Certificate #6613.01

FCC TEST REPORT

(PART 27)

Applicant:	BARTEC GmbH
Address:	Max-Eyth-Str.16 , 97980 Bad Mergentheim, Germany

Manufacturer or Supplier:	BARTEC GmbH
Address:	Max-Eyth-Str.16 , 97980 Bad Mergentheim, Germany
Product:	Smartscanner / Smartphone
Brand Name:	BARTEC
Model Name:	SP9EX1/SC9EX1/SP9EX2/SC9EX2
FCC ID:	TBUSX9EX
Date of tests:	Jan. 02, 2024~ Jul. 26, 2024

The tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 27** ☒ **ANSI/TIA/EIA-603-D**
☒ **FCC Part 2** ☒ **ANSI/TIA/EIA-603-E** ☒ **ANSI C63.26-2015**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Hanwen Xu Engineer / Mobile Department	Approved by Peibo Sun Manager / Mobile Department
Xu Hanwen Date: Jul. 26, 2024	Sun Peibo Date: Jul. 26, 2024

This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/ and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
PSU-QSU2312140113RF03	Original release	Jul. 26, 2024

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

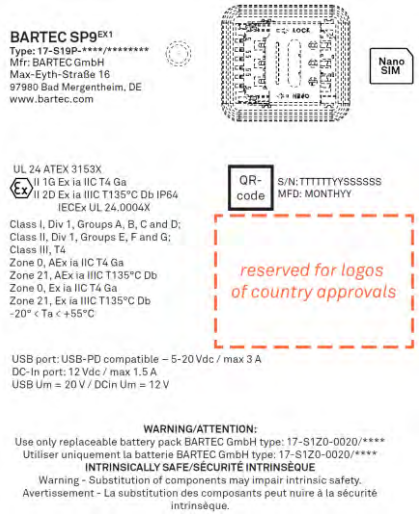
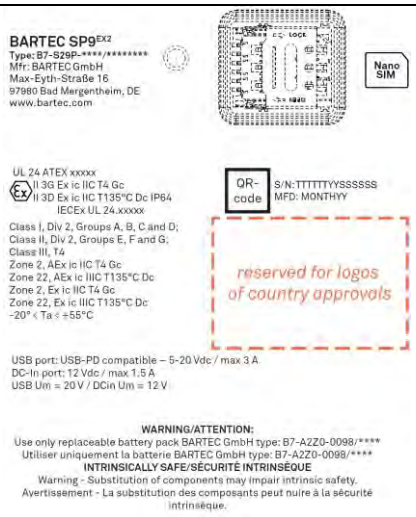
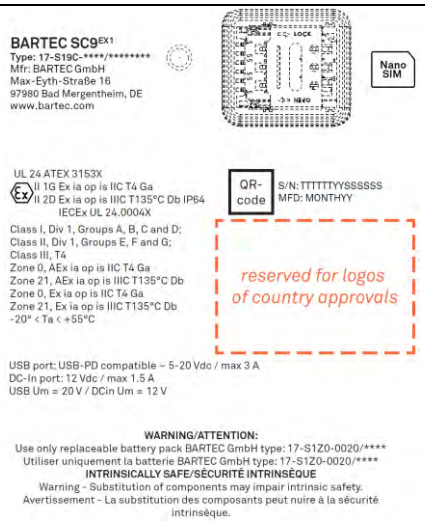
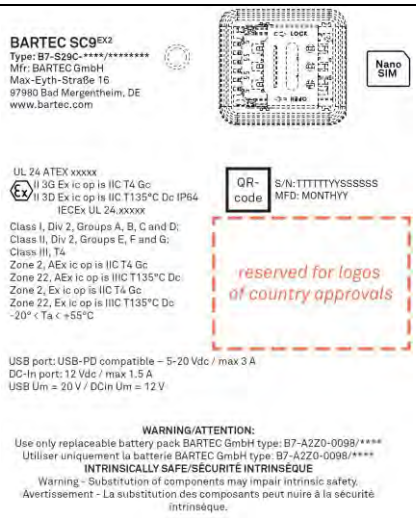
APPLIED STANDARD: FCC PART 27 & PART 2			
STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**	**TEST LAB***
§2.1046	Conducted Output Power	Compliance	A
§27.50(b)(10) §27.50(c)(10)	Effective Radiated Power (Band 12) (Band 13) (Band 17) (Band 71)	Compliance	A
§27.50(d)(4) §27.50(h)(2)	Equivalent Isotropically Radiated Power (WCMDA Band 4)(Band 7)	Compliance	A
§2.1055 §27.54	Frequency Stability	Compliance	A
§2.1049	Occupied Bandwidth	Compliance	A
§2.1051 §27.53(c)(2)(4) §27.53(g) §27.53(h) §27.53(m)(4)(6)	Conducted Band Edge Measurements (WCMDA Band 4) (Band 7) (Band 12) (Band 13) (Band 17) (Band 71)	Compliance	A
§2.1051 §27.53(h) §27.53(m)(4)(6) §27.53(g) §27.53(c)(2)(4)	Conducted Spurious Emissions (WCMDA Band 4)(Band 7) (Band 12) (Band 13) (Band 17) (Band 71)	Compliance	A
§2.1053 §27.53(h) §27.53(m)(4)(6) §27.53(g) §27.53(c)(2)(4)	Radiated Spurious Emissions (WCMDA Band 4)(Band 7) (Band 12) (Band 13) (Band 17) (Band 71)	Compliance	A
NA	Peak to average ratio	Compliance	A

NOTE:

1. In this report, the test EUT version is EVT, after the test is completed, the customer optimizes the product to DVT, and the final customer's shipment is PVT. For differences between EVT and DVT and PVT, please refer to the documentation provided by the customer (SC9EX1_SP9EX1 PCBA HW Release Note rev 2_0).

2. There are no differences on the PCBA between the Model SC9EX1 (FCC ID: TBUSX9EX) and the variants SP9EX1 (FCC ID: TBUSX9EX). All mounted components are the same. No functionality related to any radio interface is affected. The only difference is the presence of the barcode scanner module and the “bump” on the back cover that incorporates the barcode scanner module.Testing has been run on parent product SC9EX1 and the worst cases of power and RSE have been verified also on SP9EX1 variant. Only the worst-case data (SC9EX1) have been reported.

3. The devices BARTEC SP9EX1 Smartphone and BARTEC SP9EX2 Smartphone share the same hardware and software. The same applies for the devices BARTEC SC9EX1 Smartscanner and BARTEC SC9EX2 Smartscanner. The only difference are the hazardous area marking of the devices, see table for clarification.

BARTEC SP9EX1 Smartphone	BARTEC SP9EX2 Smartphone
	
BARTEC SC9EX1 Smartscanner	BARTEC SC9EX2 Smartscanner
	

***Test Lab Information Reference**

Lab A:

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

Lab Address:

Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province

Accredited Test Lab Cert 6613.01

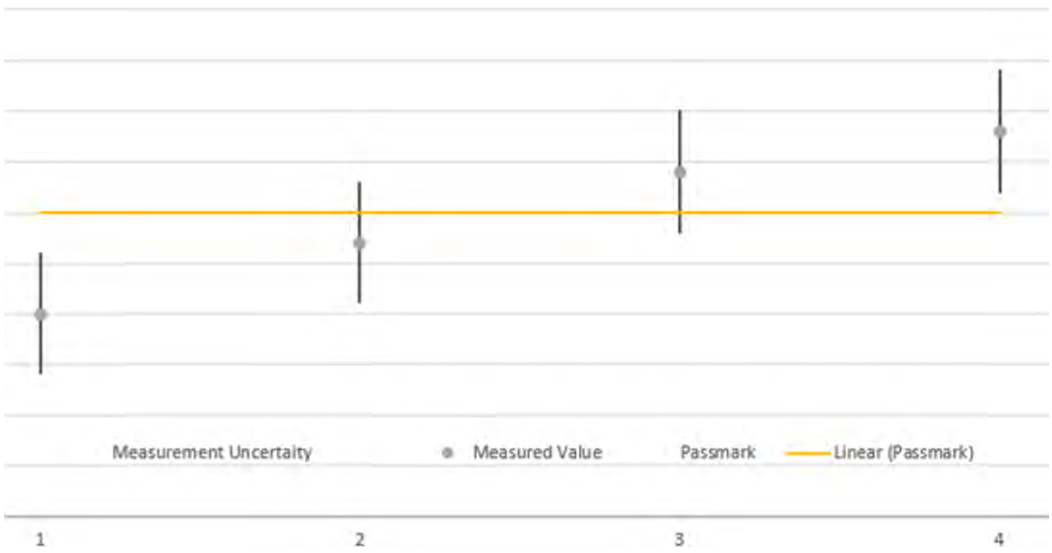
The FCC Site Registration No. is 434559; The Designation No. is CN1325.

1.1 MEASREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	UNCERTAINTY
Frequency Stability	±76.97Hz
Radiated emissions (9KHz~30MHz)	±2.68dB
Radiated emissions & Radiated Power (30MHz~1GHz)	±4.98dB
Radiated emissions & Radiated Power (1GHz ~6GHz)	±4.70dB
Radiated emissions (6GHz ~18GHz)	±4.60dB
Radiated emissions (18GHz ~40GHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±43.58KHz
Conducted Output power	±2.06dB
Band Edge Measurements	±4.70dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



The verdicts in this test report are given according the above diagram:

Case	Measured Value	Uncertainty Range	Verdict
1	below pass mark	below pass mark	Passed
2	below pass mark	within pass mark	Passed
3	above pass mark	within pass mark	Failed
4	above pass mark	above pass mark	Failed

That means, the laboratory applies, as decision rule (see ISO/IEC 17025:2017), the so-called shared risk principle.

1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Pre-Amplifier	R&S	SCU18F1	100815	Aug.30,22	Aug.29,24
Pre-Amplifier	R&S	SCU08F1	101028	Sep.16,22	Sep.15,24
Vector Signal Generator	R&S	SMBV100B	102176	Feb.16,22	Feb.15,24
Vector Signal Generator	R&S	SMBV100B	102176	Feb.15,24	Feb.14,26
Signal Generator	R&S	SMB100A	182185	Feb.16,22	Feb.15,24
Signal Generator	R&S	SMB100A	182185	Feb.15,24	Feb.14,26
3m Fully-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-01Chamber	Nov.25,22	Nov.24,25
3m Semi-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-02Chamber	Nov.25,22	Nov.24,25
EMI TEST Receiver	R&S	ESR26	101734	Feb.25,22	Feb.24,24
EMI TEST Receiver	R&S	ESR26	101734	Feb.24,24	Feb.23,26
EMI TEST Receiver	R&S	ESW44	101973	Feb.25,22	Feb.24,24
EMI TEST Receiver	R&S	ESW44	101973	Feb.24,24	Feb.23,26
Bilog Antenna	SCHWARZBECK	VULB 9163	1264	Feb.28,22	Feb.27,24
Bilog Antenna	SCHWARZBECK	VULB 9163	1264	Feb.27,24	Feb.26,26
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.22,22	Aug.21,24
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Feb.23,22	Feb.22,24
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Feb.22,24	Feb.21,26
Horn Antenna	Steatite Q-par Antennas	QMS 00208	23485	Aug.22,22	Aug.21,24
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.23,22	Feb.22,24
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.22,24	Feb.21,26
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.27,22	Jun.26,24
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.26,24	Jun.25,26
Test Software	EMC32	EMC32	N/A	N/A	N/A
Test Software	ELEKTRA	ELEKTRA4.32	N/A	N/A	N/A
Open Switch and Control Unit	R&S	OSP220	101964	Oct.01,22	Sep.30,24
DC Source	HYELEC	HY3010B	551016	Aug.31,22	Aug.30,24
Hygrothermograph	DELI	20210528	SZ014	Sep.06,22	Sep.05,24
PC	LENOVO	E14	HRSW0024	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-7.00M	N/A	N/A	N/A
TMC-	R&S	HF290-NMNM-	N/A	N/A	N/A

AMI18843A(CABLE)		4.00M			
CABLE	R&S	W13.02	N/A	Apr.28,23	Apr.27,24
CABLE	R&S	W13.02	N/A	Apr.27,24	Apr.26,25
CABLE	R&S	W12.14	N/A	Apr.28,23	Apr.27,24
CABLE	R&S	W12.14	N/A	Apr.27,24	Apr.26,25
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.28,23	Apr.27,24
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.27,24	Apr.26,25
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.28,23	Apr.27,24
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.27,24	Apr.26,25
Temperature Chamber	votsch	VT4002	58566078100050	May.31,22	May.30,24
Temperature Chamber	votsch	VT4002	58566078100050	May.30,24	May.29,26

NOTE: 1. The calibration interval of the above test instruments is 12/ 24 / 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.

3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 434559; The Designation No. is CN1325.

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT*	Smartscanner / Smartphone	
BRAND NAME*	BARTEC	
MODEL NAME*	SP9EX1/SC9EX1/SP9EX2/SC9EX2	
NOMINAL VOLTAGE*	5.0V/9.0V/12.0Vdc (adapter) 3.2V/3.8V/4.2V/dc (battery)	
MODULATION TECHNOLOGY	**WCDMA IV**	BPSK, QPSK
	LTE	QPSK, 16QAM, 64QAM,256QAM
FREQUENCY RANGE	**WCDMA IV**	1712.4MHz ~ 1752.6MHz
	LTE Band 7 Channel Bandwidth: 5MHz	2502.5MHz ~ 2567.5MHz
	LTE Band 7 Channel Bandwidth: 10MHz	2505MHz ~ 2565MHz
	LTE Band 7 Channel Bandwidth: 15MHz	2507.5MHz ~ 2562.5MHz
	LTE Band 7 Channel Bandwidth: 20MHz	2510MHz ~ 2560MHz
	LTE Band 12 Channel Bandwidth: 1.4MHz	699.7MHz ~ 715.3MHz
	LTE Band 12 Channel Bandwidth: 3MHz	700.5MHz ~ 714.5MHz
	LTE Band 12 Channel Bandwidth: 5MHz	701.5MHz ~ 713.5MHz
	LTE Band 12 Channel Bandwidth: 10MHz	704MHz ~ 711MHz
	LTE Band 13 Channel Bandwidth: 5MHz	779.5MHz ~ 784.5MHz
	LTE Band 13 Channel Bandwidth: 10MHz	782MHz
	LTE Band 17 Channel Bandwidth: 5MHz	706.5MHz ~ 713.5MHz
	LTE Band 17 Channel Bandwidth: 10MHz	709MHz ~ 711 MHz
	LTE Band 71 Channel Bandwidth: 5MHz	665.5MHz ~ 695.5MHz
	LTE Band 71 Channel Bandwidth: 10MHz	668MHz ~ 693MHz
	LTE Band 71 Channel Bandwidth: 15MHz	670.5MHz ~ 690.5MHz
	LTE Band 71 Channel Bandwidth: 20MHz	673MHz ~ 688MHz

MAX. EIRP POWER	WCDMA IV	221.31mW
	LTE Band 7 Channel Bandwidth: 5MHz	175.39mW
	LTE Band 7 Channel Bandwidth: 10MHz	172.58mW
	LTE Band 7 Channel Bandwidth: 15MHz	175.39mW
	LTE Band 7 Channel Bandwidth: 20MHz	176.2mW
	LTE Band 12 Channel Bandwidth: 1.4MHz	23.6mW
	LTE Band 12 Channel Bandwidth: 3MHz	23.33mW
	LTE Band 12 Channel Bandwidth: 5MHz	23.01mW
	LTE Band 12 Channel Bandwidth: 10MHz	23.55mW
	LTE Band 13 Channel Bandwidth: 5MHz	28.18mW
	LTE Band 13 Channel Bandwidth: 10MHz	27.61mW
	LTE Band 17 Channel Bandwidth: 5MHz	25.7mW
	LTE Band 17 Channel Bandwidth: 10MHz	26.24mW
	LTE Band 71 Channel Bandwidth: 5MHz	15.03mW
	LTE Band 71 Channel Bandwidth: 10MHz	15.14mW
	LTE Band 71 Channel Bandwidth: 15MHz	15.03mW
	LTE Band 71 Channel Bandwidth: 20MHz	15.21mW
EMISSION DESIGNATOR	WCDMA IV	4M14F9W
	LTE Band 7 Channel Bandwidth: 5MHz	QPSK: 4M49G7D
		16QAM: 4M49W7D
		64QAM: 4M48W7D

EMISSION DESIGNATOR	LTE Band 7 Channel Bandwidth: 10MHz	QPSK:8M97G7D
		16QAM: 8M97W7D
		64QAM: 8M96W7D
	LTE Band 7 Channel Bandwidth: 15MHz	QPSK: 13M5G7D
		16QAM: 13M5W7D
		64QAM: 13M5W7D
	LTE Band 7 Channel Bandwidth: 20MHz	QPSK: 18M0G7D
		16QAM: 17M9W7D
		64QAM: 17M9W7D
	LTE Band 12 Channel Bandwidth: 1.4MHz	QPSK: 1M09G7D
		16QAM: 1M09W7D
		64QAM: 1M09W7D
	LTE Band 12 Channel Bandwidth: 3MHz	QPSK: 2M69G7D
		16QAM: 2M69W7D
		64QAM: 2M69W7D
	LTE Band 12 Channel Bandwidth: 5MHz	QPSK: 4M49G7D
		16QAM: 4M48W7D
		64QAM: 4M48W7D
	LTE Band 12 Channel Bandwidth: 10MHz	QPSK: 8M96G7D
		16QAM: 8M95W7D
		64QAM: 8M95W7D
	LTE Band 13 Channel Bandwidth: 5MHz	QPSK: 4M49G7D
		16QAM: 4M48W7D
		64QAM: 4M49W7D
	LTE Band 13 Channel Bandwidth: 10MHz	QPSK: 8M94G7D
		16QAM: 8M94W7D
		64QAM: 8M93W7D

EMISSION DESIGNATOR	**LTE Band 71 Channel Bandwidth: 5MHz**	QPSK: 4M49G7D
		16QAM: 4M49W7D
		64QAM: 4M48W7D
	LTE Band 71 Channel Bandwidth: 10MHz	QPSK: 8M95G7D
		16QAM: 8M94W7D
		64QAM: 8M94W7D
	LTE Band 71 Channel Bandwidth: 15MHz	QPSK: 13M5G7D
		16QAM: 13M4W7D
		64QAM: 13M5W7D
	CLTE Band 71 Channel Bandwidth: 20MHz	QPSK: 17M9G7D
		16QAM: 17M9W7D
		64QAM: 17M9W7D
ANTENNA TYPE*	Main TX/RX ANT0: IFA Antenna with 0.4dBi gain for WCDMA IV IFA Antenna with 0dBi gain for LTE B7 IFA Antenna with -6.6dBi gain for LTE B12 IFA Antenna with -5.8dBi gain for LTE B13 IFA Antenna with -6.4dBi gain for LTE B17 IFA Antenna with -8.6dBi gain for LTE B71 RX ANT PRIM. MIMO ANT1: IFA Antenna with -0.2dBi gain for LTE B7 RX ANT SEC. ANT2: IFA Antenna with -2.8dBi gain for WCDMA IV IFA Antenna with -0.6dBi gain for LTE B7 IFA Antenna with -10.9dBi gain for LTE B12 IFA Antenna with -11.9dBi gain for LTE B13 IFA Antenna with -11.1dBi gain for LTE B17 IFA Antenna with -11.7dBi gain for LTE B71 RX ANT SEC. MIMO ANT3: IFA Antenna with -0.3dBi gain for LTE B7	
HW VERSION*	E	
SW VERSION*	TWG1.240820.261	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED*	USB cable: non-shielded cable, with w/o ferrite core, 0.8 meter	
EXTREME TEMPERATURE*	-20℃-60 ℃	
EXTREME VOLTAGE*	3.2V – 4.2V	

NOTE:

1. *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , Test Lab is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.

