.27	0	0	
		12	0	18.57	18.57	18.43	0-1	0	
		12	6	18.58	18.60	18.37	0-1	0	
		12	11	18.57	18.58	18.35	0-1	0	
	16QAM	25	0	18.66	18.61	18.49	0-1	0	
		1	0	18.95	18.74	18.91	0-1	0	
		1	12	19.01	18.79	18.83	0-1	0	
		1	24	19.06	18.76	18.80	0-1	0	
		12	0	18.61	18.62	18.45	0-2	0	
		12	6	18.66	18.65	18.37	0-2	0	
	64QAM	12	11	18.62	18.52	18.36	0-2	0	
		25	0	18.70	18.59	18.52	0-2	0	
		1	0	18.86	18.69	18.40	0-2	0	
		1	12	18.84	18.66	18.32	0-2	0	
		1	24	18.90	18.64	18.41	0-2	0	
		12	0	18.60	18.63	18.53	0-3	0	
			12	6	18.63	18.65	18.45	0-3	0
			12	11	18.61	18.66	18.43	0-3	0
			25	0	18.73	18.59	18.57	0-3	0

LTE Band 12\_ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]	MPR Allowed Per 3GPP [dB]	MPR [dB]	
				23095 Ch. 707.5 MHz			
10 MHz	QPSK	1	0	18.53	0	0	
		1	24	18.61	0	0	
		1	49	18.60	0	0	
		25	0	18.62	0-1	0	
		25	12	18.65	0-1	0	
		25	24	18.64	0-1	0	
	16QAM	50	0	18.64	0-1	0	
		1	0	18.83	0-1	0	
		1	24	18.99	0-1	0	
		1	49	18.92	0-1	0	
		25	0	18.60	0-2	0	
		25	12	18.61	0-2	0	
	64QAM	25	24	18.60	0-2	0	
		50	0	18.62	0-2	0	
		1	0	18.85	0-2	0	
		1	24	18.89	0-2	0	
		1	49	18.95	0-2	0	
		25	0	18.66	0-3	0	
			25	12	18.66	0-3	0
			25	24	18.67	0-3	0
			50	0	18.64	0-3	0

**[LTE Band 13 Conducted Power ]**

LTE Band 13 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]	MPR Allowed Per 3GPP [dB]	MPR [dB]
				23230 Ch. 782 MHz		
5 MHz	QPSK	1	0	18.44	0	0
		1	24	18.41	0	0
		1	49	18.39	0	0
		25	0	18.48	0-1	0
		25	12	18.48	0-1	0
		25	24	18.48	0-1	0
	50	0	18.46	0-1	0	
	16QAM	1	0	18.58	0-1	0
		1	24	18.59	0-1	0
		1	49	18.59	0-1	0
		25	0	18.49	0-2	0
		25	12	18.50	0-2	0
		25	24	18.48	0-2	0
	50	0	18.46	0-2	0	
	64QAM	1	0	18.69	0-2	0
		1	24	18.69	0-2	0
		1	49	18.64	0-2	0
		25	0	18.44	0-3	0
25		12	18.46	0-3	0	
25		24	18.43	0-3	0	
50	0	18.52	0-3	0		

LTE Band 13 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]	MPR Allowed Per 3GPP [dB]	MPR [dB]
				23230 Ch. 782 MHz		
10 MHz	QPSK	1	0	18.29	0	0
		1	24	18.40	0	0
		1	49	18.36	0	0
		25	0	18.53	0-1	0
		25	12	18.51	0-1	0
		25	24	18.50	0-1	0
	50	0	18.55	0-1	0	
	16QAM	1	0	18.77	0-1	0
		1	24	18.91	0-1	0
		1	49	18.84	0-1	0
		25	0	18.53	0-2	0
		25	12	18.55	0-2	0
		25	24	18.52	0-2	0
	50	0	18.54	0-2	0	
	64QAM	1	0	18.14	0-2	0
		1	24	18.25	0-2	0
		1	49	18.28	0-2	0
		25	0	18.55	0-3	0
25		12	18.55	0-3	0	
25		24	18.49	0-3	0	
50	0	18.54	0-3	0		

**[ LTE Band 17 conducted Power ]**

LTE Band 17\_ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				23755 Ch. 706.5 MHz	23790 Ch. 710.0 MHz	23825 Ch. 713.5 MHz		
5 MHz	QPSK	1	0		18.43		0	0
		1	12		18.41		0	0
		1	24		18.45		0	0
		12	0		18.46		0-1	0
		12	6		18.50		0-1	0
		12	11		18.51		0-1	0
		25	0		18.54		0-1	0
	16QAM	1	0		18.71		0-1	0
		1	12		18.75		0-1	0
		1	24		18.75		0-1	0
		12	0		18.54		0-2	0
		12	6		18.57		0-2	0
		12	11		18.51		0-2	0
		25	0		18.56		0-2	0
	64QAM	1	0		18.66		0-2	0
		1	12		18.66		0-2	0
		1	24		18.70		0-2	0
		12	0		18.61		0-3	0
		12	6		18.64		0-3	0
		12	11		18.62		0-3	0
		25	0		18.58		0-3	0

LTE Band 17\_ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]	MPR Allowed Per 3GPP [dB]	MPR [dB]
				23790 Ch. 710.0 MHz		
10 MHz	QPSK	1	0	18.50	0	0
		1	24	18.48	0	0
		1	49	18.47	0	0
		25	0	18.53	0-1	0
		25	12	18.55	0-1	0
		25	24	18.55	0-1	0
		50	0	18.50	0-1	0
	16QAM	1	0	18.85	0-1	0
		1	24	18.89	0-1	0
		1	49	18.90	0-1	0
		25	0	18.56	0-2	0
		25	12	18.57	0-2	0
		25	24	18.55	0-2	0
		50	0	18.58	0-2	0
	64QAM	1	0	18.87	0-2	0
		1	24	18.86	0-2	0
		1	49	18.88	0-2	0
		25	0	18.61	0-3	0
		25	12	18.65	0-3	0
		25	24	18.62	0-3	0
		50	0	18.58	0-3	0

**[ LTE Band 26 Conducted Power ]**

LTE Band 26\_ 1.4 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				26697 Ch. 814.7 MHz	26865 Ch. 831.5 MHz	27033 Ch. 848.3 MHz		
1.4 MHz	QPSK	1	0	18.18	18.21	18.29	0	0
		1	3	18.29	18.23	18.37	0	0
		1	5	18.17	18.15	18.29	0	0
		3	0	18.28	18.26	18.30	0	0
		3	1	18.31	18.31	18.30	0	0
		3	3	18.26	18.25	18.28	0	0
	16QAM	6	0	18.29	18.34	18.31	0-1	0
		1	0	18.75	18.35	18.30	0-1	0
		1	3	18.84	18.44	18.30	0-1	0
		1	5	18.80	18.38	18.21	0-1	0
		3	0	18.38	18.26	18.35	0-1	0
		3	1	18.41	18.28	18.41	0-1	0
	64QAM	3	3	18.35	18.22	18.35	0-1	0
		6	0	18.42	18.39	18.32	0-2	0
		1	0	18.62	18.36	18.60	0-2	0
		1	3	18.63	18.42	18.67	0-2	0
		1	5	18.57	18.35	18.58	0-2	0
		3	0	18.51	18.41	18.51	0-2	0
		3	1	18.53	18.45	18.57	0-2	0
		3	3	18.46	18.38	18.55	0-2	0
		6	0	18.40	18.40	18.33	0-3	0

LTE Band 26\_ 3 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				26705 Ch. 815.5 MHz	26865 Ch. 831.5 MHz	27025 Ch. 847.5 MHz		
3 MHz	QPSK	1	0	18.29	18.31	18.37	0	0
		1	7	18.42	18.38	18.44	0	0
		1	14	18.31	18.27	18.31	0	0
		8	0	18.33	18.31	18.36	0-1	0
		8	3	18.37	18.34	18.40	0-1	0
		8	7	18.35	18.28	18.34	0-1	0
		15	0	18.42	18.34	18.40	0-1	0
	16QAM	1	0	18.49	18.55	18.76	0-1	0
		1	7	18.63	18.63	18.89	0-1	0
		1	14	18.51	18.49	18.71	0-1	0
		8	0	18.46	18.49	18.41	0-2	0
		8	3	18.48	18.49	18.43	0-2	0
		8	7	18.43	18.45	18.37	0-2	0
		15	0	18.44	18.44	18.45	0-2	0
	64QAM	1	0	18.62	18.48	18.23	0-2	0
		1	7	18.73	18.54	18.35	0-2	0
		1	14	18.66	18.42	18.21	0-2	0
		8	0	18.45	18.36	18.48	0-3	0
		8	3	18.48	18.41	18.51	0-3	0
		8	7	18.40	18.36	18.46	0-3	0
		15	0	18.47	18.51	18.42	0-3	0

LTE Band 26\_ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				26715 Ch. 816.5 MHz	26865 Ch. 831.5 MHz	27015 Ch. 846.5 MHz		
5 MHz	QPSK	1	0	18.40	18.33	18.34	0	0
		1	12	18.33	18.33	18.27	0	0
		1	24	18.36	18.28	18.23	0	0
		12	0	18.37	18.32	18.42	0-1	0
		12	6	18.39	18.36	18.43	0-1	0
		12	11	18.36	18.33	18.41	0-1	0
		25	0	18.32	18.34	18.45	0-1	0
	16QAM	1	0	18.60	18.83	18.74	0-1	0
		1	12	18.63	18.77	18.73	0-1	0
		1	24	18.56	18.51	18.65	0-1	0
		12	0	18.34	18.50	18.39	0-2	0
		12	6	18.38	18.49	18.39	0-2	0
		12	11	18.35	18.46	18.37	0-2	0
		25	0	18.40	18.50	18.38	0-2	0
	64QAM	1	0	18.48	18.69	18.56	0-2	0
		1	12	18.44	18.62	18.57	0-2	0
		1	24	18.48	18.62	18.44	0-2	0
		12	0	18.42	18.54	18.47	0-3	0
		12	6	18.43	18.55	18.44	0-3	0
		12	11	18.41	18.52	18.41	0-3	0
		25	0	18.42	18.47	18.45	0-3	0

LTE Band 26\_ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				26740 Ch. 819 MHz	26865 Ch. 831.5 MHz	26990 Ch. 844 MHz		
10 MHz	QPSK	1	0	18.35	18.30	18.42	0	0
		1	24	18.39	18.33	18.43	0	0
		1	49	18.32	18.42	18.39	0	0
		25	0	18.48	18.38	18.36	0-1	0
		25	12	18.47	18.37	18.38	0-1	0
		25	24	18.40	18.31	18.39	0-1	0
		50	0	18.43	18.36	18.35	0-1	0
	16QAM	1	0	18.35	18.52	18.43	0-1	0
		1	24	18.43	18.55	18.46	0-1	0
		1	49	18.37	18.60	18.40	0-1	0
		25	0	18.56	18.41	18.42	0-2	0
		25	12	18.57	18.43	18.38	0-2	0
		25	24	18.50	18.37	18.42	0-2	0
		50	0	18.55	18.45	18.35	0-2	0
	64QAM	1	0	18.70	18.61	18.44	0-2	0
		1	24	18.74	18.63	18.50	0-2	0
		1	49	18.71	18.69	18.51	0-2	0
		25	0	18.47	18.52	18.39	0-3	0
		25	12	18.46	18.53	18.38	0-3	0
		25	24	18.42	18.46	18.40	0-3	0
		50	0	18.52	18.44	18.42	0-3	0

LTE Band 26\_ 15 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]	MPR Allowed Per 3GPP [dB]	MPR [dB]
				26865 Ch. 831.5 MHz		
15 MHz	QPSK	1	0	18.30	0	0
		1	36	18.28	0	0
		1	74	18.34	0	0
		36	0	18.39	0-1	0
		36	18	18.36	0-1	0
		36	39	18.31	0-1	0
		75	0	18.37	0-1	0
	16QAM	1	0	18.84	0-1	0
		1	36	18.85	0-1	0
		1	74	18.82	0-1	0
		36	0	18.52	0-2	0
		36	18	18.49	0-2	0
		36	39	18.43	0-2	0
		75	0	18.49	0-2	0
	64QAM	1	0	18.26	0-2	0
		1	36	18.21	0-2	0
		1	74	18.20	0-2	0
		36	0	18.55	0-3	0
		36	18	18.53	0-3	0
		36	39	18.43	0-3	0
		75	0	18.44	0-3	0

**[ LTE Band 41 Conducted Power ]**

LTE Band 41 \_ 5 MHz Bandwidth

Band width	Modulation	RB Size	RB Offset	Reduced Power [dBm]					MPR Allowed Per GPP [dB]	MPR [dB]
				39750 Ch. 2506.0 MHz	40185 Ch. 2549.5 MHz	40620 Ch. 2593.0 MHz	41055 Ch. 2636.5 MHz	41490 Ch. 2680.0 MHz		
5 MHz	QPSK	1	0	16.53	16.55	16.56	16.65	16.52	0	0
		1	12	16.44	16.50	16.54	16.65	16.46	0	0
		1	24	16.44	16.50	16.56	16.76	16.47	0	0
		12	0	16.56	16.50	16.53	16.74	16.61	0-1	0
		12	6	16.56	16.54	16.61	16.74	16.58	0-1	0
		12	11	16.56	16.52	16.58	16.71	16.56	0-1	0
		25	0	16.51	16.47	16.54	16.72	16.54	0-1	0
	16QAM	1	0	16.70	16.64	16.72	16.87	16.70	0-1	0
		1	12	16.67	16.62	16.69	16.84	16.62	0-1	0
		1	24	16.71	16.68	16.73	16.93	16.66	0-1	0
		12	0	16.66	16.56	16.67	16.79	16.60	0-2	0
		12	6	16.67	16.61	16.67	16.83	16.64	0-2	0
		12	11	16.66	16.59	16.67	16.80	16.58	0-2	0
		25	0	16.68	16.62	16.70	16.85	16.66	0-2	0
	64QAM	1	0	16.43	16.36	16.41	16.60	16.47	0-2	0
		1	12	16.42	16.36	16.40	16.59	16.39	0-2	0
		1	24	16.37	16.36	16.44	16.64	16.38	0-2	0
		12	0	16.65	16.61	16.66	16.82	16.68	0-3	0
		12	6	16.67	16.64	16.70	16.83	16.69	0-3	0
		12	11	16.64	16.58	16.66	16.82	16.64	0-3	0
		25	0	16.67	16.64	16.69	16.88	16.69	0-3	0

LTE Band 41 \_ 10 MHz Bandwidth

Band width	Modulation	RB Size	RB Offset	Reduced Power [dBm]					MPR Allowed Per 3GPP [dB]	MPR [dB]
				39750 Ch. 2506.0 MHz	40185 Ch. 2549.5 MHz	40620 Ch. 2593.0 MHz	41055 Ch. 2636.5 MHz	41490 Ch. 2680.0 MHz		
10 MHz	QPSK	1	0	16.64	16.55	16.62	16.76	16.65	0	0
		1	24	16.58	16.52	16.61	16.65	16.56	0	0
		1	49	16.60	16.57	16.61	16.83	16.51	0	0
		25	0	16.61	16.50	16.55	16.77	16.64	0-1	0
		25	12	16.62	16.58	16.62	16.78	16.63	0-1	0
		25	24	16.52	16.50	16.61	16.70	16.58	0-1	0
		50	0	16.58	16.51	16.57	16.76	16.64	0-1	0
	16QAM	1	0	16.80	16.71	16.78	16.97	16.81	0-1	0
		1	24	16.75	16.65	16.74	16.89	16.70	0-1	0
		1	49	16.71	16.65	16.78	16.98	16.61	0-1	0
		25	0	16.73	16.62	16.72	16.89	16.71	0-2	0
		25	12	16.73	16.69	16.76	16.88	16.72	0-2	0
		25	24	16.68	16.62	16.74	16.86	16.69	0-2	0
		50	0	16.66	16.64	16.72	16.83	16.74	0-2	0
	64QAM	1	0	16.53	16.41	16.50	16.65	16.59	0-2	0
		1	24	16.43	16.37	16.46	16.60	16.49	0-2	0
		1	49	16.34	16.35	16.46	16.71	16.36	0-2	0
		25	0	16.72	16.64	16.72	16.91	16.76	0-3	0
		25	12	16.73	16.66	16.73	16.88	16.76	0-3	0
		25	24	16.69	16.62	16.72	16.89	16.70	0-3	0
		50	0	16.63	16.64	16.68	16.85	16.73	0-3	0

LTE Band 41 \_ 15 MHz Bandwidth

Band width	Modulation	RB Size	RB Offset	Reduced Power [dBm]					MPR Allowed Per 3GPP [dB]	MPR [dB]
				39750 Ch. 2506.0 MHz	40185 Ch. 2549.5 MHz	40620 Ch. 2593.0 MHz	41055 Ch. 2636.5 MHz	41490 Ch. 2680.0 MHz		
15 MHz	QPSK	1	0	16.53	16.46	16.53	16.67	16.55	0	0
		1	36	16.43	16.41	16.52	16.63	16.55	0	0
		1	74	16.46	16.47	16.56	16.74	16.46	0	0
		36	0	16.58	16.51	16.64	16.78	16.60	0-1	0
		36	18	16.57	16.59	16.65	16.79	16.67	0-1	0
		36	39	16.57	16.51	16.62	16.71	16.65	0-1	0
	16QAM	75	0	16.50	16.53	16.58	16.73	16.49	0-1	0
		1	0	16.78	16.66	16.78	16.95	16.73	0-1	0
		1	36	16.72	16.65	16.71	16.84	16.71	0-1	0
		1	74	16.71	16.73	16.85	16.96	16.66	0-1	0
		36	0	16.69	16.63	16.72	16.83	16.66	0-2	0
		36	18	16.67	16.66	16.73	16.86	16.71	0-2	0
	64QAM	36	39	16.58	16.64	16.70	16.80	16.68	0-2	0
		75	0	16.70	16.63	16.72	16.86	16.60	0-2	0
		1	0	16.49	16.38	16.47	16.69	16.53	0-2	0
		1	36	16.43	16.35	16.43	16.59	16.48	0-2	0
		1	74	16.32	16.37	16.48	16.65	16.38	0-2	0
		36	0	16.63	16.58	16.65	16.86	16.67	0-3	0
	36	18	16.67	16.60	16.73	16.85	16.73	0-3	0	
	36	39	16.56	16.56	16.70	16.84	16.65	0-3	0	
	75	0	16.66	16.63	16.69	16.84	16.68	0-3	0	

LTE Band 41 \_ 20 MHz Bandwidth

Band width	Modulation	RB Size	RB Offset	Reduced Power [dBm]					MPR Allowed Per 3GPP [dB]	MPR [dB]
				39750 Ch. 2506.0 MHz	40185 Ch. 2549.5 MHz	40620 Ch. 2593.0 MHz	41055 Ch. 2636.5 MHz	41490 Ch. 2680.0 MHz		
20 MHz	QPSK	1	0	16.61	16.47	16.53	16.72	16.65	0	0
		1	49	16.54	16.50	16.60	16.69	16.66	0	0
		1	99	16.46	16.47	16.56	16.74	16.52	0	0
		50	0	16.63	16.53	16.63	16.77	16.60	0-1	0
		50	25	16.60	16.54	16.63	16.80	16.52	0-1	0
		50	49	16.53	16.60	16.61	16.72	16.62	0-1	0
	16QAM	100	0	16.58	16.54	16.61	16.77	16.56	0-1	0
		1	0	16.85	16.71	16.82	16.95	16.78	0-1	0
		1	49	16.73	16.73	16.85	16.87	16.72	0-1	0
		1	99	16.69	16.71	16.85	16.92	16.60	0-1	0
		50	0	16.71	16.65	16.74	16.88	16.69	0-2	0
		50	25	16.68	16.64	16.72	16.85	16.66	0-2	0
	64QAM	50	49	16.67	16.69	16.74	16.85	16.68	0-2	0
		100	0	16.67	16.63	16.73	16.90	16.60	0-2	0
		1	0	16.44	16.37	16.44	16.64	16.47	0-2	0
		1	49	16.39	16.39	16.48	16.56	16.52	0-2	0
		1	99	16.31	16.39	16.45	16.61	16.33	0-2	0
		50	0	16.66	16.63	16.72	16.90	16.74	0-3	0
	50	25	16.67	16.62	16.70	16.90	16.64	0-3	0	
	50	49	16.62	16.65	16.69	16.83	16.68	0-3	0	
	100	0	16.63	16.67	16.71	16.85	16.90	0-3	0	

Note; LTE Band 41 has 5 required test channels per FCC KDB 447498 D01v06.



