

FCC TEST REPORT

(PART 27)

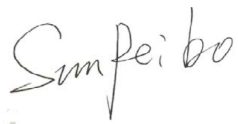
Applicant:	Telit Communications S.p.A
Address:	Via Stazione di Prosecco, 5/B Sgonico, 34010 Italy

Manufacturer or Supplier:	Telit Communications S.p.A
Address:	Via Stazione di Prosecco, 5/B Sgonico, 34010 Italy
Product:	LTE Cat 1 bis module
Brand Name:	Telit Cinterion or 
Model Name:	LE310P1-SN
FCC ID	RI7LE310P1SN
Date of tests	Apr. 16, 2025~ Jun. 27, 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: Jun. 27, 2025	Date: Jun. 27, 2025

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TABLE OF CONTENTS

1. SUMMARY OF TEST RESULTS	5
1.1 MEASUREMENT UNCERTAINTY.....	7
1.2 TEST SITE AND INSTRUMENTS.....	8
2. GENERAL INFORMATION.....	10
2.1 GENERAL DESCRIPTION OF EUT.....	10
2.2 CONFIGURATION OF SYSTEM UNDER TEST	13
2.3 DESCRIPTION OF SUPPORT UNITS.....	14
2.4 TEST ITEM AND TEST CONFIGURATION	15
2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS.....	21
3. TEST TYPES AND RESULTS	22
3.1 OUTPUT POWER MEASUREMENT	22
3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT	22
3.1.2 TEST PROCEDURES	22
3.1.3 TEST SETUP	23
3.1.4 TEST RESULTS	24
3.2 FREQUENCY STABILITY MEASUREMENT	33
3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT	33
3.2.2 TEST PROCEDURE.....	33
3.2.3 TEST SETUP	33
3.2.3 TEST RESULTS	34
3.3 OCCUPIED BANDWIDTH MEASUREMENT	35
3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT	35
3.3.2 TEST SETUP.....	35
3.3.3 TEST PROCEDURES	35
3.3.4 TEST RESULTS	35
3.4 BAND EDGE MEASUREMENT	36
3.4.1 LIMITS OF BAND EDGE MEASUREMENT	36
3.4.2 TEST SETUP.....	37
3.4.3 TEST PROCEDURES	38
3.4.4 TEST RESULTS	38
3.5 CONDUCTED SPURIOUS EMISSIONS.....	39
3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT	39
3.5.2 TEST PROCEDURE.....	40
3.5.3 TEST SETUP	40
3.5.4 TEST RESULTS	40
3.6 RADIATED EMISSION MEASUREMENT	41
3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT	41
3.6.2 TEST PROCEDURES	42
3.6.3 DEVIATION FROM TEST STANDARD	42
3.6.4 TEST SETUP.....	43
3.6.5 TEST RESULTS	45
3.7 PEAK TO AVERAGE RATIO	95
3.7.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT	95
3.7.2 TEST SETUP.....	95
3.7.3 TEST PROCEDURES	95
3.7.4 TEST RESULTS	95
4 INFORMATION ON THE TESTING LABORATORIES	96
5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	97
6 APPENDIX	98
FCC-LTE-BAND12	98



PEAK-TO-AVERAGE RATIO(CCDF)	98
TEST RESULT	98
TEST GRAPHS	99
26DB BANDWIDTH AND OCCUPIED BANDWIDTH	107
TEST RESULT	107
TEST GRAPHS	108
BAND EDGE	113
TEST RESULT	113
TEST GRAPHS	114
CONDUCTED SPURIOUS EMISSION	120
TEST RESULT	120
TEST GRAPHS	121
FREQUENCY STABILITY	126
TEST RESULT	126
FCC-LTE-BAND13	128
PEAK-TO-AVERAGE RATIO(CCDF)	128
TEST RESULT	128
TEST GRAPHS	128
26DB BANDWIDTH AND OCCUPIED BANDWIDTH	132
TEST RESULT	132
TEST GRAPHS	132
BAND EDGE	134
TEST RESULT	134
TEST GRAPHS	134
CONDUCTED SPURIOUS EMISSION	138
TEST RESULT	138
TEST GRAPHS	138
FREQUENCY STABILITY	140
FCC-LTE-BAND71	143
PEAK-TO-AVERAGE RATIO(CCDF)	143
TEST RESULT	143
TEST GRAPHS	144
26DB BANDWIDTH AND OCCUPIED BANDWIDTH	152
TEST RESULT	152
TEST GRAPHS	154
BAND EDGE	159
TEST RESULT	159
TEST GRAPHS	160
CONDUCTED SPURIOUS EMISSION	166
TEST RESULT	166
TEST GRAPHS	167
FREQUENCY STABILITY	172
TEST RESULT	172



RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
PBJ-NQN2504110217RF03	Original release	Jun. 27, 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) (Band 71)	Compliance	A
§27.50(d)(4) §27.50(h)(2)	Equivalent Isotropically Radiated Power (Band 12) (Band 13) (Band 71)	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(h) §27.53(m)(4)	Conducted Band Edge Measurements (Band 12) (Band 13) (Band 71)	Compliance	A
§2.1051 §27.53(g) §27.53(c)(2) §27.53(f) §27.53(h) §27.53(m)(4)	Conducted Spurious Emissions (Band 12) (Band 13) (Band 71)	Compliance	A
§2.1053 §27.53(c)(2) §27.53(f) §27.53(g) §27.53(h) §27.53(m)(4)	Radiated Spurious Emissions (Band 12) (Band 13) (Band 71)	Compliance	A
§27.50	Peak to average ratio*	Compliance	A

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



BUREAU VERITAS Test Report No.: PBJ-NQN2504110217RF03

***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, China

Accredited Test Lab Cert 6613.01

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

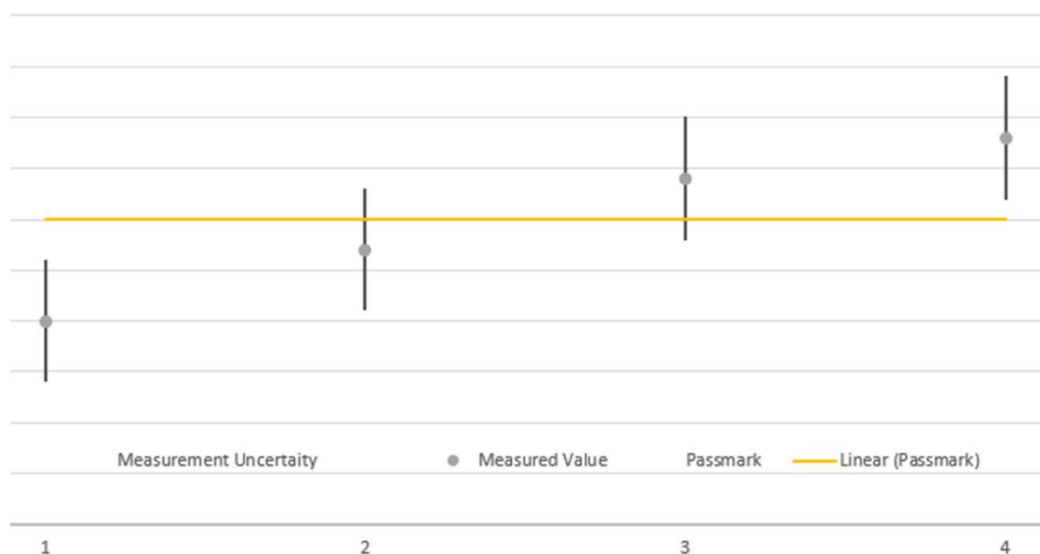


1.1 MEASUREMENT UNCERTAINTY

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	Jul.04,25	Jul.03,27
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	Mar.22,25	Mar.21,27
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
Radio Communication Tester	Rohde&Schwarz	CMX500	101446	Mar.21,25	Mar.20,27
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	Mar.18,25	Mar.17,27
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	W13.02	N/A	Apr.26,25	Apr.25,26
CABLE	R&S	W12.14	N/A	Apr.27,24	Apr.26,25
CABLE	R&S	W12.14	N/A	Apr.26,25	Apr.25,26
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.27,24	Apr.26,25
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.26,25	Apr.25,26
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.27,24	Apr.26,25
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.26,25	Apr.25,26
Temperature Chamber	votsch	VT4002	58566078100050	May.30,24	May.29,26

NOTE:

1. The calibration interval of the above test instruments is 6 months or 12 months or 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 1 bis module	
BRAND NAME*	Telit Cinterion or 	
MODEL NAME*	LE310P1-SN	
NOMINAL VOLTAGE*	3.8V dc	
MODULATION TECHNOLOGY	LTE	QPSK, 16QAM
FREQUENCY RANGE	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 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/ERP POWER	LTE Band 12 Channel Bandwidth: 1.4MHz	238.78mW
	LTE Band 12 Channel Bandwidth: 3MHz	247.17mW
	LTE Band 12 Channel Bandwidth: 5MHz	248.89mW
	LTE Band 12 Channel Bandwidth: 10MHz	250.03mW
	LTE Band 13 Channel Bandwidth: 5MHz	213.30mW
	LTE Band 13 Channel Bandwidth: 10MHz	216.27mW
	LTE Band 71 Channel Bandwidth: 5MHz	402.72mW
	LTE Band 71 Channel Bandwidth: 10MHz	405.51mW



	LTE Band 71 Channel Bandwidth: 15MHz	408.32mW
	LTE Band 71 Channel Bandwidth: 20MHz	421.70mW
EMISSION DESIGNATOR	LTE Band 12 Channel Bandwidth: 1.4MHz	QPSK: 1M10G7D 16QAM: 1M10W7D
	LTE Band 12 Channel Bandwidth: 3MHz	QPSK: 2M69G7D 16QAM: 2M70W7D
	LTE Band 12 Channel Bandwidth: 5MHz	QPSK: 4M57G7D 16QAM: 4M58W7D
	LTE Band 12 Channel Bandwidth: 10MHz	QPSK: 9M06G7D 16QAM: 4M96W7D
	LTE Band 13 Channel Bandwidth: 5MHz	QPSK: 4M60G7D 16QAM: 4M59W7D
	LTE Band 13 Channel Bandwidth: 10MHz	QPSK: 9M02G7D 16QAM: 4M92W7D
	LTE Band 71 Channel Bandwidth: 5MHz	QPSK: 4M57G7D 16QAM: 4M57W7D
	LTE Band 71 Channel Bandwidth: 10MHz	QPSK: 9M09G7D 16QAM: 4M94W7D
	LTE Band 71 Channel Bandwidth: 15MHz	QPSK: 13M6G7D 16QAM: 4M96W7D
	CLTE Band 71 Channel Bandwidth: 20MHz	QPSK: 18M1G7D 16QAM: 4M99W7D
ANTENNA GAIN*	LTE BAND12	Ant 1: 2dBi
	LTE BAND13	Ant 1: 2dBi
	LTE BAND71	Ant 1: 2dBi
ANTENNA TYPE*	Main Ant:Fixed External Antenna	
HW VERSION*	0.0	
SW VERSION*	M0E.200001	
I/O PORTS*	Refer to user's manual	



CABLE SUPPLIED*	N/A
EXTREME TEMPERATURE*	-10℃ ~ 55℃
EXTREME VOLTAGE*	3.4Vdc ~ 4.2Vdc

NOTE:

