Certificate #6613.01

IC TEST REPORT
(RSS-130)

Applicant:	Particle Industries,Inc
Address:	325 9th Street, San Francisco, CA 94103, United States Of America

Manufacturer or Supplier:	Particle Industries,Inc
Address:	325 9th Street, San Francisco, CA 94103, United States Of America
Product:	B SoM
Brand Name:	Particle
Model Name:	B504e
IC:	20127-B504
Date of tests:	Mar. 31, 2025 ~ Apr. 18, 2025

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

☒ **RSS-130 Issue 2, February, 2019**
☒ **RSS-Gen Issue 5, Amendment 2, February 2021**
☒ **ANSI C63.26-2015**

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

Prepared by Hanwen Xu Engineer / Mobile Department	Approved by Peibo Sun Manager / Mobile Department
Date: Apr. 18, 2025	Date: Apr. 18, 2025

Table of Contents

RELEASE CONTROL RECORD 4
1 SUMMARY OF TEST RESULTS 5
1.1 MEASUREMENT UNCERTAINTY 6
1.2 TEST SITE AND INSTRUMENTS 7
2 GENERAL INFORMATION 8
2.1 GENERAL DESCRIPTION OF EUT 8
2.2 CONFIGURATION OF SYSTEM UNDER TEST 10
2.3 DESCRIPTION OF SUPPORT UNITS 11
2.4 DESCRIPTION OF TEST MODES 11
2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS 14
2.6 TRANSMIT ANTENNA 14
3 TEST TYPES AND RESULTS 15
3.1 OUTPUT POWER MEASUREMENT 15
3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT 15
3.1.2 TEST PROCEDURES 15
3.1.3 TEST SETUP 16
3.1.4 TEST RESULTS 17
3.2 FREQUENCY STABILITY MEASUREMENT 23
3.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT 23
3.2.2 TEST PROCEDURE 23
3.2.3 TEST RESULTS 23
3.2.4 TEST SETUP 24
3.3 OCCUPIED BANDWIDTH MEASUREMENT 25
3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT 25
3.3.2 TEST SETUP 25
3.3.3 TEST PROCEDURES 25
3.3.4 TEST RESULTS 26
3.4 PEAK TO AVERAGE RATIO 27
3.4.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT 27
3.4.2 TEST SETUP 27
3.4.3 TEST PROCEDURES 27
3.4.4 TEST RESULTS 28
3.5 BAND EDGE MEASUREMENT 29
3.5.1 LIMITS OF BAND EDGE MEASUREMENT 29
3.5.2 TEST SETUP 29
3.5.3 TEST PROCEDURES 30
3.5.4 TEST RESULTS 31
3.6 CONDUCTED SPURIOUS EMISSIONS 32
3.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT 32
3.6.2 TEST PROCEDURE 32
3.6.3 TEST SETUP 33
3.6.4 TEST RESULTS 34
3.7 RADIATED EMISSION MEASUREMENT 35
3.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT 35
3.7.2 TEST PROCEDURES 35
3.7.3 DEVIATION FROM TEST STANDARD 35
3.7.4 TEST SETUP 36
3.7.5 TEST RESULTS 38
4 INFORMATION ON THE TESTING LABORATORIES 60
5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB 61
6 APPENDIX : 62
LTE BAND12 62
PEAK-TO-AVERAGE RATIO(CCDF) 62
TEST RESULT 62
TEST GRAPHS 64

26DB BANDWIDTH AND OCCUPIED BANDWIDTH 72
TEST RESULT 72
TEST GRAPHS 73
BAND EDGE 81
TEST RESULT 81
TEST GRAPHS 82
CONDUCTED SPURIOUS EMISSION 87
TEST RESULT 87
TEST GRAPHS 88
FREQUENCY STABILITY 90
TEST RESULT 90
LTE BAND13 92
PEAK-TO-AVERAGE RATIO(CCDF) 92
TEST RESULT 92
TEST GRAPHS 93
26DB BANDWIDTH AND OCCUPIED BANDWIDTH 96
TEST RESULT 96
TEST GRAPHS 97
BAND EDGE 101
TEST RESULT 101
TEST GRAPHS 102
CONDUCTED SPURIOUS EMISSION 105
TEST RESULT 105
TEST GRAPHS 106
FREQUENCY STABILITY 108
TEST RESULT 108

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
PSU-QSU2503280115RI03	Original release	Apr. 18, 2025

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: IC RSS-130, RSS-Gen		
STANDARD SECTION RSS-Gen	**TEST TYPE AND LIMIT**	**RESULT**
6.7	Occupied Bandwidth	Compliance
6.8	Transmit antenna	Compliance
STANDARD SECTION RSS-130	**TEST TYPE AND LIMIT**	**RESULT**
4.5	Frequency Stability AFC Freq. Error vs. Voltage AFC Freq. Error vs. Temperature	Compliance
4.6	Maximum Peak Output Power	Compliance
4.6	peak-to-average power ratio	Compliance
4.7	Band Edge Measurements	Compliance
4.7	Conducted Spurious Emissions	Compliance
4.7	Radiated Spurious Emissions	Compliance

***Test Lab Information Reference**

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

Lab Address:

Tower N, Innovation Centre 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province, P.R.C.

