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TEST REPORT

FCC SAR Test for certification of A3LSMT727V

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-SR-1905-FC002-R5

DATE OF ISSUE
Jun. 20, 2019

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Applicant	SAMSUNG Electronics Co., Ltd 129, Samsung-ro, Yeongtong-gu, Suwon-Si, Gyeonggi-do, 16677 Rep. of Korea
Equipment Type Model Name	Tablet SM-T727V
FCC ID	A3LSMT727V
Date of Test	May 20, 2019 ~ Jun 07, 2019
FCC Rule Part(s)	CFR §2.1093

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.

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.

Tested by
Kyung Mo Kim

Technical Manager
Yun Jeang Heo

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	Jun. 11, 2019	Initial Release
1	Jun. 14, 2019	Revised SAR Report 4 of 4 Revised page 5,16,18,112,99,100, 118,122,126,132,133,146
2	Jun. 17, 2019	Revised SAR Report 4 of 4 Revised page 99,100,143,148
3	Jun. 18, 2019	Revised page 99-102.
4	Jun. 19, 2019	Revised page 100.
5	Jun. 20, 2019	Revised page 29.

CONTENTS

1. Test Regulations

The tests were performed according to the following regulations:

Test Standard	IEEE Standard 1528-2013 & KDB procedures
Test Method	- FCC KDB Publication 941225 D01 3G SAR Procedures v03r01 - FCC KDB Publication 941225 D06 Hot Spot SAR v02r01 - 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 Tablet v01r02 - FCC KDB Publication 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04 - FCC KDB Publication 865664 D02 SAR Reporting v01r02 - April 2015 TCB Workshop Notes (Simultaneous transmission summation clarified) - Fall 2017 TCBC Workshop Notes(LTE Carrier Aggregation)

2. Test Location

2.1 Test Laboratory

Company Name	HCT Co., Ltd.
Address	74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA
Telephone	031-645-6300
Fax.	031-645-6401

3. Information of the EUT

3.1 General Information of the EUT

Model Name	SM-T727V
Equipment Type	Tablet
FCC ID	A3LSMT727V
Applicant	SAMSUNG Electronics Co., Ltd.

3.2 Attestation of test result of device under test

Band	Tx. Frequency	Equipment Class	SAR (W/kg)
			Reported 1g Body SAR
UMTS 850	826.4 ~ 846.6	PCB	0.86
UMTS 1900	1 852.4 ~ 1 907.6	PCB	0.25
LTE Band 2 (PCS)	1 850.7 ~ 1 909.3	PCB	0.31
LTE Band 4 (AWS)	1 710.7 ~ 1 754.3	PCB	N/A
LTE Band 5 (Cell)	824.7 ~ 848.3	PCB	0.94
LTE Band 7	2 502.5 ~ 2 567.5	PCB	1.38
LTE Band 13	779.5 ~ 784.5	PCB	1.09
LTE Band 66 (AWS)	1 712.5 ~ 1 777.5	PCB	0.76
802.11b	2 412 ~ 2 462	DTS	0.98
U-NII-1	5 180 ~ 5 240	NII	N/A
U-NII-2A	5 260 ~ 5 320	NII	0.72
U-NII-2C	5 500 ~ 5 720	NII	0.73
U-NII-3	5 745 ~ 5 825	NII	1.03
Bluetooth	2 402 ~ 2 480	DSS	0.34
Simultaneous SAR per KDB 690783 D01v01r03			**1.59**
Date(s) of Tests:	May 20, 2019 ~ Jun 07, 2019		

4. Device Under Test Description

4.1 DUT specification

Device Wireless specification overview		
Band & Mode	Operating Mode	Tx Frequency
UMTS 850	Data	826.4 ~ 846.6 MHz
UMTS 1900	Data	1 852.4 ~ 1 907.6 MHz
LTE Band 2 (PCS)	Data	1 850.7 ~ 1 909.3 MHz
LTE Band 4 (AWS)	Data	1 710.7 ~ 1 754.3 MHz
LTE Band 5 (Cell)	Data	824.7 ~ 848.3 MHz
LTE Band 7	Data	2 502.5 – 2 567.5 MHz
LTE Band 13	Data	779.5 ~ 784.5 MHz
LTE Band 66 (AWS)	Data	1 712.5 ~ 1 777.5 MHz
2.4 GHz WLAN	Data	2 412 ~ 2 462 MHz
U-NII-1	Data	5 180 ~ 5 240 MHz
U-NII-2A	Data	5 260 ~ 5 320 MHz
U-NII-2C	Data	5 500 ~ 5 720 MHz
U-NII-3	Data	5 745 ~ 5 825 MHz
Bluetooth / LE 5.0	Data	2 402 ~ 2 480 MHz
ANT+	Data	2 402 ~ 2 480 MHz

Device Description		
Device Dimension	Overall (Length x Width): 245 mm x 160 mm Overall Diagonal: 286 mm Display Diagonal: 268 mm	
Battery Options:	Standard (Li-ion Polymer Battery)	
	Battery Model Name: EB-BT725ABU	
Device Serial Numbers:	Mode	Serial Number
	UMTS 850, LTE B5, LTE B13,LTE B7	R32M400E1SY
	Bluetooth, WLAN 2.4GHz	R32M400E1FE
	UMTS 1900, LTE B2, LTE B66, WLAN 5GHz	R32M400E1LR
	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 hand. FCC KDB Publication 616217 D04v01r02 Sec.6 was used as a guideline for selection SAR test distances for device when being used in phablet use conditions.

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 Output Power

Mode / Band		Modulated Average (dBm)		
		3GPP WCDMA	3GPP HSDPA	3GPP HSUPA
UMTS Band 5 (850 MHz)	Maximum	25.0	24.0	24.0
	Nominal	24.0	23.0	23.0
UMTS Band 2 (1900 MHz)	Maximum	25.0	24.0	24.0
	Nominal	24.0	23.0	23.0
Mode / Band		Modulated Average (dBm)		
LTE Band 2 (PCS)	Maximum	25.5		
	Nominal	24.5		
LTE Band 4 (AWS)	Maximum	25.5		
	Nominal	24.5		
LTE Band 5 (Cell)	Maximum	25.0		
	Nominal	24.0		
LTE Band 7	Maximum	24.0		
	Nominal	23.0		
LTE Band 13	Maximum	25.0		
	Nominal	24.0		
LTE Band 66 (AWS)	Maximum	25.5		
	Nominal	24.5		

4.3.2 Reduced Main Output Power

Mode / Band		Modulated Average (dBm)		
		3GPP WCDMA	3GPP HSDPA	3GPP HSUPA
UMTS Band 5 (850 MHz)	Maximum	18.0	18.0	18.0
	Nominal	17.0	17.0	17.0
UMTS Band 2 (1900 MHz)	Maximum	14.0	14.0	14.0
	Nominal	13.0	13.0	13.0
Mode / Band		Modulated Average (dBm)		
LTE Band 2 (PCS)	Maximum	13.5		
	Nominal	12.5		
LTE Band 4 (AWS)	Maximum	13.5		
	Nominal	12.5		
LTE Band 5 (Cell)	Maximum	18.0		
	Nominal	17.0		
LTE Band 7	Maximum	14.5		
	Nominal	13.5		
LTE Band 13	Maximum	18.5		
	Nominal	17.5		
LTE Band 66 (AWS)	Maximum	14.0		
	Nominal	13.0		

4.3.3 Maximum WLAN/ Bluetooth Power

Mode / Band			Modulated Average (dBm)		
Mode	Channel		802.11b	802.11g	802.11n
2.4 GHz WIFI (Inactive)	Ch.1	Maximum	20	20	19
		Nominal	19	19	18
	Ch.2~ Ch.11	Maximum	20	20	20
		Nominal	19	19	19

Mode / Band			Modulated Average (dBm)		
Mode	Channel		802.11b	802.11g	802.11n
2.4 GHz WIFI (Active)	Ch.1~11	Maximum	13	13	13
		Nominal	12	12	12

Mode / Band		Modulated Average (dBm)
Bluetooth	Maximum	10.0
	Nominal	9.0
Bluetooth LE	Maximum	7.0
	Nominal	6.0

Mode / Band			Modulated Average (dBm)				
Mode			11a	11b	11g	11n	11ac
5 GHz WIFI (20 MHz) (Inactive)	(U-NII-1) 5180MHz~5240MHz	Maximum	18	N/A	N/A	18	18
		Nominal	17	N/A	N/A	17	17
	(U-NII-2A) 5260MHz	Maximum	19	N/A	N/A	18	18
		Nominal	18	N/A	N/A	17	17
	(U-NII-2A) 5280MHz~5320MHz	Maximum	19	N/A	N/A	19	18
		Nominal	18	N/A	N/A	18	17
	(U-NII-2C) 5500MHz~5720MHz	Maximum	19	N/A	N/A	19	18
		Nominal	18	N/A	N/A	18	17
	(U-NII-3) 5745MHz~5825MHz	Maximum	19	N/A	N/A	19	18
		Nominal	18	N/A	N/A	18	17
5 GHz WIFI (40 MHz) (Inactive)	(U-NII-1) 5190MHz	Maximum	N/A	N/A	N/A	17.5	17.5
		Nominal	N/A	N/A	N/A	16.5	16.5
	(U-NII-1) 5230MHz	Maximum	N/A	N/A	N/A	18	18
		Nominal	N/A	N/A	N/A	17	17
	(U-NII-2A) 5270MHz~5310MHz	Maximum	N/A	N/A	N/A	18	18
		Nominal	N/A	N/A	N/A	17	17
	(U-NII-2C) 5510MHz~5710MHz	Maximum	N/A	N/A	N/A	18	18
		Nominal	N/A	N/A	N/A	17	17
	(U-NII-3) 5755MHz~5795MHz	Maximum	N/A	N/A	N/A	18	18
		Nominal	N/A	N/A	N/A	17	17
5 GHz WIFI (80 MHz) (Inactive)	(U-NII-1) 5210MHz	Maximum	N/A	N/A	N/A	N/A	17
		Nominal	N/A	N/A	N/A	N/A	16
	(U-NII-2A) 5290MHz	Maximum	N/A	N/A	N/A	N/A	15.5
		Nominal	N/A	N/A	N/A	N/A	14.5
	(U-NII-2C) 5530MHz~5690MHz	Maximum	N/A	N/A	N/A	N/A	18
		Nominal	N/A	N/A	N/A	N/A	17
	(U-NII-3) 5775MHz	Maximum	N/A	N/A	N/A	N/A	18
		Nominal	N/A	N/A	N/A	N/A	17

Mode / Band			Modulated Average (dBm)				
Mode			11a	11b	11g	11n	11ac
5 GHz WIFI (20 MHz) (Active)	(U-NII-1) 5200MHz	Maximum	9.5	N/A	N/A	9.5	9.5
		Nominal	8.5	N/A	N/A	8.5	8.5
	(U-NII-2A) 5300MHz	Maximum	9.5	N/A	N/A	9.5	9.5
		Nominal	8.5	N/A	N/A	8.5	8.5
	(U-NII-2C) 5500MHz	Maximum	9.5	N/A	N/A	9.5	9.5
		Nominal	8.5	N/A	N/A	8.5	8.5
	(U-NII-3) 5800MHz	Maximum	9.5	N/A	N/A	9.5	9.5
		Nominal	8.5	N/A	N/A	8.5	8.5
5 GHz WIFI (40 MHz) (Active)	(U-NII-1) 5200MHz	Maximum	N/A	N/A	N/A	9.5	9.5
		Nominal	N/A	N/A	N/A	8.5	8.5
	(U-NII-2A) 5300MHz	Maximum	N/A	N/A	N/A	9.5	9.5
		Nominal	N/A	N/A	N/A	8.5	8.5
	(U-NII-2C) 5500MHz	Maximum	N/A	N/A	N/A	9.5	9.5
		Nominal	N/A	N/A	N/A	8.5	8.5
	(U-NII-3) 5800MHz	Maximum	N/A	N/A	N/A	9.5	9.5
		Nominal	N/A	N/A	N/A	8.5	8.5
5 GHz WIFI (80 MHz) (Active)	(U-NII-1) 5200MHz	Maximum	N/A	N/A	N/A	N/A	9.5
		Nominal	N/A	N/A	N/A	N/A	8.5
	(U-NII-2A) 5300MHz	Maximum	N/A	N/A	N/A	N/A	9.5
		Nominal	N/A	N/A	N/A	N/A	8.5
	(U-NII-2C) 5500MHz	Maximum	N/A	N/A	N/A	N/A	9.5
		Nominal	N/A	N/A	N/A	N/A	8.5
	(U-NII-3) 5800MHz	Maximum	N/A	N/A	N/A	N/A	9.5
		Nominal	N/A	N/A	N/A	N/A	8.5

4.4 LTE Information

Item.		Description		
Frequency Range		LTE Band 2 (PCS)	1 850.7 ~ 1 909.3 MHz	
		LTE Band 4 (AWS)	1 710.7 ~ 1 754.3 MHz	
		LTE Band 5 (Cell)	824.7 – 848.3 MHz	
		LTE Band 7	2 502.5 MHz ~ 2 567.5 MHz	
		LTE Band 13	779.5 ~ 784.5 MHz	
		LTE Band 66 (AWS)	1 710.7 ~ 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 7	5 MHz, 10 MHz, 15 MHz, 20 MHz	
		LTE Band 13	5 MHz, 10 MHz	
		LTE Band 66 (AWS)	1.4MHz, 3MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz	
Ch. No.& Freq.(MHz)		Low	Mid	High
LTE Band 2	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	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	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 13	5 MHz	779.5 (23205)	782 (23230)	784.5 (23255)
	10 MHz		782 (23230)	
LTE Band 7	5 MHz	2 502.5 (20775)	2 535 (21100)	2 567.5 (21425)
	10 MHz	2 505.0 (20800)	2 535 (21100)	2 565.0 (21400)
	15 MHz	2 507.5 (20825)	2 535 (21100)	2 562.5 (21375)
	20 MHz	2 510.0 (20850)	2 535 (21100)	2 560.0 (21350)

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)

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
		2A-2A, 2A-4A, 2A-5A, 2A-13A, 2A-66A, 4A-4A, 4A-13A, 4A-5A, 5B, 5A-66A, 13A-66A, 66A-66A, 66B, 66C
		2A-2A-5A, 2A-2A-13A, 2A-2A-66A, 2A-4A-4A, 2A-4A-5A, 2A-4A-13A, 2A-5A-66A, 2A-5B, 2A-13A-66A, 2A-66A-66A, 2A-66B, 2A-66C,4A-4A-5A, 4A-4A-13A, 5A-66A-66A, 5A-66B, 5A-66C, 5B-66A, 13A-66A-66A, 13A-66B, 13A-66C, 66A-66C
	Up-Link CA	This device dose not supports Up-Link Carrier aggregation.in US.
LTE Release 10 information	This device does not support full CA features on 3GPP Release 10. The following LTE Release 10 features are not supported. Uplink and Downlink Carrier aggregations, Relay, HetNet, Enhanced MIMO, elCl, WiFi offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.	

4.5 SAR Test Configurations

Since the Dedicated Host Approach is applied, the standalone SAR test exclusion procedure in KDB447498 4.3.1 is applied in conjunction with KDB 616217 4.3 to determine the minimum test separation distance:

When the separation distance from the antenna to an adjacent edge is ≤ 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

When the separation distance from the antenna to an adjacent edge is > 5 mm, the actual antenna-to-edge separation distance is applied to determine SAR test exclusion

Maximum Power Condition: Sensor Inactive

Ant.	Band	Freq. [MHz]	Max. Power		Separation Distances (mm)					SAR Test Exclusion Thresholds (test separation distances <50mm threshold value <3					SAR Test Exclusion Thresholds (test separation distances >50mm Power (mW)				
			(dBm)	(mW)	Rear	Top	Left	Right	Bottom	Rear	Top	Left	Right	Bottom	Rear	Top	Left	Right	Bottom
Main	UMTS B5	846.6	25	316.2	0	0	46	0	234	58.2	58.2	6.3	58.2	>50mm	<50mm	<50mm	<50mm	<50mm	1201.6
Main	UMTS B2	1 907.6	25	316.2	0	0	46	0	234	87.4	87.4	9.5	87.4	>50mm	<50mm	<50mm	<50mm	<50mm	1948.6
Main	LTE B2	1909.3	25.5	354.8	0	0	46	0	234	98.1	98.1	10.7	98.1	>50mm	<50mm	<50mm	<50mm	<50mm	1948.6
Main	LTE B4	1754.3	25.5	354.8	0	0	46	0	234	94.0	94.0	10.2	94.0	>50mm	<50mm	<50mm	<50mm	<50mm	1953.3
Main	LTE B5	848.3	25	316.2	0	0	46	0	234	58.3	58.3	6.3	58.3	>50mm	<50mm	<50mm	<50mm	<50mm	1203.4
Main	LTE B7	2 567.5	24	251.2	0	0	46	0	234	80.5	80.5	8.7	80.5	>50mm	<50mm	<50mm	<50mm	<50mm	1933.6
Main	LTE B13	782	25	316.2	0	0	46	0	234	55.9	55.9	6.1	55.9	>50mm	<50mm	<50mm	<50mm	<50mm	1203.4
Main	LTE B66	1777.5	25.5	354.8	0	0	46	0	234	94.6	94.6	10.3	94.6	>50mm	<50mm	<50mm	<50mm	<50mm	1128.9
WLAN	BT	2 480	10	10.0	0	0	0	116	234	3.1	3.1	3.1	>50mm	>50mm	<50mm	<50mm	<50mm	755.3	1935.3
WLAN	2.4 GHz	2 462	20	100.0	0	0	0	116	234	31.4	31.4	31.4	>50mm	>50mm	<50mm	<50mm	<50mm	755.6	1935.6
WLAN	5 GHz	5 825	19	79.4	0	0	0	116	234	38.3	38.3	38.3	>50mm	>50mm	<50mm	<50mm	<50mm	722.2	1902.2

Antenna	Band	Freq. [MHz]	Max. Power		Separation Distances (mm)					Device Configurations for SAR Testing				
			dBm	mW	Rear	Top	Left	Right	Bottom	Rear	Top	Left	Right	Bottom
Main	UMTS B5	846.6	25	316.2	0	0	46	0	234	Yes	Yes	Yes	Yes	No
Main	UMTS B2	1 907.6	25	316.2	0	0	46	0	234	Yes	Yes	Yes	Yes	No
Main	LTE B2	1909.3	25.5	354.8	0	0	46	0	234	Yes	Yes	Yes	Yes	No
Main	LTE B4	1754.3	25.5	354.8	0	0	46	0	234	Yes	Yes	Yes	Yes	No
Main	LTE B5	848.3	25	316.2	0	0	46	0	234	Yes	Yes	Yes	Yes	No
Main	LTE B7	2 567.5	24	251.2	0	0	46	0	234	Yes	Yes	Yes	Yes	No
Main	LTE B13	782	25	316.2	0	0	46	0	234	Yes	Yes	Yes	Yes	No
Main	LTE B66	1777.5	25.5	354.8	0	0	46	0	234	Yes	Yes	Yes	Yes	No
WLAN	BT	2 480	10	10.0	0	0	0	116	234	Yes	Yes	Yes	No	No
WLAN	2.4 GHz	2 462	20	100.0	0	0	0	116	234	Yes	Yes	Yes	No	No
WLAN	5 GHz	5 825	19	79.4	0	0	0	116	234	Yes	Yes	Yes	No	No

Antennas <50mm to adjacent edges: According to KDB 447498 D01v06, if the calculated threshold value >3 then SAR test is required.
Antennas >50mm to adjacent edges: According to KDB 447498 D01v06, if the power threshold is less than the output power, SAR is required.

Reduction Power Condition: Sensor Active

(Proximity sensor power reduction is not applied to the main band on the left side of the DUT.)

Ant.	Band	Freq. [MHz]	Max. Power		Separation Distances (mm)					SAR Test Exclusion Thresholds (test separation distances <50mm threshold value <3					SAR Test Exclusion Thresholds (test separation distances >50mm Power (mW)				
			(dBm)	(mW)	Rear	Top	Left	Right	Bottom	Rear	Top	Left	Right	Bottom	Rear	Top	Left	Right	Bottom
Main	UMTS B5	846.6	18.0	63.1	0	0	46	0	234	11.6	11.6	N/A	11.6	>50mm	<50mm	<50mm	<50mm	<50mm	1201.6
Main	UMTS B2	1907.6	14.0	25.1	0	0	46	0	234	6.9	6.9	N/A	6.9	>50mm	<50mm	<50mm	<50mm	<50mm	1948.6
Main	LTE B2	1909.3	13.5	22.4	0	0	46	0	234	6.2	6.2	N/A	6.2	>50mm	<50mm	<50mm	<50mm	<50mm	1948.6
Main	LTE B4	1754.3	13.5	22.4	0	0	46	0	234	5.9	5.9	N/A	5.9	>50mm	<50mm	<50mm	<50mm	<50mm	1953.3
Main	LTE B5	848.3	18.0	63.1	0	0	46	0	234	11.6	11.6	N/A	11.6	>50mm	<50mm	<50mm	<50mm	<50mm	1203.4
Main	LTE B7	2 567.5	14.5	28.2	0	0	46	0	234	9.0	9.0	N/A	9.0	>50mm	<50mm	<50mm	<50mm	<50mm	1933.6
Main	LTE B13	784.5	18.5	70.6	0	0	46	0	234	12.5	12.5	N/A	12.5	>50mm	<50mm	<50mm	<50mm	<50mm	1128.9
Main	LTE B66	1777.5	14.0	25.1	0	0	46	0	234	6.7	6.7	N/A	6.7	>50mm	<50mm	<50mm	<50mm	<50mm	1952.5
WLAN	2.4 GHz	2472	13.0	20.0	0	0	0	116	234	6.3	6.3	6.3	>50mm	>50mm	<50mm	<50mm	<50mm	755.6	1935.6
WLAN	5 GHz	5 25	9.5	8.9	0	0	0	116	234	9.6	9.6	9.6	>50mm	>50mm	<50mm	<50mm	<50mm	722.2	1902.2

Antenna	Band	Freq. [MHz]	Max. Power		Separation Distances (mm)					Device Configurations for SAR Testing				
			dBm	mW	Rear	Top	Left	Right	Bottom	Rear	Top	Left	Right	Bottom
Main	UMTS B5	846.6	18.0	63.1	0	0	46	0	234	Yes	Yes	N/A	Yes	No
Main	UMTS B2	1907.6	14.0	25.1	0	0	46	0	234	Yes	Yes	N/A	Yes	No
Main	LTE B2	1909.3	13.5	22.4	0	0	46	0	234	Yes	Yes	N/A	Yes	No
Main	LTE B4	1754.3	13.5	22.4	0	0	46	0	234	Yes	Yes	N/A	Yes	No
Main	LTE B5	848.3	18.0	63.1	0	0	46	0	234	Yes	Yes	N/A	Yes	No
Main	LTE B7	2 567.5	14.5	28.2	0	0	46	0	234	Yes	Yes	N/A	Yes	No
Main	LTE B13	784.5	18.5	70.6	0	0	46	0	234	Yes	Yes	N/A	Yes	No
Main	LTE B66	1777.5	14.0	25.1	0	0	46	0	234	Yes	Yes	N/A	Yes	No
WLAN	2.4 GHz	2472	13.0	20.0	0	0	0	116	234	Yes	Yes	Yes	No	No
WLAN	5 GHz	5 25	9.5	8.9	0	0	0	116	234	Yes	Yes	Yes	No	No

Antennas <50mm to adjacent edges: According to KDB 447498 D01v06, if the calculated threshold value >3 then SAR test is required.
Antennas >50mm to adjacent edges: According to KDB 447498 D01v06, if the power threshold is less than the output power, SAR is required.

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

$$\frac{MaxPowerofChannel(mW)}{TestSeparationDistance(mm)} * \sqrt{Frequency(GHz)} \leq 3.0(1g\ \text{SAR}), 7.5(10g\ \text{SAR})$$

Antennas >50mm to adjacent edges: According to KDB 447498 D01v06, if the power threshold is less than the output power ,SAR is required.

Per KDB 447498 D01v06 Sec 4.3.1 b) For 100 MHz to 6 GHz and test separation distances > 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following (also illustrated in Appendix B)

1) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·(f(MHz)/150)]} mW, for 100 MHz to 1500 MHz

2) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·10]} mW, for > 1500 MHz and ≤ 6 GHz

Additional Test Scenarios

Test Configurations	SAR Required	Note
Right Corner	Yes	Main Band : WCDMA B2, B5 LTE B2, B4, B5, B7, B13, B66
Left Corner	Yes	2.4GHz / 5GHz WLAN
Right	Yes	2.4GHz / 5GHz WLAN The right side is necessary to evaluate the simultaneous transmission conditions of the main Antenna and the WLAN.Antenna

Note; All test configurations are based on front view.

Per FCC KDB Publication 616217 D04v01r02, the rear surface and edges of tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR Exclusion Threshold in KDB 447498 D01v06 can be applied to determine SAR test exclusion for adjacent edge configurations. The closet distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

4.6 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	Yes
UMTS + 5 GHz WiFi Antenna	Yes
UMTS + 2.4 GHz Bluetooth	Yes
LTE + 2.4 GHz WiFi Antenna	Yes
LTE + 5 GHz WiFi Antenna	Yes
LTE + 2.4 GHz Bluetooth	Yes

4.7 SAR Test Considerations

4.7.1 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) 1 Tx antenna output
d) 256 QAM is supported
e) TDWR channels are supported.
f) Straddle channels are supported

4.7.2 Bluetooth LE

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

$$\frac{MaxPowerofChannel(mW)}{TestSeparationDistance(mm)} * \sqrt{Frequency(GHz)} \leq 3.0(1g\ \ SAR), 7.5(10g\ \ SAR)$$

Mode		Frequency	Maximum Allowed Power	Separation Distance	≤ 3.0
		[MHz]	[mW]	[mm]	1-g SAR
Bluetooth LE	Body SAR	2 480	5.0	5	1.6

Based on the maximum conducted power of Bluetooth LE and antenna to use separation distance, Bluetooth LE SAR was not required [(5/5)*√2.480] = 1.6≤3.0 for 1-g SAR.

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

4.7.3 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 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 4 (1 710.7 ~ 1 754.3 MHz) is covered by LTE Band 66 (1 710.7 ~ 1 779.3 MHz) and both LTE bands have the same maximum target power.

This device supports LTE Carrier Aggregation (CA) in the downlink only. All uplink communications are identical to Release 10 specifications. Per FCC KDB publication 941225 D05A v01r02, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

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.

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

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.

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

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 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

Ri_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:
$(SAR_1 + SAR_2)^{1.5}/R_i \leq 0.04$ for 1g SAR and $(SAR_1 + SAR_2)^{1.5}/R_i \leq 0.1$ 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 (d*W*) absorbed by (dissipated in) an incremental mass (d*m*) contained in a volume element (d*V*) 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)

$$SAR = \sigma E^2 / \rho$$

Where:

σ = conductivity of the tissue-simulant material (S/m)

ρ = mass density of the tissue-simulant material (kg/m³)

E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in 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.

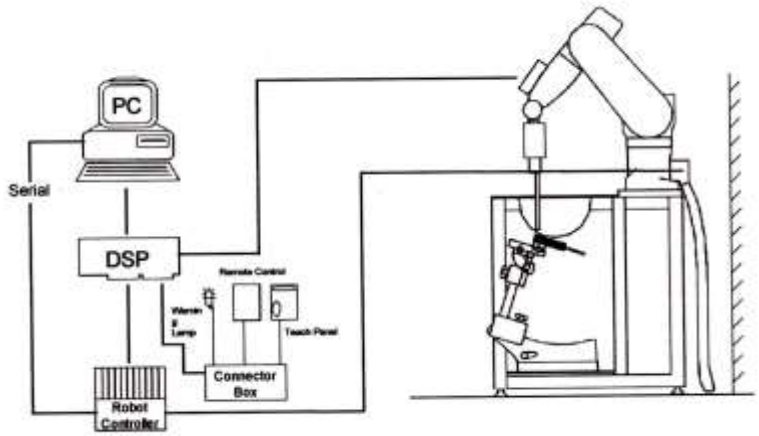


Figure 2. HCT SAR Lab. Test Measurement Set-up

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.

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5±1 mm</td><td>$^1/_2$·δ·ln(2)±0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30°±1°</td><td>20°±1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan Spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤15 mm
2-3 GHz: ≤12 mm</td><td>3-4 GHz: ≤12 mm
4-6 GHz: ≤10 mm</td></tr>
<tr><td colspan="2">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.</td></tr>
<tr><td colspan="3">Maximum zoom scan Spatial resolution: Δx_{zoom}, Δy_{zoom}</td><td>≤ 2 GHz: ≤8mm
2-3 GHz: ≤5mm*</td><td>3-4 GHz: ≤5 mm*
4-6 GHz: ≤4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan Spatial resolution normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{zoom}(n)$</td><td>≤ 5 mm</td><td>3-4 GHz: ≤4 mm
4-5 GHz: ≤3 mm
5-6 GHz: ≤2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{zoom}(1)$: between 1st two Points closest to phantom surface</td><td>≤ 4 mm</td><td>3-4 GHz: ≤3 mm
4-5 GHz: ≤2.5 mm
5-6 GHz: ≤2 mm</td></tr>
<tr><td>$\Delta z_{zoom}(n>1)$: between subsequent Points</td><td colspan="2">≤1.5·$\Delta z_{zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3-4 GHz: ≥28 mm
4-5 GHz: ≥25 mm
5-6 GHz: ≥22 mm</td></tr>
<tr><td colspan="5">Note: δ 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.</td></tr>
</table>

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 ε and loss tangent δ=0.02

8.2 SAR Testing for Tablet Per KDB Publication 616217 D04v01r02

Per FCC KDB Publication 616217 D04v01r02, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR Exclusion Threshold in KDB 447498 D01v06 can be applied to determine SAR test exclusion for adjacent edge configuration. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

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 D04 Section 8 and additional FCC guidance were used as a guideline for selecting SAR test distances for this device at these additional exposure conditions. The smallest separation distance determined by the sensor triggering and sensor coverage for each applicable edge, minus 1 mm. was used as the test separation distance for SAR testing. Sensor triggering distance evaluation is provided in a separate document.

The required separation distance to evaluate SAR at full powers were:
WWAN: Rear 16mm, top edge 17mm, right edge 10mm, right corner 6mm, left edge 0mm (no sensor coverage)
Wi-Fi: Rear 8mm, top edge 9mm, left edge 6mm, left corner 6mm, right edge 0mm (no sensor coverage)

Additional Guidance KDB inquiry:

- Additional SAR test for corner side – KDB guidance to identify that SAR test when sensor and Antenna is located near the corner side

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 * (Head)	1.60	8.00
SPATIAL AVERAGE SAR ** (Whole Body)	0.08	0.40
SPATIAL PEAK SAR *** (Hands / Feet / Ankle / Wrist)	4.00	20.00

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 Cheek 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 12.2kbps 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 12.2kbps 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.

10.4 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 ≤ 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% all0cation 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.

10.5 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-NII2A 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 380MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, the channels at 5.60 -5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification.
Unless band gap channels are permanently disabled, SAR must be considered for these channels.

10.5.4 Initial Test Position Procedure

For exposure conditions with multiple test positions, such as handset operating nest to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg for 1g SAR and ≤ 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 ≤ 0.8 W/kg for 1g SAR and ≤ 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 ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS is that exposure configuration.
2) When the reported SAR is > 0.8 W/kg, SAR is required for that position using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

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

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.2., 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 ≤ 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 ≤ 1.2 W/kg for 1g SAR and ≤ 3.0 W/kg for 10g SAR, no additional SAR tests for the subsequent test configurations are required.