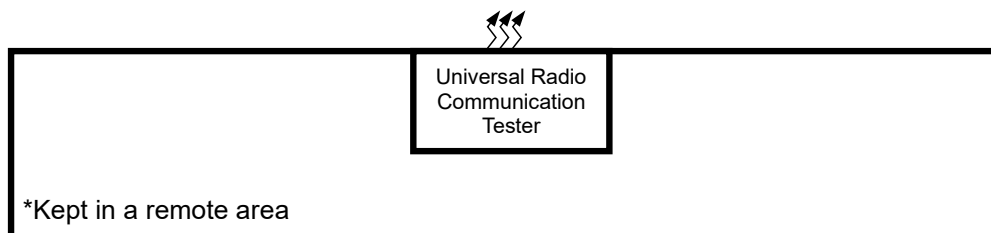
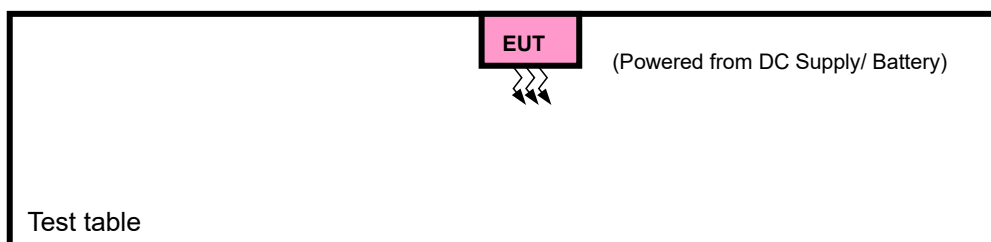
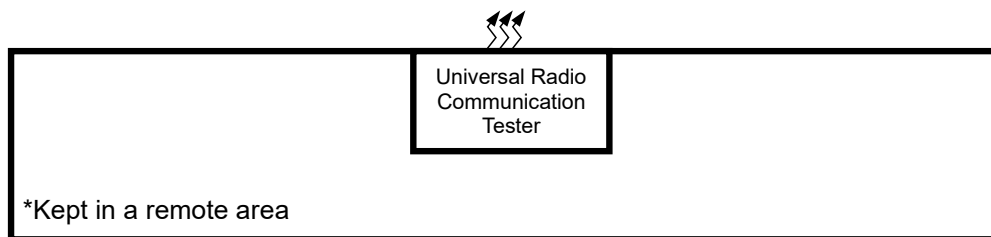
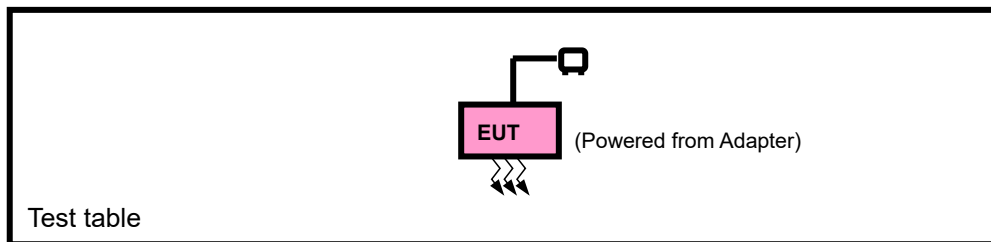
1. *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , Test Lab is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.
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.
5. The power of single LTE band is larger than that in LTE CA, so single LTE band can cover the RSE risk of LTE CA part.



BUREAU VERITAS Test Report No.: PBJ-NQN2504110217RF03
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	DC Source	HYELEC	HY3010B	551016	N/A

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



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 Y-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 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	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
A	PEAK TO AVERAGE RATIO	23017 to 23173	23017, 23095 , 23173	1.4MHz	QPSK, 16QAM	1 RB / 0 RB offset 6 RB / 0 RB offset
		23025 to 23165	23025, 23095 ,23165	3MHz	QPSK, 16QAM	1 RB / 0 RB offset 15 RB / 0 RB offset
		23035 to 23155	23035, 23095 ,23155	5MHz	QPSK, 16QAM	1 RB / 0 RB offset 25 RB / 0 RB offset
		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	CONDCUETED 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	23095	3MHz	QPSK	1 RB / 0 RB offset
		23035 to 23155	23095	5MHz	QPSK	1 RB / 0 RB offset
		23060 to 23130	23060,23095,23130	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	50 RB / 0 RB offset
A	OCCUPIED BANDWIDTH	23205 to 23255	23205, 23230, 23255	5MHz	QPSK, 16QAM	25 RB / 0 RB offset
		23230	23230	10MHz	QPSK, 16QAM	50 RB / 0 RB offset
A	PEAK TO AVERAGE RATIO	23205 to 23255	23205, 23230, 23255	5MHz	QPSK, 16QAM	1 RB / 0 RB offset 25 RB / 0 RB offset
		23230	23230	10MHz	QPSK, 16QAM	1 RB / 0 RB offset 50 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	CONDCUDED EMISSION	23205 to 23255	23205, 23230, 23255	5MHz	QPSK	1 RB / 0 RB offset
		23230	23230	10MHz	QPSK	1 RB / 0 RB offset
A	RADIATED EMISSION	23205 to 23255	23230	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.



LTE BAND 71 MODE						
EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	ERP	133147 to 133447	133147, 133297, 133447	5MHz	QPSK,16QAM	1 RB / 0 RB offset
		133172 to 133422	133172, 133297 133422	10MHz	QPSK,16QAM	1 RB / 0 RB offset
		133197 to 133397	133197, 133297, 133397	15MHz	QPSK,16QAM	1 RB / 0 RB offset
		133222 to 133372	133222, 133322, 133372	20MHz	QPSK,16QAM	1 RB / 0 RB offset
B	FREQUENCY STABILITY	133172 to 133422	133172, 133297 133422	10MHz	QPSK	50 RB / 0 RB offset
A	OCCUPIED BANDWIDTH	133147 to 133447	133147, 133297, 133447	5MHz	QPSK,16QAM	25 RB / 0 RB offset
		133172 to 133422	133172, 133297 133422	10MHz	QPSK,16QAM	50 RB / 0 RB offset
		133197 to 133397	133197, 133297, 133397	15MHz	QPSK,16QAM	75 RB / 0 RB offset
		133222 to 133372	133222, 133322, 133372	20MHz	QPSK,16QAM	100 RB / 0 RB offset
A	PEAK TO AVERAGE RATIO	133147 to 133447	133147, 133297, 133447	5MHz	QPSK,16QAM	1 RB / 0 RB offsett 25 RB / 0 RB offset
		133172 to 133422	133172, 133297 133422	10MHz	QPSK,16QAM	1 RB / 0 RB offsett 50 RB / 0 RB offset
		133197 to 133397	133197, 133297, 133397	15MHz	QPSK,16QAM	1 RB / 0 RB offsett 27 RB / 0 RB offset
		133222 to 133372	133222, 133322, 133372	20MHz	QPSK,16QAM	1 RB / 0 RB offsett 27 RB / 0 RB offset
A	BAND EDGE	133147 to 133447	133147	5MHz	QPSK,16QAM	1 RB / 0 RB offset 25 RB / 0 RB offset
			133447	5MHz	QPSK,16QAM	1 RB / 24 RB offset 25 RB / 0 RB offset
		133172 to 133422	133172	10MHz	QPSK,16QAM	1 RB / 0 RB offset 50 RB / 0 RB offset
			133422	10MHz	QPSK,16QAM	1 RB / 49 RB offset 50 RB / 0 RB offset
		133197 to 133397	133197	15MHz	QPSK,16QAM	1 RB / 0 RB offset 75 RB / 0 RB offset
			133397	15MHz	QPSK,16QAM	1 RB / 74 RB offset 75 RB / 0 RB offset
		133222 to 133372	133222	20MHz	QPSK,16QAM	1 RB / 0 RB offset 100 RB / 0 RB offset



			133372	20MHz	QPSK,16QAM	1 RB / 99 RB offset
						100 RB / 0 RB offset
A	CONDCUDED EMISSION	133147 to 133447	133147, 133297, 133447	5MHz	QPSK	1 RB / 0 RB offset
		133172 to 133422	133172, 133297 133422	10MHz	QPSK	1 RB / 0 RB offset
		133197 to 133397	133197, 133297, 133397	15MHz	QPSK	1 RB / 0 RB offset
		133222 to 133372	133222, 133322, 133372	20MHz	QPSK	1 RB / 0 RB offset
A	RADIATED EMISSION	133147 to 133447	133147, 133297, 133447	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	133322	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.



TEST CONDITION			
TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP	23deg. C, 70%RH	DC 3.8V dc By Adapter	Hanwen Xu
FREQUENCY STABILITY	23deg. C, 70%RH	DC 3.4V/ 3.8V/ 4.2V By Adapter	Hanwen Xu
OCCUPIED BANDWIDTH	23deg. C, 70%RH	DC 3.8V dc By Adapter	Hanwen Xu
BAND EDGE	23deg. C, 70%RH	DC 3.8V dc By Adapter	Hanwen Xu
CONDCUDED EMISSION	23deg. C, 70%RH	DC 3.8V dc By Adapter	Hanwen Xu
RADIATED EMISSION	23deg. C, 70%RH	AC 120V/60Hz	Hanwen Xu
PEAK TO AVERAGE RATIO	23deg. C, 70%RH	DC 3.8V 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(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.

Part 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.

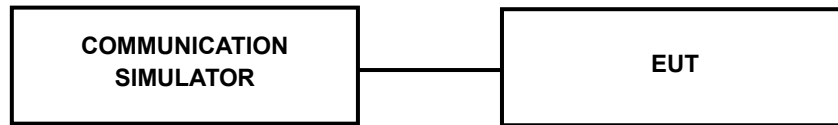
CONDUCTED POWER MEASUREMENT:

- 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 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	23.93	23.11	23.02
		1	2	23.10	23.05	23.01
		1	5	23.39	23.01	23.02
		3	0	23.12	22.56	23.08
		3	1	22.72	22.74	22.89
		3	3	22.87	22.82	22.69
		6	0	22.25	22.02	22.10
	16QAM	1	0	22.90	22.24	22.71
		1	2	22.18	22.16	22.72
		1	5	22.84	22.02	22.50
		3	0	22.98	22.53	22.92
		3	1	22.74	22.39	22.88
		3	3	22.88	22.85	22.70
		6	0	21.47	21.38	21.40
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	24.08	23.12	23.03
		1	7	23.08	23.11	23.10
		1	14	23.43	23.17	23.02
		8	0	22.46	22.22	22.33
		8	3	22.08	22.10	22.14
		8	7	22.11	22.05	22.04
		15	0	22.39	22.01	22.22
	16QAM	1	0	23.36	22.12	22.74
		1	7	22.24	22.08	22.76
		1	14	22.87	22.15	22.51
		8	0	22.71	21.76	22.34
		8	4	22.00	21.73	22.26
		8	7	22.32	22.18	22.04
		15	0	21.49	21.21	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	24.11	23.02	23.05
		1	12	23.02	23.06	23.04
		1	24	23.47	23.08	23.02
		12	0	22.52	22.14	22.34
		12	6	22.11	22.02	22.27



BUREAU VERITAS Test Report No.: PBJ-NQN2504110217RF03

		12	13	22.22	22.09	22.18	
		25	0	22.40	22.12	22.30	
	16QAM	1	0	23.46	22.05	22.80	
		1	12	22.27	22.08	22.87	
		1	24	22.95	22.20	22.57	
		12	0	22.79	21.81	22.42	
		12	7	22.02	21.86	22.35	
		12	13	22.44	22.28	22.19	
		25	0	21.58	21.03	21.53	
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	24.13	23.36	23.59	
		1	24	23.14	23.11	23.06	
		1	49	23.53	23.19	23.01	
		25	0	22.61	22.08	22.47	
		25	12	22.14	22.10	22.34	
		25	25	22.29	22.23	22.31	
		50	0	22.43	22.13	22.43	
	16QAM	1	0	23.57	22.06	22.83	
		1	12	22.41	22.19	22.90	
		1	24	22.99	22.29	22.60	
		12	0	22.90	21.96	22.56	
		12	18	22.07	22.01	22.42	
		12	36	22.46	22.36	22.25	
		27	0	21.63	21.03	21.63	
	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	23.35	23.44	23.36	
		1	12	23.24	23.30	23.01	
		1	24	23.06	23.04	23.05	
		12	0	22.01	22.04	22.39	
		12	6	22.02	22.14	22.94	
		12	13	22.15	22.18	22.83	
		25	0	22.06	22.12	22.50	
	16QAM	1	0	22.70	22.70	22.79	
		1	12	22.11	22.13	22.16	
		1	24	22.47	22.53	22.36	
		12	0	21.54	21.65	21.78	
		12	7	22.05	22.17	22.35	
		12	13	21.51	21.54	21.57	
		25	0	21.03	21.10	21.29	
		1	0	23.35	23.44	23.36	
		1	12	23.24	23.30	23.01	
Band/BW	Modulation	RB Size	RB offset	/	Mid CH 23230	/	



				/	Frequency 782.0 MHz	/
13/ 10	QPSK	1	0	/	23.50	/
		1	24	/	23.31	/
		1	49	/	23.09	/
		25	0	/	22.01	/
		25	12	/	22.15	/
		25	25	/	22.06	/
		50	0	/	22.05	/
	16QAM	1	0	/	22.79	/
		1	12	/	22.11	/
		1	24	/	22.57	/
		12	0	/	21.67	/
		12	18	/	22.20	/
		12	36	/	21.63	/
		27	0	/	21.15	/