**[LTE Band 66 Conducted Power]**

LTE Band 66 \_ 1.4 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				131979Ch. 1710.7 MHz	132322 Ch. 1745 MHz	132665 Ch. 1779.3 MHz		
1.4 MHz	QPSK	1	0	13.18	13.36	13.36	0	0
		1	3	13.22	13.43	13.38	0	0
		1	5	13.17	13.26	13.31	0	0
		3	0	13.17	13.35	13.33	0	0
		3	1	13.22	13.36	13.38	0	0
		3	3	13.18	13.35	13.33	0	0
		6	0	13.19	13.39	13.34	0-1	0
	16QAM	1	0	13.70	13.67	13.63	0-1	0
		1	3	13.70	13.78	13.64	0-1	0
		1	5	13.59	13.72	13.59	0-1	0
		3	0	13.23	13.42	13.47	0-1	0
		3	1	13.33	13.43	13.52	0-1	0
		3	3	13.25	13.38	13.48	0-1	0
	64QAM	6	0	13.30	13.59	13.54	0-2	0
		1	0	13.29	13.69	13.49	0-2	0
		1	3	13.33	13.77	13.52	0-2	0
		1	5	13.29	13.69	13.44	0-2	0
		3	0	13.44	13.61	13.30	0-2	0
		3	1	13.50	13.66	13.36	0-2	0
		3	3	13.41	13.61	13.28	0-2	0
6	0	13.23	13.47	13.43	0-3	0		

LTE Band 66 \_ 3 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				131987 Ch. 1711.5 MHz	132322 Ch. 1745 MHz	132657 Ch. 1778.5 MHz		
3 MHz	QPSK	1	0	13.23	13.35	13.43	0	0
		1	7	13.27	13.41	13.53	0	0
		1	14	13.15	13.32	13.39	0	0
		8	0	13.26	13.46	13.43	0-1	0
		8	3	13.32	13.46	13.45	0-1	0
		8	7	13.25	13.44	13.39	0-1	0
		15	0	13.27	13.44	13.47	0-1	0
	16QAM	1	0	13.73	13.56	13.56	0-1	0
		1	7	13.83	13.67	13.66	0-1	0
		1	14	13.67	13.51	13.38	0-1	0
		8	0	13.39	13.49	13.55	0-2	0
		8	3	13.44	13.51	13.62	0-2	0
		8	7	13.37	13.51	13.55	0-2	0
		15	0	13.36	13.49	13.52	0-2	0
	64QAM	1	0	13.58	13.53	13.75	0-2	0
		1	7	13.66	13.64	13.84	0-2	0
		1	14	13.53	13.47	13.73	0-2	0
		8	0	13.48	13.54	13.42	0-3	0
		8	3	13.48	13.59	13.49	0-3	0
		8	7	13.47	13.52	13.42	0-3	0
		15	0	13.31	13.51	13.52	0-3	0

LTE Band 66 \_ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				131997 Ch. 1712.5 MHz	132322Ch. 1745 MHz	132647 Ch. 1777.5 MHz		
5 MHz	QPSK	1	0	13.34	13.48	13.41	0	0
		1	12	13.30	13.41	13.38	0	0
		1	24	13.30	13.35	13.35	0	0
		12	0	13.36	13.49	13.49	0-1	0
		12	6	13.33	13.47	13.49	0-1	0
		12	11	13.29	13.43	13.47	0-1	0
		25	0	13.30	13.46	13.43	0-1	0
	16QAM	1	0	13.52	13.78	13.95	0-1	0
		1	12	13.45	13.63	13.87	0-1	0
		1	24	13.42	13.61	13.87	0-1	0
		12	0	13.37	13.54	13.52	0-2	0
		12	6	13.35	13.56	13.50	0-2	0
		12	11	13.32	13.52	13.44	0-2	0
		25	0	13.28	13.56	13.54	0-2	0
	64QAM	1	0	13.64	13.62	13.41	0-2	0
		1	12	13.56	13.55	13.34	0-2	0
		1	24	13.55	13.52	13.29	0-2	0
		12	0	13.36	13.56	13.53	0-3	0
		12	6	13.39	13.59	13.58	0-3	0
		12	11	13.37	13.53	13.55	0-3	0
		25	0	13.37	13.58	13.54	0-3	0

LTE Band 66 \_ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				132022 Ch. 1715 MHz	132322 Ch. 1745 MHz	132622 Ch. 1775 MHz		
10 MHz	QPSK	1	0	13.38	13.47	13.49	0	0
		1	24	13.27	13.34	13.37	0	0
		1	49	13.33	13.34	13.33	0	0
		25	0	13.35	13.56	13.56	0-1	0
		25	12	13.35	13.50	13.52	0-1	0
		25	24	13.39	13.48	13.46	0-1	0
		50	0	13.40	13.51	13.49	0-1	0
	16QAM	1	0	13.61	13.99	13.90	0-1	0
		1	24	13.49	13.87	13.78	0-1	0
		1	49	13.60	13.82	13.75	0-1	0
		25	0	13.40	13.58	13.54	0-2	0
		25	12	13.37	13.62	13.51	0-2	0
		25	24	13.41	13.56	13.49	0-2	0
		50	0	13.52	13.51	13.55	0-2	0
	64QAM	1	0	13.50	13.84	13.77	0-2	0
		1	24	13.40	13.71	13.56	0-2	0
		1	49	13.49	13.68	13.59	0-2	0
		25	0	13.41	13.63	13.57	0-3	0
		25	12	13.36	13.57	13.54	0-3	0
		25	24	13.41	13.55	13.51	0-3	0
		25	0	13.44	13.55	13.54	0-3	0

LTE Band 66 \_ 15 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				132047 Ch. 1717.5 MHz	132322 Ch. 1745 MHz	132597 Ch. 1772.5 MHz		
15 MHz	QPSK	1	0	13.35	13.52	13.54	0	0
		1	36	13.29	13.42	13.46	0	0
		1	74	13.29	13.37	13.37	0	0
		36	0	13.34	13.55	13.55	0-1	0
		36	18	13.48	13.57	13.54	0-1	0
		36	39	13.42	13.46	13.44	0-1	0
		75	0	13.44	13.52	13.52	0-1	0
	16QAM	1	0	13.34	13.68	13.61	0-1	0
		1	36	13.25	13.62	13.50	0-1	0
		1	74	13.36	13.55	13.48	0-1	0
		36	0	13.44	13.55	13.57	0-2	0
		36	18	13.50	13.54	13.57	0-2	0
		36	39	13.44	13.51	13.53	0-2	0
		75	0	13.48	13.57	13.55	0-2	0
	64QAM	1	0	13.68	13.85	13.63	0-2	0
		1	36	13.64	13.75	13.48	0-2	0
		1	74	13.64	13.68	13.51	0-2	0
		36	0	13.48	13.62	13.63	0-3	0
		36	18	13.54	13.64	13.65	0-3	0
		36	39	13.52	13.53	13.54	0-3	0
		75	0	13.48	13.59	13.57	0-3	0

LTE Band 66 \_ 20 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				132072 Ch. 1720 MHz	132322 Ch. 1745 MHz	132572 Ch. 1770 MHz		
20 MHz	QPSK	1	0	13.34	13.45	13.40	0	0
		1	49	13.39	13.48	13.40	0	0
		1	99	13.28	13.37	13.23	0	0
		50	0	13.48	13.60	13.52	0-1	0
		50	25	13.48	13.56	13.56	0-1	0
		50	49	13.42	13.51	13.50	0-1	0
		100	0	13.48	13.56	13.47	0-1	0
	16QAM	1	0	13.82	13.62	13.62	0-1	0
		1	49	13.88	13.73	13.62	0-1	0
		1	99	13.77	13.63	13.52	0-1	0
		50	0	13.59	13.64	13.59	0-2	0
		50	25	13.55	13.61	13.62	0-2	0
		50	49	13.52	13.56	13.55	0-2	0
		100	0	13.53	13.59	13.53	0-2	0
	64QAM	1	0	13.24	13.56	13.59	0-2	0
		1	49	13.30	13.65	13.53	0-2	0
		1	99	13.19	13.64	13.43	0-2	0
		50	0	13.64	13.64	13.59	0-3	0
		50	25	13.61	13.57	13.59	0-3	0
		50	49	13.58	13.54	13.59	0-3	0
		100	0	13.52	13.59	13.51	0-3	0

### 11.3 WIFI Conducted Power measurement method

#### Un-Licensed bands (DTS Band)

Test Description	Test Procedure Used
Conducted Output Power	- KDB 558074 v05 - Section 8.3.2.3 - ANSI 63.10-2013 - Section 11.9.2.3

#### Test Procedure

1. Measure the duty cycle.
2. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
3. Add  $10 \log(1/x)$ , where  $x$  is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

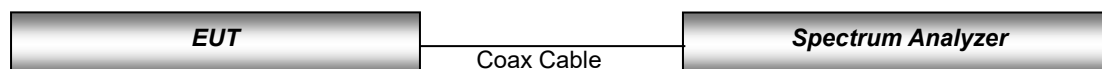
#### Un-Licensed bands (NII Band)

Test Description	Test Procedure Used
Conducted Output Power	- KDB 789033 D02 v02r01 - Section E.3.a

#### Test Procedure

1. Measure the duty cycle.
2. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
3. Add  $10 \log(1/x)$ , where  $x$  is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

#### Test setup



**11.3.1 IEEE 802.11 (2.4 GHz) Maximum Conducted Power**

Mode	Frequency [MHz]	Channel	IEEE 802.11 (2.4 GHz) Average RF Conducted Power [dBm]		
			Ant. 1	Ant. 2	MIMO
802.11b	2 412	1	13.11	13.14	16.14
	2 437	6	13.96	14.59	17.30
	2 442	7	14.65	15.41	18.06
	2 462	11	14.76	15.45	18.13
	2 467	12	2.68	3.10	5.91
	2 472	13	-4.13	-2.60	-0.29
802.11g	2 412	1	13.55	13.56	16.57
	2 417	2	14.50	15.05	17.80
	2 437	6	14.50	15.08	17.81
	2 462	11	14.51	14.85	17.70
	2 467	12	2.20	2.53	5.38
	2 472	13	-4.91	-3.49	-1.13
802.11n (HT20)	2 412	1	13.50	13.37	16.45
	2 417	2	15.22	14.74	18.00
	2 437	6	15.17	14.93	18.06
	2 462	11	14.54	14.77	17.67
	2 467	12	2.05	2.38	5.23
	2 472	13	-4.92	-3.67	-1.24
802.11ac (HT20)	2 412	1	13.52	13.37	16.46
	2 417	2	15.21	14.72	17.99
	2 437	6	14.50	14.88	17.71
	2 462	11	14.50	14.72	17.62
	2 467	12	2.02	2.27	5.16
	2 472	13	-4.90	-3.70	-1.25

**11.3.2 IEEE 802.11 (2.4 GHz) Reduced Conducted Power**

Mode	Frequency [MHz]	Channel	IEEE 802.11 (2.4 GHz) Reduced Conducted Power [dBm]		
			Ant. 1	Ant. 2	MIMO
802.11b	2 412	1	12.96	12.48	15.74
	2 437	6	12.86	12.47	15.68
	2 462	11	12.61	12.29	15.46
	2 467	12	2.68	3.10	5.91
	2 472	13	-4.13	-2.60	-0.29
802.11g	2 412	1	12.71	11.59	15.20
	2 437	6	12.36	11.95	15.17
	2 462	11	11.91	11.70	14.82
	2 467	12	2.20	2.53	5.38
	2 472	13	-4.91	-3.49	-1.13
802.11n (HT20)	2 412	1	12.52	11.50	15.05
	2 437	6	12.13	11.75	14.96
	2 462	11	11.62	11.51	14.58
	2 467	12	2.05	2.38	5.23
	2 472	13	-4.92	-3.67	-1.24
802.11ac (HT20)	2 412	1	12.47	11.50	15.03
	2 437	6	12.20	11.72	14.98
	2 462	11	11.72	11.50	14.62
	2 467	12	2.02	2.27	5.16
	2 472	13	-4.90	-3.70	-1.25

**11.3.3 IEEE 802.11 (5 GHz) Maximum Conducted Power**

Mode	Frequency [MHz]	Channel	IEEE 802.11 (5 GHz) Average RF Conducted Power [dBm] 802.11a (20 MHz BW)		
			Ant. 1	Ant. 2	MIMO
802.11a (20 MHz BW)	5 180	36	13.90	13.82	16.87
	5 200	40	15.56	13.86	17.81
	5 220	44	14.65	13.85	17.28
	5 240	48	15.09	15.40	18.26
	5 260	52	15.37	15.48	18.44
	5 280	56	15.45	15.31	18.49
	5 300	60	14.32	15.15	17.77
	5 320	64	14.26	15.21	17.77
	5 500	100	12.44	13.29	15.90
	5 600	120	14.51	14.86	17.70
	5 620	124	14.50	14.50	17.51
	5 720	144	14.09	15.42	17.82
	5 745	149	13.90	15.45	17.76
	5 785	157	14.68	15.43	18.08
5 825	165	14.83	15.39	18.13	

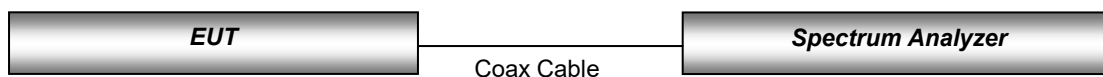
**11.3.4 IEEE 802.11 (5 GHz) Reduced Conducted Power**

Mode	Frequency [MHz]	Channel	IEEE 802.11 (5 GHz) Reduced Conducted Power [dBm] 802.11ac (80 MHz BW)		
			Ant. 1	Ant. 2	MIMO
802.11ac (80 MHz BW)	5 210	42	10.41	9.51	12.99
	5 290	58	10.42	9.10	12.82
	5 530	106	9.63	9.96	12.81
	5 610	122	10.28	10.12	13.21
	5 690	138	10.49	9.85	13.19
	5 775	155	9.47	9.14	12.32

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

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

**Test Configuration**



## 11.4 Bluetooth

### 11.4.1 Bluetooth Maximum Conducted Power

The Burst averaged-conducted power

Mode	Channel	Bluetooth Power [dBm]
DH5	0	10.96
	39	10.55
	78	10.09
2-DH5	0	8.46
	39	7.79
	78	7.80
3-DH5	0	8.45
	39	7.80
	78	7.82

Per October 2016 TCB Workshop Notes:

When call box and Bluetooth protocol are used for Bluetooth SAR measurement, time-domain plot is required to identify duty factor for supporting the test setup and result.

Bluetooth duty cycle was measured using Bluetooth tester equipment (CBT / R&S) with Bluetooth DH5 mode.



Bluetooth

Duty Cycle

$$= (\text{BT-On time} / \text{BT-Full time}) = (2.890 / 3.750) = 0.771 \text{ (DH5)}$$

$$\text{Duty factor} = 1 / \text{Duty cycle} : 1.297$$



## 12. System Verification

### 12.1 Tissue Verification

The Head simulating material is calibrated by HCT using the DAKS 3.5 to determine the conductivity and permittivity.

Table for Head Tissue Verification									
Date of Tests	Tissue Temp. (°C)	Tissue Type	Freq. (MHz)	Measured Conductivity $\sigma$ (S/m)	Measured Dielectric Constant, $\epsilon$	Target Conductivity $\sigma$ (S/m)	Target Dielectric Constant, $\epsilon$	% dev $\sigma$	% dev $\epsilon$
03/03/2021	20.7	750H	705	0.879	43.016	0.889	42.174	-1.12	2.00
			710	0.883	42.880	0.890	42.148	-0.79	1.74
			750	0.926	42.417	0.893	41.940	3.70	1.14
			785	0.928	41.968	0.896	41.758	3.57	0.50
03/02/2021	21.9	835H	820	0.895	42.061	0.899	41.577	-0.44	1.16
			835	0.912	41.817	0.900	41.500	1.33	0.76
			850	0.926	41.683	0.916	41.500	1.09	0.44
03/03/2021	20.7	835H	820	0.895	42.052	0.899	41.577	-0.44	1.14
			835	0.913	41.842	0.900	41.500	1.44	0.82
			850	0.927	41.701	0.916	41.500	1.20	0.48
03/09/2021	21.4	1800H	1710	1.337	41.168	1.348	40.144	-0.82	2.55
			1750	1.378	40.005	1.371	40.080	0.51	-0.19
			1800	1.429	40.812	1.400	40.000	2.07	2.03
03/09/2021	21.4	1800H	1710	1.334	41.036	1.348	40.144	-1.04	2.22
			1750	1.374	40.921	1.371	40.080	0.22	2.10
			1800	1.434	40.682	1.400	40.000	2.43	1.71
03/02/2021	21.9	1900H	1850	1.382	41.575	1.400	40.000	-1.29	3.94
			1900	1.449	41.336	1.400	40.000	3.50	3.34
			1910	1.445	41.297	1.400	40.000	3.21	3.24
03/05/2021	21.2	1900H	1850	1.383	41.447	1.400	40.000	-1.21	3.62
			1900	1.446	41.214	1.400	40.000	3.29	3.04
			1910	1.443	41.153	1.400	40.000	3.07	2.88
03/11/2021	20.6	2450H	2400	1.692	40.417	1.756	39.290	-3.64	2.87
			2450	1.738	40.350	1.800	39.200	-3.44	2.93
			2500	1.783	40.139	1.855	39.140	-3.88	2.55
03/10/2021	21.7	2450H	2400	1.677	40.408	1.756	39.290	-4.50	2.85
			2450	1.733	40.334	1.800	39.200	-3.72	2.89
			2500	1.783	40.149	1.855	39.140	-3.88	2.58
03/04/2021	21.2	2600H	2500	1.783	40.120	1.855	39.140	-3.88	2.50
			2600	1.892	39.646	1.964	39.010	-3.67	1.63
			2690	2.070	39.410	2.062	38.894	0.39	1.33

Table for Head Tissue Verification									
Date of Tests	Tissue Temp. (°C)	Tissue Type	Freq. (MHz)	Measured Conductivity $\sigma$ (S/m)	Measured Dielectric Constant, $\epsilon$	Target Conductivity $\sigma$ (S/m)	Target Dielectric Constant, $\epsilon$	% dev $\sigma$	% dev $\epsilon$
03/11/2021	22.5	5180H-5825H	5180	4.648	37.024	4.635	36.010	0.28	2.82
			5250	4.708	37.207	4.706	35.930	0.04	3.55
			5280	4.729	36.760	4.737	35.894	-0.17	2.41
			5320	4.984	36.852	4.778	35.846	4.31	2.81
			5500	4.994	36.523	4.963	35.640	0.62	2.48
			5600	5.058	36.526	5.065	35.530	-0.14	2.80
			5750	5.206	36.715	5.219	35.360	-0.25	3.83
			5800	5.240	36.479	5.270	35.300	-0.57	3.34
			5825	5.069	36.116	5.296	35.270	-4.29	2.40
03/10/2021	22.0	5180H-5825H	5180	4.682	36.996	4.635	36.010	1.01	2.74
			5250	4.850	37.104	4.706	35.930	3.06	3.27
			5280	4.723	36.833	4.737	35.894	-0.30	2.62
			5320	4.759	37.119	4.778	35.846	-0.40	3.55
			5500	5.057	36.719	4.963	35.640	1.89	3.03
			5600	5.190	36.746	5.065	35.530	2.47	3.42
			5750	5.317	36.707	5.219	35.360	1.88	3.81
			5800	5.157	37.062	5.270	35.300	-2.14	4.99
			5825	5.122	36.416	5.296	35.270	-3.29	3.25

### 12.2 System Verification

Input Power: 50 mW

Freq. [MHz]	Date	Probe (S/N)	Dipole (S/N)	Liquid	Amb. Temp. [°C]	Liquid Temp. [°C]	1 W Target SAR <sub>1g</sub> (SPEAG) [W/kg]	50mW Measured SAR <sub>1g</sub> [W/kg]	1 W Normalized SAR <sub>1g</sub> [W/kg]	Deviation [%]	Limit [%]
750	03/03/2021	3863	1014	Head	20.8	20.7	8.39	0.403	8.06	- 3.93	± 10
835	03/02/2021	3863	4d165	Head	22.1	21.9	9.56	0.443	8.86	- 7.32	± 10
835	03/03/2021	3863		Head	20.8	20.7	9.56	0.445	8.90	- 6.90	± 10
1 800	03/09/2021	3863	2d007	Head	21.5	21.4	38.1	1.91	38.2	+ 0.26	± 10
1 800	03/09/2021	3863		Head	21.5	21.4	38.1	1.92	38.4	+ 0.79	± 10
1 900	03/02/2021	3863	5d032	Head	22.1	21.9	40.0	2.14	42.8	+ 7.00	± 10
1 900	03/05/2021	3863		Head	21.3	21.2	40.0	2.14	42.8	+ 7.00	± 10
2 450	03/11/2021	3863	1049	Head	20.7	20.6	51.4	2.57	51.4	+ 0.00	± 10
2 450	03/10/2021	3863		Head	21.8	21.7	51.4	2.57	51.4	+ 0.00	± 10
2 600	03/04/2021	3863	1015	Head	21.3	21.2	56.7	2.79	55.8	- 1.59	± 10
5 250	03/11/2021	3968	1253	Head	22.6	22.5	79.7	4.20	84.0	+ 5.40	± 10
5 600	03/11/2021	3968		Head	22.6	22.5	82.2	4.49	89.8	+ 9.25	± 10
5 750	03/11/2021	3968		Head	22.6	22.5	79.6	4.00	80.0	+ 0.50	± 10
5 250	03/10/2021	3968	1253	Head	22.1	22.0	79.7	4.26	85.2	+ 6.90	± 10
5 600	03/10/2021	3968		Head	22.1	22.0	82.2	4.25	85.0	+ 3.41	± 10
5 750	03/10/2021	3968		Head	22.1	22.0	79.6	3.71	74.2	- 6.78	± 10

### 12.3 System Verification Procedure

SAR measurement was prior to assessment, the system is verified to the  $\pm 10\%$  of the specifications at each frequency band by using the system verification kit. (Graphic Plots Attached)

- Cabling the system, using the verification kit equipment.
- Generate about 50 mW Input level from the signal generator to the Dipole Antenna.
- Dipole antenna was placed below the flat phantom.
- The measured one-gram SAR at the surface of the phantom above the dipole feed-point should be within 10 % of the target reference value.
- The results are normalized to 1 W input power.