11. Output Power Specifications

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

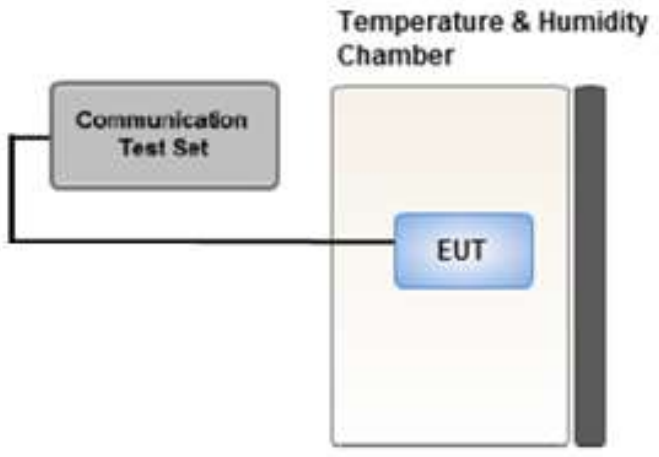
According to ANSI C63.26-2015 Section 5.2.1 when measuring the maximum RF output power from such devices, control over the EUT must be provided either through special test software (provided by manufacturer specifically for compliance testing, but not accessible by an end user) or through use of a base 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 Maximum Conducted Output Power

HSPA+
This DUT is only capable of QPSK HSPA+ in uplink. Therefore, the RF conducted power is not measured according to 941225 D01 3G SAR.

11.1.1 UMTS Maximum Conducted Output Power

WCDMA Band 5

3GPP Release Version	Mode	3GPP 34.121	WCDMA Band 5 [dBm]			3GPP MPR
		Subtest	UL 4132 DL 4357	UL 4183 DL 4408	UL 4233 DL 4458	
99	WCDMA	12.2 kbps RMC	24.09	24.18	24.33	-
99	WCDMA	12.2 kbps AMR				-
5	HSDPA	Subtest 1	22.94	23.02	23.17	0
5		Subtest 2	22.95	23.03	23.20	0
5		Subtest 3	22.46	22.54	22.70	0.5
5		Subtest 4	22.44	22.54	22.72	0.5
6	HSUPA	Subtest 1	22.45	23.04	23.19	0
6		Subtest 2	20.94	21.02	21.18	2
6		Subtest 3	21.95	22.05	22.20	1
6		Subtest 4	20.95	21.02	21.20	2
6		Subtest 5	22.96	23.04	23.20	0

WCDMA Average Conducted output powers

WCDMA Band 2

3GPP Release Version	Mode	3GPP 34.121	WCDMA Band 2 [dBm]			3GPP MPR
		Subtest	UL 9262 DL 9662	UL 9400 DL 9800	UL 9538 DL 9938	
99	WCDMA	12.2 kbps RMC	23.84	23.74	23.86	-
99	WCDMA	12.2 kbps AMR				-
5	HSDPA	Subtest 1	22.77	22.70	22.83	0
5		Subtest 2	22.79	22.71	22.84	0
5		Subtest 3	22.29	22.23	22.36	0.5
5		Subtest 4	22.30	22.23	22.36	0.5
6	HSUPA	Subtest 1	22.79	22.73	22.85	0
6		Subtest 2	20.77	20.72	20.86	2
6		Subtest 3	21.78	21.72	21.85	1
6		Subtest 4	20.78	20.71	20.82	2
6		Subtest 5	22.79	22.72	22.85	0

WCDMA Average Conducted output powers

11.1.2 UMTS Reduced Conducted Output Power

WCDMA Band 5

3GPP Release Version	Mode	3GPP 34.121	WCDMA Band 5 [dBm]			3GPP MPR
		Subtest	UL 4132 DL 4357	UL 4183 DL 4408	UL 4233 DL 4458	
99	WCDMA	12.2 kbps RMC	17.08	17.16	17.27	-
99	WCDMA	12.2 kbps AMR				-
5	HSDPA	Subtest 1	15.93	16.02	16.13	0
5		Subtest 2	15.94	16.03	16.15	0
5		Subtest 3	15.43	15.52	15.64	0.5
5		Subtest 4	15.44	15.53	15.64	0.5
6	HSUPA	Subtest 1	15.95	16.03	16.16	0
6		Subtest 2	13.95	14.04	14.17	2
6		Subtest 3	14.96	15.04	15.18	1
6		Subtest 4	13.95	14.04	14.15	2
6		Subtest 5	15.95	16.03	16.17	0

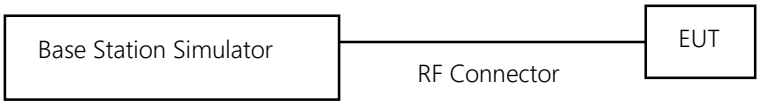
WCDMA Average Conducted output powers

WCDMA Band 2

3GPP Release Version	Mode	3GPP 34.121	WCDMA Band 2 [dBm]			3GPP MPR
		Subtest	UL 9262 DL 9662	UL 9400 DL 9800	UL 9538 DL 9938	
99	WCDMA	12.2 kbps RMC	12.78	12.68	12.80	-
99	WCDMA	12.2 kbps AMR				-
5	HSDPA	Subtest 1	11.74	11.66	11.80	0
5		Subtest 2	11.75	11.67	11.81	0
5		Subtest 3	11.18	11.18	11.32	0.5
5		Subtest 4	11.24	11.17	11.34	0.5
6	HSUPA	Subtest 1	11.73	11.66	11.81	0
6		Subtest 2	9.73	9.67	9.81	2
6		Subtest 3	10.77	10.68	10.84	1
6		Subtest 4	9.73	9.65	9.82	2
6		Subtest 5	11.74	11.66	11.82	0

WCDMA Average Conducted output powers

It is expected by the manufacturer that MPR for some HSPA Subtests may be up to 2 dB more than specified by 3GPP, But also as low as 1 dB according to the chipset implementation in this model to match manufacturer.



11.2 LTE Maximum Output Power

11.2.1 LTE Maximum Conducted Output 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	23.86	23.80	23.82	0	0
		1	3	23.88	23.84	23.95	0	0
		1	5	23.81	23.78	23.82	0	0
		3	0	23.80	23.82	23.84	0	0
		3	1	23.88	23.82	23.91	0	0
		3	3	23.83	23.84	23.84	0	0
		6	0	22.81	22.83	22.90	0-1	1
	16QAM	1	0	23.19	23.15	23.24	0-1	1
		1	3	23.30	23.23	23.17	0-1	1
		1	5	23.23	23.04	23.12	0-1	1
		3	0	22.97	22.98	22.93	0-1	1
		3	1	23.06	23.00	22.95	0-1	1
		3	3	22.94	22.92	22.96	0-1	1
		6	0	22.00	22.03	22.06	0-2	2
	64QAM	1	0	22.06	22.11	22.08	0-2	2
		1	3	22.15	22.16	22.14	0-2	2
		1	5	22.12	22.07	22.10	0-2	2
		3	0	22.06	22.03	22.05	0-2	2
		3	1	22.04	22.03	22.09	0-2	2
		3	3	22.06	21.98	22.05	0-2	2
		6	0	20.88	20.93	20.93	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	23.91	23.87	23.89	0	0
		1	7	23.96	23.98	24.04	0	0
		1	14	23.91	23.87	23.87	0	0
		8	0	22.90	22.88	22.91	0-1	1
		8	3	22.90	22.89	22.94	0-1	1
		8	7	22.87	22.84	22.93	0-1	1
		15	0	22.90	22.84	22.94	0-1	1
	16QAM	1	0	23.14	23.17	23.13	0-1	1
		1	7	23.36	23.38	23.33	0-1	1
		1	14	23.17	23.14	23.27	0-1	1
		8	0	22.05	22.03	22.03	0-2	2
		8	3	22.07	22.04	22.09	0-2	2
		8	7	22.06	22.03	22.08	0-2	2
		15	0	21.98	21.98	22.02	0-2	2
	64QAM	1	0	22.17	22.16	22.16	0-2	2
		1	7	22.28	22.16	22.25	0-2	2
		1	14	22.19	22.18	22.12	0-2	2
		8	0	21.03	20.96	21.01	0-3	3
		8	3	21.08	21.01	21.05	0-3	3
		8	7	20.99	21.03	21.08	0-3	3
		15	0	21.02	20.99	20.98	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	18900Ch. 1880 MHz	19175 Ch. 1907.5 MHz		
5 MHz	QPSK	1	0	23.93	23.94	23.97	0	0
		1	12	23.90	23.84	23.88	0	0
		1	24	23.90	23.87	23.91	0	0
		12	0	22.93	22.93	22.91	0-1	1
		12	6	22.94	22.89	23.00	0-1	1
		12	11	22.87	22.89	22.92	0-1	1
		25	0	22.92	22.89	22.92	0-1	1
	16QAM	1	0	23.18	23.24	23.34	0-1	1
		1	12	23.21	23.15	23.22	0-1	1
		1	24	23.35	23.26	23.26	0-1	1
		12	0	22.02	22.04	22.05	0-2	2
		12	6	22.02	22.03	22.05	0-2	2
		12	11	22.03	21.98	22.03	0-2	2
		25	0	22.01	21.98	22.03	0-2	2
	64QAM	1	0	22.19	22.22	22.22	0-2	2
		1	12	22.12	22.14	22.17	0-2	2
		1	24	22.12	22.11	22.25	0-2	2
		12	0	21.11	21.01	21.06	0-3	3
		12	6	21.07	21.05	21.08	0-3	3
		12	11	21.05	21.05	21.09	0-3	3
		25	0	21.00	20.94	21.04	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	24.19	24.11	23.90	0	0
		1	24	23.90	23.87	23.86	0	0
		1	49	24.13	24.11	23.89	0	0
		25	0	22.94	22.94	22.90	0-1	1
		25	12	22.92	22.95	22.99	0-1	1
		25	24	22.92	22.90	22.96	0-1	1
		50	0	22.95	22.92	22.84	0-1	1
	16QAM	1	0	23.43	23.49	23.24	0-1	1
		1	24	23.21	23.30	23.12	0-1	1
		1	49	23.36	23.47	23.23	0-1	1
		25	0	22.05	22.05	22.02	0-2	2
		25	12	22.04	22.06	22.09	0-2	2
		25	24	22.02	21.97	22.04	0-2	2
		50	0	22.03	22.06	21.94	0-2	2
	64QAM	1	0	22.38	22.36	22.16	0-2	2
		1	24	22.23	22.19	22.08	0-2	2
		1	49	22.33	22.35	22.21	0-2	2
		25	0	21.07	21.06	20.94	0-3	3
		25	12	21.06	21.02	21.04	0-3	3
		25	24	21.10	20.99	21.04	0-3	3
		50	0	21.06	21.02	20.99	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	24.01	23.97	24.03	0	0
		1	36	23.87	23.82	23.89	0	0
		1	74	23.83	23.88	23.96	0	0
		36	0	22.88	22.91	22.90	0-1	1
		36	18	22.92	22.88	22.86	0-1	1
		36	39	22.91	22.85	22.97	0-1	1
		75	0	22.93	22.92	22.90	0-1	1
	16QAM	1	0	23.30	23.28	23.34	0-1	1
		1	36	23.19	23.18	23.31	0-1	1
		1	74	23.27	23.17	23.32	0-1	1
		36	0	22.03	22.04	21.97	0-2	2
		36	18	22.02	22.00	21.98	0-2	2
		36	39	21.97	21.96	22.01	0-2	2
		75	0	22.01	22.02	22.00	0-2	2
	64QAM	1	0	22.25	22.24	22.28	0-2	2
		1	36	22.07	22.13	22.16	0-2	2
		1	74	22.21	22.21	22.26	0-2	2
		36	0	21.09	21.05	21.00	0-3	3
		36	18	21.02	21.06	21.00	0-3	3
		36	39	21.05	21.00	21.05	0-3	3
		75	0	20.98	21.00	20.93	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	24.09	24.17	23.99	0	0
		1	49	23.86	23.84	23.81	0	0
		1	99	23.99	24.10	23.91	0	0
		50	0	22.95	22.93	22.97	0-1	1
		50	25	22.88	22.91	22.89	0-1	1
		50	49	22.87	22.84	22.88	0-1	1
		100	0	22.90	22.94	22.92	0-1	1
	16QAM	1	0	23.40	23.46	23.37	0-1	1
		1	49	23.21	23.23	23.21	0-1	1
		1	99	23.34	23.50	23.23	0-1	1
		50	0	22.06	22.05	22.01	0-2	2
		50	25	21.98	22.03	21.99	0-2	2
		50	49	21.99	21.99	21.97	0-2	2
		100	0	22.05	22.02	21.99	0-2	2
	64QAM	1	0	22.35	22.36	22.25	0-2	2
		1	49	22.17	22.01	22.02	0-2	2
		1	99	22.35	22.39	22.10	0-2	2
		50	0	21.03	21.01	21.04	0-3	3
		50	25	21.02	21.00	21.01	0-3	3
		50	49	21.00	21.02	20.95	0-3	3
		100	0	20.99	21.00	20.98	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	24.07	24.18	23.72	0	0
		1	3	24.14	24.19	23.83	0	0
		1	5	24.10	24.15	23.74	0	0
		3	0	24.06	24.16	23.77	0	0
		3	1	24.14	24.21	23.83	0	0
		3	3	24.09	24.18	23.78	0	0
		6	0	23.10	23.19	22.76	0-1	1
	16QAM	1	0	23.49	23.56	23.07	0-1	1
		1	3	23.56	23.49	23.27	0-1	1
		1	5	23.32	23.52	23.06	0-1	1
		3	0	23.18	23.21	22.91	0-1	1
		3	1	23.23	23.40	22.96	0-1	1
		3	3	23.15	23.27	22.91	0-1	1
		6	0	22.26	22.35	21.91	0-2	2
	64QAM	1	0	22.26	22.44	22.03	0-2	2
		1	3	22.39	22.47	22.14	0-2	2
		1	5	22.25	22.38	22.10	0-2	2
		3	0	22.31	22.35	21.96	0-2	2
		3	1	22.33	22.42	22.09	0-2	2
		3	3	22.28	22.41	22.04	0-2	2
		6	0	21.22	21.29	20.90	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	24.11	24.22	23.80	0	0
		1	7	24.23	24.31	23.91	0	0
		1	14	24.08	24.22	23.77	0	0
		8	0	23.16	23.21	22.83	0-1	1
		8	3	23.17	23.29	22.84	0-1	1
		8	7	23.10	23.25	22.78	0-1	1
		15	0	23.17	23.27	22.82	0-1	1
	16QAM	1	0	23.51	23.55	23.11	0-1	1
		1	7	23.57	23.66	23.15	0-1	1
		1	14	23.39	23.46	23.11	0-1	1
		8	0	22.25	22.40	21.95	0-2	2
		8	3	22.37	22.43	22.04	0-2	2
		8	7	22.26	22.38	21.95	0-2	2
		15	0	22.27	22.37	21.96	0-2	2
	64QAM	1	0	22.37	22.50	22.08	0-2	2
		1	7	22.55	22.57	22.23	0-2	2
		1	14	22.32	22.48	22.15	0-2	2
		8	0	21.25	21.36	21.00	0-3	3
		8	3	21.34	21.42	20.99	0-3	3
		8	7	21.30	21.38	20.94	0-3	3
		15	0	21.22	21.33	20.93	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	24.17	24.25	23.96	0	0
		1	12	24.12	24.24	23.84	0	0
		1	24	24.13	24.17	23.88	0	0
		12	0	23.19	23.27	23.02	0-1	1
		12	6	23.17	23.30	22.89	0-1	1
		12	11	23.18	23.22	22.84	0-1	1
		25	0	23.13	23.28	23.00	0-1	1
	16QAM	1	0	23.42	23.70	23.28	0-1	1
		1	12	23.43	23.54	23.27	0-1	1
		1	24	23.48	23.61	23.11	0-1	1
		12	0	22.26	22.32	22.08	0-2	2
		12	6	22.27	22.42	21.97	0-2	2
		12	11	22.23	22.35	21.97	0-2	2
		25	0	22.25	22.39	22.05	0-2	2
	64QAM	1	0	22.50	22.57	22.25	0-2	2
		1	12	22.41	22.46	22.08	0-2	2
		1	24	22.36	22.51	22.18	0-2	2
		12	0	21.34	21.40	21.15	0-3	3
		12	6	21.34	21.44	21.02	0-3	3
		12	11	21.30	21.38	20.99	0-3	3
		25	0	21.26	21.33	21.09	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	24.20	24.29	24.01	0	0
		1	24	24.11	24.24	23.98	0	0
		1	49	24.23	24.13	23.84	0	0
		25	0	23.19	23.33	22.99	0-1	1
		25	12	23.28	23.31	23.04	0-1	1
		25	24	23.24	23.25	23.01	0-1	1
		50	0	23.28	23.29	22.98	0-1	1
	16QAM	1	0	23.56	23.59	23.39	0-1	1
		1	24	23.46	23.70	23.28	0-1	1
		1	49	23.58	23.44	23.23	0-1	1
		25	0	22.30	22.39	22.18	0-2	2
		25	12	22.37	22.42	22.09	0-2	2
		25	24	22.35	22.36	22.10	0-2	2
		50	0	22.36	22.41	22.11	0-2	2
	64QAM	1	0	22.51	22.65	22.27	0-2	2
		1	24	22.41	22.52	22.22	0-2	2
		1	49	22.51	22.37	22.07	0-2	2
		25	0	21.29	21.45	21.14	0-3	3
		25	12	21.38	21.43	21.13	0-3	3
		25	24	21.34	21.36	21.11	0-3	3
		50	0	21.36	21.41	21.11	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	24.30	24.39	24.24	0	0
		1	36	24.20	24.22	23.92	0	0
		1	74	24.27	24.18	23.91	0	0
		36	0	23.32	23.34	23.22	0-1	1
		36	18	23.30	23.30	23.05	0-1	1
		36	39	23.24	23.33	23.04	0-1	1
		75	0	23.29	23.31	23.01	0-1	1
	16QAM	1	0	23.57	23.73	23.57	0-1	1
		1	36	23.57	23.52	23.34	0-1	1
		1	74	23.62	23.50	23.29	0-1	1
		36	0	22.45	22.38	22.26	0-2	2
		36	18	22.42	22.40	22.13	0-2	2
		36	39	22.34	22.39	22.09	0-2	2
		75	0	22.41	22.42	22.13	0-2	2
	64QAM	1	0	22.58	22.66	22.45	0-2	2
		1	36	22.52	22.51	22.29	0-2	2
		1	74	22.58	22.39	22.17	0-2	2
		36	0	21.46	21.45	21.28	0-3	3
		36	18	21.41	21.49	21.15	0-3	3
		36	39	21.42	21.36	21.10	0-3	3
		75	0	21.41	21.37	21.12	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	24.35	0	0
		1	49	24.26	0	0
		1	99	24.17	0	0
		50	0	23.40	0-1	1
		50	25	23.32	0-1	1
		50	49	23.29	0-1	1
		100	0	23.34	0-1	1
	16QAM	1	0	23.75	0-1	1
		1	49	23.64	0-1	1
		1	99	23.52	0-1	1
		50	0	22.51	0-2	2
		50	25	22.44	0-2	2
		50	49	22.42	0-2	2
		100	0	22.40	0-2	2
	64QAM	1	0	22.60	0-2	2
		1	49	22.47	0-2	2
		1	99	22.42	0-2	2
		50	0	21.51	0-3	3
		50	25	21.42	0-3	3
		50	49	21.36	0-3	3
		100	0	21.39	0-3	3

Note: LTE Band 4 (AWS) at 20 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing.

[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	23.35	23.33	23.46	0	0
		1	3	23.38	23.40	23.54	0	0
		1	5	23.37	23.31	23.42	0	0
		3	0	23.39	23.32	23.45	0	0
		3	1	23.42	23.35	23.56	0	0
		3	3	23.38	23.35	23.48	0	0
		6	0	22.40	22.33	22.53	0-1	1
	16QAM	1	0	22.75	22.62	22.78	0-1	1
		1	3	22.80	22.78	22.79	0-1	1
		1	5	22.66	22.73	22.77	0-1	1
		3	0	22.46	22.42	22.65	0-1	1
		3	1	22.51	22.47	22.66	0-1	1
		3	3	22.53	22.42	22.62	0-1	1
		6	0	21.56	21.47	21.67	0-2	2
	64QAM	1	0	21.63	21.55	21.79	0-2	2
		1	3	21.65	21.60	21.88	0-2	2
		1	5	21.60	21.59	21.80	0-2	2
		3	0	21.58	21.54	21.73	0-2	2
		3	1	21.62	21.61	21.76	0-2	2
		3	3	21.62	21.54	21.71	0-2	2
		6	0	20.43	20.40	20.59	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	23.43	23.44	23.54	0	0
		1	7	23.50	23.47	23.60	0	0
		1	14	23.42	23.47	23.52	0	0
		8	0	22.46	22.45	22.54	0-1	1
		8	3	22.47	22.45	22.58	0-1	1
		8	7	22.43	22.39	22.53	0-1	1
		15	0	22.41	22.41	22.57	0-1	1
	16QAM	1	0	22.76	22.78	22.87	0-1	1
		1	7	22.81	22.89	23.01	0-1	1
		1	14	22.76	22.83	22.83	0-1	1
		8	0	21.59	21.56	21.70	0-2	2
		8	3	21.63	21.62	21.76	0-2	2
		8	7	21.57	21.55	21.66	0-2	2
		15	0	21.56	21.54	21.69	0-2	2
	64QAM	1	0	21.72	21.73	21.80	0-2	2
		1	7	21.78	21.77	21.86	0-2	2
		1	14	21.61	21.77	21.79	0-2	2
		8	0	20.56	20.53	20.71	0-3	3
		8	3	20.56	20.57	20.77	0-3	3
		8	7	20.51	20.57	20.65	0-3	3
		15	0	20.49	20.52	20.65	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	23.46	23.47	23.52	0	0
		1	12	23.37	23.38	23.59	0	0
		1	24	23.41	23.50	23.55	0	0
		12	0	22.47	22.44	22.54	0-1	1
		12	6	22.44	22.48	22.50	0-1	1
		12	11	22.40	22.41	22.60	0-1	1
		25	0	22.42	22.41	22.48	0-1	1
	16QAM	1	0	22.79	22.74	22.85	0-1	1
		1	12	22.81	22.70	22.88	0-1	1
		1	24	22.78	22.84	22.83	0-1	1
		12	0	21.56	21.51	21.61	0-2	2
		12	6	21.55	21.56	21.61	0-2	2
		12	11	21.53	21.50	21.71	0-2	2
		25	0	21.56	21.53	21.59	0-2	2
	64QAM	1	0	21.75	21.79	21.82	0-2	2
		1	12	21.73	21.76	21.81	0-2	2
		1	24	21.64	21.75	21.76	0-2	2
		12	0	20.58	20.60	20.63	0-3	3
		12	6	20.60	20.60	20.64	0-3	3
		12	11	20.55	20.57	20.69	0-3	3
		25	0	20.52	20.53	20.62	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	23.47	0	0
		1	24	23.39	0	0
		1	49	23.44	0	0
		25	0	22.46	0-1	1
		25	12	22.43	0-1	1
		25	24	22.40	0-1	1
		50	0	22.45	0-1	1
	16QAM	1	0	22.83	0-1	1
		1	24	22.72	0-1	1
		1	49	22.71	0-1	1
		25	0	21.58	0-2	2
		25	12	21.56	0-2	2
		25	24	21.51	0-2	2
		50	0	21.50	0-2	2
	64QAM	1	0	21.71	0-2	2
		1	24	21.70	0-2	2
		1	49	21.72	0-2	2
		25	0	20.56	0-3	3
		25	12	20.51	0-3	3
		25	24	20.52	0-3	3
		50	0	20.56	0-3	3

Note: LTE Band 5 at 10 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing.

[LTE Band 7 Conducted Power]

LTE Band 7 _ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20775 Ch. 2502.5 MHz	21100 Ch. 2535 MHz	21425 Ch. 2567.5MHz		
5 MHz	QPSK	1	0	22.43	22.45	22.67	0	0
		1	12	22.44	22.48	22.65	0	0
		1	24	22.41	22.47	22.58	0	0
		12	0	21.56	21.50	21.69	0-1	1
		12	6	21.58	21.53	21.69	0-1	1
		12	11	21.56	21.48	21.64	0-1	1
		25	0	21.52	21.52	21.68	0-1	1
	16QAM	1	0	21.83	21.76	21.92	0-1	1
		1	12	21.80	21.82	21.85	0-1	1
		1	24	21.72	21.64	21.90	0-1	1
		12	0	20.60	20.56	20.77	0-2	2
		12	6	20.66	20.60	20.75	0-2	2
		12	11	20.62	20.56	20.74	0-2	2
		25	0	20.63	20.56	20.77	0-2	2
	64QAM	1	0	20.76	20.64	20.84	0-2	2
		1	12	20.85	20.57	20.82	0-2	2
		1	24	20.72	20.64	20.82	0-2	2
		12	0	19.62	19.61	19.80	0-3	3
		12	6	19.69	19.61	19.80	0-3	3
		12	11	19.68	19.59	19.75	0-3	3
		25	0	19.64	19.56	19.76	0-3	3

LTE Band 7 _ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20800 Ch. 2505 MHz	21100 Ch. 2535 MHz	21400 Ch. 2565 MHz		
10 MHz	QPSK	1	0	22.59	22.48	22.71	0	0
		1	24	22.51	22.42	22.63	0	0
		1	49	22.52	22.45	22.57	0	0
		25	0	21.59	21.53	21.72	0-1	1
		25	12	21.58	21.52	21.73	0-1	1
		25	24	21.57	21.53	21.64	0-1	1
		50	0	21.58	21.50	21.68	0-1	1
	16QAM	1	0	21.82	21.77	22.00	0-1	1
		1	24	21.78	21.77	21.95	0-1	1
		1	49	21.79	21.68	21.97	0-1	1
		25	0	20.71	20.57	20.73	0-2	2
		25	12	20.70	20.60	20.78	0-2	2
		25	24	20.67	20.61	20.72	0-2	2
		50	0	20.67	20.62	20.77	0-2	2
	64QAM	1	0	20.76	20.67	20.91	0-2	2
		1	24	20.73	20.65	20.85	0-2	2
		1	49	20.71	20.61	20.84	0-2	2
		25	0	19.70	19.61	19.79	0-3	3
		25	12	19.71	19.59	19.77	0-3	3
		25	24	19.65	19.57	19.72	0-3	3
		50	0	19.69	19.63	19.77	0-3	3

LTE Band 7 _ 15 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20825 Ch. 2507.5 MHz	21100 Ch. 2535 MHz	21375 Ch. 2562.5 MHz		
15 MHz	QPSK	1	0	22.60	22.62	22.68	0	0
		1	36	22.59	22.41	22.62	0	0
		1	74	22.47	22.47	22.62	0	0
		36	0	21.58	21.53	21.70	0-1	1
		36	18	21.49	21.54	21.69	0-1	1
		36	39	21.44	21.51	21.59	0-1	1
		75	0	21.45	21.51	21.68	0-1	1
	16QAM	1	0	21.92	21.96	22.07	0-1	1
		1	36	21.73	21.83	21.83	0-1	1
		1	74	21.71	21.64	21.83	0-1	1
		36	0	20.64	20.55	20.79	0-2	2
		36	18	20.53	20.56	20.76	0-2	2
		36	39	20.54	20.54	20.70	0-2	2
		75	0	20.56	20.60	20.75	0-2	2
	64QAM	1	0	20.80	20.76	20.93	0-2	2
		1	36	20.69	20.68	20.84	0-2	2
		1	74	20.69	20.73	20.82	0-2	2
		36	0	19.74	19.59	19.76	0-3	3
		36	18	19.61	19.62	19.78	0-3	3
		36	39	19.55	19.59	19.70	0-3	3
		75	0	19.58	19.57	19.70	0-3	3

LTE Band 7 _ 20 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Max. Average Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20850 Ch. 2510 MHz	21100 Ch. 2535 MHz	21350 Ch. 2560 MHz		
20 MHz	QPSK	1	0	**22.61**	**22.61**	**22.75**	0	0
		1	49	22.51	22.39	22.61	0	0
		1	99	22.42	22.46	22.56	0	0
		50	0	**21.68**	**21.57**	**21.72**	0-1	1
		50	25	21.51	21.54	21.70	0-1	1
		50	49	21.50	21.51	21.65	0-1	1
		100	0	21.56	21.53	**21.68**	0-1	1
	16QAM	1	0	21.88	21.82	21.92	0-1	1
		1	49	21.80	21.71	21.85	0-1	1
		1	99	21.74	21.67	21.91	0-1	1
		50	0	20.75	20.56	20.80	0-2	2
		50	25	20.60	20.57	20.73	0-2	2
		50	49	20.59	20.60	20.72	0-2	2
		100	0	20.56	20.58	20.75	0-2	2
	64QAM	1	0	20.80	20.79	20.96	0-2	2
		1	49	20.74	20.68	20.76	0-2	2
		1	99	20.70	20.65	20.79	0-2	2
		50	0	19.77	19.63	19.81	0-3	3
		50	25	19.62	19.63	19.78	0-3	3
		50	49	19.59	19.61	19.75	0-3	3
		100	0	19.62	19.58	19.73	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	23.52	0	0
		1	12	23.47	0	0
		1	24	23.40	0	0
		12	0	22.51	0-1	1
		12	6	22.51	0-1	1
		12	11	22.46	0-1	1
		25	0	22.46	0-1	1
	16QAM	1	0	22.88	0-1	1
		1	12	22.81	0-1	1
		1	24	22.77	0-1	1
		12	0	21.57	0-2	2
		12	6	21.65	0-2	2
		12	11	21.57	0-2	2
		25	0	21.57	0-2	2
	64QAM	1	0	21.77	0-2	2
		1	12	21.66	0-2	2
		1	24	21.71	0-2	2
		12	0	20.65	0-3	3
		12	6	20.65	0-3	3
		12	11	20.58	0-3	3
		25	0	20.57	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	23.42	0	0
		1	24	23.47	0	0
		1	49	23.36	0	0
		25	0	22.54	0-1	1
		25	12	22.47	0-1	1
		25	24	22.46	0-1	1
		50	0	22.49	0-1	1
	16QAM	1	0	22.83	0-1	1
		1	24	22.76	0-1	1
		1	49	22.66	0-1	1
		25	0	21.65	0-2	2
		25	12	21.56	0-2	2
		25	24	21.51	0-2	2
		50	0	21.53	0-2	2
	64QAM	1	0	21.74	0-2	2
		1	24	21.68	0-2	2
		1	49	21.56	0-2	2
		25	0	20.66	0-3	3
		25	12	20.61	0-3	3
		25	24	20.55	0-3	3
		50	0	20.61	0-3	3

Note: LTE Band 13 at 5 MHz/ 10 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing.