LTE Band 71						
Band/BW	Modulation	RB Size	RB offset	Low CH 133147	Mid CH 133297	High CH 133447
				Frequency 665.5MHz	Frequency 680.5MHz	Frequency 695.5MHz
71/ 5	QPSK	1	0	24.05	23.62	23.07
		1	12	23.05	23.04	23.03
		1	24	23.02	23.09	23.01
		12	0	22.70	22.15	22.26
		12	6	22.31	22.02	22.22
		12	13	22.13	22.11	22.08
		25	0	22.32	22.12	22.03
	16QAM	1	0	23.67	23.06	22.64
		1	12	22.52	22.08	22.28
		1	24	22.11	22.07	22.08
		12	0	22.28	22.25	22.02
		12	6	22.01	21.42	21.95
		12	13	21.54	21.90	21.67
		25	0	21.77	21.19	21.27
Band/BW	Modulation	RB Size	RB offset	Low CH 133172	Mid CH 133297	High CH 133172
				Frequency 668MHz	Frequency 680.5MHz	Frequency 693MHz
71/ 10	QPSK	1	0	24.08	23.74	23.17
		1	24	23.19	23.11	23.03
		1	49	23.06	23.06	23.04
		25	0	22.73	22.05	22.09
		25	12	22.39	22.04	22.28
		25	25	22.15	22.02	22.11
		50	0	22.35	22.22	22.15
	16QAM	1	0	23.82	23.17	22.69
		1	12	22.64	22.05	22.33
		1	24	22.02	22.07	22.05
		12	0	22.98	22.71	22.25



BUREAU VERITAS Test Report No.: PBJ-NQN2504110217RF03

		12	18	22.31	21.53	22.10
		12	37	21.57	21.94	21.69
		27	0	21.78	21.22	21.29
LTE Band 71						
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	24.11	23.84	23.28
		1	37	23.27	23.07	23.05
		1	74	23.01	23.04	23.07
		36	0	22.80	22.14	22.23
		36	19	22.48	22.06	22.32
		36	39	22.08	22.02	22.17
		75	0	22.39	22.04	22.25
	16QAM	1	0	23.84	23.18	22.82
		1	12	22.65	22.06	22.37
		1	24	22.02	22.03	22.01
		12	0	22.99	22.75	22.39
		12	31	22.38	21.57	22.14
		12	62	21.66	22.07	21.77
		27	0	21.89	21.29	21.39
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	24.25	23.85	23.42
		1	50	23.37	23.08	23.16
		1	99	23.11	23.05	23.03
		50	0	22.86	22.08	22.32
		50	25	22.56	22.13	22.38
		50	50	22.05	22.03	22.10
		100	0	22.51	22.03	22.27
	16QAM	1	0	23.87	23.33	22.89
		1	50	22.69	22.12	22.50
		1	99	22.08	22.10	22.06
		12	0	22.92	22.90	22.47
		12	43	22.42	21.69	22.18
		12	87	21.81	22.16	21.82
		27	0	22.03	21.33	21.51



ERP

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	23.93	2	23.78	238.78	3
23095	707.5	23.11	2	22.96	197.70	3
23173	715.3	23.08	2	22.93	196.34	3

1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23017	699.7	22.98	2	22.83	191.87	3
23095	707.5	22.85	2	22.70	186.21	3
23173	715.3	22.92	2	22.77	189.23	3

3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23025	700.5	24.08	2	23.93	247.17	3
23095	707.5	23.17	2	23.02	200.45	3
23165	714.5	23.10	2	22.95	197.24	3

3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23025	700.5	23.36	2	23.21	209.41	3
23095	707.5	22.18	2	22.03	159.59	3
23165	714.5	22.76	2	22.61	182.39	3

5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23035	701.5	24.11	2	23.96	248.89	3
23095	707.5	23.08	2	22.93	196.34	3
23155	713.5	23.05	2	22.90	194.98	3

5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23035	701.5	23.46	2	23.31	214.29	3
23095	707.5	22.28	2	22.13	163.31	3
23155	713.5	22.87	2	22.72	187.07	3



10MHz QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23060	704	24.13	2	23.98	250.03	3
23095	707.5	23.36	2	23.21	209.41	3
23130	711	23.59	2	23.44	220.80	3

10MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23060	704	23.57	2	23.42	219.79	3
23095	707.5	22.36	2	22.21	166.34	3
23130	711	22.90	2	22.75	188.36	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	23.35	2	23.20	208.93	3
23230	782	23.44	2	23.29	213.30	3
23255	784.5	23.36	2	23.21	209.41	3

5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23205	779.5	22.70	2	22.55	179.89	3
23230	782	22.70	2	22.55	179.89	3
23255	784.5	22.79	2	22.64	183.65	3

10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23230	782	23.50	2	23.35	216.27	3

10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23230	782	22.79	2	22.64	183.65	3

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



LTE BAND 71

5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133147	665.5	24.05	2	26.05	402.72	3
133297	680.5	23.62	2	25.62	364.75	3
133447	695.5	23.07	2	25.07	321.37	3

5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133147	665.5	23.67	2	25.67	368.98	3
133297	680.5	23.06	2	25.06	320.63	3
133447	695.5	22.64	2	24.64	291.07	3

10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133172	668	24.08	2	26.08	405.51	3
133297	680.5	23.74	2	25.74	374.97	3
133422	693	23.17	2	25.17	328.85	3

10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133172	668	23.82	2	25.82	381.94	3
133297	680.5	23.17	2	25.17	328.85	3
133422	693	22.69	2	24.69	294.44	3

15MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133197	670.5	24.11	2	26.11	408.32	3
133297	680.5	23.84	2	25.84	383.71	3
133397	690.5	23.28	2	25.28	337.29	3

15MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133197	670.5	23.84	2	25.84	383.71	3
133297	680.5	23.18	2	25.18	329.61	3
133397	690.5	22.82	2	24.82	303.39	3

20MHz QPSK



BUREAU VERITAS Test Report No.: PBJ-NQN2504110217RF03

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133222	673	24.25	2	26.25	421.70	3
133322	683	23.85	2	25.85	384.59	3
133372	688	23.42	2	25.42	348.34	3

20MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
133222	673	23.87	2	25.87	386.37	3
133322	683	23.33	2	25.33	341.19	3
133372	688	22.89	2	24.89	308.32	3

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



3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

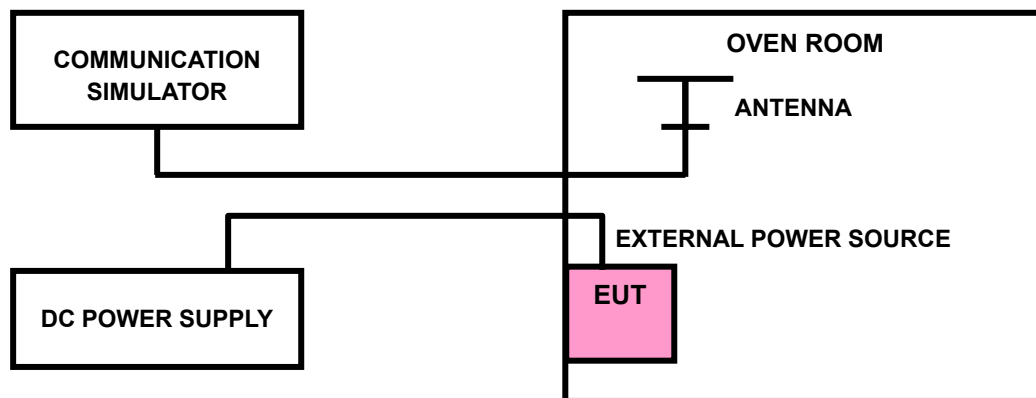
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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)

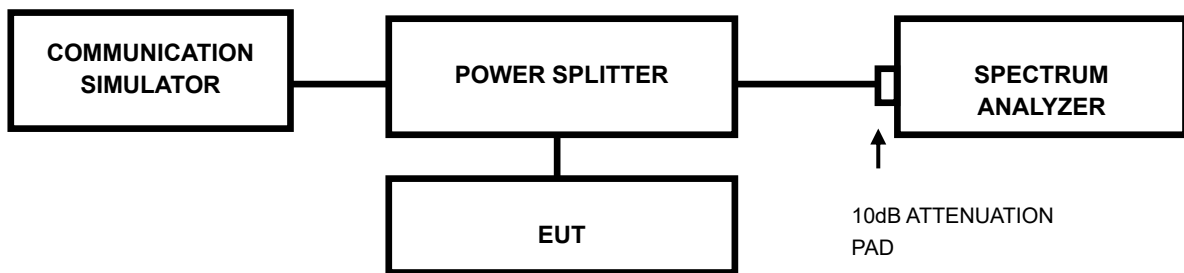


3.3 OCCUPIED BANDWIDTH MEASUREMENT

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

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.

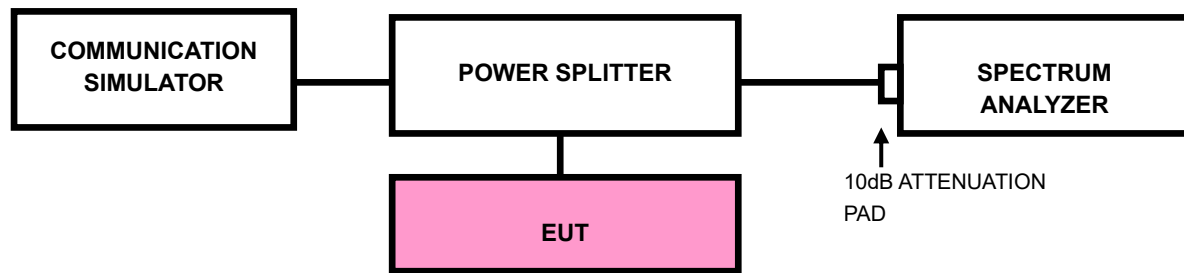
According to FCC 27.53(m)(4) specified that For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz 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 than $43 + 10 \log (P)$ 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.

47 CFR 27.53(c)(2) : On any frequency outside 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;

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.



3.4.2 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.



CONDUCTED SPURIOUS EMISSIONS

3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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.

47 CFR 27.53(c)(2) : On any frequency outside 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;

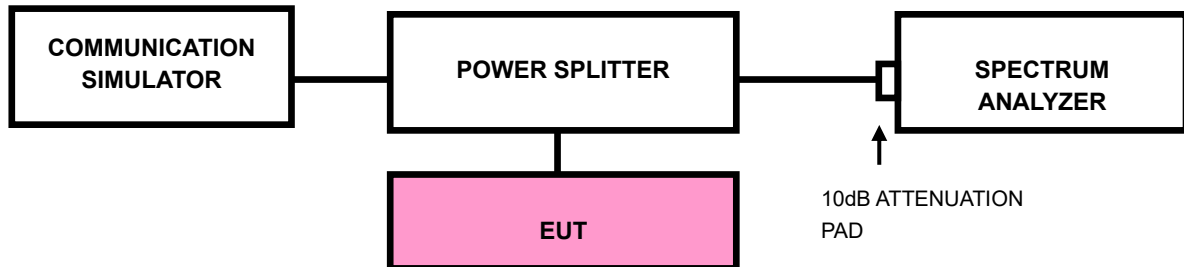
47 CFR 27.53(f) : For operations in the 746–758 MHz, 775–788 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For 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.



3.5.2 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

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 than $43 + 10 \log (P)$ 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.

47 CFR 27.53(c)(2) : On any frequency outside 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;

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.