Note;

SAR Verification was performed according to the FCC KDB 865664 D01v01r04.

### 13. SAR Test Data Summary

#### 13.1 SAR Measurement Results

UMTS 850 Body SAR													
Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Sensor	Duty Cycle	Distance	1g Meas. SAR	Scaling Factor	1g Scaled SAR	Plot No.
Mhz	Ch.												
826.4	4132	RMC	21.0	20.07	0.18	Rear	Active	1:1	0	<b>0.754</b>	1.239	0.934	1
836.6	4183	RMC	21.0	20.06	-0.14	Rear	Active	1:1	0	0.731	1.242	0.908	-
846.6	4233	RMC	21.0	19.94	0.19	Rear	Active	1:1	0	0.740	1.276	<b>0.944</b>	2
836.6	4183	RMC	24.5	23.59	-0.06	Rear	Inactive	1:1	15	0.517	1.233	0.637	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg Averaged over 1 gram						

Note: \* Data entry indicate Variability measurement.

UMTS 1700 Body SAR(1g)													
Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Sensor	Duty Cycle	Distance	1g Meas. SAR	Scaling Factor	1g Scaled SAR	Plot No.
Mhz	Ch.												
1 712.4	1312	RMC	15.0	13.87	0.01	Rear	Active	1:1	0	0.680	1.297	0.882	-
1 732.4	1412	RMC	15.0	13.92	0.01	Rear	Active	1:1	0	0.764	1.282	0.979	-
1 752.6	1513	RMC	15.0	13.77	0.01	Rear	Active	1:1	0	0.761	1.327	1.010	-
1 712.4	1312	RMC	23.5	22.73	-0.01	Rear	Inactive	1:1	15	1.02	1.194	1.218	-
1 732.4	1412	RMC	23.5	23.10	0.10	Rear	Inactive	1:1	15	1.01	1.096	1.107	-
1 752.6	1513	RMC	23.5	22.90	0.16	Rear	Inactive	1:1	15	1.19	1.148	<b>1.366</b>	3
1 752.6	1513	RMC	23.5	22.90	0.17	Rear	Inactive	1:1	15	1.16	1.148	1.332	*
1 752.6	1513	RMC	23.5	22.90	0.14	Rear	Inactive	1:1	15	1.19	1.148	1.366	**
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg Averaged over 1 gram						

Note: \* Data entry indicate Variability measurement.

\*\* Data entry indicate Device holder perturbation measurement.

UMTS 1900 Body SAR													
Frequency		Mode	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Sensor	Duty Cycle	Distance	1g Meas. SAR	Scaling Factor	1g Scaled SAR	Plot No.
Mhz	Ch.												
1 880.0	9400	RMC	15.0	14.19	0.01	Rear	Active	1:1	0	0.578	1.205	0.696	-
1 852.4	9262	RMC	23.5	23.00	0.17	Rear	Inactive	1:1	15	1.08	1.122	<b>1.212</b>	4
1 880.0	9400	RMC	23.5	22.80	0.17	Rear	Inactive	1:1	15	0.885	1.175	1.040	-
1 907.6	9538	RMC	23.5	23.10	0.16	Rear	Inactive	1:1	15	0.768	1.096	0.842	-
1 852.4	9262	RMC	23.5	23.00	0.01	Rear	Inactive	1:1	15	1.03	1.122	1.156	*
1 852.4	9262	RMC	23.5	23.00	0.16	Rear	Inactive	1:1	15	0.948	1.122	1.064	**
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg Averaged over 1 gram						

Note: \* Data entry indicate Variability measurement.

\*\* Data entry indicate Device holder perturbation measurement.

LTE Band 2 Body SAR																	
Frequency		Mode	Band width	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Sensor	MPR	RB Size	RB offset	Duty Cycle	Distance	1g Meas. SAR	Scaling Factor	1g Scaled SAR	Plot No.
Mhz	Ch.																
1 880	18900	QPSK	20	15.0	13.62	0.10	Rear	Active	0	1	0	1:1	0	0.565	1.374	0.776	-
1 880	18900	QPSK	20	15.0	13.62	0.01	Rear	Active	0	50	0	1:1	0	0.577	1.374	0.793	-
1 860	18700	QPSK	20	23.5	22.12	0.02	Rear	Inactive	0	1	0	1:1	15	0.902	1.374	<b>1.239</b>	5
1 880	18900	QPSK	20	23.5	22.65	0.12	Rear	Inactive	0	1	0	1:1	15	0.786	1.216	0.956	-
1 900	19100	QPSK	20	23.5	22.45	-0.15	Rear	Inactive	0	1	0	1:1	15	0.710	1.274	0.905	-
1 860	18700	QPSK	20	22.5	21.21	0.15	Rear	Inactive	1	50	0	1:1	15	0.712	1.346	0.958	-
1 880	18900	QPSK	20	22.5	21.60	-0.12	Rear	Inactive	1	50	0	1:1	15	0.627	1.230	0.771	-
1 900	19100	QPSK	20	22.5	21.59	-0.19	Rear	Inactive	1	50	0	1:1	15	0.685	1.233	0.845	-
1 880	18900	QPSK	20	22.5	21.52	0.18	Rear	Inactive	1	100	0	1:1	15	0.646	1.253	0.809	-
1 860	18700	QPSK	20	23.5	22.12	0.02	Rear	Inactive	0	1	0	1:1	15	0.895	1.374	1.230	*
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg Averaged over 10 gram										

Note: \* Data entry indicate Variability measurement.

LTE Band 12 Body SAR																	
Frequency		Mode	Band width	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Sensor	MPR	RB Size	RB offset	Duty Cycle	Distance	1g Meas. SAR	Scaling Factor	1g Scaled SAR	Plot No.
Mhz	Ch.																
707.5	23095	QPSK	10	20.0	18.61	0.19	Rear	Active	0	1	24	1:1	0	0.652	1.380	0.900	-
707.5	23095	QPSK	10	20.0	18.65	0.10	Rear	Active	0	25	12	1:1	0	0.665	1.368	<b>0.910</b>	6
707.5	23095	QPSK	10	20.0	18.64	0.13	Rear	Active	0	50	0	1:1	0	0.660	1.368	0.903	-
707.5	23095	QPSK	10	24.5	23.06	0.05	Rear	Inactive	0	1	49	1:1	15	0.519	1.393	0.723	-
707.5	23095	QPSK	10	23.5	23.19	0.01	Rear	Inactive	1	25	24	1:1	15	0.424	1.074	0.455	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg Averaged over 10 gram										

LTE Band 13 Body SAR																	
Frequency		Mode	Band width	Tune-Up Limit	Meas. Power	Power Drift	Test Position	Sensor	MPR	RB Size	RB offset	Duty Cycle	Distance	1g Meas. SAR	Scaling Factor	1g Scaled SAR	Plot No.
Mhz	Ch.																
782	23230	QPSK	10	20.0	18.40	0.14	Rear	Active	0	1	24	1:1	0	0.528	1.445	<b>0.763</b>	7
782	23230	QPSK	10	20.0	18.53	-0.12	Rear	Active	0	25	0	1:1	0	<b>0.530</b>	1.403	0.744	8
782	23230	QPSK	10	24.5	23.04	0.01	Rear	Inactive	0	1	24	1:1	15	0.450	1.400	0.630	-
782	23230	QPSK	10	23.5	22.09	0.04	Rear	Inactive	1	25	12	1:1	15	0.365	1.384	0.505	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg Averaged over 10 gram										

**LTE Band 26 Body SAR**

Frequency		Mode	Band width (MHz)	Tune-Up Limit (dBm)	Meas. Power (dBm)	Power Drift (dB)	Test Position	Sensor	MPR (dB)	RB Size	RB offset	Duty Cycle	Distance (mm)	1g Meas. SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plot No.
Mhz	Ch.																
831.5	26865	QPSK	15	20.0	18.34	0.12	Rear	Active	0	1	74	1:1	0	0.336	1.466	0.493	-
831.5	26865	QPSK	15	20.0	18.39	0.14	Rear	Active	0	36	0	1:1	0	0.451	1.449	<b>0.653</b>	9
831.5	26865	QPSK	15	24.5	22.89	0.07	Rear	Inactive	0	1	74	1:1	15	0.361	1.449	0.523	-
831.5	26865	QPSK	15	23.5	22.01	-0.06	Rear	Inactive	1	36	0	1:1	15	0.303	1.409	0.427	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Body 1.6 W/kg Averaged over 10 gram									

**LTE TDD Band 41 Body SAR**

Frequency		Mode	Band width (MHz)	Tune-Up Limit (dBm)	Meas. Power (dBm)	Power Drift (dB)	Test Position	Sensor	MPR (dB)	RB Size	RB offset	Duty Cycle	Distance (mm)	1g Meas. SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plot No.
Mhz	Ch.																
2 506.0	39750	QPSK	20	18.0	16.61	0.01	Rear	Active	0	1	0	1:1.58	0	0.658	1.377	0.906	-
2 549.5	40185	QPSK	20	18.0	16.50	0.01	Rear	Active	0	1	49	1:1.58	0	0.647	1.413	0.914	-
2 593.0	40620	QPSK	20	18.0	16.60	0.01	Rear	Active	0	1	49	1:1.58	0	0.597	1.380	0.824	-
2 636.5	41055	QPSK	20	18.0	16.74	0.01	Rear	Active	0	1	99	1:1.58	0	0.470	1.337	0.628	-
2 680.0	41490	QPSK	20	18.0	16.66	0.01	Rear	Active	0	1	49	1:1.58	0	0.387	1.361	0.527	-
2 506.0	39750	QPSK	20	18.0	16.63	0.01	Rear	Active	0	50	0	1:1.58	0	0.666	1.371	0.913	-
2 549.5	40185	QPSK	20	18.0	16.60	0.18	Rear	Active	0	50	49	1:1.58	0	0.665	1.380	0.918	-
2 593.0	40620	QPSK	20	18.0	16.63	-0.10	Rear	Active	0	50	0	1:1.58	0	0.621	1.371	0.851	-
2 636.5	41055	QPSK	20	18.0	16.80	0.10	Rear	Active	0	50	25	1:1.58	0	0.512	1.318	0.675	-
2 680.0	41490	QPSK	20	18.0	16.62	0.01	Rear	Active	0	50	49	1:1.58	0	0.384	1.374	0.528	-
2 636.5	41055	QPSK	20	18.0	16.77	0.01	Rear	Active	0	100	0	1:1.58	0	0.693	1.327	<b>0.920</b>	10
2 549.5	40185	QPSK	20	24.5	23.35	0.18	Rear	Inactive	0	1	49	1:1.58	15	0.425	1.303	0.554	-
2 506.0	39750	QPSK	20	23.5	22.40	-0.02	Rear	Inactive	1	50	0	1:1.58	15	0.374	1.288	0.482	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Body 1.6 W/kg Averaged over 10 gram									

LTE Band 66 Body SAR																		
Frequency		Mode	Band width (MHz)	Tune-Up Limit (dBm)	Meas. Power (dBm)	Power Drift (dB)	Test Position	Sensor	MPR (dB)	RB Size	RB offset	Duty Cycle	Distance (mm)	1g Meas. SAR (W/kg)	Scaling Factor	1g Scaled SAR (W/kg)	Plot No.	
MHz	Ch.																	
1 720	132072	QPSK	20	15.0	13.39	0.01	Rear	Active	0	1	49	1:1	0	0.623	1.449	0.903	-	
1 745	132322	QPSK	20	15.0	13.48	0.01	Rear	Active	0	1	49	1:1	0	0.663	1.419	0.941	-	
1 770	132572	QPSK	20	15.0	13.40	0.10	Rear	Active	0	1	49	1:1	0	0.694	1.445	1.003	-	
1 720	132072	QPSK	20	15.0	13.48	0.01	Rear	Active	0	50	0	1:1	0	0.639	1.419	0.907	-	
1 745	132322	QPSK	20	15.0	13.60	0.01	Rear	Active	0	50	0	1:1	0	0.678	1.380	0.936	-	
1 770	132572	QPSK	20	15.0	13.56	0.01	Rear	Active	0	50	25	1:1	0	0.714	1.393	0.995	-	
1 745	132322	QPSK	20	15.0	13.56	0.01	Rear	Active	0	100	0	1:1	0	0.686	1.393	0.956	-	
1 720	132072	QPSK	20	23.5	22.58	-0.17	Rear	Inactive	0	1	0	1:1	15	0.907	1.236	1.121	-	
1 745	132322	QPSK	20	23.5	22.55	0.17	Rear	Inactive	0	1	0	1:1	15	0.987	1.245	1.229	-	
1 770	132572	QPSK	20	23.5	22.68	0.12	Rear	Inactive	0	1	0	1:1	15	1.11	1.208	<b>1.341</b>	11	
1 720	132072	QPSK	20	22.5	21.70	0.11	Rear	Inactive	1	50	0	1:1	15	0.738	1.202	0.887	-	
1 745	132322	QPSK	20	22.5	21.66	0.15	Rear	Inactive	1	50	0	1:1	15	0.815	1.213	0.989	-	
1 770	132572	QPSK	20	22.5	21.74	-0.13	Rear	Inactive	1	50	0	1:1	15	0.904	1.191	1.077	-	
1 770	132572	QPSK	20	22.5	21.66	0.11	Rear	Inactive	1	100	0	1:1	15	0.918	1.213	1.114	-	
1 770	132572	QPSK	20	23.5	22.68	0.16	Rear	Inactive	0	1	0	1:1	15	1.1	1.208	1.329	*	
1 770	132572	QPSK	20	23.5	22.68	0.11	Rear	Inactive	0	1	0	1:1	15	1.1	1.208	1.329	**	
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Body 1.6 W/kg Averaged over 10 gram										

Note: \* Data entry indicate Variability measurement.  
 \*\* Data entry indicate Device holder perturbation measurement.

Wi-Fi (DTS) Body SAR																		
Frequency		Mode	Band width (MHz)	Data Rate (Mbps)	Tune-Up Limit (dBm)	Meas. Power (dBm)	Power Drift (dB)	Test Position	Ant.	Sensor	Duty Cycle	Distance (mm)	Area Scan Peak SAR (W/kg)	1g Meas. SAR (W/kg)	Scaling Factor	Scaling Factor (Duty)	1g Reported SAR (W/kg)	Plot No.
MHz	Ch.																	
2 412	1	802.11b	20	1	13.0	12.96	0.01	Rear	Ant.1	Active	98.9	0	0.681	<b>0.362</b>	1.009	1.011	0.369	12
2 412	1	802.11b	20	1	13.0	12.48	0.01	Rear	Ant.2	Active	98.9	0	0.578	0.328	1.127	1.011	<b>0.374</b>	13
2 412	1	802.11b	20	1	16.0	15.74	0.01	Rear	MIMO	Active	98.9	0	0.594	0.315	1.127	1.011	0.359	-
2 462	11	802.11b	20	1	16.0	14.76	-0.11	Rear	Ant.1	Inactive	98.9	6	0.342	0.195	1.330	1.011	0.262	-
2 462	11	802.11b	20	1	16.0	15.45	0.01	Rear	Ant.2	Inactive	98.9	9	0.391	0.233	1.135	1.011	0.267	-
2 462	11	802.11b	20	1	19.0	18.13	0.10	Rear	MIMO	Inactive	98.9	6	0.432	0.253	1.330	1.011	0.340	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Body 1.6 W/kg Averaged over 1 gram										

Note:  
 1.The power scaled factor of WLAN MIMO Mode is the largest scaled factor among each antenna chain.  
 2.Since the activation distance of the grip sensor of each antenna chain was different, the SAR of the WLAN MIMO mode was measured at the shorter distance.



**Wi-Fi (NII) Body SAR**

Frequency		Mode	Band width (MHz)	Data Rate (Mbps)	Tune-Up Limit (dBm)	Meas. Power (dBm)	Power Drift (dB)	Test Position	Ant.	Sensor	Duty Cycle	Distance (mm)	Area Scan Peak SAR (W/kg)	1g Meas. SAR (W/kg)	Scaling Factor	Scaling Factor (Duty)	1g Reported SAR (W/kg)	Plot No.
Mhz	Ch.																	
5 290	58	802.11ac	80	MCS0	11.0	10.42	0.01	Rear	Ant.1	Active	90.2	0	0.528	0.219	1.143	1.109	0.278	-
5 290	58	802.11ac	80	MCS0	11.0	9.10	0.01	Rear	Ant.2	Active	90.2	0	0.459	0.155	1.549	1.109	0.266	-
5 290	58	802.11ac	80	MCS0	14.0	12.82	0.01	Rear	MIMO	Active	90.2	0	0.656	0.243	1.549	1.109	0.417	-
5 280	56	802.11a	20	6Mbps	16.0	15.45	0.01	Rear	Ant.1	Inactive	97.7	6	0.695	0.297	1.135	1.024	0.345	-
5 260	52	802.11a	20	6Mbps	16.0	15.48	0.01	Rear	Ant.2	Inactive	97.7	9	0.417	0.179	1.127	1.024	0.207	-
5 280	56	802.11a	20	6Mbps	19.0	18.49	-0.10	Rear	MIMO	Inactive	97.7	6	0.797	0.335	1.135	1.024	0.389	-
5 690	138	802.11ac	80	MCS0	11.0	10.49	0.01	Rear	Ant.1	Active	90.2	0	0.404	0.159	1.125	1.109	0.198	-
5 610	122	802.11ac	80	MCS0	11.0	10.12	-0.10	Rear	Ant.2	Active	90.2	0	0.817	0.285	1.225	1.109	0.387	-
5 610	122	802.11ac	80	MCS0	14.0	13.21	0.01	Rear	MIMO	Active	90.2	0	0.863	0.266	1.225	1.109	0.361	-
5 600	120	802.11a	20	6Mbps	16.0	14.51	0.01	Rear	Ant.1	Inactive	97.7	6	0.497	0.220	1.409	1.024	0.317	-
5 720	144	802.11a	20	6Mbps	16.0	15.42	0.01	Rear	Ant.2	Inactive	97.7	9	0.817	0.342	1.143	1.024	0.400	-
5 720	144	802.11a	20	6Mbps	19.0	17.82	0.01	Rear	MIMO	Inactive	97.7	6	0.962	<b>0.381</b>	1.409	1.024	<b>0.550</b>	14
5 775	155	802.11ac	80	MCS0	11.0	9.47	0.01	Rear	Ant.1	Active	90.2	0	0.585	0.199	1.422	1.109	0.314	-
5 775	155	802.11ac	80	MCS0	11.0	9.14	0.01	Rear	Ant.2	Active	90.2	0	0.887	0.317	1.535	1.109	0.540	-
5 775	155	802.11ac	80	MCS0	14.0	12.32	0.01	Rear	MIMO	Active	90.2	0	0.562	0.216	1.535	1.109	0.368	-
5 825	165	802.11a	20	6Mbps	16.0	14.83	-0.10	Rear	Ant.1	Inactive	97.7	6	0.857	0.354	1.309	1.024	0.475	-
5 745	149	802.11a	20	6Mbps	16.0	15.45	0.01	Rear	Ant.2	Inactive	97.7	9	0.416	0.168	1.135	1.024	0.195	-
5 825	165	802.11a	20	6Mbps	19.0	18.13	0.01	Rear	MIMO	Inactive	97.7	6	0.619	0.258	1.309	1.024	0.346	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Body 1.6 W/kg Averaged over 1 gram										

Note:

- 1.The power scaled factor of the SAR of WLAN MIMO Mode is the largest scaled factor among each antenna chain.
- 2.Since the activation distance of the grip sensor of each antenna chain was different, the SAR of the WLAN MIMO mode was measured at the shorter distance.