[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	24.12	24.09	23.62	0	0
		1	3	24.24	24.17	23.70	0	0
		1	5	24.08	24.06	23.59	0	0
		3	0	24.11	24.09	23.63	0	0
		3	1	24.18	24.12	23.68	0	0
		3	3	24.18	24.10	23.62	0	0
		6	0	23.16	23.12	22.62	0-1	1
	16QAM	1	0	23.43	23.35	22.93	0-1	1
		1	3	23.50	23.44	23.10	0-1	1
		1	5	23.50	23.48	22.93	0-1	1
		3	0	23.25	23.22	22.77	0-1	1
		3	1	23.33	23.30	22.80	0-1	1
		3	3	23.24	23.16	22.71	0-1	1
		6	0	22.34	22.32	21.83	0-2	2
	64QAM	1	0	22.41	22.42	21.84	0-2	2
		1	3	22.51	22.37	22.01	0-2	2
		1	5	22.40	22.38	21.86	0-2	2
		3	0	22.41	22.33	21.85	0-2	2
		3	1	22.45	22.39	21.90	0-2	2
		3	3	22.40	22.31	21.82	0-2	2
		6	0	21.29	21.21	20.66	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	24.20	24.15	23.70	0	0
		1	7	24.31	24.23	23.82	0	0
		1	14	24.14	24.15	23.68	0	0
		8	0	23.26	23.15	22.67	0-1	1
		8	3	23.27	23.21	22.73	0-1	1
		8	7	23.22	23.18	22.69	0-1	1
		15	0	23.22	23.23	22.71	0-1	1
	16QAM	1	0	23.53	23.45	23.07	0-1	1
		1	7	23.68	23.59	23.03	0-1	1
		1	14	23.46	23.52	22.96	0-1	1
		8	0	22.36	22.31	21.87	0-2	2
		8	3	22.42	22.35	21.83	0-2	2
		8	7	22.40	22.32	21.84	0-2	2
		15	0	22.36	22.29	21.80	0-2	2
	64QAM	1	0	22.41	22.43	22.02	0-2	2
		1	7	22.59	22.49	22.09	0-2	2
		1	14	22.46	22.42	21.96	0-2	2
		8	0	21.35	21.36	20.86	0-3	3
		8	3	21.39	21.38	20.91	0-3	3
		8	7	21.38	21.32	20.82	0-3	3
		15	0	21.34	21.26	20.85	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	24.25	24.23	23.73	0	0
		1	12	24.22	24.15	23.69	0	0
		1	24	24.21	24.14	23.71	0	0
		12	0	23.27	23.21	22.73	0-1	1
		12	6	23.27	23.22	22.78	0-1	1
		12	11	23.26	23.20	22.72	0-1	1
		25	0	23.28	23.21	22.71	0-1	1
	16QAM	1	0	23.54	23.61	23.10	0-1	1
		1	12	23.51	23.54	23.09	0-1	1
		1	24	23.58	23.50	23.13	0-1	1
		12	0	22.35	22.27	21.84	0-2	2
		12	6	22.35	22.31	21.88	0-2	2
		12	11	22.35	22.31	21.83	0-2	2
		25	0	22.32	22.30	21.82	0-2	2
	64QAM	1	0	22.52	22.49	22.06	0-2	2
		1	12	22.44	22.50	22.02	0-2	2
		1	24	22.44	22.40	21.96	0-2	2
		12	0	21.40	21.34	20.93	0-3	3
		12	6	21.36	21.41	20.88	0-3	3
		12	11	21.41	21.36	20.88	0-3	3
		25	0	21.33	21.27	20.85	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	24.31	24.22	23.86	0	0
		1	24	24.22	24.19	23.77	0	0
		1	49	24.18	24.18	23.73	0	0
		25	0	23.26	23.20	22.92	0-1	1
		25	12	23.26	23.19	22.78	0-1	1
		25	24	23.27	23.23	22.77	0-1	1
		50	0	23.29	23.25	22.85	0-1	1
	16QAM	1	0	23.66	23.50	23.29	0-1	1
		1	24	23.58	23.61	23.02	0-1	1
		1	49	23.52	23.59	23.02	0-1	1
		25	0	22.40	22.35	21.97	0-2	2
		25	12	22.42	22.36	21.89	0-2	2
		25	24	22.34	22.34	21.85	0-2	2
		50	0	22.39	22.30	21.97	0-2	2
	64QAM	1	0	22.59	22.55	22.19	0-2	2
		1	24	22.45	22.38	21.97	0-2	2
		1	49	22.52	22.45	21.96	0-2	2
		25	0	21.37	21.31	21.01	0-3	3
		25	12	21.35	21.32	20.86	0-3	3
		25	24	21.34	21.33	20.89	0-3	3
		50	0	21.40	21.31	20.94	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	24.36	24.35	24.01	0	0
		1	36	24.23	24.23	23.70	0	0
		1	74	24.21	24.10	23.77	0	0
		36	0	23.27	23.29	22.93	0-1	1
		36	18	23.27	23.29	22.92	0-1	1
		36	39	23.21	23.22	22.73	0-1	1
		75	0	23.25	23.24	22.86	0-1	1
	16QAM	1	0	23.71	23.62	23.29	0-1	1
		1	36	23.57	23.41	22.99	0-1	1
		1	74	23.62	23.48	23.19	0-1	1
		36	0	22.38	22.35	22.03	0-2	2
		36	18	22.32	22.37	22.02	0-2	2
		36	39	22.31	22.28	21.83	0-2	2
		75	0	22.35	22.33	21.98	0-2	2
	64QAM	1	0	22.65	22.54	22.24	0-2	2
		1	36	22.50	22.41	22.02	0-2	2
		1	74	22.52	22.40	22.07	0-2	2
		36	0	21.39	21.42	21.09	0-3	3
		36	18	21.40	21.36	21.02	0-3	3
		36	39	21.33	21.32	20.89	0-3	3
		75	0	21.36	21.35	21.01	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	24.38	24.37	24.06	0	0
		1	49	24.20	24.13	23.89	0	0
		1	99	24.32	24.07	23.76	0	0
		50	0	23.31	23.32	22.97	0-1	1
		50	25	23.25	23.23	22.89	0-1	1
		50	49	23.36	23.25	22.89	0-1	1
		100	0	23.37	23.26	22.92	0-1	1
	16QAM	1	0	23.64	23.67	23.49	0-1	1
		1	49	23.61	23.59	23.18	0-1	1
		1	99	23.66	23.45	23.15	0-1	1
		50	0	22.39	22.45	22.07	0-2	2
		50	25	22.40	22.33	22.05	0-2	2
		50	49	22.48	22.35	21.99	0-2	2
		100	0	22.46	22.38	22.04	0-2	2
	64QAM	1	0	22.59	22.65	22.33	0-2	2
		1	49	22.44	22.39	22.18	0-2	2
		1	99	22.58	22.35	21.93	0-2	2
		50	0	21.46	21.44	21.07	0-3	3
		50	25	21.38	21.40	21.03	0-3	3
		50	49	21.47	21.34	21.02	0-3	3
		100	0	21.50	21.37	21.08	0-3	3

The EUT enables maximum power reduction in accordance with 3GPP 36.101. The MPR settings are configured during the manufacture process and are not configurable by the network, carrier, or end user.

11.1.2 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	11.76	11.79	11.73	0	0
		1	3	11.85	11.77	11.87	0	0
		1	5	11.77	11.75	11.74	0	0
		3	0	11.75	11.74	11.77	0	0
		3	1	11.83	11.79	11.85	0	0
		3	3	11.78	11.73	11.80	0	0
		6	0	11.82	11.76	11.81	0-1	0
	16QAM	1	0	12.05	11.93	12.06	0-1	0
		1	3	12.09	12.03	12.11	0-1	0
		1	5	12.09	11.99	12.02	0-1	0
		3	0	11.89	11.79	11.87	0-1	0
		3	1	11.88	11.85	11.94	0-1	0
		3	3	11.84	11.88	11.84	0-1	0
		6	0	11.94	11.91	11.98	0-2	0
	64QAM	1	0	12.05	11.90	12.02	0-2	0
		1	3	12.04	12.01	12.10	0-2	0
		1	5	11.89	11.89	12.07	0-2	0
		3	0	11.98	11.89	11.98	0-2	0
		3	1	11.95	11.95	12.02	0-2	0
		3	3	11.94	11.89	11.99	0-2	0
		6	0	11.81	11.81	11.90	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. 1880MHz	19185 Ch. 1908.5 MHz		
3 MHz	QPSK	1	0	11.86	11.84	11.86	0	0
		1	7	11.95	11.96	11.96	0	0
		1	14	11.83	11.79	11.84	0	0
		8	0	11.86	11.84	11.88	0-1	0
		8	3	11.89	11.89	11.87	0-1	0
		8	7	11.87	11.85	11.89	0-1	0
		15	0	11.89	11.87	11.93	0-1	0
	16QAM	1	0	12.14	12.02	12.05	0-1	0
		1	7	12.25	12.13	12.17	0-1	0
		1	14	12.07	12.08	12.09	0-1	0
		8	0	11.91	11.91	11.94	0-2	0
		8	3	11.95	11.95	11.99	0-2	0
		8	7	11.95	11.91	11.97	0-2	0
		15	0	11.97	11.91	11.95	0-2	0
	64QAM	1	0	11.97	12.02	12.08	0-2	0
		1	7	12.18	12.09	12.23	0-2	0
		1	14	11.99	12.00	12.09	0-2	0
		8	0	11.87	11.90	11.98	0-3	0
		8	3	11.96	11.92	12.00	0-3	0
		8	7	11.95	11.84	11.96	0-3	0
		15	0	11.95	11.88	12.00	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	18900Ch. 1880 MHz	19175 Ch. 1907.5 MHz		
5 MHz	QPSK	1	0	11.88	11.90	11.90	0	0
		1	12	11.85	11.78	11.88	0	0
		1	24	11.83	11.86	11.88	0	0
		12	0	11.90	11.86	11.94	0-1	0
		12	6	11.90	11.91	11.94	0-1	0
		12	11	11.88	11.89	11.95	0-1	0
		25	0	11.89	11.86	11.92	0-1	0
	16QAM	1	0	12.21	12.18	12.14	0-1	0
		1	12	12.09	12.13	12.13	0-1	0
		1	24	12.22	12.10	12.18	0-1	0
		12	0	11.99	11.99	11.94	0-2	0
		12	6	11.96	11.95	11.97	0-2	0
		12	11	11.93	11.81	11.97	0-2	0
		25	0	11.93	11.95	11.97	0-2	0
	64QAM	1	0	12.10	12.08	12.13	0-2	0
		1	12	11.98	12.03	12.15	0-2	0
		1	24	12.05	11.98	12.08	0-2	0
		12	0	11.99	11.95	12.05	0-3	0
		12	6	11.97	11.93	12.07	0-3	0
		12	11	11.94	11.96	12.00	0-3	0
		25	0	11.95	11.90	12.01	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	12.17	12.09	11.82	0	0
		1	24	11.82	11.85	11.86	0	0
		1	49	12.01	12.03	11.94	0	0
		25	0	11.94	11.92	11.85	0-1	0
		25	12	11.95	11.88	11.98	0-1	0
		25	24	11.91	11.89	11.96	0-1	0
		50	0	11.93	11.93	11.85	0-1	0
	16QAM	1	0	12.46	12.28	12.20	0-1	0
		1	24	12.18	12.16	12.16	0-1	0
		1	49	12.37	12.30	12.14	0-1	0
		25	0	12.00	11.99	11.93	0-2	0
		25	12	11.98	11.99	12.01	0-2	0
		25	24	11.95	11.95	11.99	0-2	0
		50	0	11.98	11.97	11.88	0-2	0
	64QAM	1	0	12.24	12.36	12.02	0-2	0
		1	24	12.09	12.03	12.10	0-2	0
		1	49	12.30	12.17	12.13	0-2	0
		25	0	11.98	11.98	11.95	0-3	0
		25	12	11.95	11.96	12.07	0-3	0
		25	24	11.94	11.87	12.01	0-3	0
		50	0	11.98	11.95	11.92	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	11.92	11.93	11.97	0	0
		1	36	11.83	11.83	11.83	0	0
		1	74	11.89	11.83	11.90	0	0
		36	0	11.91	11.93	11.91	0-1	0
		36	18	11.92	11.92	11.87	0-1	0
		36	39	11.93	11.90	11.95	0-1	0
		75	0	11.93	11.92	11.88	0-1	0
	16QAM	1	0	12.23	12.19	12.15	0-1	0
		1	36	12.09	12.17	12.21	0-1	0
		1	74	12.05	12.16	12.23	0-1	0
		36	0	12.01	11.96	11.93	0-2	0
		36	18	11.98	11.94	11.88	0-2	0
		36	39	11.93	11.93	11.93	0-2	0
		75	0	11.97	11.94	11.91	0-2	0
	64QAM	1	0	12.13	12.11	12.21	0-2	0
		1	36	12.09	11.92	12.16	0-2	0
		1	74	11.96	11.99	12.16	0-2	0
		36	0	12.00	12.00	11.98	0-3	0
		36	18	12.00	11.96	11.95	0-3	0
		36	39	11.97	11.91	12.02	0-3	0
		75	0	11.98	11.94	11.94	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	12.12	12.04	11.94	0	0
		1	49	11.78	11.72	11.80	0	0
		1	99	12.03	11.96	11.89	0	0
		50	0	11.97	11.96	11.99	0-1	0
		50	25	11.95	11.89	11.94	0-1	0
		50	49	11.94	11.84	11.87	0-1	0
		100	0	11.93	11.90	11.91	0-1	0
	16QAM	1	0	12.39	12.38	12.24	0-1	0
		1	49	11.97	11.99	12.05	0-1	0
		1	99	12.21	12.31	12.20	0-1	0
		50	0	12.06	12.01	12.04	0-2	0
		50	25	11.99	11.98	12.00	0-2	0
		50	49	11.95	11.95	11.91	0-2	0
		100	0	12.00	11.97	11.93	0-2	0
	64QAM	1	0	12.32	12.23	12.10	0-2	0
		1	49	12.00	11.91	12.00	0-2	0
		1	99	12.10	12.22	12.12	0-2	0
		50	0	12.03	11.95	11.98	0-3	0
		50	25	12.02	11.94	11.95	0-3	0
		50	49	11.99	11.90	11.89	0-3	0
		100	0	11.99	11.92	11.96	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	12.05	12.09	11.71	0	0
		1	3	12.07	12.14	11.83	0	0
		1	5	12.02	12.05	11.71	0	0
		3	0	12.00	12.16	11.77	0	0
		3	1	12.08	12.17	11.80	0	0
		3	3	12.00	12.13	11.74	0	0
		6	0	12.07	12.19	11.76	0-1	0
	16QAM	1	0	12.28	12.38	11.93	0-1	0
		1	3	12.36	12.51	12.07	0-1	0
		1	5	12.28	12.29	12.02	0-1	0
		3	0	12.14	12.24	11.78	0-1	0
		3	1	12.15	12.26	11.85	0-1	0
		3	3	12.10	12.22	11.82	0-1	0
		6	0	12.17	12.22	11.88	0-2	0
	64QAM	1	0	12.26	12.32	11.90	0-2	0
		1	3	12.25	12.39	11.98	0-2	0
		1	5	12.21	12.37	11.92	0-2	0
		3	0	12.21	12.30	11.92	0-2	0
		3	1	12.29	12.32	11.90	0-2	0
		3	3	12.24	12.27	11.85	0-2	0
		6	0	12.12	12.21	11.81	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	12.07	12.19	11.76	0	0
		1	7	12.13	12.30	11.97	0	0
		1	14	12.02	12.16	11.78	0	0
		8	0	12.10	12.22	11.81	0-1	0
		8	3	12.15	12.23	11.84	0-1	0
		8	7	12.07	12.18	11.83	0-1	0
		15	0	12.10	12.21	11.85	0-1	0
	16QAM	1	0	12.43	12.32	12.10	0-1	0
		1	7	12.49	12.47	12.13	0-1	0
		1	14	12.37	12.34	12.00	0-1	0
		8	0	12.17	12.31	11.96	0-2	0
		8	3	12.23	12.32	11.93	0-2	0
		8	7	12.16	12.29	11.89	0-2	0
		15	0	12.21	12.28	11.89	0-2	0
	64QAM	1	0	12.31	12.44	11.99	0-2	0
		1	7	12.40	12.39	12.08	0-2	0
		1	14	12.27	12.31	12.00	0-2	0
		8	0	12.21	12.25	11.89	0-3	0
		8	3	12.25	12.33	11.97	0-3	0
		8	7	12.20	12.27	11.91	0-3	0
		15	0	12.20	12.28	11.88	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	12.13	12.21	11.92	0	0
		1	12	12.07	12.15	11.85	0	0
		1	24	12.04	12.17	11.81	0	0
		12	0	12.12	12.23	11.93	0-1	0
		12	6	12.16	12.24	11.85	0-1	0
		12	11	12.14	12.20	11.83	0-1	0
		25	0	12.13	12.24	11.93	0-1	0
	16QAM	1	0	12.40	12.42	12.21	0-1	0
		1	12	12.34	12.48	12.13	0-1	0
		1	24	12.31	12.43	12.11	0-1	0
		12	0	12.21	12.27	12.01	0-2	0
		12	6	12.21	12.28	11.92	0-2	0
		12	11	12.17	12.24	11.91	0-2	0
		25	0	12.17	12.28	12.01	0-2	0
	64QAM	1	0	12.39	12.46	12.14	0-2	0
		1	12	12.33	12.37	11.97	0-2	0
		1	24	12.30	12.39	12.05	0-2	0
		12	0	12.24	12.34	12.02	0-3	0
		12	6	12.21	12.31	11.97	0-3	0
		12	11	12.20	12.32	11.94	0-3	0
		25	0	12.19	12.26	12.01	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	12.15	12.22	11.95	0	0
		1	24	12.09	12.15	11.84	0	0
		1	49	12.19	12.08	11.81	0	0
		25	0	12.17	12.28	11.95	0-1	0
		25	12	12.26	12.27	11.95	0-1	0
		25	24	12.25	12.23	11.95	0-1	0
		50	0	12.24	12.26	11.93	0-1	0
	16QAM	1	0	12.46	12.61	12.30	0-1	0
		1	24	12.29	12.43	12.20	0-1	0
		1	49	12.40	12.37	12.07	0-1	0
		25	0	12.21	12.32	12.04	0-2	0
		25	12	12.29	12.33	12.02	0-2	0
		25	24	12.25	12.29	12.01	0-2	0
		50	0	12.29	12.27	12.04	0-2	0
	64QAM	1	0	12.37	12.48	12.25	0-2	0
		1	24	12.32	12.40	12.13	0-2	0
		1	49	12.31	12.27	11.94	0-2	0
		25	0	12.27	12.33	12.06	0-3	0
		25	12	12.33	12.31	12.05	0-3	0
		25	24	12.30	12.30	12.04	0-3	0
		50	0	12.31	12.31	12.02	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	12.23	12.33	12.14	0	0
		1	36	12.18	12.16	11.85	0	0
		1	74	12.16	12.07	11.80	0	0
		36	0	12.25	12.33	12.11	0-1	0
		36	18	12.24	12.30	11.95	0-1	0
		36	39	12.18	12.27	11.96	0-1	0
		75	0	12.24	12.29	12.01	0-1	0
	16QAM	1	0	12.49	12.55	12.36	0-1	0
		1	36	12.44	12.44	12.09	0-1	0
		1	74	12.48	12.41	12.12	0-1	0
		36	0	12.33	12.35	12.15	0-2	0
		36	18	12.27	12.29	12.05	0-2	0
		36	39	12.28	12.24	12.02	0-2	0
		75	0	12.29	12.29	12.05	0-2	0
	64QAM	1	0	12.42	12.47	12.38	0-2	0
		1	36	12.33	12.39	12.18	0-2	0
		1	74	12.27	12.30	12.01	0-2	0
		36	0	12.35	12.36	12.19	0-3	0
		36	18	12.27	12.33	12.05	0-3	0
		36	39	12.26	12.31	12.03	0-3	0
		75	0	12.29	12.31	12.06	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	12.24	0	0
		1	49	12.12	0	0
		1	99	12.06	0	0
		50	0	12.33	0-1	0
		50	25	12.28	0-1	0
		50	49	12.26	0-1	0
		100	0	12.30	0-1	0
	16QAM	1	0	12.49	0-1	0
		1	49	12.41	0-1	0
		1	99	12.38	0-1	0
		50	0	12.35	0-2	0
		50	25	12.30	0-2	0
		50	49	12.30	0-2	0
		100	0	12.32	0-2	0
	64QAM	1	0	12.38	0-2	0
		1	49	12.32	0-2	0
		1	99	12.28	0-2	0
		50	0	12.41	0-3	0
		50	25	12.35	0-3	0
		50	49	12.29	0-3	0
		100	0	12.31	0-3	0

Note: LTE Band 4 (AWS) at 20 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing.

[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	16.56	16.61	16.75	0	0
		1	3	16.74	16.65	16.78	0	0
		1	5	16.56	16.57	16.72	0	0
		3	0	16.65	16.58	16.75	0	0
		3	1	16.67	16.64	16.80	0	0
		3	3	16.61	16.59	16.71	0	0
		6	0	16.64	16.62	16.78	0-1	0
	16QAM	1	0	17.00	16.85	16.97	0-1	0
		1	3	17.01	16.91	17.07	0-1	0
		1	5	16.97	16.86	17.00	0-1	0
		3	0	16.77	16.69	16.86	0-1	0
		3	1	16.78	16.78	16.88	0-1	0
		3	3	16.71	16.69	16.82	0-1	0
		6	0	16.83	16.78	16.92	0-2	0
	64QAM	1	0	16.88	16.87	16.92	0-2	0
		1	3	16.87	16.91	17.07	0-2	0
		1	5	16.78	16.77	16.98	0-2	0
		3	0	16.78	16.81	16.93	0-2	0
		3	1	16.79	16.88	17.01	0-2	0
		3	3	16.82	16.82	16.90	0-2	0
		6	0	16.75	16.75	16.84	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	16.71	16.69	16.84	0	0
		1	7	16.79	16.74	16.90	0	0
		1	14	16.67	16.69	16.79	0	0
		8	0	16.73	16.70	16.88	0-1	0
		8	3	16.72	16.70	16.86	0-1	0
		8	7	16.67	16.67	16.82	0-1	0
		15	0	16.72	16.69	16.88	0-1	0
	16QAM	1	0	17.11	16.98	17.12	0-1	0
		1	7	17.11	17.03	17.22	0-1	0
		1	14	16.91	17.10	17.12	0-1	0
		8	0	16.81	16.81	16.97	0-2	0
		8	3	16.88	16.82	17.02	0-2	0
		8	7	16.81	16.78	16.90	0-2	0
		15	0	16.80	16.77	16.92	0-2	0
	64QAM	1	0	16.91	16.94	17.05	0-2	0
		1	7	17.01	16.88	17.12	0-2	0
		1	14	16.94	16.97	17.03	0-2	0
		8	0	16.80	16.78	16.98	0-3	0
		8	3	16.82	16.83	16.95	0-3	0
		8	7	16.79	16.76	16.90	0-3	0
		15	0	16.81	16.79	16.91	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	16.73	16.71	16.77	0	0
		1	12	16.68	16.66	16.81	0	0
		1	24	16.62	16.69	16.80	0	0
		12	0	16.73	16.72	16.77	0-1	0
		12	6	16.77	16.69	16.79	0-1	0
		12	11	16.71	16.65	16.83	0-1	0
		25	0	16.69	16.69	16.77	0-1	0
	16QAM	1	0	17.06	17.08	17.13	0-1	0
		1	12	16.83	16.91	17.21	0-1	0
		1	24	16.91	17.02	17.17	0-1	0
		12	0	16.84	16.85	16.90	0-2	0
		12	6	16.80	16.83	16.88	0-2	0
		12	11	16.73	16.83	16.95	0-2	0
		25	0	16.79	16.77	16.85	0-2	0
	64QAM	1	0	16.91	16.96	16.97	0-2	0
		1	12	16.93	16.91	17.04	0-2	0
		1	24	16.82	16.99	17.09	0-2	0
		12	0	16.87	16.84	16.92	0-3	0
		12	6	16.90	16.88	16.90	0-3	0
		12	11	16.80	16.80	16.99	0-3	0
		25	0	16.78	16.79	16.88	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	16.71	0	0
		1	24	16.65	0	0
		1	49	16.67	0	0
		25	0	16.77	0-1	0
		25	12	16.69	0-1	0
		25	24	16.64	0-1	0
		50	0	16.65	0-1	0
	16QAM	1	0	17.01	0-1	0
		1	24	17.03	0-1	0
		1	49	17.08	0-1	0
		25	0	16.78	0-2	0
		25	12	16.81	0-2	0
		25	24	16.78	0-2	0
		50	0	16.78	0-2	0
	64QAM	1	0	16.99	0-2	0
		1	24	16.93	0-2	0
		1	49	16.91	0-2	0
		25	0	16.82	0-3	0
		25	12	16.81	0-3	0
		25	24	16.79	0-3	0
		50	0	16.83	0-3	0

Note: LTE Band 5 at 10 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing.

[LTE Band 7 Conducted Power]

LTE Band 7 _ 5 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20775 Ch. 2502.5 MHz	21100 Ch. 2535 MHz	21425 Ch. 2567.5MHz		
5 MHz	QPSK	1	0	13.00	12.94	13.11	0	0
		1	12	12.99	12.95	13.11	0	0
		1	24	12.95	12.91	13.09	0	0
		12	0	13.07	12.98	13.19	0-1	0
		12	6	13.12	13.02	13.21	0-1	0
		12	11	13.07	12.99	13.15	0-1	0
		25	0	13.09	13.00	13.15	0-1	0
	16QAM	1	0	13.35	13.21	13.35	0-1	0
		1	12	13.28	13.25	13.26	0-1	0
		1	24	13.24	13.25	13.35	0-1	0
		12	0	13.14	13.02	13.23	0-2	0
		12	6	13.18	13.05	13.25	0-2	0
		12	11	13.11	13.04	13.24	0-2	0
		25	0	13.13	13.04	13.24	0-2	0
	64QAM	1	0	13.34	13.21	13.21	0-2	0
		1	12	13.26	13.26	13.29	0-2	0
		1	24	13.23	13.11	13.35	0-2	0
		12	0	13.21	13.10	13.26	0-3	0
		12	6	13.21	13.15	13.29	0-3	0
		12	11	13.21	13.17	13.31	0-3	0
		25	0	13.16	13.10	13.26	0-3	0

LTE Band 7 _ 10 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20800 Ch. 2505 MHz	21100 Ch. 2535 MHz	21400 Ch. 2565 MHz		
10 MHz	QPSK	1	0	13.07	12.98	13.17	0	0
		1	24	13.06	12.94	13.10	0	0
		1	49	13.02	12.94	13.05	0	0
		25	0	13.09	13.04	13.19	0-1	0
		25	12	13.13	13.01	13.21	0-1	0
		25	24	13.08	13.03	13.19	0-1	0
		50	0	13.08	13.03	13.17	0-1	0
	16QAM	1	0	13.22	13.27	13.21	0-1	0
		1	24	13.29	13.14	13.36	0-1	0
		1	49	13.35	13.22	13.20	0-1	0
		25	0	13.14	13.10	13.25	0-2	0
		25	12	13.20	13.08	13.27	0-2	0
		25	24	13.14	13.07	13.19	0-2	0
		50	0	13.16	13.08	13.27	0-2	0
	64QAM	1	0	13.32	13.27	13.22	0-2	0
		1	24	13.29	13.14	13.36	0-2	0
		1	49	13.37	13.13	13.28	0-2	0
		25	0	13.22	13.10	13.30	0-3	0
		25	12	13.23	13.16	13.28	0-3	0
		25	24	13.19	13.09	13.24	0-3	0
		50	0	13.22	13.09	13.27	0-3	0

LTE Band 7 _ 15 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20825 Ch. 2507.5 MHz	21100 Ch. 2535 MHz	21375 Ch. 2562.5 MHz		
15 MHz	QPSK	1	0	13.13	13.12	13.17	0	0
		1	36	13.03	12.97	13.13	0	0
		1	74	12.99	12.94	13.09	0	0
		36	0	13.15	13.03	13.19	0-1	0
		36	18	13.02	13.05	13.16	0-1	0
		36	39	13.03	12.98	13.12	0-1	0
		75	0	13.03	13.00	13.19	0-1	0
	16QAM	1	0	13.28	13.22	13.21	0-1	0
		1	36	13.32	13.24	13.22	0-1	0
		1	74	13.33	13.23	13.35	0-1	0
		36	0	13.22	13.05	13.25	0-2	0
		36	18	13.07	13.06	13.21	0-2	0
		36	39	13.01	13.05	13.19	0-2	0
		75	0	13.06	13.10	13.22	0-2	0
	64QAM	1	0	13.26	13.25	13.27	0-2	0
		1	36	13.36	13.26	13.28	0-2	0
		1	74	13.29	13.23	13.37	0-2	0
		36	0	13.29	13.12	13.33	0-3	0
		36	18	13.11	13.11	13.33	0-3	0
		36	39	13.11	13.15	13.24	0-3	0
		75	0	13.06	13.11	13.25	0-3	0

LTE Band 7 _ 20 MHz Bandwidth

Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				20850 Ch. 2510 MHz	21100 Ch. 2535 MHz	21350 Ch. 2560 MHz		
20 MHz	QPSK	1	0	13.16	13.15	13.20	0	0
		1	49	13.05	12.93	13.10	0	0
		1	99	12.97	12.93	13.04	0	0
		50	0	13.18	13.05	13.23	0-1	0
		50	25	13.04	13.07	13.18	0-1	0
		50	49	13.04	13.02	13.13	0-1	0
		100	0	13.08	13.04	13.15	0-1	0
	16QAM	1	0	13.29	13.24	13.37	0-1	0
		1	49	13.20	13.24	13.20	0-1	0
		1	99	13.21	13.28	13.26	0-1	0
		50	0	13.25	13.09	13.31	0-2	0
		50	25	13.11	13.10	13.28	0-2	0
		50	49	13.12	13.09	13.20	0-2	0
		100	0	13.07	13.09	13.20	0-2	0
	64QAM	1	0	13.25	13.39	13.24	0-2	0
		1	49	13.24	13.19	13.28	0-2	0
		1	99	13.23	13.22	13.29	0-2	0
		50	0	13.31	13.17	13.30	0-3	0
		50	25	13.11	13.14	13.28	0-3	0
		50	49	13.10	13.12	13.25	0-3	0
		100	0	13.13	13.08	13.29	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	17.15	0	0
		1	12	17.11	0	0
		1	24	17.06	0	0
		12	0	17.20	0-1	0
		12	6	17.18	0-1	0
		12	11	17.16	0-1	0
		25	0	17.14	0-1	0
	16QAM	1	0	17.46	0-1	0
		1	12	17.41	0-1	0
		1	24	17.30	0-1	0
		12	0	17.30	0-2	0
		12	6	17.29	0-2	0
		12	11	17.21	0-2	0
		25	0	17.24	0-2	0
	64QAM	1	0	17.43	0-2	0
		1	12	17.30	0-2	0
		1	24	17.36	0-2	0
		12	0	17.32	0-3	0
		12	6	17.32	0-3	0
		12	11	17.28	0-3	0
		25	0	17.26	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	17.08	0	0
		1	24	17.08	0	0
		1	49	17.05	0	0
		25	0	17.20	0-1	0
		25	12	17.18	0-1	0
		25	24	17.07	0-1	0
		50	0	17.16	0-1	0
	16QAM	1	0	17.42	0-1	0
		1	24	17.38	0-1	0
		1	49	17.32	0-1	0
		25	0	17.30	0-2	0
		25	12	17.24	0-2	0
		25	24	17.20	0-2	0
		50	0	17.23	0-2	0
	64QAM	1	0	17.37	0-2	0
		1	24	17.43	0-2	0
		1	49	17.29	0-2	0
		25	0	17.29	0-3	0
		25	12	17.30	0-3	0
		25	24	17.23	0-3	0
		50	0	17.26	0-3	0

Note: LTE Band 13 at 5 MHz/ 10 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing.