Accredited Test Lab Cert 6613.01

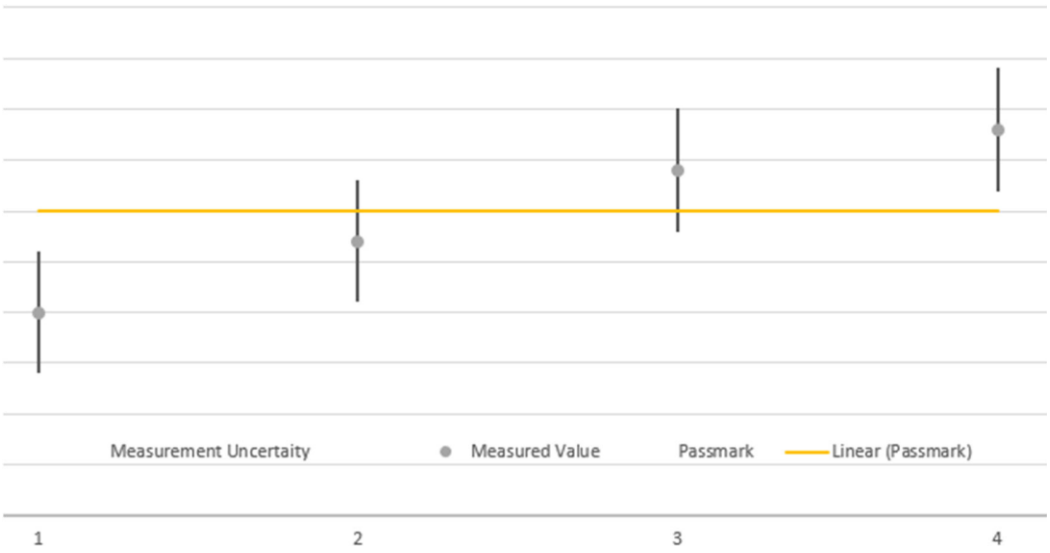
The IC Company Number is 28371; The CAB Identifier No. is CN0131.

1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in ETSI TR 100 028-1 V1.4.1(2001-12):

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
Peak to average ratio	±0.76dB

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
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

NOTE: 1. The calibration interval of the above test instruments is 12 months or 24 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 IC Company Number is 28371; The CAB Identifier No. is CN0131.

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	B SoM	
BRAND NAME	Particle	
MODEL NAME	B504e	
NOMINAL VOLTAGE	VCC: 3.8V. 3V3:3.3V	
MODULATION TECHNOLOGY	**WCDMA IV**	BPSK, QPSK
	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
MAX. EIRP/ERP POWER	**LTE Band 12 Channel Bandwidth: 1.4MHz**	208.93mW
	LTE Band 12 Channel Bandwidth: 3MHz	207.49mW
	LTE Band 12 Channel Bandwidth: 5MHz	208.45mW
	LTE Band 12 Channel Bandwidth: 10MHz	210.86mW
	LTE Band 13 Channel Bandwidth: 5MHz	265.46mW
	LTE Band 13 Channel Bandwidth: 10MHz	269.41mW
EMISSION DESIGNATOR	**LTE Band 12 Channel Bandwidth: 1.4MHz**	QPSK: 1M10G7D
		16QAM: 1M09W7D
	LTE Band 12 Channel Bandwidth: 3MHz	QPSK: 2M70G7D
		16QAM: 2M69W7D
	LTE Band 12 Channel Bandwidth: 5MHz	QPSK: 4M50G7D
		16QAM: 4M49W7D
	LTE Band 12 Channel Bandwidth: 10MHz	QPSK: 8M97G7D
		16QAM: 4M85W7D
	LTE Band 13	QPSK: 4M50G7D

	Channel Bandwidth: 5MHz	16QAM: 4M51W7D
	LTE Band 13 Channel Bandwidth: 10MHz	QPSK: 8M97G7D
		16QAM: 4M84W7D
ANTENNA TYPE	FPC Antenna with 2.17dBi gain for LTE B12 FPC Antenna with 2.74dBi gain for LTE B13	
HW VERSION	R1.0	
SW VERSION	EG91NAXGAR07A03M1G	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	N/A	
EXTREME TEMPERATURE	-35-75 ℃	
EXTREME VOLTAGE	VCC: 3.3V. 3V3:3.0V - VCC: 4.3V. 3V3:3.6V	

NOTE:

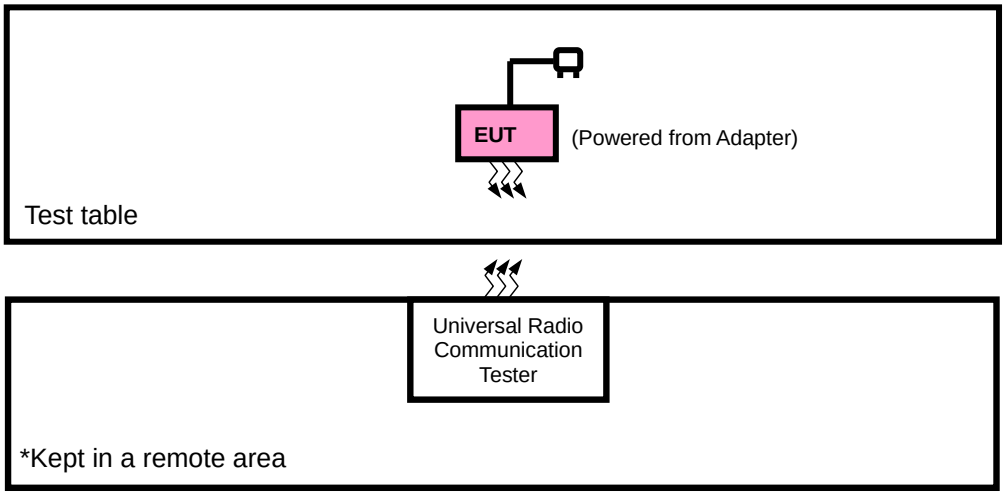
1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