2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
3. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and four receivers.

MODULATION MODE	TX FUNCTION
WCDMA/LTE B12/13/17/71	1TX/2RX
LTE B7	1TX/4RX

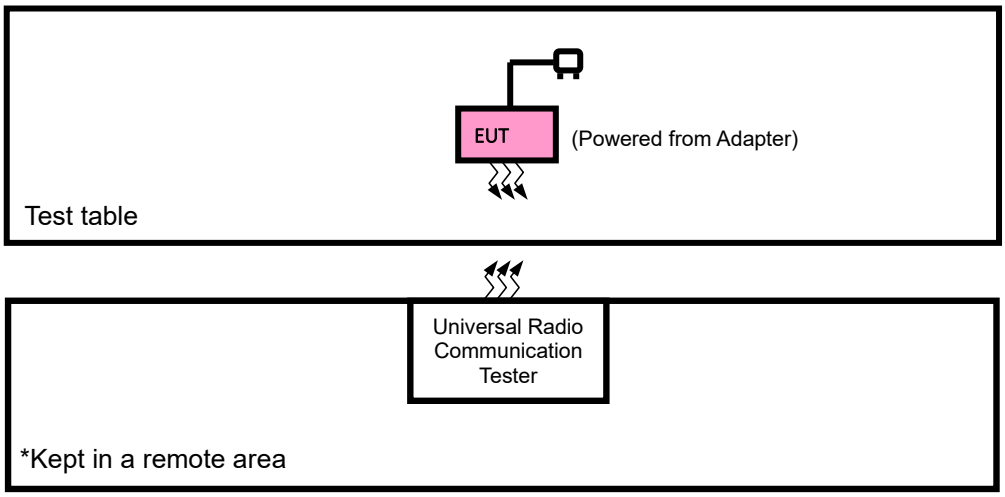
4. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
5. Antenna gain and EUT conducted cable loss are provided by the customer, and the laboratory will record the results based on these items that involve these two parameters.
6. Output power measurements were measured on QPSK,16QAM,64QAM and 256QAM modulations. And tests other than output power are performed only in worst-case QPSK and 16QAM,64QAM modes.

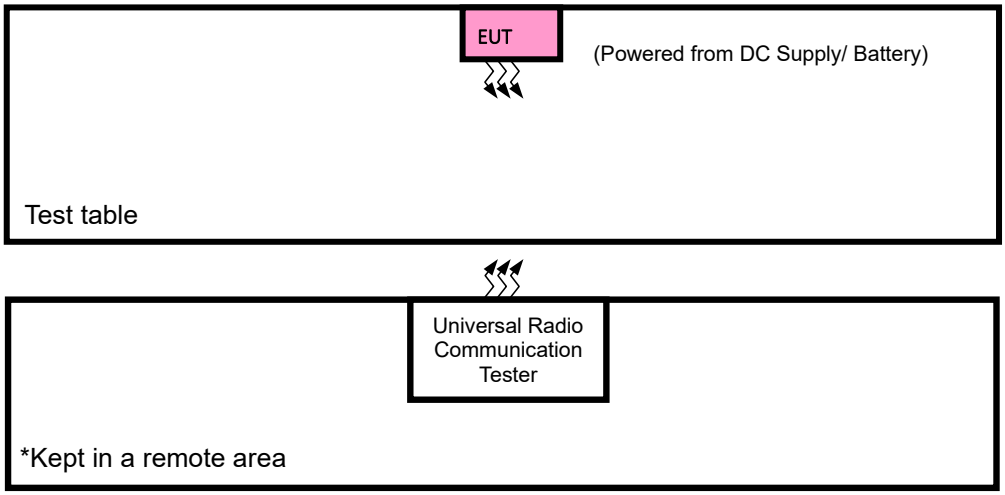
7. **List of Accessory:**

ACCESSORIES	BRAND	MANUFACTURER	MODEL	SPECIFICATION
Display(AMOLED)	Xiao Xin	N/A	XX611OLED-A002.1	N/A
Back cover	IV Techmould	N/A	N/A	N/A
Bezel	IV Techmould	N/A	N/A	N/A
Photo/Video Camera 1	Sunny Optical	N/A	F48N03A (Auto focus)	N/A
Photo/Video Camera 2	TrulyOpto	N/A	CSF208-B8BF-E(Fix focus)	N/A
CPU	Qualcomm	N/A	QCM6490	N/A
UFS	Kioxia	N/A	THGJFAT0T44BAIL	N/A
BT/WLAN Module	Murata	N/A	LBEE5QG2CX-830	N/A
NFC chipset	NXP	N/A	SN110TUK1	N/A
Battery	BARTEC	N/A	17-S1Z0-0020/****	4300 mAh, 3.68V
USB-C Cable	BARTEC	N/A	G7-A0Z0-0010	Length: 0.8m

2.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST





2.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Adapter	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	USB Line: Shielded, Detachable 0.8m;

2.4 TEST ITEM AND TEST CONFIGURATION

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports
The worst case was found when positioned on Y-plane for EIRP and X-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	EUT + Adapter + USB Cable with WCDMA or LTE link
B	EUT + Battery with GSM or WCDMA or LTE link

WCDMA MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
A	EIRP	1312 to 1513	1312, 1413, 1513	WCDMA
B	FREQUENCY STABILITY	1312 to 1513	1312, 1413, 1513	WCDMA
A	OCCUPIED BANDWIDTH	1312 to 1513	1312, 1413, 1513	WCDMA
A	BAND EDGE	1312 to 1513	1312, 1513	WCDMA
A	PEAK TO AVERAGE RATIO	1312 to 1513	1312, 1413, 1513	WCDMA
A	CONDUCTED EMISSION	1312 to 1513	1312, 1413, 1513	WCDMA
A	RADIATED EMISSION	1312 to 1513	1312, 1413, 1513	WCDMA

LTE BAND 7 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	EIRP	20775 to 21425	20775, 21100, 21425	5MHz	QPSK,16QAM,64QAM, 256QAM	1 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10MHz	QPSK,16QAM,64QAM, 256QAM	1 RB / 0RB Offset
		20825 to 21375	20825, 21100, 21375	15MHz	QPSK,16QAM,64QAM, 256QAM	1 RB / 0 RB Offset
		20850 to 21350	20850, 21100, 21350	20MHz	QPSK,16QAM,64QAM, 256QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset
A	PEAK TO AVERAGE RATIO	20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 100 RB / 0 RB Offset
A	BAND EDGE	20775 to 21425	20775	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			21425	5MHz	QPSK, 16QAM, 64QAM	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		20800 to 21400	20800	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			21400	10MHz	QPSK, 16QAM, 64QAM	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		20825 to 21375	20825	15MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
			21375	15MHz	QPSK, 16QAM, 64QAM	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
		20850 to 21350	20850	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
			21350	20MHz	QPSK, 16QAM, 64QAM	1 RB / 99 RB Offset
						100 RB / 0 RB Offset
A	CONDUCTED EMISSION	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0RB Offset
		20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	20775 to 21425	20775, 21100, 21425	5MHz	QPSK	1 RB / 0 RB Offset
		20800 to 21400	21100	10MHz	QPSK	1 RB / 0 RB Offset
		20825 to 21375	21100	15MHz	QPSK	1 RB / 0 RB Offset
		20850 to 21350	21100	20MHz	QPSK	1 RB / 0 RB Offset

Note: 1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

2. Output power measurements were measured on QPSK,16QAM,64QAM and 256QAM modulations. And tests other than output power are performed only in worst-case QPSK and 16QAM,64QAM modes.

LTE BAND 12 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	ERP	23017 to 23173	23017, 23095 , 23173	1.4MHz	QPSK,16QAM,64QAM, 256QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095 ,23165	3MHz	QPSK,16QAM,64QAM, 256QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095 ,23155	5MHz	QPSK,16QAM,64QAM, 256QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095 ,23130	10MHz	QPSK,16QAM,64QAM, 256QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	23060 to 23130	23060, 23095 ,23130	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	23017 to 23173	23017, 23095 , 23173	1.4MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset
		23025 to 23165	23025, 23095 ,23165	3MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		23035 to 23155	23035, 23095 ,23155	5MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		23060 to 23130	23060, 23095 ,23130	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
A	PEAK TO AVERAGE RATIO	23060 to 23130	23060, 23095 ,23130	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 50 RB / 0 RB Offset
A	BAND EDGE	23017 to 23173	23017	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			23173	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		23025 to 23165	23025	3MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			23165	3MHz	QPSK, 16QAM, 64QAM	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		23035 to 23155	23035	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			23155	5MHz	QPSK, 16QAM, 64QAM	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		23060 to 23130	23060	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			23130	10MHz	QPSK, 16QAM, 64QAM	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
A	CONDUCTED EMISSION	23017 to 23173	23017, 23095 , 23173	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095 ,23165	3MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095 ,23155	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095 ,23130	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	23017 to 23173	23017, 23095 , 23173	1.4MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23095	3MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23095	5MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23095	10MHz	QPSK	1 RB / 0 RB Offset

Note: 1.This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

2. Output power measurements were measured on QPSK,16QAM,64QAM and 256QAM modulations. And tests other than output power are performed only in worst-case QPSK and 16QAM,64QAM modes.

LTE BAND 13 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	ERP	23205 to 23255	23205, 23230, 23255	5MHz	QPSK,16QAM,64QAM, 256QAM	1 RB / 0 RB Offset
		23230	23230	10MHz	QPSK,16QAM,64QAM, 256QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	23230	23230	10MHz	QPSK,16QAM,64QAM	50 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	23205 to 23255	23205, 23230, 23255	5MHz	QPSK,16QAM,64QAM	25 RB / 0 RB Offset
		23230	23230	10MHz	QPSK,16QAM,64QAM	50 RB / 0 RB Offset
A	PEAK TO AVERAGE RATIO	23230	23230	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset 50 RB / 0 RB Offset
A	BAND EDGE	23205 to 23255	23205	5MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			23255	5MHz	QPSK,16QAM, 64QAM	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		23230	23230	10MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
						1 RB / 49 RB Offset
						50 RB / 0 RB Offset
A	CONDUCTED EMISSION	23205 to 23255	23205, 23230, 23255	5MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		23230	23230	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	23205 to 23255	23205, 23230, 23255	5MHz	QPSK	1 RB / 0 RB Offset
		23230	23230	10MHz	QPSK	1 RB / 0 RB Offset

Note: 1.This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

2. Output power measurements were measured on QPSK,16QAM,64QAM and 256QAM modulations. And tests other than output power are performed only in worst-case QPSK and 16QAM,64QAM modes.

LTE BAND 17 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	ERP	23755 to 23825	23755, 23790, 23825	5MHz	QPSK,16QAM,64QAM,256QAM	1 RB / 0 RB Offset
		23780 to 23800	23780, 23790, 23800	10MHz	QPSK,16QAM,64QAM,256QAM	1 RB / 0 RB Offset

Note: 1.This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

2. LTE Band 17 are covered by LTE Band 12, Because it is a subset of LTE Band 12 with the same output power and supported bandwidths, So the conducted test data and RSE test data please refer to LTE Band 12

LTE BAND 71

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	ERP	133147 to 133447	133147, 133297, 133447	5MHz	QPSK,16QAM,64QAM,256QAM	1 RB / 0 RB Offset
		133172 to 133422	133172, 133297 133422	10MHz	QPSK,16QAM,64QAM,256QAM	1 RB / 0 RB Offset
		133197 to 133397	133197, 133297, 133397	15MHz	QPSK,16QAM,64QAM,256QAM	1 RB / 0 RB Offset
		133222 to 133372	133222, 133322, 133372	20MHz	QPSK,16QAM,64QAM,256QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	133172 to 133422	133172, 133297 133422	10MHz	QPSK,16QAM,64QAM	50 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	133147 to 133447	133147, 133297, 133447	5MHz	QPSK,16QAM,64QAM	25 RB / 0 RB Offset
		133172 to 133422	133172, 133297 133422	10MHz	QPSK,16QAM,64QAM	50 RB / 0 RB Offset
		133197 to 133397	133197, 133297, 133397	15MHz	QPSK,16QAM,64QAM	75 RB / 0 RB Offset
		133222 to 133372	133222, 133322, 133372	20MHz	QPSK,16QAM,64QAM	100 RB / 0 RB Offset
A	PEAK TO AVERAGE RATIO	133222 to 133372	133222, 133322, 133372	20MHz	QPSK, 16QAM,64QAM	1 RB / 0 RB Offset 100 RB / 0 RB Offset
A	BAND EDGE	133147 to 133447	133147	5MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			133447	5MHz	QPSK,16QAM, 64QAM	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		133172 to 133422	133172	10MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			133422	10MHz	QPSK,16QAM, 64QAM	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		133197 to 133397	133197	15MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset

						75 RB / 0 RB Offset
			133397	15MHz	QPSK,16QAM, 64QAM	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
		133222 to 133372	133222	20MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
			133372	20MHz	QPSK,16QAM, 64QAM	1 RB / 99 RB Offset
						100 RB / 0 RB Offset
A	CONDUCTED EMISSION	133147 to 133447	133147, 133297, 133447	5MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		133172 to 133422	133172, 133297 133422	10MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		133197 to 133397	133197, 133297, 133397	15MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		133222 to 133372	133222, 133322, 133372	20MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	133147 to 133447	133297	5MHz	QPSK	1 RB / 0 RB Offset
		133172 to 133422	133297	10MHz	QPSK	1 RB / 0 RB Offset
		133197 to 133397	133297	15MHz	QPSK	1 RB / 0 RB Offset
		133222 to 133372	133222, 133322, 133372	20MHz	QPSK	1 RB / 0 RB Offset

Note: 1.This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

2. Output power measurements were measured on QPSK,16QAM,64QAM and 256QAM modulations. And tests other than output power are performed only in worst-case QPSK and 16QAM,64QAM modes.

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP&EIRP	23deg. C, 70%RH	DC 5.0V/ 9.0V/ 12.0V By Adapter	Hanwen Xu
FREQUENCY STABILITY	23deg. C, 70%RH	DC 3.2V/ 3.8V/ 4.2V By Battery	Hanwen Xu
OCCUPIED BANDWIDTH	23deg. C, 70%RH	DC 5.0V/ 9.0V/ 12.0V By Adapter	Hanwen Xu
BAND EDGE	23deg. C, 70%RH	DC 5.0V/ 9.0V/ 12.0V By Adapter	Hanwen Xu
CONDUCTED EMISSION	23deg. C, 70%RH	DC 5.0V/ 9.0V/ 12.0V By Adapter	Hanwen Xu
RADIATED EMISSION	23deg. C, 70%RH	DC 5.0V/ 9.0V/ 12.0V By Adapter	Hanwen Xu
PEAK TO AVERAGE RATIO	23deg. C, 70%RH	DC 5.0V/ 9.0V/ 12.0V By Adapter	Hanwen Xu

2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 27

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-D

ANSI/TIA/EIA-603-E

ANSI C63.26-2015

NOTE: All test items have been performed and recorded as per the above standards.

3 TEST TYPES AND RESULTS

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

The radiated peak output power shall be according to the specific rule Part 27.50(h)(2) that “User stations are limited to 2 watts” and 27.50(i) specific that “Peak transmit power must be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent voltage.”

Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP

According to the specific rule Part 27.50(b)(10) and 27.50(c)(10) Fixed, mobile, and Portable stations (hand-held devices) transmitting in the 698-746 MHz, 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

3.1.2 TEST PROCEDURES

EIRP MEASUREMENT:

Per KDB 971168 D01 Power Meas License Digital Systems v03r01 or subclause 5.2.5.5 of ANSI C63.26-2015, the relevant equation for determing the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

ERP or EIRP = $P_{Meas} + G_T – L_C$

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively

(expressed in the same units as P_{Meas}, typically dBW or dBm);

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

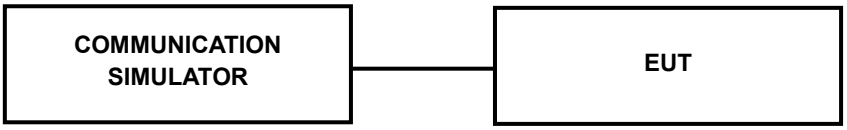
L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

CONDUCTED POWER MEASUREMENT:

a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

3.1.3 TEST SETUP

CONDUCTED POWER MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

Band	WCDMA IV(ANT0)		
Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
RMC 12.2K	**23.05**	23.02	23.03
HSDPA Subtest-1	22.15	22.14	22.16
HSDPA Subtest-2	22.25	22.17	22.17
HSDPA Subtest-3	21.65	21.72	21.72
HSDPA Subtest-4	21.69	21.67	21.64
DC-HSDPA Subtest-1	22.23	22.18	22.14
DC-HSDPA Subtest-2	22.15	22.14	22.22
DC-HSDPA Subtest-3	21.70	21.63	21.71
DC-HSDPA Subtest-4	21.65	21.70	21.67
HSUPA Subtest-1	21.41	21.39	21.42
HSUPA Subtest-2	20.09	20.07	20.12
HSUPA Subtest-3	20.95	21.01	20.96
HSUPA Subtest-4	19.72	19.70	19.68
HSUPA Subtest-5	21.97	21.92	21.93

LTE Band 7(ANT0)

Band/BW	Modulation	RB Size	RB Offset	Low CH 20775 Frequency 2502.5 MHz	Mid CH 21100 Frequency 2535 MHz	High CH 21425 Frequency 2567.5 MHz
7/ 5	QPSK	1	0	22.44	22.25	22.39
		1	12	22.41	22.21	22.41
		1	24	22.22	22.29	22.32
		12	0	21.59	21.36	21.53
		12	6	21.63	21.45	21.60
		12	13	21.48	21.31	21.45
		25	0	21.61	21.48	21.48
	16QAM	1	0	21.63	21.49	21.70
		1	12	21.64	21.47	21.57
		1	24	21.55	21.59	21.63
		12	0	20.65	20.46	20.46
		12	6	20.65	20.47	20.55
		12	13	20.47	20.27	20.47
		25	0	20.51	20.45	20.50
	64QAM	1	0	20.63	20.39	20.46
		1	12	20.54	20.35	20.54
		1	24	20.42	20.44	20.47
		12	0	19.60	19.44	19.55
		12	6	19.58	19.52	19.65
		12	13	19.56	19.37	19.46
		25	0	19.64	19.37	19.53
	256QAM	1	0	19.62	19.38	19.41
		1	12	19.44	19.28	19.36
		1	24	19.31	19.25	19.27
		12	0	18.57	18.41	18.37
		12	6	18.54	18.33	18.56
		12	13	18.40	18.29	18.41
		25	0	18.45	18.28	18.42