[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	12.60	12.53	12.09	0	0
		1	3	12.67	12.59	12.18	0	0
		1	5	12.61	12.53	12.10	0	0
		3	0	12.66	12.58	12.11	0	0
		3	1	12.69	12.64	12.17	0	0
		3	3	12.66	12.55	12.11	0	0
		6	0	12.68	12.64	12.11	0-1	0
	16QAM	1	0	12.88	12.90	12.34	0-1	0
		1	3	12.98	12.92	12.44	0-1	0
		1	5	12.90	12.77	12.43	0-1	0
		3	0	12.74	12.60	12.17	0-1	0
		3	1	12.75	12.71	12.23	0-1	0
		3	3	12.67	12.66	12.15	0-1	0
		6	0	12.78	12.72	12.30	0-2	0
	64QAM	1	0	12.87	12.82	12.25	0-2	0
		1	3	12.90	12.86	12.32	0-2	0
		1	5	12.86	12.67	12.30	0-2	0
		3	0	12.86	12.72	12.32	0-2	0
		3	1	12.91	12.80	12.29	0-2	0
		3	3	12.83	12.78	12.26	0-2	0
		6	0	12.75	12.65	12.24	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	12.71	12.61	12.17	0	0
		1	7	12.77	12.74	12.22	0	0
		1	14	12.68	12.61	12.14	0	0
		8	0	12.77	12.66	12.21	0-1	0
		8	3	12.74	12.66	12.21	0-1	0
		8	7	12.73	12.67	12.20	0-1	0
		15	0	12.74	12.66	12.19	0-1	0
	16QAM	1	0	13.05	12.81	12.56	0-1	0
		1	7	13.10	12.95	12.55	0-1	0
		1	14	12.85	12.83	12.39	0-1	0
		8	0	12.84	12.74	12.32	0-2	0
		8	3	12.81	12.76	12.36	0-2	0
		8	7	12.81	12.75	12.32	0-2	0
		15	0	12.81	12.71	12.27	0-2	0
	64QAM	1	0	12.88	12.91	12.36	0-2	0
		1	7	13.07	12.94	12.56	0-2	0
		1	14	12.97	12.86	12.37	0-2	0
		8	0	12.82	12.70	12.26	0-3	0
		8	3	12.87	12.78	12.34	0-3	0
		8	7	12.78	12.72	12.27	0-3	0
		15	0	12.79	12.70	12.30	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	12.72	12.64	12.23	0	0
		1	12	12.69	12.67	12.15	0	0
		1	24	12.66	12.65	12.16	0	0
		12	0	12.77	12.73	12.23	0-1	0
		12	6	12.76	12.69	12.27	0-1	0
		12	11	12.72	12.71	12.21	0-1	0
		25	0	12.75	12.69	12.24	0-1	0
	16QAM	1	0	12.96	12.95	12.49	0-1	0
		1	12	12.93	12.95	12.53	0-1	0
		1	24	12.94	12.99	12.53	0-1	0
		12	0	12.79	12.73	12.32	0-2	0
		12	6	12.82	12.72	12.30	0-2	0
		12	11	12.78	12.70	12.28	0-2	0
		25	0	12.78	12.74	12.32	0-2	0
	64QAM	1	0	12.99	12.91	12.47	0-2	0
		1	12	12.99	12.83	12.50	0-2	0
		1	24	12.87	12.83	12.39	0-2	0
		12	0	12.82	12.77	12.32	0-3	0
		12	6	12.90	12.80	12.32	0-3	0
		12	11	12.84	12.74	12.32	0-3	0
		25	0	12.81	12.73	12.31	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	12.72	12.76	12.32	0	0
		1	24	12.67	12.59	12.17	0	0
		1	49	12.65	12.63	12.19	0	0
		25	0	12.76	12.72	12.36	0-1	0
		25	12	12.76	12.72	12.31	0-1	0
		25	24	12.72	12.69	12.28	0-1	0
		50	0	12.73	12.67	12.38	0-1	0
	16QAM	1	0	12.94	13.02	12.71	0-1	0
		1	24	12.91	12.87	12.46	0-1	0
		1	49	12.92	12.90	12.43	0-1	0
		25	0	12.88	12.82	12.47	0-2	0
		25	12	12.81	12.80	12.36	0-2	0
		25	24	12.75	12.74	12.33	0-2	0
		50	0	12.79	12.74	12.46	0-2	0
	64QAM	1	0	13.00	12.96	12.60	0-2	0
		1	24	12.90	12.80	12.46	0-2	0
		1	49	12.91	12.78	12.40	0-2	0
		25	0	12.86	12.77	12.47	0-3	0
		25	12	12.83	12.77	12.36	0-3	0
		25	24	12.80	12.74	12.33	0-3	0
		50	0	12.85	12.80	12.46	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	12.83	12.75	12.43	0	0
		1	36	12.68	12.62	12.21	0	0
		1	74	12.63	12.61	12.21	0	0
		36	0	12.81	12.74	12.46	0-1	0
		36	18	12.72	12.75	12.39	0-1	0
		36	39	12.74	12.72	12.27	0-1	0
		75	0	12.72	12.75	12.41	0-1	0
	16QAM	1	0	13.19	13.04	12.74	0-1	0
		1	36	13.04	12.93	12.52	0-1	0
		1	74	12.86	12.85	12.50	0-1	0
		36	0	12.83	12.81	12.50	0-2	0
		36	18	12.76	12.77	12.44	0-2	0
		36	39	12.76	12.75	12.29	0-2	0
		75	0	12.79	12.78	12.45	0-2	0
	64QAM	1	0	13.07	13.06	12.70	0-2	0
		1	36	12.84	12.83	12.36	0-2	0
		1	74	12.90	12.80	12.41	0-2	0
		36	0	12.83	12.81	12.52	0-3	0
		36	18	12.83	12.78	12.50	0-3	0
		36	39	12.77	12.73	12.31	0-3	0
		75	0	12.81	12.74	12.45	0-3	0

LTE Band 66 _ 20 MHz Bandwidth

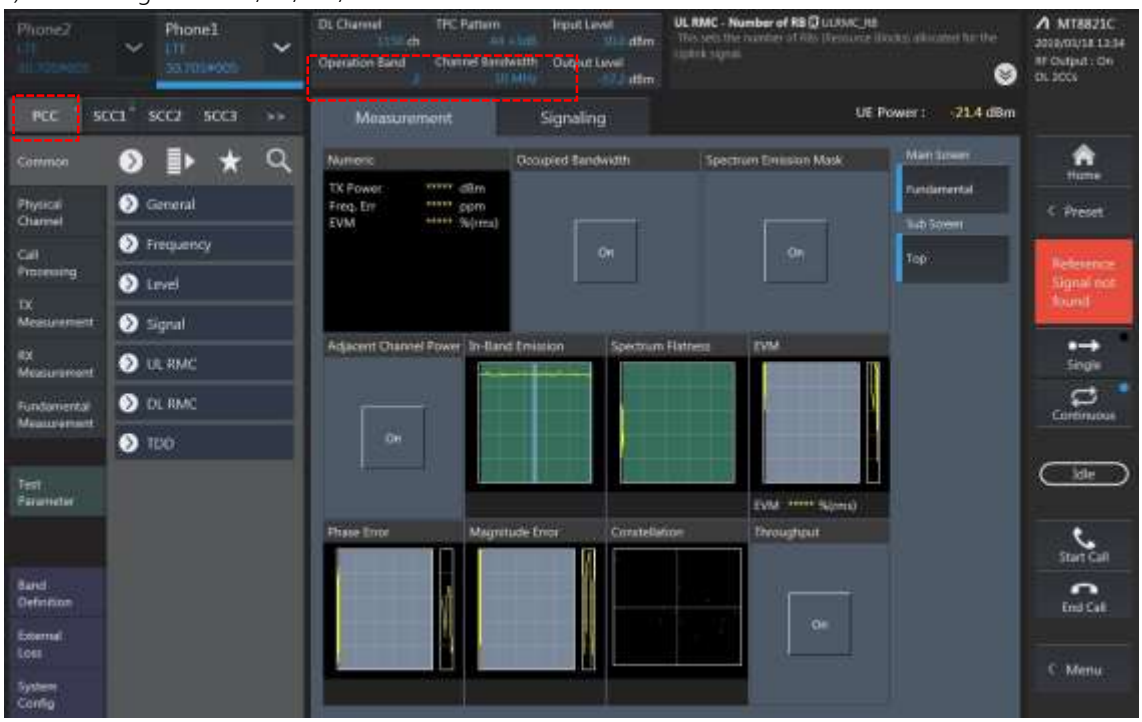
Bandwidth	Modulation	RB Size	RB Offset	Reduced Power [dBm]			MPR Allowed Per 3GPP [dB]	MPR [dB]
				132072 Ch. 1720 MHz	132322 Ch. 1745 MHz	132572 Ch. 1770 MHz		
20 MHz	QPSK	1	0	12.83	12.81	12.50	0	0
		1	49	12.62	12.61	12.29	0	0
		1	99	12.72	12.54	12.22	0	0
		50	0	12.83	12.78	12.49	0-1	0
		50	25	12.76	12.76	12.44	0-1	0
		50	49	12.80	12.72	12.37	0-1	0
		100	0	12.88	12.74	12.47	0-1	0
	16QAM	1	0	13.16	13.09	12.81	0-1	0
		1	49	12.94	12.82	12.59	0-1	0
		1	99	12.98	12.75	12.52	0-1	0
		50	0	12.87	12.81	12.51	0-2	0
		50	25	12.79	12.80	12.51	0-2	0
		50	49	12.87	12.80	12.43	0-2	0
		100	0	12.88	12.79	12.50	0-2	0
	64QAM	1	0	13.04	13.02	12.71	0-2	0
		1	49	12.82	12.89	12.45	0-2	0
		1	99	13.00	12.68	12.39	0-2	0
		50	0	12.90	12.88	12.57	0-3	0
		50	25	12.83	12.80	12.52	0-3	0
		50	49	12.86	12.77	12.49	0-3	0
		100	0	12.90	12.81	12.51	0-3	0

The EUT enables maximum power reduction in accordance with 3GPP 36.101. The MPR settings are configured during the manufacture process and are not configurable by the network, carrier, or end user.

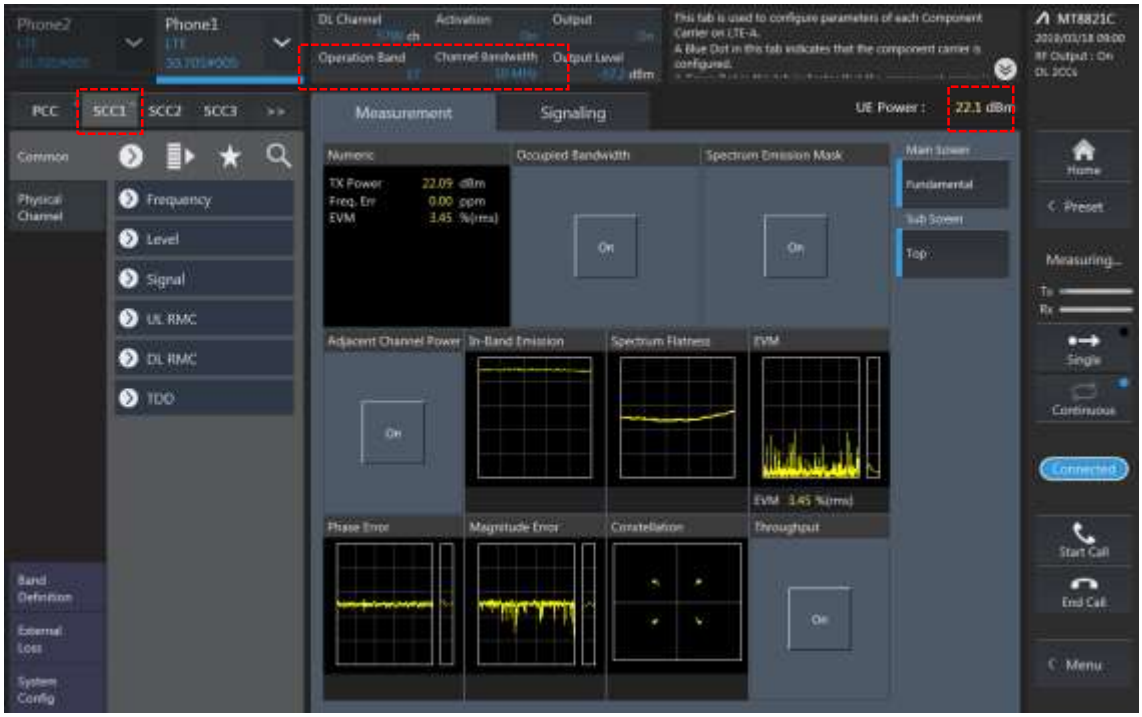
11.1.3 LTE Down-link Carrier Aggregation Conducted Powers

LTE Down Link 2CA Call Setup

1) PCC Setting :Channel /RB/BW/Modulation

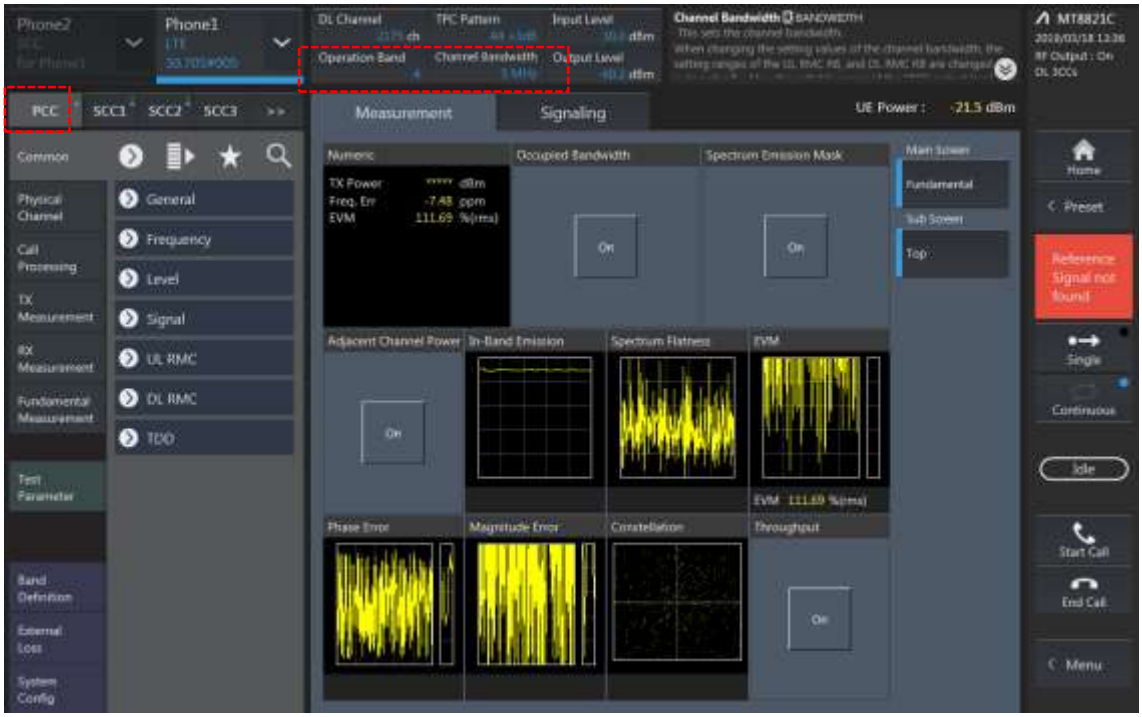


2) SCC Setting (Channel /RB/BW/Modulation) and call Connection

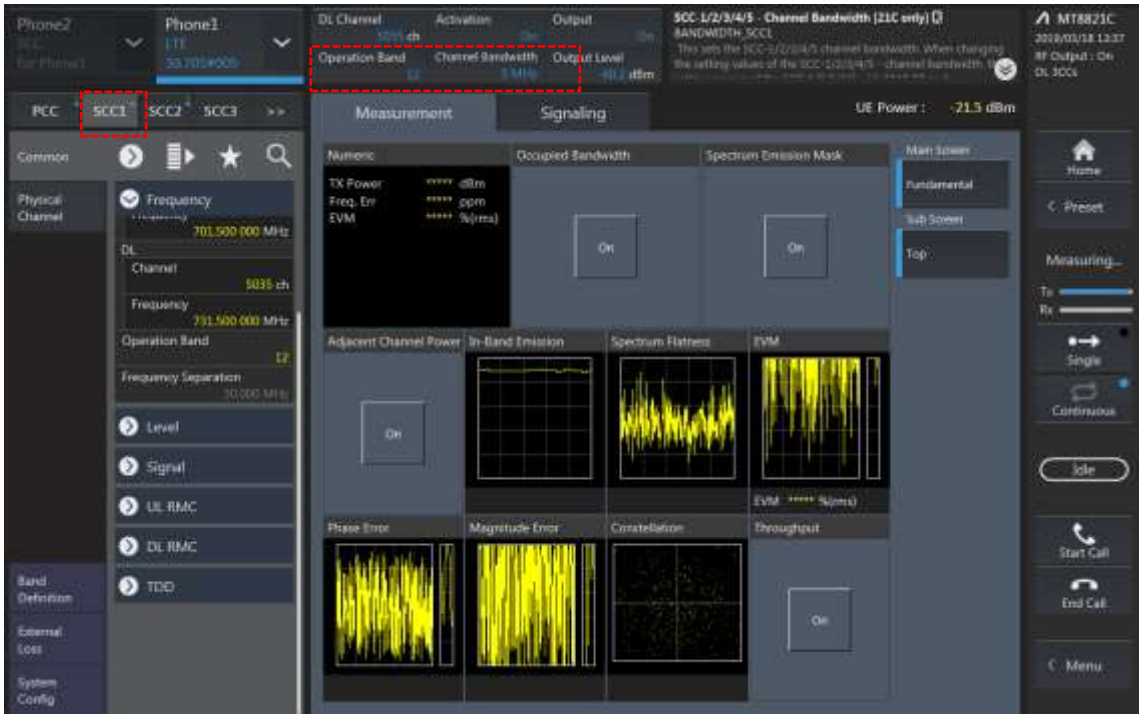


LTE Down Link 3CA Call Setup

1) PCC Setting: Channel /RB/BW/Modulation



2) SCC1 Setting : Channel /RB/BW/Modulation



3) SCC2 Setting (Channel /RB/BW/Modulation)and call Connection

2CA Downlink Carrier aggregation Maximum Conducted Powers

Combination	PCC									SCC1				Tx Power		Deviation (2)-(1)
	Band	BW	PCC UL Channel	PCC UL Frequency	PCC DL Channel	PCC DL Frequency	Modulation	RB	offset	SCC1 Band	SCC1 BW	SCC1 DL Channel	SCC1 DL Frequency	LTE Single (1)	LTE DL CA (2)	
CA_2A-2A	2	10	18650	1855	650	1935	QPSK	1	0	2	20	1100	1980	24.19	24.34	0.15
CA_2A-4A	2	10	18650	1855	650	1935	QPSK	1	0	4	20	2175	2132.5	24.19	24.38	0.19
	4	15	20185	1732.5	2175	2132.5	QPSK	1	0	2	20	900	1960	24.39	24.63	0.24
CA_2A-5A	2	10	18650	1855	650	1935	QPSK	1	0	5	10	2525	881.5	24.19	24.34	0.15
	5	5	20625	846.5	2625	891.5	QPSK	1	12	2	20	900	1960	23.59	23.82	0.23
CA_2A-13A	2	10	18650	1855	650	1935	QPSK	1	0	13	5	5230	751	24.19	24.36	0.17
	13	10	23230	782	5230	751	QPSK	1	0	2	20	900	1960	23.52	23.73	0.21
CA_2A-66A	2	10	18650	1855	650	1935	QPSK	1	0	66	20	66536	2120	24.19	24.38	0.19
	66	20	132072	1720	66536	2120	QPSK	1	0	2	20	900	1960	24.38	24.62	0.24
CA_4A-4A	4	15	20025	1717.5	2025	2117.5	QPSK	1	0	4	20	2300	2145	24.39	24.45	0.06
CA_4A-5A	4	15	20025	1717.5	2025	2117.5	QPSK	1	0	5	10	2525	881.5	24.39	24.48	0.09
	5	5	20625	846.5	2625	891.5	QPSK	1	12	4	20	2175	2132.5	23.59	23.83	0.24
CA_4A-13A	4	15	20025	1717.5	2025	2117.5	QPSK	1	0	13	10	5230	751	24.39	24.46	0.07
	13	10	23230	782	5230	751	QPSK	1	24	4	20	2175	2132.5	23.47	23.7	0.23
CA_5B	5	3	20586	842.6	2586	887.6	QPSK	1	7	5	5	2625	891.5	23.6	23.48	-0.12
CA_5A-66A	5	5	20625	846.5	2625	891.5	QPSK	1	12	66	20	1372656	132732	23.59	23.81	0.22
	66	20	132072	1720	66536	2120	QPSK	1	0	5	10	2525	881.5	24.38	24.54	0.16
CA_13A-66A	13	5	23230	782	5230	752	QPSK	1	0	66	20	66786	2145	23.52	23.75	0.23
	66	20	132072	1720	66536	2120	QPSK	1	0	13	10	5230	751	24.38	24.56	0.18
CA_66A-66A	66	20	132072	1720	66536	2120	QPSK	1	0	66	20	67036	2170	24.38	24.56	0.18
CA_66B	66	15	132047	1717.5	66511	2117.5	QPSK	1	0	66	5	66786	2145	24.36	24.55	0.19
CA_66C	66	20	132072	1720	66536	2120	QPSK	1	0	66	10	66680	2134.4	24.38	24.59	0.21

3CA Downlink Carrier aggregation Maximum Conducted Powers

Combination	PCC									SCC1					SCC2				Tx Power		Deviation
	Band	BW	PCC UL Channel	PCC UL Frequency	PCC DL Channel	PCC DL Frequency	Modulation	RB	offset	SCC1 Band	SCC1 BW	SCC1 DL Channel	SCC1 DL Frequency	SCC2 Band	SCC2 BW	SCC2 DL Channel	SCC2 DL Frequency	LTE Single (1)	LTE DL CA (2)	(2)-(1)
CA_2A-2A-5A	2	10	18650	1855	650	1935	QPSK	1	0	2	20	1100	1980	5	10	2525	881.5	24.19	24.39	0.2
	5	5	20625	846.5	2625	891.5	QPSK	1	12	2	10	650	1935	2	20	1100	1980	23.59	23.8	0.21
CA_2A-2A-13A	2	10	18650	1855	650	1935	QPSK	1	0	2	20	1100	1980	13	10	5230	751	24.19	24.33	0.14
	13	10	23230	782	5230	751	QPSK	1	24	2	10	650	1935	2	20	1100	1980	23.47	23.71	0.24
CA_2A-2A-66A	2	10	18650	1855	650	1935	QPSK	1	0	2	20	1100	1980	66	20	66786	2145	24.19	24.24	0.05
	66	20	132072	1720	66536	2120	QPSK	1	0	2	20	1100	1980	5	10	2525	881.5	24.38	24.58	0.2
CA_2A-4A-4A	2	10	18650	1855	650	1935	QPSK	1	0	4	15	2025	2117.5	4	20	2300	2145	24.19	24.33	0.14
	4	15	20025	1717.5	2025	2117.5	QPSK	1	0	4	20	2300	2145	2	20	900	1960	24.39	24.45	0.06
CA_2A-4A-5A	2	10	18650	1855	650	1935	QPSK	1	0	4	20	2175	2132.5	5	10	2525	881.5	24.19	24.35	0.16
	4	15	20175	1732.5	2175	2132.5	QPSK	1	0	2	20	900	1960	5	10	2525	881.5	24.39	24.5	0.11
	5	5	20625	846.5	2625	891.5	QPSK	1	12	2	20	900	1960	4	20	2175	2132.5	23.59	23.8	0.21
CA_2A-4A-13A	2	10	18650	1855	650	1935	QPSK	1	0	4	20	2175	2132.5	13	10	5230	751	24.19	24.38	0.19
	4	15	20175	1732.5	2175	2132.5	QPSK	1	0	2	20	900	1960	13	10	5230	751	24.39	24.5	0.11
	13	10	23230	782	5230	751	QPSK	1	24	2	20	900	1960	4	20	2175	2132.5	23.47	23.7	0.23
CA_2A-5A-66A	2	10	18650	1855	650	1935	QPSK	1	0	5	10	2525	881.5	66	20	66786	2145	24.19	24.39	0.2
	5	5	20625	846.5	2625	891.5	QPSK	1	12	2	20	900	1960	66	20	66786	2145	23.59	23.8	0.21
	66	20	132072	1720	66536	2120	QPSK	1	0	2	20	900	1960	5	10	2525	881.5	24.38	24.54	0.16
CA_2A-5B	2	10	18650	1855	650	1935	QPSK	1	0	5	5	2625	891.5	5	10	2553	884.3	24.19	24.35	0.16
	5	5	20625	846.5	2625	891.5	QPSK	1	12	5	10	2553	884.3	2	20	900	1960	23.59	23.65	0.06
CA_2A-13A-66A	2	10	18650	1855	650	1935	QPSK	1	0	13	10	5230	751	66	20	66786	2145	24.19	24.41	0.22
	13	5	23230	782	5230	752	QPSK	1	0	2	20	900	1960	66	20	66786	2145	23.52	23.72	0.2
	66	20	132072	1720	66536	2120	QPSK	1	0	2	20	900	1960	13	10	5230	751	24.38	24.51	0.13
CA_2A-66A-66A	2	10	18650	1855	650	1935	QPSK	1	0	66	20	66536	52120	66	20	67036	2170	24.19	24.3	0.11
	66	20	132072	1720	66536	2120	QPSK	1	0	66	20	67036	2170	2	20	900	1960	24.38	24.5	0.12
CA_2A-66B	2	10	18650	1855	650	1935	QPSK	1	0	66	15	66511	2117.5	66	5	66786	2145	24.19	24.35	0.16
	66	15	132047	1717.5	66511	2117.5	QPSK	1	0	66	5	66786	2145	2	20	900	1960	24.36	24.59	0.23
CA_2A-66C	2	10	18650	1855	650	1935	QPSK	1	0	66	20	66536	2120	66	10	66680	2134.4	24.19	24.34	0.15
	66	20	132072	1720	66536	2120	QPSK	1	0	66	10	66680	2134.4	2	20	900	1960	24.38	24.62	0.24
CA_4A-4A-5A	4	15	20025	1717.5	2025	2117.5	QPSK	1	0	4	20	2300	2145	5	10	2525	881.5	24.39	24.47	0.08
	5	5	20625	846.5	2625	891.5	QPSK	1	12	4	15	2025	2117.5	4	20	2300	2145	23.59	23.81	0.22
CA_4A-4A-13A	4	15	20025	1717.5	2025	2117.5	QPSK	1	0	4	20	2300	2145	13	10	5230	751	24.39	24.5	0.11
	13	10	23230	782	5230	751	QPSK	1	24	4	15	2025	2117.5	4	20	2300	2145	23.47	23.7	0.23
CA_5A-66A-66A	5	5	20625	846.5	2625	891.5	QPSK	1	12	66	20	66536	52120	66	20	67036	2170	23.59	23.48	-0.11
	66	20	132072	1720	66536	2120	QPSK	1	0	66	20	67036	2170	5	10	2525	881.5	24.38	24.55	0.17
CA_5A-66B	5	5	20625	846.5	2625	891.5	QPSK	1	12	66	15	66511	2117.5	66	5	66786	2145	23.59	23.81	0.22
	66	15	132047	1717.5	66511	2117.5	QPSK	1	0	66	5	66786	2145	5	10	2525	881.5	24.36	24.57	0.21
CA_5A-66C	5	5	20625	846.5	2625	891.5	QPSK	1	12	66	20	66536	52120	66	10	66680	2134.4	23.59	23.8	0.21
	66	20	132072	1720	66536	2120	QPSK	1	0	66	10	66680	2134.4	5	10	2525	881.5	24.38	24.52	0.14
CA_5B-66A	5	3	20501	834.1	2501	879.1	QPSK	1	7	5	5	2540	883	66	20	66786	2145	23.6	23.45	-0.15
	66	20	132072	1720	66536	2120	QPSK	1	0	5	3	2501	879.1	5	5	2540	883	24.38	24.26	-0.12
CA_13A-66A-66A	13	5	23230	782	5230	752	QPSK	1	0	66	20	66536	52120	66	20	67036	2170	23.52	23.74	0.22
	66	20	132072	1720	66536	2120	QPSK	1	0	66	20	67036	2170	13	10	5230	751	24.38	24.54	0.16
CA_13A-66B	13	5	23230	782	5230	752	QPSK	1	0	66	15	66511	2117.5	66	5	66786	2145	23.52	23.75	0.23
	66	15	132047	1717.5	66511	2117.5	QPSK	1	0	66	5	66786	2145	13	10	5230	751	24.36	24.22	-0.14
CA_13A-66C	13	5	23230	782	5230	752	QPSK	1	0	66	20	66536	52120	66	10	66680	2134.4	23.52	23.74	0.22
	66	20	132072	1720	66536	2120	QPSK	1	0	66	10	66680	2134.4	13	10	5230	751	24.38	24.26	-0.12
CA_66A-66C	66	20	132072	1720	66536	52120	QPSK	1	0	66	20	667038	2170.1	66	20	67236	2190	24.38	24.49	0.11
	66	20	132072	1720	66536	2120	QPSK	1	0	66	20	66734	2139.8	66	20	27236	2190	24.38	24.5	0.12

2CA Downlink Carrier aggregation Reduced Conducted Powers

Combination	PCC									SCC1				Tx Power		Deviation
	Band	BW	PCC UL Channel	PCC UL Frequency	PCC DL Channel	PCC DL Frequency	Modulation	RB	offset	SCC1 Band	SCC1 BW	SCC1 DL Channel	SCC1 DL Frequency	LTE Single (1)	LTE DL CA (2)	(2)-(1)
CA_2A-4A	2	10	18650	1855	650	1935	16QAM	1	0	4	20	2175	2132.5	12.46	12.31	-0.15
	4	10	20175	1732.5	2175	2132.5	16QAM	1	0	2	20	900	1960	12.61	12.61	0
CA_2A-66A	2	10	18650	1855	650	1935	16QAM	1	0	66	20	66786	2145	12.46	12.31	-0.15
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	2	20	900	1960	13.19	13.43	0.24
CA_2A-2A	2	10	18650	1855	650	1935	16QAM	1	0	2	20	1100	1900	12.46	12.69	0.23
CA_2A-5A	2	10	18650	1855	650	1935	16QAM	1	0	5	10	2525	881.5	12.46	12.68	0.22
	5	5	20625	846.5	2625	891.5	16QAM	1	12	2	20	900	1960	17.21	17.06	-0.15
CA_2A-13A	2	10	18650	1855	650	1935	16QAM	1	0	13	10	5230	751	12.46	12.64	0.18
	13	10	23230	782	5230	751	64QAM	1	24	2	20	900	1960	17.43	17.54	0.11
CA_4A-4A	4	10	20175	1732.5	2175	2132.5	16QAM	1	0	4	20	2175	2132.5	12.61	12.64	0.03
CA_4A-5A	4	10	20175	1732.5	2175	2132.5	16QAM	1	0	5	10	650	881.5	12.61	12.8	0.19
	5	5	20625	846.5	2625	891.5	16QAM	1	12	4	20	2300	2145	17.21	17.3	0.09
CA_4A-13A	4	10	20175	1732.5	2175	2132.5	16QAM	1	0	13	10	5230	751	12.61	12.49	-0.12
	13	10	23230	782	5230	751	64QAM	1	24	4	20	2300	2145	17.43	17.4	-0.03
CA_5B	5	3	20635	847.5	2635	892.5	16QAM	1	7	5	5	2525	881.5	17.22	17.06	-0.16
CA_5A-66A	5	5	20625	846.5	2625	891.5	16QAM	1	12	66	20	66786	2145	17.21	17.35	0.14
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	5	10	650	881.5	13.19	13.13	-0.06
CA_13A-66A	13	5	23230	782	5230	751	16QAM	1	0	66	20	66786	2145	17.46	17.36	-0.1
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	13	10	5230	751	13.19	13.22	0.03
CA_66B	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	66	5	66604	1726.8	13.19	13.42	0.23
CA_66C	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	66	15	66661	2132.5	13.19	13.4	0.21
CA_66A-66A	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	66	20	67036	2170	13.19	13.41	0.22