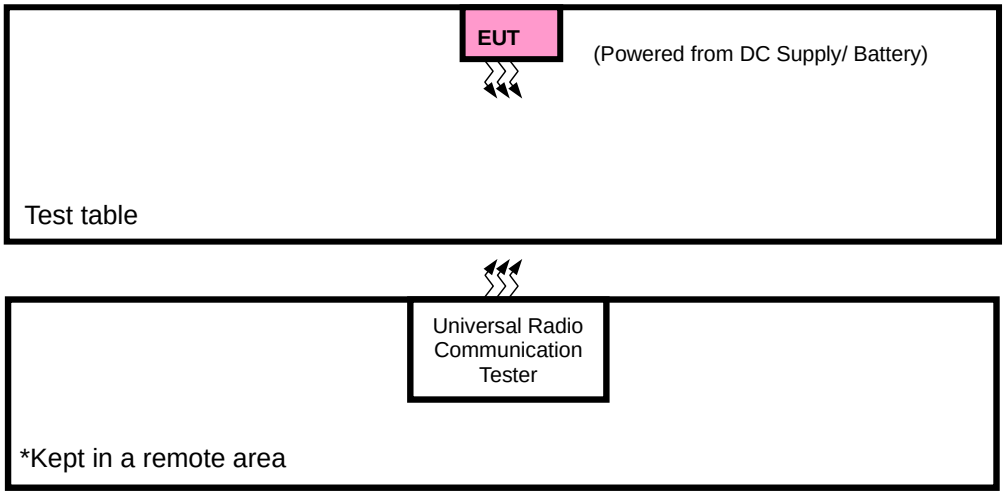
MODULATION MODE	TX FUNCTION
WCDMA	1TX/1RX
LTE	1TX/1RX

3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
4. Antenna gain and EUT conducted cable loss are provided by the customer, and the laboratory will record the results based on these items that involve these two parameters.

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 DESCRIPTION OF TEST MODES

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 ERP 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/ Battery 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, 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
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	CONDCUDETED 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	23017,23095,23173	1.4MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23095	3MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23095	5MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	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,16QAM	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	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	CONDCUDETED 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	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
ERP	23deg. C, 70%RH	AC 120V/60HZ	Hanwen Xu
FREQUENCY STABILITY	23deg. C, 70%RH	AC 120V/60HZ	Hanwen Xu
OCCUPIED BANDWIDTH	23deg. C, 70%RH	AC 120V/60HZ	Hanwen Xu
BAND EDGE	23deg. C, 70%RH	AC 120V/60HZ	Hanwen Xu
CONDCUDETED EMISSION	23deg. C, 70%RH	AC 120V/60HZ	Hanwen Xu
RADIATED EMISSION	23deg. C, 70%RH	AC 120V/60HZ	Hanwen Xu
PEAK TO AVERAGE RATIO	23deg. C, 70%RH	AC 120V/60HZ	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:

Canada RSS-130, Issue 2, February 2019

Canada RSS-Gen, Issue 5, Amendment 2, February 2021

ANSI C63.26 - 2015

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

2.6 TRANSMIT ANTENNA

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

Antenna Type	FPC antenna
Antenna Gain	FPC Antenna with 2.17dBi gain for LTE B12 FPC Antenna with 2.74dBi gain for LTE B13
Impedance	50 Ω

3 TEST TYPES AND RESULTS

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

For frequency bands 617-652MHz and 663-698MHz:
The e.r.p. shall not exceed 3 watts for mobile equipment, fixed subscriber equipment and portable equipment.
For frequency bands 698-756MHz and 777-787MHz:
The e.r.p. shall not exceed 30 watts for mobile equipment and outdoor fixed subscriber equipment. The e.r.p. shall not exceed 3 watts for portable equipment and indoor fixed subscriber equipment.

3.1.2 TEST PROCEDURES

ERP MEASUREMENT:

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

ERP or EIRP = $P_{Meas} + G_T – L_C$

Where:

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

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

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

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

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

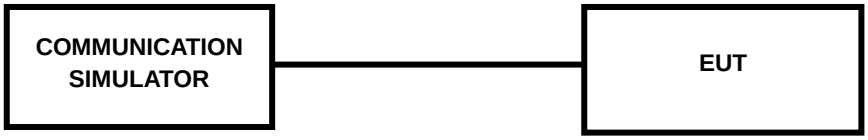
ERP=EIRP-2.15

CONDUCTED POWER MEASUREMENT:

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

3.1.3 TEST SETUP

CONDUCTED POWER MEASUREMENT:



3.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

LTE Band 12

BW: 1.4M

BW	Modulation	RB Size	RB Offset	Low	Mid	High
		Channel		23017	23095	23173
		Frequency (MHz)		699.70	707.50	715.30
1.4M	QPSK	1	0	22.71	22.82	22.94
		1	2	23.06	22.85	23.18
		1	5	22.80	22.82	23.08
		3	0	22.67	22.74	22.67
		3	1	22.85	22.70	23.04
		3	3	22.72	22.73	22.89
		6	0	21.66	21.58	21.91
	16QAM	1	0	21.90	21.73	21.90
		1	2	21.69	21.59	21.85
		1	5	21.46	21.55	21.69
		3	0	21.91	21.84	21.94
		3	1	22.04	21.84	21.97
		3	3	21.83	21.82	22.02
		6	0	20.75	20.65	20.91