**DSS Tethering SAR**

Frequency		Mode	Tune-Up Limit (dBm)	Meas. Power (dBm)	Power Drift (dB)	Test Position	Distance (mm)	1g Meas. SAR (W/kg)	Scaling Factor	Scaling Factor (Duty)	1g Scaled SAR (W/kg)	Plot No.
Mhz	Ch.											
2 402	0	Bluetooth DH5	11.5	10.96	0.10	Rear	0	0.175	1.132	1.297	<b>0.257</b>	15
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg Averaged over 1 gram					



## 13.6 SAR Test Notes

### General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in FCC KDB Publication 616217 D04v01r02 and 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 447498 D01v06.
6. Per FCC KDB 865664 D01v01r04, variability SAR measurement were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg for 1g SAR and >2 for 10g SAR Please see Section 15 for variability analysis. the maximum tune-up tolerance limit.
7. This device utilizes power reduction for some wireless mode and technologies, as outlined in sec. 4.3 The maximum output power allowed for each transmitter and exposure condition was evaluated for SAR compliance based on expected use conditions and simultaneous scenarios.
8. FCC KDB Publication 616217 D04v01r02 Section 4.2, SAR tests for Laptop are required for the rear side with the DUT touching the phantom with the display screen opened at an angle of 90°

### UMTS Notes:

1. The 12.2 kbps RMC mode is the primary mode per KDB 941225 D01v03r01.
2. UMTS SAR was tested under RMC 12.2 kbps with HSPA inactive per KDB publication 941225 D01v03r01. HSPA SAR was not required per the 3G Test Reduction Procedure in KDB Publication 941225 D01v03r01.
3. Per FCC KDB 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 channel highest output power channel was used.

### LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Consideration for LTE Devices in FCC KDB 941225 D05v02r05.
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 1RB, 50%RB and 100%RB allocation with highest output power for that channel.  
Only one channel, and as reported SAR values for 1RB 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 target MPR is indicated alongside the SAR results.
4. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator.
5. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) LTE TDD Band 41 SAR measured at the highest output power channel for each test configuration is 0.6 W/kg then testing at the other channels is not required for such test configurations.
6. TDD LTE B41 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. Per KDB 941225 D05Av01r02, SAR for LTE Carrier Aggregation operations was not needed because the maximum average output power in LTE CA mode was not > 0.25 dB higher than the maximum output power when downlink CA was not activated.
  8. 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 1RB, 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 16-QAM 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. Per KDB 2482227 D01v02r02 justification for test configurations of 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 802.11 g/n/ac) was not required due to the maximum allowed powers and the highest reported DSSS SAR.
2. Per KDB 2482227 D01v02r02 justification for test configurations of 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 mode were not investigated since the highest reported SAR for initial test configuration adjusted by the ration of maximum output powers is less than 1.2 W/kg for 1g SAR and less than 3.0 W/kg for 10 g SAR.
3. When the maximum reported 1g averaged SAR is  $\leq 0.8$  W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was  $\leq 1.20$  W/kg or all test channels were measured.
4. The device was configured to transmit continuously at the required data rated, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated WLAN test reports.

**Bluetooth Notes:**

1. Bluetooth SAR was measured with the device connected to a call box with hopping disabled with DH5 operation and Tx Tests mode type. Per October 2016 TCBC Workshop Notes, the reported SAR was scaled to 100% transmission duty factor to determine compliance. Please see sec.11 for the time-domain plot and calculation for duty factor of the device.

## 14. Simultaneous SAR Analysis

### 14.1 Body SAR Simultaneous Transmission Analysis. (Reduced Power)

(The Grip sensor is activated)

Simultaneous Transmission Summation Scenario with 2.4 GHz WLAN (Activated)											
Exposure condition	Band	WWAN SAR	2.4 GHz WLAN Ant.1 SAR	2.4 GHz WLAN Ant.2 SAR	2.4 GHz WLAN MIMO SAR	∑ 1-g SAR	∑ 1-g SAR	∑ 1-g SAR	SPLSR		
		(W/kg)	(W/kg)	(W/kg)	(W/kg)	(W/kg)	(W/kg)	(W/kg)	(W/kg)	(Yes/No)	Plot No.
		1	2	3	4	1+2	1+3	1+4			
Body SAR	UMTS 850	0.944	0.369	0.374	0.359	1.313	1.318	1.303	No	-	
	UMTS 1700	1.010	0.369	0.374	0.359	1.379	1.384	1.369	No	-	
	UMTS 1900	0.696	0.369	0.374	0.359	1.065	1.070	1.055	No	-	
	LTE Band 2	0.793	0.369	0.374	0.359	1.162	1.167	1.152	No	-	
	LTE Band 12	0.910	0.369	0.374	0.359	1.279	1.284	1.269	No	-	
	LTE Band 13	0.763	0.369	0.374	0.359	1.132	1.137	1.122	No	-	
	LTE Band 26	0.653	0.369	0.374	0.359	1.022	1.027	1.012	No	-	
	LTE Band 41	0.920	0.369	0.374	0.359	1.289	1.294	1.279	No	-	
LTE Band 66	1.003	0.369	0.374	0.359	1.372	1.377	1.362	No	-		

Simultaneous Transmission Summation Scenario with 5 GHz WLAN (Activated)										
Exposure condition	Band	WWAN SAR	5 GHz WLAN Ant.1 SAR	5 GHz WLAN Ant.2 SAR	5 GHz WLAN MIMO SAR	∑ 1-g SAR	∑ 1-g SAR	∑ 1-g SAR	SPLSR	
		(W/kg)	(W/kg)	(W/kg)	(W/kg)	(W/kg)	(W/kg)	(W/kg)	(Yes/No)	Plot No.
		1	2	3	4	1+2	1+3	1+4		
Body SAR	UMTS 850	0.944	0.314	0.540	0.417	1.258	1.484	1.361	No	-
	UMTS 1700	1.010	0.314	0.540	0.417	1.324	1.550	1.427	No	-
	UMTS 1900	0.696	0.314	0.540	0.417	1.010	1.236	1.113	No	-
	LTE Band 2	0.793	0.314	0.540	0.417	1.107	1.333	1.210	No	-
	LTE Band 12	0.910	0.314	0.540	0.417	1.224	1.450	1.327	No	-
	LTE Band 13	0.763	0.314	0.540	0.417	1.077	1.303	1.180	No	-
	LTE Band 26	0.653	0.314	0.540	0.417	0.967	1.193	1.070	No	-
	LTE Band 41	0.920	0.314	0.540	0.417	1.234	1.460	1.337	No	-
LTE Band 66	1.003	0.314	0.540	0.417	1.317	1.543	1.420	No	-	

Simultaneous Transmission Summation Scenario with Bluetooth						
Exposure condition	Band	WWAN SAR	Bluetooth SAR	$\sum$ 1-g SAR	SPLSR	
		(W/kg)	(W/kg)	(W/kg)	(Yes/No)	Plot No.
		1	2	1+2		
Body SAR	UMTS 850	0.944	0.257	1.201	No	-
	UMTS 1700	1.010	0.257	1.267	No	-
	UMTS 1900	0.696	0.257	0.953	No	-
	LTE Band 2	0.793	0.257	1.050	No	-
	LTE Band 12	0.910	0.257	1.167	No	-
	LTE Band 13	0.763	0.257	1.020	No	-
	LTE Band 26	0.653	0.257	0.910	No	-
	LTE Band 41	0.920	0.257	1.177	No	-
LTE Band 66	1.003	0.257	1.260	No	-	

Simultaneous Transmission Summation Scenario with 5 GHz WLAN MIMO & Bluetooth							
Exposure condition	Band	WWAN SAR	5 GHz WLAN MIMO SAR	Bluetooth SAR	$\sum$ 1-g SAR	SPLSR	
		(W/kg)	(W/kg)	(W/kg)	(W/kg)	(Yes/No)	Plot No.
		1	2	3	1+2+3		
Body SAR	UMTS 850	0.944	0.417	0.257	1.618	Yes	#1
	UMTS 1700	1.010	0.417	0.257	1.684	Yes	#2
	UMTS 1900	0.696	0.417	0.257	1.370	No	-
	LTE Band 2	0.793	0.417	0.257	1.467	No	-
	LTE Band 12	0.910	0.417	0.257	1.584	No	-
	LTE Band 13	0.763	0.417	0.257	1.437	No	-
	LTE Band 26	0.653	0.417	0.257	1.327	No	-
	LTE Band 41	0.920	0.417	0.257	1.594	No	-
LTE Band 66	1.003	0.417	0.257	1.677	Yes	#3	

### 14.2 Body SAR Simultaneous Transmission Analysis. (Maximum Power)

(The Grip sensor is Inactivated)

Simultaneous Transmission Summation Scenario with 2.4 GHz WLAN											
Exposure condition	Band	WWAN SAR	2.4 GHz WLAN Ant.1 SAR	2.4 GHz WLAN Ant.2 SAR	2.4 GHz WLAN MIMO SAR	$\Sigma$ 1-g SAR	$\Sigma$ 1-g SAR	$\Sigma$ 1-g SAR	SPLSR		
		(W/kg)	(W/kg)	(W/kg)	(W/kg)	(W/kg)	(W/kg)	(W/kg)	(W/kg)	(Yes/No)	Plot No.
		1	2	3	4	1+2	1+3	1+4			
Body SAR	UMTS 850	0.637	0.262	0.267	0.340	0.899	0.904	0.977	No	-	
	UMTS 1700	1.366	0.262	0.267	0.340	1.628	1.633	1.706	Yes	#4, #5, #6	
	UMTS 1900	1.212	0.262	0.267	0.340	1.474	1.479	1.552	No	-	
	LTE Band 2	1.239	0.262	0.267	0.340	1.501	1.506	1.579	No	-	
	LTE Band 12	0.723	0.262	0.267	0.340	0.985	0.990	1.063	No	-	
	LTE Band 13	0.630	0.262	0.267	0.340	0.892	0.897	0.970	No	-	
	LTE Band 26	0.523	0.262	0.267	0.340	0.785	0.790	0.863	No	-	
	LTE Band 41	0.554	0.262	0.267	0.340	0.816	0.821	0.894	No	-	
LTE Band 66	1.341	0.262	0.267	0.340	1.603	1.608	1.681	Yes	#7, #8, #9		

Simultaneous Transmission Summation Scenario with 5 GHz WLAN (Inactivated)										
Exposure condition	Band	WWAN SAR	5 GHz WLAN Ant.1 SAR	5 GHz WLAN Ant.2 SAR	5 GHz WLAN MIMO SAR	$\Sigma$ 1-g SAR	$\Sigma$ 1-g SAR	$\Sigma$ 1-g SAR	SPLSR	
		(W/kg)	(W/kg)	(W/kg)	(W/kg)	(W/kg)	(W/kg)	(W/kg)	(Yes/No)	Plot No.
		1	2	3	4	1+2	1+3	1+4		
Body SAR	UMTS 850	0.637	0.475	0.400	0.550	1.112	1.037	1.187	No	-
	UMTS 1700	1.366	0.475	0.400	0.550	1.841	1.766	1.916	Yes	#10, #11, #12
	UMTS 1900	1.212	0.475	0.400	0.550	1.687	1.612	1.762	Yes	#13, #14, #15
	LTE Band 2	1.239	0.475	0.400	0.550	1.714	1.639	1.789	Yes	#16, #17, #18
	LTE Band 12	0.723	0.475	0.400	0.550	1.198	1.123	1.273	No	-
	LTE Band 13	0.630	0.475	0.400	0.550	1.105	1.030	1.180	No	-
	LTE Band 26	0.523	0.475	0.400	0.550	0.998	0.923	1.073	No	-
	LTE Band 41	0.554	0.475	0.400	0.550	1.029	0.954	1.104	No	-
	LTE Band 66	1.341	0.475	0.400	0.550	1.816	1.741	1.891	Yes	#19, #20, #21

Simultaneous Transmission Summation Scenario with Bluetooth (Inactivated)						
Exposure condition	Band	WWAN SAR	Bluetooth SAR	$\sum$ 1-g SAR	SPLSR	
		(W/kg)	(W/kg)	(W/kg)	(Yes/No)	Plot No.
		1	2	1+2		
Body SAR	UMTS 850	0.637	0.257	0.894	No	-
	UMTS 1700	1.366	0.257	1.623	Yes	#22
	UMTS 1900	1.212	0.257	1.469	No	-
	LTE Band 2	1.239	0.257	1.496	No	-
	LTE Band 12	0.723	0.257	0.980	No	-
	LTE Band 13	0.630	0.257	0.887	No	-
	LTE Band 26	0.523	0.257	0.780	No	-
	LTE Band 41	0.554	0.257	0.811	No	-
LTE Band 66	1.341	0.257	<b>1.598</b>	No	-	

Simultaneous Transmission Summation Scenario with 5 GHz WLAN MIMO & Bluetooth (Inactivated)							
Exposure condition	Band	WWAN SAR	5 GHz WLAN MIMO SAR	Bluetooth SAR	$\sum$ 1-g SAR	SPLSR	
		(W/kg)	(W/kg)	(W/kg)	(W/kg)	(Yes/No)	Plot No.
		1	2	3	1+2+3		
Body SAR	UMTS 850	0.637	0.550	0.257	1.444	No	-
	UMTS 1700	1.366	0.550	0.257	2.173	Yes	#23
	UMTS 1900	1.212	0.550	0.257	2.019	Yes	#24
	LTE Band 2	1.239	0.550	0.257	2.046	Yes	#25
	LTE Band 12	0.723	0.550	0.257	1.530	No	-
	LTE Band 13	0.630	0.550	0.257	1.437	No	-
	LTE Band 26	0.523	0.550	0.257	1.330	No	-
	LTE Band 41	0.554	0.550	0.257	1.361	No	-
LTE Band 66	1.341	0.550	0.257	2.148	Yes	#26	

### 14.3 SAR to Peak Location Separation Ratio (SPLSR)

FCC KDB 447498 D01v06 General RF Exposure Guidance introduces a new formula for calculating the SAR a Peak Location Separation Ratio(SPLSR) between pairs of simultaneously transmitting antennas:

$$SPLSR = (SAR_1 + SAR_2)^{1.5} / R_i$$

Where:

$SAR_1$  is the highest measured or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

$SAR_2$  is the highest measured of estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

$R_i$  is the separation distance between the pair of simultaneous transmitting antennas, When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of the square root of  $[(X_1 - X_2)^2 + (Y_1 - Y_2)^2 + (Z_1 - Z_2)^2]$

In order for a pair of simultaneous transmitting antennas with the sum 1-g of SAR > 1.6 W/kg and with the sum 10-g of SAR > 4 W/Kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:

$$(SAR_1 + SAR_2)^{1.5} / R_i \leq 0.04 \text{ for 1g SAR and } (SAR_1 + SAR_2)^{1.5} / R_i \leq 0.1 \text{ for 10g SAR}$$

Per Sec. 14, below simultaneous transmission summations need to be calculated SPLSR.

#### 14.3.1 SPLSR Evaluation

##### Peak SAR location for Rear side (Proximity Sensor is Activated)

Mode/Band	X(m)	Y(m)	Z(m)	Reported SAR [W/kg]
UMTS 850 Grip	-94.5	110.2	0.79	0.944
UMTS 1700 Grip	-95.90	115.90	0.71	1.010
LTE Band 66 Grip	-82.50	130.80	0.84	1.003
WLAN 5GHz Grip (MIMO)	-32.2	-163.2	1.36	0.417

##### Peak SAR location for Rear side (Proximity Sensor is Inactivated)

Mode/Band	X(m)	Y(m)	Z(m)	Reported SAR [W/kg]
UMTS 1700 Max	-102.00	124.90	0.68	1.366
UMTS 1900 Max	-100.50	128.00	0.81	1.212
LTE Band 2 Max	-100.50	126.50	0.73	1.239
LTE Band 66 Max	-97.50	119.00	0.50	1.341
WLAN 2.4GHz Max (Ant 1)	-4.00	-155.60	1.63	0.262
WLAN 2.4GHz Max (Ant 2)	-9.00	143.00	-0.25	0.267
WLAN 2.4GHz Max (MIMO)	-10.80	142.40	-0.11	0.340
WLAN 5GHz Max (Ant 1)	-26.6	-152.00	0.62	0.475
WLAN 5GHz Max (Ant 2)	-31.00	152.00	0.96	0.400
WLAN 5GHz Max (MIMO)	-32.20	143.00	0.80	0.550
Bluetooth	-5.60	-151.20	4.10	0.257



**SAR to Peak Location Ratio (SPLSR) Figures (Sensor Activated)**

Mode			Sum 1g SAR [W/kg]			Peak SAR Separation Distance (mm)			SPLSR			Plot No.
1	2	3	1+2	1+3	2+3	1+2	1+3	2+3	1+2	1+3	2+3	
UMTS 850	5 GHz WLAN MIMO	Bluetooth	1.361	1.201	0.674	280.41	276.12	29.31	0.006	0.005	0.019	#1
UMTS 1700	5 GHz WLAN MIMO	Bluetooth	1.427	1.267	0.674	286.28	281.97	29.31	0.006	0.005	0.019	#2
LTE Band 66	5 GHz WLAN MIMO	Bluetooth	1.420	1.260	0.674	298.27	292.32	29.31	0.006	0.005	0.019	#3

**SAR to Peak Location Ratio (SPLSR) Figures( Sensor Inactivated)**

Mode		Sum 1g SAR [W/kg]	Peak SAR Separation Distance (mm)	SPLSR	Plot No.
1	2	1+2	1+2	1+2	
UMTS 1700	2.4 GHz WLAN Ant.1	1.628	297.13	0.007	#4
UMTS 1700	2.4 GHz WLAN Ant.2	1.633	94.75	0.022	#5
UMTS 1700	2.4 GHz WLAN MIMO	1.706	92.87	0.023	#6
LTE Band 66	2.4 GHz WLAN Ant.1	1.603	290.08	0.007	#7
LTE Band 66	2.4 GHz WLAN Ant.2	1.608	91.70	0.022	#8
LTE Band 66	2.4 GHz WLAN MIMO	1.681	89.80	0.023	#9
UMTS 1700	5 GHz WLAN Ant.1	1.841	286.98	0.009	#10
UMTS 1700	5 GHz WLAN Ant.2	1.766	76.00	0.031	#11
UMTS 1700	5 GHz WLAN MIMO	1.916	72.11	0.036	#12
UMTS 1900	5 GHz WLAN Ant.1	1.687	289.59	0.008	#13
UMTS 1900	5 GHz WLAN Ant.2	1.612	73.53	0.028	#14
UMTS 1900	5 GHz WLAN MIMO	1.762	69.93	0.032	#15
LTE Band 2	5 GHz WLAN Ant.1	1.714	288.14	0.008	#16
LTE Band 2	5 GHz WLAN Ant.2	1.639	74.03	0.029	#17
LTE Band 2	5 GHz WLAN MIMO	1.789	294.24	0.008	#18
LTE Band 66	5 GHz WLAN Ant.1	1.816	280.12	0.009	#19
LTE Band 66	5 GHz WLAN Ant.2	1.784	74.24	0.031	#20
LTE Band 66	5 GHz WLAN MIMO	1.891	69.57	0.036	#21
UMTS 1700	Bluetooth	1.623	292.47	0.007	#22

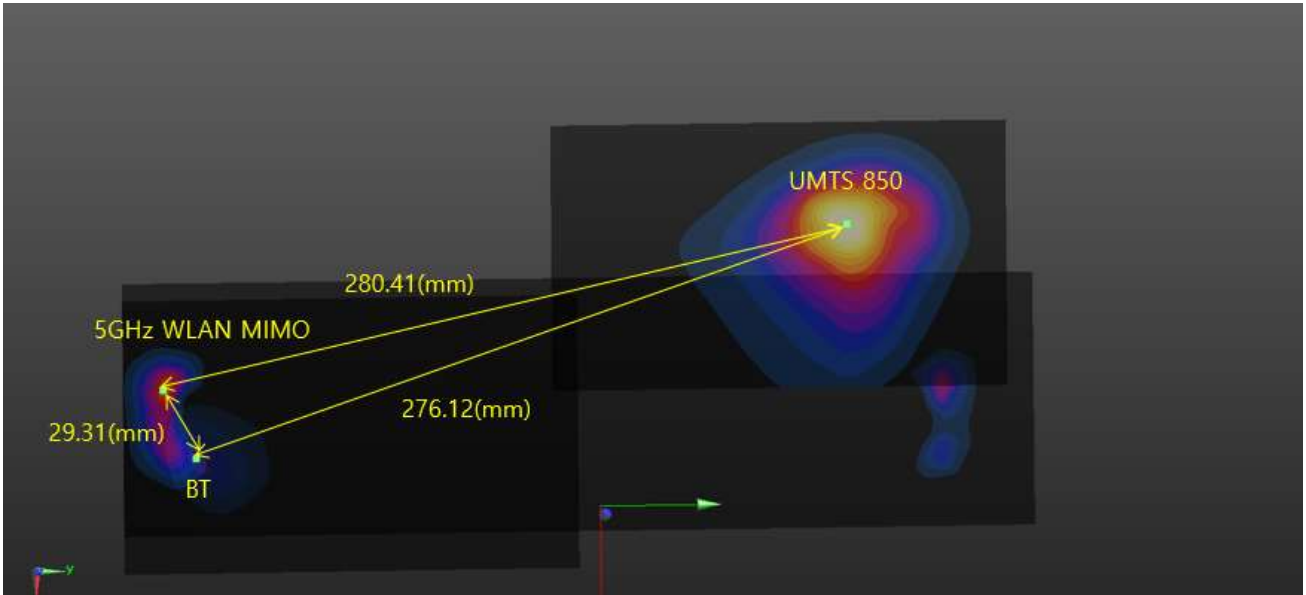
Mode			Sum 1g SAR [W/kg]			Peak SAR Separation Distance (mm)			SPLSR			Plot No.
1	2	3	1+2	1+3	2+3	1+2	1+3	2+3	1+2	1+3	2+3	
UMTS 1700	5 GHz WLAN MIMO	Bluetooth	1.916	1.623	0.807	72.11	292.47	295.42	0.036	0.007	0.002	#23
UMTS 1900	5 GHz WLAN MIMO	Bluetooth	1.762	1.469	0.807	69.93	294.91	295.42	0.032	0.006	0.002	#24
LTE Band 2	5 GHz WLAN MIMO	Bluetooth	1.789	1.496	0.807	70.26	293.49	295.42	0.033	0.006	0.002	#25
LTE Band 66	5 GHz WLAN MIMO	Bluetooth	1.891	1.598	0.807	69.57	285.42	295.42	0.036	0.007	0.002	#26