Band/BW	Modulation	RB Size	RB Offset	Low CH 20800 Frequency 2505 MHz	Mid CH 21100 Frequency 2535 MHz	High CH 21400 Frequency 2565 MHz
7/ 10	QPSK	1	0	22.36	22.37	22.36
		1	24	22.29	22.19	22.33
		1	49	22.21	22.28	22.21
		25	0	21.60	21.42	21.52
		25	12	21.56	21.45	21.54
		25	25	21.51	21.31	21.45
		50	0	21.60	21.49	21.54
	16QAM	1	0	21.73	21.50	21.68
		1	24	21.74	21.44	21.66
		1	49	21.62	21.59	21.57
		25	0	20.59	20.52	20.53
		25	12	20.64	20.42	20.65
		25	25	20.57	20.33	20.52
		50	0	20.61	20.51	20.57
	64QAM	1	0	20.67	20.38	20.56
		1	24	20.48	20.48	20.45
		1	49	20.29	20.48	20.40
		25	0	19.63	19.38	19.54
		25	12	19.59	19.46	19.60
		25	25	19.57	19.42	19.52
		50	0	19.62	19.43	19.57
	256QAM	1	0	19.55	19.44	19.44
		1	24	19.45	19.26	19.37
		1	49	19.24	19.27	19.34
		25	0	18.53	18.31	18.38
		25	12	18.55	18.28	18.61
		25	25	18.43	18.19	18.35
		50	0	18.50	18.27	18.47

Band/BW	Modulation	RB Size	RB Offset	Low CH 20825	Mid CH 21100	High CH 21375
				Frequency 2507.5 MHz	Frequency 2535 MHz	Frequency 2562.5 MHz
7/ 15	QPSK	1	0	22.44	22.24	22.37
		1	37	22.33	22.20	22.27
		1	74	22.29	22.20	22.34
		36	0	21.55	21.34	21.66
		36	19	21.64	21.41	21.58
		36	39	21.44	21.33	21.42
		75	0	21.58	21.48	21.51
	16QAM	1	0	21.65	21.62	21.77
		1	37	21.67	21.46	21.63
		1	74	21.61	21.66	21.58
		36	0	20.61	20.42	20.45
		36	19	20.60	20.43	20.60
		36	39	20.53	20.35	20.53
		75	0	20.60	20.37	20.47
	64QAM	1	0	20.71	20.43	20.53
		1	37	20.49	20.45	20.49
		1	74	20.34	20.55	20.40
		36	0	19.57	19.38	19.50
		36	19	19.69	19.47	19.56
		36	39	19.51	19.48	19.50
		75	0	19.57	19.49	19.61
	256QAM	1	0	19.63	19.30	19.36
		1	37	19.45	19.26	19.32
		1	74	19.29	19.26	19.38
		36	0	18.49	18.41	18.33
		36	19	18.59	18.33	18.60
		36	39	18.41	18.31	18.43
		75	0	18.38	18.29	18.52

Band/BW	Modulation	RB Size	RB Offset	Low CH 20850 Frequency 2510 MHz	Mid CH 21100 Frequency 2535 MHz	High CH 21350 Frequency 2560 MHz
7/ 20	QPSK	1	0	**22.46**	22.38	22.45
		1	50	22.43	22.29	22.42
		1	99	22.35	22.34	22.36
		50	0	21.69	21.49	21.67
		50	25	21.65	21.48	21.61
		50	50	21.59	21.46	21.54
		100	0	21.62	21.53	21.60
	16QAM	1	0	21.76	21.63	21.79
		1	50	21.75	21.58	21.71
		1	99	21.68	21.67	21.65
		50	0	20.67	20.53	20.56
		50	25	20.66	20.48	20.69
		50	50	20.61	20.42	20.56
		100	0	20.64	20.52	20.62
	64QAM	1	0	20.73	20.53	20.57
		1	50	20.59	20.49	20.56
		1	99	20.43	20.56	20.55
		50	0	19.71	19.52	19.59
		50	25	19.72	19.53	19.68
		50	50	19.62	19.49	19.56
		100	0	19.67	19.50	19.67
	256QAM	1	0	19.69	19.45	19.50
		1	50	19.51	19.40	19.39
		1	99	19.38	19.39	19.42
		50	0	18.59	18.43	18.48
		50	25	18.64	18.43	18.62
		50	50	18.55	18.34	18.49
		100	0	18.51	18.42	18.57

LTE Band 12(ANT0)

Band/BW	Modulation	RB Size	RB Offset	Low CH 23017 Frequency 699.7 MHz	Mid CH 23095 Frequency 707.5 MHz	High CH 23173 Frequency 715.3 MHz
12/ 1.4	QPSK	1	0	22.29	22.39	22.24
		1	2	22.18	22.19	22.22
		1	5	22.44	22.32	22.45
		3	0	22.43	22.42	22.46
		3	1	22.32	22.35	22.39
		3	3	22.45	22.48	22.39
		6	0	21.48	21.52	21.31
	16QAM	1	0	21.63	21.75	21.85
		1	2	21.65	21.81	21.81
		1	5	21.59	21.77	21.78
		3	0	21.35	21.62	21.46
		3	1	21.46	21.54	21.50
		3	3	21.47	21.43	21.56
		6	0	20.38	20.53	20.56
	64QAM	1	0	20.53	20.73	20.68
		1	2	20.49	20.50	20.40
		1	5	20.52	20.63	20.54
		3	0	20.55	20.53	20.52
		3	1	20.58	20.48	20.52
		3	3	20.55	20.61	20.47
		6	0	19.67	19.61	19.45
	256QAM	1	0	19.38	19.62	19.56
		1	2	19.33	19.58	19.36
		1	5	19.51	19.62	19.36
		3	0	19.18	19.27	19.16
		3	1	19.32	19.17	19.10
		3	3	19.23	19.23	19.27
		6	0	18.45	18.54	18.27

Band/BW	Modulation	RB Size	RB Offset	Low CH 23025 Frequency 700.5 MHz	Mid CH 23095 Frequency 707.5 MHz	High CH 23165 Frequency 714.5 MHz
12/ 3	QPSK	1	0	22.24	22.40	22.33
		1	7	22.20	22.24	22.23
		1	14	22.36	22.43	22.38
		8	0	21.42	21.46	21.45
		8	3	21.34	21.43	21.35
		8	7	21.40	21.37	21.37
		15	0	21.57	21.51	21.39
	16QAM	1	0	21.65	21.83	21.71
		1	7	21.67	21.78	21.73
		1	14	21.67	21.86	21.77
		8	0	20.29	20.68	20.48
		8	3	20.36	20.57	20.39
		8	7	20.42	20.45	20.53
		15	0	20.44	20.59	20.46
	64QAM	1	0	20.45	20.70	20.68
		1	7	20.42	20.53	20.45
		1	14	20.51	20.62	20.60
		8	0	19.42	19.53	19.53
		8	3	19.64	19.54	19.48
		8	7	19.61	19.61	19.46
		15	0	19.65	19.61	19.39
	256QAM	1	0	19.38	19.54	19.64
		1	7	19.25	19.57	19.38
		1	14	19.59	19.53	19.40
		8	0	18.39	18.49	18.47
		8	3	18.47	18.39	18.26
		8	7	18.47	18.44	18.41
		15	0	18.40	18.44	18.25

Band/BW	Modulation	RB Size	RB Offset	Low CH 23035 Frequency 701.5 MHz	Mid CH 23095 Frequency 707.5 MHz	High CH 23155 Frequency 713.5 MHz
12/ 5	QPSK	1	0	22.20	22.32	22.33
		1	12	22.25	22.20	22.17
		1	24	22.36	22.37	22.31
		12	0	21.42	21.46	21.48
		12	6	21.32	21.42	21.34
		12	13	21.43	21.36	21.41
		25	0	21.62	21.47	21.27
	16QAM	1	0	21.66	21.88	21.77
		1	12	21.55	21.74	21.75
		1	24	21.63	21.81	21.76
		12	0	20.39	20.66	20.44
		12	6	20.36	20.56	20.42
		12	13	20.49	20.47	20.58
		25	0	20.52	20.59	20.46
	64QAM	1	0	20.50	20.70	20.63
		1	12	20.48	20.50	20.39
		1	24	20.58	20.68	20.56
		12	0	19.50	19.57	19.46
		12	6	19.55	19.47	19.52
		12	13	19.54	19.59	19.46
		25	0	19.70	19.61	19.37
	256QAM	1	0	19.50	19.58	19.55
		1	12	19.25	19.47	19.26
		1	24	19.59	19.51	19.46
		12	0	18.34	18.36	18.41
		12	6	18.48	18.40	18.37
		12	13	18.42	18.40	18.46
		25	0	18.50	18.53	18.26

Band/BW	Modulation	RB Size	RB Offset	Low CH 23060 Frequency 704 MHz	Mid CH 23095 Frequency 707.5 MHz	High CH 23130 Frequency 711 MHz
12/ 10	QPSK	1	0	22.35	22.42	22.38
		1	24	22.30	22.32	22.32
		1	49	**22.47**	22.45	22.46
		25	0	21.54	21.53	21.52
		25	12	21.43	21.49	21.48
		25	25	21.47	21.51	21.45
		50	0	21.63	21.59	21.42
	16QAM	1	0	21.76	21.89	21.86
		1	24	21.68	21.82	21.83
		1	49	21.73	21.88	21.81
		25	0	20.42	20.69	20.50
		25	12	20.50	20.61	20.54
		25	25	20.54	20.52	20.62
		50	0	20.53	20.60	20.57
	64QAM	1	0	20.57	20.75	20.71
		1	24	20.54	20.64	20.52
		1	49	20.66	20.72	20.64
		25	0	19.57	19.64	19.60
		25	12	19.65	19.61	19.58
		25	25	19.62	19.66	19.57
		50	0	19.71	19.72	19.48
	256QAM	1	0	19.52	19.65	19.67
		1	24	19.36	19.60	19.40
		1	49	19.62	19.66	19.49
		25	0	18.43	18.51	18.50
		25	12	18.57	18.46	18.41
		25	25	18.57	18.50	18.52
		50	0	18.54	18.59	18.36

LTE Band 13(ANT0)

Band/BW	Modulation	RB Size	RB Offset	Low CH 23205 Frequency 779.5 MHz	Mid CH 23230 Frequency 782.0 MHz	High CH 23255 Frequency 784.5 MHz
13/ 5	QPSK	1	0	22.34	22.32	22.36
		1	12	22.43	22.27	22.40
		1	24	22.45	22.15	22.41
		12	0	21.27	21.28	21.39
		12	6	21.46	21.30	21.45
		12	13	21.39	21.33	21.48
		25	0	21.47	21.36	21.49
	16QAM	1	0	21.65	21.44	21.71
		1	12	21.58	21.64	21.76
		1	24	21.71	21.51	21.74
		12	0	20.48	20.34	20.61
		12	6	20.61	20.20	20.57
		12	13	20.56	20.40	20.59
		25	0	20..51	20.53	20.46
	64QAM	1	0	20.53	20.35	20.57
		1	12	20.37	20.54	20.60
		1	24	20.65	20.45	20.55
		12	0	19.41	19.38	19.60
		12	6	19.43	19.51	19.54
		12	13	19.36	19.33	19.24
		25	0	19.44	19.48	19.52
	256QAM	1	0	19.47	19.23	19.48
		1	12	19.31	19.42	19.56
		1	24	19.62	19.39	19.41
		12	0	18.29	18.31	18.51
		12	6	18.31	18.34	18.44
		12	13	18.20	18.19	18.17
		25	0	18.36	18.32	18.42

Band/BW	Modulation	RB Size	RB Offset	/	Mid CH 23230	/
				/	Frequency 782.0 MHz	/
13/ 10	QPSK	1	0	/	**22.36**	/
		1	24	/	22.31	/
		1	49	/	22.23	/
		25	0	/	21.35	/
		25	12	/	21.44	/
		25	25	/	21.48	/
		50	0	/	21.42	/
	16QAM	1	0	/	21.54	/
		1	24	/	21.67	/
		1	49	/	21.61	/
		25	0	/	20.47	/
		25	12	/	20.35	/
		25	25	/	20.50	/
		50	0	/	20.64	/
	64QAM	1	0	/	20.41	/
		1	24	/	20.57	/
		1	49	/	20.48	/
		25	0	/	19.43	/
		25	12	/	19.55	/
		25	25	/	19.45	/
		50	0	/	19.49	/
	256QAM	1	0	/	19.25	/
		1	24	/	19.44	/
		1	49	/	19.31	/
		25	0	/	18.28	/
		25	12	/	18.38	/
		25	25	/	18.36	/
		50	0	/	18.43	/

LTE Band 17(ANT0)

Band/BW	Modulation	RB Size	RB Offset	Low CH 23755 Frequency 706.5 MHz	Mid CH 23790 Frequency 710 MHz	High CH 23825 Frequency 713.5 MHz
17/ 5	QPSK	1	0	22.52	22.65	22.62
		1	12	22.49	22.45	22.25
		1	24	22.39	22.36	22.44
		12	0	21.57	21.63	21.50
		12	6	21.51	21.49	21.49
		12	13	21.48	21.50	21.45
		25	0	21.51	21.48	21.59
	16QAM	1	0	21.85	21.84	21.80
		1	12	21.95	21.89	21.81
		1	24	21.80	21.89	21.69
		12	0	20.60	20.58	20.65
		12	6	20.64	20.61	20.51
		12	13	20.40	20.48	20.48
		25	0	20.72	20.41	20.50
	64QAM	1	0	20.66	20.87	20.79
		1	12	20.71	20.60	20.66
		1	24	20.50	20.62	20.56
		12	0	19.64	19.61	19.67
		12	6	19.67	19.62	19.55
		12	13	19.51	19.43	19.54
		25	0	19.73	19.57	19.57
	256QAM	1	0	19.56	19.74	19.74
		1	12	19.76	19.54	19.69
		1	24	19.38	19.71	19.62
		12	0	18.51	18.62	18.61
		12	6	18.49	18.45	18.54
		12	13	18.40	18.40	18.51
		25	0	18.54	18.44	18.56

Band/BW	Modulation	RB Size	RB Offset	Low CH 23780 Frequency 709 MHz	Mid CH 23790 Frequency 710 MHz	High CH 23800 Frequency 711 MHz
17/ 10	QPSK	1	0	22.63	**22.74**	22.69
		1	24	22.51	22.53	22.34
		1	49	22.53	22.41	22.53
		25	0	21.67	21.68	21.65
		25	12	21.66	21.56	21.60
		25	25	21.57	21.63	21.57
		50	0	21.62	21.63	21.62
	16QAM	1	0	21.90	21.88	21.92
		1	24	21.98	21.96	21.88
		1	49	21.82	21.94	21.74
		25	0	20.65	20.73	20.71
		25	12	20.71	20.62	20.64
		25	25	20.48	20.54	20.60
		50	0	20.74	20.49	20.57
	64QAM	1	0	20.78	20.89	20.83
		1	24	20.81	20.68	20.77
		1	49	20.64	20.76	20.65
		25	0	19.76	19.74	19.78
		25	12	19.78	19.64	19.70
		25	25	19.60	19.58	19.66
		50	0	19.75	19.63	19.67
	256QAM	1	0	19.68	19.86	19.82
		1	24	19.79	19.66	19.70
		1	49	19.53	19.72	19.63
		25	0	18.62	18.69	18.68
		25	12	18.64	18.53	18.66
		25	25	18.47	18.49	18.65
		50	0	18.64	18.52	18.66

LTE Band 71(ANT0)

Band/BW	Modulation	RB Size	RB Offset	Low CH 133147	Mid CH 133247	High CH 133447
				Frequency 665.5MHz	Frequency 675.5MHz	Frequency 695.5MHz
71/ 5	QPSK	1	0	22.52	22.51	22.42
		1	12	22.50	22.46	22.46
		1	24	22.44	22.33	22.31
		12	0	21.41	21.54	21.58
		12	6	21.55	21.51	21.61
		12	13	21.51	21.61	21.54
		25	0	21.48	21.51	21.42
	16QAM	1	0	21.82	21.79	21.85
		1	12	21.79	21.78	21.82
		1	24	21.74	21.86	21.80
		12	0	20.38	20.52	20.52
		12	6	20.50	20.64	20.59
		12	13	20.46	20.58	20.63
		25	0	20.56	20.51	20.71
	64QAM	1	0	20.70	20.78	20.79
		1	12	20.55	20.83	20.69
		1	24	20.78	20.67	20.65
		12	0	19.56	19.46	19.56
		12	6	19.58	19.69	19.61
		12	13	19.42	19.38	19.54
		25	0	19.58	19.64	19.58
	256QAM	1	0	19.73	19.74	19.73
		1	12	19.47	19.67	19.73
		1	24	19.64	19.55	19.66
		12	0	18.39	18.36	18.47
		12	6	18.68	18.69	18.49
		12	13	18.36	18.29	18.53
		25	0	18.56	18.57	18.64

Band/BW	Modulation	RB Size	RB Offset	Low CH 133172	Mid CH 133272	High CH 133172
				Frequency 668MHz	Frequency 678MHz	Frequency 693MHz
71/ 10	QPSK	1	0	22.55	22.52	22.49
		1	24	22.43	22.40	22.43
		1	49	22.37	22.39	22.40
		25	0	21.42	21.57	21.56
		25	12	21.61	21.50	21.59
		25	25	21.54	21.53	21.58
		50	0	21.46	21.45	21.52
	16QAM	1	0	21.88	21.88	21.88
		1	24	21.73	21.75	21.83
		1	49	21.72	21.79	21.82
		25	0	20.45	20.46	20.53
		25	12	20.56	20.66	20.56
		25	25	20.50	20.52	20.63
		50	0	20.44	20.55	20.72
	64QAM	1	0	20.76	20.84	20.72
		1	24	20.63	20.79	20.69
		1	49	20.76	20.66	20.67
		25	0	19.54	19.52	19.64
		25	12	19.57	19.66	19.67
		25	25	19.45	19.46	19.49
		50	0	19.67	19.68	19.59
	256QAM	1	0	19.70	19.67	19.66
		1	24	19.56	19.77	19.74
		1	49	19.74	19.56	19.65
		25	0	18.44	18.33	18.61
		25	12	18.66	18.64	18.51
		25	25	18.46	18.35	18.43
		50	0	18.50	18.56	18.54

