

FCC TEST REPORT

(PART 27)

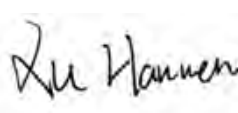
Applicant:	Foxx Development Inc
Address:	3480 Preston Ridge Road Suite 500, Alpharetta, GA 30005

Manufacturer or Supplier:	Foxx Development Inc
Address:	3480 Preston Ridge Road Suite 500, Alpharetta, GA 30005
Product:	LTE Cat 1bis Module
Brand Name:	FOXX
Model Name:	IQ10
FCC ID:	2AQRM-IQ10
Date of tests:	Feb. 07, 2025 ~ Feb. 28, 2025

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

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

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
	
Date: Feb. 28, 2025	Date: Feb. 28, 2025

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
PSZ-NQN2412300616RF03	Original release	Feb. 28, 2025

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(c)(10) §27.50(b)(10)	Effective Radiated Power (Band 12) (Band 13)	Compliance	A
§27.50(h)(2)	Equivalent Isotropically Radiated Power (Band 7)	Compliance	A
§2.1055 §27.54	Frequency Stability	Compliance	A
§2.1049	Occupied Bandwidth	Compliance	A
§2.1051 §27.53(c)(2) §27.53(g) §27.53(m)(4)	Conducted Band Edge Measurements (Band 7) (Band 12) (Band 13)	Compliance	A
§2.1051 §27.53(g) §27.53(c)(2) §27.53 (f) §27.53(m)(4)	Conducted Spurious Emissions (Band 7) (Band 12) (Band 13)	Compliance	A
§2.1053 §27.53(c)(2) §27.53(g) §27.53 (f) §27.53(m)(4)	Radiated Spurious Emissions (Band 7) (Band 12) (Band 13)	Compliance	A
§27.50	Peak to average ratio*	Compliance	A

* Refer to KDB 971168 D01 Power Meas License Digital Systems v03r01.

*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.

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

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

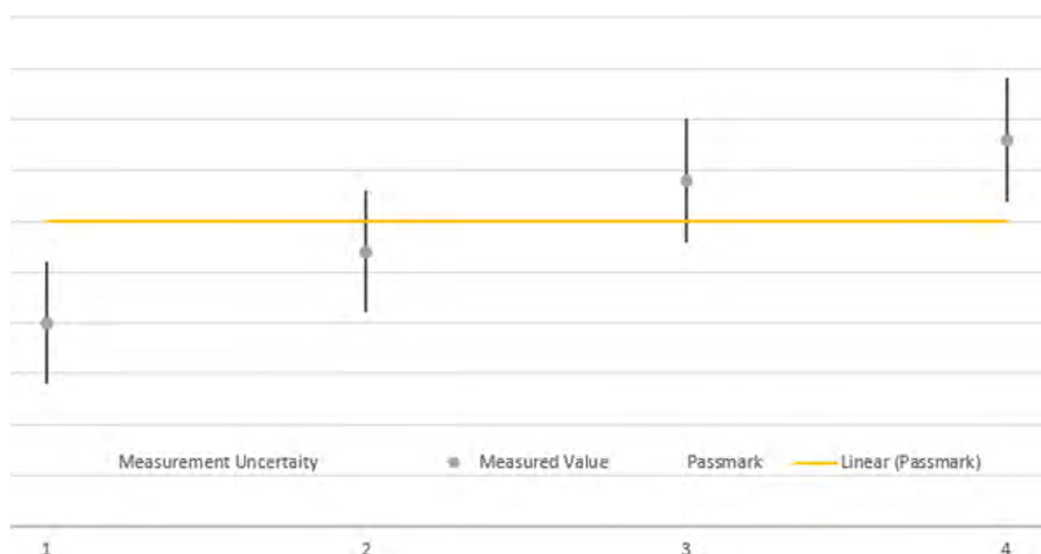
Tel: +86 (0557) 368 1008

1.1 MEASUREMENT 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.30,23	Aug.29,25
Pre-Amplifier	R&S	SCU08F1	101028	Jan.22,24	Jan.21,26
Vector Signal Generator	R&S	SMBV100B	102176	Mar.29,24	Mar.28,26
Signal Generator	R&S	SMB100A	182185	Mar.29,24	Mar.28,26
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	Mar.28,24	Mar.27,26
EMI TEST Receiver	R&S	ESW44	101973	Mar.28,24	Mar.27,26
Bilog Antenna	SCHWARZBECK	VULB 9163	1264	Dec.26,23	Dec.25,25
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.22,23	Aug.21,25
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Jul.15,24	Jul.14,26
Horn Antenna	Steatite Q-par Antennas	QMS 00208	23485	Aug.22,23	Aug.21,25
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.23,23	Feb.22,25
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.22,25	Feb.21,27
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.19,24	Jun.18,26
Test Software	EMC32	EMC32	N/A	N/A	N/A
6DB attenuator	Tonscend Technology Co., Ltd	N/A	23062787	N/A	N/A
Test Software	ELEKTRA	ELEKTRA4.32	N/A	N/A	N/A
Open Switch and Control Unit	R&S	OSP220	101964	N/A	N/A
DC Source	HYELEC	HY3010B	551016	Aug.31,23	Aug.30,25
Hygrothermograph	DELI	20210528	SZ014	Sep.06,23	Sep.05,25
PC	LENOVO	E14	HRSW0024	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-7.00M	N/A	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-4.00M	N/A	N/A	N/A
CABLE	R&S	W13.02	N/A	Apr.27,24	Apr.26,25
CABLE	R&S	W12.14	N/A	Apr.27,24	Apr.26,25
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.27,24	Apr.26,25
Temperature Chamber	votsch	VT4002	58566078100050	May.30,24	May.29,26



Test Report No.: PSZ-NQN2412300616RF03

- 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*	LTE Cat 1bis Module	
BRAND NAME*	FOXX	
MODEL NAME*	IQ10	
NOMINAL VOLTAGE*	EUT 3.8V	
MODULATION TECHNOLOGY	LTE	QPSK, 16QAM
FREQUENCY RANGE	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 13 Channel Bandwidth: 15MHz	782MHz
MAX. EIRP/ERP POWER	LTE Band 7 Channel Bandwidth: 5MHz	468.81mW
	LTE Band 7 Channel Bandwidth: 10MHz	465.59mW
	LTE Band 7 Channel Bandwidth: 15MHz	473.15mW
	LTE Band 7 Channel Bandwidth: 20MHz	476.43mW
	LTE Band 12 Channel Bandwidth: 1.4MHz	179.89mW
	LTE Band 12 Channel Bandwidth: 3MHz	181.97mW
	LTE Band 12 Channel Bandwidth: 5MHz	182.39mW
	LTE Band 12 Channel Bandwidth: 10MHz	184.93mW



MAX. EIRP/ERP POWER	LTE Band 13 Channel Bandwidth: 5MHz	228.03mW
	LTE Band 13 Channel Bandwidth: 10MHz	231.21mW
EMISSION DESIGNATOR	LTE Band 7 Channel Bandwidth: 5MHz	QPSK: 4M46G7D 16QAM: 4M46W7D
	LTE Band 7 Channel Bandwidth: 10MHz	QPSK: 8M91G7D 16QAM: 4M82W7D
	LTE Band 7 Channel Bandwidth: 15MHz	QPSK: 13M4G7D 16QAM: 4M84W7D
	LTE Band 7 Channel Bandwidth: 20MHz	QPSK: 17M8G7D 16QAM: 4M84W7D
	LTE Band 12 Channel Bandwidth: 1.4MHz	QPSK: 1M08G7D 16QAM: 1M08W7D
	LTE Band 12 Channel Bandwidth: 3MHz	QPSK: 2M68G7D 16QAM: 2M68W7D
	LTE Band 12 Channel Bandwidth: 5MHz	QPSK: 4M46G7D 16QAM: 4M46W7D
	LTE Band 12 Channel Bandwidth: 10MHz	QPSK: 8M92G7D 16QAM: 4M82W7D
	LTE Band 13 Channel Bandwidth: 5MHz	QPSK: 4M46G7D 16QAM: 4M46W7D
	LTE Band 13 Channel Bandwidth: 10MHz	QPSK: 8M90G7D 16QAM: 4M81W7D
	LTE BAND7	2.9dBi
	LTE BAND12	1.28dBi
	LTE BAND13	2.23dBi
ANTENNA TYPE*	PIFA Antenna	
HW VERSION*	V2.02	
SW VERSION*	2382B01IQ10M5A_M	
I/O PORTS*	Refer to user's manual	



CABLE SUPPLIED*	N/A
EXTREME TEMPERATURE*	-30-75 °C
EXTREME VOLTAGE*	3.4V - 4.2V

NOTE:

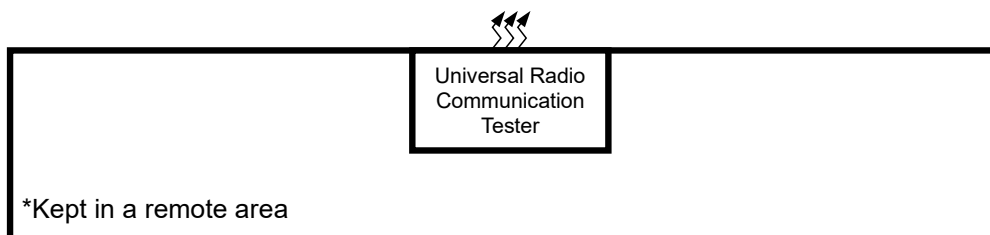
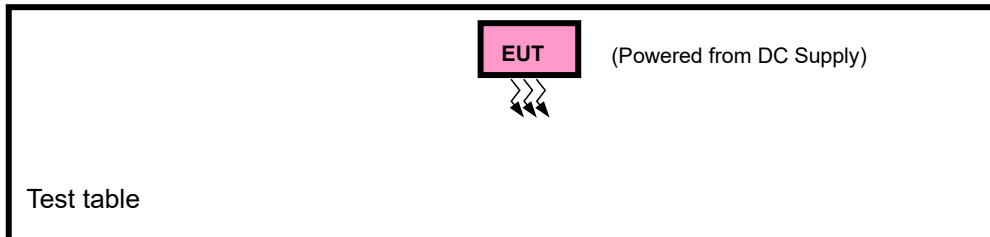
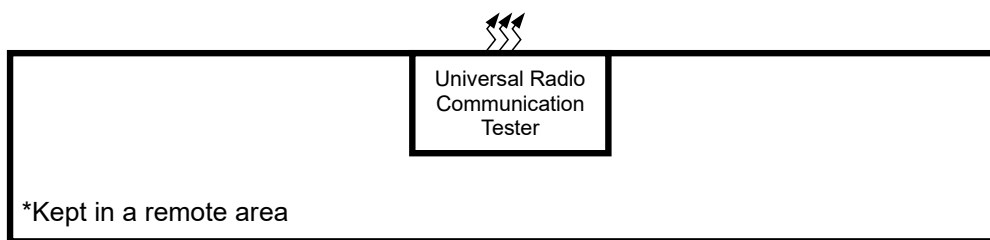
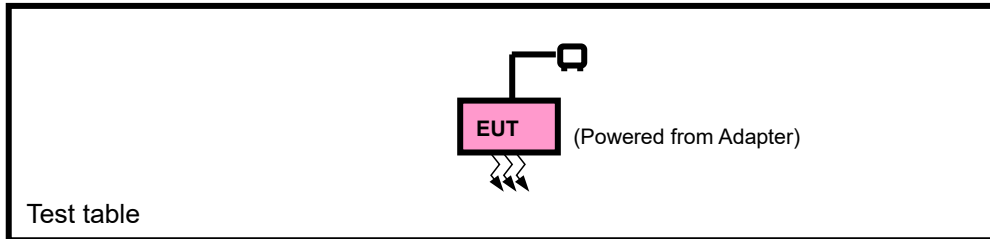
1. *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , Test Lab is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.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

MODULATION MODE	TX FUNCTION
LTE	1TX/1RX

4. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in the test report.

2.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION





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
2	DC Source	HYELEC	HY3010B	551016	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable, 1.0m;
2	N/A

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 with LTE link
B	EUT + DC Supply with LTE link

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	1 RB / 0 RB offset
		20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM	1 RB / 0 RB offset
		20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM	1 RB / 0 RB offset
		20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM	1 RB / 0 RB offset
B	FREQUENCY STABILITY	20850 to 21350	20850, 21100, 21350	20MHz	QPSK	100 RB / 0 RB offset
A	OCCUPIED BANDWIDTH	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM	25 RB / 0 RB offset
		20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM	50 RB / 0 RB offset 27 RB / 0 RB offset
		20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM	75 RB / 0 RB offset 27 RB / 0 RB offset
		20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM	100 RB / 0 RB offset 27 RB / 0 RB offset
A	PEAK TO AVERAGE RATIO	20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM	1 RB / 0 RB offset 100 RB / 0 RB offset 27 RB / 0 RB offset
A	BAND EDGE	20775 to 21425	20775	5MHz	QPSK, 16QAM	1 RB / 0 RB offset 25 RB / 0 RB offset
			21425	5MHz	QPSK, 16QAM	1 RB / 24 RB offset 25 RB / 0 RB offset
		20800 to 21400	20800	10MHz	QPSK, 16QAM	1 RB / 0 RB offset 50 RB / 0 RB offset



			21400	10MHz	QPSK, 16QAM	1 RB / 49 RB offset
						50 RB / 0 RB offset
		20825 to 21375	20825	15MHz	QPSK, 16QAM	1 RB / 0 RB offset
						75 RB / 0 RB offset
		20850 to 21350	21375	15MHz	QPSK, 16QAM	1 RB / 74 RB offset
						75 RB / 0 RB offset
			20850	20MHz	QPSK, 16QAM	1 RB / 0 RB offset
						100 RB / 0 RB offset
A	CONDCUETED EMISSION	20775 to 21425	20775, 21100, 21425	5MHz	QPSK	1 RB / 0 RB offset
		20800 to 21400	20800, 21100, 21400	10MHz	QPSK	1 RB / 0RB offset
		20825 to 21375	20825, 21100, 21375	15MHz	QPSK	1 RB / 0 RB offset
		20850 to 21350	20850, 21100, 21350	20MHz	QPSK	1 RB / 0 RB offset
A	RADIATED EMISSION	20775 to 21425	21100	5MHz	QPSK	1 RB / 0 RB offset
		20800 to 21400	20800, 21100, 21400	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: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

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	1 RB / 0 RB offset
		23025 to 23165	23025, 23095 ,23165	3MHz	QPSK, 16QAM	1 RB / 0 RB offset
		23035 to 23155	23035, 23095 ,23155	5MHz	QPSK, 16QAM	1 RB / 0 RB offset
		23060 to 23130	23060, 23095 ,23130	10MHz	QPSK, 16QAM	1 RB / 0 RB offset
B	FREQUENCY STABILITY	23060 to 23130	23060, 23095 ,23130	10MHz	QPSK, 16QAM	50 RB / 0 RB offset
A	OCCUPIED BANDWIDTH	23017 to 23173	23017, 23095 , 23173	1.4MHz	QPSK, 16QAM	6 RB / 0 RB offset
		23025 to 23165	23025, 23095 ,23165	3MHz	QPSK, 16QAM	15 RB / 0 RB offset
		23035 to 23155	23035, 23095 ,23155	5MHz	QPSK, 16QAM	25 RB / 0 RB offset
		23060 to 23130	23060, 23095 ,23130	10MHz	QPSK, 16QAM	50 RB / 0 RB offset 27 RB / 0 RB offset



A	PEAK TO AVERAGE RATIO	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	1 RB / 0 RB offset 50 RB / 0 RB offset
A	BAND EDGE	23017 to 23173	23017	1.4MHz	QPSK, 16QAM	1 RB / 0 RB offset 6 RB / 0 RB offset
			23173	1.4MHz	QPSK, 16QAM	1 RB / 5 RB offset 6 RB / 0 RB offset
		23025 to 23165	23025	3MHz	QPSK, 16QAM	1 RB / 0 RB offset 15 RB / 0 RB offset
			23165	3MHz	QPSK, 16QAM	1 RB / 14 RB offset 15 RB / 0 RB offset
		23035 to 23155	23035	5MHz	QPSK, 16QAM	1 RB / 0 RB offset 25 RB / 0 RB offset
			23155	5MHz	QPSK, 16QAM	1 RB / 24 RB offset 25 RB / 0 RB offset
		23060 to 23130	23060	10MHz	QPSK, 16QAM	1 RB / 0 RB offset 50 RB / 0 RB offset
			23130	10MHz	QPSK, 16QAM	1 RB / 49 RB offset 50 RB / 0 RB offset
A	CONDCUDED EMISSION	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK	1 RB / 0 RB offset
		23025 to 23165	23025, 23095, 23165	3MHz	QPSK	1 RB / 0 RB offset
		23035 to 23155	23035, 23095, 23155	5MHz	QPSK	1 RB / 0 RB offset
		23060 to 23130	23060, 23095, 23130	10MHz	QPSK	1 RB / 0 RB offset
A	RADIATED EMISSION	23017 to 23173	23095	1.4MHz	QPSK	1 RB / 0 RB offset
		23025 to 23165	23025, 23095, 23165	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: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

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	1 RB / 0 RB offset
		23230	23230	10MHz	QPSK, 16QAM	1 RB / 0 RB offset
B	FREQUENCY STABILITY	23230	23230	10MHz	QPSK, 16QAM	50 RB / 0 RB offset
A	OCCUPIED BANDWIDTH	23205 to 23255	23205, 20175, 23255	5MHz	QPSK, 16QAM	25 RB / 0 RB offset



		23230	23230	10MHz	QPSK,16QAM	50 RB / 0 RB offset 27 RB / 0 RB offset
A	PEAK TO AVERAGE RATIO	23230	23230	10MHz	QPSK,16QAM	1 RB / 0 RB offset 50 RB / 0 RB offset 27 RB / 0 RB offset
A	BAND EDGE	23205 to 23255	23205	5MHz	QPSK,16QAM	1 RB / 0 RB offset 25 RB / 0 RB offset
			23255	5MHz	QPSK,16QAM	1 RB / 24 RB offset 25 RB / 0 RB offset
		23230	23230	10MHz	QPSK,16QAM	1 RB / 0 RB offset 1 RB / 49 RB offset 50 RB / 0 RB offset
A	CONDCUETED EMISSION	23205 to 23255	23205, 20175, 23255	5MHz	QPSK	1 RB / 0 RB offset
		23230	23230	10MHz	QPSK	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: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

TEST CONDITION			
TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
EIRP/ ERP	23deg. C, 70%RH	EUT 3.8V	Hanwen Xu
FREQUENCY STABILITY	23deg. C, 70%RH	DC 3.0V/3.8V/4.2V By DC Supply	Hanwen Xu
OCCUPIED BANDWIDTH	23deg. C, 70%RH	EUT 3.8V	Hanwen Xu
BAND EDGE	23deg. C, 70%RH	EUT 3.8V	Hanwen Xu
CONDCUETED EMISSION	23deg. C, 70%RH	EUT 3.8V	Hanwen Xu
RADIATED EMISSION	23deg. C, 70%RH	EUT 3.8V	Hanwen Xu
PEAK TO AVERAGE RATIO	23deg. C, 70%RH	EUT 3.8V	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

§27.50(h)(2)

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.

§27.50(c)(10)

Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

§27.50(b)(10)

Portable stations (hand-held devices) transmitting in the 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 determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_T - L_C$$

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.