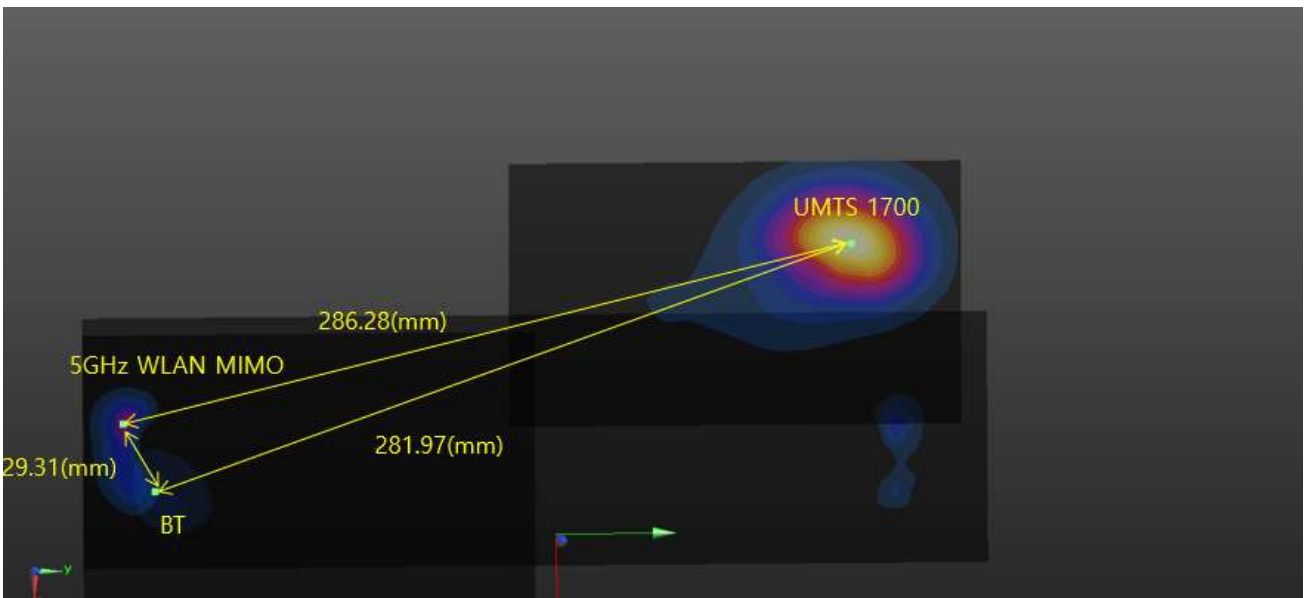
14.3.3 SPLSR Plot

(Proximity Sensor Activated)

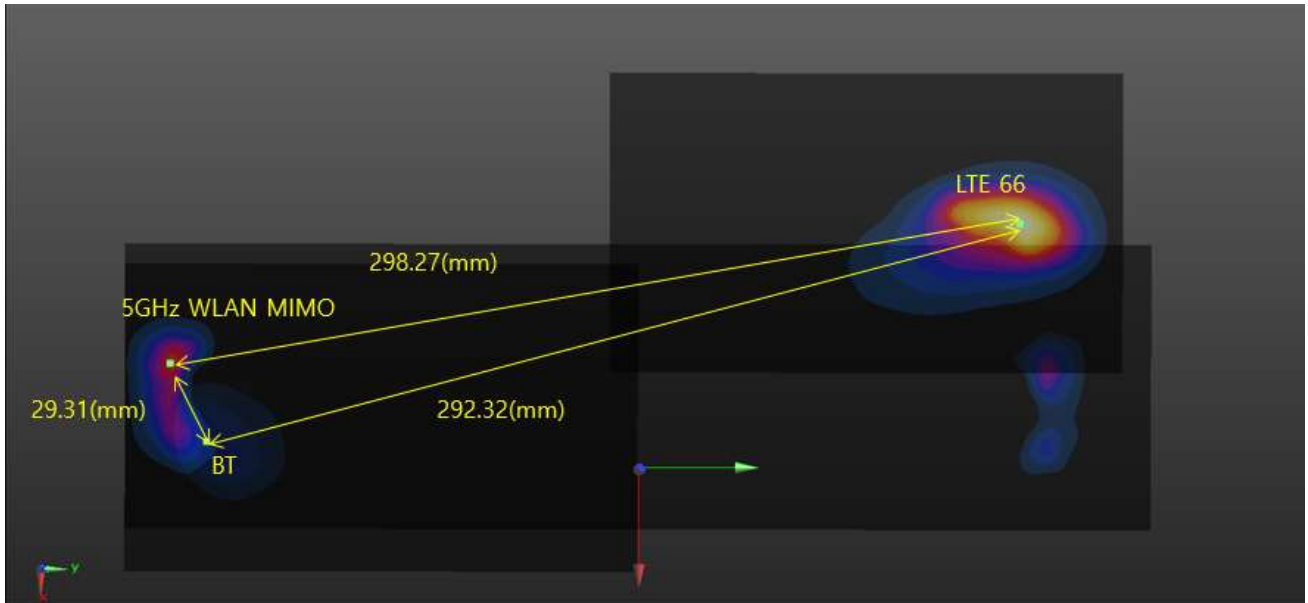
Plot #1 UMTS 850 + 5 GHz MIMO + Bluetooth.



Plot #2 UMTS 1700 + 5 GHz MIMO + Bluetooth

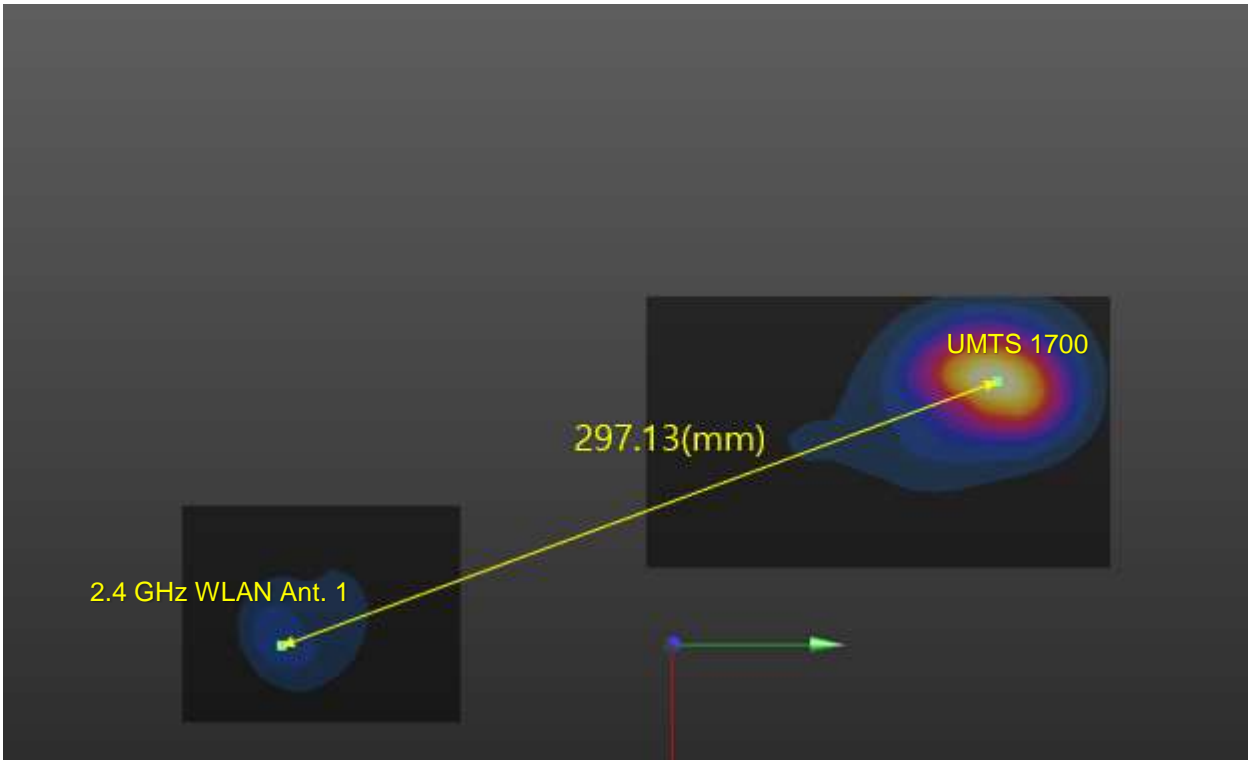


Plot #3 LTE Band 66 + 5 GHz MIMO + Bluetooth

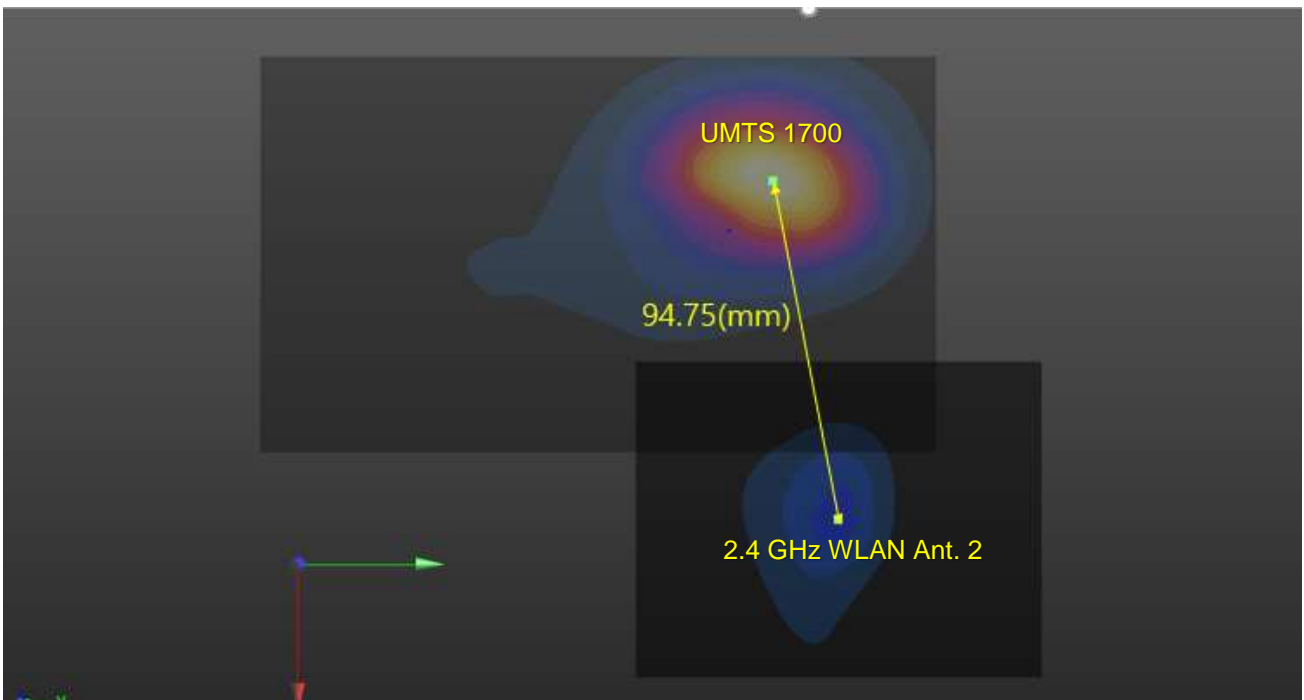


**(Proximity Sensor is Inactivated)**

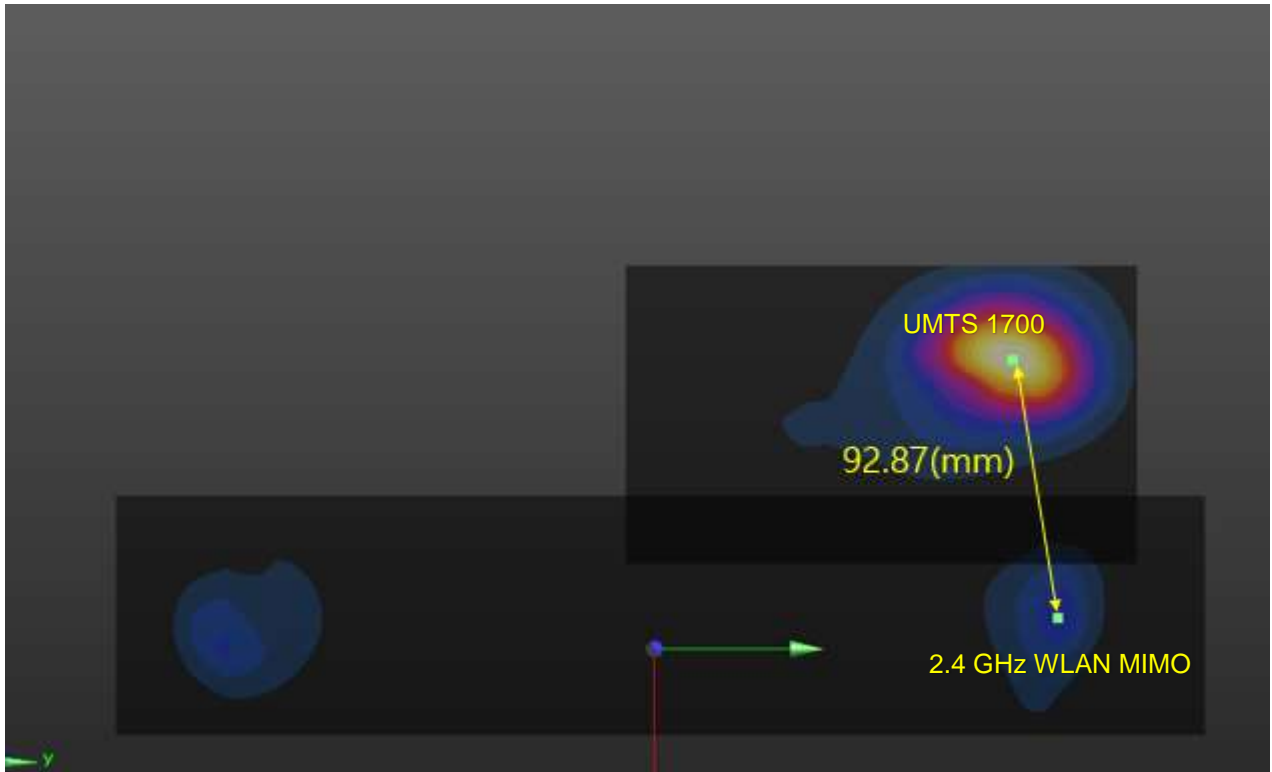
Plot #4 UMTS 1700 MAX. + 2.4 GHz WLAN Ant.1 Max.



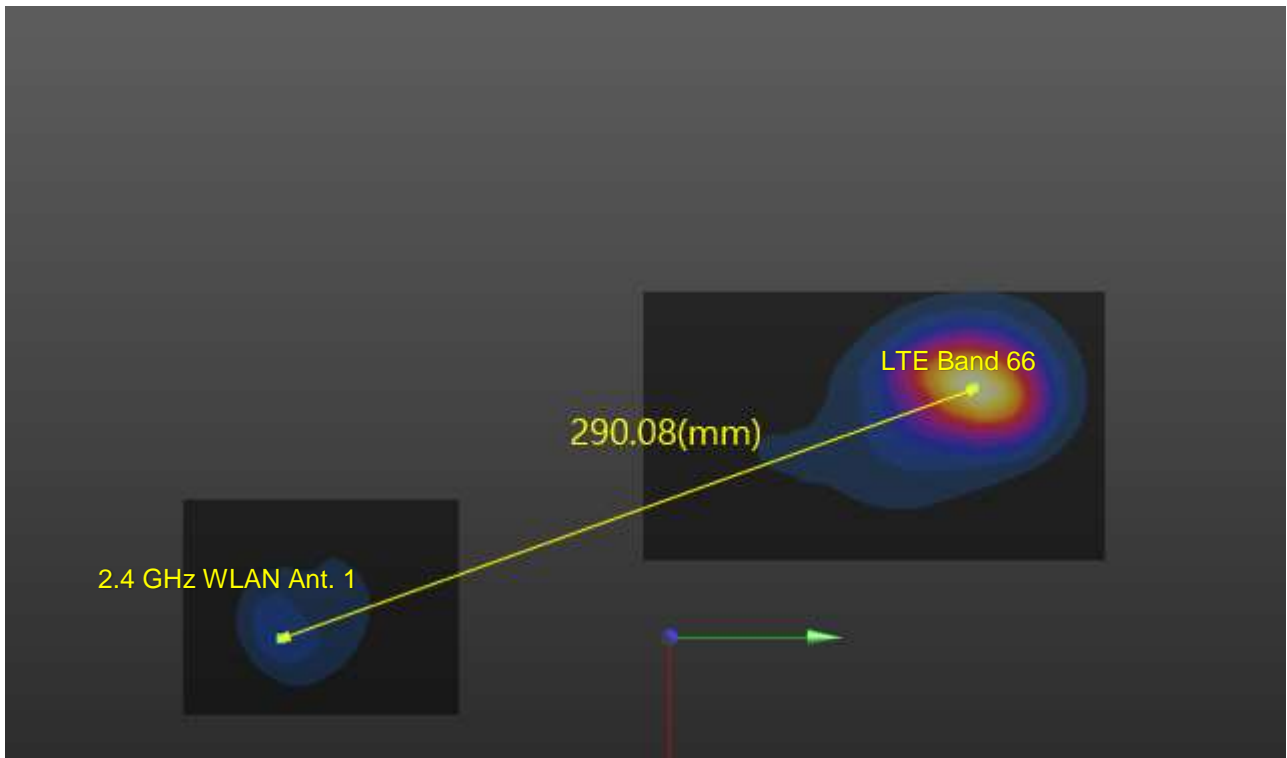
Plot #5 UMTS 1700 MAX. + 2.4 GHz WLAN Ant.2 Max.



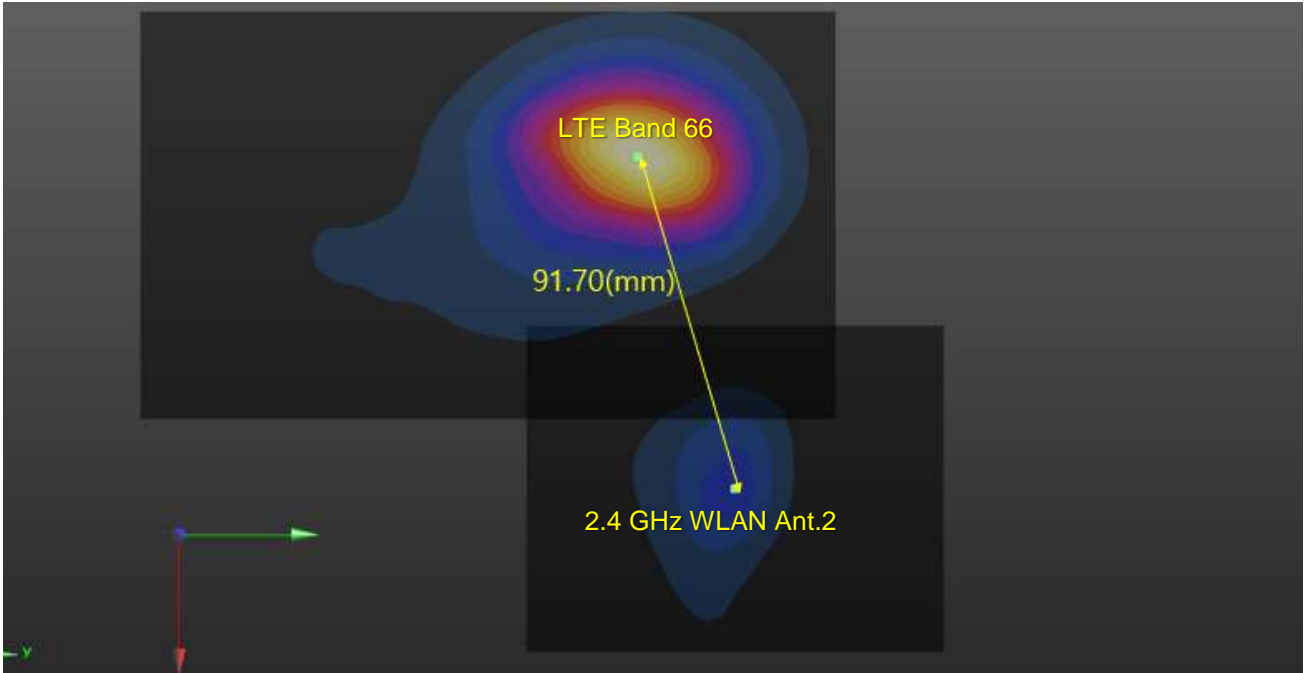
Plot #6 UMTS 1700 MAX. + 2.4 GHz WLAN MIMO Max.