Band/BW	Modulation	RB Size	RB Offset	Low CH 133197	Mid CH 133297	High CH 133397
				Frequency 670.5MHz	Frequency 680.5MHz	Frequency 690.5MHz
71/ 15	QPSK	1	0	22.45	22.46	22.47
		1	37	22.49	22.52	22.33
		1	74	22.43	22.41	22.34
		36	0	21.49	21.50	21.58
		36	19	21.60	21.57	21.59
		36	39	21.60	21.58	21.54
		75	0	21.48	21.53	21.52
	16QAM	1	0	21.81	21.84	21.80
		1	37	21.65	21.84	21.82
		1	74	21.69	21.85	21.82
		36	0	20.36	20.43	20.54
		36	19	20.46	20.58	20.59
		36	39	20.43	20.54	20.59
		75	0	20.53	20.49	20.73
	64QAM	1	0	20.79	20.79	20.73
		1	37	20.57	20.78	20.80
		1	74	20.68	20.63	20.66
		36	0	19.55	19.46	19.59
		36	19	19.68	19.65	19.66
		36	39	19.49	19.42	19.59
		75	0	19.58	19.60	19.66
	256QAM	1	0	19.73	19.76	19.71
		1	37	19.44	19.69	19.71
		1	74	19.73	19.56	19.58
		36	0	18.37	18.35	18.53
		36	19	18.64	18.62	18.53
		36	39	18.44	18.30	18.44
		75	0	18.57	18.55	18.56

Band/BW	Modulation	RB Size	RB Offset	Low CH 133222	Mid CH 133322	High CH 133372
				Frequency 673MHz	Frequency 683MHz	Frequency 688MHz
71/ 20	QPSK	1	0	**22.57**	22.54	22.56
		1	50	22.55	22.54	22.47
		1	99	22.47	22.43	22.42
		50	0	21.51	21.60	21.62
		50	25	21.64	21.61	21.63
		50	50	21.65	21.63	21.64
		100	0	21.56	21.54	21.55
	16QAM	1	0	21.91	21.92	21.93
		1	50	21.80	21.88	21.85
		1	99	21.84	21.87	21.86
		50	0	20.51	20.55	20.67
		50	25	20.61	20.67	20.68
		50	50	20.55	20.60	20.66
		100	0	20.59	20.63	20.76
	64QAM	1	0	20.83	20.87	20.84
		1	50	20.67	20.84	20.81
		1	99	20.80	20.72	20.73
		50	0	19.59	19.61	19.67
		50	25	19.72	19.76	19.71
		50	50	19.54	19.50	19.63
		100	0	19.73	19.69	19.73
	256QAM	1	0	19.78	19.82	19.80
		1	50	19.58	19.79	19.79
		1	99	19.77	19.68	19.70
		50	0	18.46	18.47	18.62
		50	25	18.69	18.71	18.63
		50	50	18.50	18.41	18.55
		100	0	18.60	18.66	18.68

EIRP

WCDMA IV(ANT0)

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
1312	1712.4	23.05	0.4	23.45	221.31	1
1413	1732.6	23.02	0.4	23.42	219.79	1
1513	1752.6	23.03	0.4	23.43	220.29	1

LTE BAND 7(ANT0)
CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20775	2502.5	22.44	0	22.44	175.39	2
21100	2535.0	22.29	0	22.29	169.43	2
21425	2567.5	22.41	0	22.41	174.18	2

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20775	2502.5	21.64	0	21.64	145.88	2
21100	2535.0	21.59	0	21.59	144.21	2
21425	2567.5	21.7	0	21.7	147.91	2

CHANNEL BANDWIDTH: 5MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20775	2502.5	20.63	0	20.63	115.61	2
21100	2535	20.44	0	20.44	110.66	2
21425	2567.5	20.54	0	20.54	113.24	2

CHANNEL BANDWIDTH: 5MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20775	2502.5	19.62	0	19.62	91.62	2
21100	2535	19.38	0	19.38	86.7	2
21425	2567.5	19.41	0	19.41	87.3	2

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20800	2505.0	22.36	0	22.36	172.19	2
21100	2535.0	22.37	0	22.37	172.58	2
21400	2565.0	22.36	0	22.36	172.19	2

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20800	2505.0	21.74	0	21.74	149.28	2
21100	2535.0	21.59	0	21.59	144.21	2
21400	2565.0	21.68	0	21.68	147.23	2

CHANNEL BANDWIDTH: 10MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20800	2505	20.67	0	20.67	116.68	2
21100	2535	20.48	0	20.48	111.69	2
21400	2565	20.563	0	20.563	113.84	2

CHANNEL BANDWIDTH: 10MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20800	2505	19.55	0	19.55	90.16	2
21100	2535	19.44	0	19.44	87.9	2
21400	2565	19.44	0	19.44	87.9	2

CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20825	2507.5	22.44	0	22.44	175.39	2
21100	2535.0	22.24	0	22.24	167.49	2
21375	2562.5	22.37	0	22.37	172.58	2

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20825	2507.5	21.67	0	21.67	146.89	2
21100	2535.0	21.66	0	21.66	146.55	2
21375	2562.5	21.77	0	21.77	150.31	2

CHANNEL BANDWIDTH: 15MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20825	2507.5	20.71	0	20.71	117.76	2
21100	2535	20.55	0	20.55	113.5	2
21375	2562.5	20.533	0	20.533	113.06	2

CHANNEL BANDWIDTH: 15MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20825	2507.5	19.63	0	19.63	91.83	2
21100	2535	19.3	0	19.3	85.11	2
21375	2562.5	19.38	0	19.38	86.7	2

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20850	2510.0	22.46	0	22.46	176.2	2
21100	2535.0	22.38	0	22.38	172.98	2
21350	2560.0	22.45	0	22.45	175.79	2

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20850	2510.0	21.76	0	21.76	149.97	2
21100	2535.0	21.67	0	21.67	146.89	2
21350	2560.0	21.79	0	21.79	151.01	2

CHANNEL BANDWIDTH: 20MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20850	2510	20.73	0	20.73	118.3	2
21100	2535	20.56	0	20.56	113.76	2
21350	2560	20.573	0	20.573	114.1	2

CHANNEL BANDWIDTH: 20MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20850	2510	19.69	0	19.69	93.11	2
21100	2535	19.45	0	19.45	88.1	2
21350	2560	19.503	0	19.503	89.19	2

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

LTE BAND 12(ANT0)
CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23017	699.7	22.45	-6.6	13.7	23.44	3
23095	707.5	22.48	-6.6	13.73	23.6	3
23173	715.3	22.46	-6.6	13.71	23.5	3

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23017	699.7	21.65	-6.6	12.9	19.5	3
23095	707.5	21.81	-6.6	13.06	20.23	3
23173	715.3	21.85	-6.6	13.1	20.42	3

CHANNEL BANDWIDTH: 1.4MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23017	699.7	20.58	-6.6	11.83	15.24	3
23095	707.5	20.73	-6.6	11.98	15.78	3
23173	715.3	20.68	-6.6	11.93	15.6	3

CHANNEL BANDWIDTH: 1.4MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23017	699.7	19.51	-6.6	10.76	11.91	3
23095	707.5	19.62	-6.6	10.87	12.22	3
23173	715.3	19.56	-6.6	10.81	12.05	3

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23025	700.5	22.36	-6.6	13.61	22.96	3
23095	707.5	22.43	-6.6	13.68	23.33	3
23165	714.5	22.38	-6.6	13.63	23.07	3

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23025	700.5	21.67	-6.6	12.92	19.59	3
23095	707.5	21.86	-6.6	13.11	20.46	3
23165	714.5	21.77	-6.6	13.02	20.04	3

CHANNEL BANDWIDTH: 3MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23025	700.5	20.51	-6.6	11.76	15	3
23095	707.5	20.7	-6.6	11.95	15.67	3
23165	714.5	20.68	-6.6	11.93	15.6	3

CHANNEL BANDWIDTH: 3MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23025	700.5	19.59	-6.6	10.84	12.13	3
23095	707.5	19.57	-6.6	10.82	12.08	3
23165	714.5	19.64	-6.6	10.89	12.27	3

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23035	701.5	22.36	-6.6	13.61	22.96	3
23095	707.5	22.37	-6.6	13.62	23.01	3
23155	713.5	22.33	-6.6	13.58	22.8	3

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23035	701.5	21.66	-6.6	12.91	19.54	3
23095	707.5	21.88	-6.6	13.13	20.56	3
23155	713.5	21.77	-6.6	13.02	20.04	3

CHANNEL BANDWIDTH: 5MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23035	701.5	20.58	-6.6	11.83	15.24	3
23095	707.5	20.7	-6.6	11.95	15.67	3
23155	713.5	20.63	-6.6	11.88	15.42	3

CHANNEL BANDWIDTH: 5MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23035	701.5	19.59	-6.6	10.84	12.13	3
23095	707.5	19.58	-6.6	10.83	12.11	3
23155	713.5	19.55	-6.6	10.8	12.02	3

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23060	704	22.47	-6.6	13.72	23.55	3
23095	707.5	22.45	-6.6	13.7	23.44	3
23130	711	22.46	-6.6	13.71	23.5	3

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23060	704	21.76	-6.6	13.01	20	3
23095	707.5	21.89	-6.6	13.14	20.61	3
23130	711	21.86	-6.6	13.11	20.46	3

CHANNEL BANDWIDTH: 10MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23060	704	20.66	-6.6	11.91	15.52	3
23095	707.5	20.75	-6.6	12	15.85	3
23130	711	20.71	-6.6	11.96	15.7	3

CHANNEL BANDWIDTH: 10MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23060	704	19.62	-6.6	10.87	12.22	3
23095	707.5	19.66	-6.6	10.91	12.33	3
23130	711	19.67	-6.6	10.92	12.36	3

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

LTE BAND 13(ANT0)

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23205	779.5	22.45	-5.8	14.5	28.18	3
23230	782	22.32	-5.8	14.37	27.35	3
23255	784.5	22.41	-5.8	14.46	27.93	3

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23205	779.5	21.71	-5.8	13.76	23.77	3
23230	782	21.64	-5.8	13.69	23.39	3
23255	784.5	21.76	-5.8	13.81	24.04	3

CHANNEL BANDWIDTH: 5MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23205	779.5	20.65	-5.8	12.7	18.62	3
23230	782	20.54	-5.8	12.59	18.16	3
23255	784.5	20.6	-5.8	12.65	18.41	3

CHANNEL BANDWIDTH: 5MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23205	779.5	19.62	-5.8	11.67	14.69	3
23230	782	19.42	-5.8	11.47	14.03	3
23255	784.5	19.56	-5.8	11.61	14.49	3

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
-	-	-	-	-	-	-
23230	782	22.36	-5.8	14.41	27.61	3
-	-	-	-	-	-	-

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
-	-	-	-	-	-	-
23230	782	21.67	-5.8	13.72	23.55	3
-	-	-	-	-	-	-

CHANNEL BANDWIDTH: 10MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
-	-	-	-	-	-	-
23230	782	20.57	-5.8	12.62	18.28	3
-	-	-	-	-	-	-

CHANNEL BANDWIDTH: 10MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
-	-	-	-	-	-	-
23230		19.44	-5.8	11.49	14.09	3
-	-	-	-	-	-	-

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

LTE BAND 17(ANT0)

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23755	706.5	22.52	-6.4	13.97	24.95	3
23790	710	22.65	-6.4	14.1	25.7	3
23825	713.5	22.62	-6.4	14.07	25.53	3

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23755	706.5	21.95	-6.4	13.4	21.88	3
23790	710	21.89	-6.4	13.34	21.58	3
23825	713.5	21.81	-6.4	13.26	21.18	3

CHANNEL BANDWIDTH: 5MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23755	706.5	20.71	-6.4	12.16	16.44	3
23790	710	20.87	-6.4	12.32	17.06	3
23825	713.5	20.79	-6.4	12.24	16.75	3

CHANNEL BANDWIDTH: 5MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23755	706.5	19.76	-6.4	11.21	13.21	3
23790	710	19.74	-6.4	11.19	13.15	3
23825	713.5	19.74	-6.4	11.19	13.15	3

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23780	709	22.63	-6.4	14.08	25.59	3
23790	710	22.74	-6.4	14.19	26.24	3
23800	711	22.69	-6.4	14.14	25.94	3

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23780	709	21.98	-6.4	13.43	22.03	3
23790	710	21.96	-6.4	13.41	21.93	3
23800	711	21.92	-6.4	13.37	21.73	3

CHANNEL BANDWIDTH: 10MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23780	709	20.81	-6.4	12.26	16.83	3
23790	710	20.89	-6.4	12.34	17.14	3
23800	711	20.83	-6.4	12.28	16.9	3

CHANNEL BANDWIDTH: 10MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23780	709	19.79	-6.4	11.24	13.3	3
23790	710	19.86	-6.4	11.31	13.52	3
23800	711	19.82	-6.4	11.27	13.4	3

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

LTE BAND 71(ANT0)

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133147	665.5	22.52	-8.6	11.77	15.03	3
133297	680.5	22.51	-8.6	11.76	15	3
133447	695.5	22.46	-8.6	11.71	14.83	3

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133147	665.5	21.82	-8.6	11.07	12.79	3
133297	680.5	21.86	-8.6	11.11	12.91	3
133447	695.5	21.85	-8.6	11.1	12.88	3

CHANNEL BANDWIDTH: 5MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133147	665.5	20.78	-8.6	10.03	10.07	3
133297	680.5	20.83	-8.6	10.08	10.19	3
133447	695.5	20.79	-8.6	10.04	10.09	3

CHANNEL BANDWIDTH: 5MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133147	665.5	19.73	-8.6	8.98	7.91	3
133297	680.5	19.74	-8.6	8.99	7.93	3
133447	695.5	19.73	-8.6	8.98	7.91	3

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133172	668	22.55	-8.6	11.8	15.14	3
133297	680.5	22.52	-8.6	11.77	15.03	3
133422	693	22.49	-8.6	11.74	14.93	3

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133172	668	21.88	-8.6	11.13	12.97	3
133297	680.5	21.88	-8.6	11.13	12.97	3
133422	693	21.88	-8.6	11.13	12.97	3

CHANNEL BANDWIDTH: 10MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133172	668	20.76	-8.6	10.01	10.02	3
133297	680.5	20.84	-8.6	10.09	10.21	3
133422	693	20.72	-8.6	9.97	9.93	3

CHANNEL BANDWIDTH: 10MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133172	668	19.74	-8.6	8.99	7.93	3
133297	680.5	19.77	-8.6	9.02	7.98	3
133422	693	19.74	-8.6	8.99	7.93	3

CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133197	670.5	22.49	-8.6	11.74	14.93	3
133297	680.5	22.52	-8.6	11.77	15.03	3
133397	690.5	22.47	-8.6	11.72	14.86	3

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133197	670.5	21.81	-8.6	11.06	12.76	3
133297	680.5	21.85	-8.6	11.1	12.88	3
133397	690.5	21.82	-8.6	11.07	12.79	3

CHANNEL BANDWIDTH: 15MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133197	670.5	20.79	-8.6	10.04	10.09	3
133297	680.5	20.79	-8.6	10.04	10.09	3
133397	690.5	20.8	-8.6	10.05	10.12	3

CHANNEL BANDWIDTH: 15MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133197	670.5	19.73	-8.6	8.98	7.91	3
133297	680.5	19.76	-8.6	9.01	7.96	3
133397	690.5	19.71	-8.6	8.96	7.87	3

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133222	673	22.57	-8.6	11.82	15.21	3
133322	683	22.54	-8.6	11.79	15.1	3
133372	688	22.56	-8.6	11.81	15.17	3

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133222	673	21.91	-8.6	11.16	13.06	3
133322	683	21.92	-8.6	11.17	13.09	3
133372	688	21.93	-8.6	11.18	13.12	3

CHANNEL BANDWIDTH: 20MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133222	673	20.83	-8.6	10.08	10.19	3
133322	683	20.87	-8.6	10.12	10.28	3
133372	688	20.84	-8.6	10.09	10.21	3

CHANNEL BANDWIDTH: 20MHz 256QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133222	673	19.78	-8.6	9.03	8	3
133322	683	19.82	-8.6	9.07	8.07	3
133372	688	19.8	-8.6	9.05	8.04	3

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

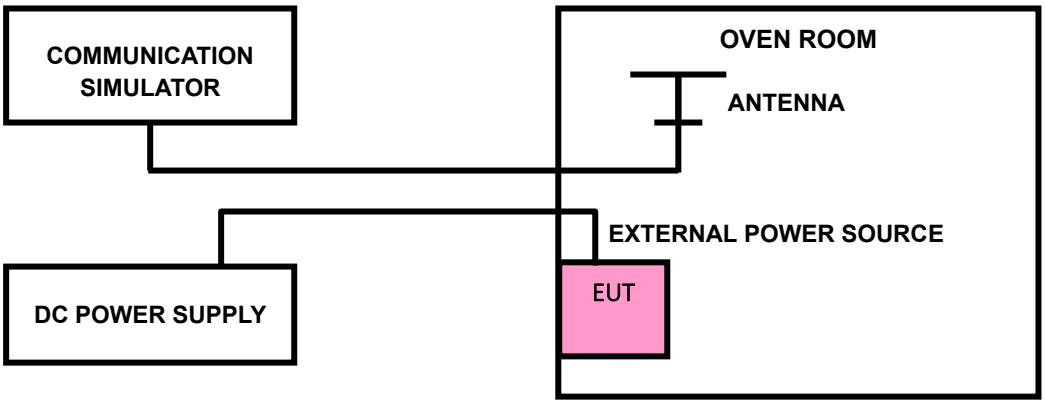
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

3.2.2 TEST PROCEDURE

a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

3.2.3 TEST SETUP



3.2.4 TEST RESULTS

Please Refer to Appendix Of this test report.

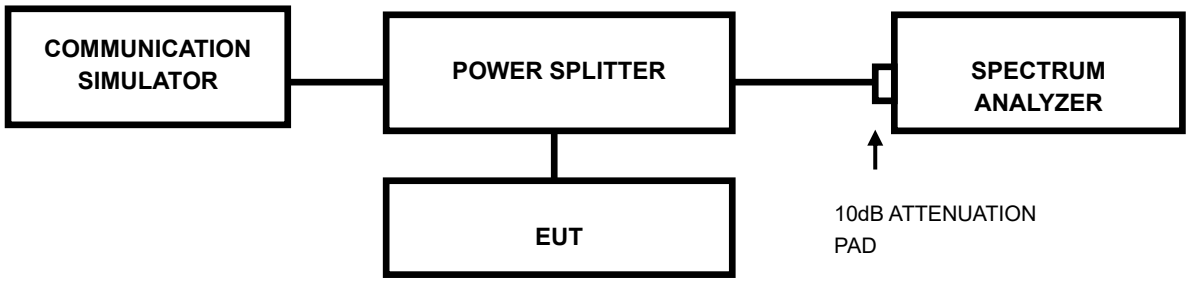
Note: VL = Low voltage(3.2V); VN/NV = Normal voltage(3.8V); VH = High voltage(4.2V);
NT = Normal temperature (25℃)

3.3 OCCUPIED BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

3.3.2 TEST SETUP



3.3.3 TEST PROCEDURES

a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

3.3.4 TEST RESULTS

Please Refer to Appendix Of this test report.