BW: 3M

BW	Modulation	RB Size	RB Offset	Low	Mid	High
		Channel		23025	23095	23165
		Frequency (MHz)		700.50	707.50	714.50
3M	QPSK	1	0	22.76	22.70	22.93
		1	7	23.13	22.89	23.15
		1	14	22.88	22.76	22.98
		8	0	21.73	21.68	21.79
		8	3	21.91	21.83	22.04
		8	7	21.78	21.73	21.87
		15	0	21.76	21.71	21.91
	16QAM	1	0	21.86	21.76	21.93
		1	7	21.68	21.64	21.85
		1	14	21.52	21.44	21.76
		8	0	20.95	20.89	21.03
		8	3	20.98	20.84	21.02
		8	7	20.80	20.75	21.05
		15	0	20.78	20.60	20.87

BW: 5M

BW	Modulation	RB Size	RB Offset	Low	Mid	High
		Channel		23035	23095	23155
		Frequency (MHz)		701.50	707.50	713.50
5M	QPSK	1	0	22.76	22.73	22.95
		1	12	23.09	22.95	23.17
		1	24	22.79	22.83	22.95
		12	0	21.78	21.73	21.79
		12	6	21.82	21.72	22.09
		12	13	21.67	21.82	21.86
		25	0	21.74	21.72	21.92
	16QAM	1	0	21.83	21.68	21.93
		1	12	21.67	21.72	21.76
		1	24	21.58	21.44	21.76
		12	0	20.99	20.89	21.02
		12	6	21.08	20.93	20.99
		12	13	20.88	20.76	20.99
		25	0	20.84	20.62	20.83

BW: 10M

BW	Modulation	RB Size	RB Offset	Low	Mid	High
		Channel		23060	23095	23130
		Frequency (MHz)		704	707.50	711
10M	QPSK	1	0	22.80	22.85	23.00
		1	24	23.14	22.97	23.22
		1	49	22.93	22.90	23.09
		25	0	21.80	21.76	21.82
		25	12	21.96	21.84	22.14
		25	25	21.81	21.84	21.96
		50	0	21.78	21.73	21.95
	16QAM	1	0	21.94	21.80	22.05
		1	24	21.75	21.74	21.86
		1	49	21.61	21.57	21.77
		12	0	22.05	21.96	22.06
		12	17	22.09	21.96	22.12
		12	36	21.91	21.88	22.12
		27	0	20.87	20.73	20.96

LTE Band 13

BW: 5M

BW	Modulation	RB Size	RB Offset	Low	Mid	High
		Channel		23205	23230	23255
		Frequency (MHz)		779.50	782	784.50
5M	QPSK	1	0	23.19	23.29	23.25
		1	12	23.04	23.10	23.16
		1	24	23.65	23.56	23.65
		12	0	22.02	22.14	22.05
		12	6	22.17	22.21	22.15
		12	13	22.22	22.25	22.27
		25	0	22.16	22.16	22.09
	16QAM	1	0	22.56	22.61	22.61
		1	12	21.87	21.97	21.97
		1	24	22.06	21.97	22.01
		12	0	20.95	20.92	20.99
		12	6	21.00	21.02	21.00
		12	13	21.12	21.11	21.20
		25	0	21.20	21.24	21.27

BW: 10M

BW	Modulation	RB Size	RB Offset	Mid
		Channel		23230
		Frequency (MHz)		782
10M	QPSK	1	0	23.33
		1	24	23.17
		1	49	23.66
		25	0	22.16
		25	12	22.24
		25	25	22.35
		50	0	22.24
	16QAM	1	0	22.62
		1	24	22.00
		1	49	22.12
		12	0	22.06
		12	17	22.08
		12	36	22.24
		27	0	21.30

ERP

LTE B12 1.4M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	ERP (dBm)	ERP (mW)	Lmit (W)
23017	699.7	23.06	2.17	23.08	203.24	3
23095	707.5	22.85	2.17	22.87	193.64	3
23173	715.3	23.18	2.17	23.2	208.93	3

LTE B12 1.4M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	ERP (dBm)	ERP (mW)	Lmit (W)
23017	699.7	22.04	2.17	22.06	160.69	3
23095	707.5	21.84	2.17	21.86	153.46	3
23173	715.3	22.02	2.17	22.04	159.96	3

LTE B12 3M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	ERP (dBm)	ERP (mW)	Lmit (W)
23025	700.5	23.13	2.17	23.15	206.54	3
23095	707.5	22.89	2.17	22.91	195.43	3
23165	714.5	23.15	2.17	23.17	207.49	3

LTE B12 3M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	ERP (dBm)	ERP (mW)	Lmit (W)
23025	700.5	21.86	2.17	21.88	154.17	3
23095	707.5	21.76	2.17	21.78	150.66	3
23165	714.5	21.93	2.17	21.95	156.68	3

LTE B12 5M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	ERP (dBm)	ERP (mW)	Lmit (W)
23035	701.5	23.09	2.17	23.11	204.64	3
23095	707.5	22.95	2.17	22.97	198.15	3
23155	713.5	23.17	2.17	23.19	208.45	3

LTE B12 5M 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	ERP (dBm)	ERP (mW)	Lmit (W)
23035	701.5	21.83	2.17	21.85	153.11	3
23095	707.5	21.72	2.17	21.74	149.28	3
23155	713.5	21.93	2.17	21.95	156.68	3