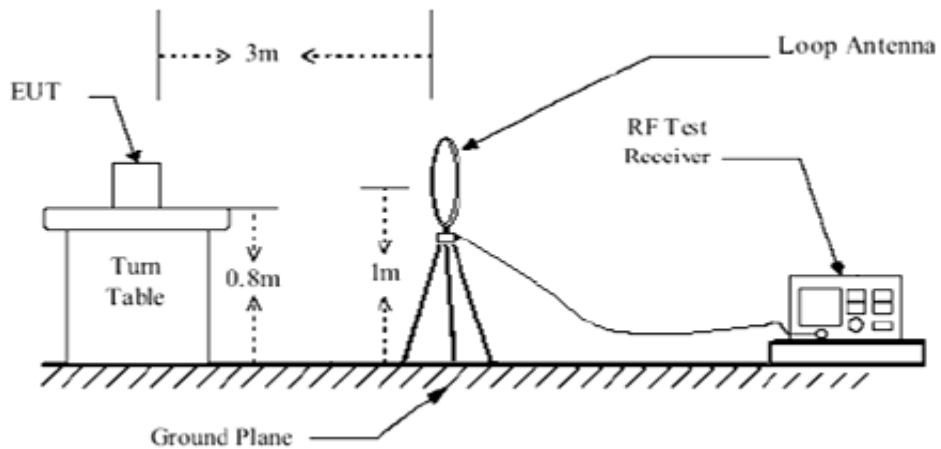
3.6.3 DEVIATION FROM TEST STANDARD

No deviation

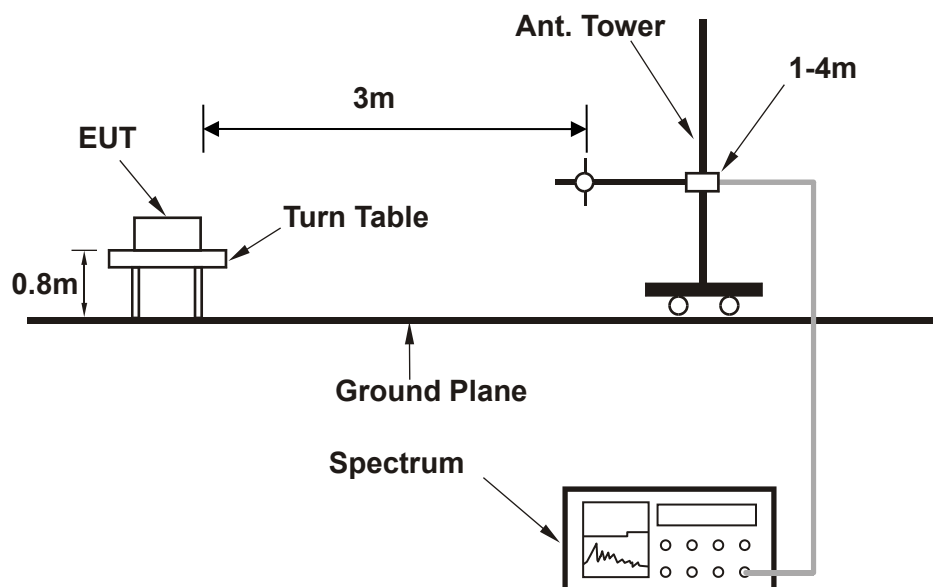


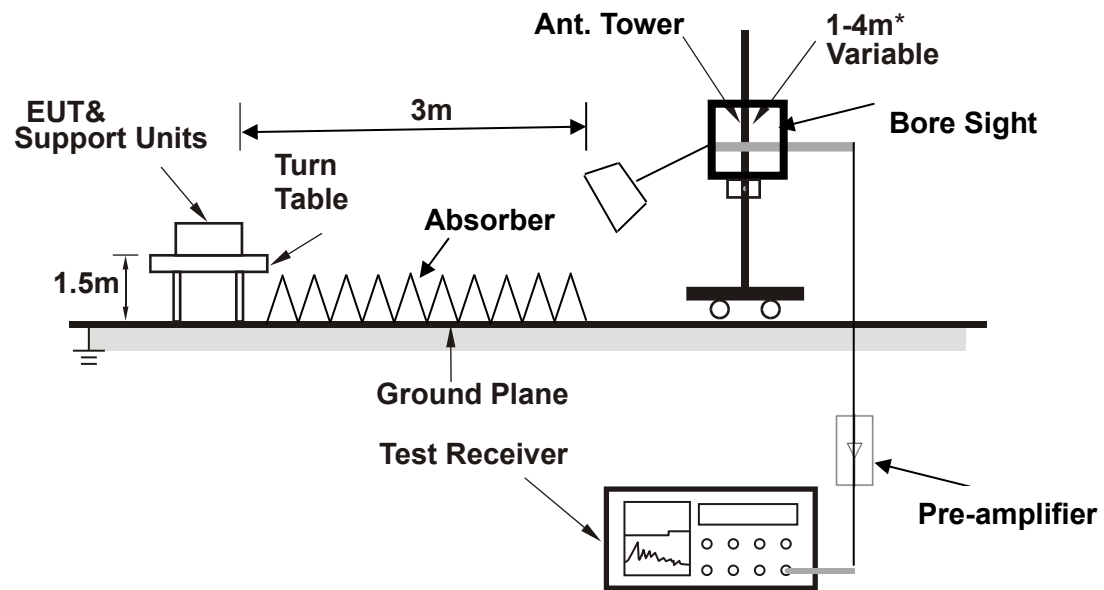
3.6.4 TEST SETUP

< Frequency Range below 30MHz >



< Frequency Range 30MHz~1GHz >





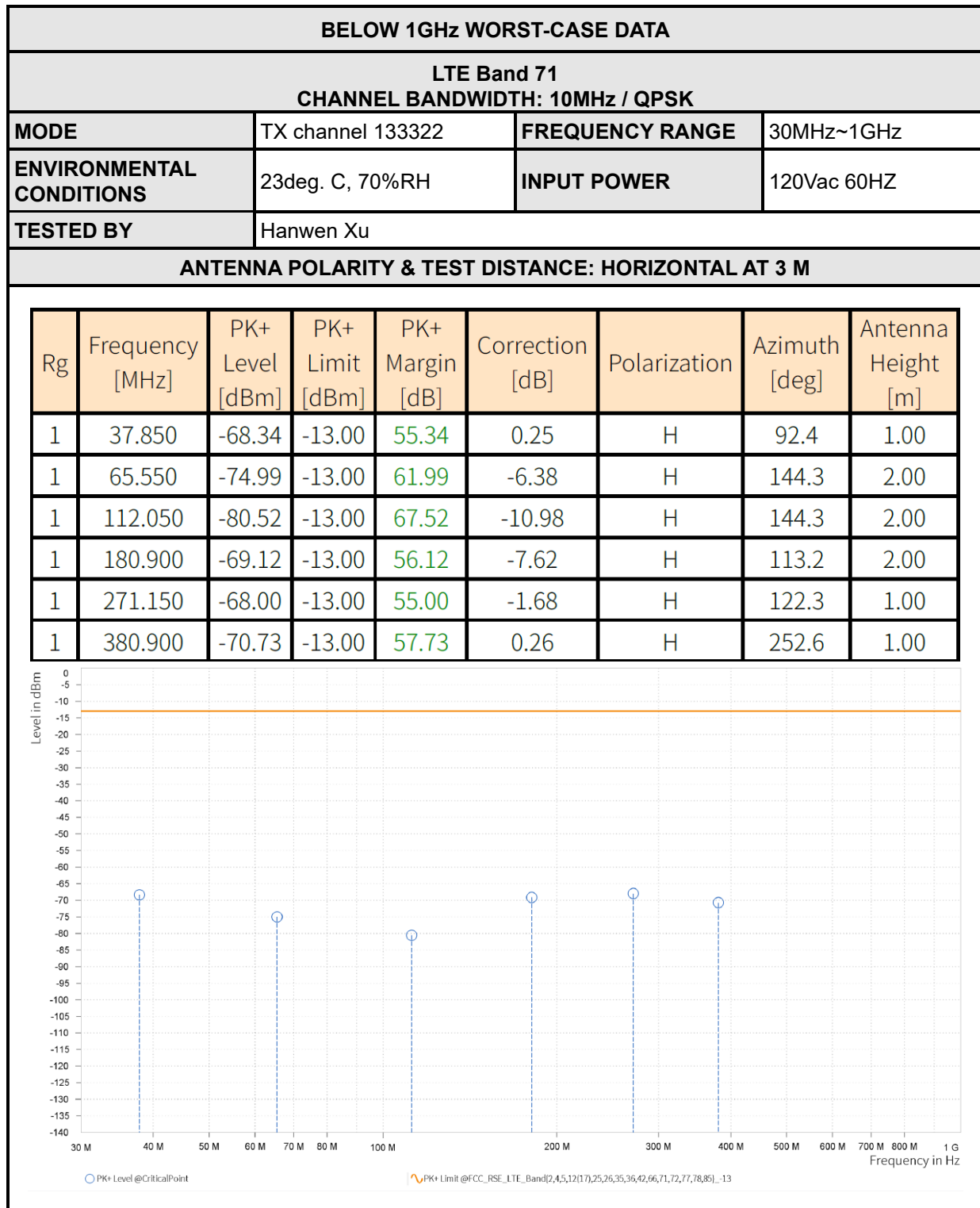
Note: Above 1G is a directional antenna depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

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.

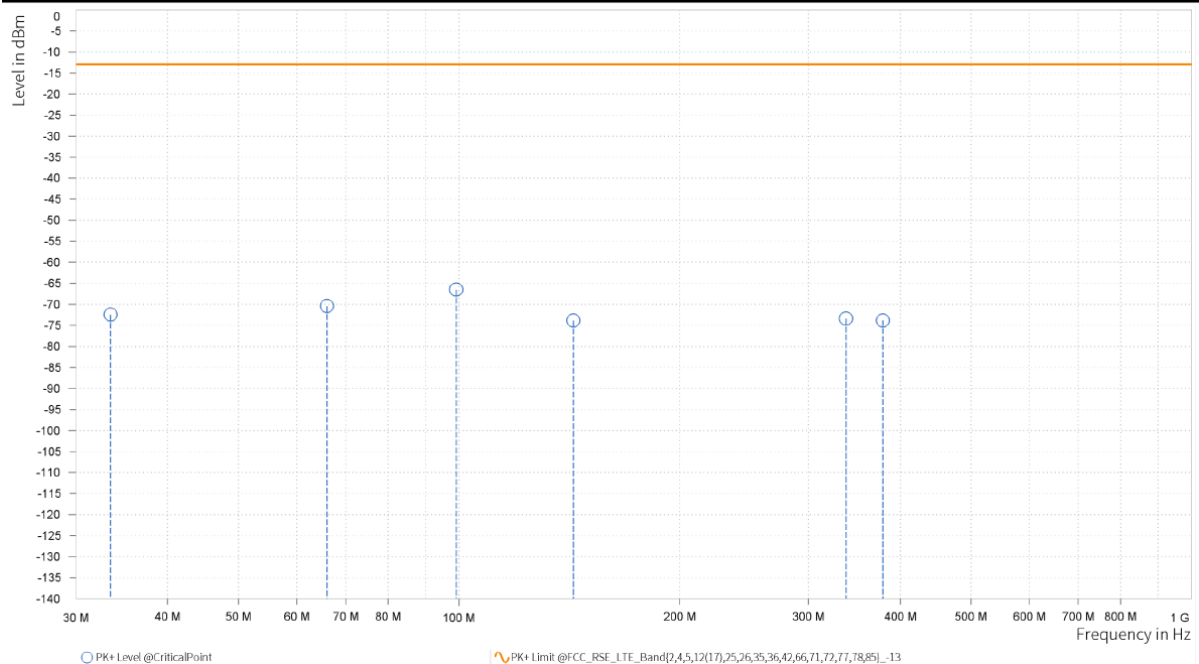




MODE	TX channel 13322	FREQUENCY RANGE	30MHz~1GHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		

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	33.450	-72.46	-13.00	59.46	-8.10	V	134.3	1.00
1	66.000	-70.43	-13.00	57.43	-7.54	V	359.1	1.00
1	99.100	-66.50	-13.00	53.50	5.06	V	143.2	2.00
1	143.200	-73.84	-13.00	60.84	-12.08	V	357.4	1.00
1	337.450	-73.40	-13.00	60.40	-0.15	V	196.6	1.00
1	378.850	-73.81	-13.00	60.81	-0.01	V	256.2	1.00





ABOVE 1GHz

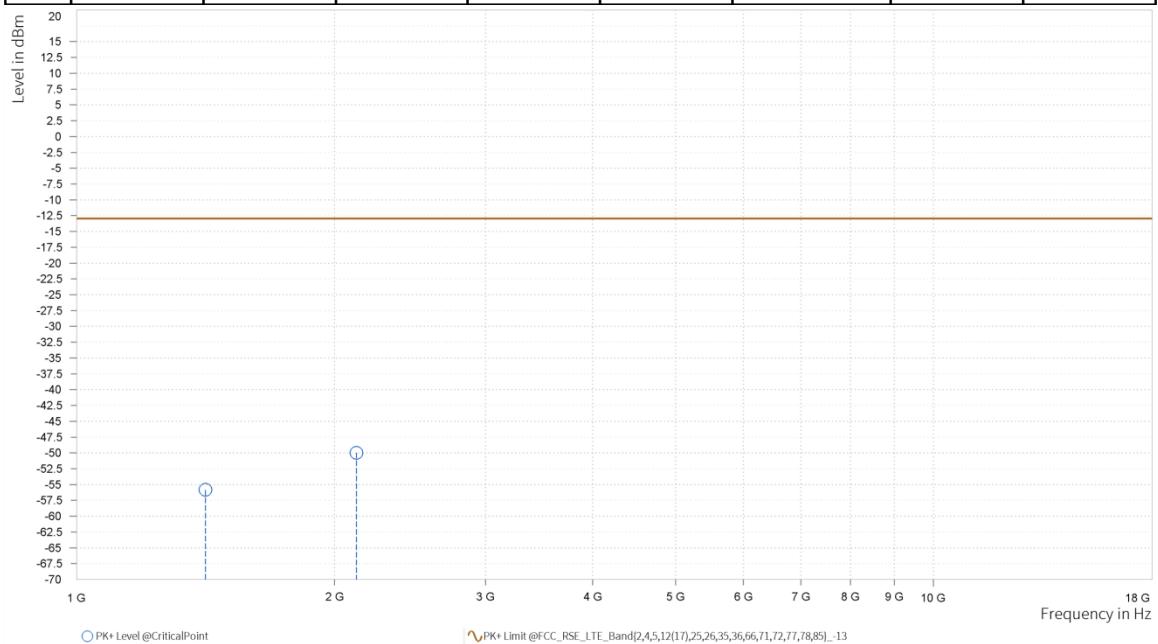
Note: For higher frequency, the emission is too low to be detected.