3.4 BAND EDGE MEASUREMENT

3.4.1 LIMITS OF BAND EDGE MEASUREMENT

According to FCC 27.53(c) specified that For operations in the 746-758 MHz band and the 776-788 MHz band , the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.In addition, the power of any unwanted emission in an 6.25kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power,P(dBW),by at least 65 +10log10p(P),dB,for mobile and portable equipment.

According to FCC 27.53(g) specified that For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

According to FCC 27.53(h) specified that For operations in the 1710-1755 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

According to FCC 27.53(m)(4) specified that For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. For mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed.

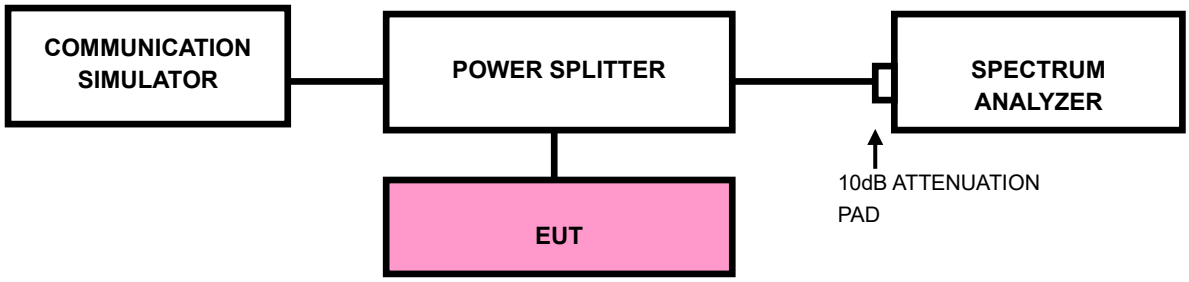
According to FCC 27.53(a)(4) specified that For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300 MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz;

(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

3.4.2 TEST SETUP



3.4.3 TEST PROCEDURES

a) All measurements were done at low and high operational frequency range

b) Connect the transmitter to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.

c) Tune the analyzer to the nominal center frequency of the emission bandwidth

(EBW)

d) .Set the resolution bandwidth (RBW) ≧ 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.

e) Beyond the 1MHz band from the band edge, RBW=1MHz was used.

f) Set the video bandwidth (VBW) to ≧3 x RBW.

g) Select the average power (RMS) display detector.

h) Set the number of measurement points to ≧ 1001.

i) Use auto-coupled sweep time.

j) Perform the measurement over an interval of time when the transmission is continuous and at its maximum power level.

k) The RF fundamental frequency should be excluded against the limit line in the operating frequency band and use RBW is 10KHz or 100KHz.

l) Record the max trace plot into the test report.

3.4.4 TEST RESULTS

Please Refer to Appendix Of this test report.

3.5 CONDUCTED SPURIOUS EMISSIONS

3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

For: LTE Band7

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 55 +10 log10(P) dB. The limit of emission is equal to -25dBm.

For: LTE Band30

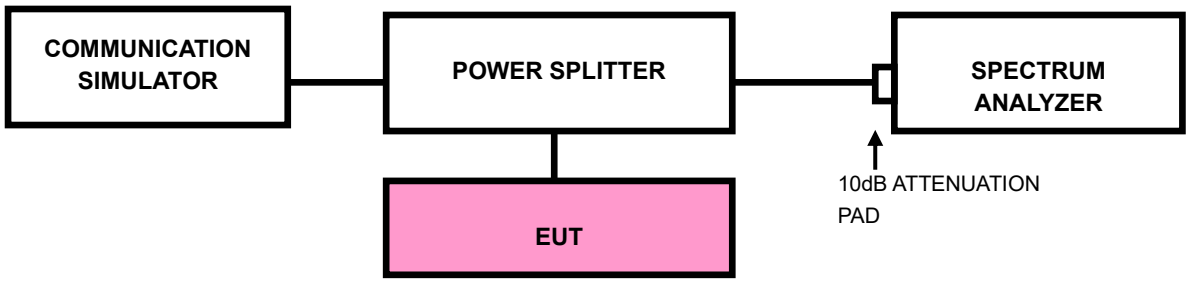
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 70 +10 log10(P) dB. The limit of emission is equal to -40dBm.

3.5.2 TEST PROCEDURE

a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

b. Measuring frequency range is from 9kHz up to a frequency including its 10th harmonic. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

3.5.3 TEST SETUP



3.5.4 TEST RESULTS

NOTE：The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

Please Refer to Appendix Of this test report.

3.6 RADIATED EMISSION MEASUREMENT

3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

For: LTE Band7/ Band41

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 55 +10 log10(P) dB. The limit of emission is equal to -25dBm.

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3.6.2 TEST PROCEDURES

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value “ of step a. Record the power level of S.G.
c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

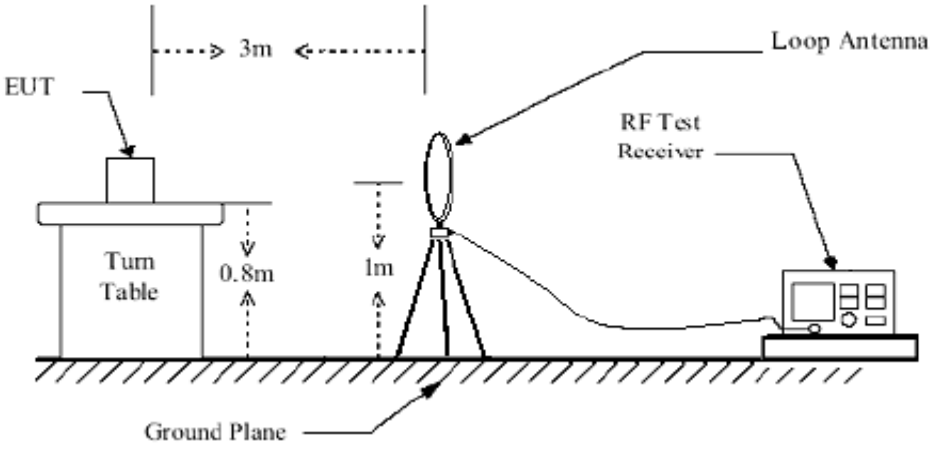
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

3.6.3 DEVIATION FROM TEST STANDARD

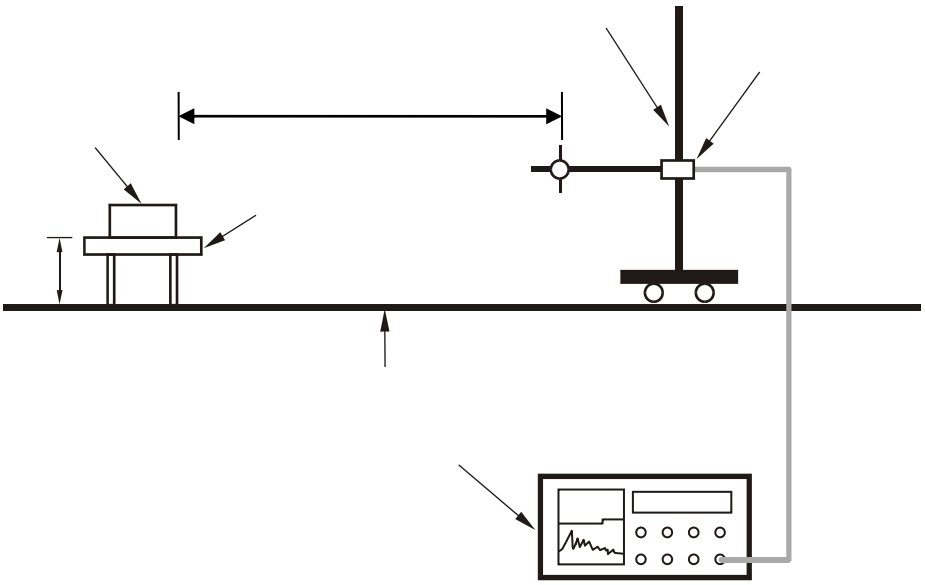
No deviation

3.6.4 TEST SETUP

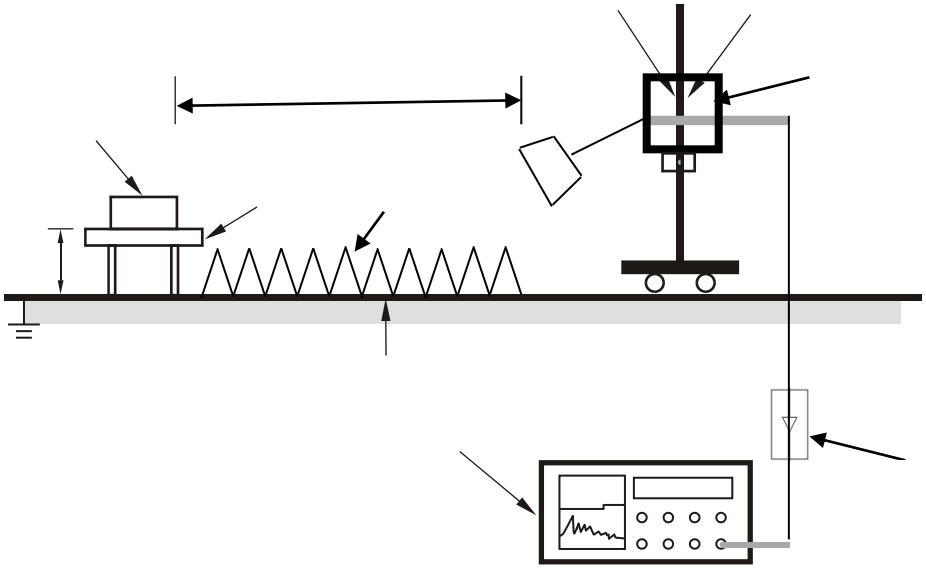
< Frequency Range below 30MHz >



< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.6.5 TEST RESULTS

NOTE： The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

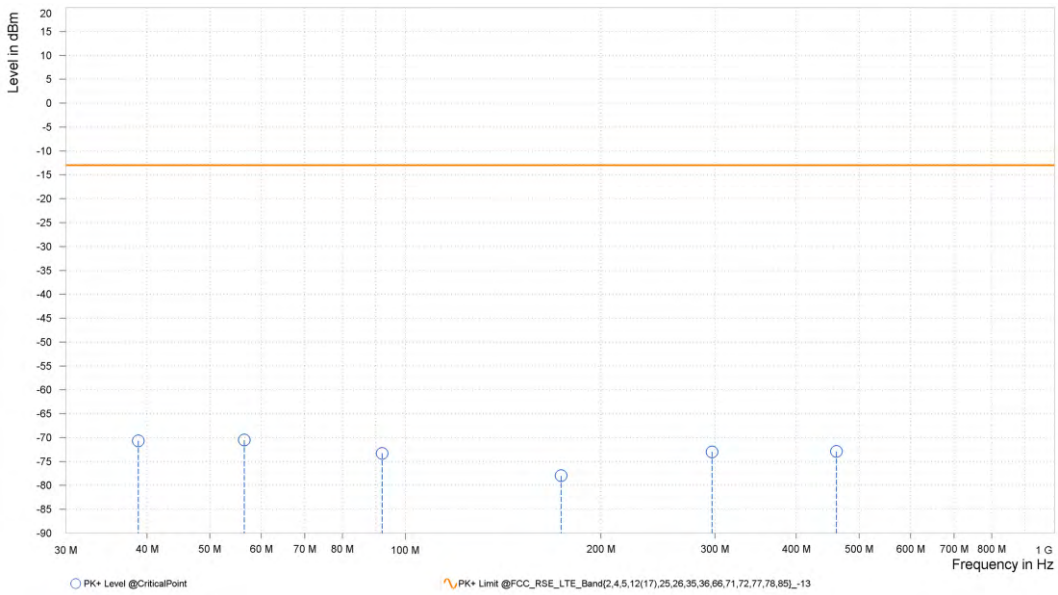
BELOW 1GHz WORST-CASE DATA

30 MHz – 1GHz data:

LTE Band 13
CHANNEL BANDWIDTH: 5MHz / QPSK

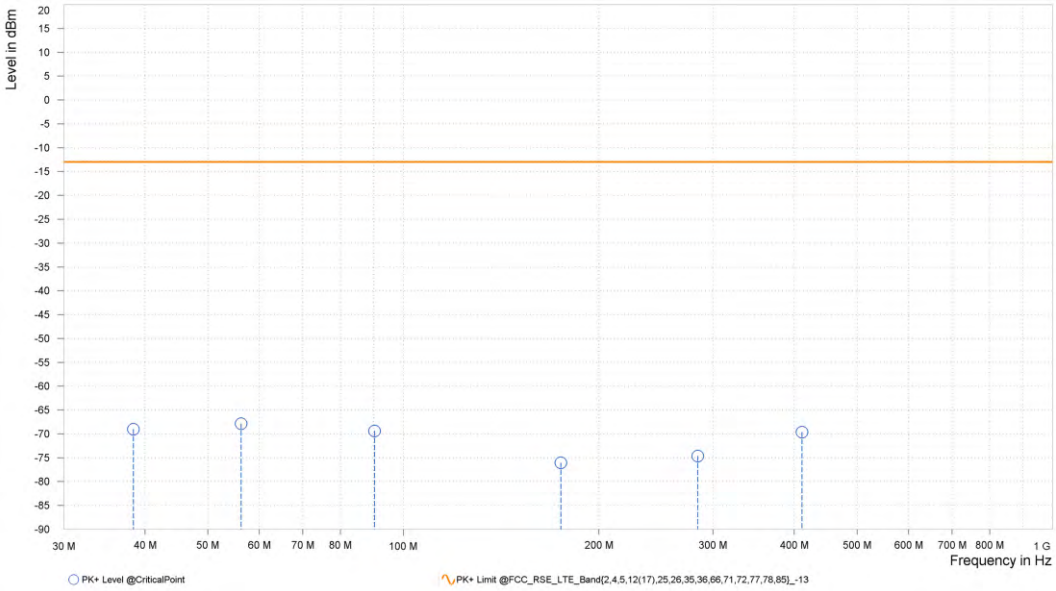
MODE	TX channel 23230	**FREQUENCY RANGE**	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	38.800	-70.66	-13.00	57.66	1.65	H	1	1.00
1	56.500	-70.51	-13.00	57.51	3.25	H	129.8	1.00
1	92.100	-73.28	-13.00	60.28	-1.63	H	229	2.00
1	173.750	-77.96	-13.00	64.96	-2.52	H	129.8	1.00
1	296.700	-72.99	-13.00	59.99	5.56	H	1	2.00
2	461.275	-72.91	-13.00	59.91	6.47	H	3	2.00



MODE	TX channel 23230	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	38.400	-69.03	-13.00	56.03	2.48	V	0.9	2.00
1	56.250	-67.85	-13.00	54.85	3.35	V	0.9	2.00
1	90.250	-69.39	-13.00	56.39	2.12	V	231.4	2.00
1	174.750	-76.05	-13.00	63.05	-1.01	V	5.2	1.00
1	284.250	-74.64	-13.00	61.64	3.91	V	359	2.00
1	411.150	-69.62	-13.00	56.62	7.06	V	324.7	1.00



ABOVE 1GHz

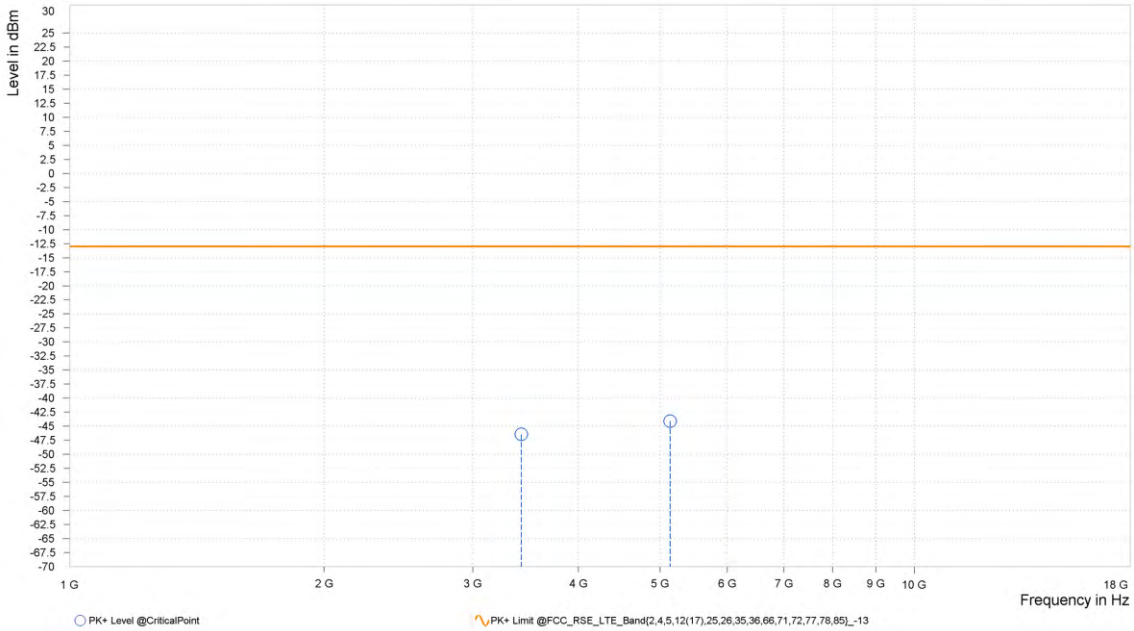
Note: For higher frequency, the emission is too low to be detected.