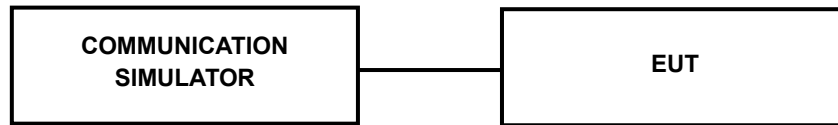
CONDUCTED POWER MEASUREMENT:

- The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- 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)

LTE Band 7						
Band/BW	Modulation	RB Size	RB offset	Low CH 20775	Mid CH 21100	High CH 21425
				Frequency 2502.5 MHz	Frequency 2535 MHz	Frequency 2567.5 MHz
7/ 5	QPSK	1	0	23.22	23.26	23.37
		1	12	23.74	23.56	23.81
		1	24	23.26	23.12	23.03
		12	0	22.42	22.52	22.60
		12	6	22.53	22.47	22.69
		12	13	22.62	22.59	22.62
		25	0	22.50	22.53	22.61
	16QAM	1	0	21.82	21.65	21.70
		1	12	22.45	22.18	22.36
		1	24	22.09	22.05	22.12
		12	0	21.98	21.86	22.10
		12	6	22.18	22.16	22.13
		12	13	22.26	22.20	21.97
		25	0	21.82	21.73	21.94
Band/BW	Modulation	RB Size	RB offset	Low CH 20800	Mid CH 21100	High CH 21400
				Frequency 2505 MHz	Frequency 2535 MHz	Frequency 2565 MHz
7/ 10	QPSK	1	0	23.20	23.29	23.34
		1	24	23.78	23.55	23.74
		1	49	23.35	23.05	23.13
		25	0	22.49	22.53	22.58
		25	12	22.60	22.55	22.69
		25	25	22.52	22.47	22.63
		50	0	22.62	22.52	22.57
	16QAM	1	0	21.86	21.72	21.78
		1	12	22.45	22.23	22.38
		1	24	22.05	22.02	22.23
		12	0	21.89	21.90	21.98
		12	17	22.21	22.16	22.07
		12	36	22.35	22.11	22.09
		27	0	21.83	21.71	21.93



LTE Band 7						
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	23.21	23.30	23.26
		1	37	23.84	23.56	23.85
		1	74	23.33	23.11	23.05
		36	0	22.42	22.48	22.61
		36	19	22.60	22.50	22.60
		36	39	22.65	22.56	22.58
		75	0	22.61	22.55	22.64
	16QAM	1	0	21.78	21.67	21.73
		1	12	22.40	22.28	22.27
		1	24	22.07	22.12	22.19
		12	0	21.94	21.96	22.03
		12	30	22.24	22.12	22.06
		12	61	22.24	22.15	22.07
		27	0	21.77	21.76	21.82
Band/BW	Modulation	RB Size	RB offset	Low CH 20850	Mid CH 21100	High CH 21350
				Frequency 2510 MHz	Frequency 2535 MHz	Frequency 2560 MHz
7/ 20	QPSK	1	0	23.29	23.32	23.39
		1	50	23.87	23.65	23.88
		1	99	23.39	23.16	23.18
		50	0	22.57	22.63	22.71
		50	25	22.64	22.61	22.74
		50	50	22.66	22.60	22.66
		100	0	22.65	22.64	22.69
	16QAM	1	0	21.91	21.79	21.81
		1	50	22.54	22.31	22.41
		1	99	22.18	22.13	22.26
		12	0	21.99	22.01	22.11
		12	42	22.28	22.19	22.16
		12	86	22.38	22.23	22.12
		27	0	21.86	21.84	21.95



LTE Band 12						
Band/BW	Modulation	RB Size	RB offset	Low CH 23017	Mid CH 23095	High CH 23173
				Frequency 699.7 MHz	Frequency 707.5 MHz	Frequency 715.3 MHz
12/ 1.4	QPSK	1	0	23.03	22.90	22.45
		1	2	23.14	22.74	23.42
		1	5	22.48	23.03	23.02
		3	0	23.55	22.37	22.54
		3	1	23.63	22.30	23.22
		3	3	23.12	22.58	23.35
		6	0	22.23	21.93	22.41
	16QAM	1	0	21.57	21.44	21.51
		1	2	22.28	21.90	22.00
		1	5	21.82	21.83	21.84
		3	0	21.62	21.68	21.75
		3	1	22.07	21.84	21.93
		3	3	22.07	21.95	21.72
		6	0	21.58	21.56	21.52
Band/BW	Modulation	RB Size	RB offset	Low CH 23025	Mid CH 23095	High CH 23165
				Frequency 700.5 MHz	Frequency 707.5 MHz	Frequency 714.5 MHz
12/ 3	QPSK	1	0	22.91	22.99	22.33
		1	7	23.06	22.78	23.47
		1	14	22.38	23.03	22.99
		8	0	23.06	21.77	22.00
		8	3	23.12	21.77	22.62
		8	7	22.60	21.98	22.89
		15	0	22.21	21.86	22.49
	16QAM	1	0	21.57	21.45	21.52
		1	7	22.19	21.91	22.02
		1	14	21.80	21.83	21.88
		8	0	21.68	21.61	21.80
		8	3	22.03	21.82	21.85
		8	7	22.12	21.98	21.70
		15	0	21.60	21.47	21.51



LTE Band 12						
Band/BW	Modulation	RB Size	RB offset	Low CH 23035	Mid CH 23095	High CH 23155
				Frequency 701.5 MHz	Frequency 707.5 MHz	Frequency 713.5 MHz
12/ 5	QPSK	1	0	22.98	22.87	22.32
		1	12	23.07	22.78	23.48
		1	24	22.37	22.96	22.95
		12	0	22.92	21.72	22.04
		12	6	23.08	21.83	22.61
		12	13	22.50	22.04	22.79
		25	0	22.25	21.91	22.43
	16QAM	1	0	21.67	21.44	21.58
		1	12	22.31	21.92	21.99
		1	24	21.82	21.79	21.98
		12	0	21.71	21.60	21.77
		12	6	21.95	21.88	21.86
		12	13	22.13	21.92	21.78
		25	0	21.50	21.47	21.61
Band/BW	Modulation	RB Size	RB offset	Low CH 23060	Mid CH 23095	High CH 23130
				Frequency 704 MHz	Frequency 707.5 MHz	Frequency 711 MHz
12/ 10	QPSK	1	0	23.05	23.01	22.47
		1	24	23.16	22.89	23.54
		1	49	22.52	23.06	23.07
		25	0	23.07	21.87	22.14
		25	12	23.15	21.89	22.71
		25	25	22.63	22.05	22.93
		50	0	22.26	22.00	22.53
	16QAM	1	0	21.69	21.54	21.59
		1	12	22.33	22.01	22.10
		1	24	21.95	21.91	21.99
		12	0	21.77	21.75	21.83
		12	17	22.08	21.89	21.95
		12	36	22.19	22.03	21.83
		27	0	21.61	21.62	21.64



LTE Band 13						
Band/BW	Modulation	RB Size	RB offset	Low CH 23205	Mid CH 23230	High CH 23255
				Frequency 779.5 MHz	Frequency 782.0 MHz	Frequency 784.5 MHz
13/ 5	QPSK	1	0	23.38	23.42	23.50
		1	12	22.81	22.72	22.72
		1	24	23.03	23.15	23.10
		12	0	22.20	22.18	22.30
		12	6	22.11	22.05	22.13
		12	13	22.03	21.99	22.10
		25	0	22.13	22.18	22.20
	16QAM	1	0	22.67	22.73	22.81
		1	12	22.41	22.51	22.43
		1	24	22.11	22.20	22.16
		12	0	22.37	22.31	22.44
		12	6	22.17	22.27	22.19
		12	13	22.18	22.16	22.22
		25	0	21.24	21.26	21.24
Band/BW	Modulation	RB Size	RB offset		Mid CH 23230	
				/	Frequency 782.0 MHz	/
13/ 10	QPSK	1	0	/	23.03	/
		1	24	/	23.56	/
		1	49	/	23.01	/
		25	0	/	22.47	/
		25	12	/	22.64	/
		25	25	/	22.51	/
		50	0	/	22.53	/
	16QAM	1	0	/	22.71	/
		1	12	/	22.42	/
		1	24	/	22.29	/
		12	0	/	22.42	/
		12	17	/	22.40	/
		12	36	/	22.25	/
		27	0	/	21.33	/



EIRP/ ERP

LTE BAND 7						
5MHz QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20775	2502.5	23.74	2.9	26.64	461.32	2
21100	2535	23.56	2.9	26.46	442.59	2
21425	2567.5	23.81	2.9	26.71	468.81	2

5MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20775	2502.5	22.45	2.9	25.35	342.77	2
21100	2535	22.20	2.9	25.1	323.59	2
21425	2567.5	22.36	2.9	25.26	335.74	2

10MHz QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20800	2505	23.78	2.9	26.68	465.59	2
21100	2535	23.55	2.9	26.45	441.57	2
21400	2565	23.74	2.9	26.64	461.32	2

10MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20800	2505	22.45	2.9	25.35	342.77	2
21100	2535	22.23	2.9	25.13	325.84	2
21400	2565	22.38	2.9	25.28	337.29	2



15MHz QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20825	2507.5	23.84	2.9	26.74	472.06	2
21100	2535	23.56	2.9	26.46	442.59	2
21375	2562.5	23.85	2.9	26.75	473.15	2

15MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20825	2507.5	22.40	2.9	25.3	338.84	2
21100	2535	22.28	2.9	25.18	329.61	2
21375	2562.5	22.27	2.9	25.17	328.85	2

20MHz QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20850	2510	23.87	2.9	26.77	475.34	2
21100	2535	23.65	2.9	26.55	451.86	2
21350	2560	23.88	2.9	26.78	476.43	2

20MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20850	2510	22.54	2.9	25.44	349.95	2
21100	2535	22.31	2.9	25.21	331.89	2
21350	2560	22.41	2.9	25.31	339.63	2

LTE BAND 12

1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23017	699.7	23.53	1.28	22.66	184.5	3
23095	707.5	23.03	1.28	22.16	164.44	3
23173	715.3	23.42	1.28	22.55	179.89	3

1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23017	699.7	22.28	1.28	21.41	138.36	3
23095	707.5	21.95	1.28	21.08	128.23	3
23173	715.3	22.00	1.28	21.13	129.72	3

3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23025	700.5	23.12	1.28	22.25	167.88	3
23095	707.5	23.03	1.28	22.16	164.44	3
23165	714.5	23.47	1.28	22.6	181.97	3

3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23025	700.5	22.19	1.28	21.32	135.52	3
23095	707.5	21.98	1.28	21.11	129.12	3
23165	714.5	22.02	1.28	21.15	130.32	3

5MHz QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23035	701.5	23.08	1.28	22.21	166.34	3
23095	707.5	22.96	1.28	22.09	161.81	3
23155	713.5	23.48	1.28	22.61	182.39	3

5MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23035	701.5	22.31	1.28	21.44	139.32	3
23095	707.5	21.92	1.28	21.05	127.35	3
23155	713.5	21.99	1.28	21.12	129.42	3

10MHz QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23060	704	23.16	1.28	22.29	169.43	3
23095	707.5	23.06	1.28	22.19	165.58	3
23130	711	23.54	1.28	22.67	184.93	3

10MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23060	704	22.33	1.28	21.46	139.96	3
23095	707.5	22.03	1.28	21.16	130.62	3
23130	711	22.10	1.28	21.23	132.74	3

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

**LTE BAND 13****5MHz QPSK**

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23205	779.5	23.38	2.23	23.46	221.82	3
23230	782	23.42	2.23	23.5	223.87	3
23255	784.5	23.50	2.23	23.58	228.03	3

5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23205	779.5	22.67	2.23	22.75	188.36	3
23230	782	22.73	2.23	22.81	190.99	3
23255	784.5	22.81	2.23	22.89	194.54	3

10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23230	782	23.56	2.23	23.64	231.21	3

10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23230	782	22.71	2.23	22.79	190.11	3

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



3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

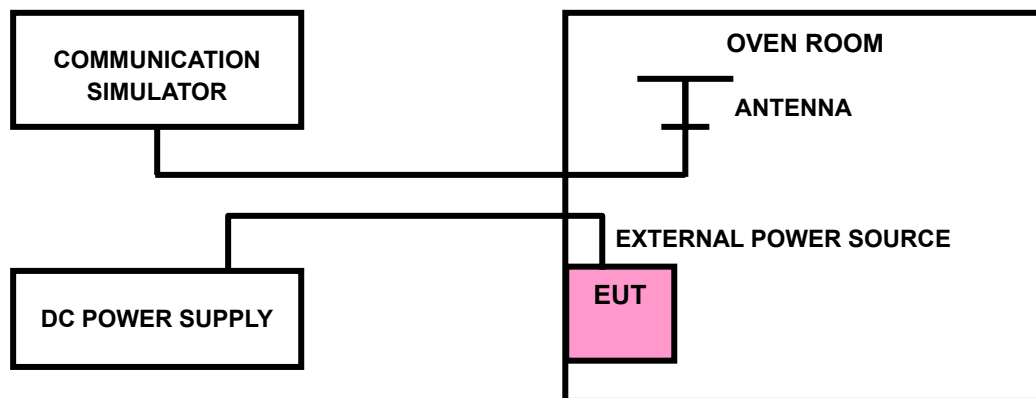
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

3.2.2 TEST PROCEDURE

- 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.
- 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.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ 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.

3.3.3 TEST SETUP





3.2.3 TEST RESULTS

Please Refer to Appendix of this test report.

Note: VL = Low voltage(3.4V); VN/NV = Normal voltage(3.8V); VH = High voltage(4.2V);

NT = Normal temperature (25°C)

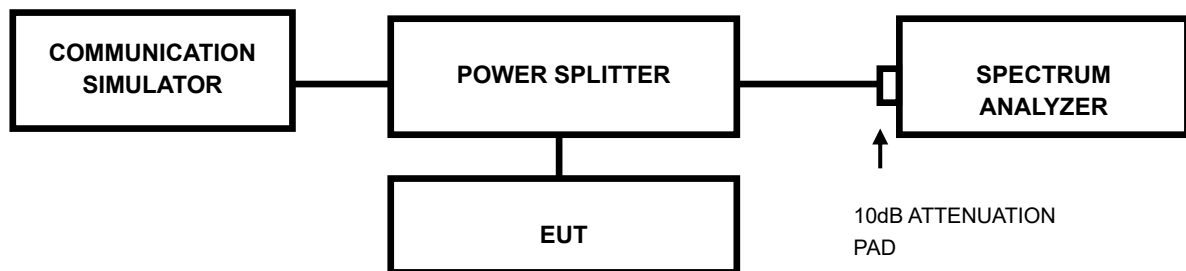


3.3 OCCUPIED BANDWIDTH MEASUREMENT

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

- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- 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

§27.53(m)(4)

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.

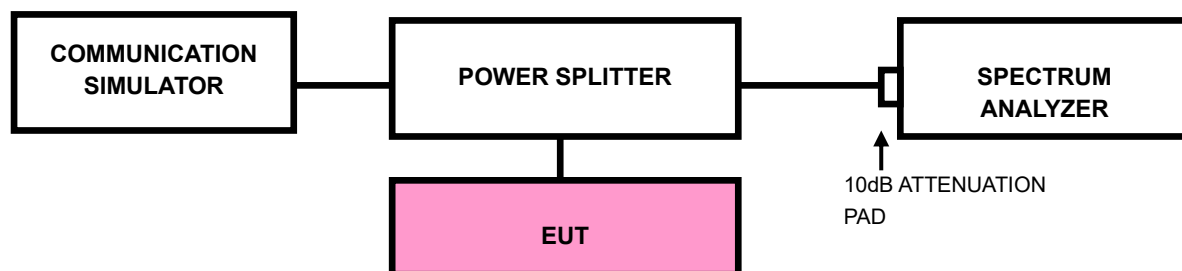
§27.53(g)

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.

§27.53(c)(2)(4)

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 $65 + 10 \log 10p(P)$, dB, for mobile and portable equipment.

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) $\geq 1\%$ 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 $\geq 3 \times$ 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 .

47 CFR 27.53(f)

For operations in the 746–758 MHz, 775–788 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

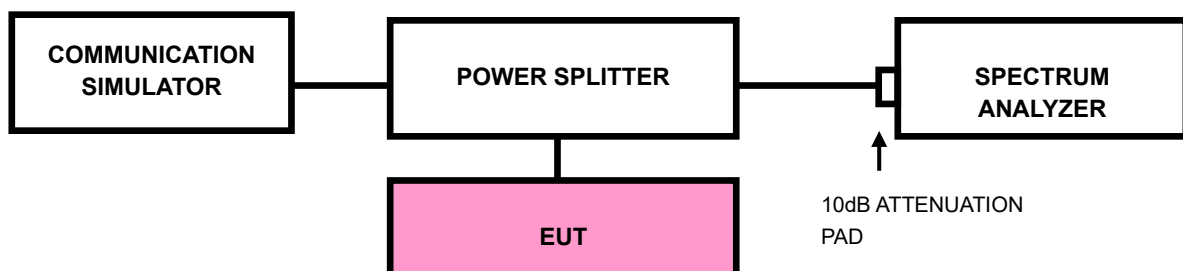
For: LTE Band7

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

3.5.2 TEST PROCEDURE

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

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

47 CFR 27.53(f)

For operations in the 746–758 MHz, 775–788 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

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,
$$\text{E.R.P power} = \text{E.I.P.R power} - 2.15\text{dBi}.$$

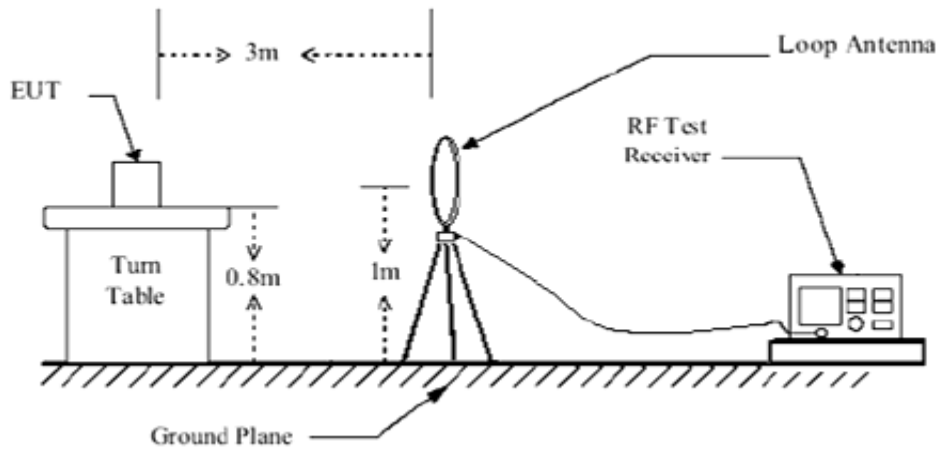
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

3.6.3 DEVIATION FROM TEST STANDARD

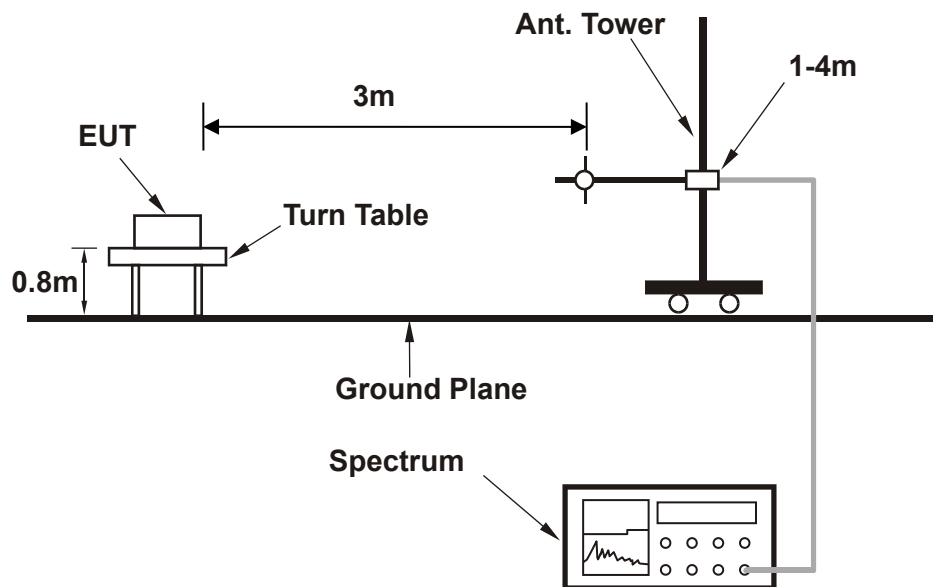
No deviation

3.6.4 TEST SETUP

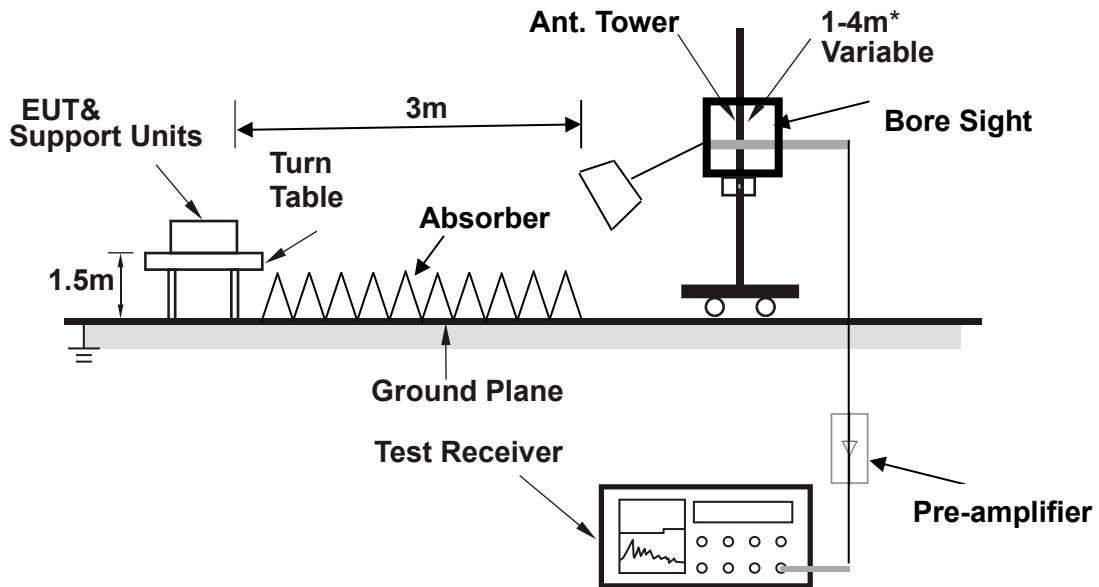
< Frequency Range below 30MHz >



< 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

LTE Band 13 CHANNEL BANDWIDTH: 50MHz / QPSK								
MODE	TX channel 23230		FREQUENCY RANGE		30MHz~1GHz			
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH		INPUT POWER		120Vac 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	37.300	-66.99	-13.00	53.99	0.20	H	185.8	1.00
1	58.900	-72.00	-13.00	59.00	-3.87	H	185.8	1.00
1	153.000	-71.47	-13.00	58.47	-14.35	H	185.8	1.00
1	228.850	-74.27	-13.00	61.27	0.81	H	134.7	2.00
1	335.050	-77.22	-13.00	64.22	-2.95	H	208.8	2.00
1	432.500	-74.35	-13.00	61.35	2.25	H	268.2	1.00