LTE B12 10M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	ERP (dBm)	ERP (mW)	Lmit (W)
23060	704	23.14	2.17	23.16	207.01	3
23095	707.5	22.97	2.17	22.99	199.07	3
23130	711	23.22	2.17	23.24	210.86	3

LTE B12 10M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	ERP (dBm)	ERP (mW)	Lmit (W)
23060	704	22.09	2.17	22.11	162.55	3
23095	707.5	21.96	2.17	21.98	157.76	3
23130	711	22.12	2.17	22.14	163.68	3

LTE B13 5M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	ERP (dBm)	ERP (mW)	Lmit (W)
23205	779.5	23.65	2.74	24.24	265.46	3
23230	782	23.56	2.74	24.15	260.02	3
23255	784.5	23.65	2.74	24.24	265.46	3

LTE B13 5M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	ERP (dBm)	ERP (mW)	Lmit (W)
23205	779.5	22.56	2.74	23.15	206.54	3
23230	782	22.61	2.74	23.2	208.93	3
23255	784.5	22.61	2.74	23.2	208.93	3

LTE B13 10M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	ERP (dBm)	ERP (mW)	Lmit (W)
23230	782	23.66	2.74	24.25	266.07	3

LTE B13 10M 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	ERP (dBm)	ERP (mW)	Lmit (W)
23230	782	22.62	2.74	23.21	209.41	3

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

3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

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

3.2.2 TEST PROCEDURE

a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

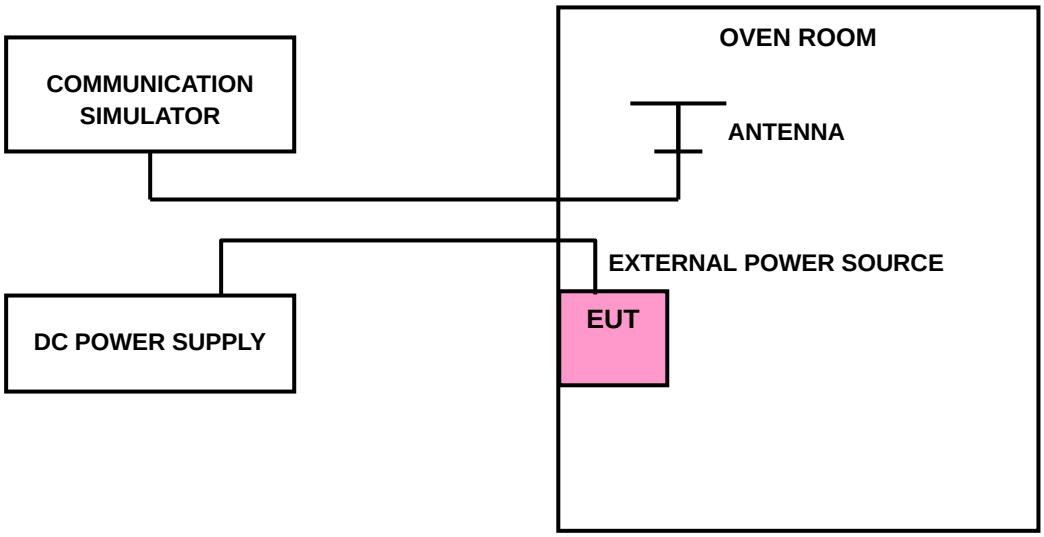
NOTE: The frequency error was recorded frequency error from the communication simulator.

3.2.3 TEST RESULTS

Please Refer to Appendix Of this test report.

Note: 1.VL = Low voltage(3.6V); VN/NV = Normal voltage(3.87V); VH = High voltage(4.45V);
NT = Normal temperature (25℃)
2. The frequency fundamental emissions stay within the authorized frequency block.