3CA Downlink Carrier aggregation Reduced Conducted Powers

Combination	PCC									SCC1				SCC2				Tx Power		Deviation (2)-(1)
	Band	BW	PCC UL Channel	PCC UL Frequency	PCC DL Channel	PCC DL Channel	Modulation	RB	offset	SCC1 Band	SCC1 BW	SCC1 DL Channel	SCC1 DL Frequency	SCC2 Band	SCC2 BW	SCC2 DL Channel	SCC2 DL Frequency	LTE Single (1)	LTE DL CA (2)	
CA_2A-2A-5A	2	10	18650	1855	650	1935	16QAM	1	0	2	20	1100	1900	5	10	2525	881.5	12.46	12.46	0
	5	5	20625	846.5	2625	891.5	16QAM	1	12	2	10	650	1935	2	20	1100	1900	17.21	16.96	-0.25
CA_2A-5B	2	10	18650	1855	650	1935	16QAM	1	0	5	5	2625	891.5	5	10	2553	884.3	12.46	12.27	-0.19
	5	5	20625	846.5	2625	891.5	16QAM	1	12	5	10	2553	884.3	2	20	900	1960	17.21	17.15	-0.06
CA_2A-66B	2	10	18650	1855	650	1935	16QAM	1	0	66	15	66511	2117.5	66	5	66604	2126.8	12.46	12.38	-0.08
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	66	5	66604	2126.8	2	20	900	1960	13.19	13.21	0.02
CA_2A-66C	2	10	18650	1855	650	1935	16QAM	1	0	66	15	66511	2117.5	66	15	66661	2132.5	12.46	12.36	-0.1
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	66	15	66661	2132.5	2	20	900	1960	13.19	13.13	-0.06
CA_2A-2A-13A	2	10	18650	1855	650	1935	16QAM	1	0	2	20	1100	1900	13	10	5230	751	12.46	12.37	-0.09
	13	10	23230	782	5230	751	64QAM	1	24	2	10	650	1935	2	20	1100	1900	17.43	17.37	-0.06
CA_2A-2A-66A	2	10	18650	1855	650	1935	16QAM	1	0	2	20	1100	1900	66	20	66786	2145	12.46	12.38	-0.08
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	2	10	650	1935	2	20	1100	1900	13.19	13.12	-0.07
CA_2A-4A-4A	2	10	18650	1855	650	1935	16QAM	1	0	4	10	2175	2132.5	4	20	2175	2132.5	12.46	12.06	-0.4
	4	10	20175	1732.5	2175	2132.5	16QAM	1	0	4	20	2175	2132.5	2	20	900	1960	12.61	12.22	-0.39
CA_2A-4A-5A	2	10	18650	1855	650	1935	16QAM	1	0	4	20	2300	2145	5	10	2525	881.5	12.46	12.36	-0.1
	4	10	20175	1732.5	2175	2132.5	16QAM	1	0	5	10	2525	881.5	2	20	900	1960	12.61	12.44	-0.17
	5	5	20625	846.5	2625	891.5	16QAM	1	12	2	20	900	1960	4	20	2300	2145	17.21	17.23	0.02
CA_2A-4A-13A	2	10	18650	1855	650	1935	16QAM	1	0	4	20	2300	2145	13	10	5230	751	12.46	12.34	-0.12
	4	10	20175	1732.5	2175	2132.5	16QAM	1	0	2	20	900	1960	13	10	5230	751	12.61	12.51	-0.1
	13	10	23230	782	5230	751	64QAM	1	24	2	20	900	1960	4	20	2300	2145	17.43	17.34	-0.09
CA_2A-5A-66A	2	10	18650	1855	650	1935	16QAM	1	0	5	10	650	881.5	66	20	66786	2145	12.46	12.35	-0.11
	5	5	20625	846.5	2625	891.5	16QAM	1	12	2	20	900	1960	66	20	66786	2145	17.21	16.91	-0.3
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	2	20	900	1960	5	10	650	881.5	13.19	13.05	-0.14
CA_2A-13A-66A	2	10	18650	1855	650	1935	16QAM	1	0	13	10	5230	751	66	20	66786	2145	12.46	12.31	-0.15
	13	5	23230	782	5230	751	16QAM	1	0	2	20	900	1960	66	20	66786	2145	17.46	17.39	-0.07
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	2	20	900	1960	13	10	5230	751	13.19	13.04	-0.15
CA_2A-66A-66A	2	10	18650	1855	650	1935	16QAM	1	0	66	15	66511	2117.5	66	20	67036	2170	12.46	12.37	-0.09
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	66	20	67036	2170	2	20	900	1960	13.19	12.89	-0.3
CA_4A-4A-5A	4	10	20175	1732.5	2175	2132.5	16QAM	1	0	4	20	2175	2132.5	5	10	2525	881.5	12.61	12.13	-0.48
	5	5	20625	846.5	2625	891.5	16QAM	1	12	4	10	2175	2132.5	4	20	2175	2132.5	17.21	16.62	-0.59
CA_4A-4A-13A	4	10	20175	1732.5	2175	2132.5	16QAM	1	0	4	20	2175	2132.5	13	10	5230	751	12.61	12.09	-0.52
	13	10	23230	782	5230	751	64QAM	1	24	4	10	2175	2132.5	4	20	2175	2132.5	17.43	17.1	-0.33
CA_5A-66A-66A	5	5	20625	846.5	2625	891.5	16QAM	1	12	66	15	66511	2117.5	66	20	67036	2170	17.21	16.96	-0.25
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	66	20	67036	2170	5	10	2525	881.5	13.19	13.04	-0.15
CA_5A-66B	5	5	20625	846.5	2625	891.5	16QAM	1	12	66	15	66511	2117.5	66	15	66661	2132.5	17.21	16.94	-0.27
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	66	15	66661	2132.5	5	10	2525	881.5	13.19	13.09	-0.1
CA_5A-66C	5	5	20625	846.5	2625	891.5	16QAM	1	12	66	15	66511	2117.5	66	15	66661	2132.5	17.21	16.94	-0.27
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	66	15	66661	2132.5	5	10	2525	881.5	13.19	12.93	-0.26
CA_5B-66A	5	3	20635	847.5	2635	892.5	16QAM	1	7	5	5	2525	881.5	66	20	66786	2145	17.22	16.6	-0.62
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	5	3	2635	892.5	5	5	2525	881.5	13.19	12.98	-0.21
CA_13A-66A-66A	13	5	23230	782	5230	751	16QAM	1	0	66	15	66511	2117.5	66	20	67036	2170	17.46	17.4	-0.06
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	66	20	67036	2170	13	10	5230	751	13.19	13	-0.19
CA_13A-66B	13	5	23230	782	5230	751	16QAM	1	0	66	15	66511	2117.5	66	15	66661	2132.5	17.46	17.37	-0.09
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	66	15	66661	2132.5	13	10	5230	751	13.19	13.09	-0.1
CA_13A-66C	13	5	23230	782	5230	751	16QAM	1	0	66	15	66511	2117.5	66	15	66661	2132.5	17.46	17.37	-0.09
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	66	15	66661	2132.5	13	10	5230	751	13.19	13.09	-0.1
CA_66A-66C	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	66	15	66511	2117.5	66	15	66661	2132.5	13.19	12.74	-0.45
	66	15	132047	1717.5	66511	2117.5	16QAM	1	0	66	15	66661	2132.5	66	20	66786	2145	13.19	12.8	-0.39

Notes :

Downlink Carrier aggregation:

1. This device only supports downlink carrier aggregation. For every supported combination of downlink carrier aggregation, power measurements were performed with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.
2. All control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
3. Per FCC KDB publication 941225 D05A v01r02, Section C)3)b)ii), PCC uplink channel was selected at downlink carrier aggregation combinations. The downlink PCC channel was paired with the selected PCC uplink channel according to normal configurations without carrier aggregation.
4. For continuous intra-band carrier aggregation, the downlink channel spacing between the component carriers was set to multiple of 300kHz less than the nominal channel spacing defined in section 5.4.1A of 3GPP TS 36.521.
5. For non-continuous intra-band carrier aggregation, the downlink channel spacing between the component carriers was set to be larger than the nominal channel spacing and provided maximum separation between the component carriers.
6. All selected downlink channels remained fully within the downlink transmission band of the respective component carrier.

Power Measurement setup

11.3 WIFI Conducted Power measurement method

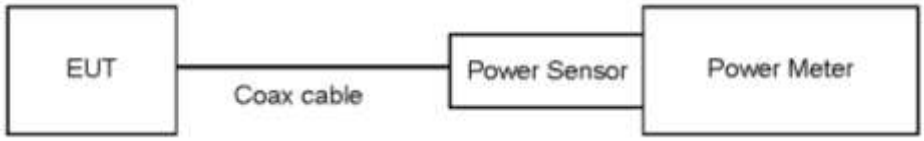
Un-Licensed bands (DTS Band)

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.

Test setup



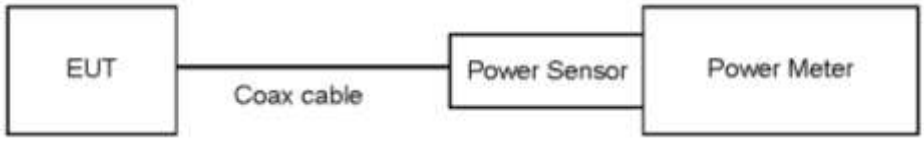
Un-Licensed bands(UNII Band)

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]
802.11b	2 412	1	17.78
	2 437	6	18.07
	2 462	11	17.59
802.11g	2 412	1	17.70
	2 437	6	17.91
	2 462	11	17.63
802.11n (HT20)	2 412	1	16.67
	2 437	6	18.30
	2 462	11	18.08

11.3.2 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)	5 180	36	16.18
	5 200	40	15.90
	5 220	44	15.71
	5 240	48	16.66
	5 260	52	16.76
	5 280	56	17.21
	5 300	60	17.57
	5 320	64	17.77
	5 500	100	17.66
	5 580	116	17.45
	5 600	120	17.70
	5 620	124	17.41
	5 720	144	17.51
	5 745	149	17.34
	5 785	157	17.87
	5 825	165	17.90

11.3.3 IEEE 802.11 (2.4 GHz) Reduced Conducted Power

Mode	Frequency [MHz]	Channel	IEEE 802.11 (2.4 GHz) Reduced Average Conducted Power [dBm]
802.11b	2 412	1	12.61
	2 437	6	12.87
	2 462	11	12.63
802.11g	2 412	1	12.82
	2 437	6	12.55
	2 462	11	12.72
802.11n (HT20)	2 412	1	12.63
	2 437	6	12.33
	2 462	11	12.63

11.3.4 IEEE 802.11 (5 GHz) Reduced Conducted Power

Mode	Frequency [MHz]	Channel	IEEE 802.11 (5 GHz) Reduced Average Conducted Power [dBm]
802.11ac (80 MHz BW)	5 210	42	9.11
	5 290	58	8.99
	5 530	106	8.95
	5 610	122	9.11
	5 690	138	9.42
	5 775	155	9.08

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

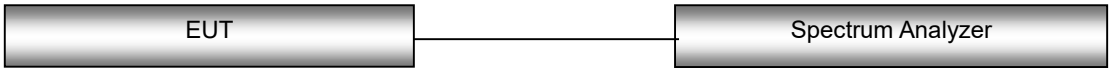
▪ Power measurements were performed for the transmission mode configuration with the highest maximum output power specified for production units.

▪ 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



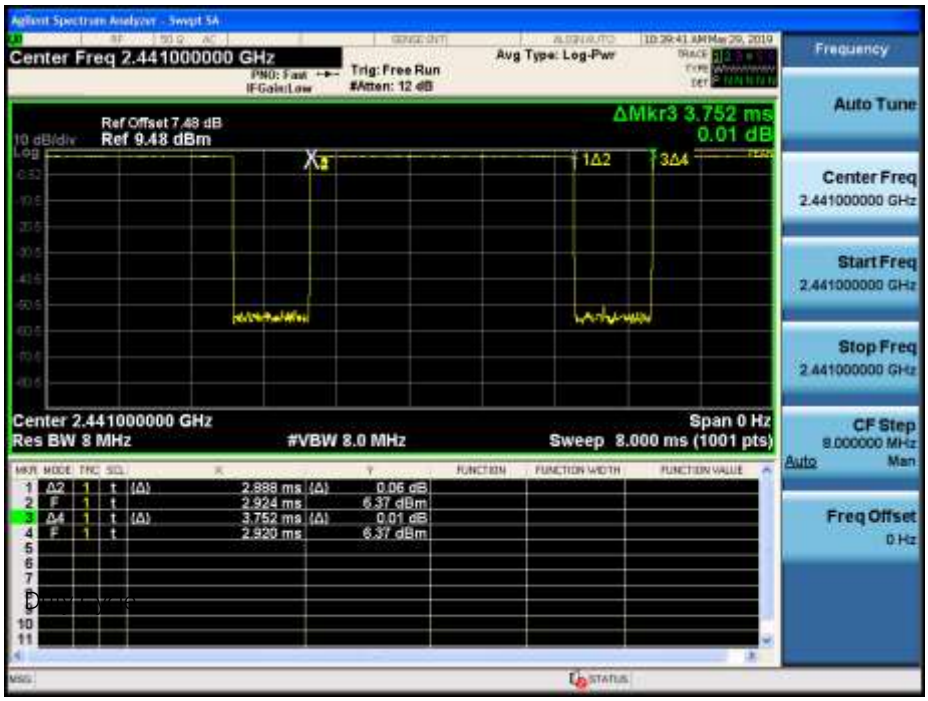
Coax Cable

11.4 Bluetooth Conducted Power

The Burst averaged-conducted power

Mode	Channel	Bluetooth Power [dBm]
DH5	0	9.32
	39	8.90
	78	8.88
2-DH5	0	8.69
	39	8.34
	78	8.28
3-DH5	0	8.70
	39	8.34
	78	8.29

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 protocol. DH5 mode is the highest duty cycle and conducted power. SAR test were performed at DH5 mode.



= (BT-On time /BT-Full time) =(2.888/3.752) = 0.770 (DH5)

Duty factor= 1/Duty cycle : 1.299

12. System Verification

12.1 Tissue Verification

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

Table for Body Tissue Verification									
Date of Tests	Tissue Temp. (°C)	Tissue Type	Freq. (MHz)	Measured Conductivity σ (S/m)	Measured Dielectric Constant, ε	Target Conductivity σ (S/m)	Target Dielectric Constant, ε	% dev σ	% dev ε
05/21/2019	20.9	750B	740	0.922	56.402	0.962	55.570	-4.16%	1.50%
			750	0.929	56.338	0.963	55.530	-3.53%	1.46%
			775	0.954	56.072	0.965	55.435	-1.14%	1.15%
			785	0.964	55.950	0.966	55.397	-0.21%	1.00%
05/20/2019	22.4	835B	820	0.944	56.557	0.969	55.260	-2.58%	2.35%
			835	0.961	56.495	0.970	55.200	-0.93%	2.35%
			850	0.969	56.282	0.988	55.150	-1.92%	2.05%
05/21/2019	20.4	1800B	1710	1.430	53.880	1.463	53.534	-2.26%	0.65%
			1750	1.466	53.826	1.488	53.430	-1.48%	0.74%
			1 800	1.506	53.716	1.520	53.300	-0.92%	0.78%
05/20/2019	20.2	1900B	1850	1.481	53.589	1.520	53.300	-2.57%	0.54%
			1900	1.528	53.474	1.520	53.300	0.53%	0.33%
			1910	1.544	53.540	1.520	53.300	1.58%	0.45%
05/29/2019	21.8	2450B	2400	1.879	53.798	1.902	52.770	-1.21%	1.95%
			2450	1.944	53.673	1.950	52.700	-0.31%	1.85%
			2500	2.004	53.529	2.021	52.640	-0.84%	1.69%
05/28/2019	21.2	2450B	2400	1.888	53.730	1.902	52.770	-0.74%	1.82%
			2450	1.943	53.555	1.950	52.700	-0.36%	1.62%
			2500	2.004	53.454	2.021	52.640	-0.84%	1.55%
06/07/2019	21.7	2600B	2500	2.007	53.527	2.021	52.640	**-0.69%**	**1.69%**
			2600	2.106	53.134	2.163	52.510	**-2.64%**	**1.19%**
			2690	2.227	52.972	2.291	52.394	**-2.79%**	**1.10%**
05/28/2019	21.9	5180B–5320B	5180	5.371	48.470	5.276	49.038	1.80%	-1.16%
			5250	5.531	48.255	5.358	48.950	3.23%	-1.42%
			5280	5.511	48.451	5.393	48.908	2.19%	-0.93%
			5320	5.556	47.989	5.439	48.852	2.15%	-1.77%
05/29/2019	21.8	5500B–5825B	5500	5.734	47.361	5.650	48.610	1.49%	-2.57%
			5600	5.887	47.068	5.766	48.470	2.10%	-2.89%
			5750	6.069	46.589	5.942	48.270	2.14%	-3.48%
			5800	6.141	46.443	6.000	48.200	2.35%	-3.65%
			5825	6.055	46.586	6.029	48.165	0.43%	-3.28%

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_{1g} (SPEAG) [W/kg]	50mW Measured SAR_{1g} [W/kg]	1 W Normalized SAR_{1g} [W/kg]	Deviation [%]	Limit [%]
750	05/21/2019	3903	1014	Body	21.2	20.9	8.58	0.390	7.8	- 9.09	± 10
835	05/20/2019	3903	4d165	Body	22.7	22.4	9.50	0.448	8.96	- 5.68	± 10
1 800	05/21/2019	3967	2d007	Body	20.6	20.4	38.4	1.84	36.8	- 4.17	± 10
1 900	05/20/2019	3967	5d032	Body	20.5	20.2	39.7	1.91	38.2	- 3.78	± 10
2 400	05/29/2019	3903	743	Body	22.1	21.8	49.9	2.41	48.2	- 3.41	± 10
2 400	05/28/2019	3076	743	Body	21.6	21.2	49.9	2.40	48.0	- 3.81	± 10
2 600	06/07/2019	3903	1015	Body	21.7	21.6	54.8	2.92	58.4	+ 6.57	± 10
5 200	05/28/2019	3903	1253	Body	22.1	21.9	78.0	3.81	76.2	- 2.31	± 10
5 600	05/29/2019	3903		Body	22.1	21.8	81.6	4.37	87.4	+ 7.11	± 10
5 750	05/29/2019	3903		Body	22.1	21.8	77.3	3.83	76.6	- 0.91	± 10

12.3 System Verification Procedure

SAR measurement was prior to assessment, the system is verified to the ± 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 (dB)	Meas. Power (dB)	Power Drift (dB)	Test Position	Sensor	Duty Cycle	Distance (mm)	Meas. SAR (W/kg)	Scaling Factor	Reported SAR (W/kg)	Plot No.
MHz	Ch.												
826.4	4132	RMC	18.0	17.08	-0.08	Rear	Active	1:1	0	0.693	1.236	**0.857**	1
836.6	4183	RMC	18.0	17.16	-0.11	Rear	Active	1:1	0	0.683	1.213	0.828	-
846.6	4233	RMC	18.0	17.27	-0.13	Rear	Active	1:1	0	0.666	1.183	0.788	-
836.6	4183	RMC	18.0	17.16	0.04	Right	Active	1:1	0	0.081	1.213	0.098	-
836.6	4183	RMC	18.0	17.16	-0.04	Top	Active	1:1	0	0.273	1.213	0.331	-
836.6	4183	RMC	18.0	17.16	-0.07	Right Corner	Active	1:1	0	0.085	1.213	0.103	-
836.6	4183	RMC	25.0	24.18	-0.03	Rear	Inactive	1:1	16	0.160	1.208	0.193	-
836.6	4183	RMC	25.0	24.18	-0.06	Right	Inactive	1:1	10	0.128	1.208	0.155	-
836.6	4183	RMC	25.0	24.18	-0.02	Left	Inactive	1:1	0	0.185	1.208	0.223	-
836.6	4183	RMC	25.0	24.18	-0.04	Top	Inactive	1:1	17	0.512	1.208	0.618	-
836.6	4183	RMC	25.0	24.18	-0.01	Right Corner	Inactive	1:1	6	0.178	1.208	0.215	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Body 1.6 W/kg Averaged over 1 gram					

UMTS 1900 Body SAR													
Frequency		Mode	Tune-Up Limit (dB)	Meas. Power (dB)	Power Drift (dB)	Test Position	Sensor	Duty Cycle	Distance (mm)	Meas. SAR (W/kg)	Scaling Factor	Reported SAR (W/kg)	Plot No.
MHz	Ch.												
1 880.0	9400	RMC	14.0	12.68	-0.19	Rear	Active	1:1	0	0.184	1.355	**0.249**	2
1 880.0	9400	RMC	14.0	12.68	0.13	Right	Active	1:1	0	0.053	1.355	0.072	-
1 880.0	9400	RMC	14.0	12.68	-0.11	Top	Active	1:1	0	0.139	1.355	0.188	-
1 880.0	9400	RMC	14.0	12.68	0.14	Right Corner	Active	1:1	0	0.028	1.355	0.038	-
1 880.0	9400	RMC	25.0	23.74	0.12	Rear	Inactive	1:1	16	0.155	1.337	0.207	-
1 880.0	9400	RMC	25.0	23.74	0.10	Right	Inactive	1:1	10	0.125	1.337	0.167	-
1 880.0	9400	RMC	25.0	23.74	0.19	Left	Inactive	1:1	0	0.099	1.337	0.132	-
1 880.0	9400	RMC	25.0	23.74	-0.05	Top	Inactive	1:1	17	0.084	1.337	0.112	-
1 880.0	9400	RMC	25.0	23.74	0.19	Right Corner	Inactive	1:1	6	0.060	1.337	0.080	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population								Body 1.6 W/kg Averaged over 1 gram					

LTE Band 2 (PCS) Body SAR																	
Frequency		Mode	BW	Tune-Up Limit (dB)	Meas. Power (dB)	Power Drift (dB)	Test Position	Sensor	MPR (dB)	RB Size	RB Offset	Duty Cycle	Distance (mm)	Meas. SAR (W/kg)	Scaling Factor	Reported SAR (W/kg)	Plot No.
MHz	Ch.																
1 860	18700	QPSK	20	13.5	12.12	0.17	Rear	Active	0	1	0	1:1	0	0.167	1.374	0.229	-
1 900	19100	QPSK	20	13.5	11.99	0.15	Rear	Active	0	50	0	1:1	0	0.184	1.416	0.261	-
1 860	18700	QPSK	20	13.5	12.12	0.10	Right	Active	0	1	0	1:1	0	0.042	1.374	0.058	-
1 900	19100	QPSK	20	13.5	11.99	0.15	Right	Active	0	50	0	1:1	0	0.046	1.416	0.065	-
1 860	18700	QPSK	20	13.5	12.12	-0.12	Top	Active	0	1	0	1:1	0	0.138	1.374	0.190	-
1 900	19100	QPSK	20	13.5	11.99	-0.05	Top	Active	0	50	0	1:1	0	0.137	1.416	0.194	-
1 860	18700	QPSK	20	13.5	12.12	0.11	Right Corner	Active	0	1	0	1:1	0	0.012	1.374	0.016	-
1 900	19100	QPSK	20	13.5	11.99	0.09	Right Corner	Active	0	50	0	1:1	0	0.030	1.416	0.042	-
1 880	18900	QPSK	20	25.5	24.17	0.14	Rear	Inactive	0	1	0	1:1	16	0.204	1.358	0.277	-
1 900	19100	QPSK	20	24.5	22.97	0.10	Rear	Inactive	1	50	0	1:1	16	0.218	1.422	**0.310**	3
1 880	18900	QPSK	20	25.5	24.17	0.19	Right	Inactive	0	1	0	1:1	10	0.155	1.358	0.210	-
1 900	19100	QPSK	20	24.5	22.97	0.12	Right	Inactive	1	50	0	1:1	10	0.093	1.422	0.132	-
1 880	18900	QPSK	20	25.5	24.17	0.06	Left	Inactive	0	1	0	1:1	0	0.110	1.358	0.149	-
1 900	19100	QPSK	20	24.5	22.97	-0.01	Left	Inactive	1	50	0	1:1	0	0.083	1.422	0.118	-
1 880	18900	QPSK	20	25.5	24.17	-0.03	Top	Inactive	0	1	0	1:1	17	0.100	1.358	0.136	-
1 900	19100	QPSK	20	24.5	22.97	-0.11	Top	Inactive	1	50	0	1:1	17	0.084	1.422	0.119	-
1 880	18900	QPSK	20	25.5	24.17	0.05	Right Corner	Inactive	0	1	0	1:1	6	0.062	1.358	0.084	-
1 900	19100	QPSK	20	24.5	22.97	-0.12	Right Corner	Inactive	1	50	0	1:1	6	0.067	1.422	0.095	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population									Body 1.6 W/kg Averaged over 1 gram								

LTE Band 5 (Cell) Body SAR																	
Frequency		Mode	BW	Tune-Up Limit (dB)	Meas. Power (dB)	Power Drift (dB)	Test Position	Sensor	MPR (dB)	RB Size	RB Offset	Duty Cycle	Distance (mm)	Meas. SAR (W/kg)	Scaling Factor	Reported SAR (W/kg)	Plot No.
MHz	Ch.																
836.5	20525	QPSK	10	18.0	16.71	-0.03	Rear	Active	0	1	0	1:1	0	0.669	1.346	0.900	
836.5	20525	QPSK	10	18.0	16.77	-0.03	Rear	Active	0	25	0	1:1	0	0.670	1.327	0.889	-
836.5	20525	QPSK	10	18.0	16.65	-0.04	Rear	Active	0	50	0	1:1	0	0.690	1.365	**0.942**	4
836.5	20525	QPSK	10	18.0	16.71	0.07	Right	Active	0	1	0	1:1	0	0.070	1.346	0.094	-
836.5	20525	QPSK	10	18.0	16.77	0.05	Right	Active	0	25	0	1:1	0	0.073	1.327	0.097	-
836.5	20525	QPSK	10	18.0	16.71	-0.06	Top	Active	0	1	0	1:1	0	0.225	1.346	0.303	-
836.5	20525	QPSK	10	18.0	16.77	0.02	Top	Active	0	25	0	1:1	0	0.225	1.327	0.299	-
836.5	20525	QPSK	10	18.0	16.71	-0.07	Right Corner	Active	0	1	0	1:1	0	0.077	1.346	0.104	-
836.5	20525	QPSK	10	18.0	16.77	-0.11	Right Corner	Active	0	25	0	1:1	0	0.079	1.327	0.105	-
836.5	20525	QPSK	10	25.0	23.47	-0.04	Rear	Inactive	0	1	0	1:1	16	0.439	1.422	0.624	-
836.5	20525	QPSK	10	24.0	22.46	-0.05	Rear	Inactive	1	25	0	1:1	16	0.440	1.426	0.627	-
836.5	20525	QPSK	10	25.0	23.47	-0.01	Right	Inactive	0	1	0	1:1	10	0.150	1.422	0.213	-
836.5	20525	QPSK	10	24.0	22.46	0.01	Right	Inactive	1	25	0	1:1	10	0.122	1.426	0.174	-
836.5	20525	QPSK	10	25.0	23.47	0.01	Left	Inactive	0	1	0	1:1	0	0.167	1.422	0.237	-
836.5	20525	QPSK	10	24.0	22.46	0.06	Left	Inactive	1	25	0	1:1	0	0.137	1.426	0.195	-
836.5	20525	QPSK	10	25.0	23.47	-0.03	Top	Inactive	0	1	0	1:1	17	0.427	1.422	0.607	-
836.5	20525	QPSK	10	24.0	22.46	-0.02	Top	Inactive	1	25	0	1:1	17	0.347	1.426	0.495	-
836.5	20525	QPSK	10	25.0	23.47	-0.08	Right Corner	Inactive	0	1	0	1:1	6	0.160	1.422	0.228	-
836.5	20525	QPSK	10	24.0	22.46	-0.08	Right Corner	Inactive	1	25	0	1:1	6	0.128	1.426	0.183	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population									Body 1.6 W/kg Averaged over 1 gram								

LTE Band 7 Body SAR																	
Frequency		Mode	BW	Tune-Up Limit (dB)	Meas. Power (dB)	Power Drift (dB)	Test Position	Sensor	MPR (dB)	RB Size	RB Offset	Duty Cycle	Distance (mm)	Meas. SAR (W/kg)	Scaling Factor	Reported SAR (W/kg)	Plot No.
MHz	Ch.																
2510	20850	QPSK	20	14.5	13.16	0.17	Rear	Active	0	1	0	1:1	0	0.979	1.361	1.332	-
2535	21100	QPSK	20	14.5	13.15	-0.14	Rear	Active	0	1	0	1:1	0	0.944	1.365	1.289	-
2 560	21350	QPSK	20	14.5	13.2	0.13	Rear	Active	0	1	0	1:1	0	0.973	1.349	1.313	-
2510	20850	QPSK	20	14.5	13.18	-0.12	Rear	Active	0	50	0	1:1	0	0.977	1.355	1.324	-
2535	21100	QPSK	20	14.5	13.07	-0.14	Rear	Active	0	50	25	1:1	0	0.902	1.390	1.254	-
2 560	21350	QPSK	20	14.5	13.23	0.19	Rear	Active	0	50	0	1:1	0	0.986	1.340	1.321	-
2 560	21350	QPSK	20	14.5	13.15	0.01	Rear	Active	0	100	0	1:1	0	1.01	1.365	**1.379**	5
2510	20850	QPSK	20	14.5	13.16	-0.12	Right	Active	0	1	0	1:1	0	0.716	1.361	0.974	-
2535	21100	QPSK	20	14.5	13.15	-0.15	Right	Active	0	1	0	1:1	0	0.694	1.365	0.947	-
2 560	21350	QPSK	20	14.5	13.2	0.17	Right	Active	0	1	0	1:1	0	0.761	1.349	1.027	-
2510	20850	QPSK	20	14.5	13.18	-0.01	Right	Active	0	50	0	1:1	0	0.875	1.355	1.186	-
2535	21100	QPSK	20	14.5	13.07	-0.17	Right	Active	0	50	25	1:1	0	0.661	1.390	0.919	-
2 560	21350	QPSK	20	14.5	13.23	-0.06	Right	Active	0	50	0	1:1	0	0.736	1.340	0.986	-
2 560	21350	QPSK	20	14.5	13.15	-0.12	Right	Active	0	100	0	1:1	0	0.931	1.365	1.271	-
2510	20850	QPSK	20	14.5	13.16	0.02	Top	Active	0	1	0	1:1	0	0.569	1.361	0.774	-
2535	21100	QPSK	20	14.5	13.15	-0.1	Top	Active	0	1	0	1:1	0	0.618	1.365	0.844	-
2 560	21350	QPSK	20	14.5	13.2	-0.10	Top	Active	0	1	0	1:1	0	0.603	1.349	0.813	-
2 560	21350	QPSK	20	14.5	13.23	-0.11	Top	Active	0	50	0	1:1	0	0.569	1.340	0.762	-
2 560	21350	QPSK	20	14.5	13.15	-0.03	Top	Active	0	100	0	1:1	0	0.555	1.365	0.758	-
2 560	21350	QPSK	20	14.5	13.2	0.14	Right Corner	Active	0	1	0	1:1	0	0.369	1.349	0.498	-
2 560	21350	QPSK	20	14.5	13.23	0.15	Right Corner	Active	0	50	0	1:1	0	0.373	1.340	0.500	-
2 560	21350	QPSK	20	24.0	22.75	-0.13	Rear	Inactive	0	1	0	1:1	16	0.366	1.334	0.488	-
2 560	21350	QPSK	20	23.0	21.72	-0.15	Rear	Inactive	1	50	0	1:1	16	0.261	1.343	0.351	-
2510	20850	QPSK	20	24.0	22.61	-0.02	Right	Inactive	0	1	0	1:1	10	0.992	1.377	1.366	-
2535	21100	QPSK	20	24.0	22.61	-0.04	Right	Inactive	0	1	0	1:1	10	0.927	1.377	1.276	-
2 560	21350	QPSK	20	24.0	22.75	-0.05	Right	Inactive	0	1	0	1:1	10	0.993	1.334	1.325	-
2510	20850	QPSK	20	23.0	21.68	-0.01	Right	Inactive	1	50	0	1:1	10	0.707	1.355	0.958	-
2535	21100	QPSK	20	23.0	21.57	-0.06	Right	Inactive	1	50	0	1:1	10	0.776	1.390	1.079	-
2 560	21350	QPSK	20	23.0	21.72	-0.10	Right	Inactive	1	50	0	1:1	10	0.804	1.343	1.080	-
2 560	21350	QPSK	20	23.0	21.68	0.03	Right	Inactive	1	100	0	1:1	10	0.721	1.355	0.977	-
2 560	21350	QPSK	20	24.0	22.75	0.09	Left	Inactive	0	1	0	1:1	0	0.067	1.334	0.089	-

2 560	21350	QPSK	20	23.0	21.72	-0.08	Left	Inactive	1	50	0	1:1	0	0.035	1.343	0.047	-
2 560	21350	QPSK	20	24.0	22.75	0.01	Top	Inactive	0	1	0	1:1	17	0.213	1.334	0.284	-
2 560	21350	QPSK	20	23.0	21.72	0.02	Top	Inactive	1	50	0	1:1	17	0.169	1.343	0.227	-
2 560	21350	QPSK	20	24.0	22.75	0.01	Right Corner	Inactive	0	1	0	1:1	6	0.352	1.334	0.470	-
2 560	21350	QPSK	20	23.0	21.72	0.03	Right Corner	Inactive	1	50	0	1:1	6	0.277	1.343	0.372	-
2 560	21350	QPSK	20	14.5	13.15	0.01	Rear	Active	0	100	0	1:1	0	0.993	1.365	1.355	**
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.