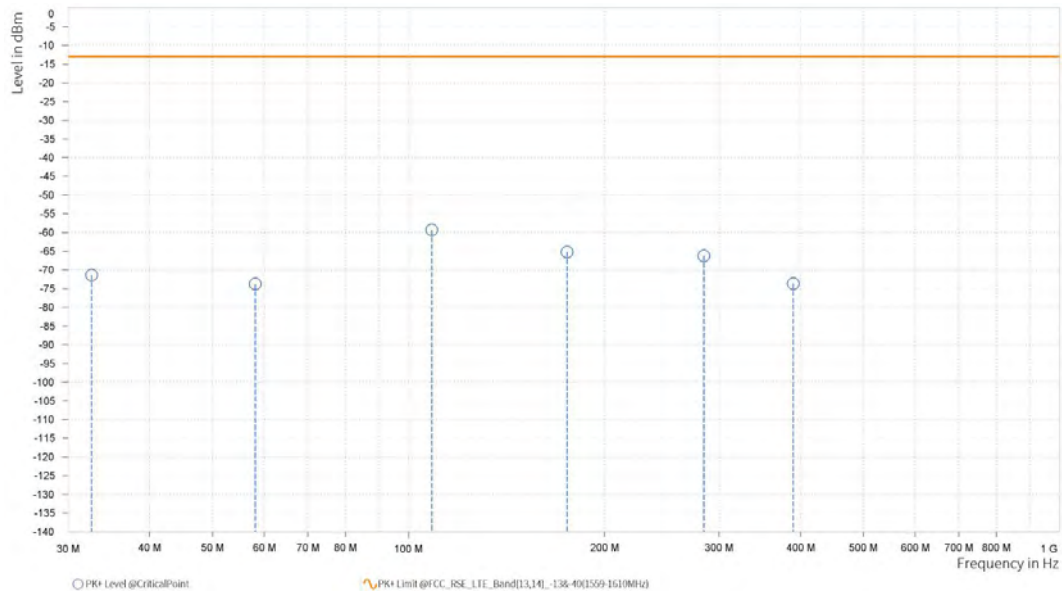
Level in dBm



MODE	TX channel 23230	FREQUENCY RANGE	30MHz~1GHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 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	32.600	-71.37	-13.00	58.37	-7.67	V	121.2	1.00
1	58.150	-73.77	-13.00	60.77	-3.61	V	69	2.00
1	108.550	-59.30	-13.00	46.30	1.46	V	345.2	1.00
1	175.250	-65.22	-13.00	52.22	-9.43	V	212.5	2.00
1	284.050	-66.24	-13.00	53.24	-1.19	V	212.5	2.00
1	389.750	-73.67	-13.00	60.67	0.34	V	282.6	1.00



ABOVE 1GHz

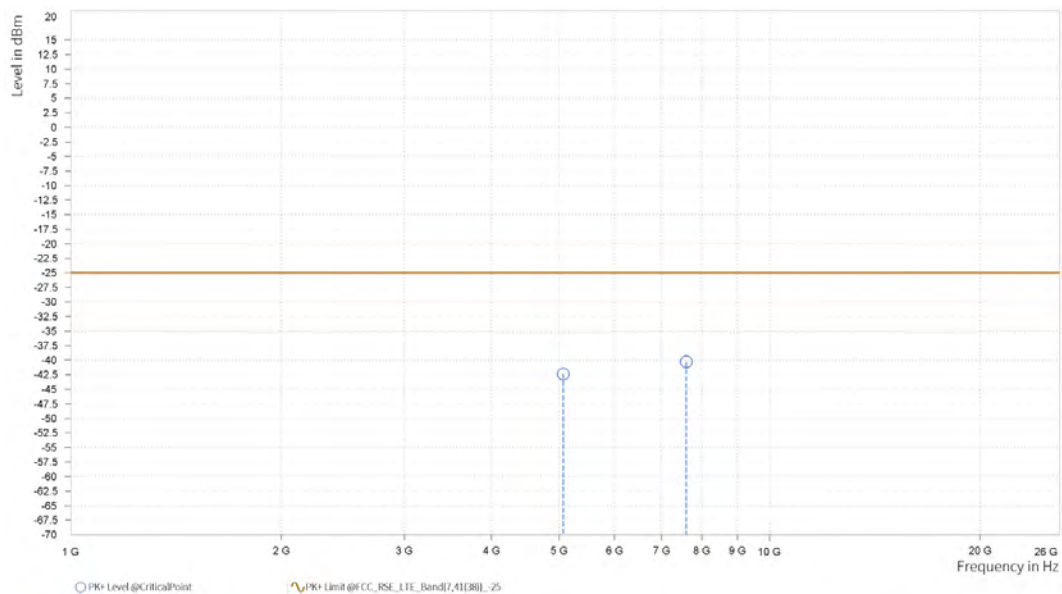
Note: For higher frequency, the emission is too low to be detected.

LTE Band 7

CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 21100
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 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	-42.39	-25.00	17.39	31.05	H	0.9	2.00
4	7,598.250	-40.29	-25.00	15.29	35.92	H	0.9	2.00

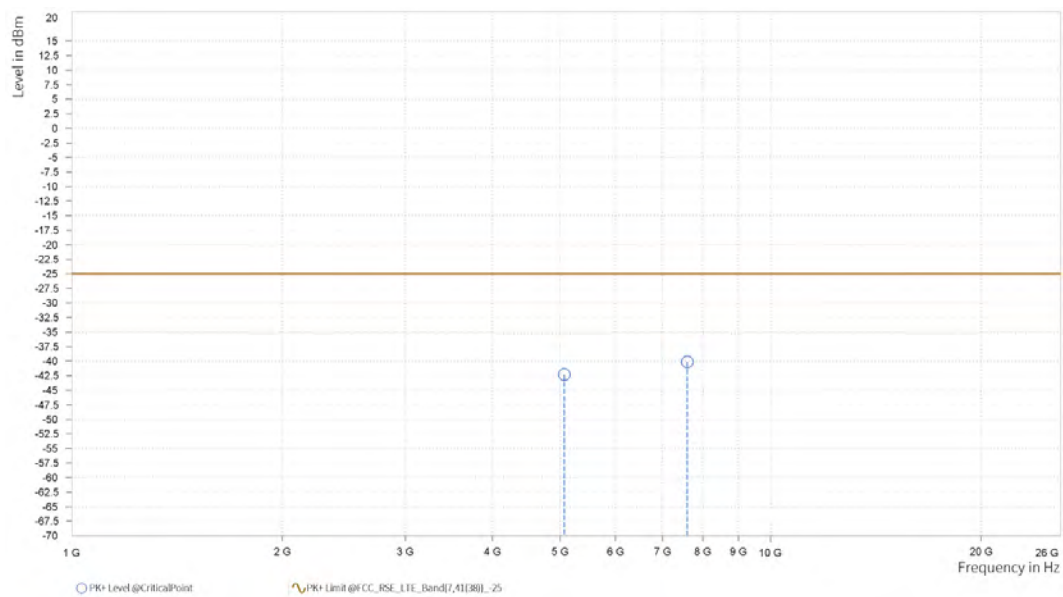




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 21100
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-42.30	-25.00	17.30	30.82	V	111.9	2.00
4	7,598.250	-40.13	-25.00	15.13	35.94	V	1	2.00

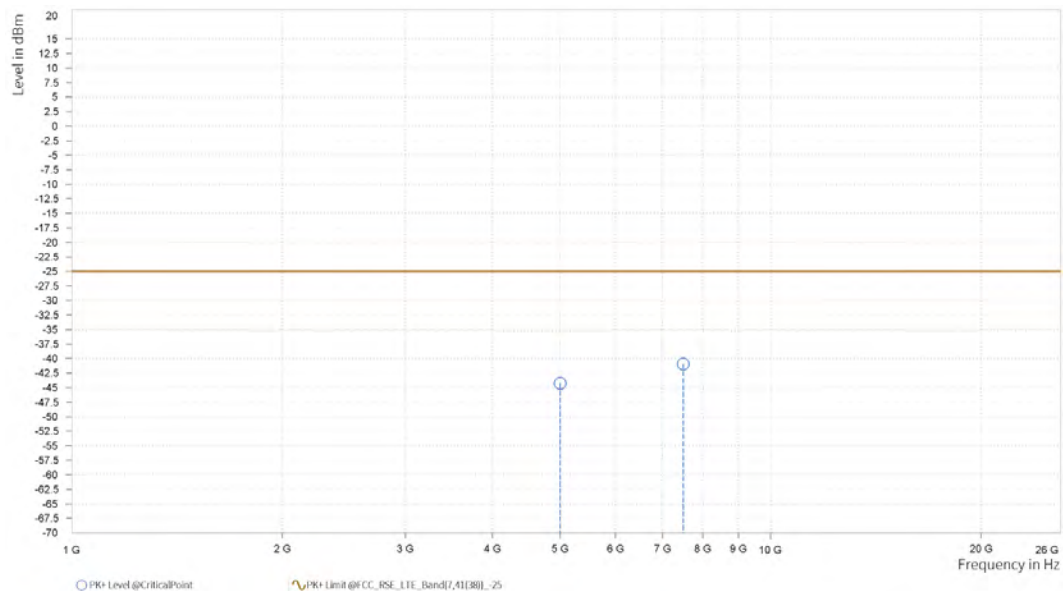




CHANNEL BANDWIDTH	10MHz / QPSK	MODE	TX channel 20800
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	5,001.000	-44.25	-25.00	19.25	29.99	H	0.9	2.00
4	7,501.500	-40.93	-25.00	15.93	35.66	H	249.4	1.00

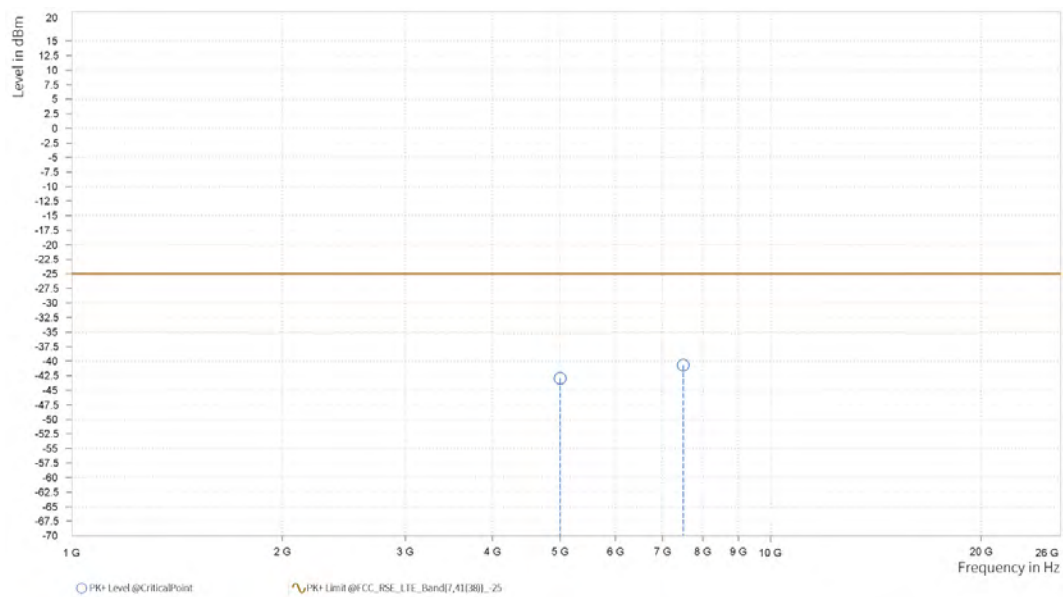




CHANNEL BANDWIDTH	10MHz / QPSK	MODE	TX channel 20800
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	5,001.000	-42.95	-25.00	17.95	29.84	V	252.9	1.00
4	7,501.500	-40.68	-25.00	15.68	35.83	V	1	1.00

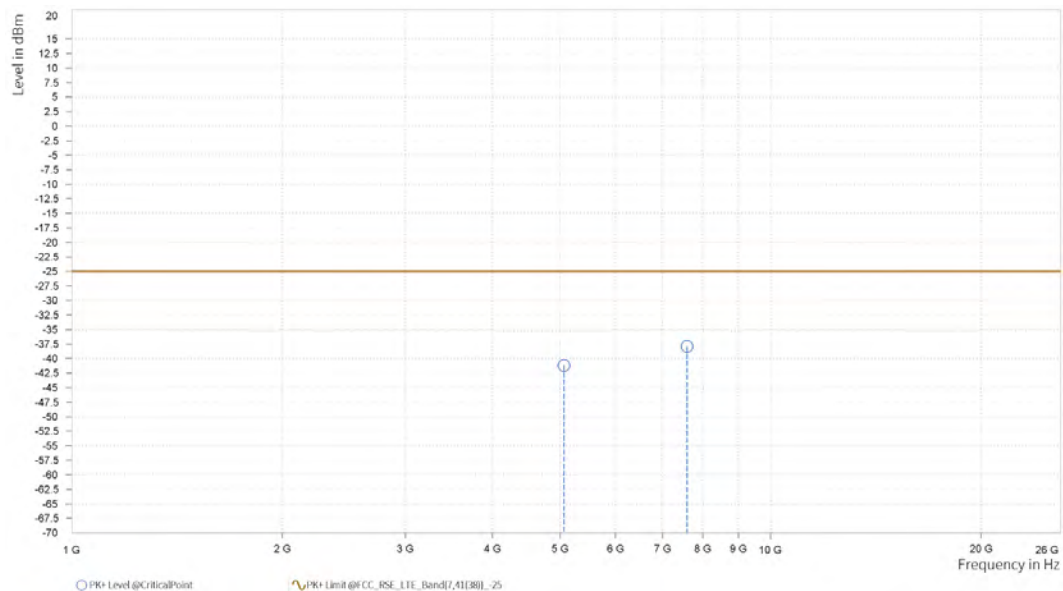




CHANNEL BANDWIDTH	10MHz / QPSK	MODE	TX channel 21100
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-41.18	-25.00	16.18	31.50	H	359.1	1.00
4	7,591.500	-37.93	-25.00	12.93	36.45	H	339.5	1.00

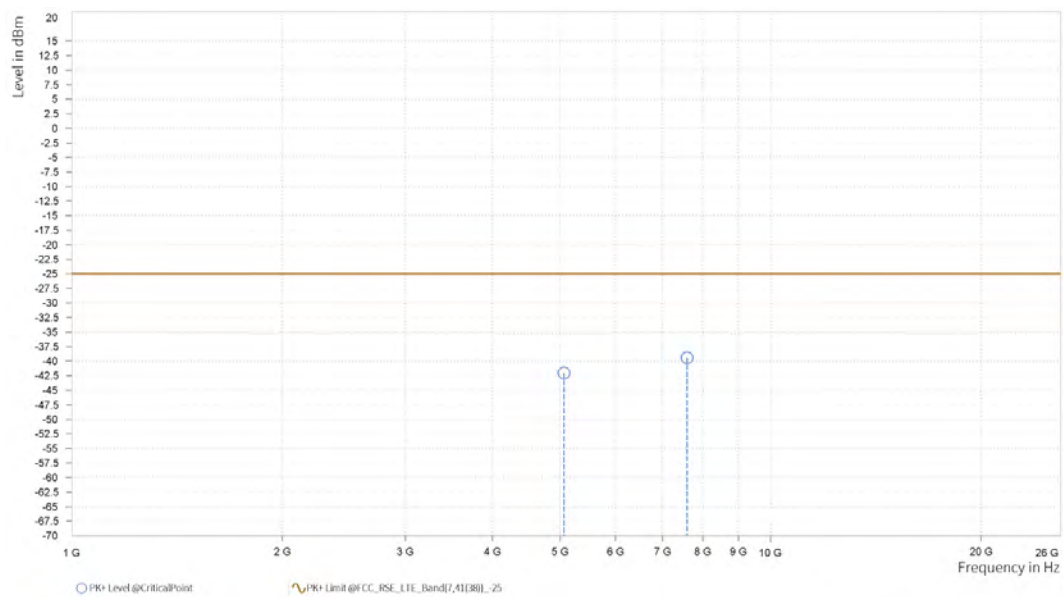




CHANNEL BANDWIDTH	10MHz / QPSK	MODE	TX channel 21100
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-42.03	-25.00	17.03	31.27	V	117.8	2.00
4	7,591.500	-39.43	-25.00	14.43	36.48	V	117.8	2.00

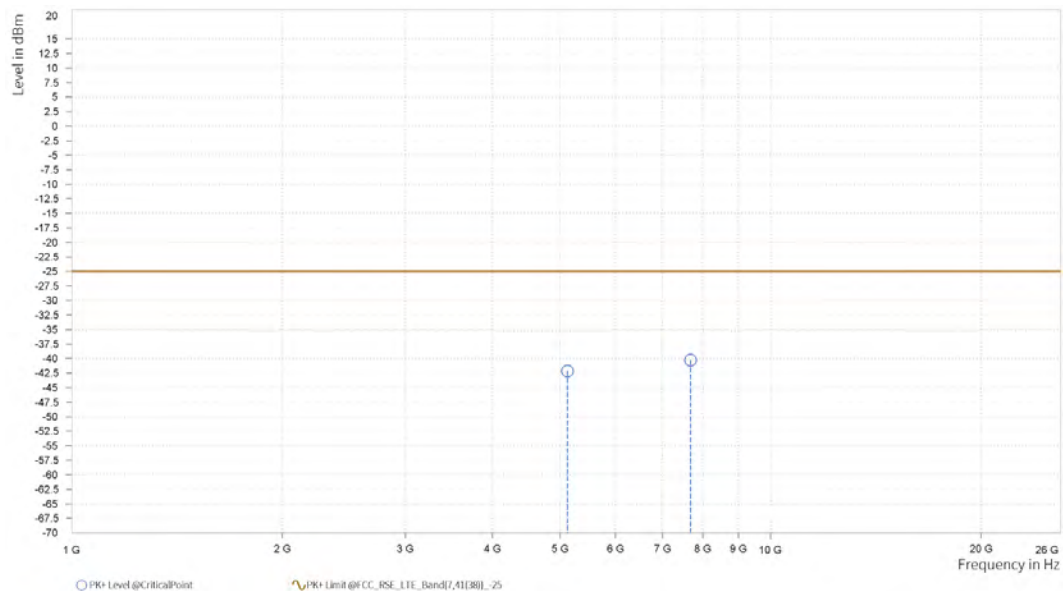




CHANNEL BANDWIDTH	10MHz / QPSK	MODE	TX channel 21400
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	5,121.000	-42.14	-25.00	17.14	31.30	H	1	1.00
4	7,681.500	-40.26	-25.00	15.26	35.84	H	0.9	2.00

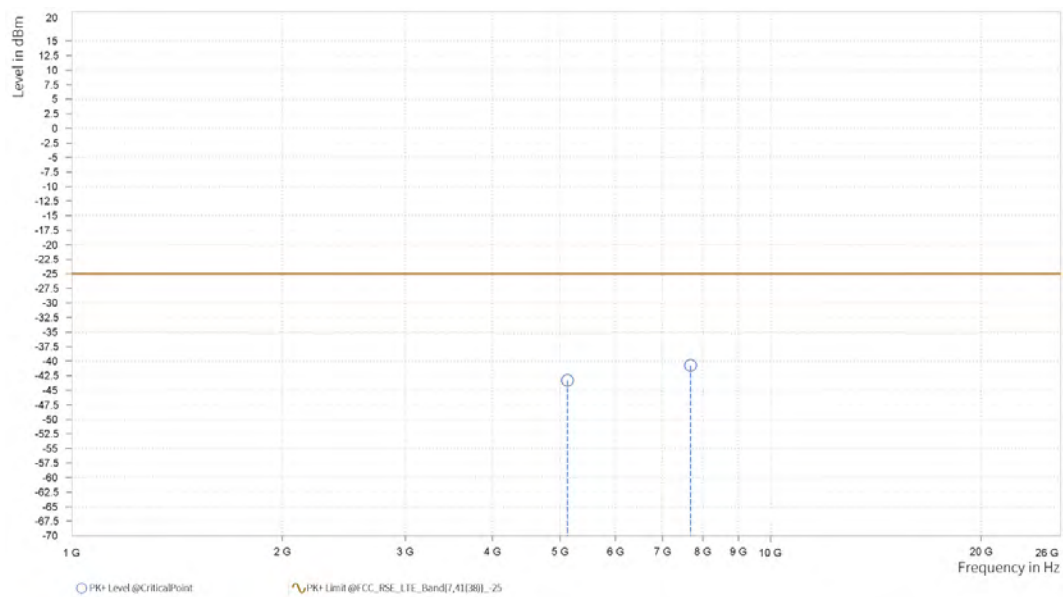




CHANNEL BANDWIDTH	10MHz / QPSK	MODE	TX channel 21400
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	5,121.000	-43.30	-25.00	18.30	31.15	V	359	2.00
4	7,681.500	-40.76	-25.00	15.76	35.80	V	359	2.00