LTE BAND 12

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: 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	-55.85	-13.00	42.85	15.13	H	1.4	2.00
2	2,120.610	-49.99	-13.00	36.99	22.23	H	1.4	2.00

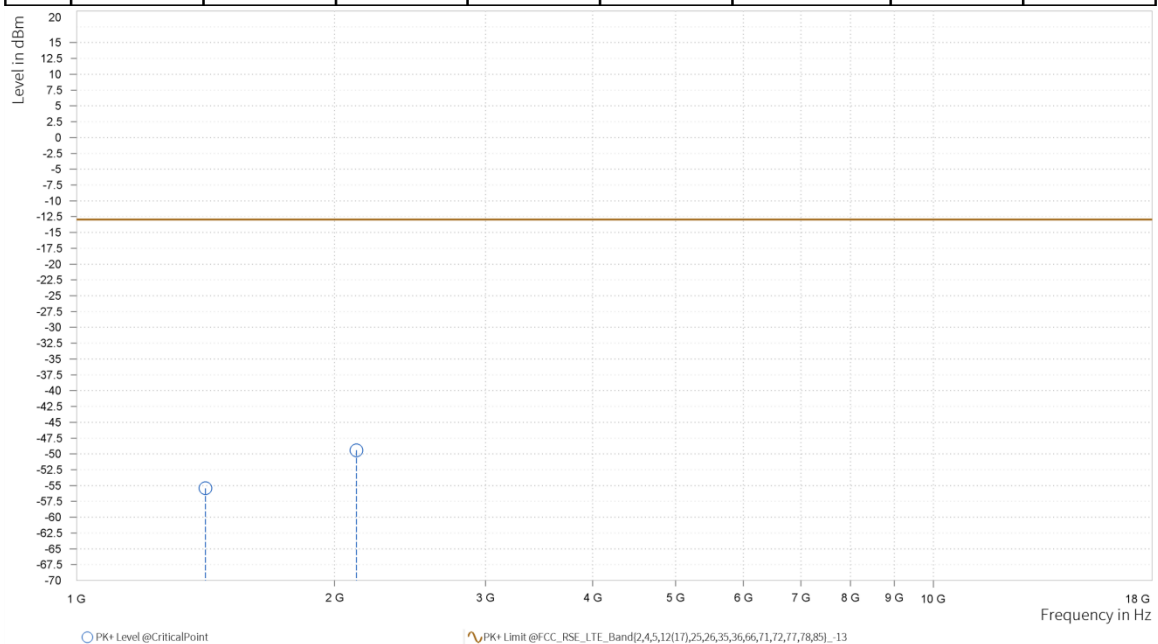




CHANNEL BANDWIDTH	1.4MHz / QPSK	MODE	TX channel 23095
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-55.44	-13.00	42.44	15.03	V	74.8	1.00
2	2,120.610	-49.44	-13.00	36.44	21.87	V	359	2.00

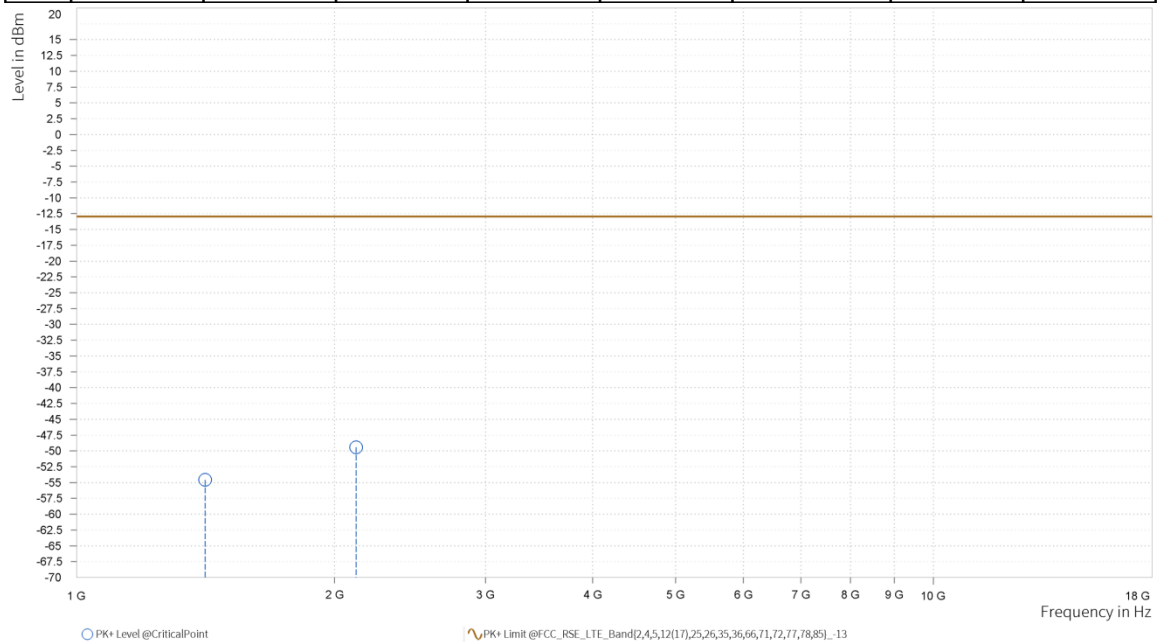




CHANNEL BANDWIDTH	3MHz / QPSK	MODE	TX channel 23095
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

ANTENNA POLARITY & TEST DISTANCE: 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	-54.59	-13.00	41.59	15.31	H	285.3	2.00
2	2,118.450	-49.43	-13.00	36.43	22.12	H	1	1.00

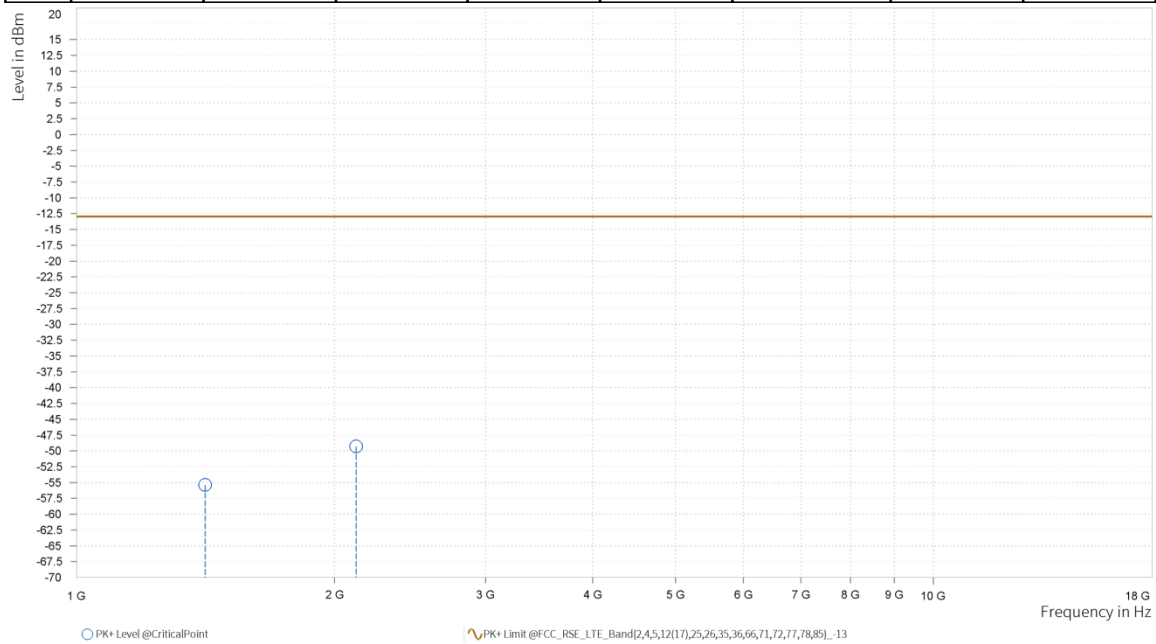




CHANNEL BANDWIDTH	3MHz / QPSK	MODE	TX channel 23095
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

ANTENNA POLARITY & TEST DISTANCE: 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	-55.38	-13.00	42.38	15.21	V	1	2.00
2	2,118.450	-49.29	-13.00	36.29	21.78	V	286.4	2.00

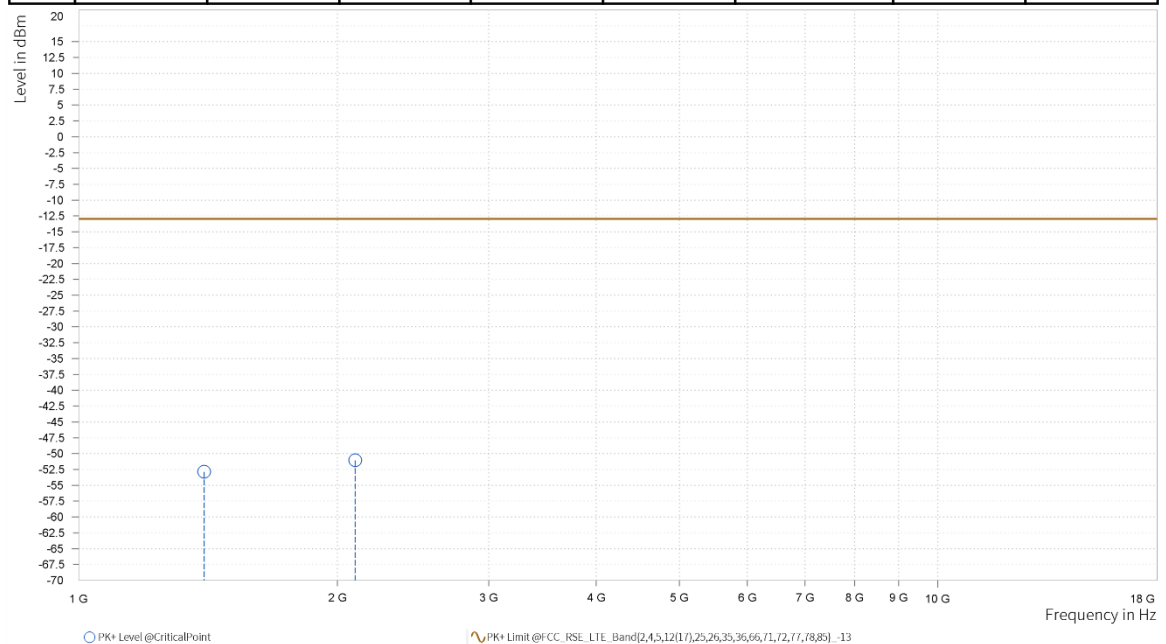




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23035
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,398.500	-52.87	-13.00	39.87	17.18	H	1	1.00
2	2,097.750	-51.06	-13.00	38.06	21.48	H	2.3	2.00