WCDMA Band IV:

CH 1312

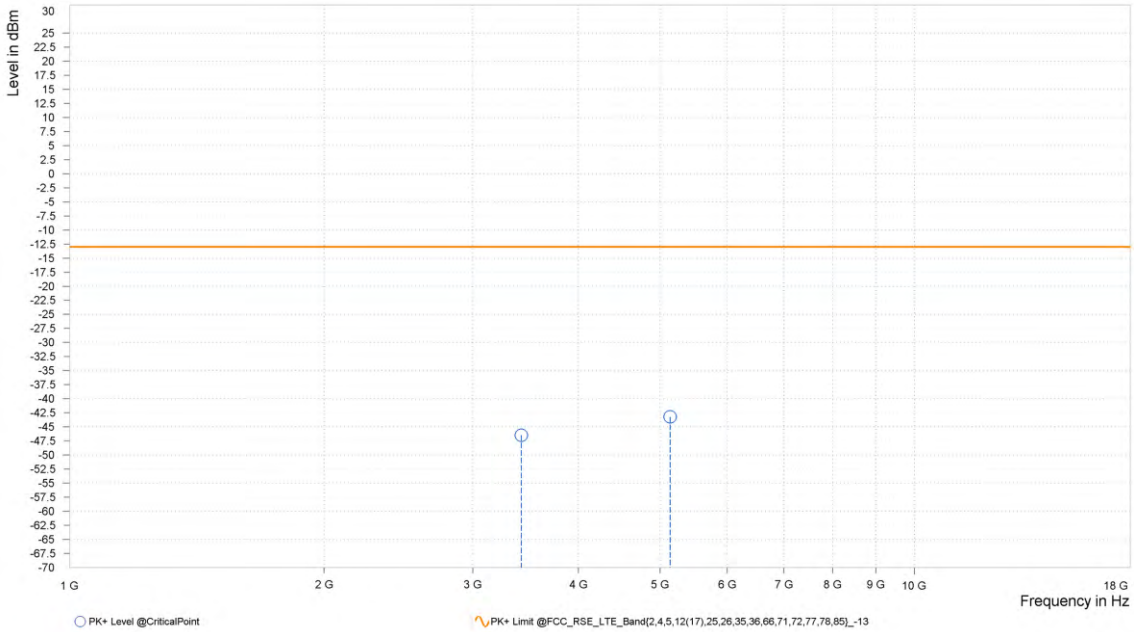
MODE	TX channel 1312	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	3,424.800	-46.44	-13.00	33.44	16.04	H	359.1	1.00
2	5,137.200	-44.09	-13.00	31.09	17.62	H	1	1.00



MODE	TX channel 1312	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

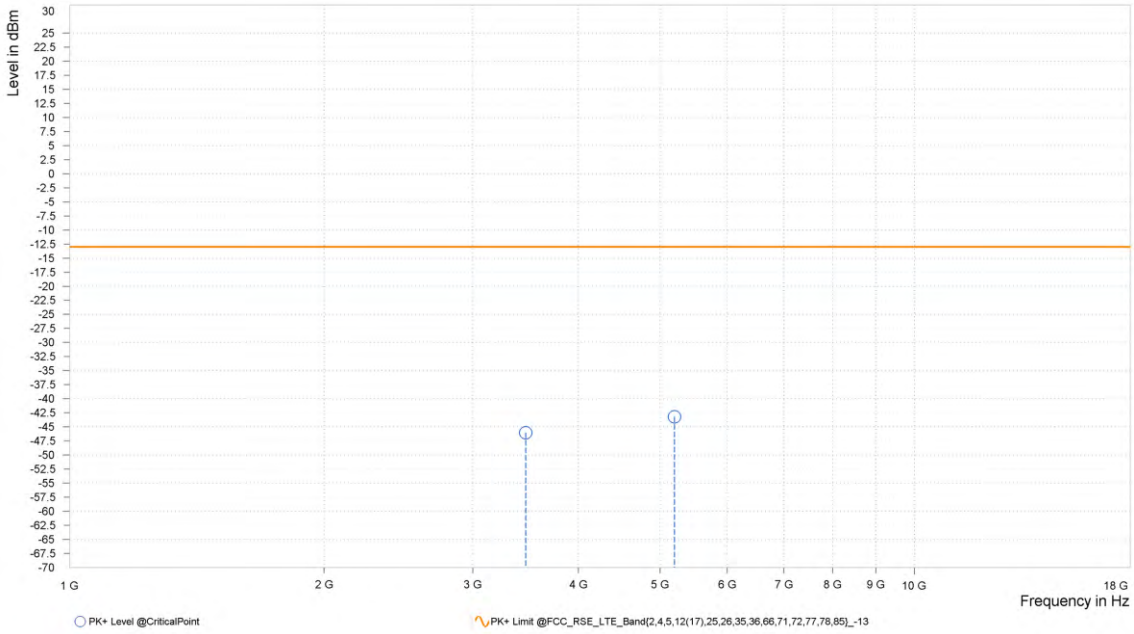
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	3,424.800	-46.47	-13.00	33.47	15.83	V	1	1.00
2	5,137.200	-43.21	-13.00	30.21	17.50	V	279.3	1.00



CH 1413

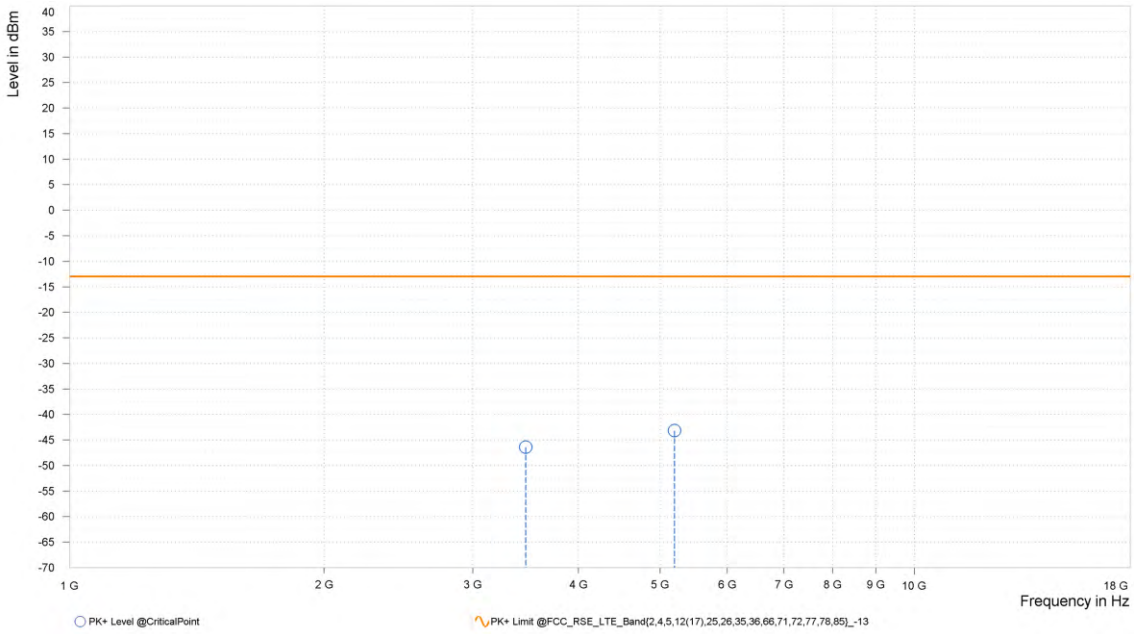
MODE	TX channel 1413	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	3,465.200	-46.01	-13.00	33.01	16.06	H	269.6	2.00
2	5,197.800	-43.20	-13.00	30.20	18.28	H	359	2.00



MODE	TX channel 1413	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

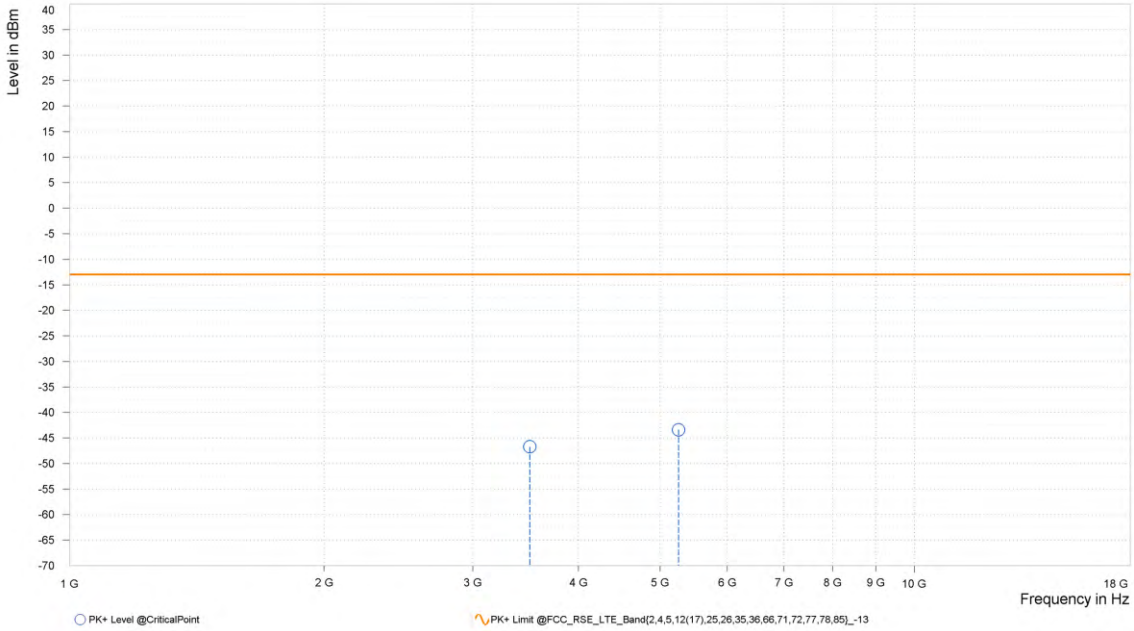
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	3,465.200	-46.42	-13.00	33.42	15.78	V	268.5	2.00
2	5,197.800	-43.18	-13.00	30.18	18.24	V	359.1	1.00



CH 1513

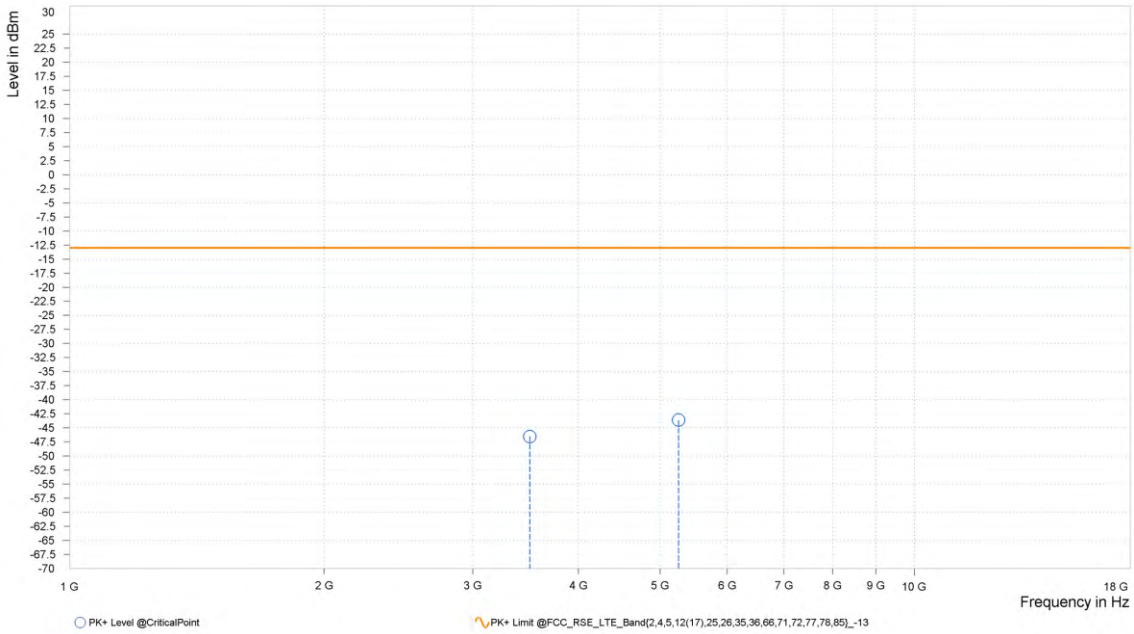
MODE	TX channel 1513	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	3,505.200	-46.71	-13.00	33.71	15.37	H	80.8	2.00
2	5,257.800	-43.40	-13.00	30.40	17.71	H	359	1.00



MODE	TX channel 1513	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

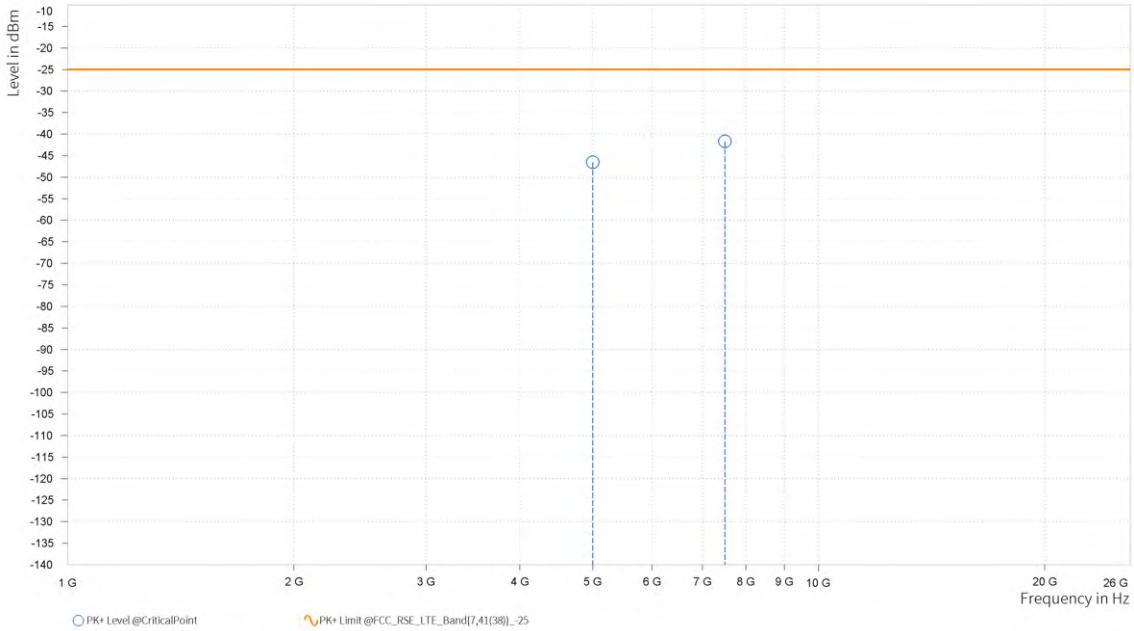
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	3,505.200	-46.53	-13.00	33.53	15.19	V	359	2.00
2	5,257.800	-43.62	-13.00	30.62	17.65	V	359	2.00



LTE Band 7
CHANNEL BANDWIDTH: 5MHz / QPSK
CH 20775

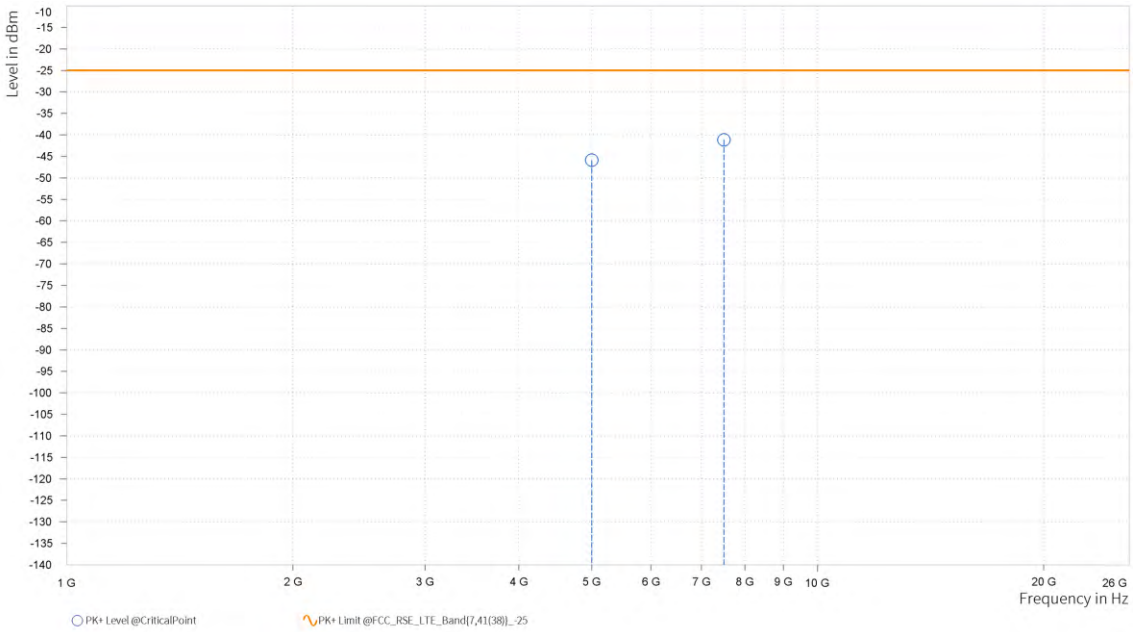
MODE	TX channel 20775	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	5,000.500	-46.56	-25.00	21.56	25.21	H	315	1.00
5	7,500.750	-41.67	-25.00	16.67	29.18	H	359.1	1.00



MODE	TX channel 20775	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

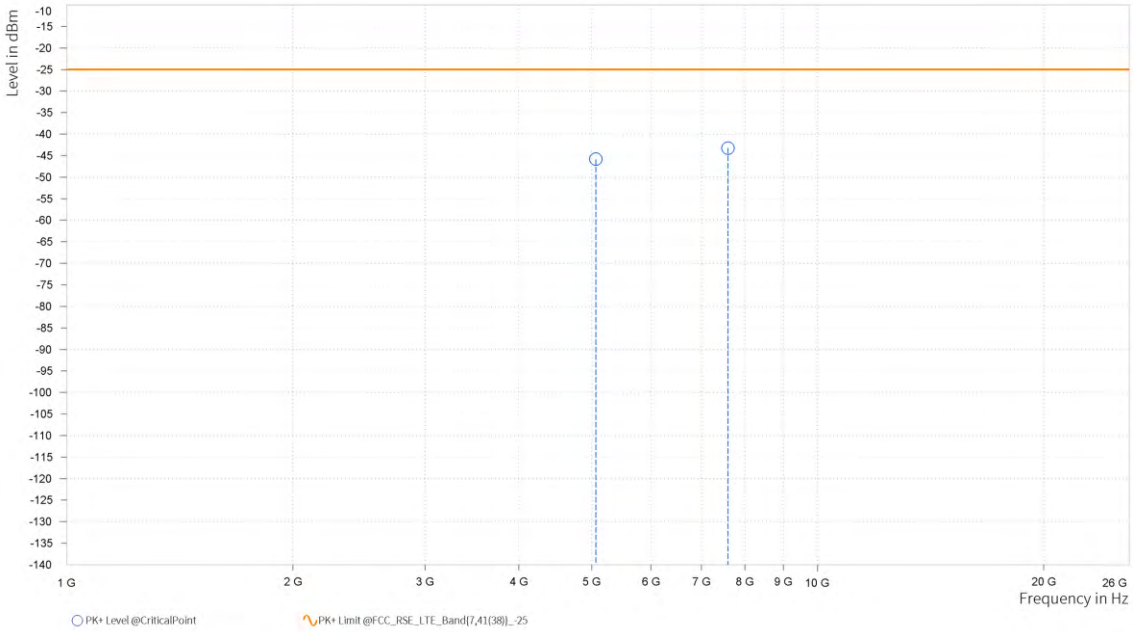
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	5,000.500	-45.89	-25.00	20.89	25.42	V	336.3	1.00
5	7,500.750	-41.15	-25.00	16.15	29.16	V	36.7	2.00