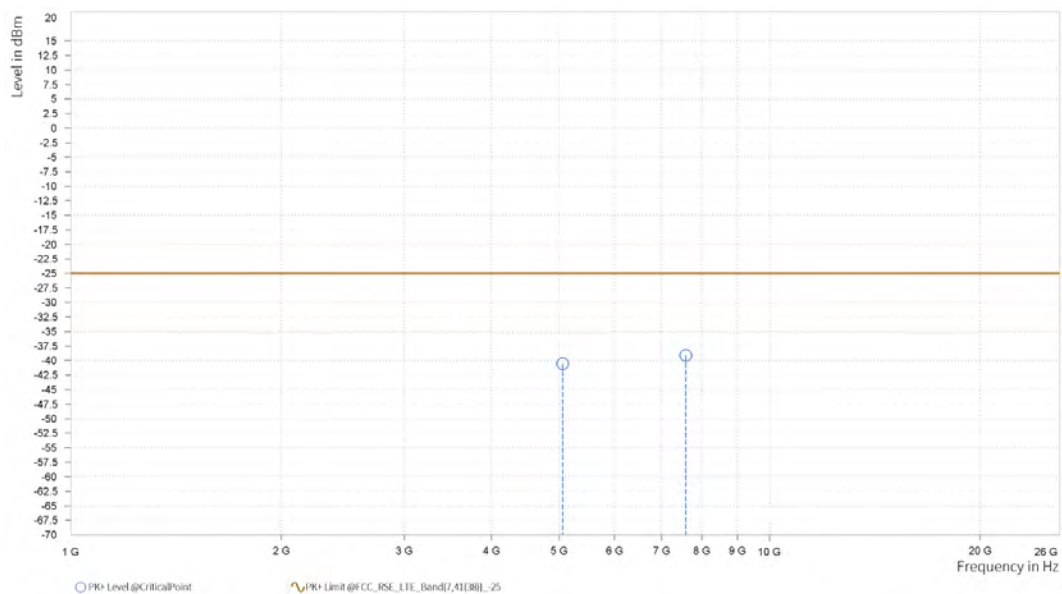




CHANNEL BANDWIDTH	15MHz / QPSK	MODE	TX channel 21100
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-40.54	-25.00	15.54	31.91	H	1	1.00
4	7,584.750	-39.15	-25.00	14.15	36.76	H	359.1	1.00

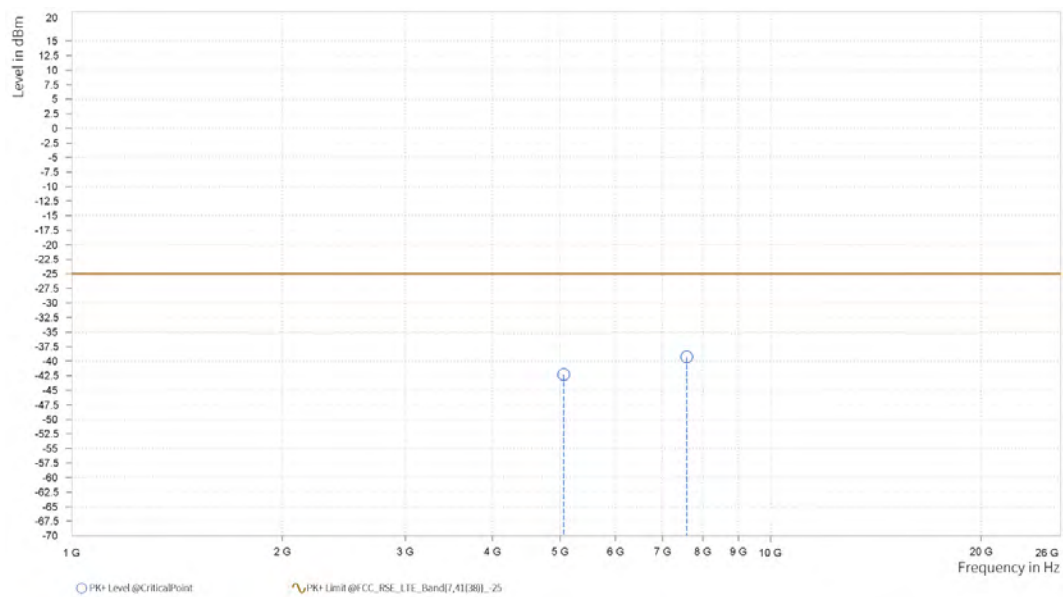




CHANNEL BANDWIDTH	15MHz / QPSK	MODE	TX channel 21100
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-42.30	-25.00	17.30	31.69	V	113.1	2.00
4	7,584.750	-39.28	-25.00	14.28	36.80	V	0.9	2.00

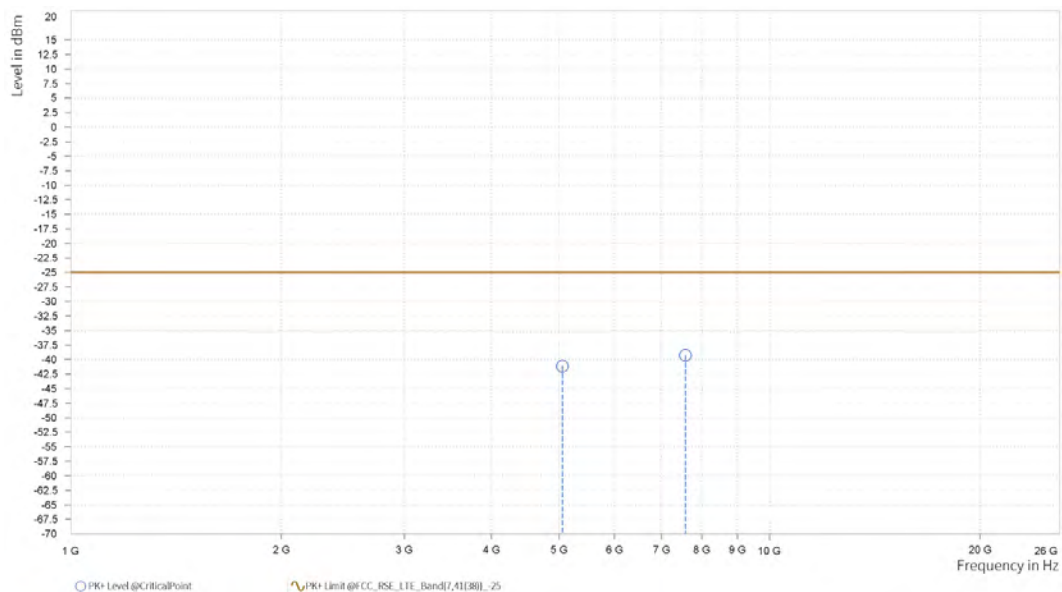




CHANNEL BANDWIDTH	20MHz / QPSK	MODE	TX channel 21100
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-41.12	-25.00	16.12	32.31	H	0.9	2.00
4	7,578.000	-39.27	-25.00	14.27	36.69	H	359	2.00

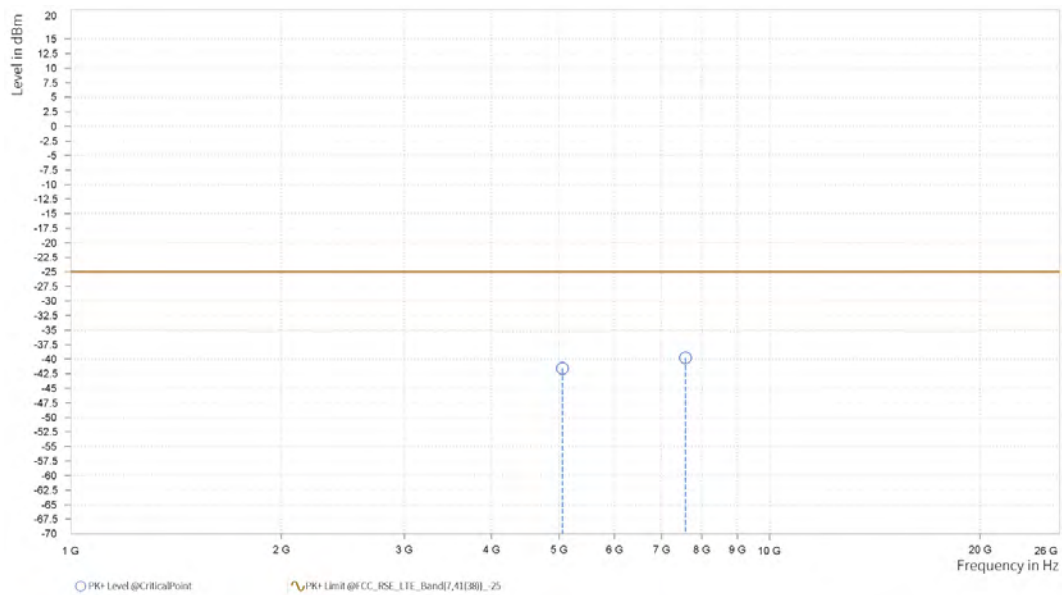


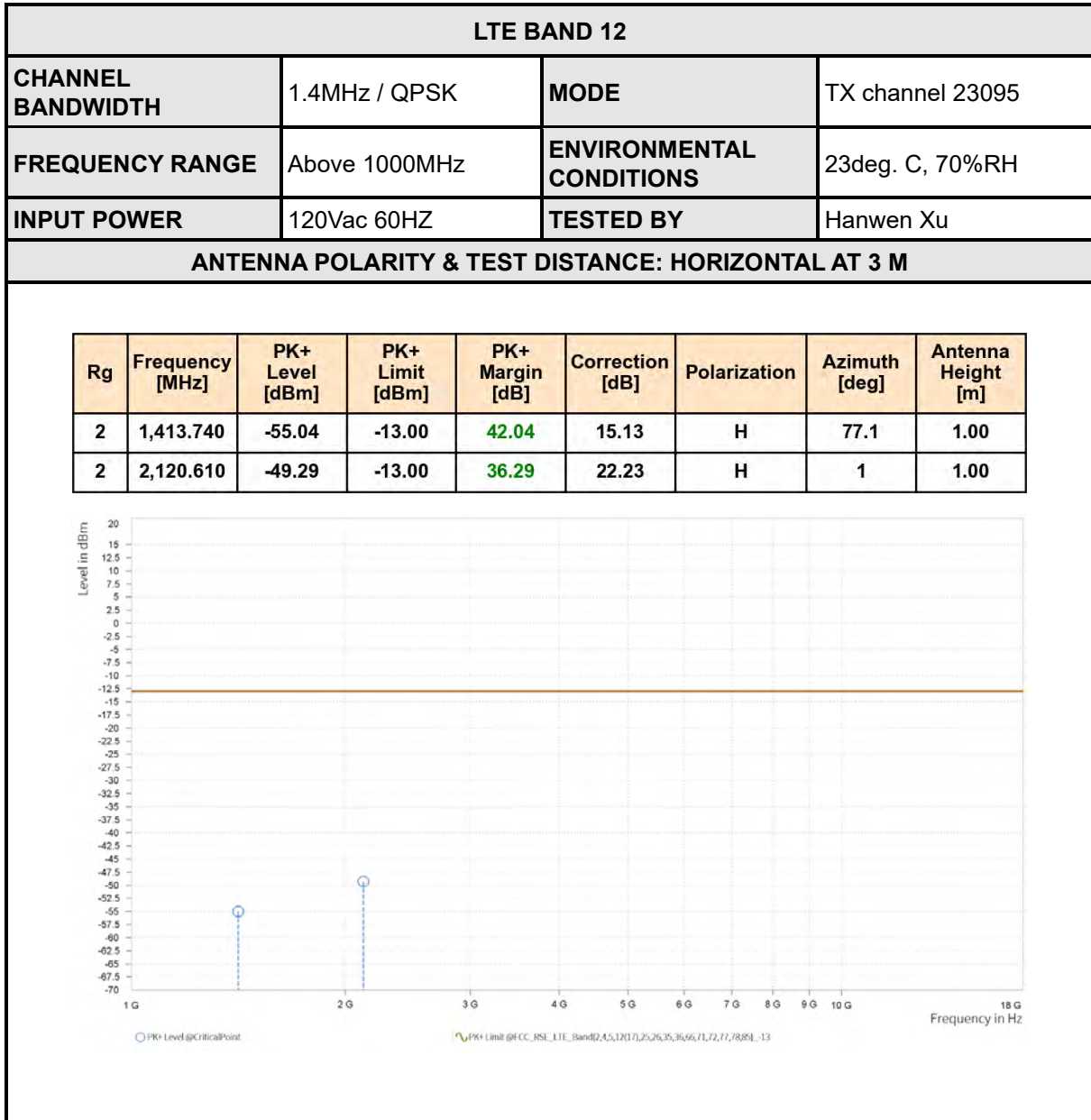


CHANNEL BANDWIDTH	20MHz / QPSK	MODE	TX channel 21100
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-41.59	-25.00	16.59	32.10	V	245.8	1.00
4	7,578.000	-39.80	-25.00	14.80	36.74	V	359	2.00



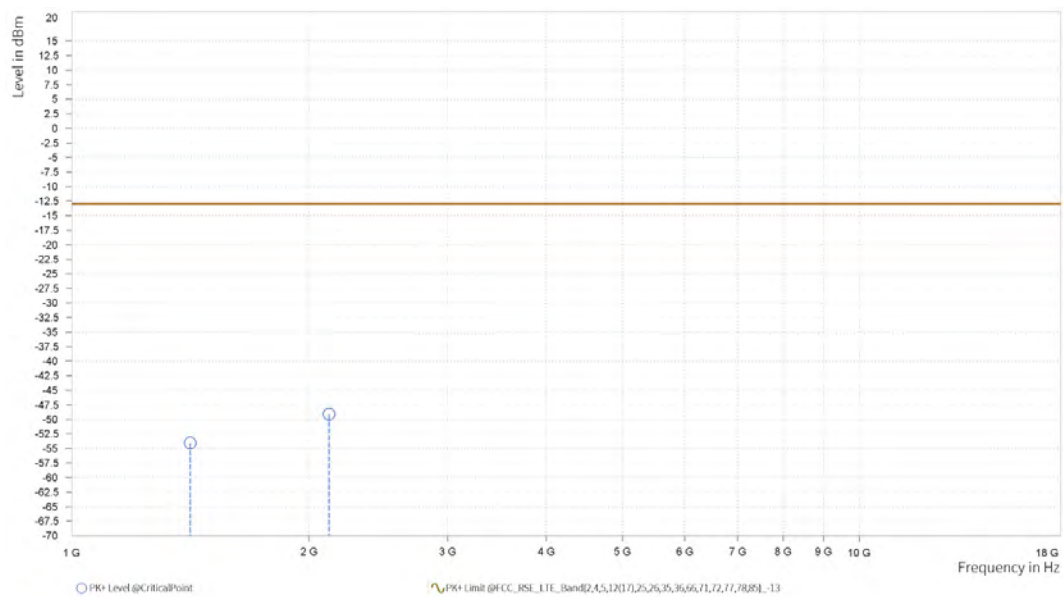




CHANNEL BANDWIDTH	1.4MHz / QPSK	MODE	TX channel 23095
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-54.07	-13.00	41.07	15.03	V	1	1.00
2	2,120.610	-49.09	-13.00	36.09	21.87	V	1	1.00

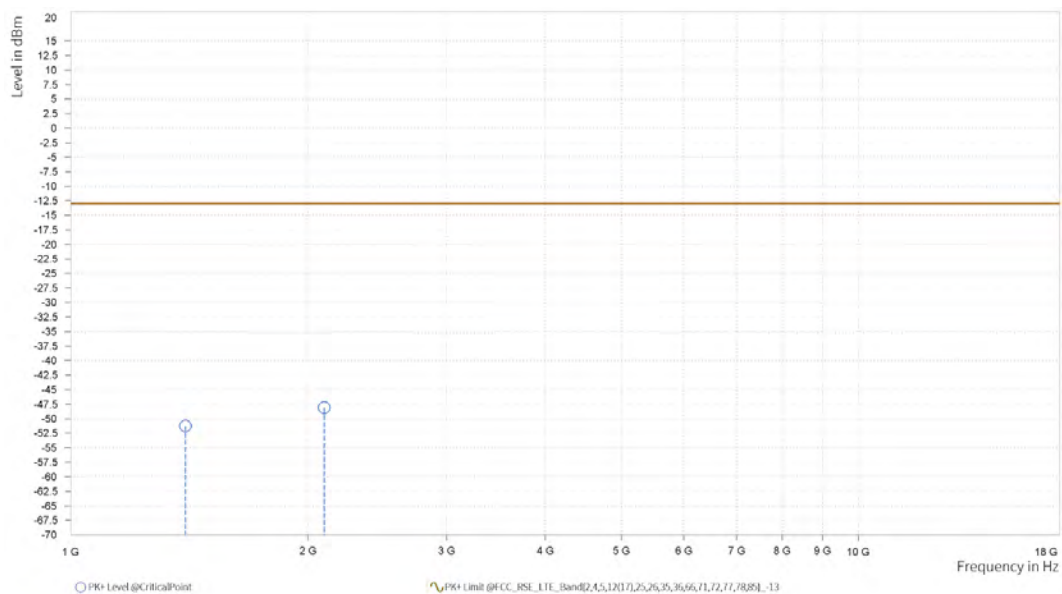




CHANNEL BANDWIDTH	3MHz / QPSK	MODE	TX channel 23025
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,398.300	-51.24	-13.00	38.24	17.18	H	294.8	2.00
2	2,097.450	-48.08	-13.00	35.08	21.48	H	357.3	1.00

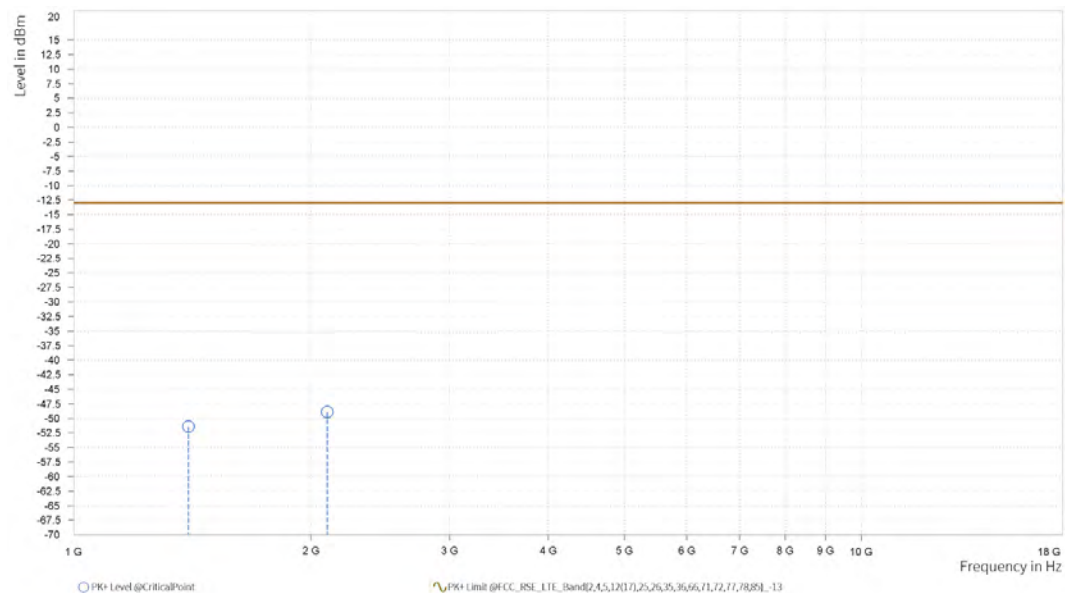




CHANNEL BANDWIDTH	3MHz / QPSK	MODE	TX channel 23025
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,398.300	-51.40	-13.00	38.40	17.18	V	1	1.00
2	2,097.450	-48.90	-13.00	35.90	21.39	V	357.6	1.00