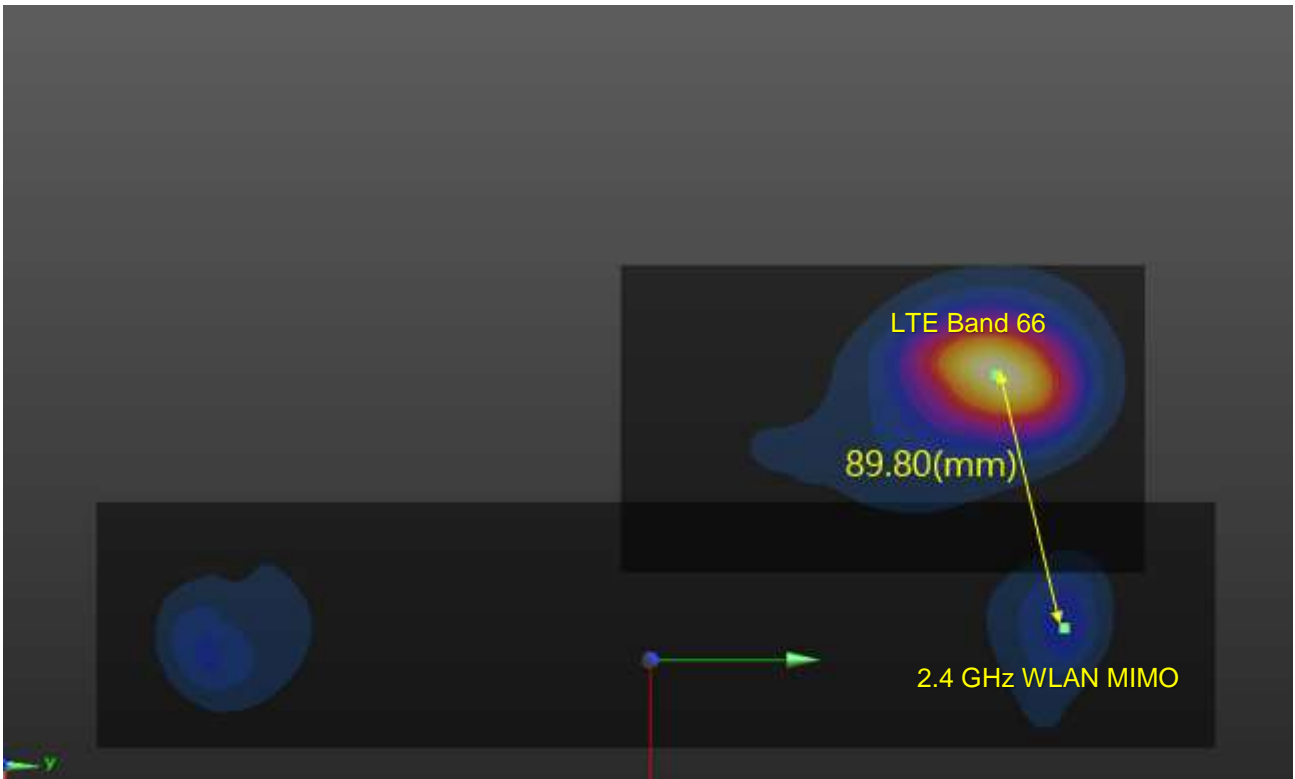
Plot #7 LTE Band 66 MAX. + 2.4 GHz WLAN Ant.1 Max.



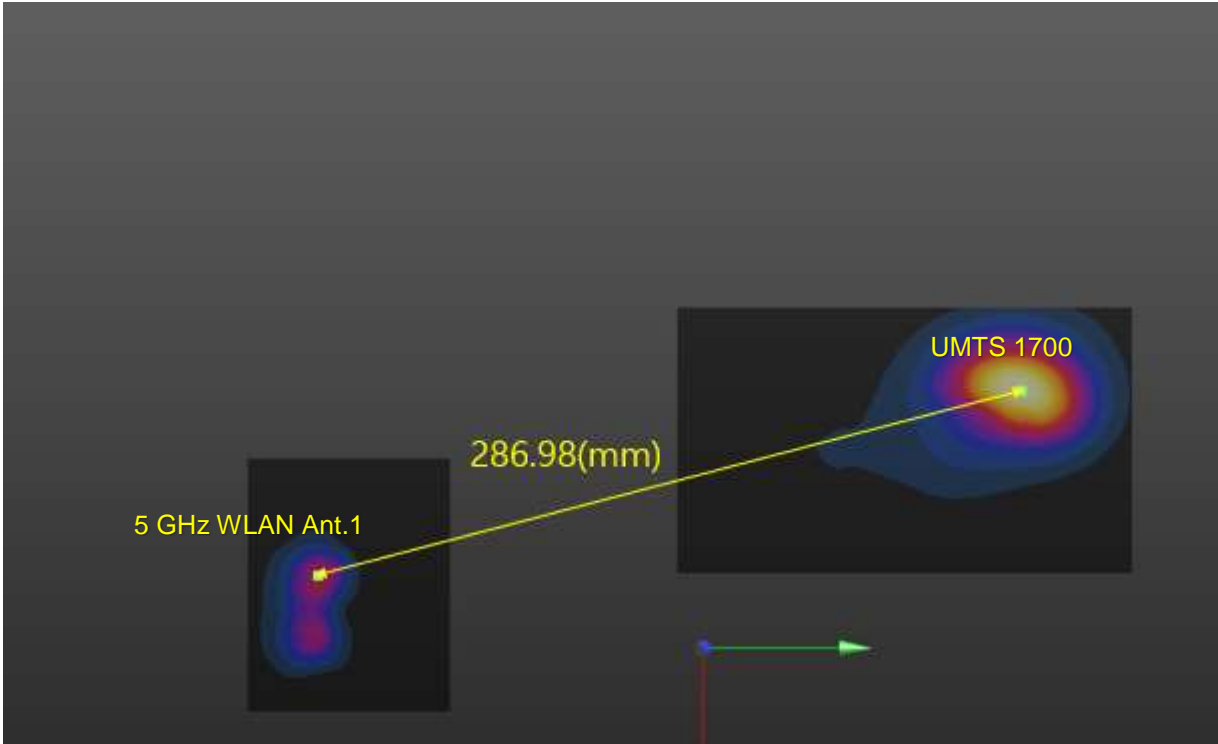
Plot #8 LTE Band 66 MAX. + 2.4 GHz WLAN Ant.2 Max.



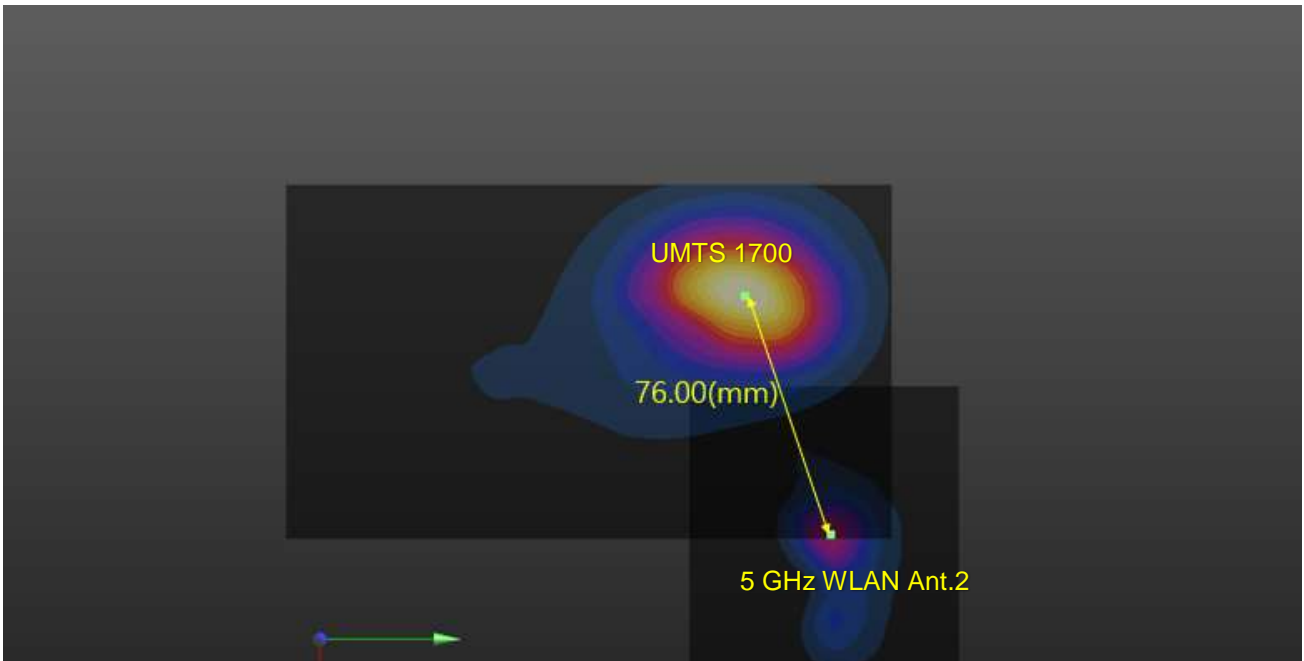
Plot #9 LTE Band 66 MAX. + 2.4 GHz WLAN MIMO Max.



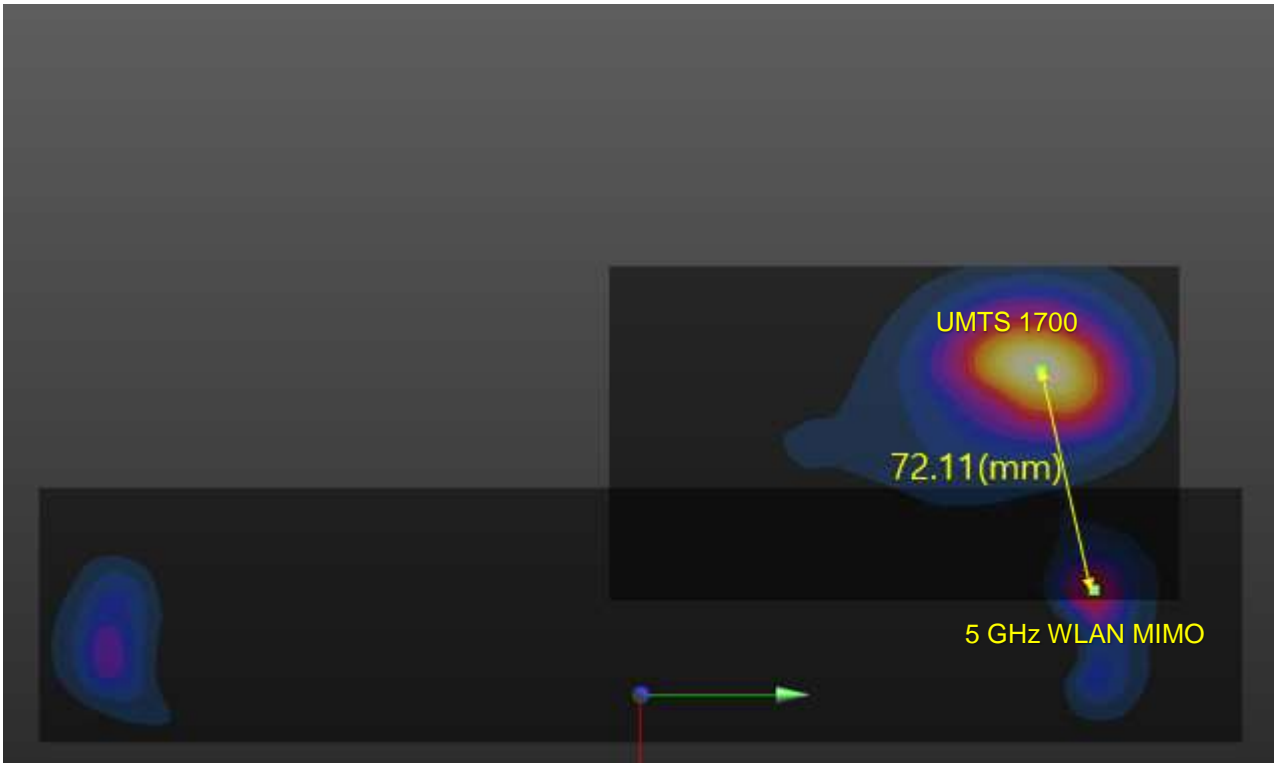
Plot #10 UMTS 1700 MAX. + 5 GHz WLAN Ant.1 Max.



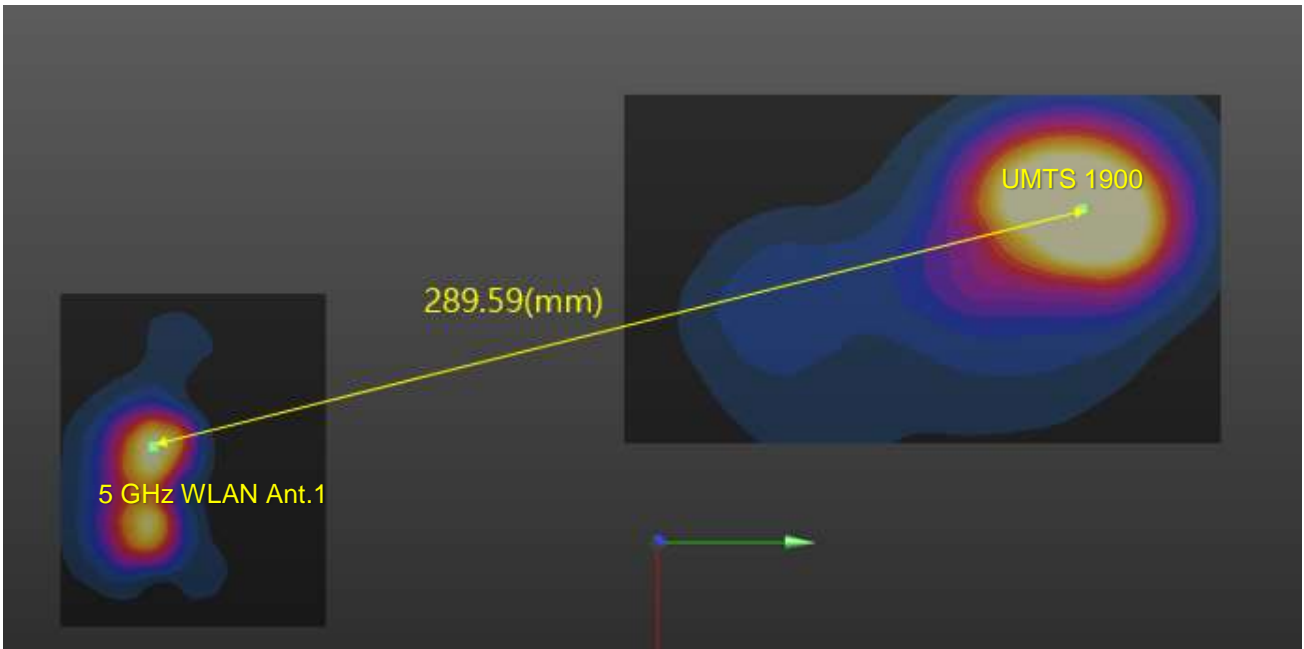
Plot #11 UMTS 1700 MAX. + 5 GHz WLAN Ant.2 Max.



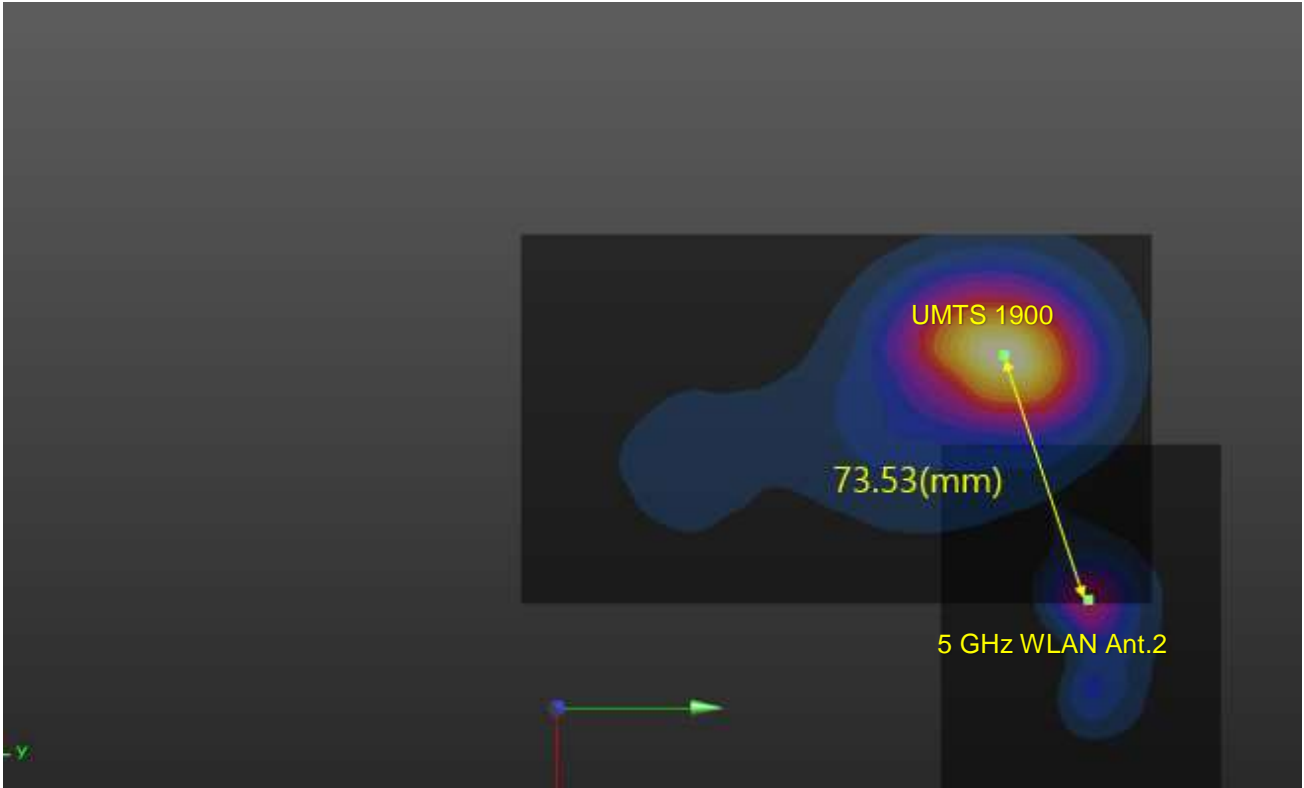
Plot #12 UMTS 1700 MAX. + 5 GHz WLAN MIMO Max.



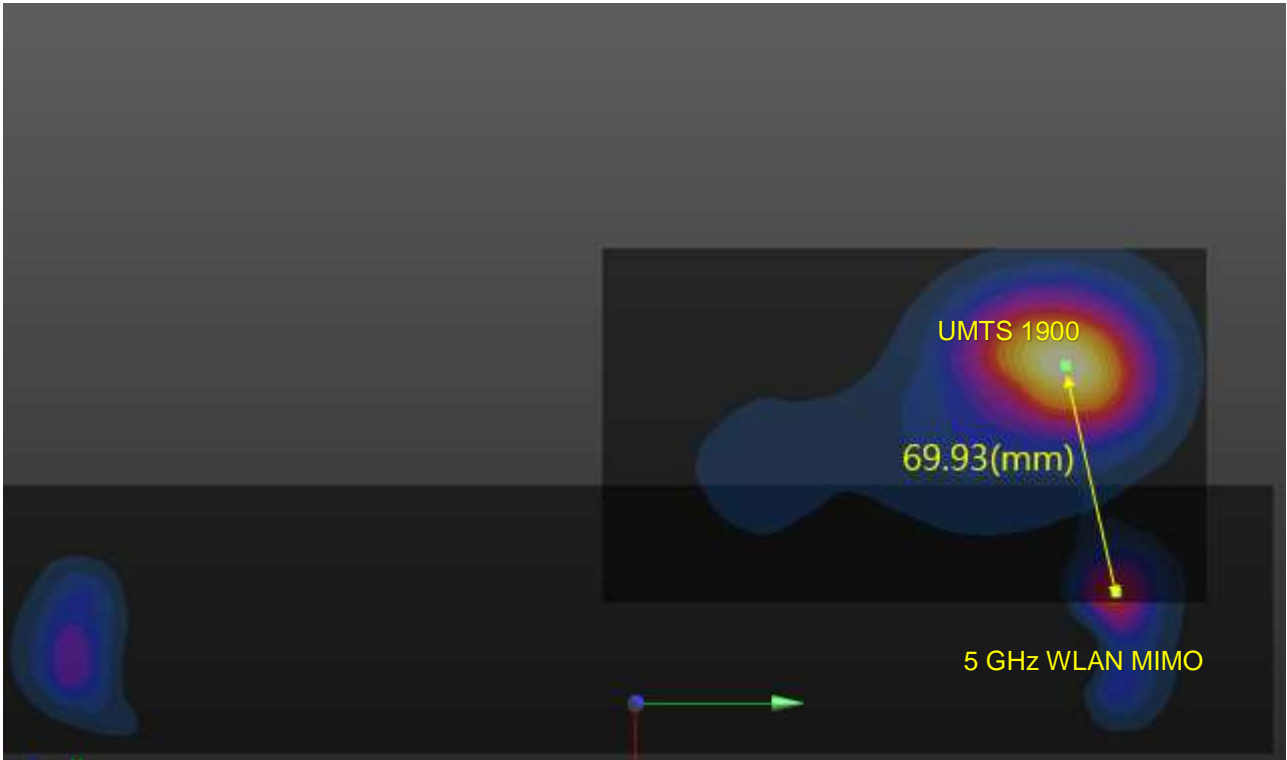
Plot #13 UMTS 1900 MAX. + 5 GHz WLAN Ant.1 Max.