LTE Band 13 Body SAR																	
Frequency		Mode	BW	Tune-Up Limit (dB)	Meas. Power (dB)	Power Drift (dB)	Test Position	Sensor	MPR (dB)	RB Size	RB Offset	Duty Cycle	Distance (mm)	Meas. SAR (W/kg)	Scaling Factor	Reported SAR (W/kg)	Plot No.
MHz	Ch.																
782	23230	QPSK	10	18.5	17.08	-0.01	Rear	Active	0	1	0	1:1	0	0.787	1.387	**1.092**	6
782	23230	QPSK	10	18.5	17.20	-0.01	Rear	Active	0	25	0	1:1	0	0.791	1.349	1.067	-
782	23230	QPSK	10	18.5	17.16	-0.06	Rear	Active	0	50	0	1:1	0	0.774	1.361	1.053	-
782	23230	QPSK	10	18.5	17.08	0.06	Right	Active	0	1	0	1:1	0	0.076	1.387	0.105	-
782	23230	QPSK	10	18.5	17.20	0.12	Right	Active	0	25	0	1:1	0	0.079	1.349	0.107	-
782	23230	QPSK	10	18.5	17.08	-0.04	Top	Active	0	1	0	1:1	0	0.376	1.387	0.522	-
782	23230	QPSK	10	18.5	17.20	-0.05	Top	Active	0	25	0	1:1	0	0.387	1.349	0.522	-
782	23230	QPSK	10	18.5	17.08	-0.14	Right Corner	Active	0	1	0	1:1	0	0.080	1.387	0.111	-
782	23230	QPSK	10	18.5	17.20	-0.17	Right Corner	Active	0	25	0	1:1	0	0.079	1.349	0.107	-
782	23230	QPSK	10	25.0	23.47	-0.04	Rear	Inactive	0	1	24	1:1	16	0.399	1.422	0.567	-
782	23230	QPSK	10	24.0	22.54	-0.03	Rear	Inactive	1	25	0	1:1	16	0.309	1.400	0.433	-
782	23230	QPSK	10	25.0	23.47	-0.01	Right	Inactive	0	1	24	1:1	10	0.112	1.422	0.159	-
782	23230	QPSK	10	24.0	22.54	-0.07	Right	Inactive	1	25	0	1:1	10	0.088	1.400	0.123	-
782	23230	QPSK	10	25.0	23.47	0.04	Left	Inactive	0	1	24	1:1	0	0.115	1.422	0.164	-
782	23230	QPSK	10	24.0	22.54	0.02	Left	Inactive	1	25	0	1:1	0	0.086	1.400	0.120	-
782	23230	QPSK	10	25.0	23.47	-0.10	Top	Inactive	0	1	24	1:1	17	0.353	1.422	0.502	-
782	23230	QPSK	10	24.0	22.54	-0.04	Top	Inactive	1	25	0	1:1	17	0.329	1.400	0.461	-
782	23230	QPSK	10	25.0	23.47	-0.04	Right Corner	Inactive	0	1	24	1:1	6	0.105	1.422	0.149	-
782	23230	QPSK	10	24.0	22.54	-0.01	Right Corner	Inactive	1	25	0	1:1	6	0.085	1.400	0.119	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population									Body 1.6 W/kg Averaged over 1 gram								

LTE Band 66 (AWS) Body SAR																	
Frequency		Mode	BW	Tune-Up Limit (dB)	Meas. Power (dB)	Power Drift (dB)	Test Position	Sensor	MPR (dB)	RB Size	RB Offset	Duty Cycle	Distance (mm)	Meas. SAR (W/kg)	Scaling Factor	Reported SAR (W/kg)	Plot No.
MHz	Ch.																
1 720	132072	QPSK	20	14.0	12.83	-0.02	Rear	Active	0	1	0	1:1	0	0.542	1.309	0.709	-
1 720	132072	QPSK	20	14.0	12.83	-0.01	Rear	Active	0	50	0	1:1	0	0.548	1.309	0.717	-
1 720	132072	QPSK	20	14.0	12.83	0.10	Right	Active	0	1	0	1:1	0	0.070	1.309	0.092	-
1 720	132072	QPSK	20	14.0	12.83	0.12	Right	Active	0	50	0	1:1	0	0.067	1.309	0.088	-
1 720	132072	QPSK	20	14.0	12.83	-0.08	Top	Active	0	1	0	1:1	0	0.316	1.309	0.414	-
1 720	132072	QPSK	20	14.0	12.83	-0.10	Top	Active	0	50	0	1:1	0	0.320	1.309	0.419	-
1 720	132072	QPSK	20	14.0	12.83	0.15	Right Corner	Active	0	1	0	1:1	0	0.038	1.309	0.050	-
1 720	132072	QPSK	20	14.0	12.83	0.13	Right Corner	Active	0	50	0	1:1	0	0.040	1.309	0.052	-
1 720	132072	QPSK	20	25.5	24.38	0.04	Rear	Inactive	0	1	0	1:1	16	0.589	1.294	**0.762**	7
1 720	132072	QPSK	20	24.5	23.36	0.04	Rear	Inactive	1	50	49	1:1	16	0.464	1.300	0.603	-
1 720	132072	QPSK	20	25.5	24.38	0.16	Right	Inactive	0	1	0	1:1	10	0.120	1.294	0.155	-
1 720	132072	QPSK	20	24.5	23.36	0.13	Right	Inactive	1	50	49	1:1	10	0.095	1.300	0.124	-
1 720	132072	QPSK	20	25.5	24.38	-0.07	Left	Inactive	0	1	0	1:1	0	0.277	1.294	0.358	-
1 720	132072	QPSK	20	24.5	23.36	0.03	Left	Inactive	1	50	49	1:1	0	0.236	1.300	0.307	-
1 720	132072	QPSK	20	25.5	24.38	-0.09	Top	Inactive	0	1	0	1:1	17	0.464	1.294	0.600	-
1 720	132072	QPSK	20	24.5	23.36	-0.06	Top	Inactive	1	50	49	1:1	17	0.345	1.300	0.449	-
1 720	132072	QPSK	20	25.5	24.38	-0.09	Right Corner	Inactive	0	1	0	1:1	6	0.144	1.294	0.186	-
1 720	132072	QPSK	20	24.5	23.36	0.01	Right Corner	Inactive	1	50	49	1:1	6	0.109	1.300	0.142	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population									Body 1.6 W/kg Averaged over 1 gram								

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	Position	Duty Cycle	Distance (mm)	Area Scan Peak SAR (W/kg)	Meas. SAR (W/kg)	Scaling Factor	Scaling Factor (Duty)	Reported SAR (W/kg)	Plot No.
MHz	Ch.																
2 437	6	802.11b	22	1	13	12.87	0.16	Rear	Active	98.5	0	1.59	0.619	1.030	1.015	0.647	-
2 412	1	802.11b	22	1	13	12.61	0.01	Left	Active	98.5	0	1.87	0.886	1.094	1.015	**0.984**	8
2 437	6	802.11b	22	1	13	12.87	0.07	Left	Active	98.5	0	1.84	0.883	1.030	1.015	0.923	-
2 462	11	802.11b	22	1	13	12.63	-0.17	Left	Active	98.5	0	1.74	0.880	1.089	1.015	0.973	-
2 437	6	802.11b	22	1	13	12.87	0.14	Top	Active	98.5	0	0.413	0.287	1.030	1.015	0.300	-
2 437	6	802.11b	22	1	13	12.87	-0.10	Left Corner	Active	98.5	0	0.815	0.220	1.030	1.015	0.230	-
2 437	6	802.11b	22	1	20	18.07	0.19	Rear	Inactive	98.5	8	0.212	0.123	1.560	1.015	0.195	-
2 437	6	802.11b	22	1	20	18.07	0.13	Left	Inactive	98.5	6	0.752	0.424	1.560	1.015	0.671	-
2 437	6	802.11b	22	1	20	18.07	-0.19	Right	Inactive	98.5	0	0.0227	0.0054	1.560	1.015	0.0086	-
2 437	6	802.11b	22	1	20	18.07	0.18	Top	Inactive	98.5	9	0.287	0.165	1.560	1.015	0.261	-
2 437	6	802.11b	22	1	20	18.07	0.10	Left Corner	Inactive	98.5	6	0.339	0.182	1.560	1.015	0.288	-
2 412	1	802.11b	22	1	13	12.61	0.08	Left	Active	98.5	0	1.80	0.871	1.094	1.015	0.967	**
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.

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	Position	Duty Cycle	Distance (mm)	Area Scan Peak SAR (W/kg)	Meas. SAR (W/kg)	Scaling Factor	Scaling Factor (Duty)	Reported SAR (W/kg)	Plot No.
MHz	Ch.																
5 290	58	802.11ac	80	MCS0	9.5	8.99	0.10	Rear	Active	90.2	0	1.02	0.314	1.125	1.109	0.392	-
5 290	58	802.11ac	80	MCS0	9.5	8.99	0.07	Left	Active	90.2	0	1.20	0.625	1.125	1.109	0.780	-
5 290	58	802.11ac	80	MCS0	9.5	8.99	0.19	Top	Active	90.2	0	0.381	0.211	1.125	1.109	0.263	-
5 290	58	802.11ac	80	MCS0	9.5	8.99	-0.13	Left Corner	Active	90.2	0	0.218	0.110	1.125	1.109	0.137	-
5 320	64	802.11a	20	6Mbps	19	17.77	0.15	Rear	Inactive	97.5	8	0.455	0.201	1.327	1.026	0.274	-
5 320	64	802.11a	20	6Mbps	19	17.77	0.18	Left	Inactive	97.5	6	1.21	0.511	1.327	1.026	0.696	-
5 320	64	802.11a	20	6Mbps	19	17.77	-0.09	Right	Inactive	97.5	0	0.096	0.00569	1.327	1.026	0.00775	
5 320	64	802.11a	20	6Mbps	19	17.77	0.11	Top	Inactive	97.5	9	0.393	0.134	1.327	1.026	0.182	-
5 320	64	802.11a	20	6Mbps	19	17.77	-0.18	Left Corner	Inactive	97.5	6	0.247	0.106	1.327	1.026	0.144	-
5 690	138	802.11ac	80	MCS0	9.5	9.42	0.16	Rear	Active	90.2	0	1.03	0.288	1.019	1.109	0.325	-
5 690	138	802.11ac	80	MCS0	9.5	9.42	0.15	Left	Active	90.2	0	0.962	0.495	1.019	1.109	0.559	-
5 690	138	802.11ac	80	MCS0	9.5	9.42	0.15	Top	Active	90.2	0	0.305	0.188	1.019	1.109	0.212	-
5 690	138	802.11ac	80	MCS0	9.5	9.42	-0.04	Left Corner	Active	90.2	0	0.283	0.169	1.019	1.109	0.191	-
5 600	120	802.11a	20	6Mbps	19	17.70	0.12	Rear	Inactive	97.5	8	0.308	0.092	1.349	1.026	0.127	-
5 600	120	802.11a	20	6Mbps	19	17.70	0.05	Left	Inactive	97.5	6	1.41	0.530	1.349	1.026	0.734	-
5 600	120	802.11a	20	6Mbps	19	17.70	0.08	Right	Inactive	97.5	0	0.142	0.0705	1.349	1.026	0.0976	
5 600	120	802.11a	20	6Mbps	19	17.70	0.12	Top	Inactive	97.5	9	0.582	0.202	1.349	1.026	0.280	-
5 600	120	802.11a	20	6Mbps	19	17.70	0.07	Left Corner	Inactive	97.5	6	0.375	0.163	1.349	1.026	0.226	-
5 775	155	802.11ac	80	MCS0	9.5	9.08	0.14	Rear	Active	90.2	0	0.952	0.290	1.102	1.109	0.354	-
5 775	155	802.11ac	80	MCS0	9.5	9.08	-0.01	Left	Active	90.2	0	1.22	0.599	1.102	1.109	0.732	-
5 775	155	802.11ac	80	MCS0	9.5	9.08	-0.17	Top	Active	90.2	0	0.405	0.282	1.102	1.109	0.345	-
5 775	155	802.11ac	80	MCS0	9.5	9.08	-0.04	Left Corner	Active	90.2	0	0.410	0.237	1.102	1.109	0.290	-
5 825	165	802.11a	20	6Mbps	19	17.90	0.19	Rear	Inactive	97.5	8	0.673	0.270	1.288	1.026	0.357	-
5 745	149	802.11a	20	6Mbps	19	17.34	0.10	Left	Inactive	97.5	6	1.31	0.546	1.466	1.026	0.821	-
5 785	157	802.11a	20	6Mbps	19	17.87	0.01	Left	Inactive	97.5	6	1.81	0.750	1.297	1.026	0.998	-
5 825	165	802.11a	20	6Mbps	19	17.90	0.01	Left	Inactive	97.5	6	2.01	0.782	1.288	1.026	**1.033**	9
5 825	165	802.11a	20	6Mbps	19	17.90	0.19	Right	Inactive	97.5	6	0.337	0.115	1.288	1.026	0.151	
5 825	165	802.11a	20	6Mbps	19	17.90	0.16	Top	Inactive	97.5	9	0.979	0.395	1.288	1.026	0.522	-
5 825	165	802.11a	20	6Mbps	19	17.90	-0.02	Left Corner	Inactive	97.5	6	0.875	0.375	1.288	1.026	0.496	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population											Body 1.6 W/kg Averaged over 1 gram						

DSS Tethering SAR												
Frequency		Mode	Tune-Up Limit (dBm)	Meas. Power (dBm)	Power Drift (dB)	Test Position	Distance (mm)	Meas. SAR (W/kg)	Scaling Factor	Scaling Factor (Duty)	Reported SAR (W/kg)	Plot No.
MHz	Ch.											
2 402	0	Bluetooth DH5	10.0	9.32	0.01	Rear	0	0.225	1.169	1.299	**0.342**	10
2 402	0	Bluetooth DH5	10.0	9.32	0.15	Left	0	0.192	1.169	1.299	0.292	-
2 402	0	Bluetooth DH5	10.0	9.32	0.02	Right	0	0.0013	1.169	1.299	0.002	-
2 402	0	Bluetooth DH5	10.0	9.32	0.17	Top	0	0.079	1.169	1.299	0.120	-
2 402	0	Bluetooth DH5	10.0	9.32	0.16	Left Corner	0	0.064	1.169	1.299	0.097	-
ANSI/ IEEE C95.1 - 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg Averaged over 1 gram					

13.2 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 4.3, SAR tests are required for the back surface and edges of the tablet with the tablet touching the phantom. The SAR Exclusion Threshold in FCC KDB 447498 D01v06 was applied to determine SAR test exclusion for adjacent edge configurations.
9. Regarding additional test configuration with keyboard, Samsung wants to verify this configuration based on the worst case of the stand-alone mode. If the mode of Tablet is idle and the case is folded, the SAR test was not applied.

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. AMR and 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 1.45W/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. 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. For held-to-ear and hotspot operations, the initial test position procedures were applied. For initial test position, the highest extrapolated peak SAR will be used. When reported SAR for the initial test position is ≤ 0.4 W/kg for 1g SAR and ≤ 1.0 W/kg for 10g SAR, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR results is ≤ 0.8 W/kg for 1g SAR and ≤ 2.0 W/kg for 10g SAR or all test position are measured.
2. 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) was not required due to the maximum allowed powers and the highest reported DSSS SAR.
3. 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.
4. When the maximum reported 1g averaged SAR is ≤ 0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg or all test channels were measured.
5. 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.9. for the time-domain plot and calculation for duty factor of the device.

14. Simultaneous SAR Analysis

14.1 Simultaneous Transmission Scenario with 2.4 GHz WLAN

Simultaneous Tx	Configurations	UMTS 850 (W/kg)	2.4 GHz Ant.(W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.857	0.647	1.504	No
	Left	0.223	0.984	1.207	No
	Right	0.155	0.0086	0.1636	No
	Top	0.618	0.3	0.918	No
	Right Corner	0.215	0.4	0.615	No
	Left Corner	0.4	0.288	0.688	No
Simultaneous Tx	Configurations	UMTS1900(W/kg)	2.4 GHz Ant.(W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.249	0.647	0.896	No
	Left	0.132	0.984	1.116	No
	Right	0.167	0.0086	0.1756	No
	Top	0.188	0.3	0.488	No
	Right Corner	0.08	0.4	0.48	No
	Left Corner	0.4	0.288	0.688	No
Simultaneous Tx	Configurations	LTE 2 (W/kg)	2.4 GHz Ant.(W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.31	0.647	0.957	No
	Left	0.149	0.984	1.133	No
	Right	0.21	0.0086	0.2186	No
	Top	0.194	0.3	0.494	No
	Right Corner	0.095	0.4	0.495	No
	Left Corner	0.4	0.288	0.688	No
Simultaneous Tx	Configurations	LTE 5 (W/kg)	2.4 GHz Ant.(W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.942	0.647	**1.589**	No
	Left	0.237	0.984	1.221	No
	Right	0.213	0.0086	0.2216	No
	Top	0.607	0.3	0.907	No
	Right Corner	0.228	0.4	0.628	No
	Left Corner	0.4	0.288	0.688	No
Simultaneous Tx	Configurations	LTE 7 (W/kg)	2.4 GHz Ant.(W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	1.379	0.647	2.026	Yes
	Left	0.089	0.984	1.073	No
	Right	1.366	0.0086	1.3746	No
	Top	0.844	0.3	1.144	No
	Right Corner	0.500	0.4	0.9	No
	Left Corner	0.4	0.288	0.688	No

Simultaneous Tx	Configurations	LTE 13 (W/kg)	2.4 GHz Ant.(W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	1.092	0.647	1.739	**Yes**
	Left	0.164	0.984	1.148	No
	Right	0.159	0.0086	0.559	No
	Top	0.522	0.3	0.822	No
	Right Corner	0.149	0.4	0.549	No
	Left Corner	0.4	0.288	0.688	No
Simultaneous Tx	Configurations	LTE 66 (W/kg)	2.4 GHz Ant.(W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.762	0.647	1.409	No
	Left	0.358	0.984	1.342	No
	Right	0.155	0.0086	0.1636	No
	Top	0.6	0.3	0.9	No
	Right Corner	0.186	0.4	0.586	No
	Left Corner	0.4	0.288	0.688	No

14.2 Simultaneous Transmission Scenario with 5 GHz WLAN

Simultaneous Tx	Configurations	UMTS 850 (W/kg)	5 GHz Ant.(W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.857	0.392	1.249	No
	Left	0.223	1.033	1.256	No
	Right	0.155	0.151	0.306	No
	Top	0.618	0.522	1.14	No
	Right Corner	0.215	0.4	0.615	No
	Left Corner	0.4	0.496	0.896	No
Simultaneous Tx	Configurations	UMTS1900(W/kg)	5 GHz Ant.(W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.249	0.392	0.641	No
	Left	0.132	1.033	1.165	No
	Right	0.167	0.151	0.318	No
	Top	0.188	0.522	0.71	No
	Right Corner	0.08	0.4	0.48	No
	Left Corner	0.4	0.496	0.896	No
Simultaneous Tx	Configurations	LTE 2 (W/kg)	5 GHz Ant.(W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.31	0.392	0.702	No
	Left	0.149	1.033	1.182	No
	Right	0.21	0.151	0.361	No
	Top	0.194	0.522	0.716	No
	Right Corner	0.095	0.4	0.495	No
	Left Corner	0.4	0.496	0.896	No
Simultaneous Tx	Configurations	LTE 5 (W/kg)	5 GHz Ant.(W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.942	0.392	1.334	No
	Left	0.237	1.033	1.27	No
	Right	0.213	0.151	0.364	No
	Top	0.607	0.522	1.129	No
	Right Corner	0.228	0.4	0.628	No
	Left Corner	0.4	0.496	0.896	No
Simultaneous Tx	Configurations	LTE 7 (W/kg)	5 GHz Ant.(W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	1.379	0.392	1.771	Yes
	Left	0.089	1.033	1.122	No
	Right	1.366	0.151	1.517	No
	Top	0.844	0.522	1.366	No
	Right Corner	0.500	0.4	0.9	No
	Left Corner	0.4	0.496	0.896	No

Simultaneous Tx	Configurations	LTE 13 (W/kg)	5 GHz Ant.(W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	1.092	0.392	1.484	No
	Left	0.164	1.033	1.197	No
	Right	0.159	0.151	0.31	No
	Top	0.522	0.522	1.044	No
	Right Corner	0.149	0.4	0.549	No
	Left Corner	0.4	0.496	0.896	No
Simultaneous Tx	Configurations	LTE 66 (W/kg)	5 GHz Ant.(W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.762	0.392	1.154	No
	Left	0.358	1.033	1.391	No
	Right	0.155	0.151	0.306	No
	Top	0.6	0.522	1.122	No
	Right Corner	0.186	0.4	0.586	No
	Left Corner	0.4	0.496	0.896	No

14.3 Simultaneous Transmission Scenario with Bluetooth

Simultaneous Tx	Configurations	UMTS 850 (W/kg)	Bluetooth (W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.857	0.342	1.199	No
	Left	0.223	0.292	0.515	No
	Right	0.155	0.002	**0.157**	No
	Top	0.618	0.12	0.738	No
	Right Corner	0.215	0.4	0.615	No
	Left Corner	0.4	0.097	0.497	No
Simultaneous Tx	Configurations	UMTS 1900 (W/kg)	Bluetooth (W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.249	0.342	0.591	No
	Left	0.132	0.292	0.424	No
	Right	0.167	0.002	**0.169**	No
	Top	0.188	0.12	0.308	No
	Right Corner	0.08	0.4	0.48	No
	Left Corner	0.4	0.097	0.497	No
Simultaneous Tx	Configurations	LTE 2 (W/kg)	Bluetooth (W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.31	0.342	0.652	No
	Left	0.149	0.292	0.441	No
	Right	0.21	0.002	**0.212**	No
	Top	0.194	0.12	0.314	No
	Right Corner	0.095	0.4	0.495	No
	Left Corner	0.4	0.097	0.497	No
Simultaneous Tx	Configurations	LTE 5 (W/kg)	Bluetooth (W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.942	0.342	1.284	No
	Left	0.237	0.292	0.529	No
	Right	0.213	0.002	0.215	No
	Top	0.607	0.12	0.727	No
	Right Corner	0.228	0.4	0.628	No
	Left Corner	0.4	0.097	0.497	No

Simultaneous Tx	Configurations	LTE 7 (W/kg)	Bluetooth (W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	1.379	0.342	1.721	**Yes**
	Left	0.089	0.292	0.381	No
	Right	1.366	0.002	1.368	No
	Top	0.844	0.12	0.964	No
	Right Corner	0.500	0.4	0.9	No
	Left Corner	0.4	0.097	0.497	No
Simultaneous Tx	Configurations	LTE 13 (W/kg)	Bluetooth (W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	1.092	0.342	1.434	No
	Left	0.164	0.292	0.456	No
	Right	0.159	0.002	0.559	No
	Top	0.522	0.12	0.642	No
	Right Corner	0.149	0.4	0.549	No
	Left Corner	0.4	0.097	0.497	No
Simultaneous Tx	Configurations	LTE 66 (W/kg)	Bluetooth (W/kg)	∑ 1-g SAR(W/kg)	SPLSR(Yes/No)
Body SAR	Rear	0.762	0.342	1.104	No
	Left	0.358	0.292	0.65	No
	Right	0.155	0.002	0.555	No
	Top	0.6	0.12	0.72	No
	Right Corner	0.186	0.4	0.586	No
	Left Corner	0.4	0.097	0.497	No

Note:

When the antenna separation distance was >50 mm, an estimated SAR of 0.4 W/kg was used to determine the simultaneous transmission SAR exclusion for test positions exclude per FCC KDB Publication 447498D01v06

14.4 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:

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

Where:

$\boldsymbol{SAR_1}$ 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

$\boldsymbol{SAR_2}$ 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

$\boldsymbol{Ri}$ 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 $[(\mathbf{X_1} - \mathbf{X_2})^2 + (\mathbf{Y_1} - \mathbf{Y_2})^2 + (\mathbf{Z_1} - \mathbf{Z_2})^2]$

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:

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

Per Sec. 13, below simultaneous transmission summations need to be calculated SPLSR.

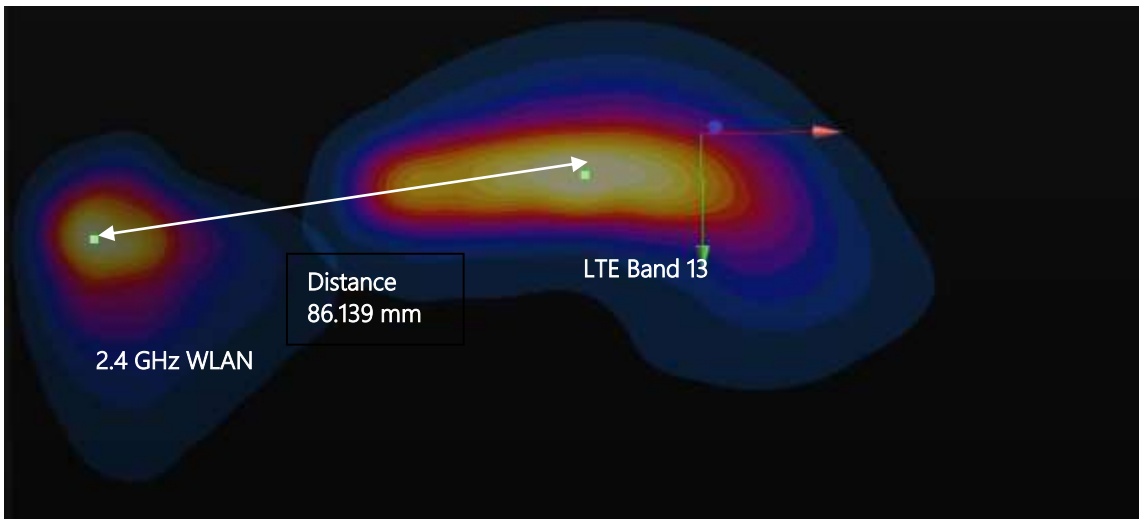
14.4.1 SPLSR Evaluation

Peak location for SAR Rear side

Mode/Band	X(mm)	Y(mm)	Z(mm)
LTE Band 13	9.5	-1.5	-172
LTE Band 7	75	13.6	-172
2.4 GHz WLAN	-76.5	3.4	-172
2.4 GHz BT	-66.2	-1.2	-172
5 GHz WLAN	-69	7	-172

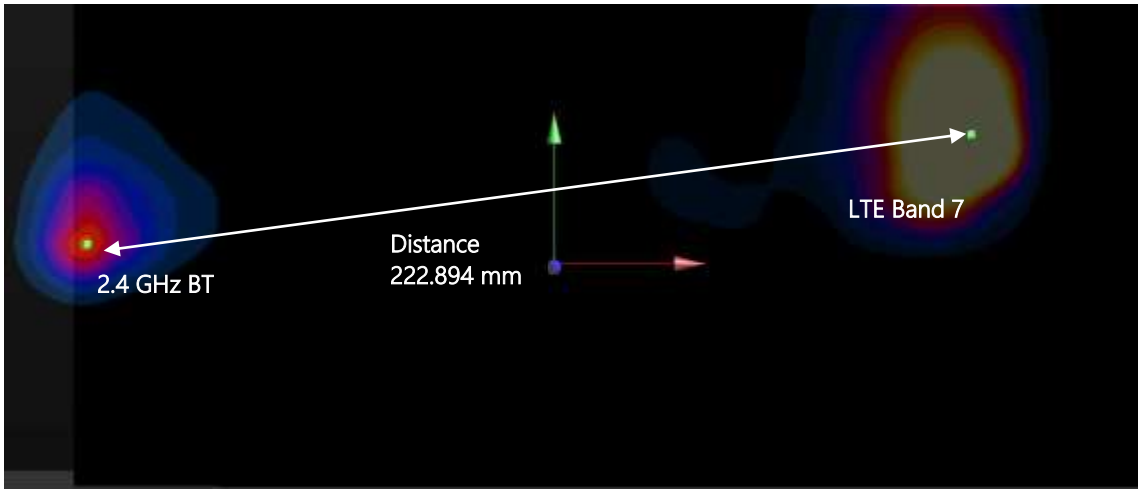
14.4.2 SAR to Peak Location Ratio (SPLSR) Figures

LTE Band 13 SAR 1g (W/kg)	2.4 GHz WLAN SAR 1g (W/kg)	Sum 1g SAR 1+2	Peak SAR Separation Distance (mm)	SPLSR
1	2			
1.092	0.647	1.739	86.139	0.0266

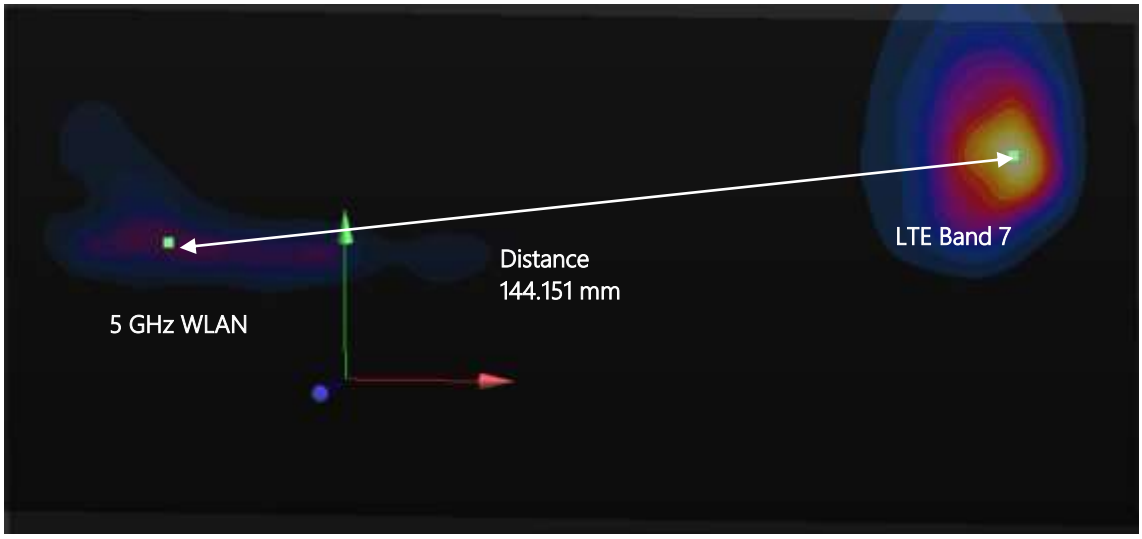


LTE Band 7 SAR 1g (W/kg)	2.4 GHz WLAN SAR 1g (W/kg)	Sum 1g SAR 1+2	Peak SAR Separation Distance (mm)	SPLSR
1	2			
1.379	0.647	2.026	151.84	0.02

LTE Band 7 SAR 1g (W/kg)	2.4 GHz BT SAR 1g (W/kg)	Sum 1g SAR 1+2	Peak SAR Separation Distance (mm)	SPLSR
1	2			
1.379	0.342	1.721	222.894	0.01



LTE Band 7 SAR 1g (W/kg)	5 GHz WLAN SAR 1g (W/kg)	Sum 1g SAR 1+2	Peak SAR Separation Distance (mm)	SPLSR
1	2			
1.379	0.392	1.771	144.151	0.016



14.5 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 ≥ 0.80 W/kg or 10g SAR ≥ 2.0W/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 ≥ 1.45 W/kg for 1g SAR or ≥ 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 ≥1.5 W/kg for 1g SAR or ≥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.