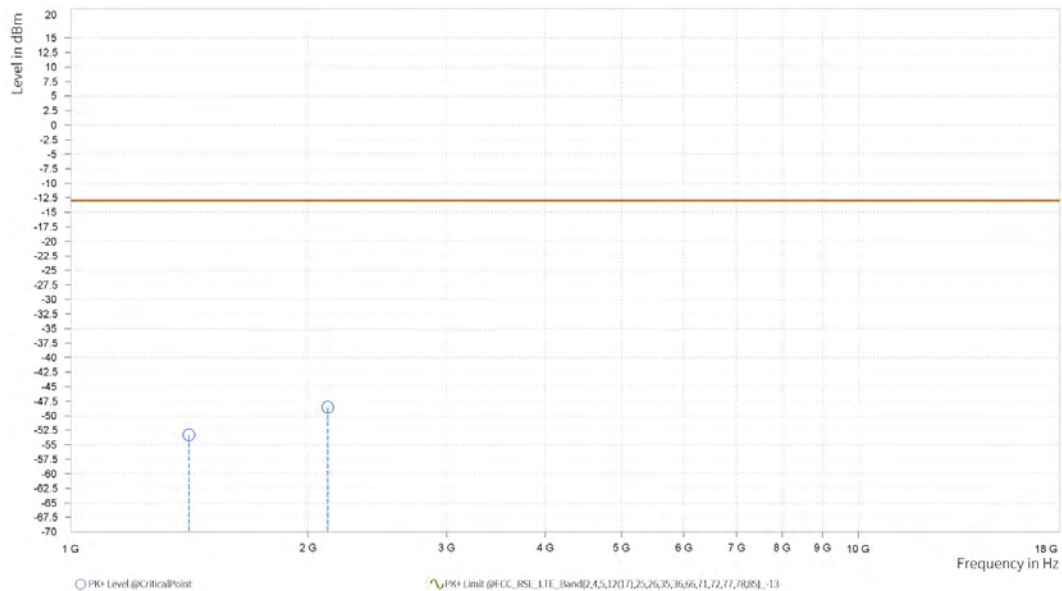




CHANNEL BANDWIDTH	3MHz / QPSK	MODE	TX channel 23095
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,412.300	-53.32	-13.00	40.32	15.31	H	359	1.00
2	2,118.450	-48.55	-13.00	35.55	22.12	H	359	2.00

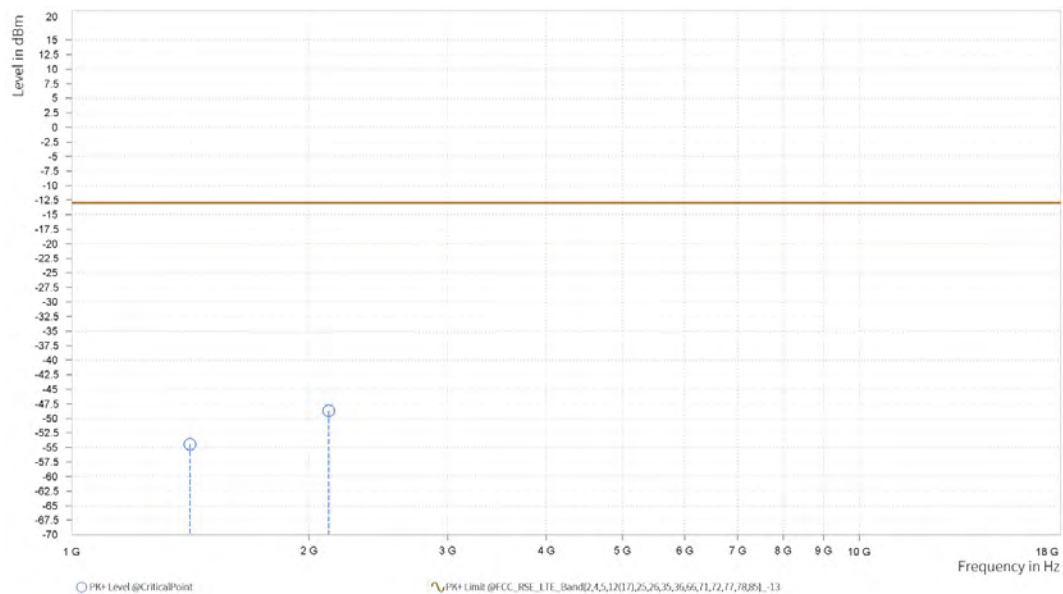




CHANNEL BANDWIDTH	3MHz / QPSK	MODE	TX channel 23095
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,412.300	-54.44	-13.00	41.44	15.21	V	1	2.00
2	2,118.450	-48.69	-13.00	35.69	21.78	V	359	2.00

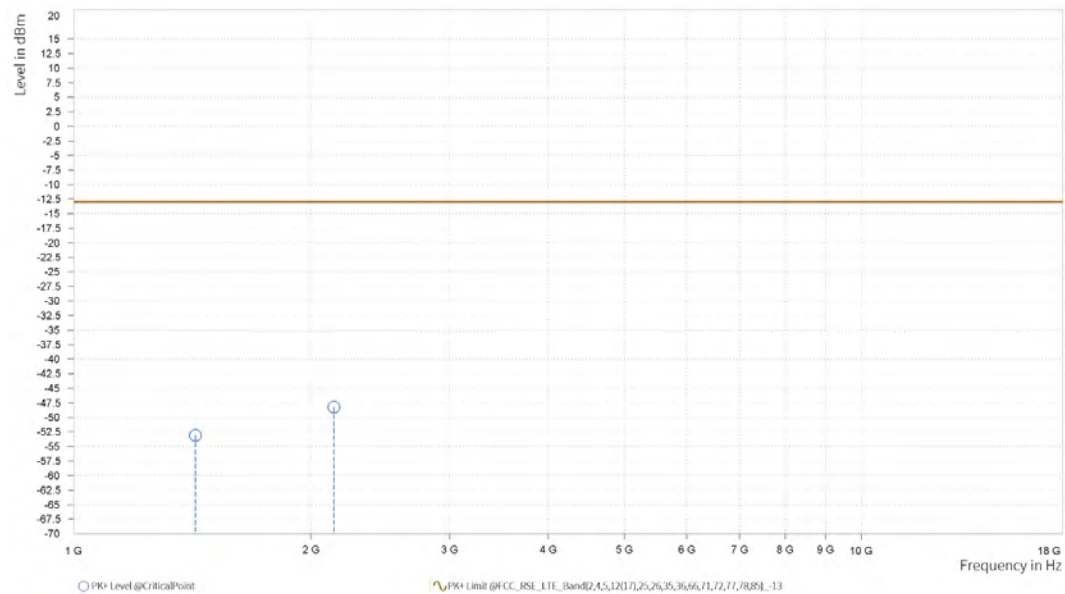




CHANNEL BANDWIDTH	3MHz / QPSK	MODE	TX channel 23165
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,427.000	-53.09	-13.00	40.09	13.74	H	2.6	2.00
2	2,139.450	-48.24	-13.00	35.24	23.12	H	66.4	1.00

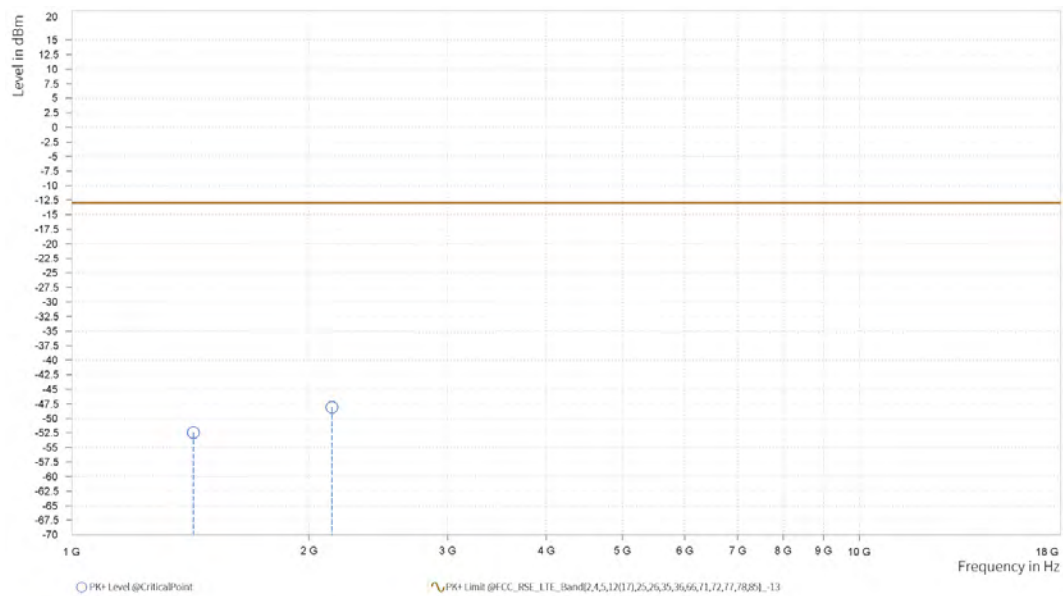




CHANNEL BANDWIDTH	3MHz / QPSK	MODE	TX channel 23165
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,426.500	-52.43	-13.00	39.43	13.50	V	1	1.00
2	2,139.450	-48.07	-13.00	35.07	22.55	V	67.6	1.00

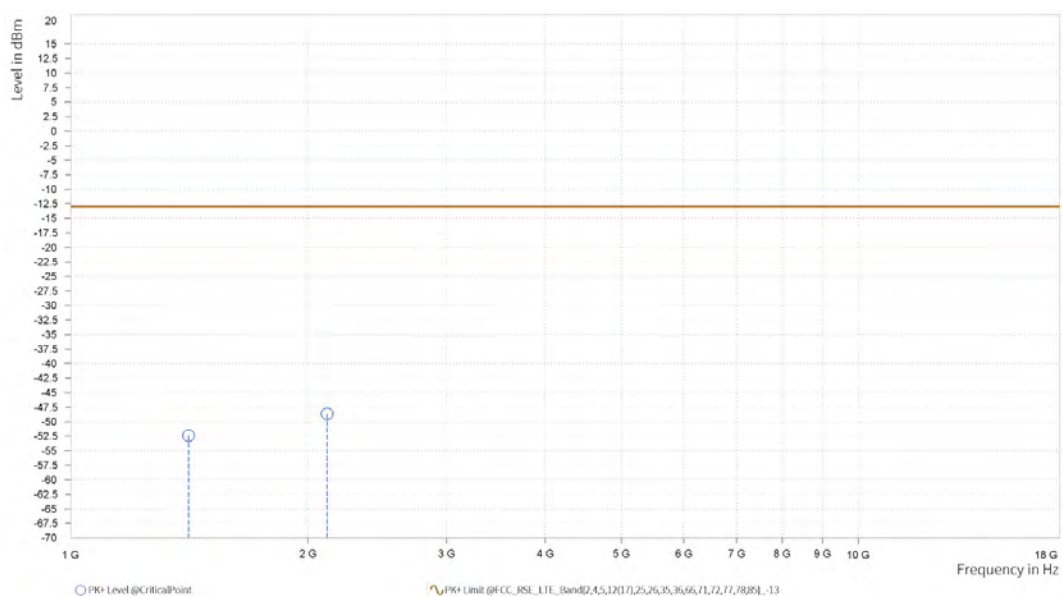




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23095
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,410.500	-52.38	-13.00	39.38	15.67	H	1	2.00
2	2,115.750	-48.63	-13.00	35.63	21.98	H	290	2.00

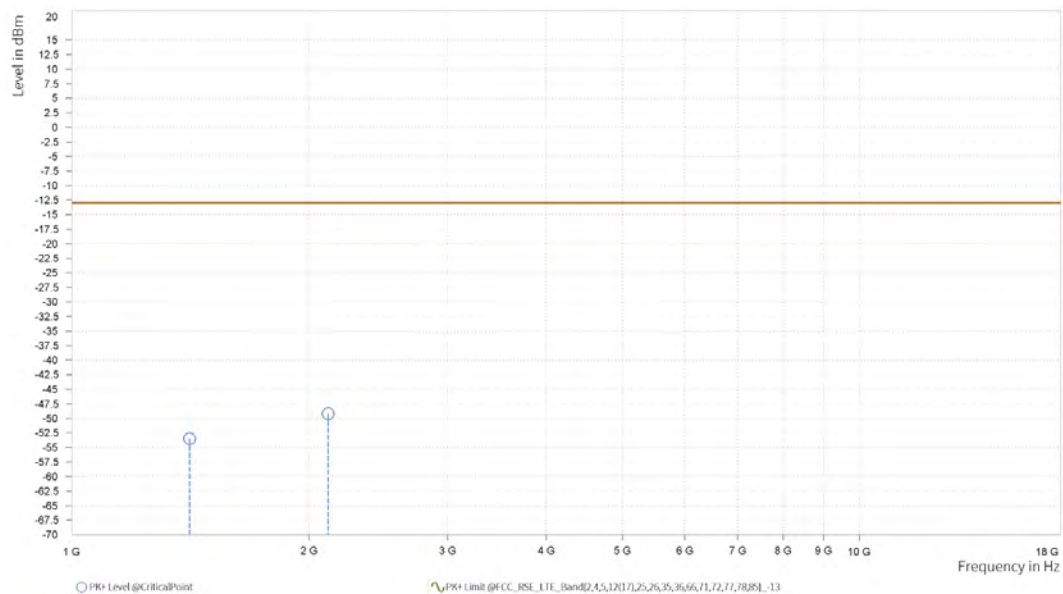




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23095
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,410.500	-53.49	-13.00	40.49	15.59	V	359	2.00
2	2,115.750	-49.18	-13.00	36.18	21.68	V	71.3	1.00

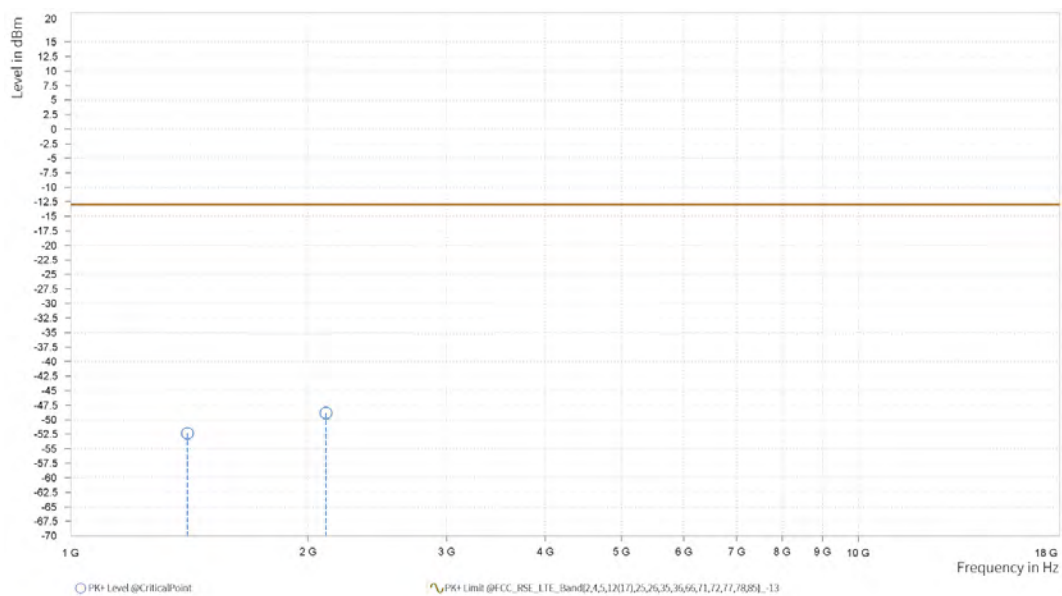




CHANNEL BANDWIDTH	10MHz / QPSK	MODE	TX channel 23095
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,406.000	-52.35	-13.00	39.35	16.24	H	359.1	1.00
2	2,109.000	-48.81	-13.00	35.81	21.73	H	286.4	2.00

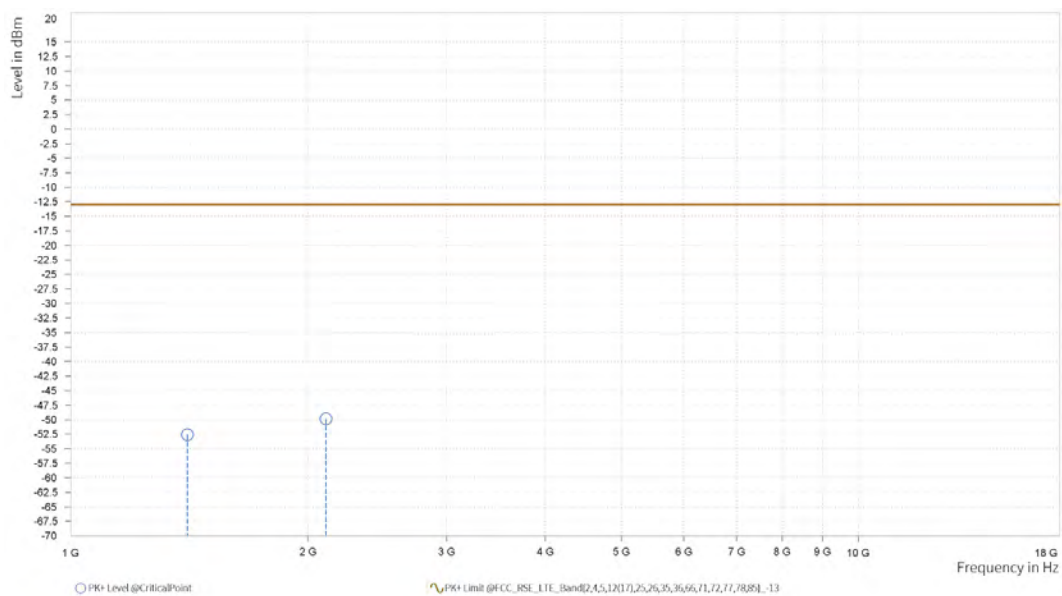


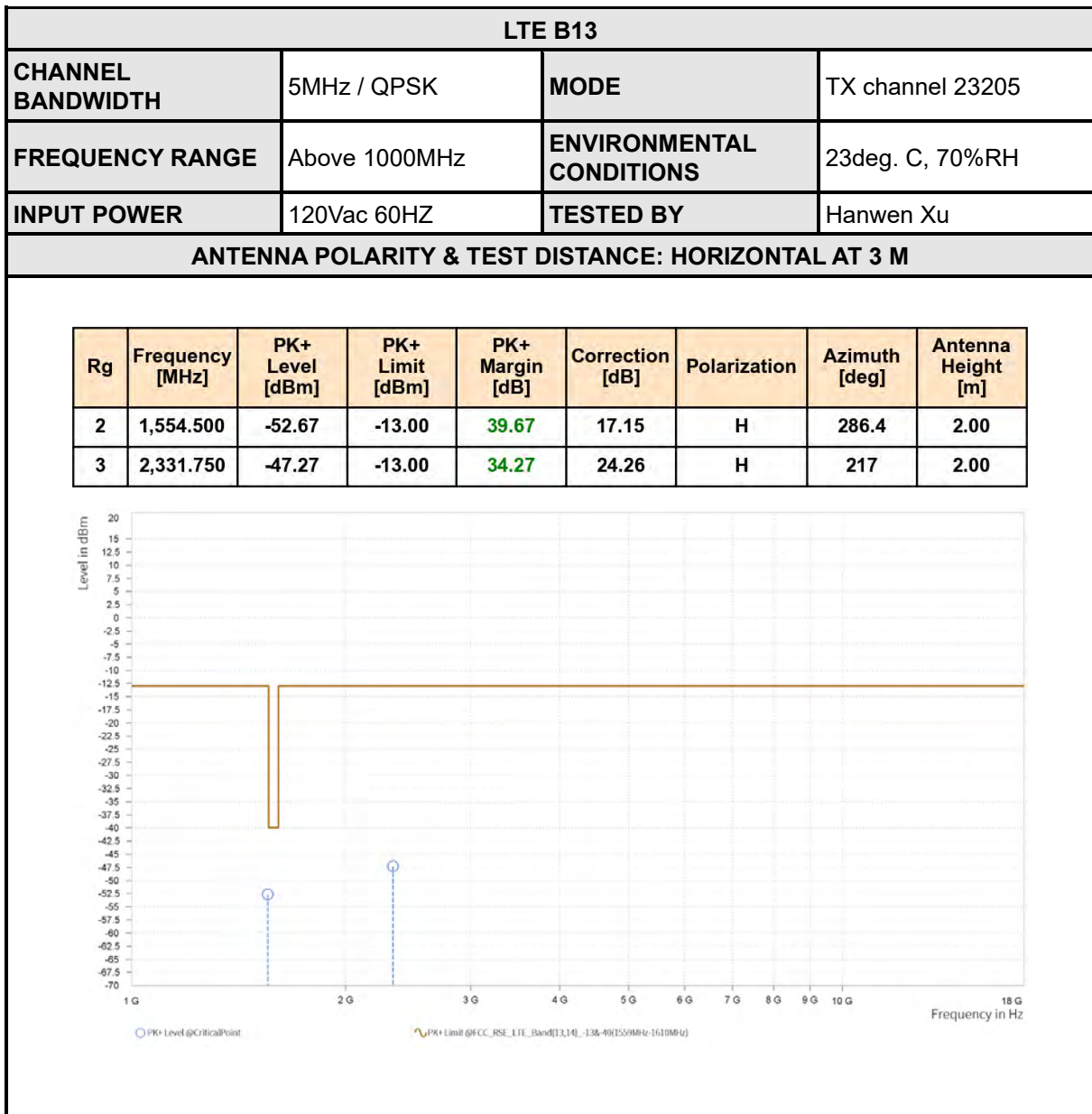


CHANNEL BANDWIDTH	10MHz / QPSK	MODE	TX channel 23095
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,406.000	-52.60	-13.00	39.60	16.19	V	77.1	1.00
2	2,109.000	-49.81	-13.00	36.81	21.51	V	286.4	2.00