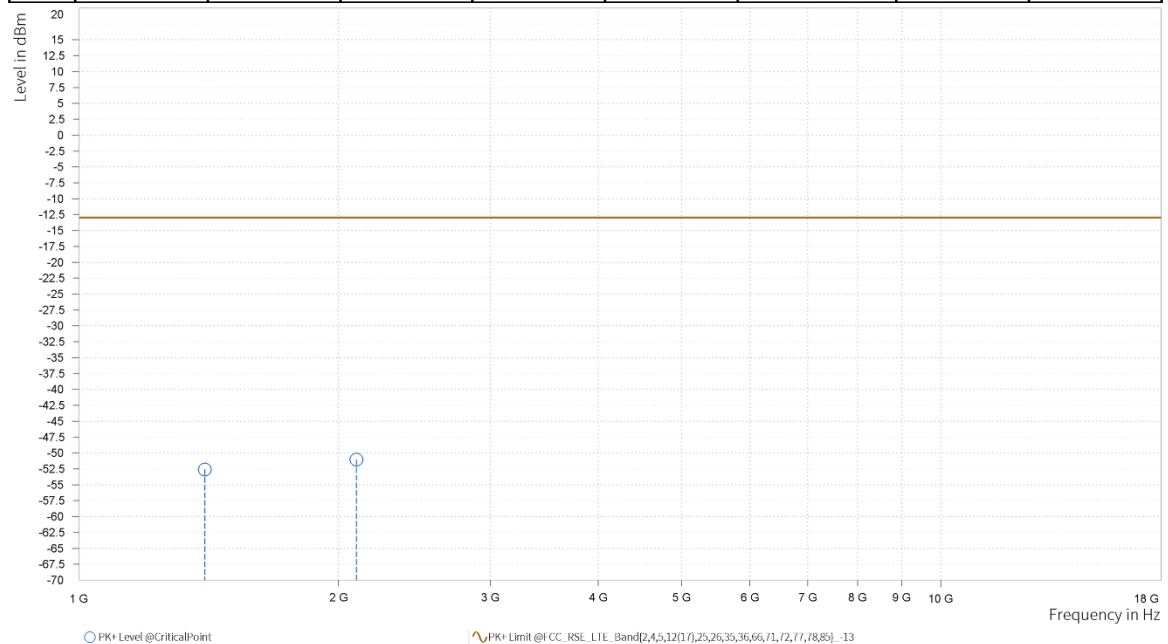




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23035
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,398.500	-52.58	-13.00	39.58	17.18	V	67.6	1.00
2	2,097.750	-51.03	-13.00	38.03	21.39	V	1	1.00

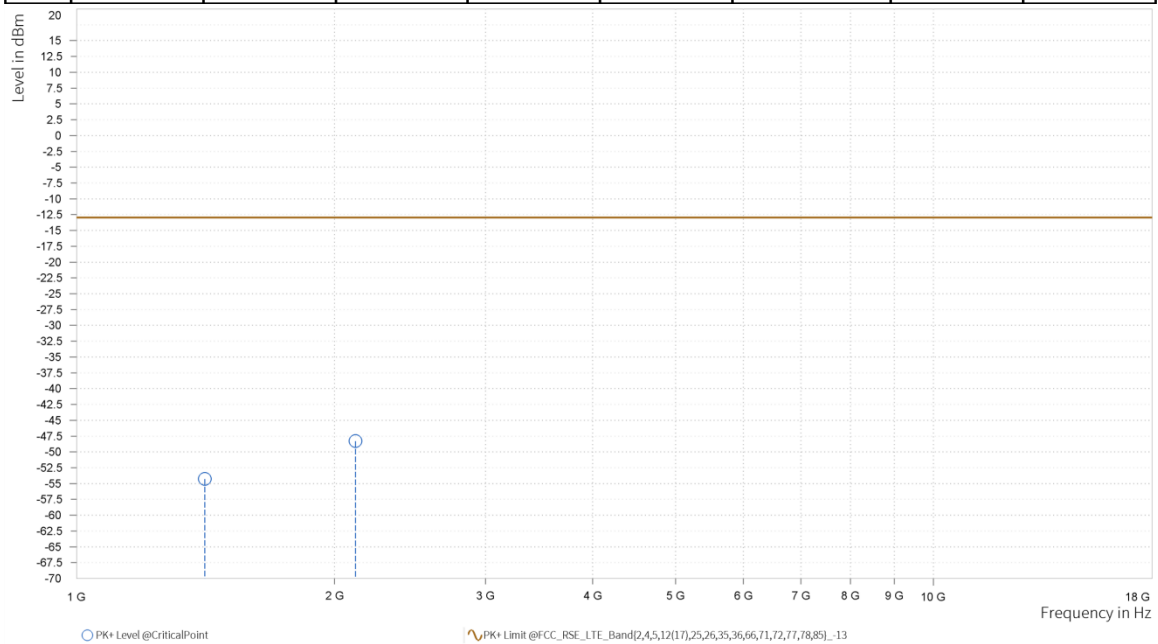




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23095
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-54.29	-13.00	41.29	15.67	H	284	2.00
2	2,115.750	-48.28	-13.00	35.28	21.98	H	1	1.00

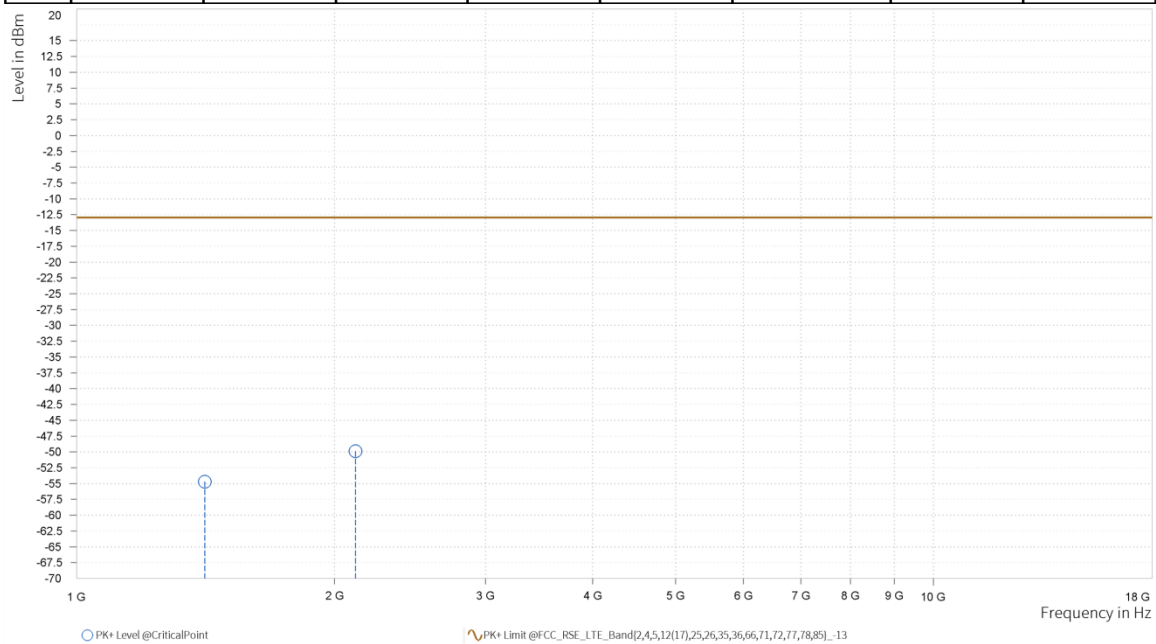




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23095
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

ANTENNA POLARITY & TEST DISTANCE: 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	-54.71	-13.00	41.71	15.59	V	1	1.00
2	2,115.750	-49.87	-13.00	36.87	21.68	V	359.1	1.00

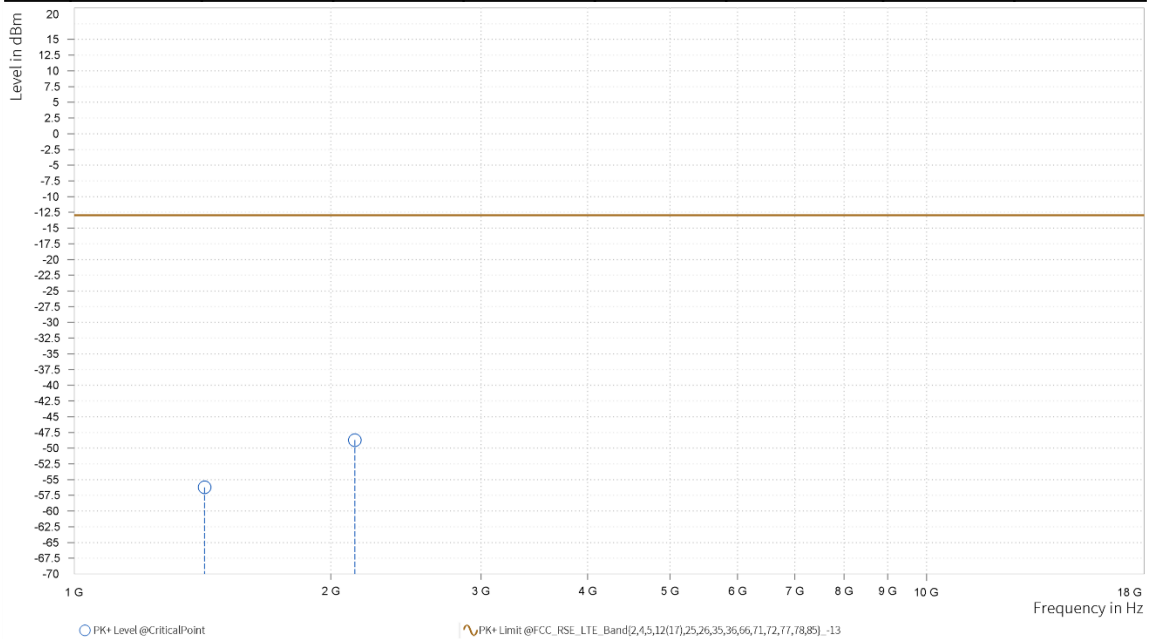




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23155
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,422.500	-56.25	-13.00	43.25	13.65	H	357.4	1.00
2	2,133.750	-48.71	-13.00	35.71	23.07	H	292.4	2.00

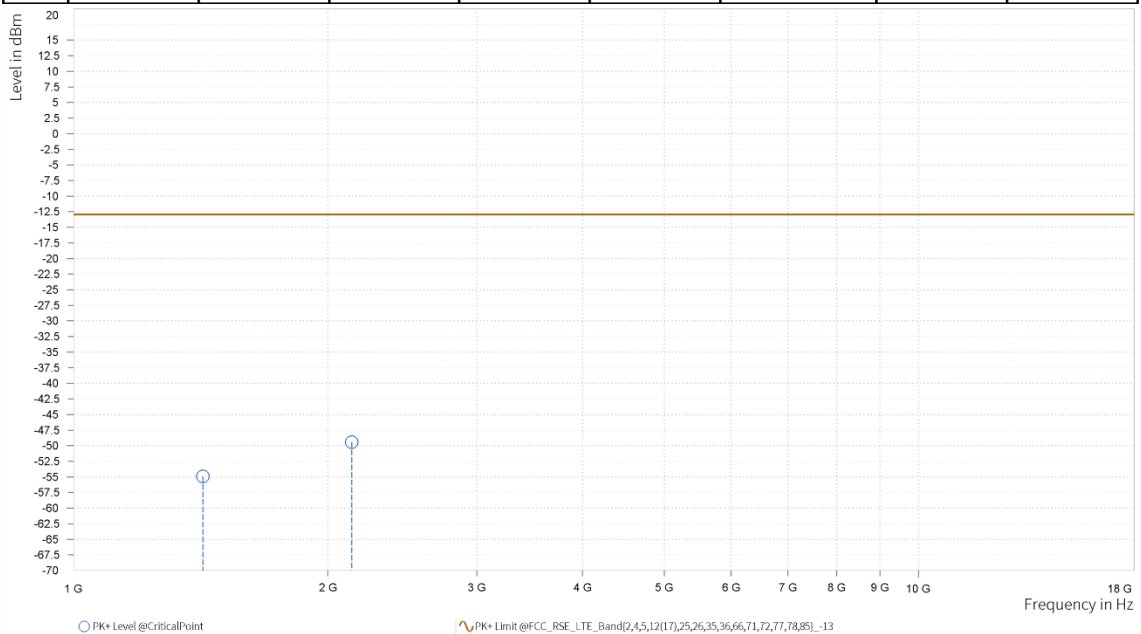




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23155
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,422.500	-54.94	-13.00	41.94	13.49	V	2.6	2.00
2	2,133.750	-49.43	-13.00	36.43	22.57	V	292.4	2.00