Body SAR measurement variability Results

Frequency		Mode/Band	Configuration	Measured SAR (W/kg)	Repeated SAR (W/kg)	SAR Ratio
MHz	Channel					
2 412	1	Wi-Fi (DTS)	Left Side	0.886	0.871	1.02
2 560	21350	LTE B7	Rear	1.01	0.993	1.02

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.

Frequency		Mode/Band	Configuration	Highest Reported SAR		Deviation (%)
				(with Device Holder)	(without Device Holder)	
MHz	Channel			(W/kg)	(W/kg)	
2560	21350	LTE B7	Rear (100RB)	1.379	1.378	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	Triple Modular 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	F13/5R4XF1/C/01	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F11/5K3RA1/C/01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F17/59CHA1/A/01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F13/5R4XF1/A/01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F11/5K3RA1/A/01	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	010963	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	S-1338 1332	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	S-1203 0309	N/A	N/A	N/A
SPEAG	DAE4	1417	01/25/2019	Annual	01/25/2020
SPEAG	DAE4	869	09/19/2018	Annual	09/19/2019
SPEAG	DAE3	466	08/22/2018	Annual	08/22/2019
SPEAG	E-Field Probe EX3DV4	3967	02/20/2019	Annual	02/20/2020
SPEAG	E-Field Probe EX3DV4	3903	09/24/2018	Annual	09/24/2019
SPEAG	E-Field Probe ES3DV3	3076	07/26/2018	Annual	07/26/2019
SPEAG	Dipole D750V3	1014	08/14/2018	Annual	08/14/2019
SPEAG	Dipole D835V2	4d165	09/18/2018	Annual	09/18/2019
SPEAG	Dipole D1800V2	2d007	11/19/2018	Annual	11/19/2019
SPEAG	Dipole D1900V2	5d032	02/21/2019	Annual	02/21/2020
SPEAG	Dipole D2450V2	743	01/28/2019	Annual	01/28/2020
SPEAG	Dipole D2600V2	1015	11/20/2018	Annual	11/20/2019
SPEAG	Dipole D5GHzV2	1253	11/22/2018	Annual	11/22/2019
Agilent	Power Meter E4419B	MY41291386	10/11/2018	Annual	10/11/2019
Agilent	Power Meter N1911A	MY45101406	09/06/2018	Annual	09/06/2019

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
Agilent	Power Sensor 8481A	SG1091286	10/11/2018	Annual	10/11/2019
Agilent	Power Sensor 8481A	MY41090873	10/11/2018	Annual	10/11/2019
Agilent	Power Sensor N1921A	MY55220026	09/06/2018	Annual	09/06/2019
SPEAG	DAKS 3.5	1038	05/29/2018	Annual	05/29/2019
SPEAG	DAKS 3.5	1031	04/16/2019	Annual	04/16/2020
Agilent	WIRELESS COMMUNICATION E5515C	MY48361100	10/02/2018	Annual	10/02/2019
Agilent	Signal Generator N5182A	MY47070230	05/08/2019	Annual	05/08/2020
Agilent	11636B/Power Divider	58698	02/28/2019	Annual	03/06/2020
TESTO	175-H1/Thermometer	40331939309	01/29/2019	Annual	01/29/2020
TESTO	175-H1/Thermometer	40331915309	01/29/2019	Annual	01/29/2020
TESTO	175-H1/Thermometer	40332651310	01/29/2019	Annual	01/29/2020
EMPOWER	RF Power Amplifier	1084	06/11/2018	Annual	06/11/2019
EMPOWER	RF Power Amplifier	1011	10/11/2018	Annual	10/11/2019
MICRO LAB	LP Filter / LA-15N	10453	10/11/2018	Annual	10/11/2019
MICRO LAB	LP Filter / LA-30N	-	10/11/2018	Annual	10/11/2019
MICRO LAB	LP Filter / LA-60N	32011	10/11/2018	Annual	10/11/2019
Apitech	Attenuator (3dB) 18B-03	1	06/07/2018	Annual	06/07/2019
Agilent	Attenuator (20dB) 33340C	1642	05/08/2019	Annual	05/08/2020
Agilent	Directional Bridge	3140A03878	06/11/2018	Annual	06/11/2019
Agilent	MXA Signal Analyzer N9020A	MY50510407	10/31/2018	Annual	10/31/2019
HP	Dual Directional Coupler	16072	10/11/2018	Annual	10/11/2019
Anritsu	Radio Communication Tester MT8820C	6200628628	07/19/2018	Annual	07/19/2019
Anritsu	Radio Communication Tester MT8821C	6201502997	08/13/2018	Annual	08/13/2019
R&S	Bluetooth CBT	100272	03/04/2019	Annual	03/04/2020

1. 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.

19. 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 abortion and distribution of electromagnetic energy in the body are very complex phenomena the 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.

20. References

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

[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

[3] ANSI/IEEE C 95.1 - 2005, American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 300 GHz, New York: IEEE, 2006

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

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

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Attachment 1. – SAR Test Plots

Test Laboratory:	HCT CO., LTD
EUT Type:	Tablet
Liquid Temperature:	22.4 °C
Ambient Temperature:	22.7 °C
Test Date:	05/20/2019
Plot No.:	1

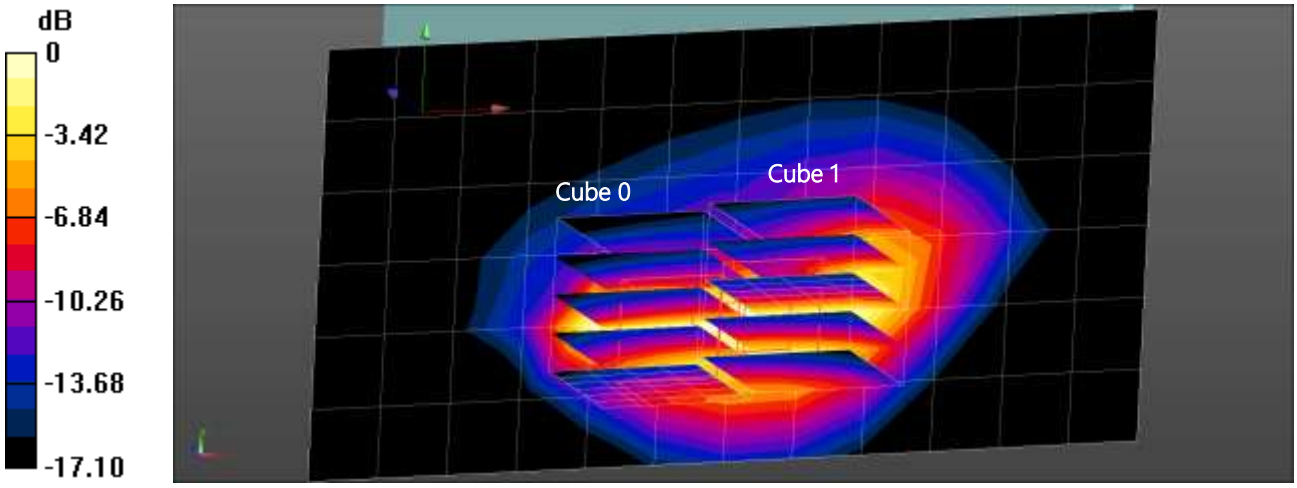
DUT: SM-T727V

Communication System: UID 0, WCDMA850 (0); Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.953 S/m; ε_r = 56.561; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3903; ConvF(10, 10, 10); Calibrated: 2018-09-24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2018-09-19
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.8 (8);

WCDMA850 Body Rear 4132ch Back off 0mm/Area Scan (13x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.28 W/kg
WCDMA850 Body Rear 4132ch Back off 0mm/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 38.70 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.93 W/kg
SAR(1 g) = 0.693 W/kg; SAR(10 g) = 0.320 W/kg
Maximum value of SAR (measured) = 1.41 W/kg
WCDMA850 Body Rear 4132ch Back off 0mm/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 38.70 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.94 W/kg
SAR(1 g) = 0.669 W/kg; SAR(10 g) = 0.319 W/kg
Maximum value of SAR (measured) = 1.22 W/kg



0 dB = 1.22 W/kg = 0.86 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Tablet
Liquid Temperature:	20.2 °C
Ambient Temperature:	20.5 °C
Test Date:	05/20/2019
Plot No.:	2

DUT: SM-T727V

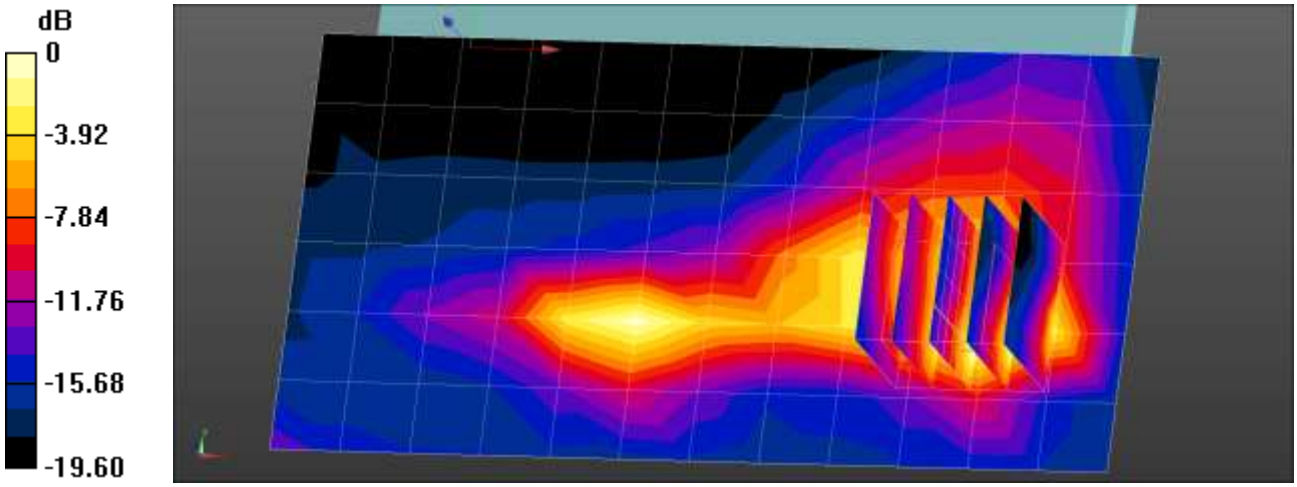
Communication System: UID 0, WCDMA1900 (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.517 S/m; ε_r = 53.556; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.64, 7.64, 7.64); Calibrated: 2019-02-01;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1417; Calibrated: 2019-01-25
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.10 (2);

WCDMA Band 2 Body Rear 9400ch/Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.394 W/kg

WCDMA Band 2 Body Rear 9400ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.859 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.417 W/kg
SAR(1 g) = 0.184 W/kg; SAR(10 g) = 0.085 W/kg
Maximum value of SAR (measured) = 0.302 W/kg



0 dB = 0.302 W/kg = -5.20 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Tablet
Liquid Temperature:	20.2 °C
Ambient Temperature:	20.5 °C
Test Date:	05/20/2019
Plot No.:	3

DUT: SM-T727V

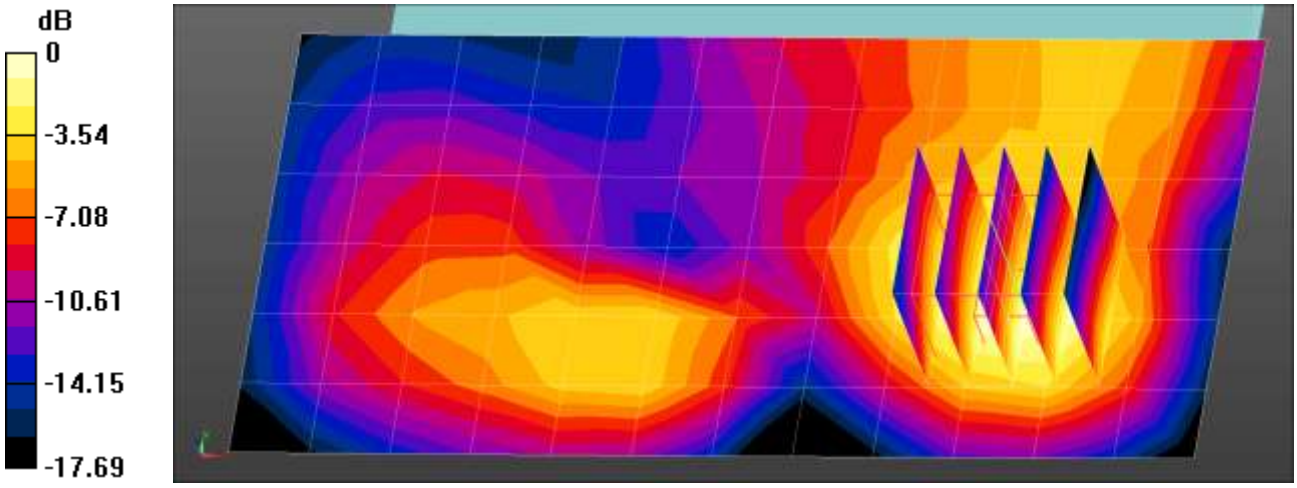
Communication System: UID 0, LTE Band2 (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.528 S/m; ε_r = 53.474; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.64, 7.64, 7.64); Calibrated: 2019-02-01;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1417; Calibrated: 2019-01-25
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.10 (2);

LTE Band 2 Body Rear QPSK 20MHz 50RB 0offset 19100ch/Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.284 W/kg

LTE Band 2 Body Rear QPSK 20MHz 50RB 0offset 19100ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.061 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.359 W/kg
SAR(1 g) = 0.218 W/kg; SAR(10 g) = 0.127 W/kg
Maximum value of SAR (measured) = 0.299 W/kg



0 dB = 0.299 W/kg = -5.24 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Tablet
Liquid Temperature:	22.4 °C
Ambient Temperature:	22.7 °C
Test Date:	05/20/2019
Plot No.:	4

DUT: SM-T727V

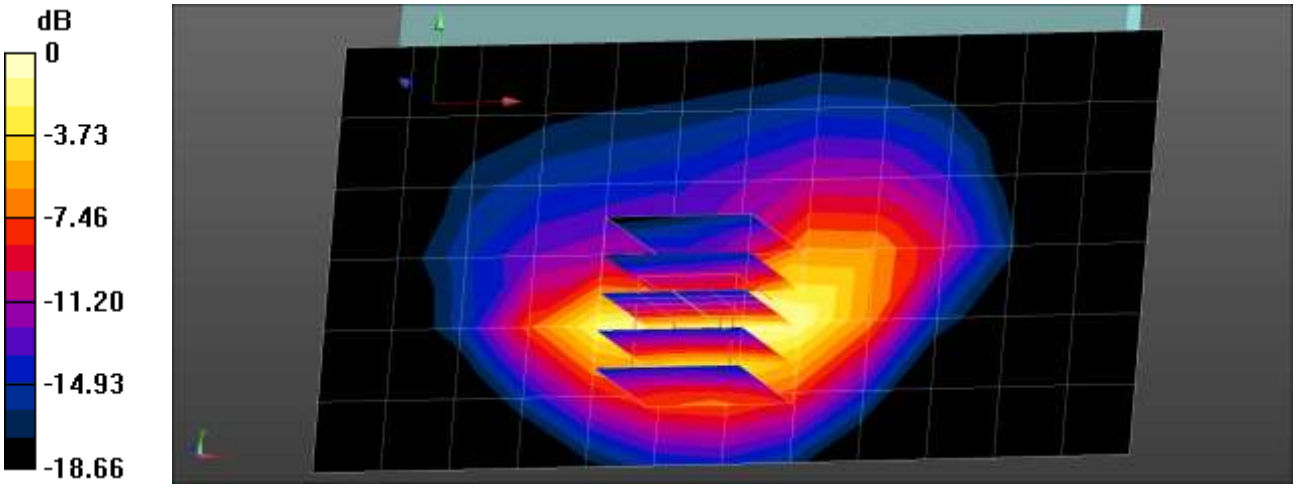
Communication System: UID 0, LTE Band 5 (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.963 S/m; ε_r = 56.475; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3903; ConvF(10, 10, 10); Calibrated: 2018-09-24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2018-09-19
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.8 (8);

LTE Band5 Body Rear QPSK 10MHz 50RB 0offset 20525ch Back off 0mm/Area Scan (13x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.30 W/kg

LTE Band5 Body Rear QPSK 10MHz 50RB 0offset 20525ch Back off 0mm/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 38.45 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.78 W/kg
SAR(1 g) = 0.690 W/kg; SAR(10 g) = 0.330 W/kg
Maximum value of SAR (measured) = 1.36 W/kg



0 dB = 1.36 W/kg = 1.34 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Tablet
Liquid Temperature:	21.6 ℃
Ambient Temperature:	21.7 ℃
Test Date:	06/07/2019
Plot No.:	5

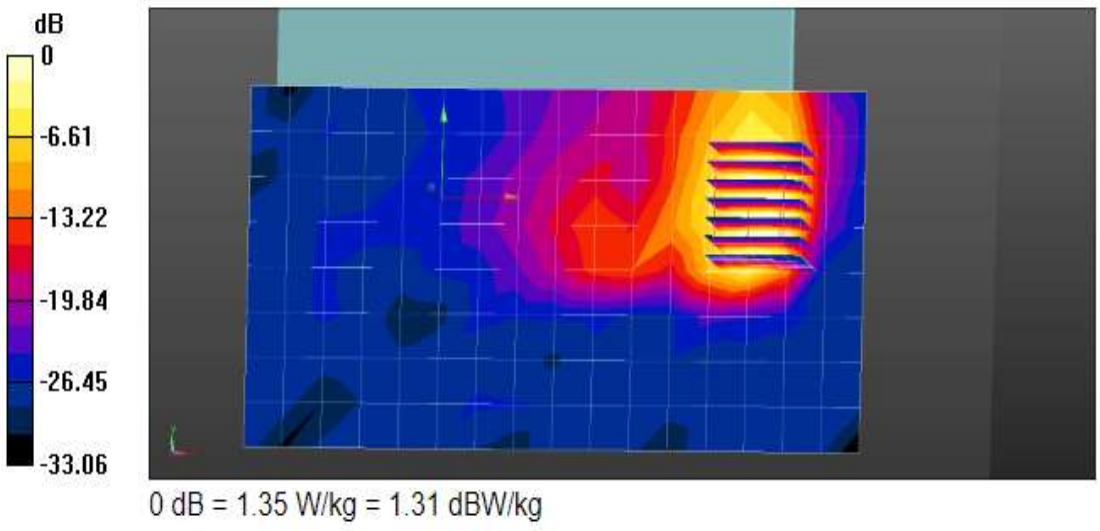
UT: SM-T727V

Communication System: UID 0, LTE Band 7 (0); Frequency: 2560 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2560 MHz; σ = 2.069 S/m; εr = 53.244; ρ = 1000 kg/m3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3903; ConvF(7.38, 7.38, 7.38); Calibrated: 2018-09-24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2018-09-19
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.10 (2);

LTE Band 7 Body Rear QPSK 20MHz 100RB 0offset 21350ch Back off 0mm/Area Scan (17x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 1.35 W/kg
LTE Band 7 Body Rear QPSK 20MHz 100RB 0offset 21350ch Back-off 0mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.394 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.36 W/kg
SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.424 W/kg
Maximum value of SAR (measured) = 2.31 W/kg



0 dB = 1.35 W/kg = 1.31 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Tablet
Liquid Temperature:	20.9 °C
Ambient Temperature:	21.2 °C
Test Date:	05/21/2019
Plot No.:	6

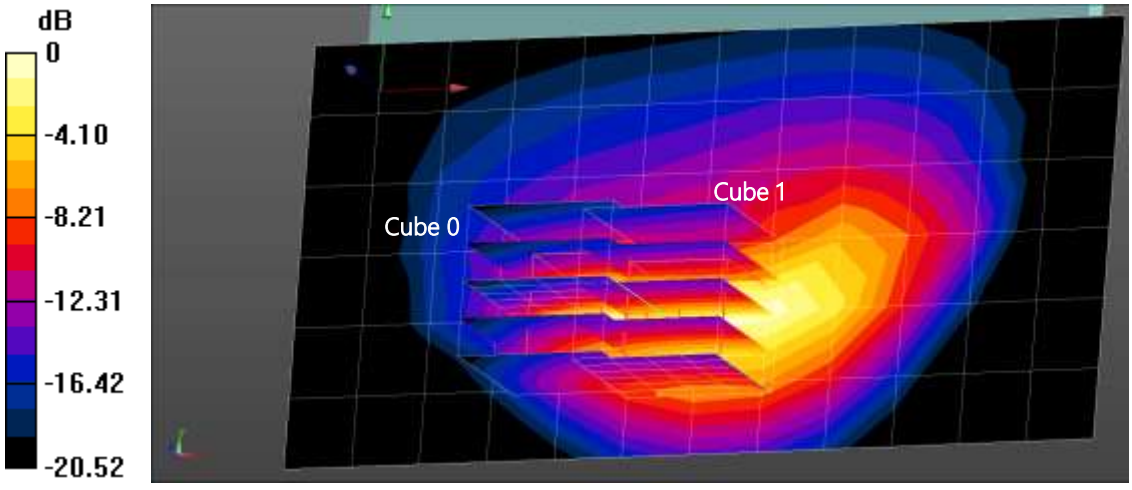
DUT: SM-T727V

Communication System: UID 0, LTE Band 13 (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 782 MHz; σ = 0.963 S/m; ε_r = 55.971; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3903; ConvF(10.42, 10.42, 10.42); Calibrated: 2018-09-24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2018-09-19
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.8 (8);

LTE Band13 Body Rear QPSK 10MHz 1RB 0offset 23230ch Back off 0mm/Area Scan (13x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.60 W/kg
LTE Band13 Body Rear QPSK 10MHz 1RB 0offset 23230ch Back off 0mm/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 42.48 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 2.00 W/kg
SAR(1 g) = 0.787 W/kg; SAR(10 g) = 0.383 W/kg
Maximum value of SAR (measured) = 1.54 W/kg
LTE Band13 Body Rear QPSK 10MHz 1RB 0offset 23230ch Back off 0mm/Zoom Scan (5x5x7)/Cube 1:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 42.48 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 2.15 W/kg
SAR(1 g) = 0.668 W/kg; SAR(10 g) = 0.287 W/kg
Maximum value of SAR (measured) = 1.55 W/kg



0 dB = 1.55 W/kg = 1.90 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Tablet
Liquid Temperature:	20.4 °C
Ambient Temperature:	20.6 °C
Test Date:	05/21/2019
Plot No.:	7

DUT: SM-T727V

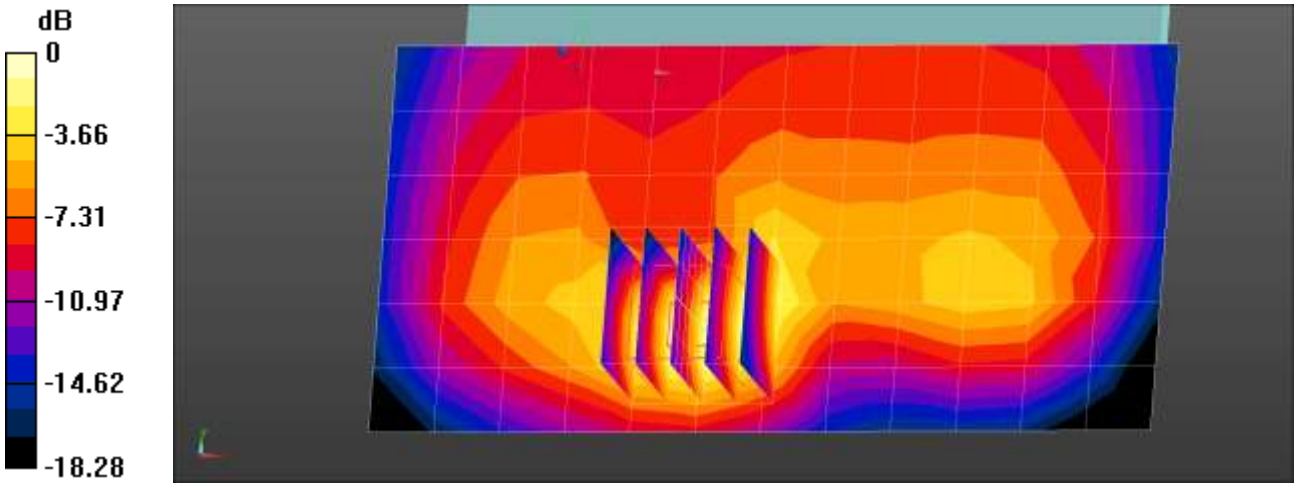
Communication System: UID 0, LTE Band66 (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.436 S/m; ε_r = 53.892; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.91, 7.91, 7.91); Calibrated: 2019-02-01;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1417; Calibrated: 2019-01-25
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.10 (2);

LTE Band 66 Body Rear QPSK 20MHz 1RB 0offset 132072ch/Area Scan (7x13x1): Measurement grid:
dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.599 W/kg

LTE Band 66 Body Rear QPSK 20MHz 1RB 0offset 132072ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid:
dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.73 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.991 W/kg
SAR(1 g) = 0.589 W/kg; SAR(10 g) = 0.321 W/kg
Maximum value of SAR (measured) = 0.856 W/kg



0 dB = 0.856 W/kg = -0.68 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Tablet
Liquid Temperature:	21.8 ℃
Ambient Temperature:	22.1 ℃
Test Date:	05/29/2019
Plot No.:	8

DUT: SM-T727V

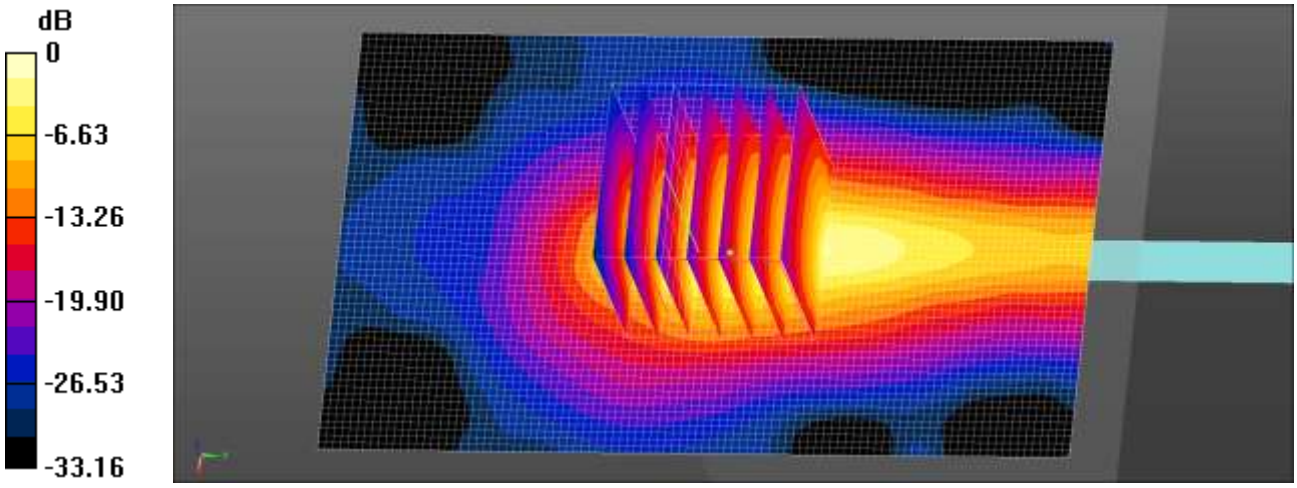
Communication System: UID 0, 2450MHz FCC (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.895 S/m; ε_r = 53.816; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3903; ConvF(7.51, 7.51, 7.51); Calibrated: 2018-09-24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2018-09-19
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.8 (8);

802.11b Body Left 1Mbps 1ch Grip 0mm/Area Scan (61x101x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.87 W/kg

802.11b Body Left 1Mbps 1ch Grip 0mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.51 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 2.71 W/kg
SAR(1 g) = 0.886 W/kg; SAR(10 g) = 0.340 W/kg
Maximum value of SAR (measured) = 1.92 W/kg



0 dB = 1.92 W/kg = 2.83 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Tablet
Liquid Temperature:	21.8 ℃
Ambient Temperature:	22.1 ℃
Test Date:	05/29/2019
Plot No.:	9

DUT: SM-T727V

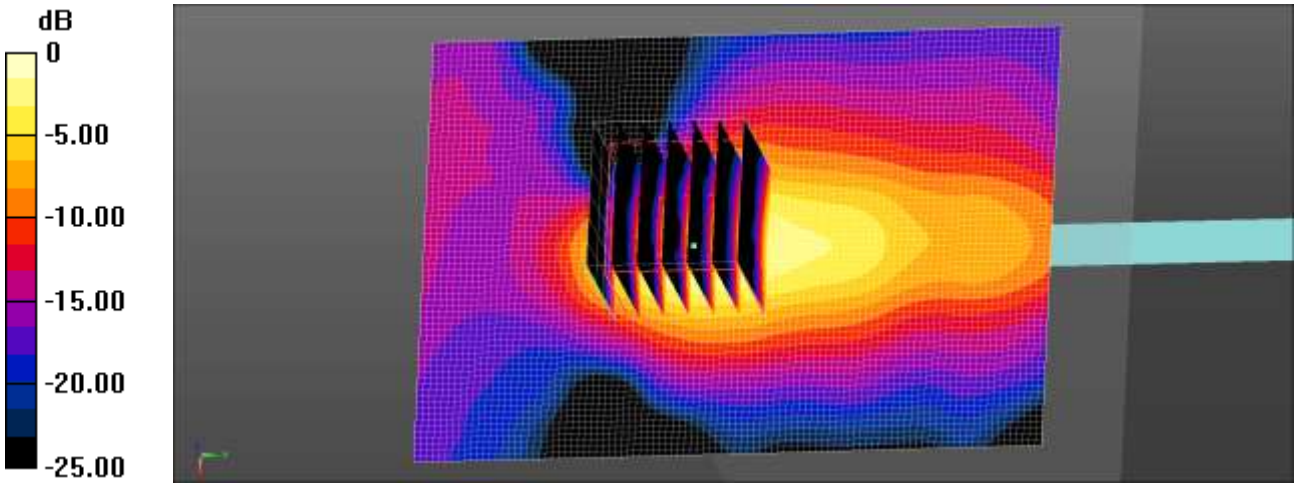
Communication System: UID 0, WIFI 5GHz (0); Frequency: 5825 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5825 MHz; σ = 6.063 S/m; ε_r = 46.587; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3903; ConvF(4.36, 4.36, 4.36); Calibrated: 2018-09-24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2018-09-19
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.8 (8);

802.11a Body Left 6Mbps 165ch 6mm/Area Scan (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 2.01 W/kg

802.11a Body Left 6Mbps 165ch 6mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Graded Ratio:1.4
Reference Value = 12.71 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.67 W/kg
SAR(1 g) = 0.782 W/kg; SAR(10 g) = 0.240 W/kg
Maximum value of SAR (measured) = 2.04 W/kg



0 dB = 2.04 W/kg = 3.10 dBW/kg

Test Laboratory:	HCT CO., LTD
EUT Type:	Tablet
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.6 ℃
Test Date:	05/28/2019
Plot No.:	10