Plot #14 UMTS 1900 MAX. + 5 GHz WLAN Ant.2 Max.

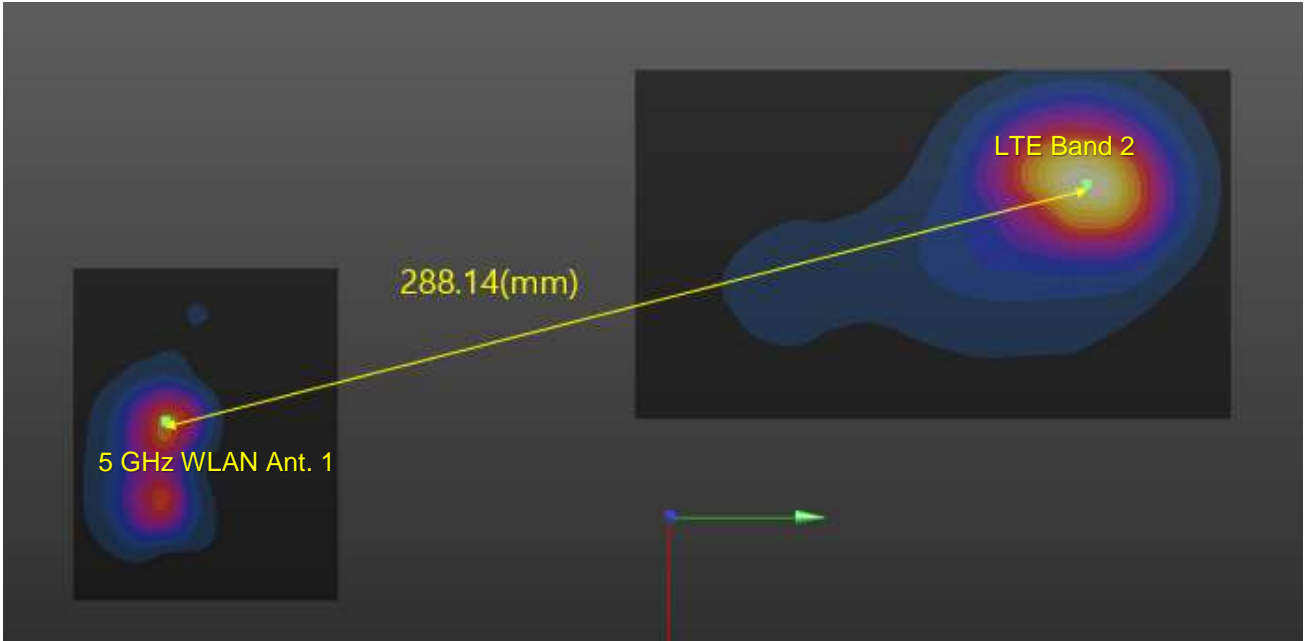


Plot #15 UMTS 1900 MAX. + 5 GHz WLAN MIMO Max.

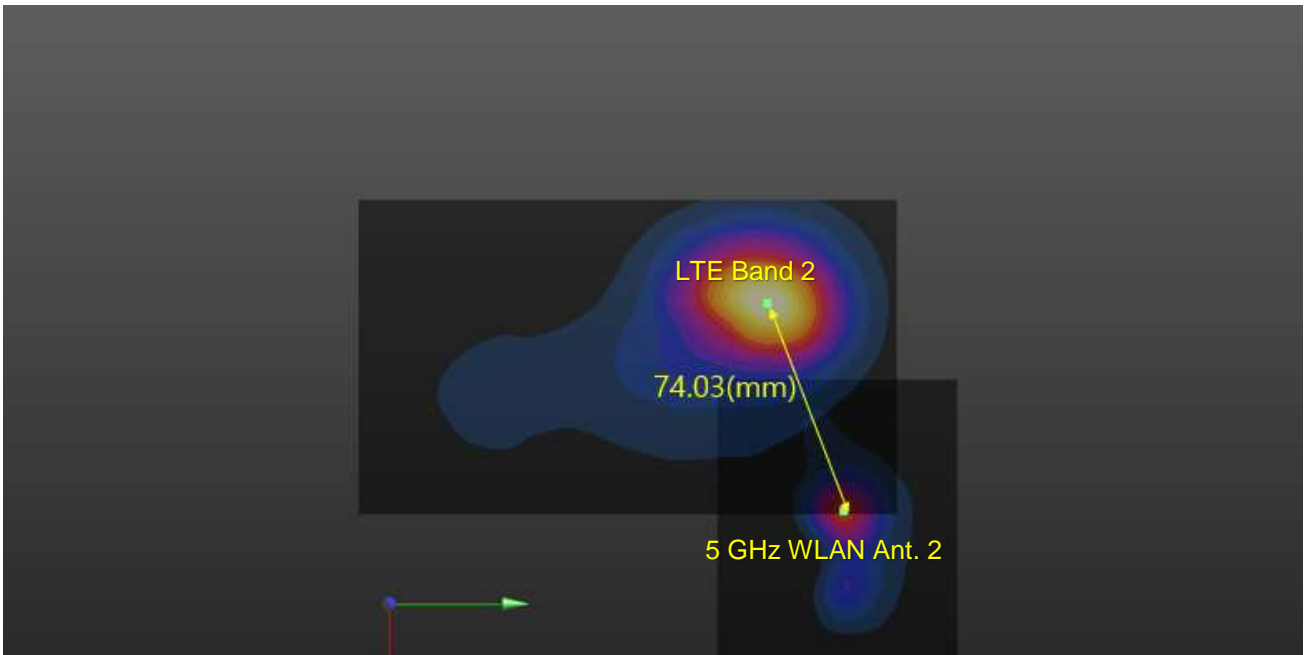




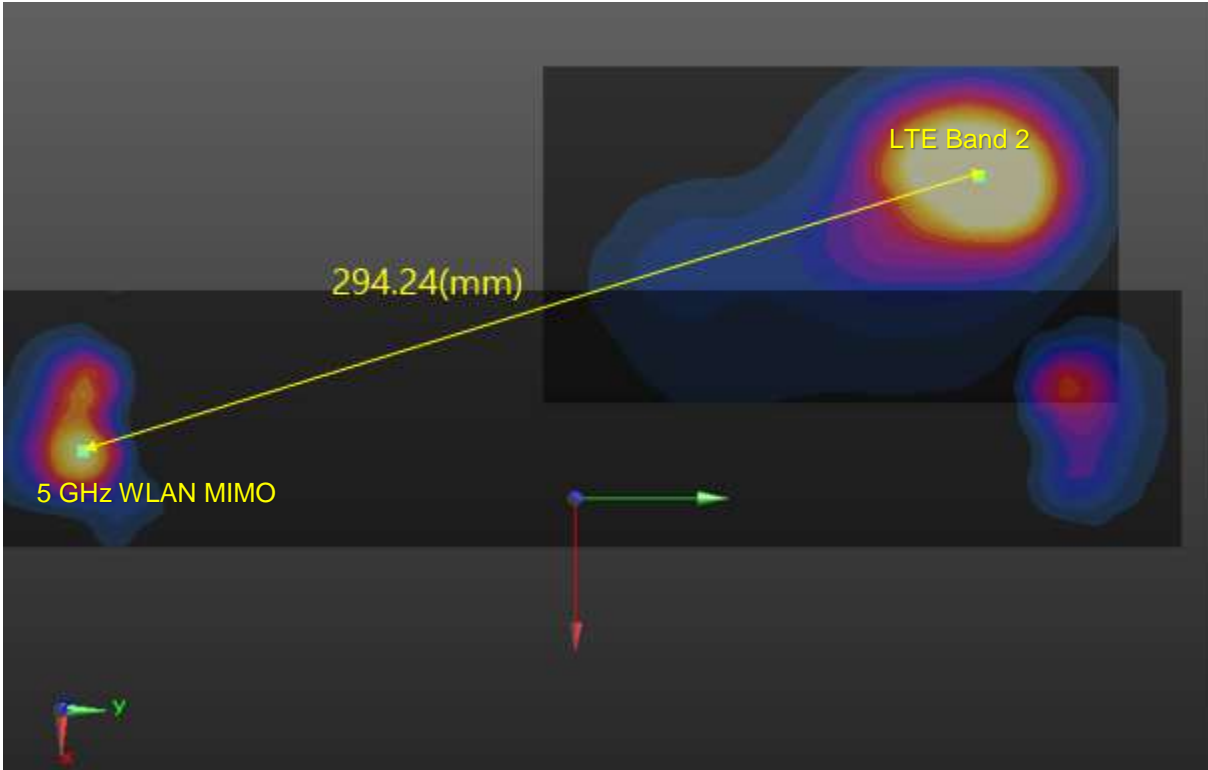
Plot #16 LTE Band 2 MAX. + 5 GHz WLAN Ant.1 Max.



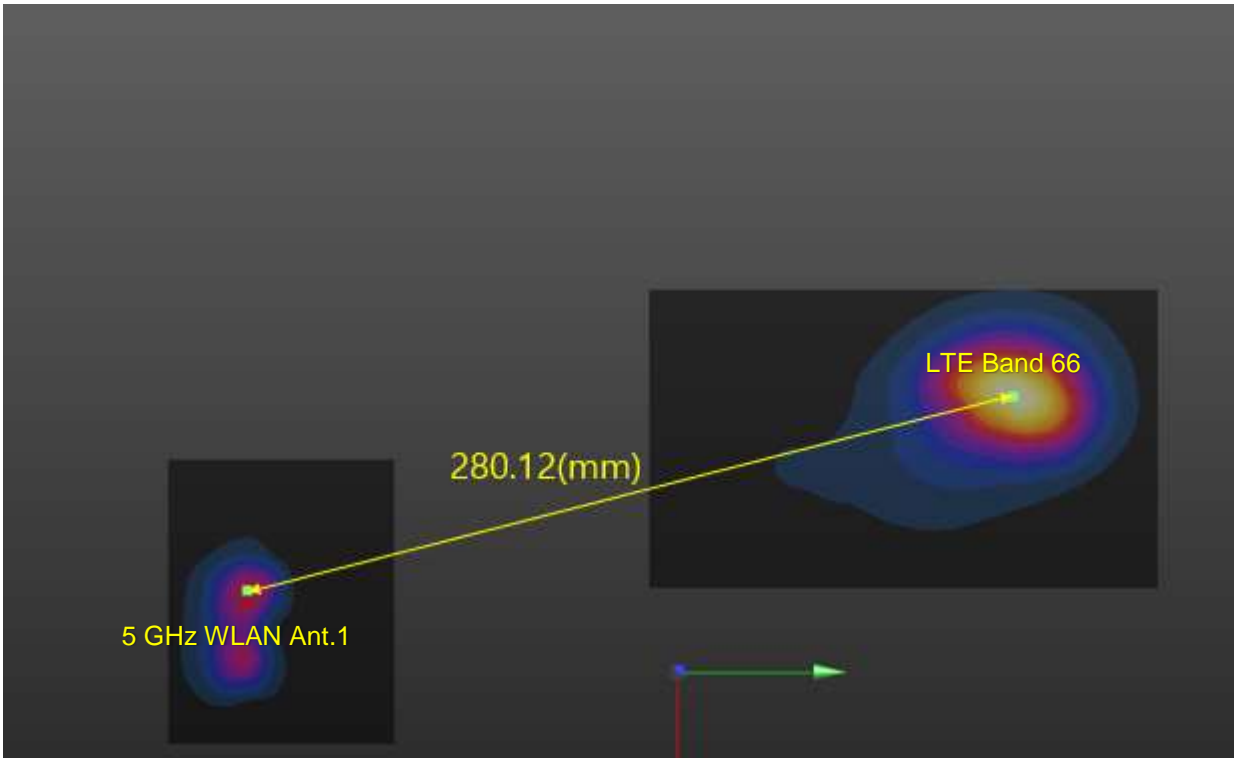
Plot #17 LTE Band 2 MAX. + 5 GHz WLAN Ant.2 Max.



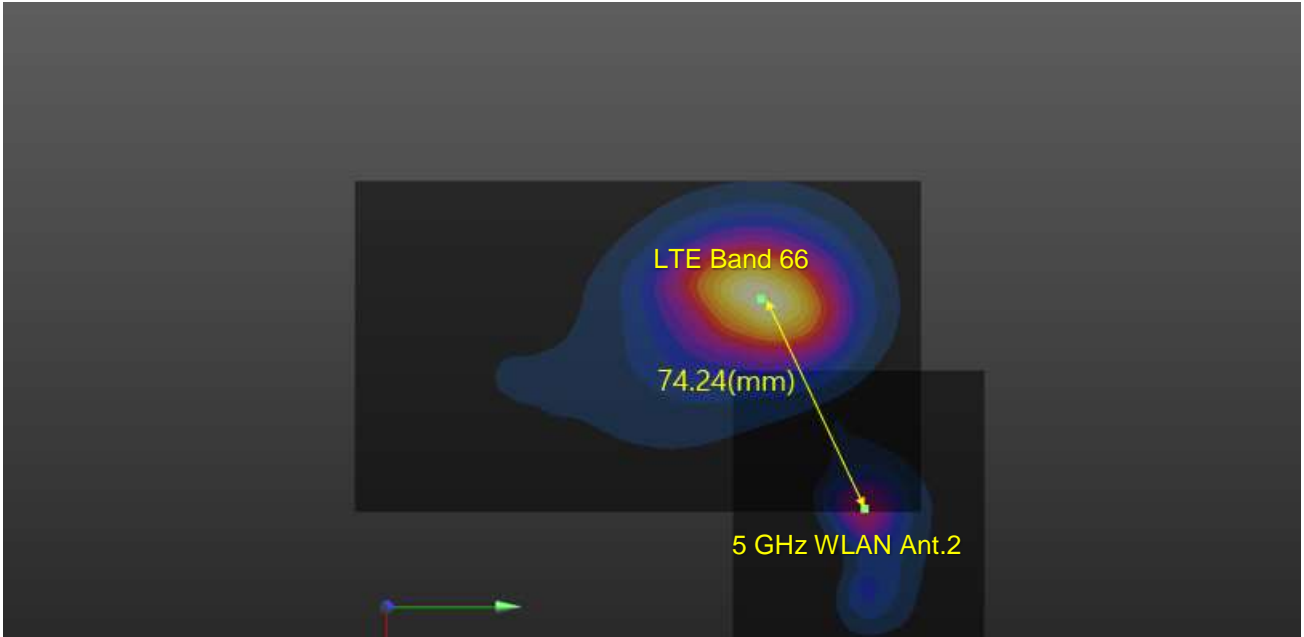
Plot #18 LTE Band 2 MAX. + 5 GHz WLAN MIMO Max.



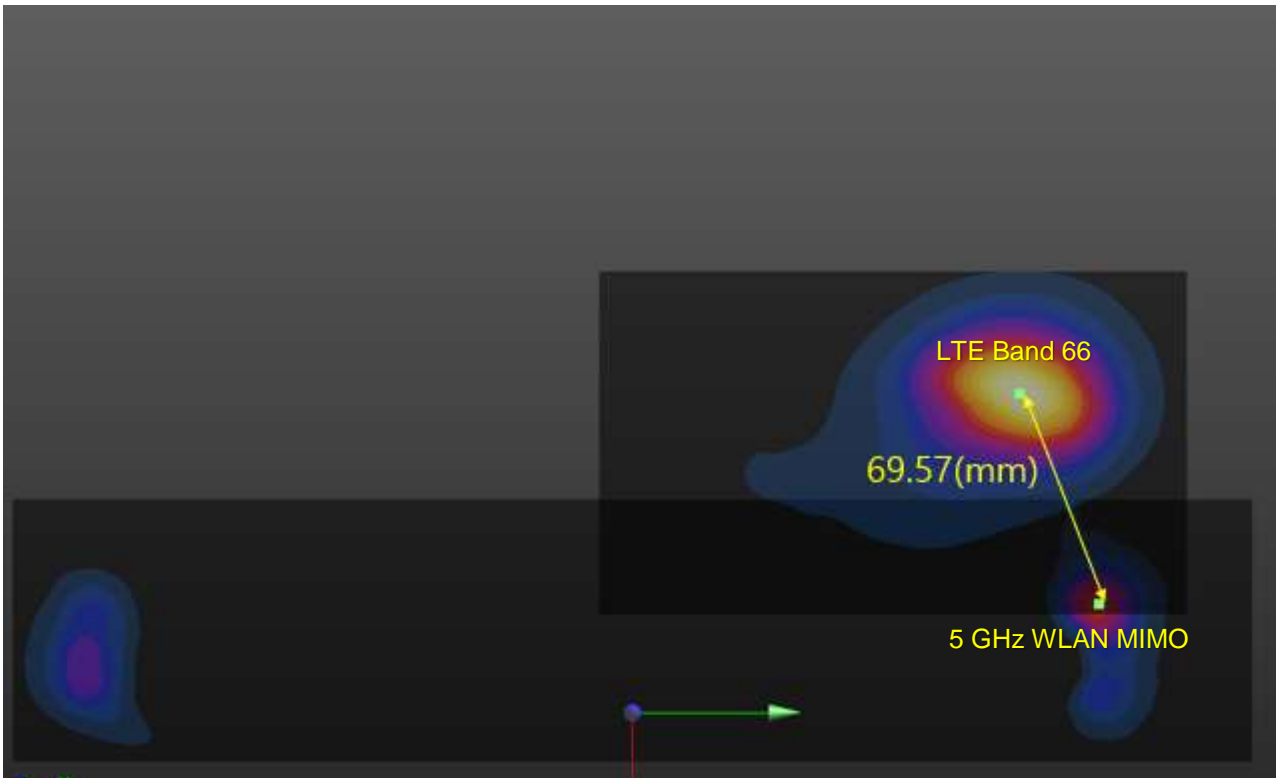
Plot #19 LTE Band 66 MAX. + 5 GHz WLAN Ant.1 Max.



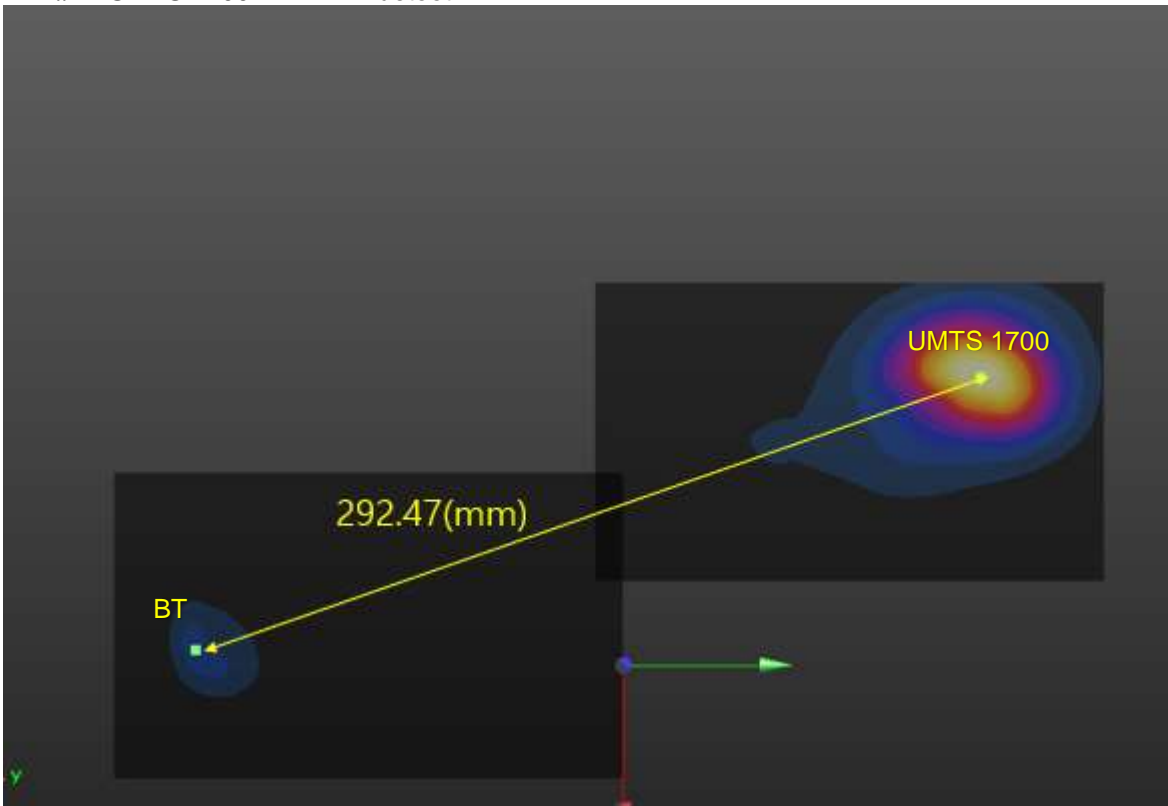
Plot #20 LTE Band 66 MAX. + 5 GHz WLAN Ant.2 Max.