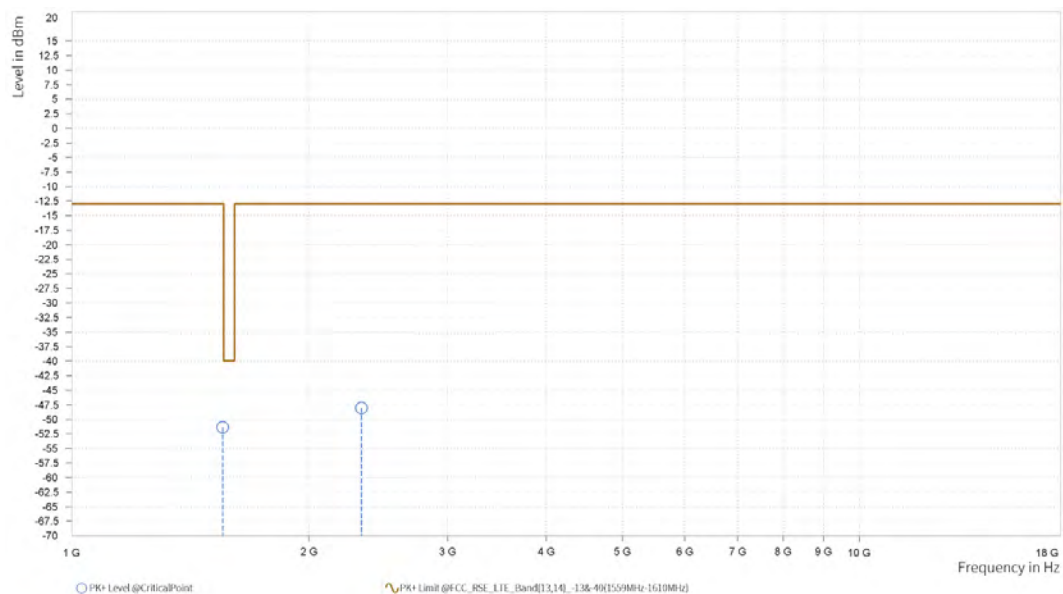




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23205
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,554.500	-51.35	-13.00	38.35	16.78	V	359	2.00
3	2,331.750	-48.02	-13.00	35.02	23.77	V	141.7	1.00

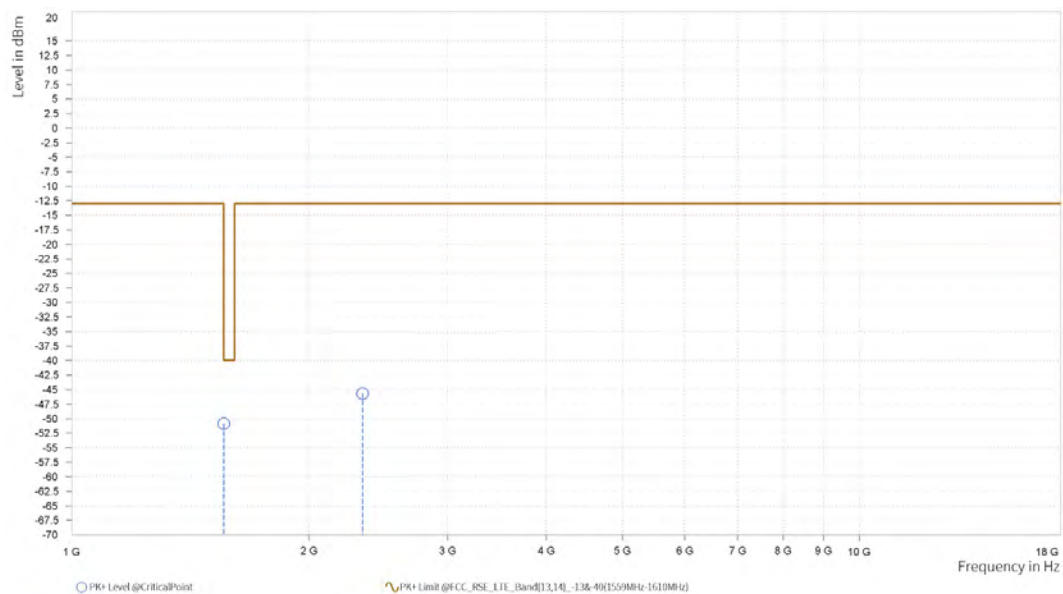




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23230
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,559.500	-50.85	-40.00	10.85	17.19	H	291.2	2.00
3	2,339.250	-45.66	-13.00	32.66	24.41	H	225.5	2.00

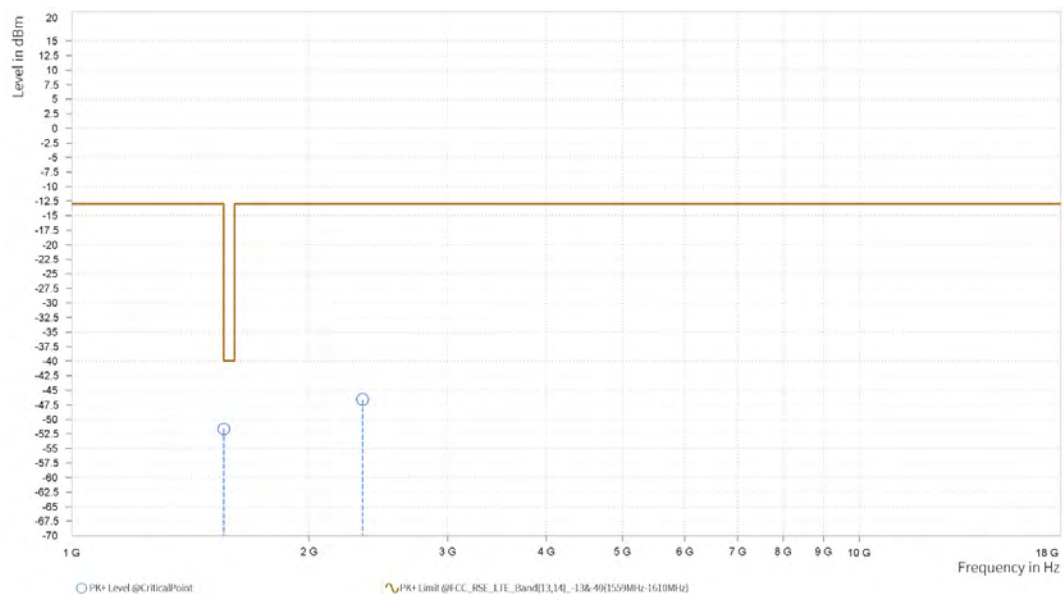




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23230
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,559.500	-51.64	-40.00	11.64	16.86	V	1	1.00
3	2,339.250	-46.59	-13.00	33.59	23.96	V	0.9	2.00

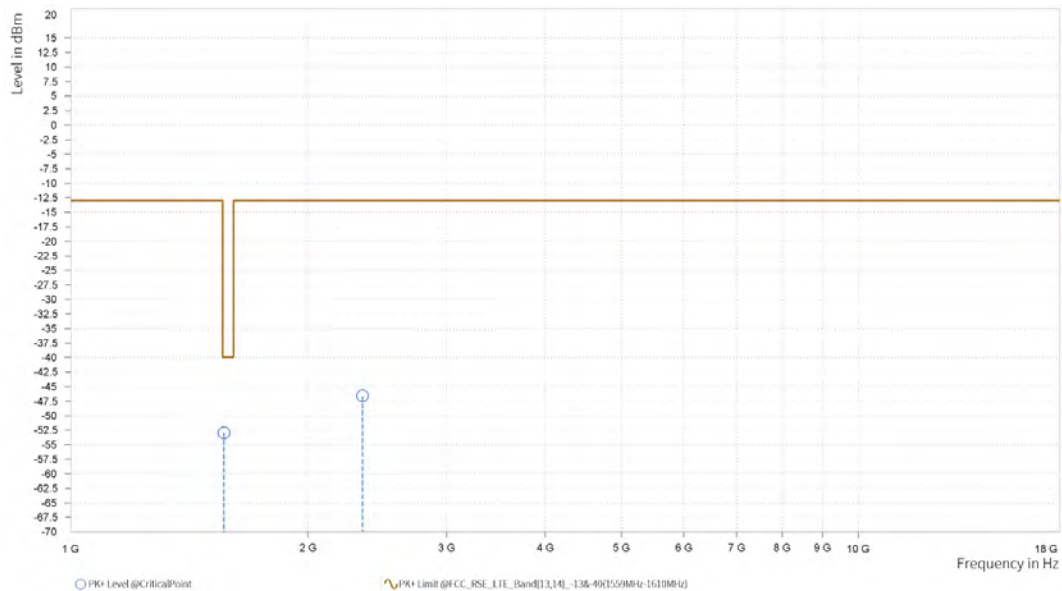




CHANNEL BANDWIDTH	10MHz / QPSK	MODE	TX channel 23255
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,564.500	-52.95	-40.00	12.95	17.15	H	0.9	2.00
3	2,346.750	-46.58	-13.00	33.58	24.45	H	143	1.00

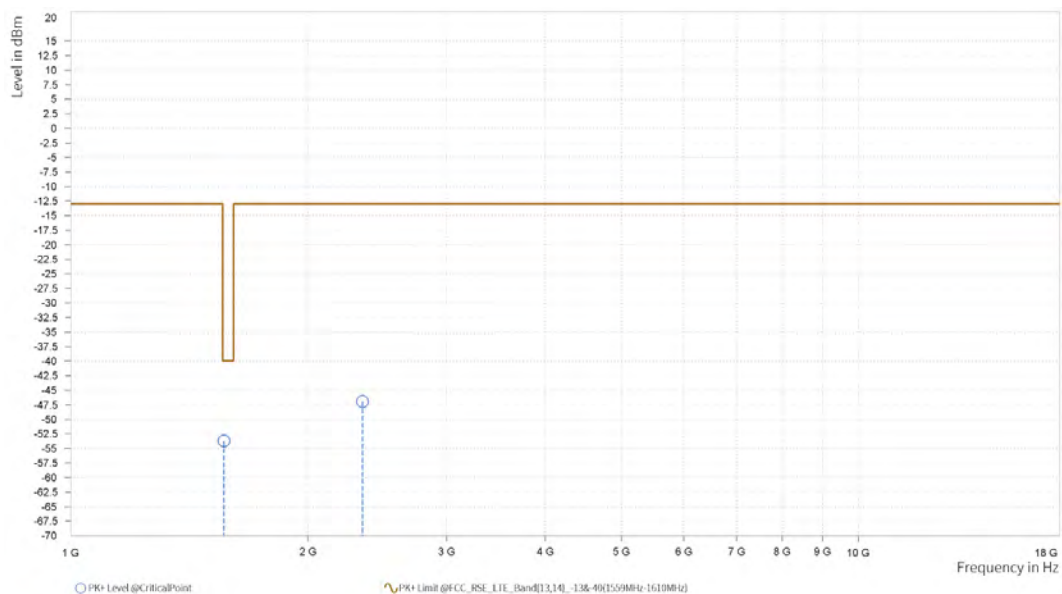




CHANNEL BANDWIDTH	10MHz / QPSK	MODE	TX channel 23255
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,564.500	-53.72	-40.00	13.72	16.86	V	0.9	2.00
3	2,346.750	-46.90	-13.00	33.90	24.05	V	0.9	2.00

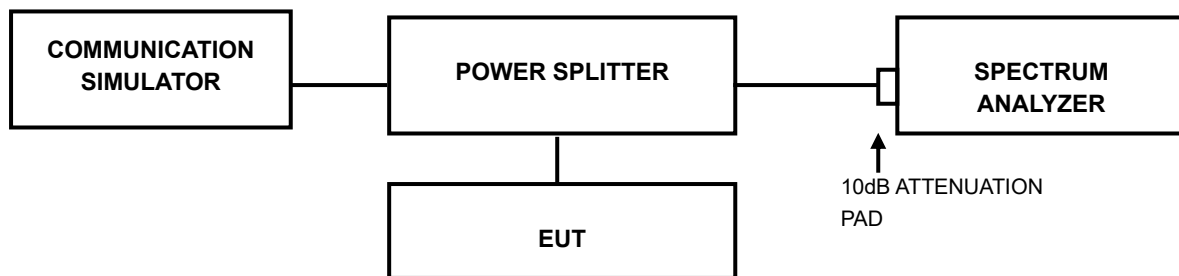


3.7 PEAK TO AVERAGE RATIO

3.7.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

3.7.2 TEST SETUP



3.7.3 TEST PROCEDURES

1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

3.7.4 TEST RESULTS

Please Refer to Appendix of this test report.

4 INFORMATION ON THE TESTING LABORATORIES

We, Huarui 7layers High Technology (Suzhou) Co., Ltd. ,were founded in 2020 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

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

If you have any comments, please feel free to contact us at the following:

Suzhou EMC/RF Lab:

Tel: +86 (0557) 368 1008



5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

6 Appendix

LTE BAND 7

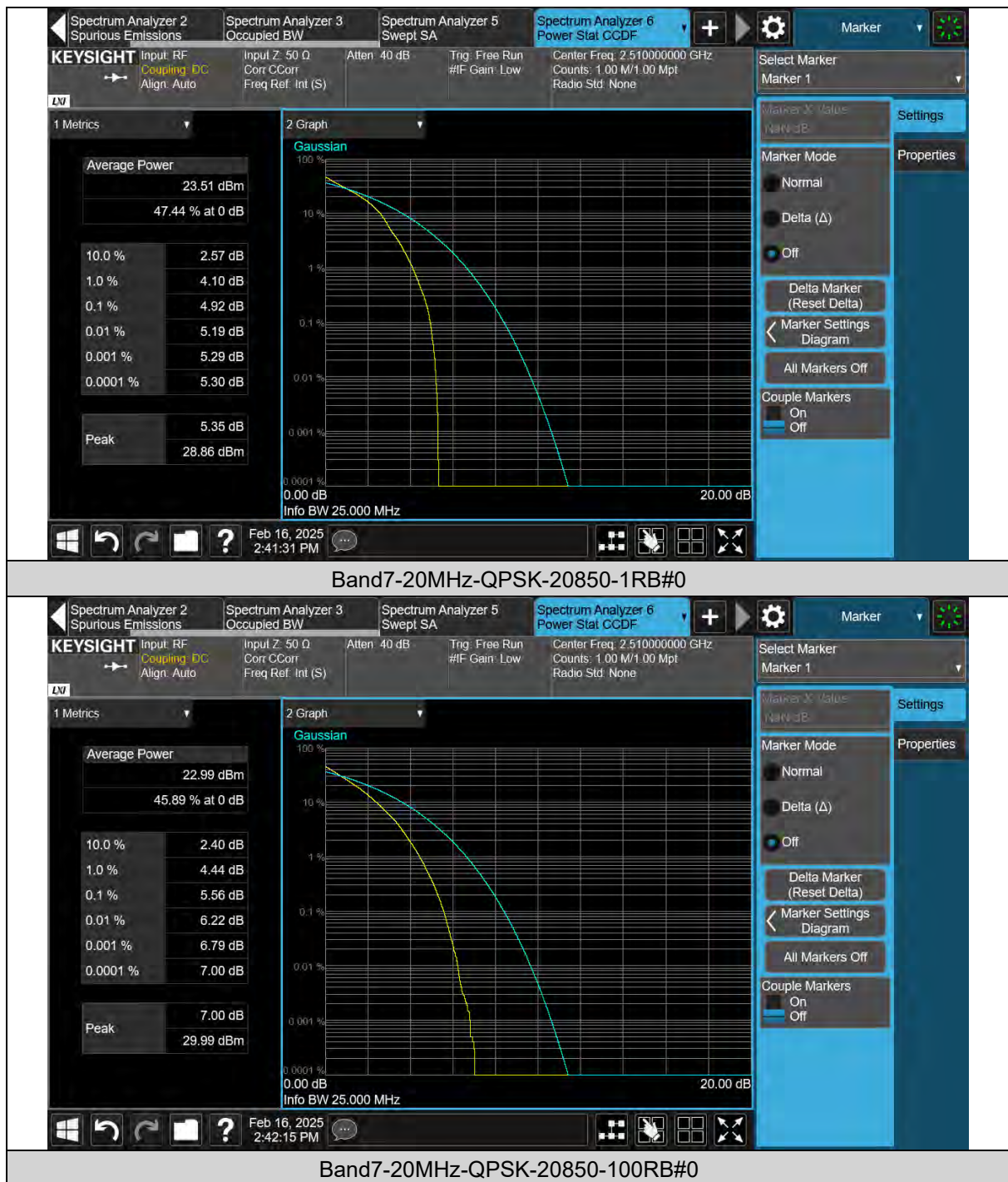
PEAK-TO-AVERAGE RATIO(CCDF)

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band7	20MHz	QPSK	20850	1RB#0	4.92	13	PASS
Band7	20MHz	QPSK	20850	100RB#0	5.56	13	PASS
Band7	20MHz	QPSK	21100	1RB#0	5.15	13	PASS
Band7	20MHz	QPSK	21100	100RB#0	5.63	13	PASS
Band7	20MHz	QPSK	21350	1RB#0	5.11	13	PASS
Band7	20MHz	QPSK	21350	100RB#0	5.61	13	PASS
Band7	20MHz	16QAM	20850	1RB#0	5.54	13	PASS
Band7	20MHz	16QAM	20850	27RB#0	6.19	13	PASS
Band7	20MHz	16QAM	21100	1RB#0	6.04	13	PASS
Band7	20MHz	16QAM	21100	27RB#0	6.48	13	PASS
Band7	20MHz	16QAM	21350	1RB#0	6.09	13	PASS
Band7	20MHz	16QAM	21350	27RB#0	6.51	13	PASS