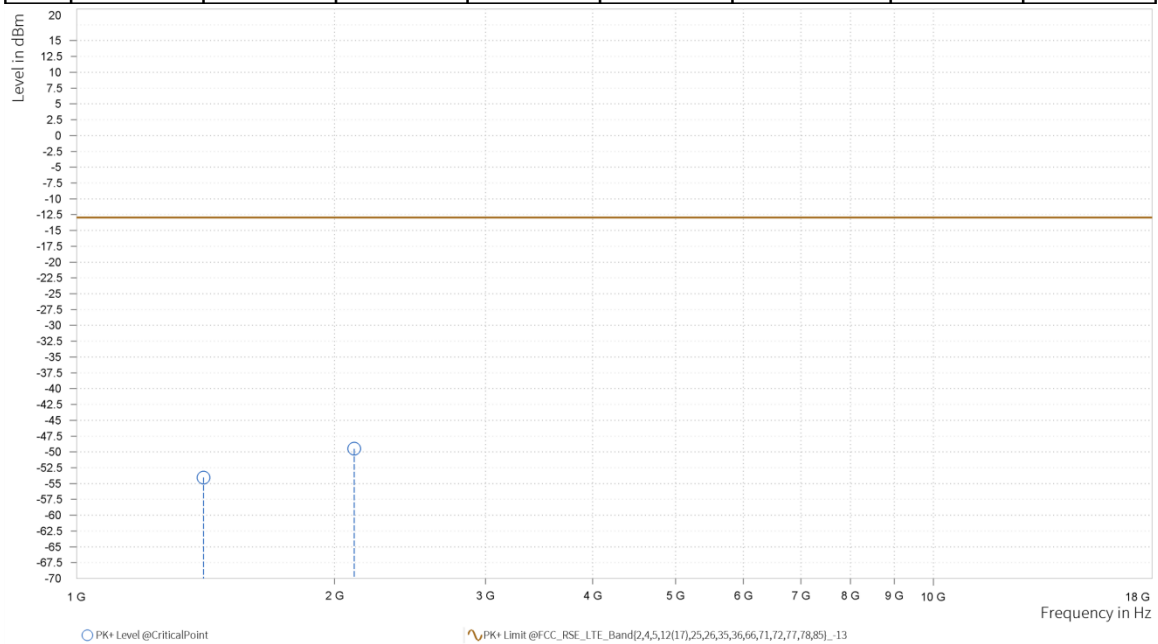




CHANNEL BANDWIDTH	10MHz / QPSK	MODE	TX channel 23095
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

ANTENNA POLARITY & TEST DISTANCE: 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	-54.05	-13.00	41.05	16.24	H	292.3	2.00
2	2,109.000	-49.50	-13.00	36.50	21.73	H	66.4	1.00

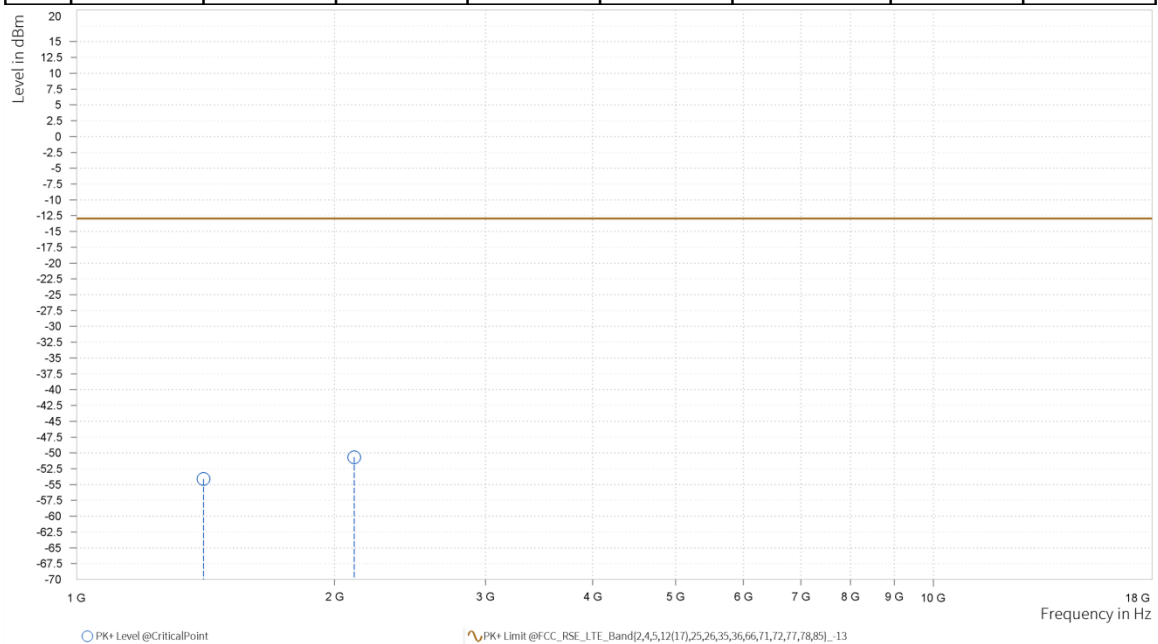


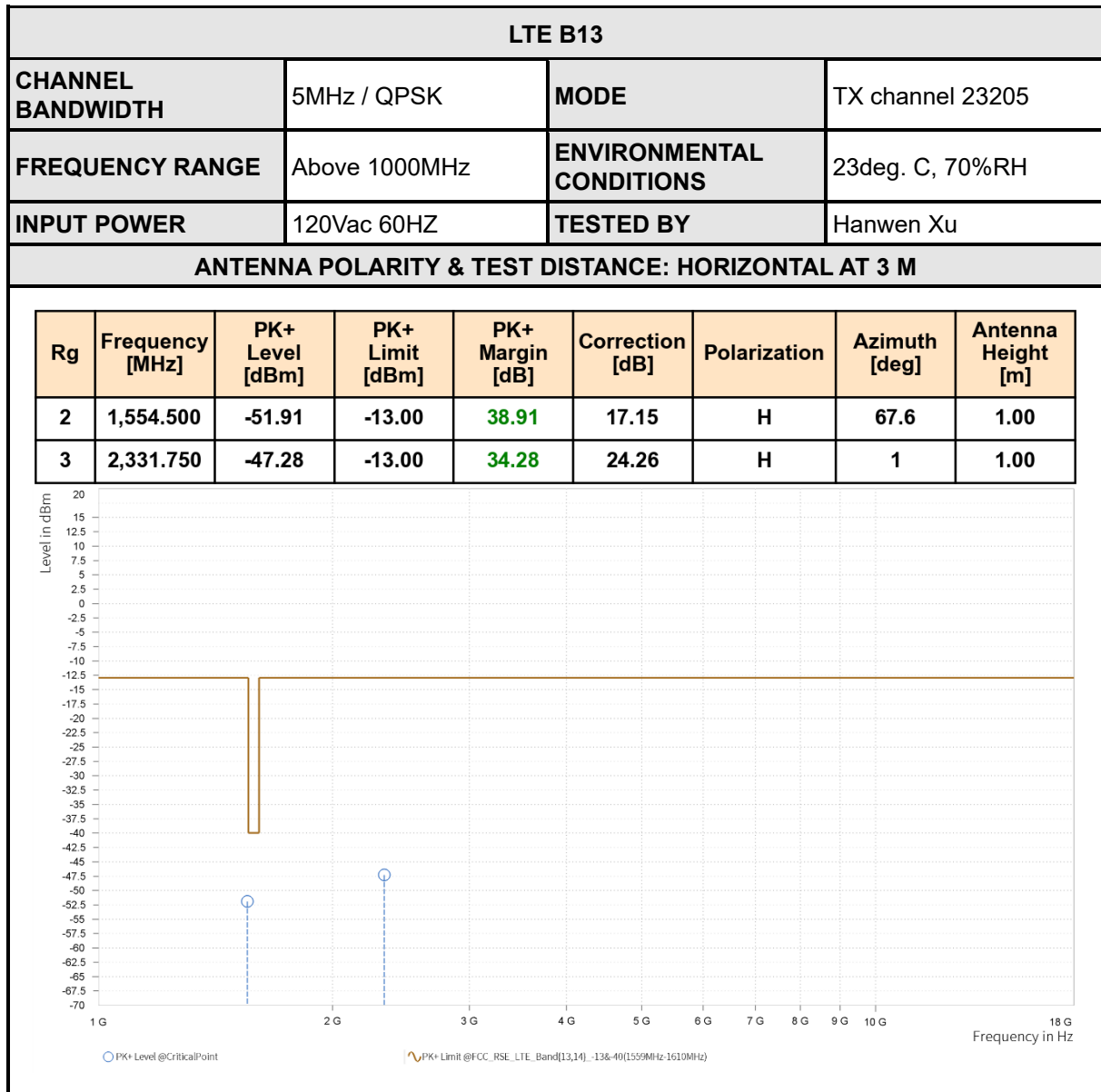


CHANNEL BANDWIDTH	10MHz / QPSK	MODE	TX channel 23095
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

ANTENNA POLARITY & TEST DISTANCE: 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	-54.12	-13.00	41.12	16.19	V	2.1	2.00
2	2,109.000	-50.68	-13.00	37.68	21.51	V	1	1.00



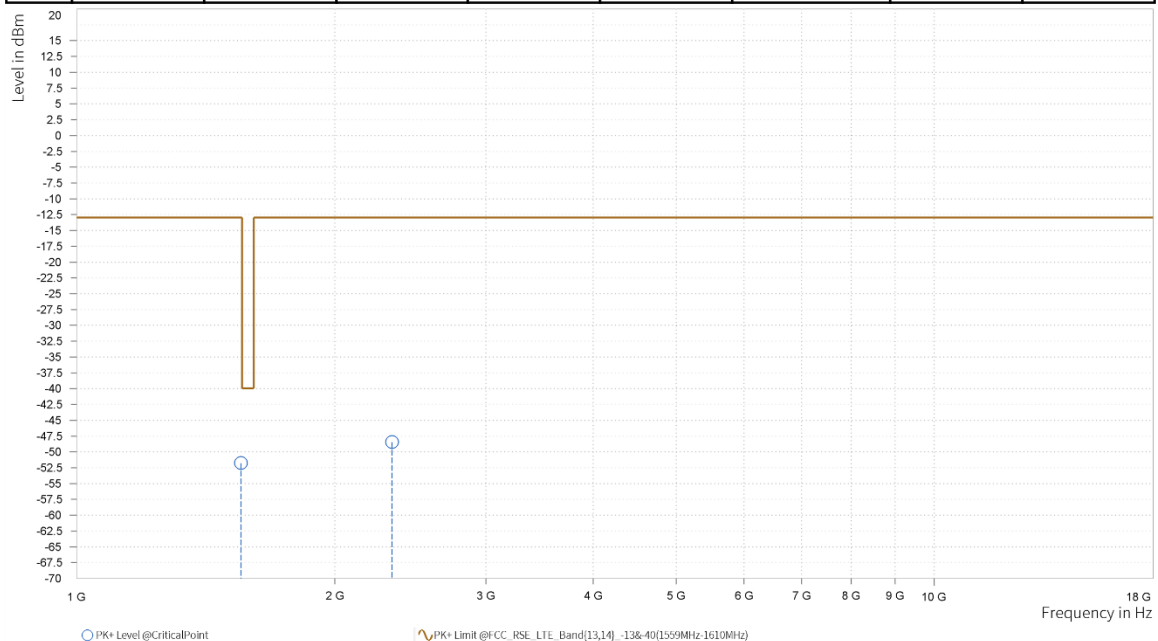




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23205
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-51.77	-13.00	38.77	16.78	V	1	1.00
3	2,331.750	-48.44	-13.00	35.44	23.77	V	134.6	1.00