3.2.4 TEST SETUP

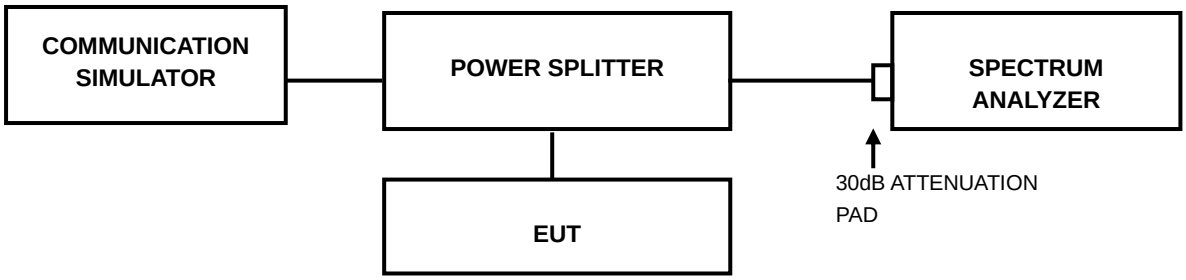


3.3 OCCUPIED BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

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

3.3.2 TEST SETUP



3.3.3 TEST PROCEDURES

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

b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

3.3.4 TEST RESULTS

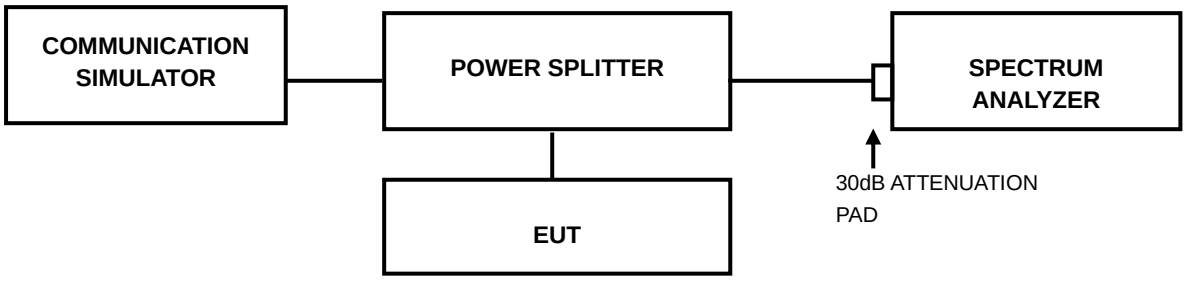
Please Refer to Appendix Of this test report.

3.4 PEAK TO AVERAGE RATIO

3.4.1 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

3.4.2 TEST SETUP



3.4.3 TEST PROCEDURES

1. Set resolution/measurement bandwidth ≥ 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%.

3.4.4 TEST RESULTS

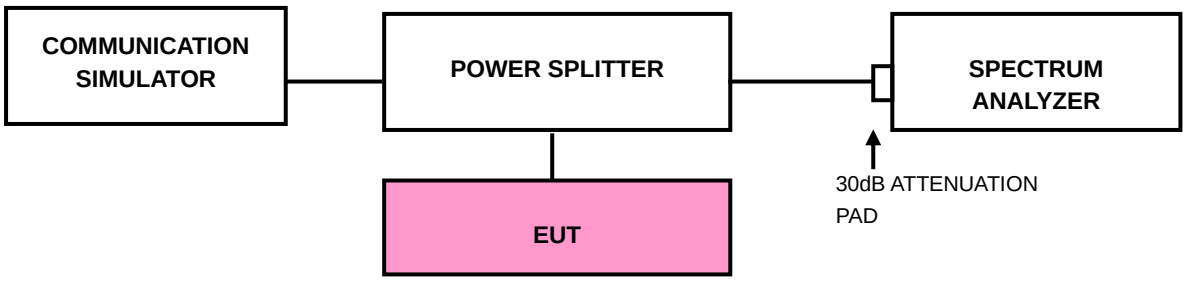
Please Refer to Appendix Of this test report.

3.5 BAND EDGE MEASUREMENT

3.5.1 LIMITS OF BAND EDGE MEASUREMENT

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. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.
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.

3.5.2 TEST SETUP



3.5.3 TEST PROCEDURES

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

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

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

(EBW)

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

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

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

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

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

i) Use auto-coupled sweep time.

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

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

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

3.5.4 TEST RESULTS

Please Refer to Appendix Of this test report.

3.6 CONDUCTED SPURIOUS EMISSIONS

3.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10(P) dB. The limit of emission equal to –13dBm

Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

   i. 76 + 10 $\log_{10}$ p (watts), dB, for base and fixed equipment and

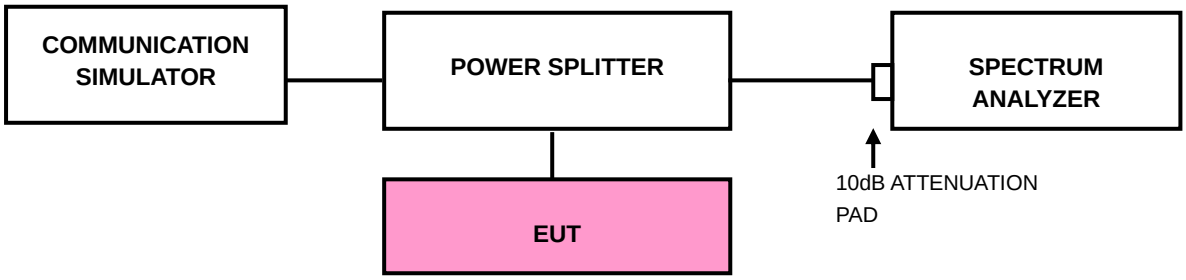
   ii. 65 + 10 $\log_{10}$ p (watts), dB, for mobile and portable equipment

b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed −70 dBW/MHz for wideband signal and −80 dBW for discrete emission with bandwidth less than 700 Hz.

3.6.2 TEST PROCEDURE

a. The EUT makes a phone call to the communication simulator. All measurements were done at middle operational frequency range.
b. Measuring frequency range is from 9 kHz up to a frequency including its 10^{th} harmonic. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

3.6.3 TEST SETUP



3.6.4 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.

3.7 RADIATED EMISSION MEASUREMENT

3.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10(P) dB. The limit of emission equal to –13dBm

3.7.2 TEST PROCEDURES

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m/1.5m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G

c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

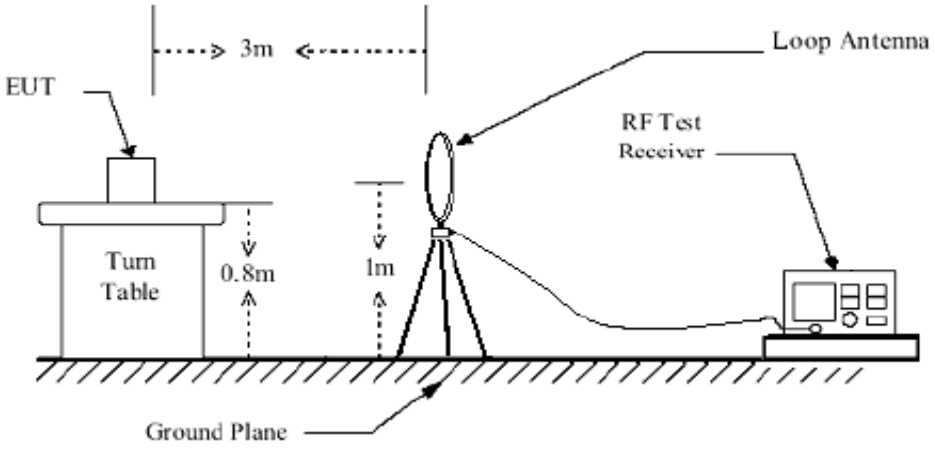
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