CH 21100

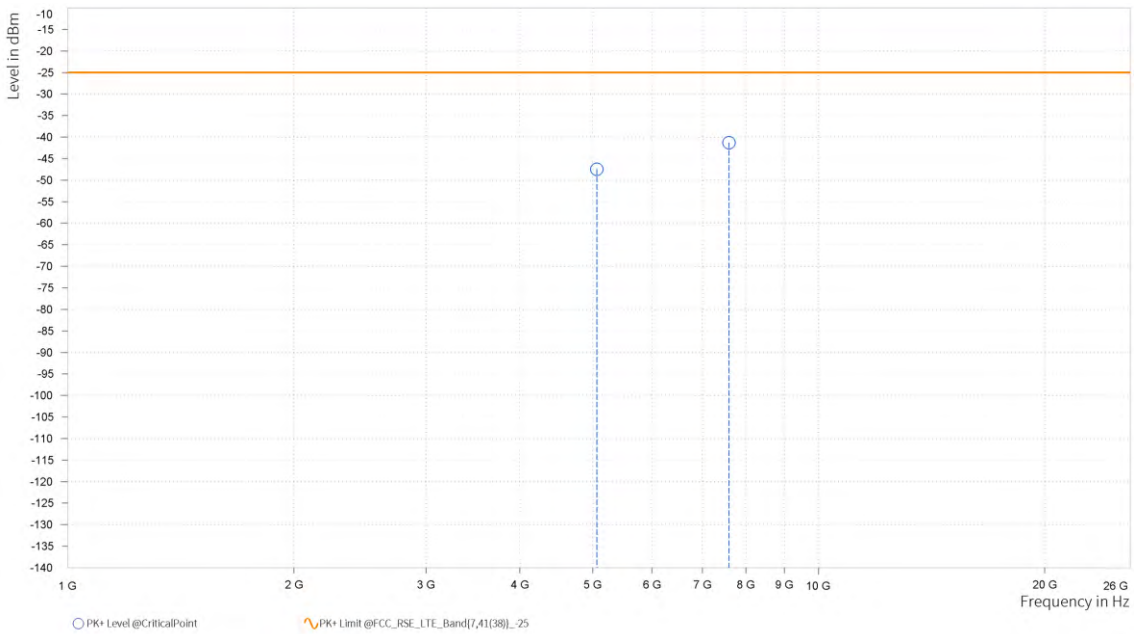
MODE	TX channel 21100	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	5,065.500	-45.81	-25.00	20.81	25.37	H	358.8	1.00
5	7,598.250	-43.26	-25.00	18.26	29.39	H	203.7	1.00



MODE	TX channel 21100	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

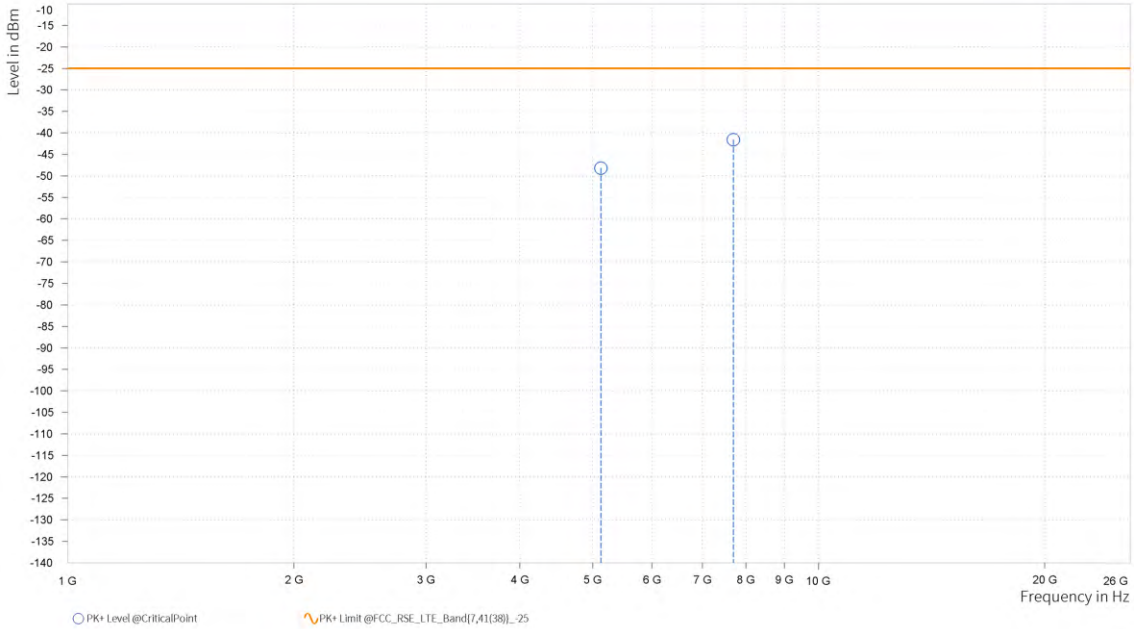
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	5,065.500	-47.45	-25.00	22.45	25.82	V	359	1.00
5	7,598.250	-41.28	-25.00	16.28	29.18	V	359	2.00



CH 21425

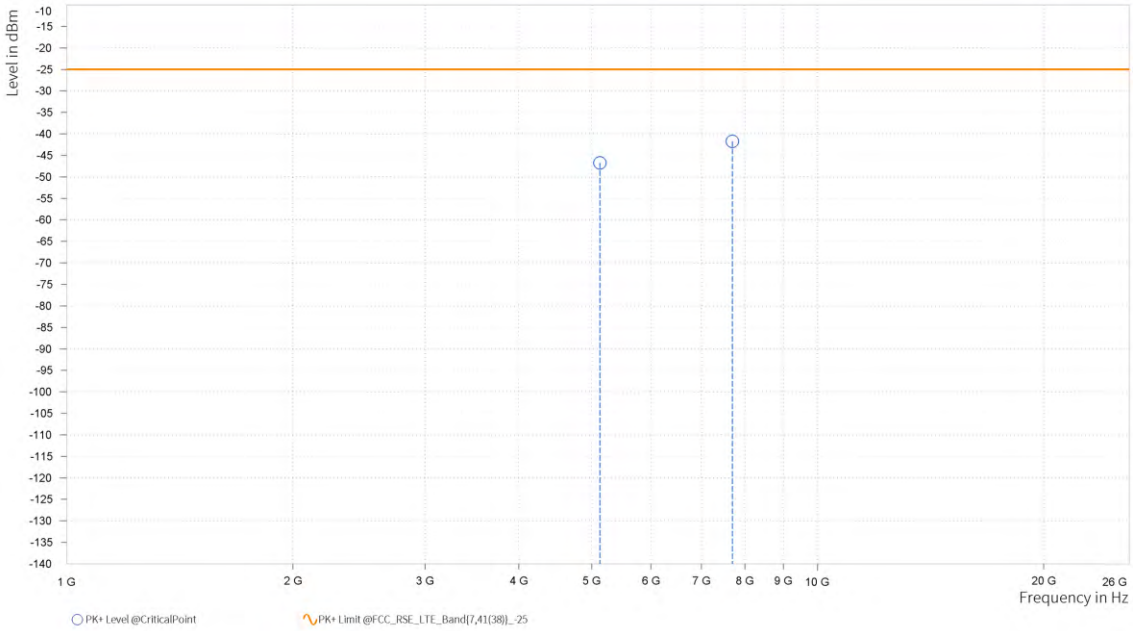
MODE	TX channel 21425	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	5,130.500	-48.20	-25.00	23.20	25.21	H	359	1.00
5	7,695.750	-41.58	-25.00	16.58	29.22	H	359	2.00



MODE	TX channel 21425	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

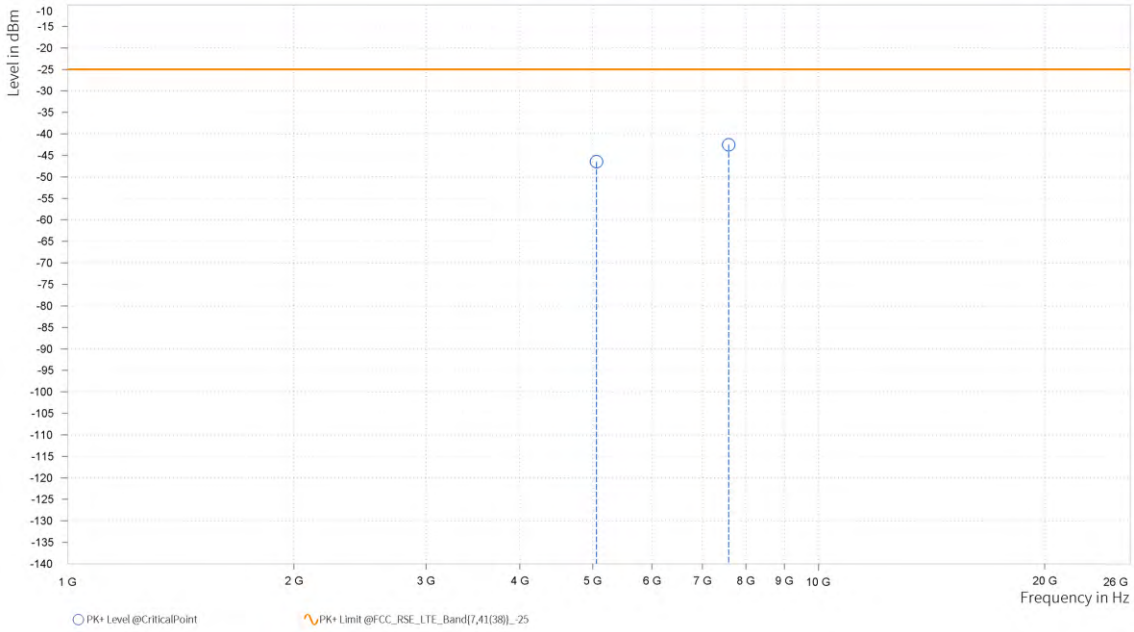
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	5,130.500	-46.72	-25.00	21.72	25.46	V	352.6	1.00
5	7,695.750	-41.72	-25.00	16.72	29.01	V	359	2.00



CHANNEL BANDWIDTH: 10MHz / QPSK

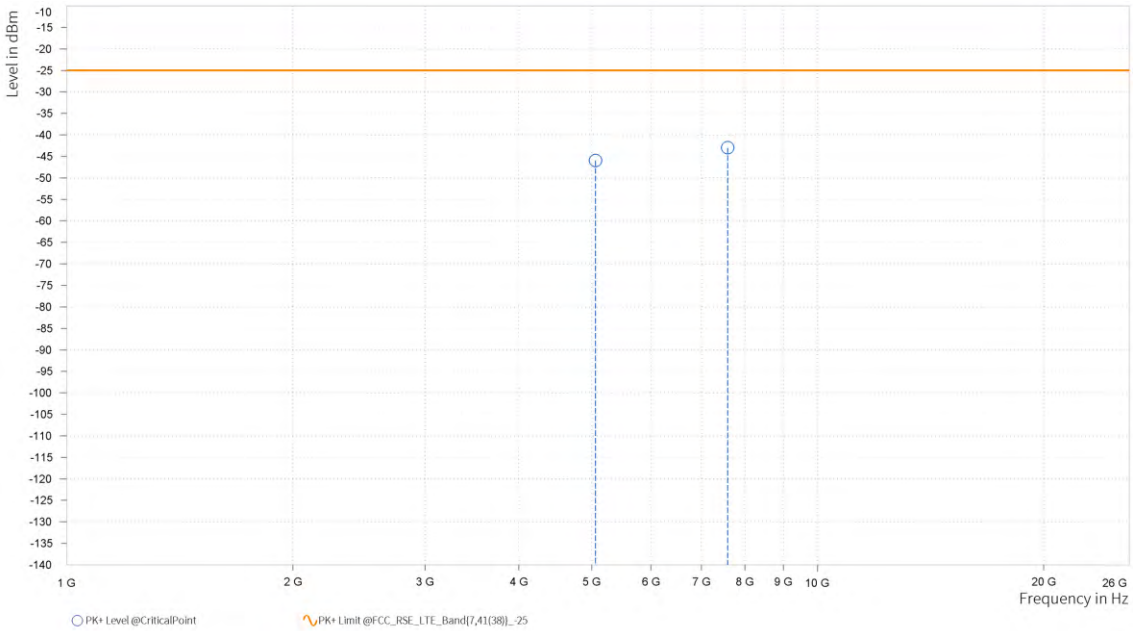
MODE	TX channel 21100	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	5,061.000	-46.48	-25.00	21.48	25.47	H	1.4	2.00
5	7,590.500	-42.52	-25.00	17.52	29.34	H	0.9	2.00



MODE	TX channel 21100	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

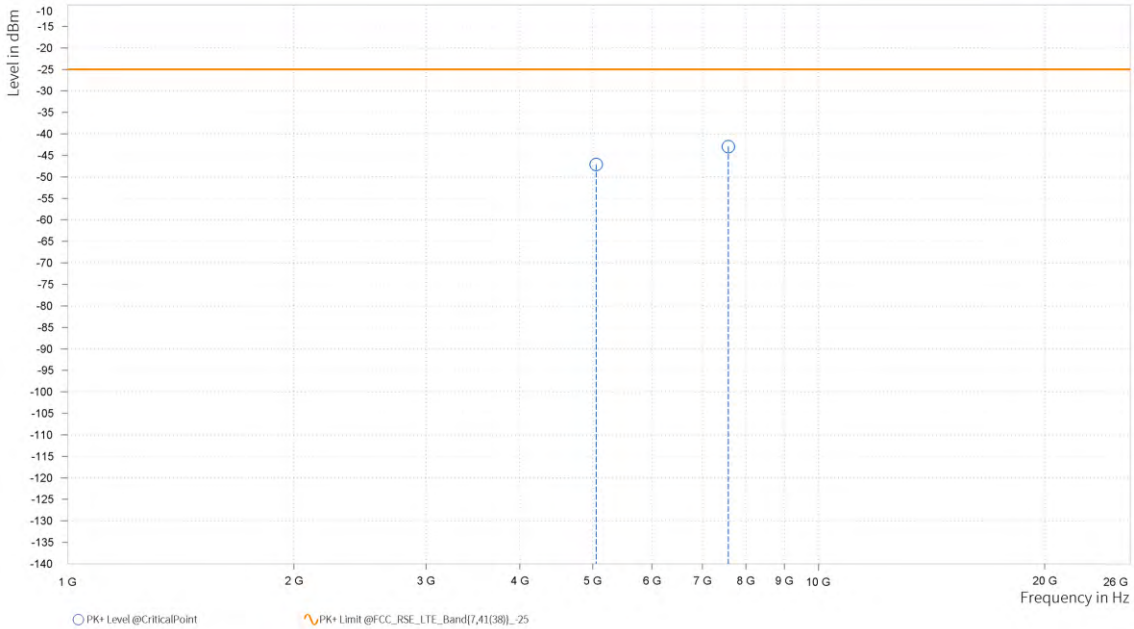
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	5,061.000	-45.96	-25.00	20.96	25.47	H	153.8	2.00
5	7,591.500	-42.98	-25.00	17.98	29.34	H	1.3	2.00



CHANNEL BANDWIDTH: 15MHz / QPSK

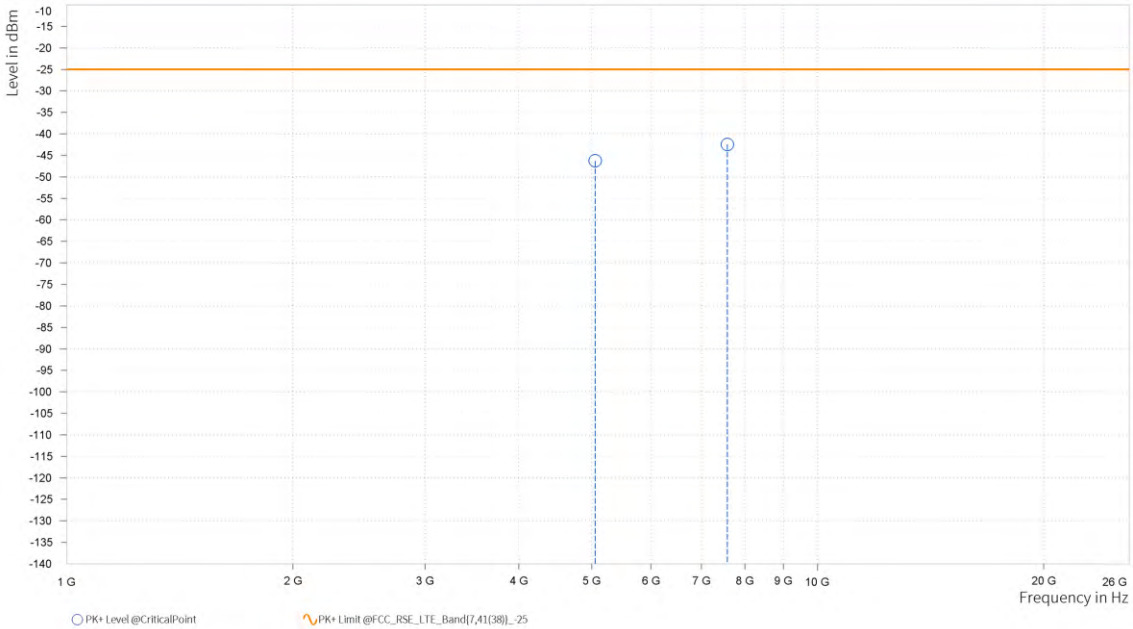
MODE	TX channel 21100	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	5,056.500	-47.10	-25.00	22.10	25.54	H	318.5	1.00
5	7,584.750	-42.94	-25.00	17.94	29.30	H	332.8	1.00



MODE	TX channel 21100	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

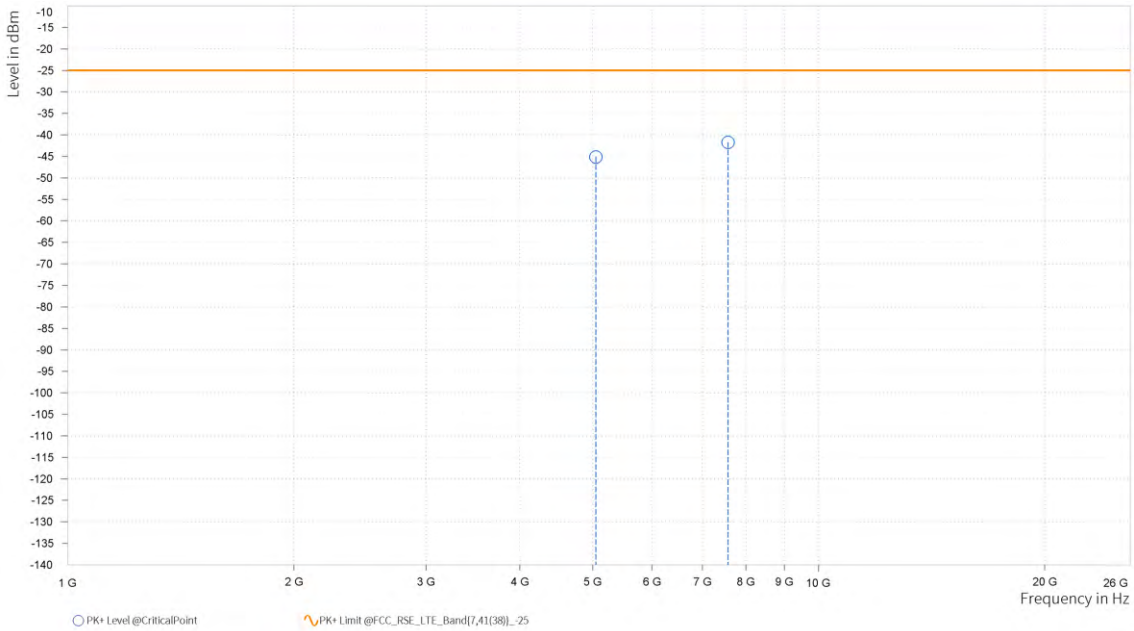
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	5,056.500	-46.27	-25.00	21.27	25.96	V	49.8	2.00
5	7,584.750	-42.43	-25.00	17.43	29.08	V	157.4	2.00