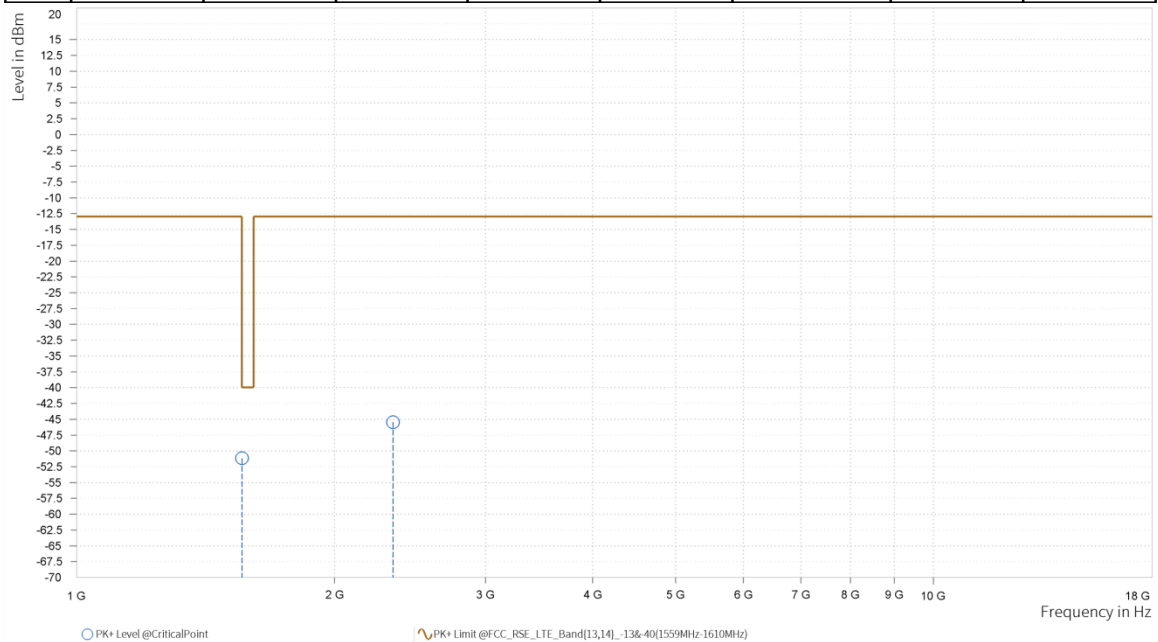




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23230
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-51.16	-40.00	11.16	17.19	H	2.7	2.00
3	2,339.250	-45.44	-13.00	32.44	24.41	H	359	2.00

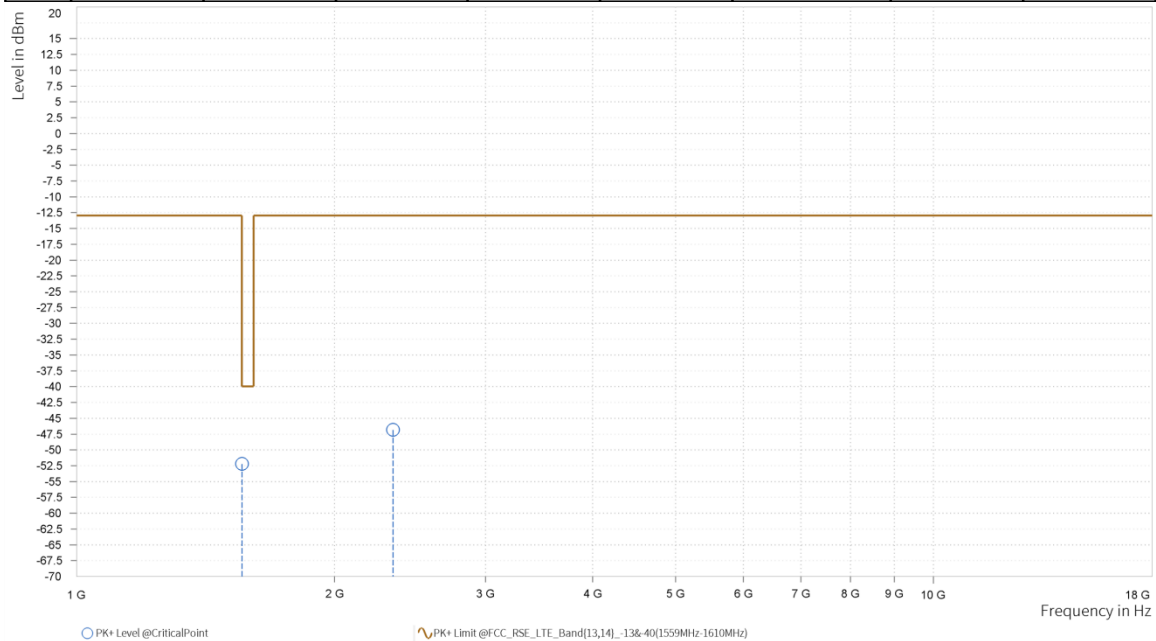




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23230
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-52.21	-40.00	12.21	16.86	V	357.4	1.00
3	2,339.250	-46.83	-13.00	33.83	23.96	V	226.6	2.00

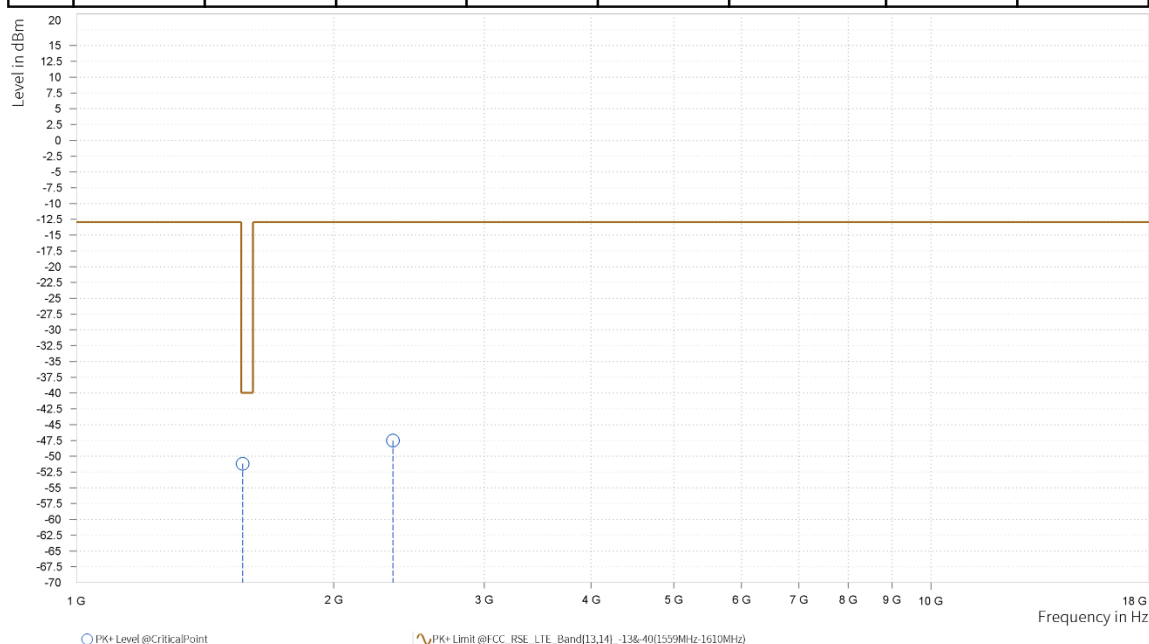




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23255
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-51.19	-40.00	11.19	17.15	H	290	2.00
3	2,346.750	-47.53	-13.00	34.53	24.45	H	224.3	2.00

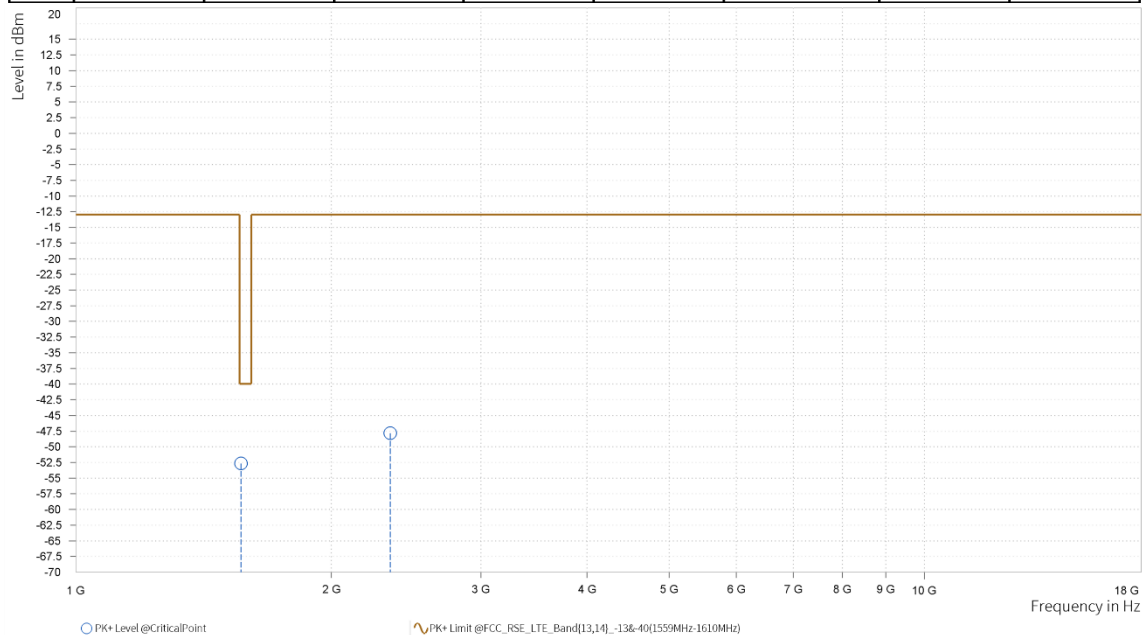




CHANNEL BANDWIDTH	5MHz / QPSK	MODE	TX channel 23255
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	-52.66	-40.00	12.66	16.86	V	291.3	2.00
3	2,346.750	-47.84	-13.00	34.84	24.05	V	137	1.00

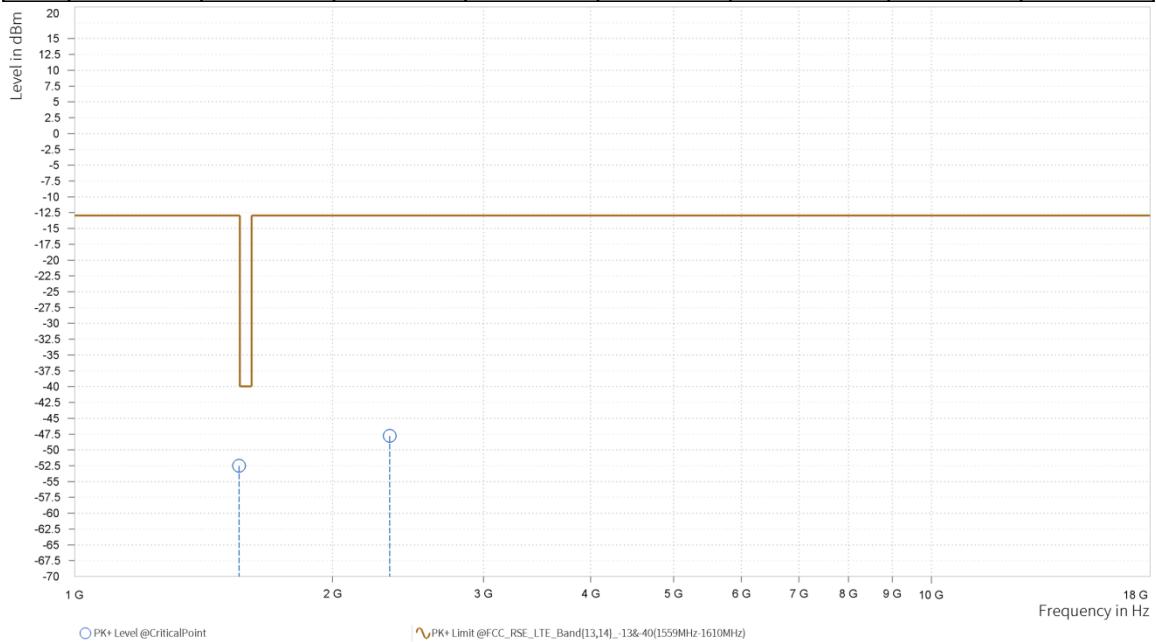




CHANNEL BANDWIDTH	10MHz / QPSK	MODE	TX channel 23230
FREQUENCY RANGE	Above 1000MHz	ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH
INPUT POWER	120Vac 60HZ	TESTED BY	Hanwen Xu

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	1,555.000	-52.51	-13.00	39.51	17.16	H	68.8	1.00
3	2,332.500	-47.79	-13.00	34.79	24.28	H	0.9	2.00





CHANNEL BANDWIDTH	10MHz / 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	1,555.000	-51.56	-13.00	38.56	16.80	V	358	1.00
3	2,332.500	-46.99	-13.00	33.99	23.80	V	359	2.00