Test Graphs

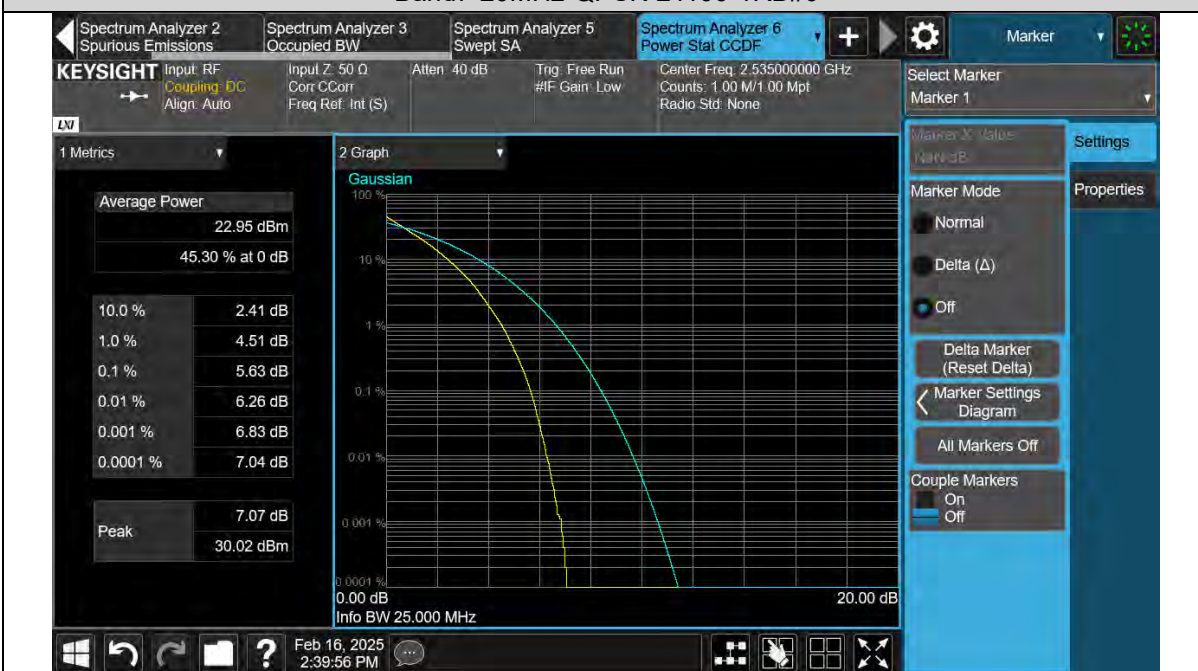




BUREAU VERITAS Test Report No.: PSZ-NQN2412300616RF03



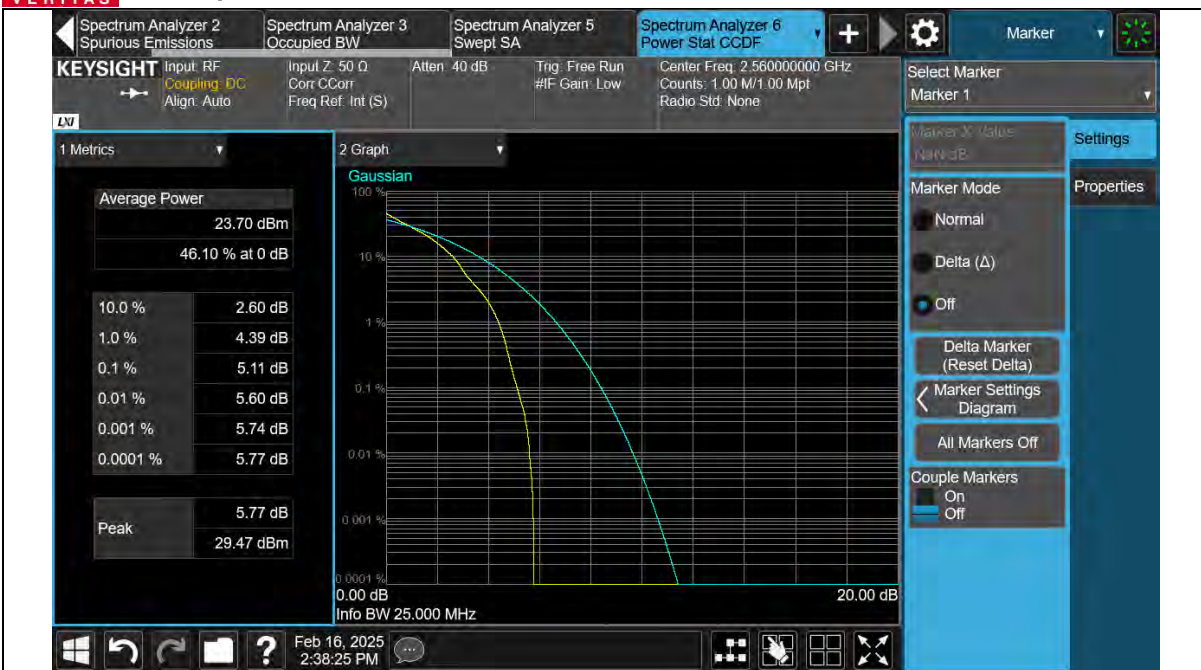
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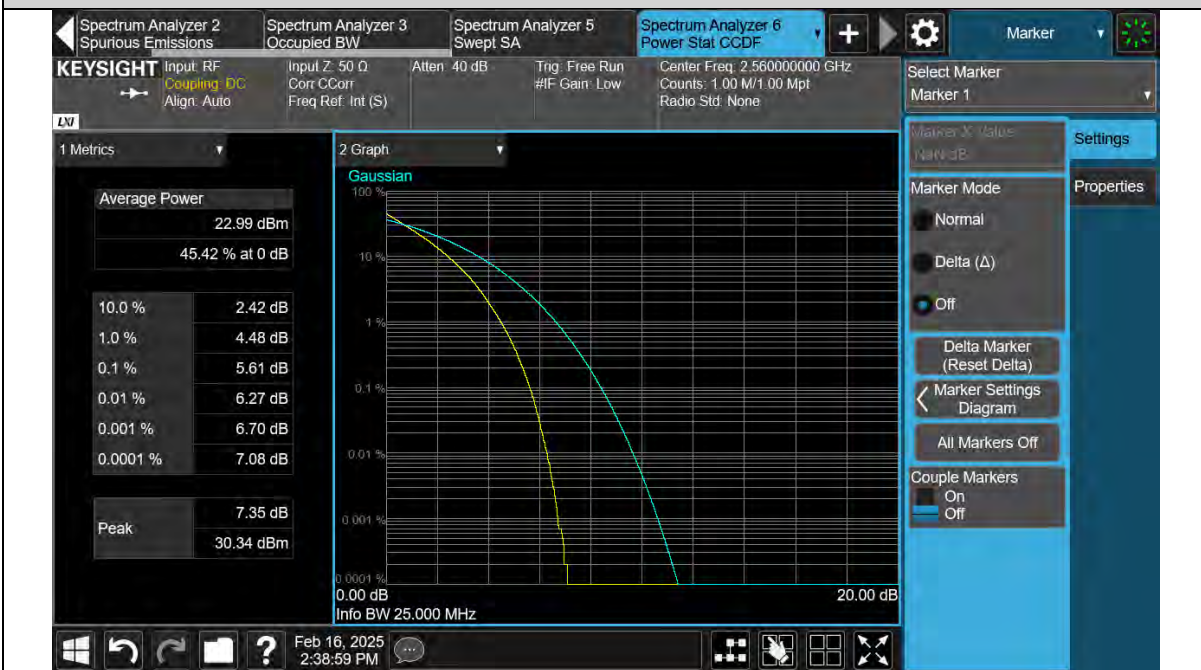
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BUREAU VERITAS Test Report No.: PSZ-NQN2412300616RF03



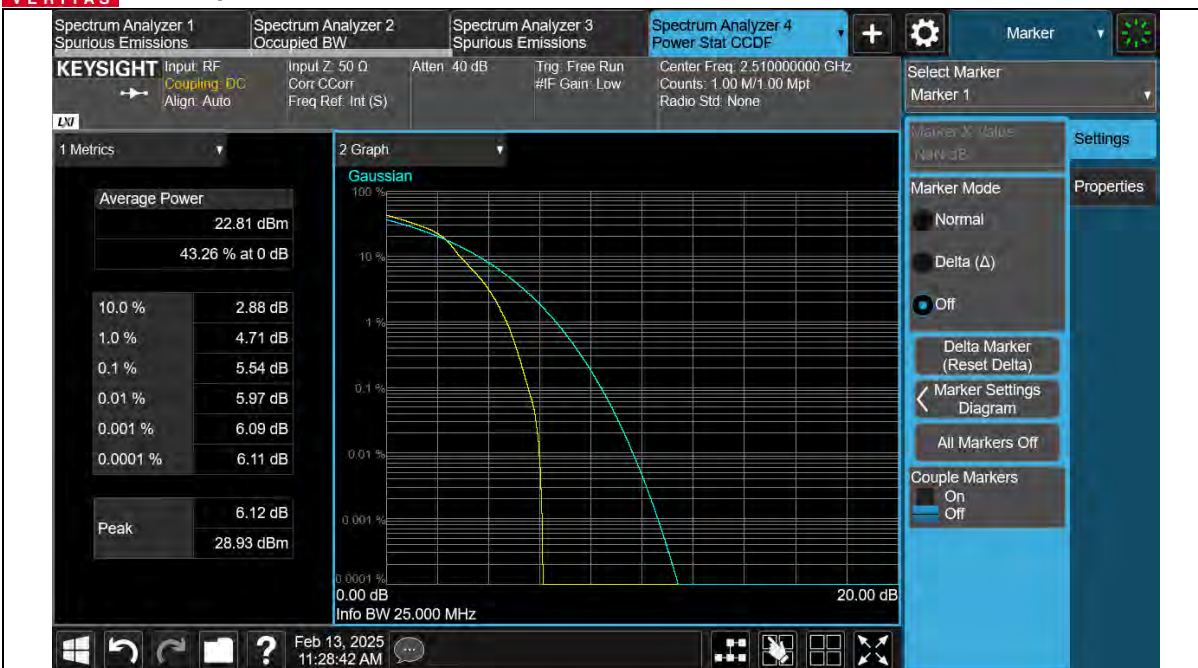
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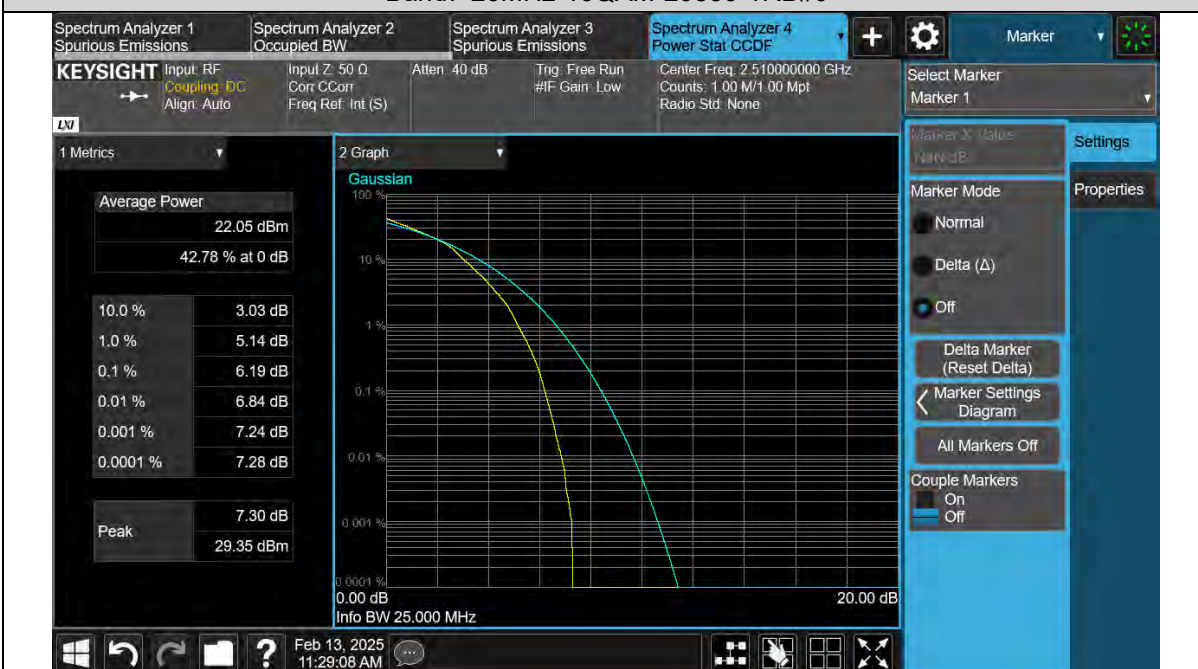
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BUREAU VERITAS Test Report No.: PSZ-NQN2412300616RF03



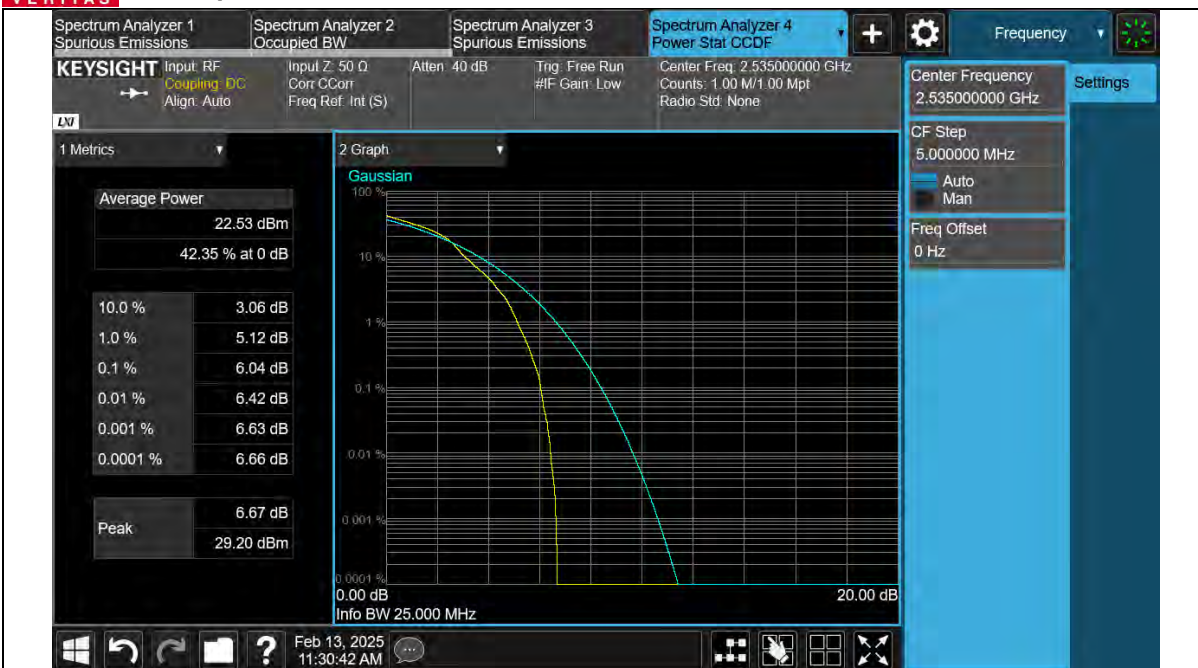
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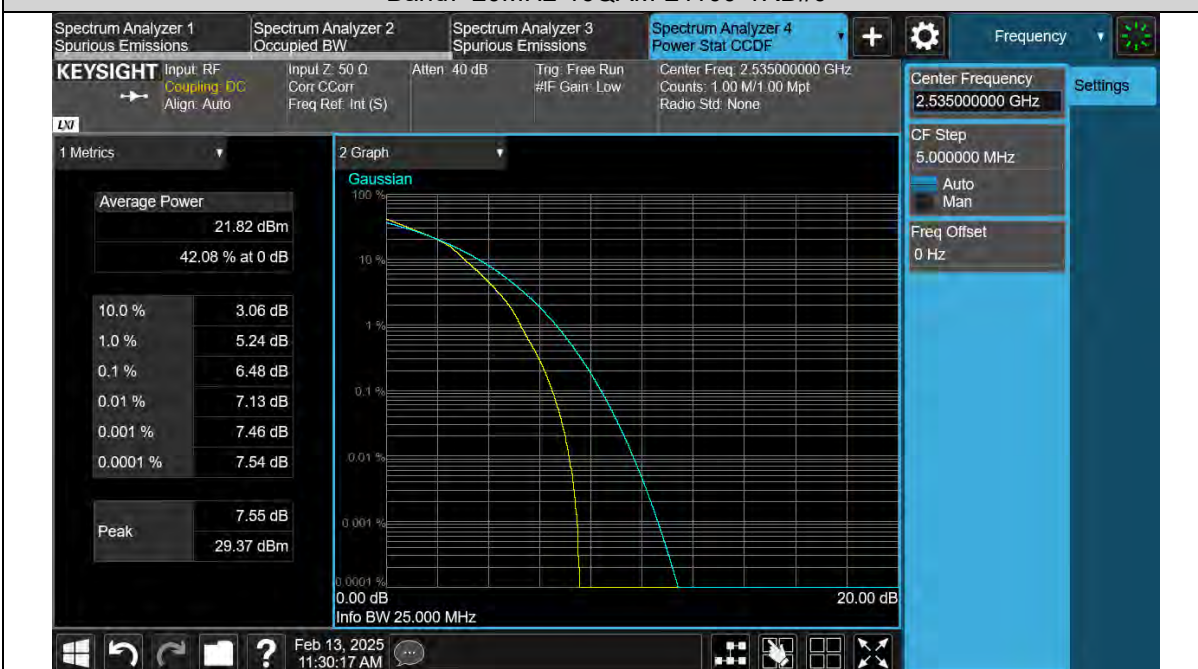
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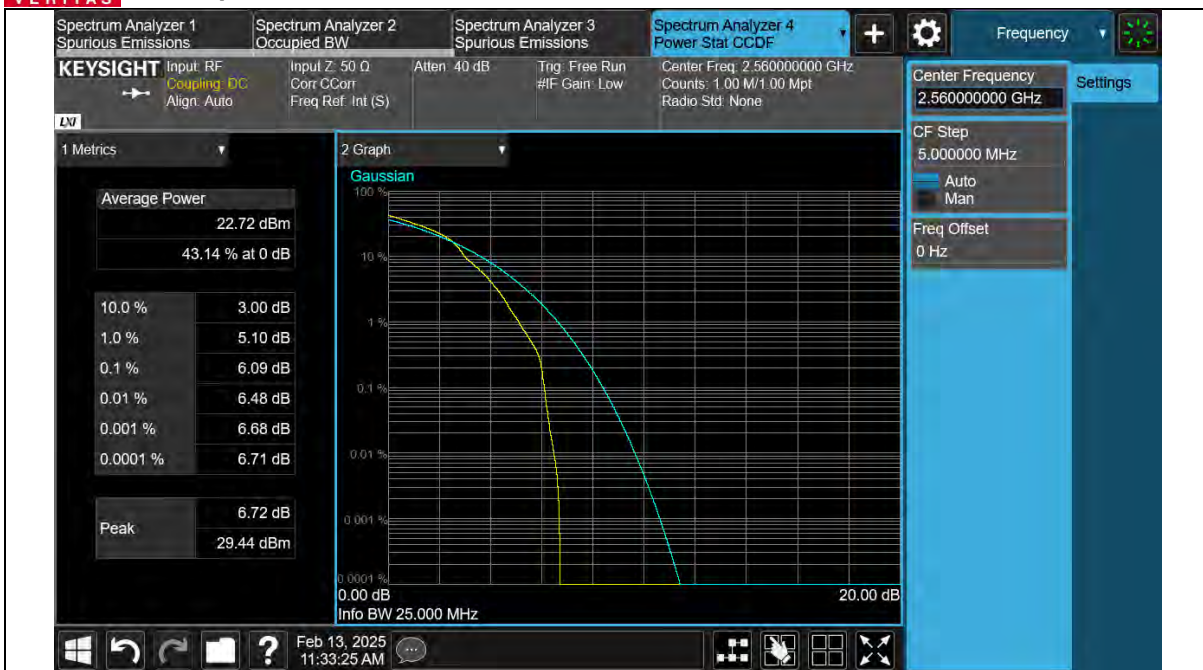
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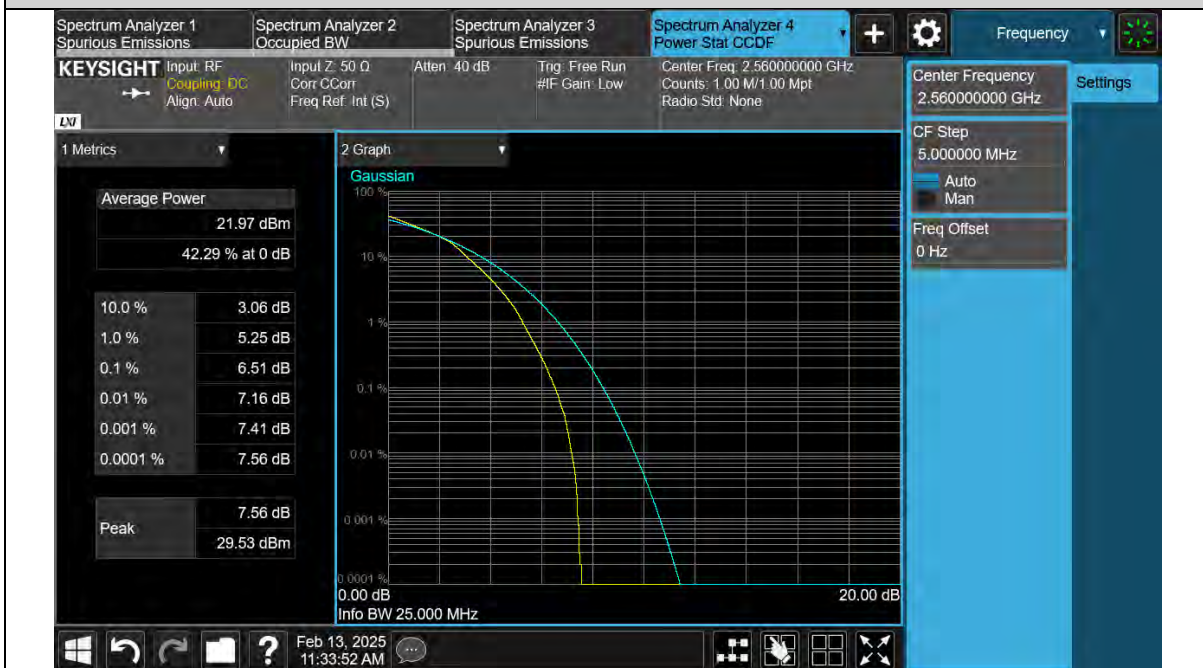
Band7-20MHz-16QAM-21100-27RB#0