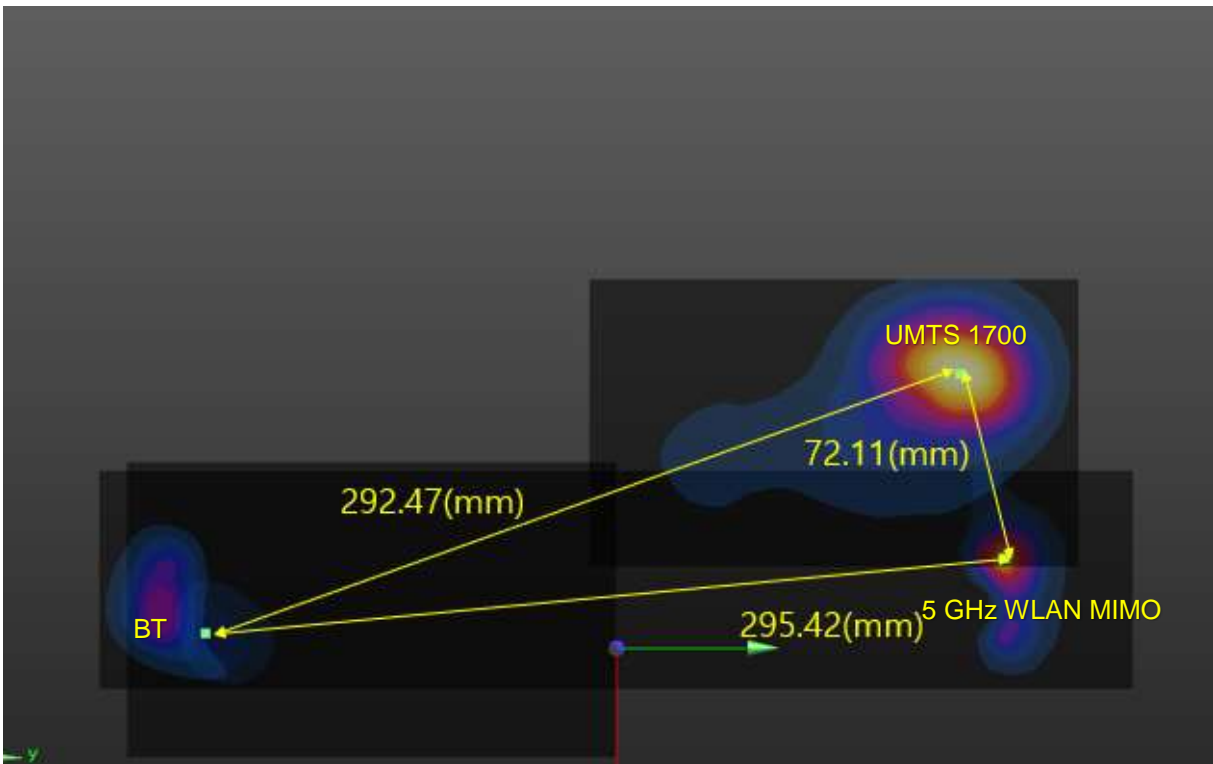
Plot #21 LTE Band 66 MAX. + 5 GHz WLAN MIMO Max.



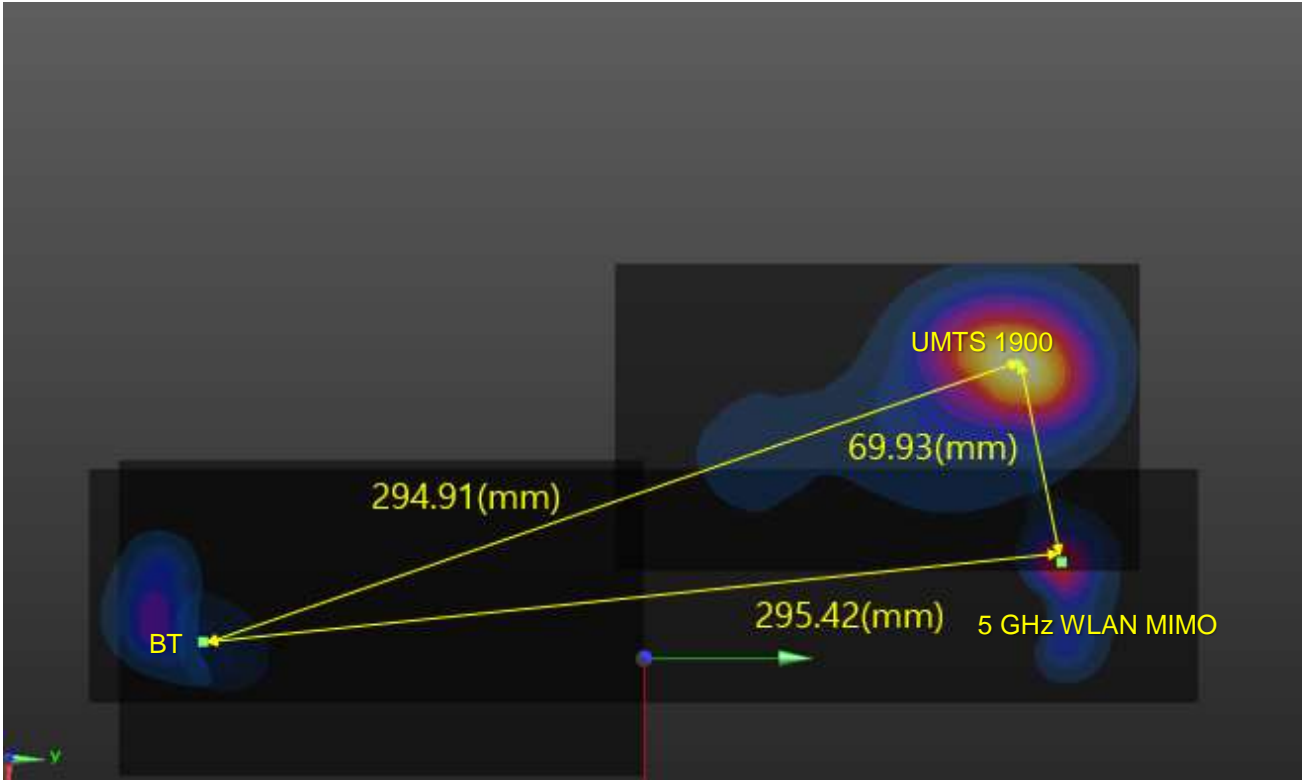
Plot #22 UMTS 1700 MAX. + Bluetooth



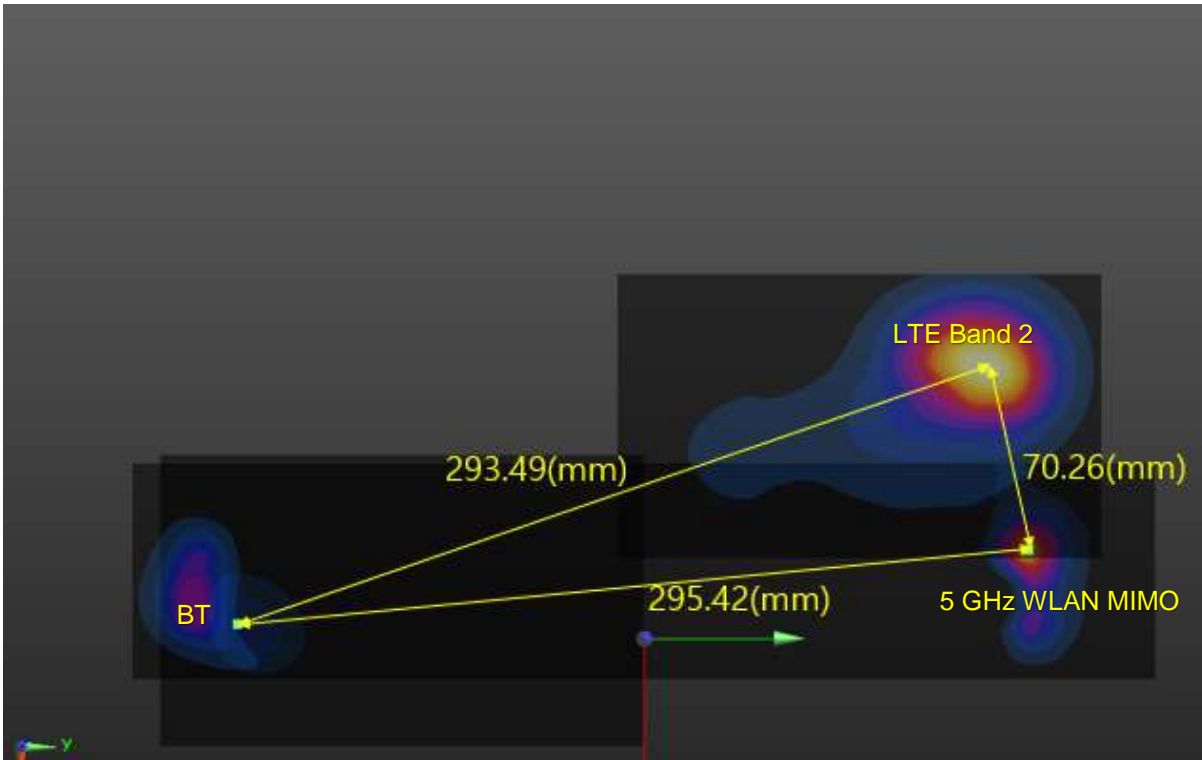
Plot #23 UMTS 1700 MAX.+ 5 GHz WLAN MIMO Max. + Bluetooth



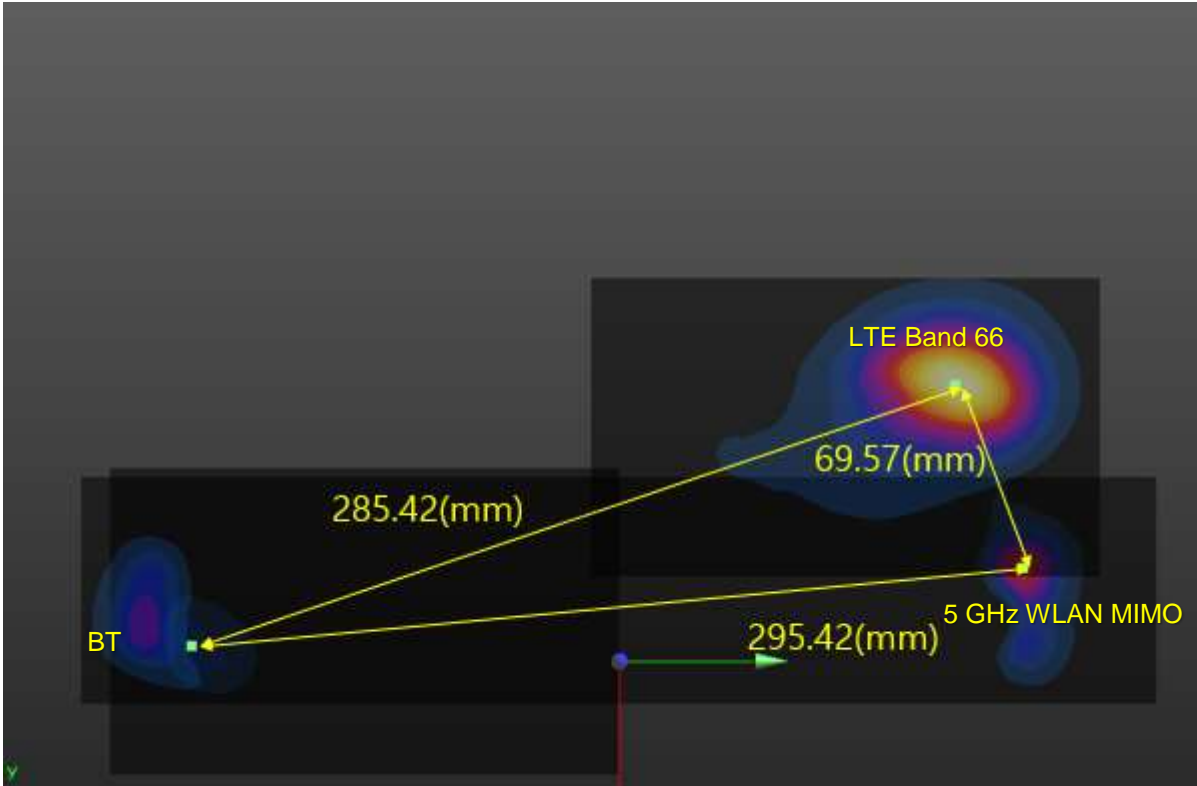
Plot #24 UMTS 1900 MAX.+ 5 GHz WLAN MIMO Max. + Bluetooth



Plot #25 LTE Band 2 MAX.+ 5 GHz WLAN MIMO Max. + Bluetooth



Plot #26 LTE Band 66 MAX.+ 5 GHz WLAN MIMO Max. + Bluetooth



**14.4 Simultaneous Transmission Conclusion**

The above numerical summed SAR Results are sufficient to determine that simultaneous transmission cases will not exceed the SAR Limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06 and IEEE1528-2013.

## 15. SAR Measurement Variability and Uncertainty

In accordance with KDB procedure 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz, SAR additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is 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) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg for 1g SAR or < 2.0 W/kg for 10g SAR; steps 2) through 4) do not apply.
- 2) When the original highest measured 1g SAR is  $\geq 0.80$  W/kg or 10g SAR  $\geq 2.0$ W/kg, repeat that measurement once.
- 3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is  $\geq 1.45$  W/kg for 1g SAR or  $\geq 3.625$  W/kg for 10g SAR (~ 10% from the 1-g SAR limit).
- 4) Perform a third repeated measurement only if the original, first or second repeated measurement is  $\geq 1.5$  W/kg for 1g SAR or  $\geq 3.75$  W/kg for 10g SAR and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

SAR measurement variability Results

Frequency		Mode/Band	Configuration	Measured SAR (W/kg)	Repeated SAR (W/kg)	SAR Ratio
MHz	Channel					
1 752.6	1513	UMTS 1700	Rear (Inactive)	1.19	1.16	1.03
1 852.4	9262	UMTS 1900	Rear (Inactive)	1.08	1.03	1.05
1 770.0	132572	LTE Band 66	Rear (Inactive)	1.11	1.10	1.01

## 16. Device Holder Perturbation Verification.

In accordance with published DUT Holder Perturbations in Oct.2016 TCB Workshop.  
 When Highest reported SAR is over 1.2 W/kg, Holder Perturbation Verification is required for each antenna, using the highest configuration among all applicable frequency bands.

Antenna configuration	Frequency		Mode/Band	Configuration	Highest Reported SAR		Deviation
	MHz	Channel			(without Device Holder)	(with Device Holder)	
					(W/kg)	(W/kg)	
Main Ant.	1 752.6	1513	UMTS 1700	Rear (Inactive)	1.366	1.366	1.00



## 17. Measurement Uncertainty

The measured SAR was  $<1.5$  W/Kg for 1g SAR and  $<3.75$  W/Kg For 10g SAR for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE1528-2013 was not required.

### 18. SAR Test Equipment

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	ELI Phantom	-	N/A	N/A	N/A
HP	SAR System Control PC	-	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F17/ 59CHA1/ C/ 01	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F17/ 59RAA1/ C/ 01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F17/ 59CHA1/ A/ 01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F17/ 59RAA1/ A/ 01	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	010963	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	011578	N/A	N/A	N/A
SPEAG	DAE4	868	09/29/2020	Annual	09/29/2021
SPEAG	DAE4	652	01/21/2021	Annual	01/21/2022
SPEAG	E-Field Probe EX3DV4	3863	09/28/2020	Annual	09/28/2021
SPEAG	E-Field Probe EX3DV4	3968	09/28/2020	Annual	09/28/2021
SPEAG	Dipole D750V3	1014	05/19/2020	Annual	05/19/2021
SPEAG	Dipole D835V2	4d165	07/28/2020	Annual	07/28/2021
SPEAG	Dipole D1800V2	2d007	08/26/2020	Annual	08/26/2021
SPEAG	Dipole D1900V2	5d032	01/28/2021	Annual	01/28/2022
SPEAG	Dipole D2450V2	1049	08/26/2020	Annual	08/26/2021
SPEAG	Dipole D2600V2	1015	08/26/2020	Annual	08/26/2021
SPEAG	Dipole D5GHzV2	1253	08/31/2020	Annual	08/31/2021
Agilent	Power Meter E4419B	MY41291386	10/23/2020	Annual	10/23/2021
Agilent	Power Meter N1911A	MY45101406	08/31/2020	Annual	08/31/2021
Agilent	Power Sensor 8481A	SG1091286	10/05/2020	Annual	10/05/2021
Agilent	Power Sensor 8481A	MY41090873	10/05/2020	Annual	10/05/2021
Agilent	Power Sensor N1921A	MY55220026	08/31/2020	Annual	08/31/2021
SPEAG	DAKS 3.5	1038	03/24/2020	Annual	03/24/2021
H.P	Network Analyzer /8753ES	JP39240221	01/11/2021	Annual	01/11/2022
Agilent	WIRELESS COMMUNICATION E5515C	MY48360252	08/06/2020	Annual	08/06/2021
Agilent	Signal Generator N5182A	MY47070230	05/06/2020	Annual	05/06/2021
Agilent	11636B/Power Divider	58698	02/26/2021	Annual	02/26/2022
OSI	4Way Power Divider	9	07/15/2020	Annual	07/15/2021
OSI	4Way Power Divider	11	07/15/2020	Annual	07/15/2021
TESTO	175-H1/Thermometer	40331915309	01/26/2021	Annual	01/26/2022
TESTO	175-H1/Thermometer	40331922309	01/26/2021	Annual	01/26/2022
EMPOWER	RF Power Amplifier	1084	07/01/2020	Annual	07/01/2021
EMPOWER	RF Power Amplifier	1011	07/30/2020	Annual	07/30/2021
MICRO LAB	LP Filter / LA-15N	10453	10/05/2020	Annual	10/05/2021
MICRO LAB	LP Filter / LA-30N	-	10/05/2020	Annual	10/05/2021
MICRO LAB	LP Filter / LA-60N	32011	10/05/2020	Annual	10/05/2021
Agilent	Attenuator (3dB) 8693B	MY39260298	09/18/2020	Annual	09/18/2021
HP	Attenuator (20dB) 8493C	09271	09/18/2020	Annual	09/18/2021
Agilent	Directional Bridge	3140A03878	06/08/2020	Annual	06/08/2021
Agilent	MXA Signal Analyzer N9020A	MY50510407	10/23/2020	Annual	10/23/2021
HP	Dual Directional Coupler	16072	10/05/2020	Annual	10/05/2021
Anritsu	Radio Communication Tester MT8820C	6200695605	05/06/2020	Annual	05/06/2021
R&S	Bluetooth CBT	100272	02/26/2021	Annual	02/26/2022

\* The E-field probe was calibrated by SPEAG, by the waveguide technique procedure. Dipole Verification measurement is performed by HCT Lab. before each test. The brain/body simulating material is calibrated by HCT using the DAKS 3.5 to determine the conductivity and permittivity (dielectric constant) of the brain/body-equivalent material.

## 18. Conclusion

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the ANSI/ IEEE C95.1 - 2005.

These measurements were taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

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

## 19. References

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- [2] ANSI/IEEE C95.1 - 2005 , American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300 kHz to 300 GHz, New York: IEEE, Sept. 1992
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- [20] IEC 62209-1, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation and procedures – Part 1: Procedure to determine the

specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz), July. 2016..

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

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[28] SAR Measurement and Reporting Requirements for 100 MHz – 6 GHz, KDB 865664 D01, D02.

[29] FCC General RF Exposure Guidance and SAR procedures for Dongles, KDB 447498 D01,D02.

## Appendix A. DUT Ant. Information & SETUP PHOTO

Please refer to test DUT Ant. Information & setup photo file no. as follows:

Report No.
HCT-SR-2103-FC002-P