DUT: SM-T727V

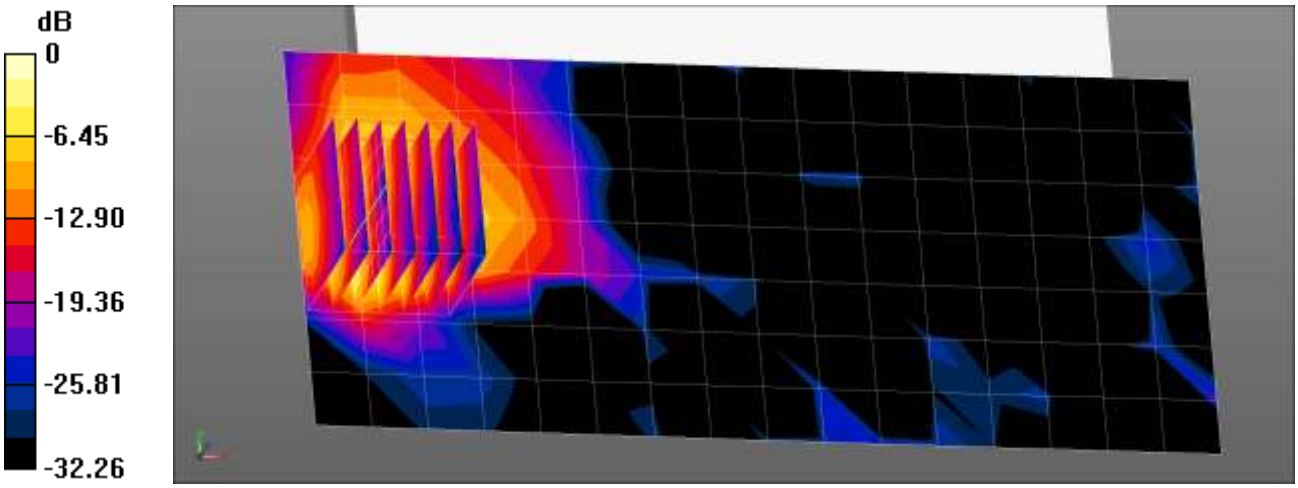
Communication System: UID 0, Bluetooth (0); Frequency: 2402 MHz;Duty Cycle: 1:1.299
Medium parameters used (interpolated): f = 2402 MHz; σ = 1.892 S/m; ε_r = 53.729; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: ES3DV3 - SN3076; ConvF(4.45, 4.45, 4.45); Calibrated: 2018-07-26;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.8 (8);

Bluetooth Body Rear DH5 0ch 0mm/Area Scan (8x17x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.275 W/kg

Bluetooth Body Rear DH5 0ch 0mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.667 W/kg
SAR(1 g) = 0.225 W/kg; SAR(10 g) = 0.099 W/kg
Maximum value of SAR (measured) = 0.314 W/kg



0 dB = 0.314 W/kg = -5.03 dBW/kg

Attachment 2. – Dipole Verification Plots

■ Verification Data (750 MHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	20.9 ℃
Test Date:	05/21/2019

DUT: Dipole 750 MHz; Type: D750V3

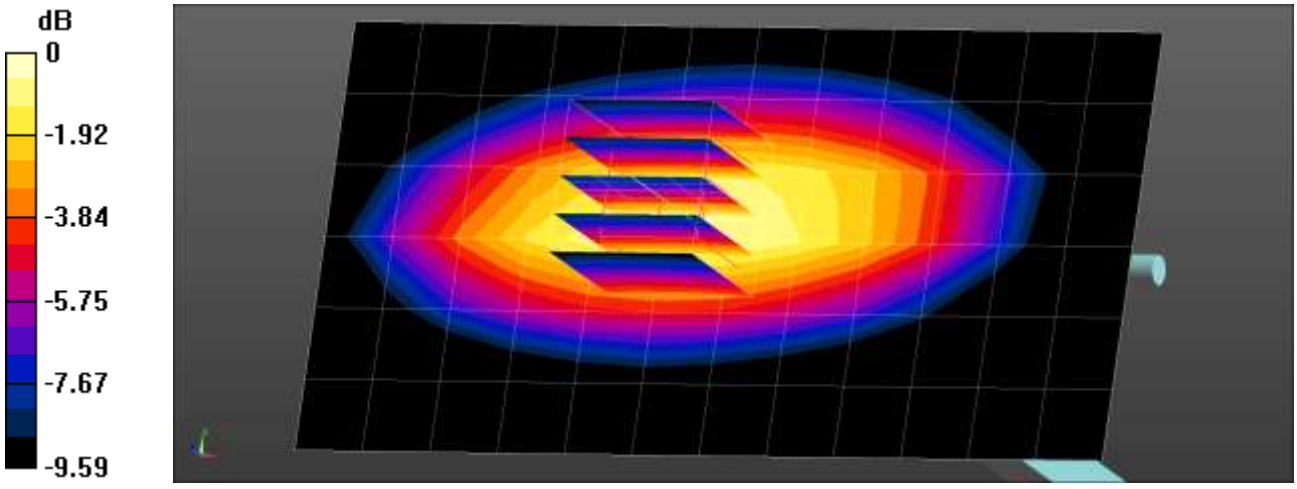
Communication System: UID 0, CW (0); Frequency: 750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.929 S/m; ε_r = 56.338; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3903; ConvF(10.42, 10.42, 10.42); Calibrated: 2018-09-24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2018-09-19
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.8 (8);

Dipole/750 MHz Body Verification/Area Scan (13x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.453 W/kg

Dipole/750 MHz Body Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.76 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.569 W/kg
SAR(1 g) = 0.390 W/kg; SAR(10 g) = 0.261 W/kg
Maximum value of SAR (measured) = 0.503 W/kg



0 dB = 0.503 W/kg = -2.98 dBW/kg

■ Verification Data (835 MHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	22.4 ℃
Test Date:	05/20/2019

DUT: Dipole 835 MHz; Type: D835V2

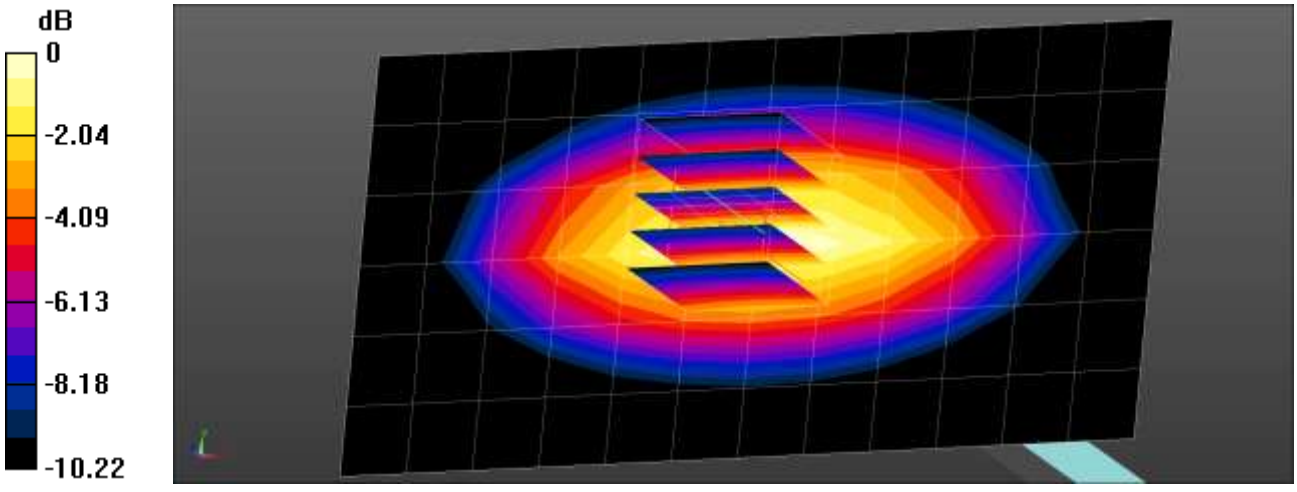
Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 835 MHz; σ = 0.961 S/m; ε_r = 56.495; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3903; ConvF(10, 10, 10); Calibrated: 2018-09-24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2018-09-19
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.8 (8);

Dipole/835MHz Body Verification/Area Scan (13x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.576 W/kg

Dipole/835MHz Body Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.86 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.663 W/kg
SAR(1 g) = 0.448 W/kg; SAR(10 g) = 0.297 W/kg
Maximum value of SAR (measured) = 0.593 W/kg



0 dB = 0.593 W/kg = -2.27 dBW/kg

■ Verification Data (1 800 MHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	20.4 ℃
Test Date:	05/21/2019

DUT: Dipole 1800 MHz ; Type: D1800V2

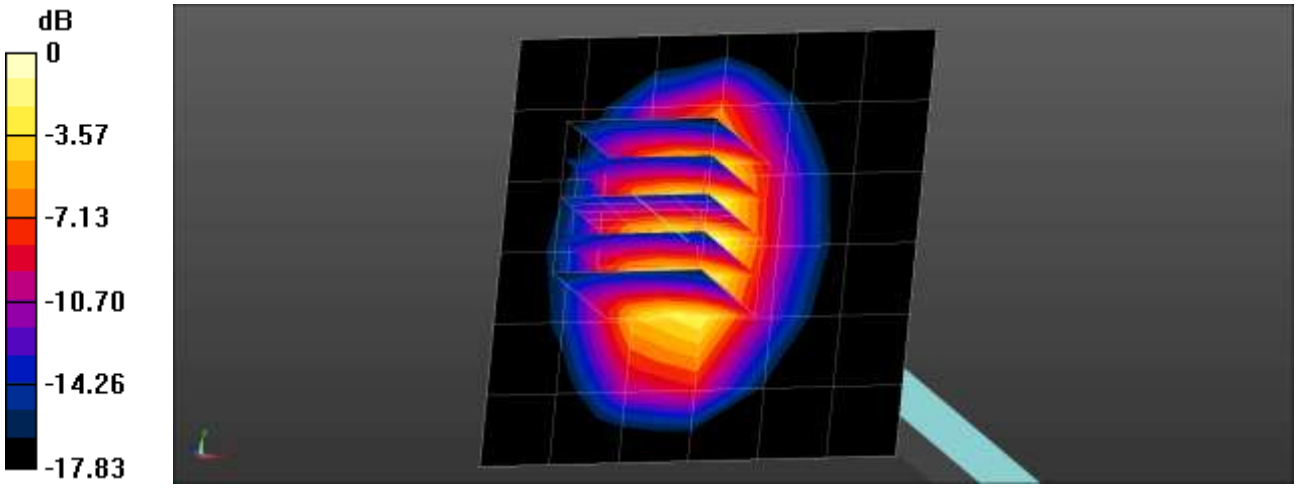
Communication System: UID 0, CW (0); Frequency: 1800 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1800 MHz; σ = 1.506 S/m; ε_r = 53.716; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.91, 7.91, 7.91); Calibrated: 2019-02-01;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1417; Calibrated: 2019-01-25
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.10 (2);

Dipole/1 800 MHz Body Verification/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.44 W/kg

Dipole/1 800 MHz Body Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 41.96 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 3.36 W/kg
SAR(1 g) = 1.84 W/kg; SAR(10 g) = 0.960 W/kg
Maximum value of SAR (measured) = 2.85 W/kg



0 dB = 2.85 W/kg = 4.55 dBW/kg

■ Verification Data (1 900 MHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	20.2 ℃
Test Date:	05/20/2019

DUT: Dipole 1900 MHz; Type: D1900V2

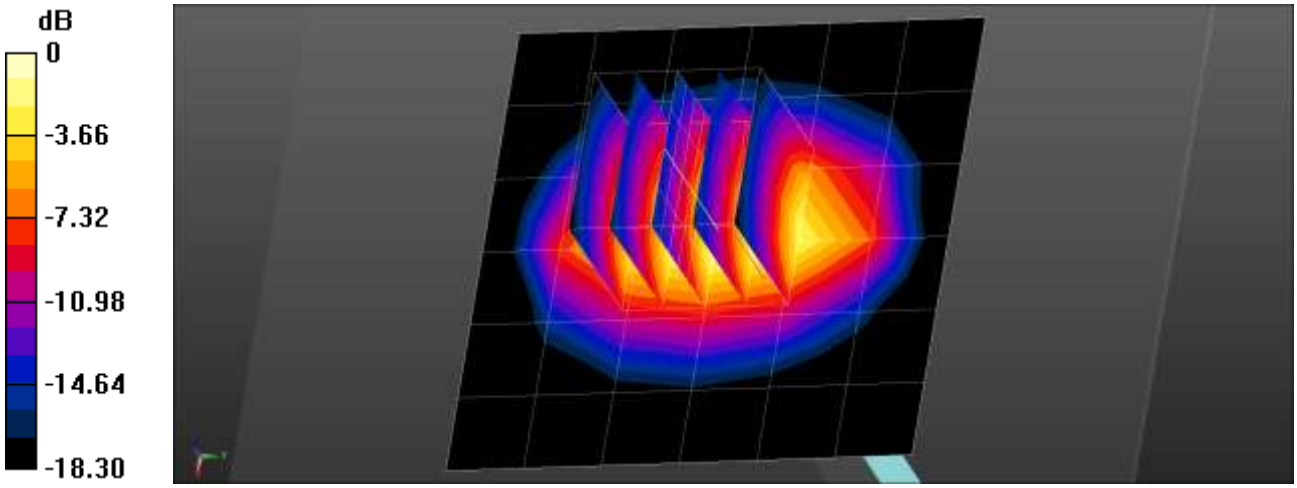
Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.528 S/m; ε_r = 53.474; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3967; ConvF(7.64, 7.64, 7.64); Calibrated: 2019-02-01;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1417; Calibrated: 2019-01-25
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.10 (2);

Dipole/1 900 MHz Body Verification/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.80 W/kg

Dipole/1 900 MHz Body Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 44.86 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 3.52 W/kg
SAR(1 g) = 1.91 W/kg; SAR(10 g) = 0.980 W/kg
Maximum value of SAR (measured) = 2.98 W/kg



0 dB = 2.98 W/kg = 4.74 dBW/kg

■ Verification Data (2 450 MHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	21.8 °C
Test Date:	05/29/2019

DUT: Dipole 2450 MHz ; Type: D2450V2

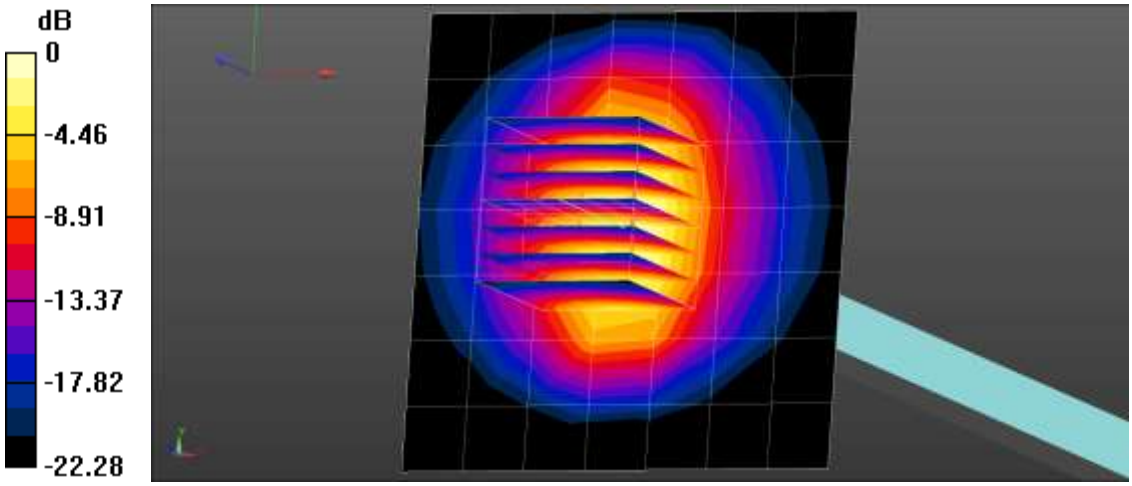
Communication System: UID 0, CW (0); Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.944 S/m; ε_r = 53.673; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3903; ConvF(7.51, 7.51, 7.51); Calibrated: 2018-09-24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2018-09-19
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.8 (8);

2450MHz Body Verification/Area Scan (8x8x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 3.30 W/kg

2450MHz Body Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 46.80 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 5.08 W/kg
SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.12 W/kg
Maximum value of SAR (measured) = 4.07 W/kg



0 dB = 4.07 W/kg = 6.10 dBW/kg

■ Verification Data (2 450 MHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	21.2 °C
Test Date:	05/28/2019

DUT: Dipole 2450 MHz ; Type: D2450V2

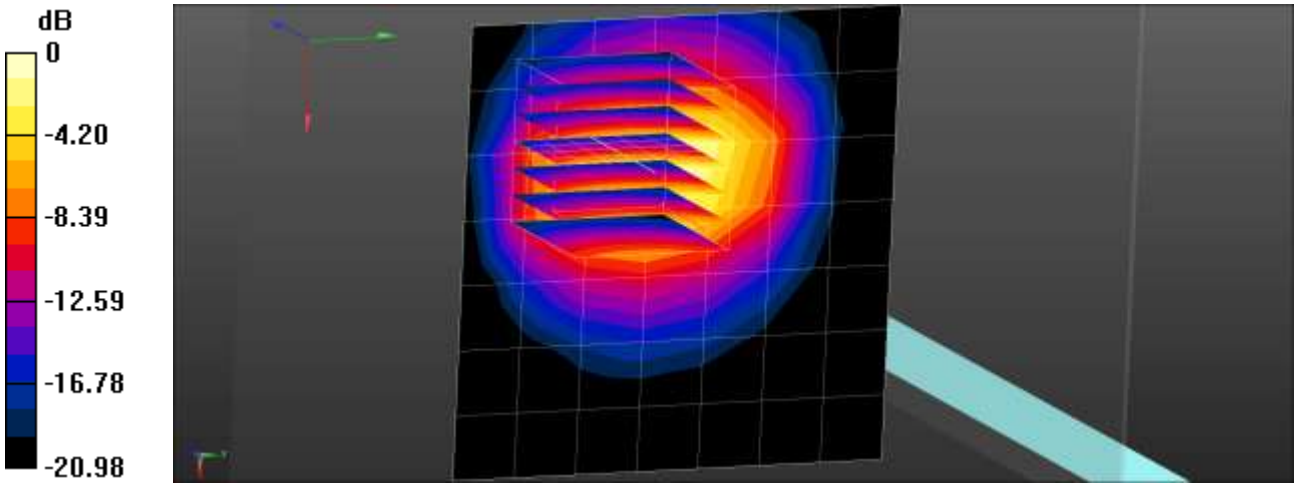
Communication System: UID 0, CW (0); Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.943 S/m; ε_r = 53.555; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: ES3DV3 - SN3076; ConvF(4.45, 4.45, 4.45); Calibrated: 2018-07-26;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2018-08-22
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.8 (8);

2450MHz Body Verification/Area Scan (8x8x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 2.60 W/kg

2450MHz Body Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.95 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 4.88 W/kg
SAR(1 g) = 2.4 W/kg; SAR(10 g) = 1.13 W/kg
Maximum value of SAR (measured) = 3.17 W/kg



0 dB = 3.17 W/kg = 5.01 dBW/kg

■ Verification Data (2 600 MHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	21.6 °C
Test Date:	06/07/2019

DUT: Dipole 2600 MHz D2600V2; Type: D2600V2

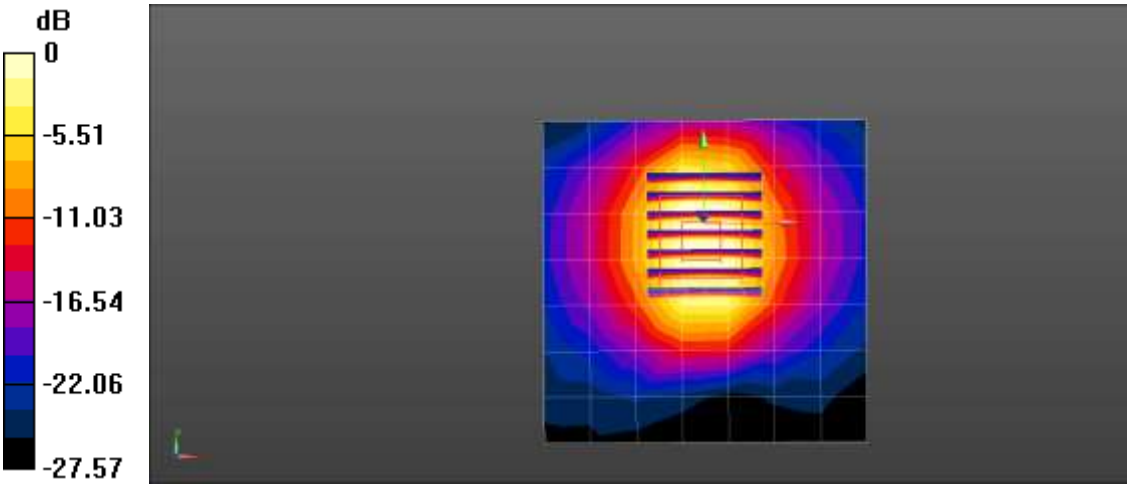
Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.106 S/m; εr = 53.134; ρ = 1000 kg/m3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3903; ConvF(7.38, 7.38, 7.38); Calibrated: 2018-09-24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2018-09-19
- Phantom: MFP_V5.1C
- Measurement SW: DASY52, Version 52.10 (2);

Dipole/2 600 MHz Body Verification/Area Scan (8x8x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 3.32 W/kg

Dipole/2 600 MHz Body Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 43.32 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 6.34 W/kg
SAR(1 g) = 2.92 W/kg; SAR(10 g) = 1.29 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 5.01 W/kg



0 dB = 3.32 W/kg = 5.21 dBW/kg

■ Verification Data (5 250 MHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	21.9 °C
Test Date:	05/28/2019

DUT: Dipole D5GHzV2; Type: D5GHzV2

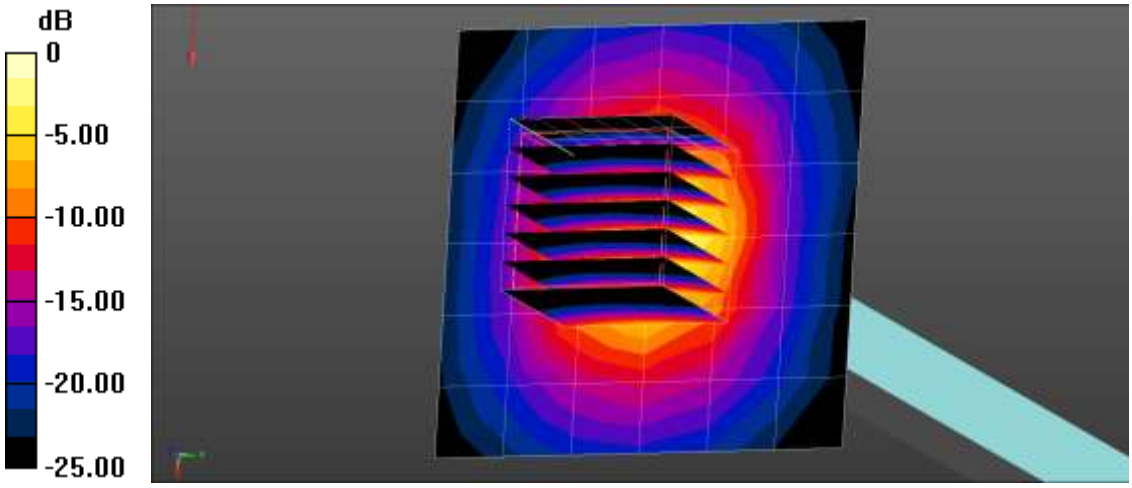
Communication System: UID 0, CW (0); Frequency: 5250 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5250 MHz; σ = 5.531 S/m; ε_r = 48.255; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3903; ConvF(4.59, 4.59, 4.59); Calibrated: 2018-09-24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2018-09-19
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.8 (8);

Dipole/5250MHz Body Verification/Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 8.89 W/kg

Dipole/5250MHz Body Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 46.19 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 14.3 W/kg
SAR(1 g) = 3.81 W/kg; SAR(10 g) = 1.11 W/kg
Maximum value of SAR (measured) = 8.90 W/kg



0 dB = 8.90 W/kg = 9.49 dBW/kg

■ Verification Data (5 600 MHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	21.8 °C
Test Date:	05/29/2019

DUT: Dipole D5GHzV2; Type: D5GHzV2

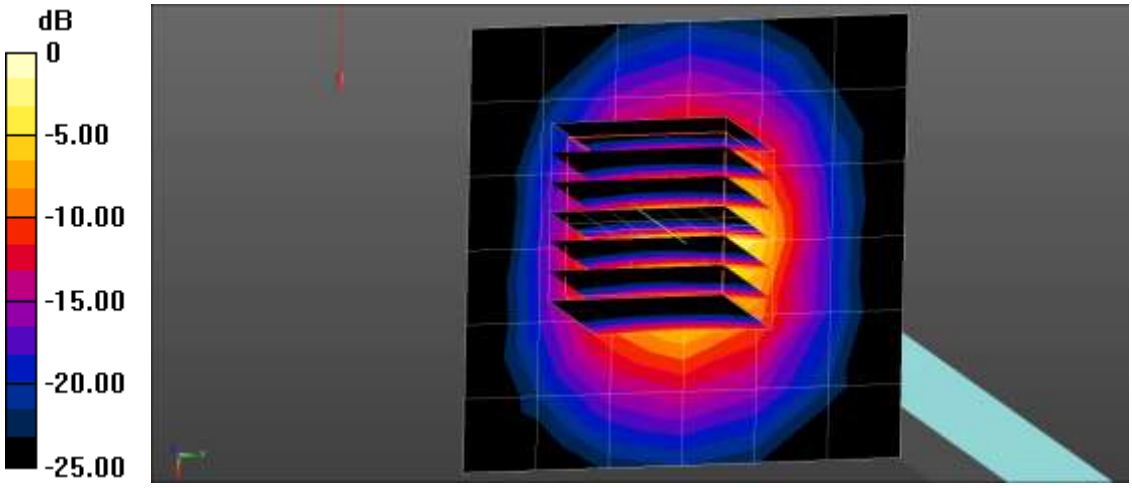
Communication System: UID 0, CW (0); Frequency: 5600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; σ = 5.887 S/m; ε_r = 47.068; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3903; ConvF(4.02, 4.02, 4.02); Calibrated: 2018-09-24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2018-09-19
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.8 (8);

Dipole/5600MHz Body Verification/Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 10.5 W/kg

Dipole/5600MHz Body Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 48.38 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 18.3 W/kg
SAR(1 g) = 4.37 W/kg; SAR(10 g) = 1.23 W/kg
Maximum value of SAR (measured) = 10.7 W/kg



0 dB = 10.7 W/kg = 10.29 dBW/kg

■ Verification Data (5 750 MHz Body)

Test Laboratory:	HCT CO., LTD
Input Power	0.05 W
Liquid Temp:	21.8 °C
Test Date:	05/29/2019

DUT: Dipole D5GHzV2; Type: D5GHzV2

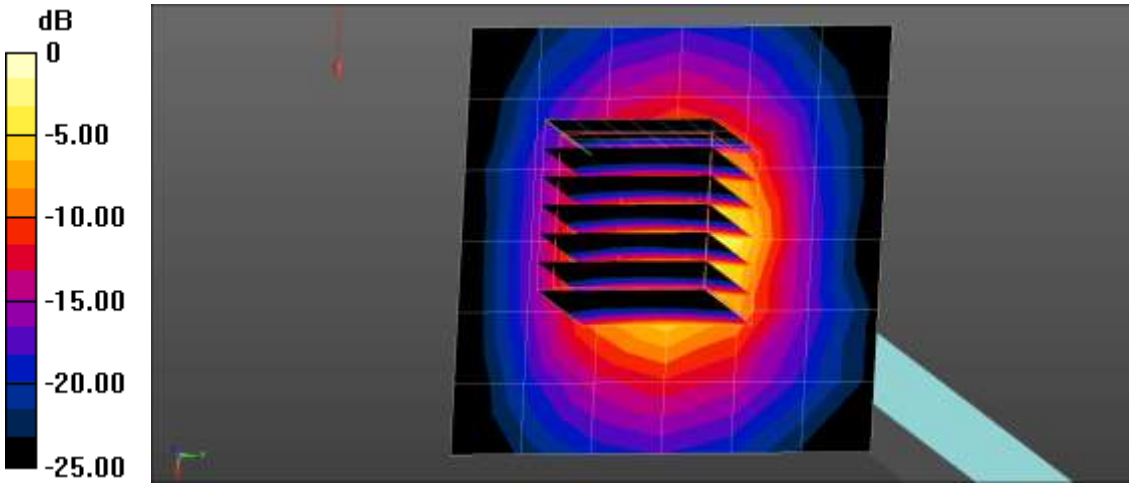
Communication System: UID 0, CW (0); Frequency: 5750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5750 MHz; σ = 6.069 S/m; ε_r = 46.589; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:

- Probe: EX3DV4 - SN3903; ConvF(4.36, 4.36, 4.36); Calibrated: 2018-09-24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2018-09-19
- Phantom: Triple Flat Phantom 5.1C
- Measurement SW: DASY52, Version 52.8 (8);

Dipole/5750MHz Body Verification/Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 9.28 W/kg

Dipole/5750MHz Body Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 45.23 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 16.3 W/kg
SAR(1 g) = 3.83 W/kg; SAR(10 g) = 1.11 W/kg
Maximum value of SAR (measured) = 9.40 W/kg



0 dB = 9.40 W/kg = 9.73 dBW/kg

Attachment 3. – SAR Tissue Characterization

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

Ingredients (% by weight)	Frequency (MHz)											
	750		835		1 750		1 900		2 450 – 2 700		5 200 - 5 800	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	41.1	51.7	40.45	53.06	52.6	68.8	54.9	70.17	71.88	73.2	65.52	78.66
Salt (NaCl)	1.4	0.9	1.45	0.94	0.4	0.2	0.18	0.39	0.16	0.1	0.0	0.0
Sugar	57.0	47.2	57.0	44.9	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0
HEC	0.2	0	1.0	1.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0
Bactericide	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.97	0.0	17.24	10.67
DGBE	0.0	0.0	0.0	0.0	47	31	44.92	29.44	7.99	26.7	0.0	0.0
Diethylene glycol hexyl ether	-	-	-	-	-	-	-	-	-	-	-	-

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

Composition of the Tissue Equivalent Matter

Attachment 4. – SAR System Validation

Per FCC KCB 865664 D02v01r02, SAR system validation status should be document to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in IEEE 1528-2013 and FCC KDB 865664 D01v01r04. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.
A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

SAR System No.	Probe	Probe Type	Probe Calibration Point		Dipole	Date	Dielectric Parameters		CW Validation			Modulation Validation		
							Measured Permittivity	Measured Conductivity	Sensitivity	Probe Linearity	Probe Isotropy	MOD. Type	Duty Factor	PAR
5	3903	EX3DV4	Body	750	1014	2018-10-03	55.6	0.97	PASS	PASS	PASS	N/A	N/A	N/A
5	3903	EX3DV4	Body	835	4d165	2018-10-03	55.4	0.98	PASS	PASS	PASS	N/A	N/A	N/A
5	3903	EX3DV4	Body	835	4d165	2018-10-03	55.4	0.98	PASS	PASS	PASS	GMSK	PASS	N/A
8	3967	EX3DV4	Body	1750	2d007	2019-02-11	53.5	1.52	PASS	PASS	PASS	N/A	N/A	N/A
8	3967	EX3DV4	Body	1900	5d032	2019-03-04	53.3	1.53	PASS	PASS	PASS	GMSK	PASS	N/A
5	3903	EX3DV4	Body	2450	743	2019-02-11	52.8	1.94	PASS	PASS	PASS	OFDM	N/A	PASS
11	3076	ES3DV3	Body	2450	743	2019-02-11	52.8	1.94	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Body	2600	1015	2018-12-03	52.4	2.16	PASS	PASS	PASS	N/A	N/A	N/A
5	3903	EX3DV4	Body	5250	1253	2018-12-03	48.8	5.36	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Body	5600	1253	2018-12-03	48.3	5.78	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Body	5250	1253	2018-12-03	48.8	5.36	PASS	PASS	PASS	OFDM	N/A	PASS

SAR System Validation Summary 1g

Note;
All measurement were performed using probes calibrated for CW signal only. Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01r04. SAR system were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5 dB), such as OFDM according to KDB 865664 D01v01r04.