BUREAU VERITAS Test Report No.: PSZ-NQN2412300616RF03



Band7-20MHz-16QAM-21350-1RB#0



Band7-20MHz-16QAM-21350-27RB#0

26DB BANDWIDTH AND OCCUPIED BANDWIDTH

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band7	5MHz	QPSK	20775	25RB#0	4.462	4.740	PASS
Band7	5MHz	QPSK	21100	25RB#0	4.457	4.760	PASS
Band7	5MHz	QPSK	21425	25RB#0	4.459	4.735	PASS
Band7	5MHz	16QAM	20775	25RB#0	4.459	4.767	PASS
Band7	5MHz	16QAM	21100	25RB#0	4.458	4.757	PASS
Band7	5MHz	16QAM	21425	25RB#0	4.461	4.737	PASS
Band7	10MHz	QPSK	20800	50RB#0	8.906	9.335	PASS
Band7	10MHz	QPSK	21100	50RB#0	8.807	9.354	PASS
Band7	10MHz	QPSK	21400	50RB#0	8.914	9.338	PASS
Band7	10MHz	16QAM	20800	27RB#0	4.817	5.274	PASS
Band7	10MHz	16QAM	21100	27RB#0	4.822	5.238	PASS
Band7	10MHz	16QAM	21400	27RB#0	4.824	5.280	PASS
Band7	15MHz	QPSK	20825	75RB#0	13.384	13.930	PASS
Band7	15MHz	QPSK	21100	75RB#0	13.385	13.980	PASS
Band7	15MHz	QPSK	21375	75RB#0	13.391	13.990	PASS
Band7	15MHz	16QAM	20825	27RB#0	4.840	5.351	PASS
Band7	15MHz	16QAM	21100	27RB#0	4.839	5.474	PASS



Band7	15MHz	16QAM	21375	27RB#0	4.837	5.408	PASS
Band7	20MHz	QPSK	20850	100RB#0	17.809	18.530	PASS
Band7	20MHz	QPSK	21100	100RB#0	17.827	18.560	PASS
Band7	20MHz	QPSK	21350	100RB#0	17.823	18.540	PASS
Band7	20MHz	16QAM	20850	27RB#0	4.836	5.360	PASS
Band7	20MHz	16QAM	21100	27RB#0	4.826	5.334	PASS
Band7	20MHz	16QAM	21350	27RB#0	4.840	5.467	PASS



Test Graphs



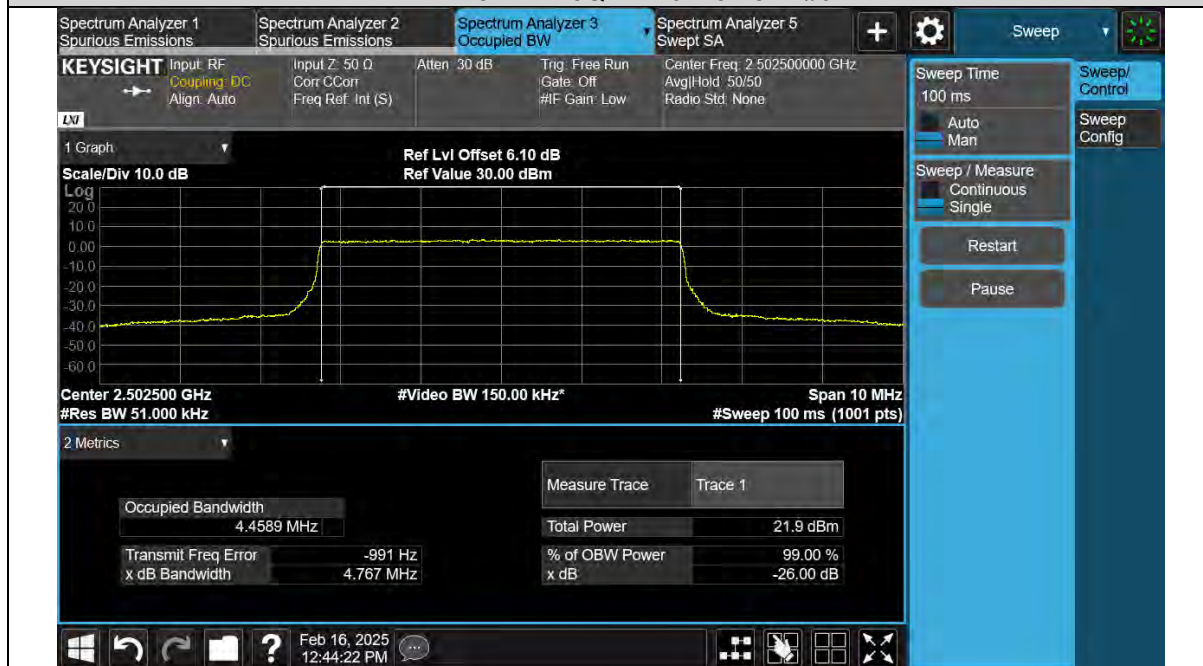


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Test Report No.: PSZ-NQN2412300616RF03



Band7-5MHz-16QAM-20775-25RB#0



Band7-5MHz-16QAM-21100-25RB#0

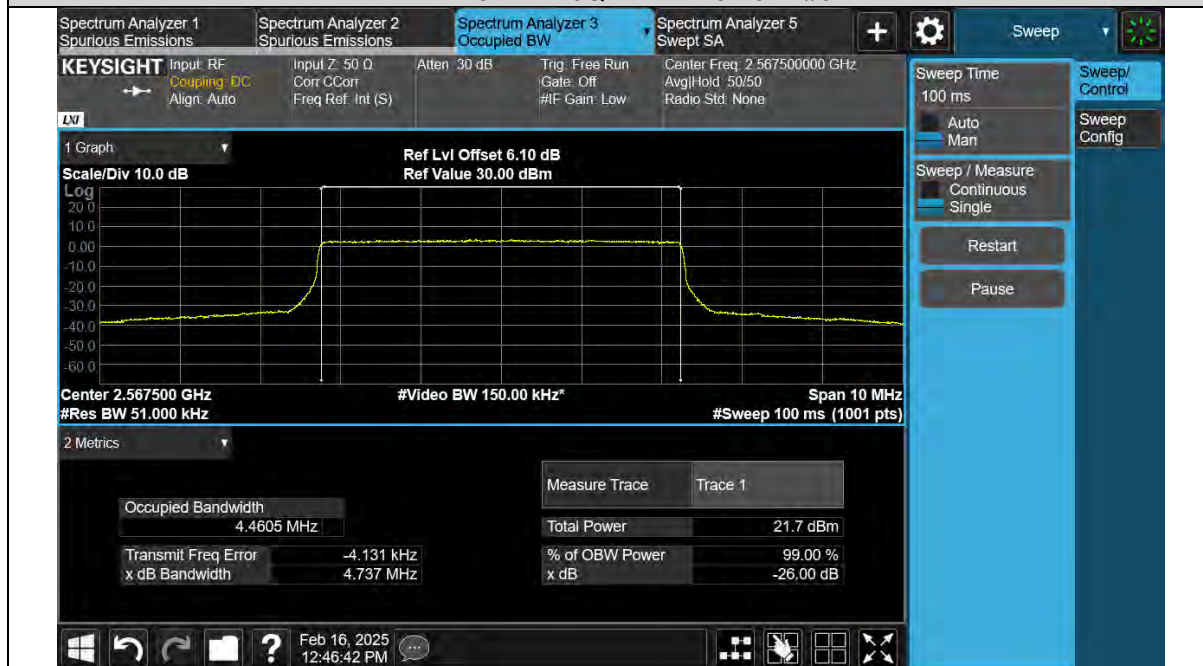


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Test Report No.: PSZ-NQN2412300616RF03



Band7-5MHz-16QAM-21425-25RB#0



Band7-10MHz-QPSK-20800-50RB#0

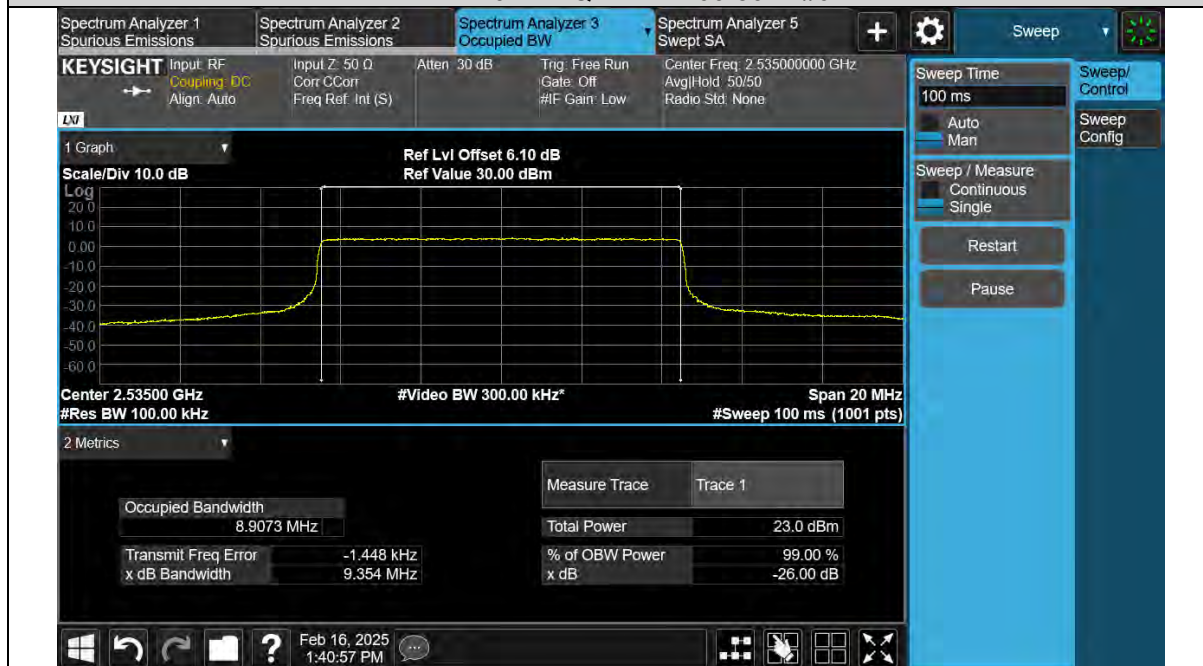


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Test Report No.: PSZ-NQN2412300616RF03



Band7-10MHz-QPSK-21100-50RB#0



Band7-10MHz-QPSK-21400-50RB#0



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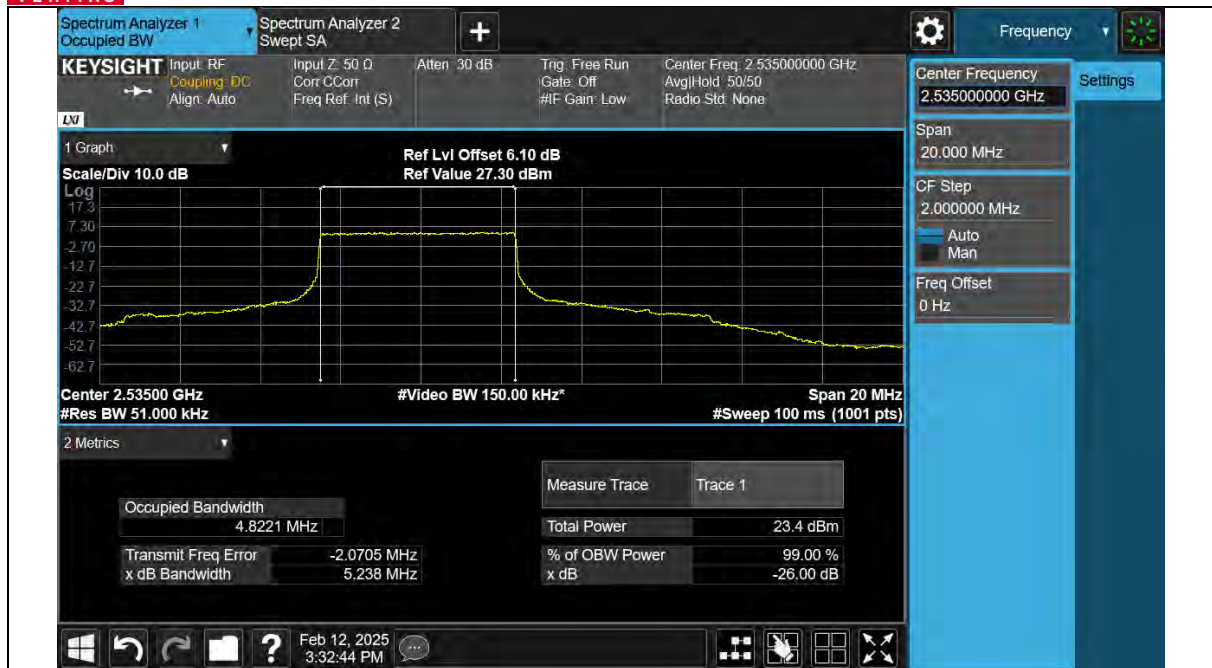
Test Report No.: PSZ-NQN2412300616RF03



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Band7-10MHz-16QAM-21100-27RB#0



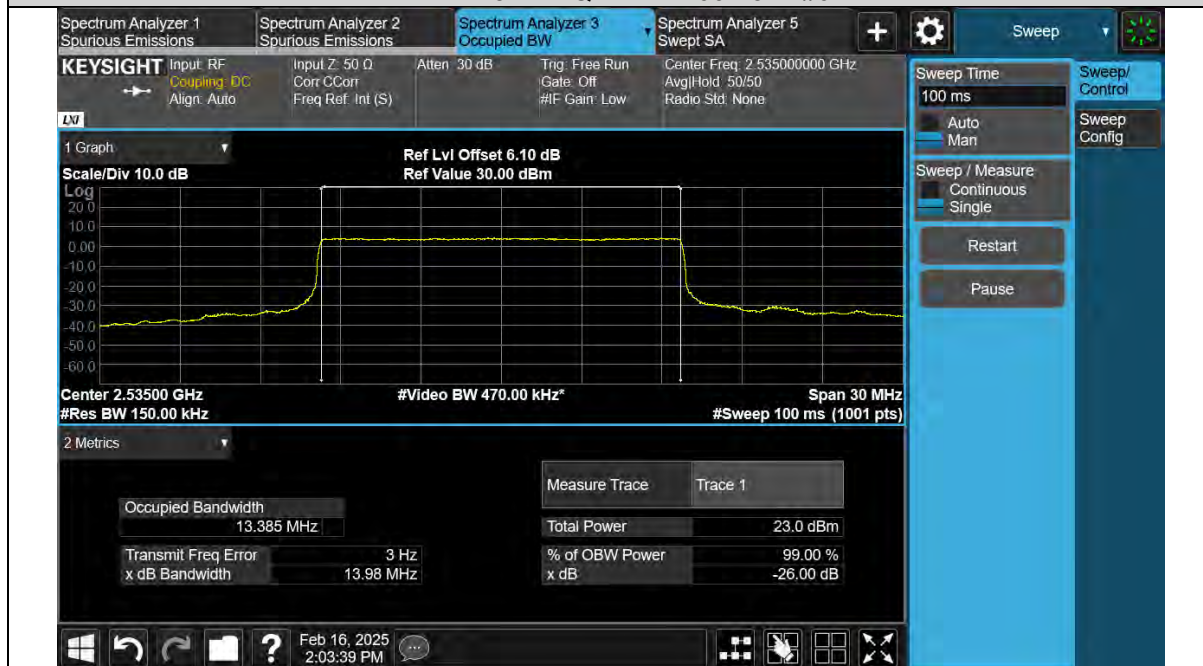
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Band7-15MHz-QPSK-20825-75RB#0



Band7-15MHz-QPSK-21100-75RB#0



Band7-15MHz-QPSK-21375-75RB#0



BUREAU
VERITAS

Test Report No.: PSZ-NQN2412300616RF03



Band7-15MHz-16QAM-20825-27RB#0



Band7-15MHz-16QAM-21100-27RB#0



BUREAU
VERITAS

Test Report No.: PSZ-NQN2412300616RF03



Band7-15MHz-16QAM-21375-27RB#0



Band7-20MHz-QPSK-20850-100RB#0

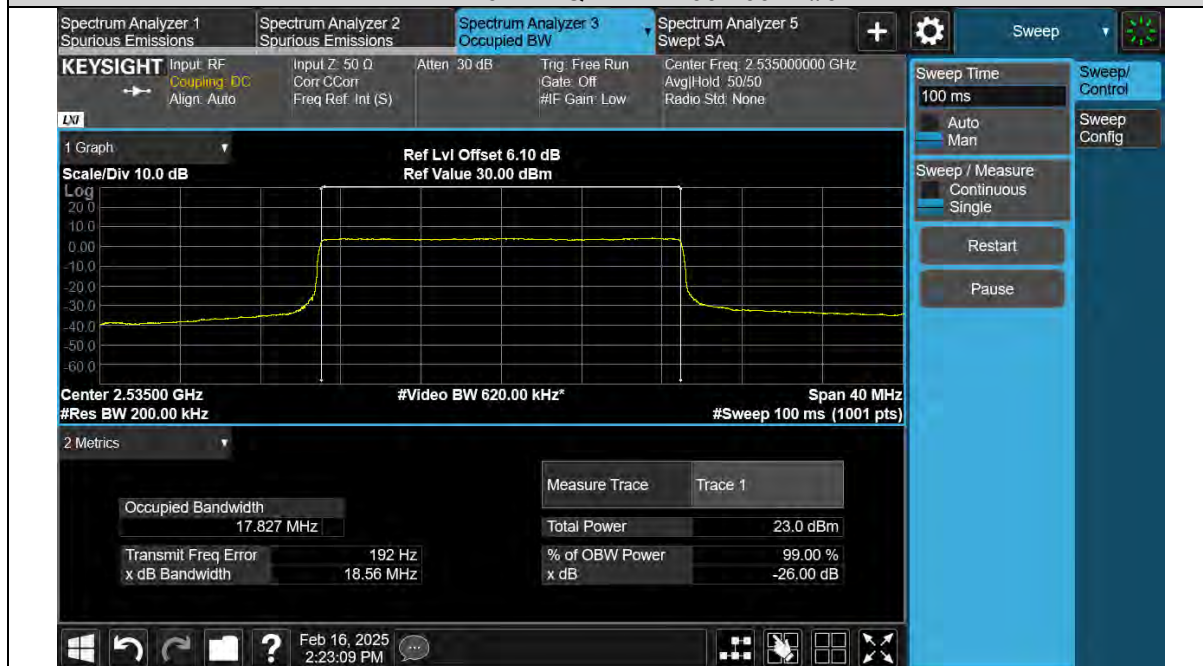


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VERITAS

Test Report No.: PSZ-NQN2412300616RF03



Band7-20MHz-QPSK-21100-100RB#0



Band7-20MHz-QPSK-21350-100RB#0

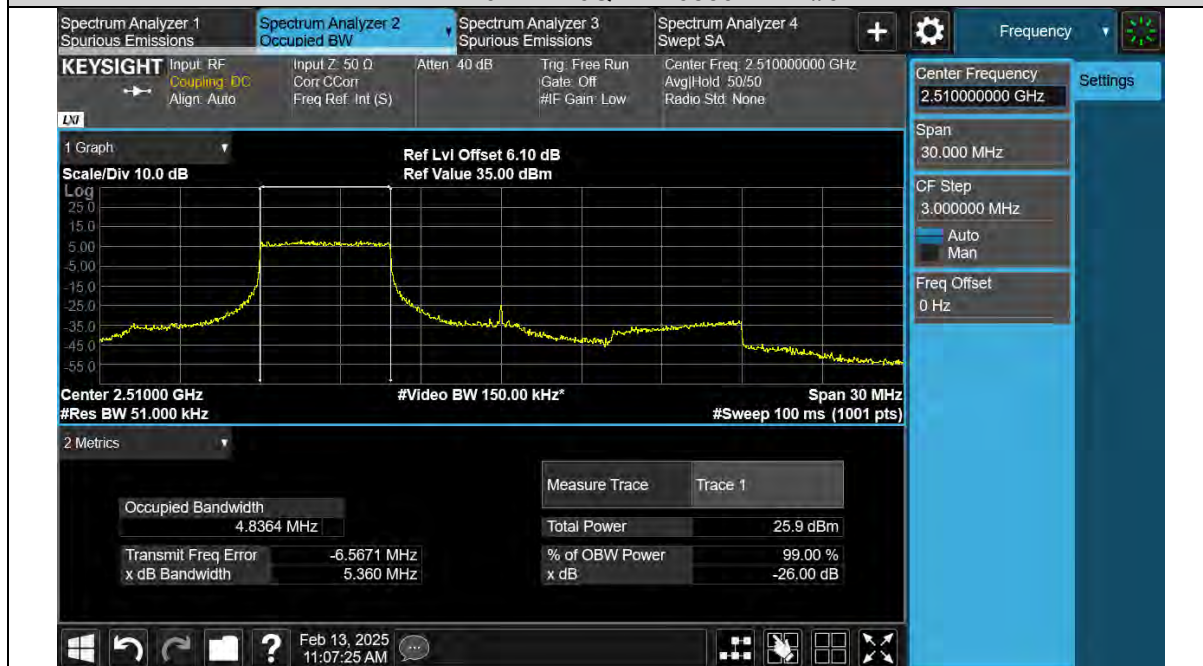


BUREAU
VERITAS

Test Report No.: PSZ-NQN2412300616RF03



Band7-20MHz-16QAM-20850-27RB#0



Band7-20MHz-16QAM-21100-27RB#0