CHANNEL BANDWIDTH: 20MHz / QPSK

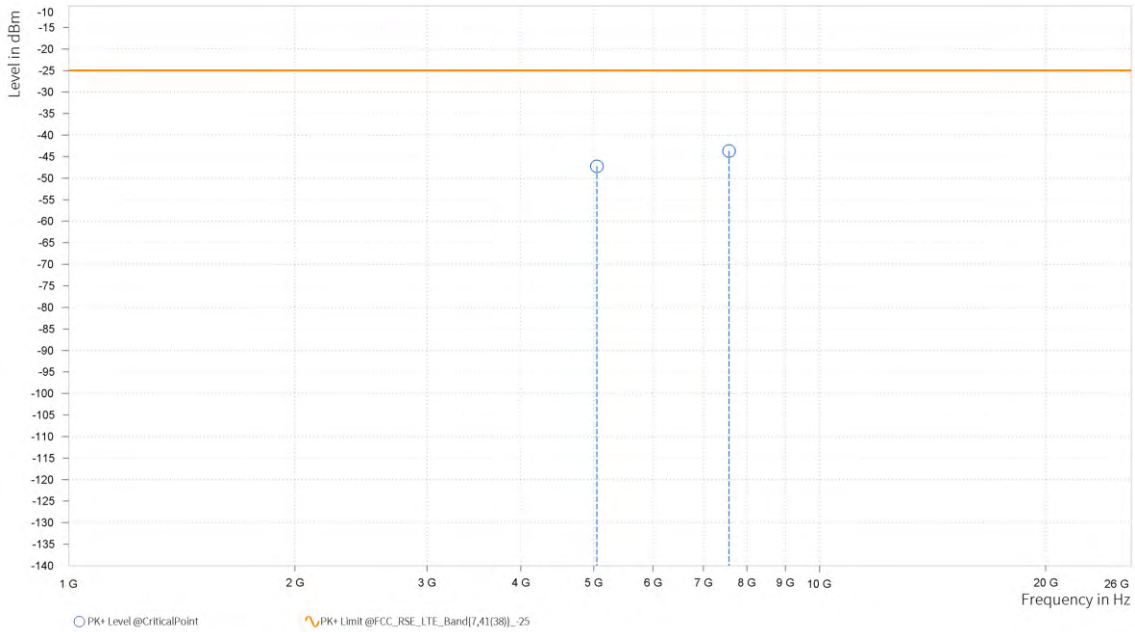
MODE	TX channel 21100	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	5,052.000	-45.12	-25.00	20.12	25.59	H	359	2.00
5	7,578.000	-41.71	-25.00	16.71	29.30	H	1	2.00



MODE	TX channel 21100	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	5,052.000	-47.24	-25.00	22.24	26.00	V	359	1.00
5	7,578.000	-43.70	-25.00	18.70	29.10	V	358.5	1.00



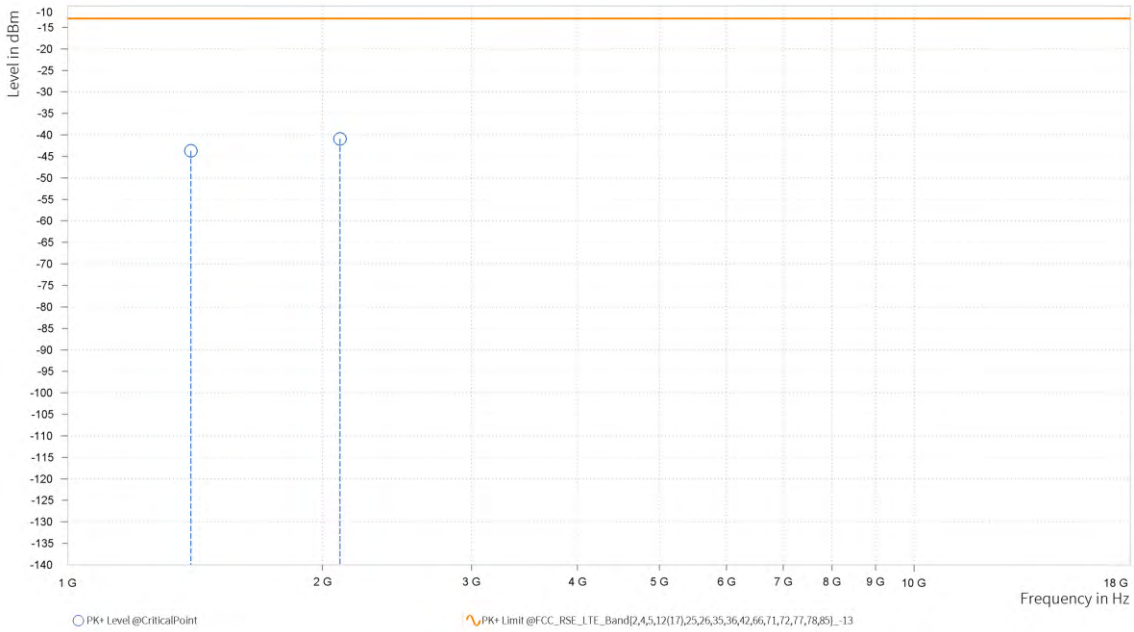
LTE BAND 12

CHANNEL BANDWIDTH: 1.4MHz / QPSK

CH23017

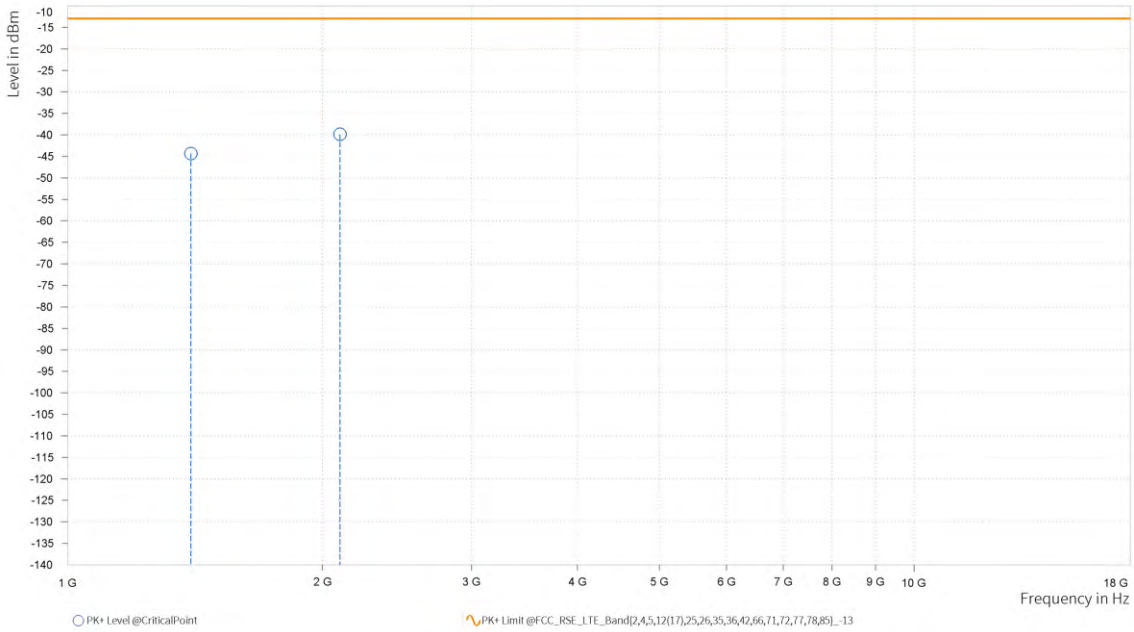
MODE	TX channel 23017	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,398.140	-43.71	-13.00	30.71	23.25	H	50.7	1.00
2	2,097.210	-40.91	-13.00	27.91	28.61	H	308.1	2.00



MODE	TX channel 23017	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

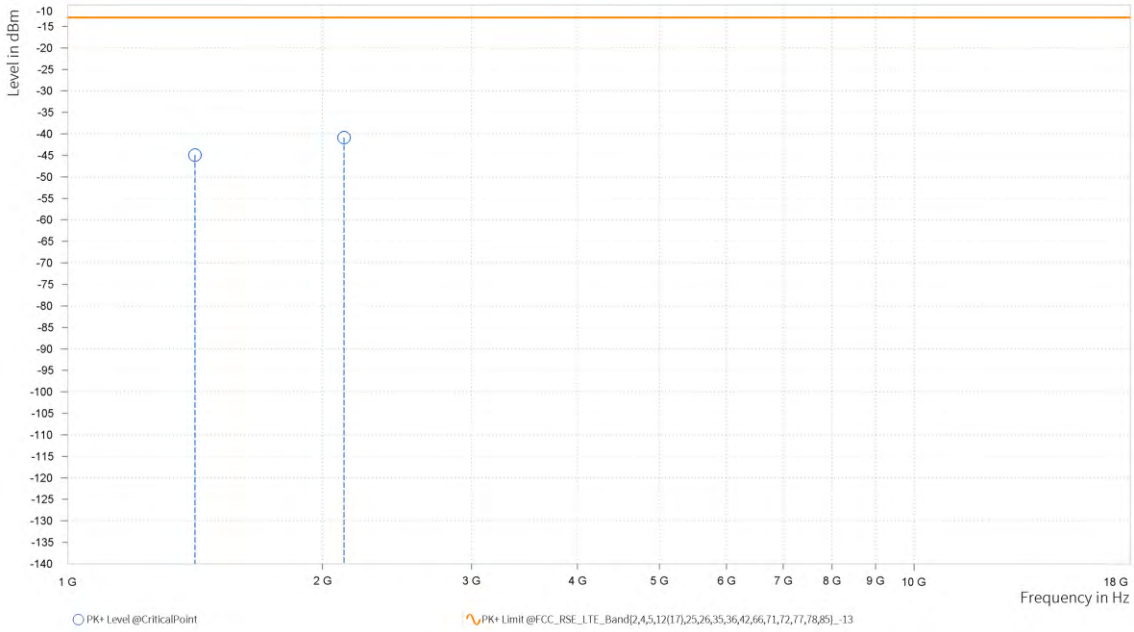
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,398.140	-44.32	-13.00	31.32	23.68	V	359.1	1.00
2	2,097.210	-39.88	-13.00	26.88	29.67	V	50.6	1.00



CH23095

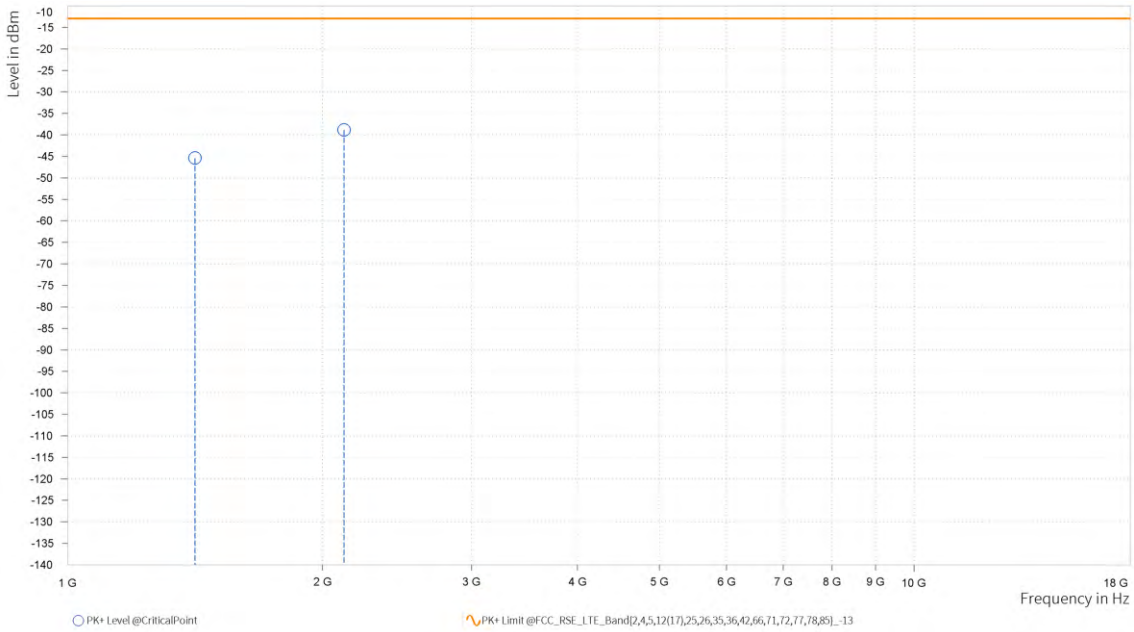
MODE	TX channel 23095	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,413.740	-44.90	-13.00	31.90	23.89	H	358.6	1.00
2	2,120.610	-40.85	-13.00	27.85	28.89	H	5	2.00



MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

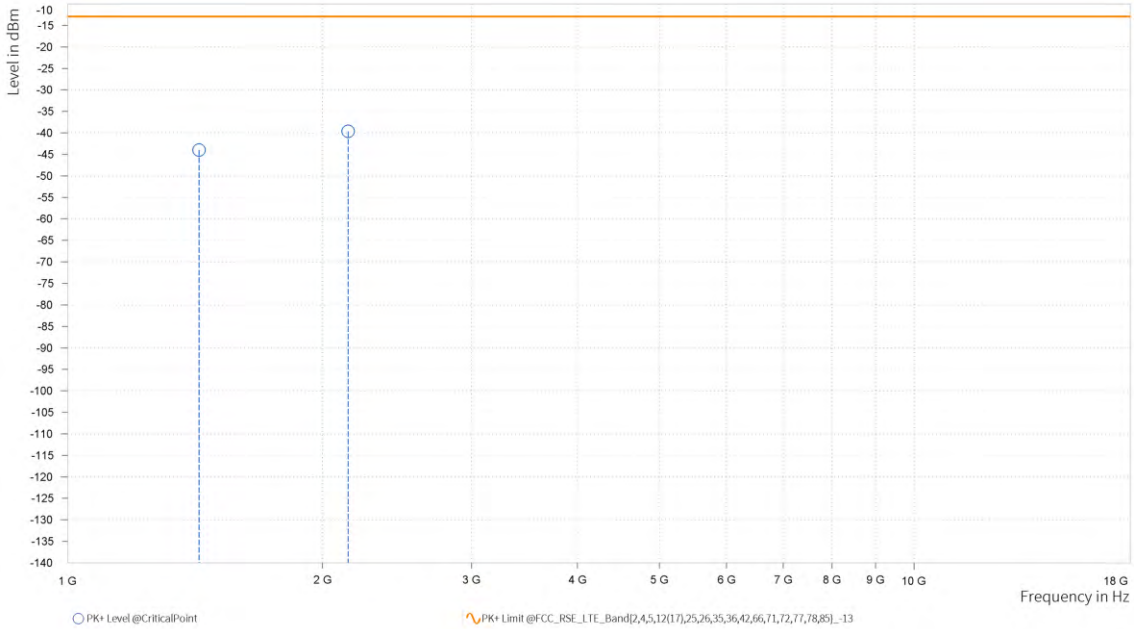
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,413.740	-45.39	-13.00	32.39	23.50	V	76.2	2.00
2	2,120.610	-38.84	-13.00	25.84	29.48	V	76.2	2.00

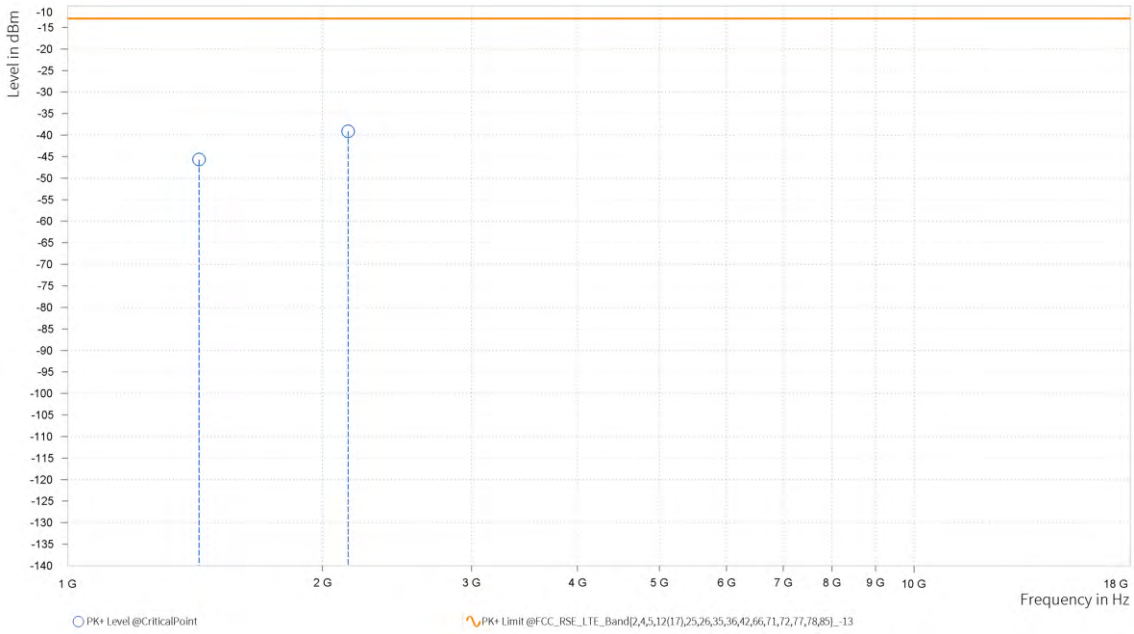


CH23173

MODE	TX channel 23173	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,429.340	-43.98	-13.00	30.98	23.87	H	51.8	1.00
2	2,144.010	-39.66	-13.00	26.66	29.67	H	358.2	1.00



MODE	TX channel 23173	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,429.340	-45.68	-13.00	32.68	23.33	V	1	1.00
2	2,144.010	-39.11	-13.00	26.11	29.29	V	285	1.00