3.7.3 DEVIATION FROM TEST STANDARD

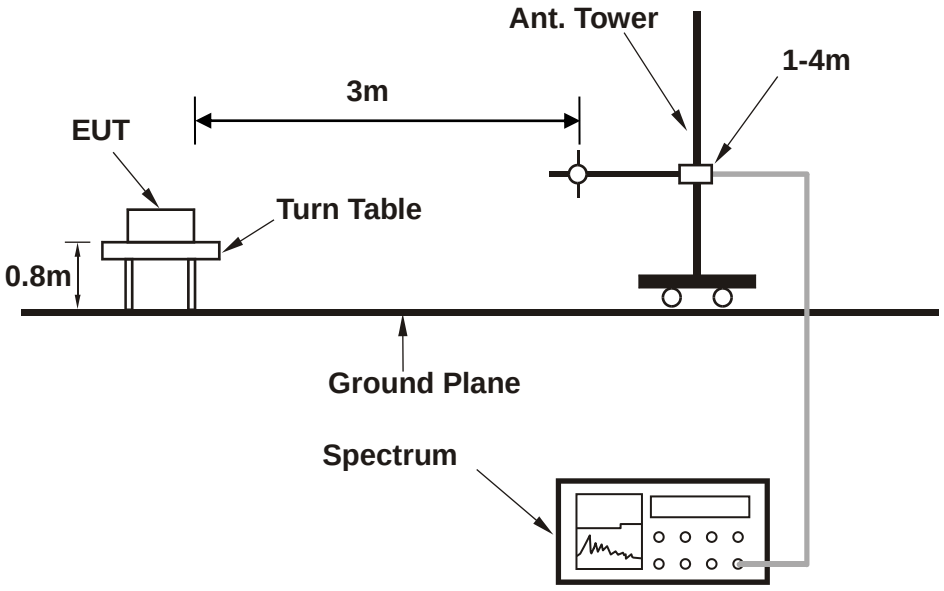
No deviation

3.7.4 TEST SETUP

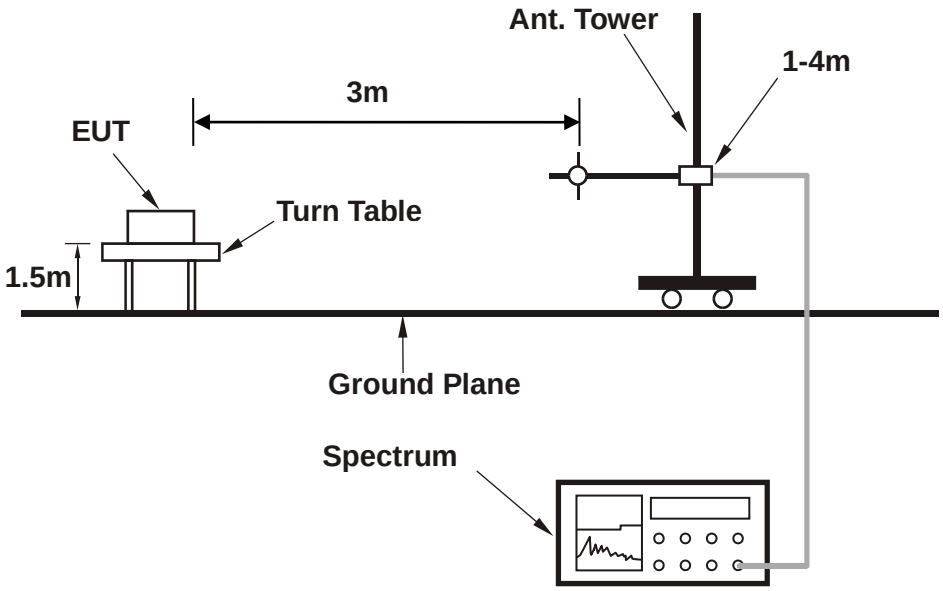
< Frequency Range below 30MHz >



< Frequency Range 30MHz~1GHz >



< Frequency Range above 1GHz >



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

3.7.5 TEST RESULTS

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

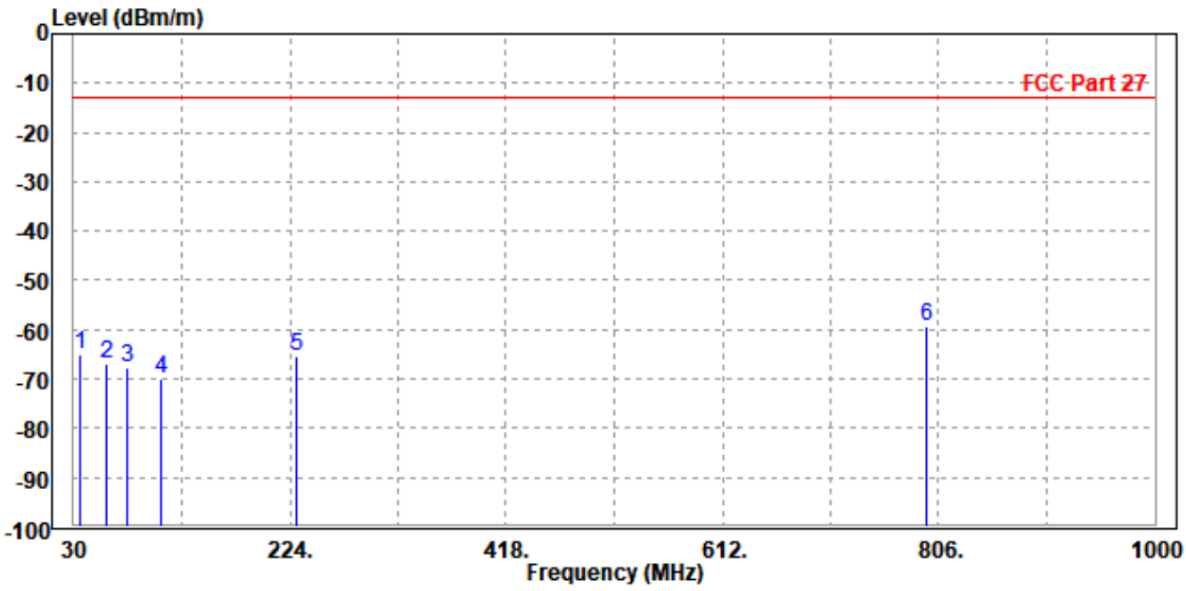
BELOW 1GHz WORST-CASE DATA

30 MHz – 1GHz data:

LTE Band 12
CHANNEL BANDWIDTH: 5MHz / QPSK

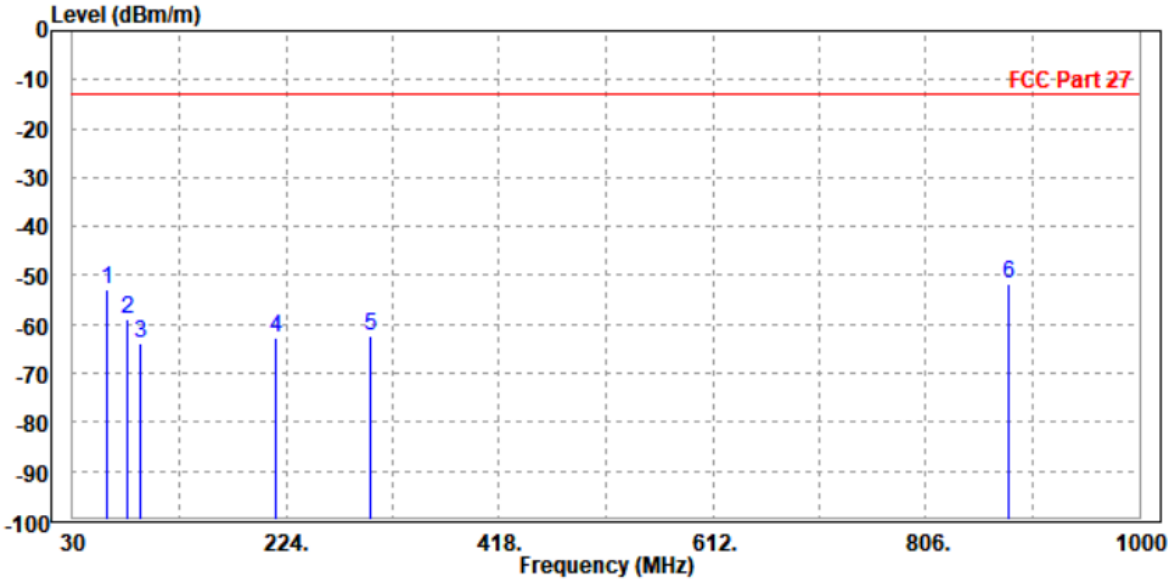
MODE	TX channel 23230	**FREQUENCY RANGE**	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 48V POE ADAPTER
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	35.820	-65.10	-59.94	-13.00	-52.10	-5.16	Peak	Horizontal
2	59.100	-66.92	-54.58	-13.00	-53.92	-12.34	Peak	Horizontal
3	77.530	-67.51	-54.92	-13.00	-54.51	-12.59	Peak	Horizontal
4	108.570	-70.11	-55.96	-13.00	-57.11	-14.15	Peak	Horizontal
5	229.820	-65.52	-52.65	-13.00	-52.52	-12.87	Peak	Horizontal
6 PP	794.360	-59.40	-64.57	-13.00	-46.40	5.17	Peak	Horizontal



MODE	TX channel 23230	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 48V POE ADAPTER
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	61.040	-52.87	-34.38	-13.00	-39.87	-18.49	Peak	Vertical
2	79.470	-58.93	-39.88	-13.00	-45.93	-19.05	Peak	Vertical
3	91.110	-63.78	-46.49	-13.00	-50.78	-17.29	Peak	Vertical
4	215.270	-62.67	-55.16	-13.00	-49.67	-7.51	Peak	Vertical
5	300.630	-62.29	-58.88	-13.00	-49.29	-3.41	Peak	Vertical
6 PP	881.660	-51.72	-62.54	-13.00	-38.72	10.82	Peak	Vertical



ABOVE 1GHz

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

WORST-CASE DATA

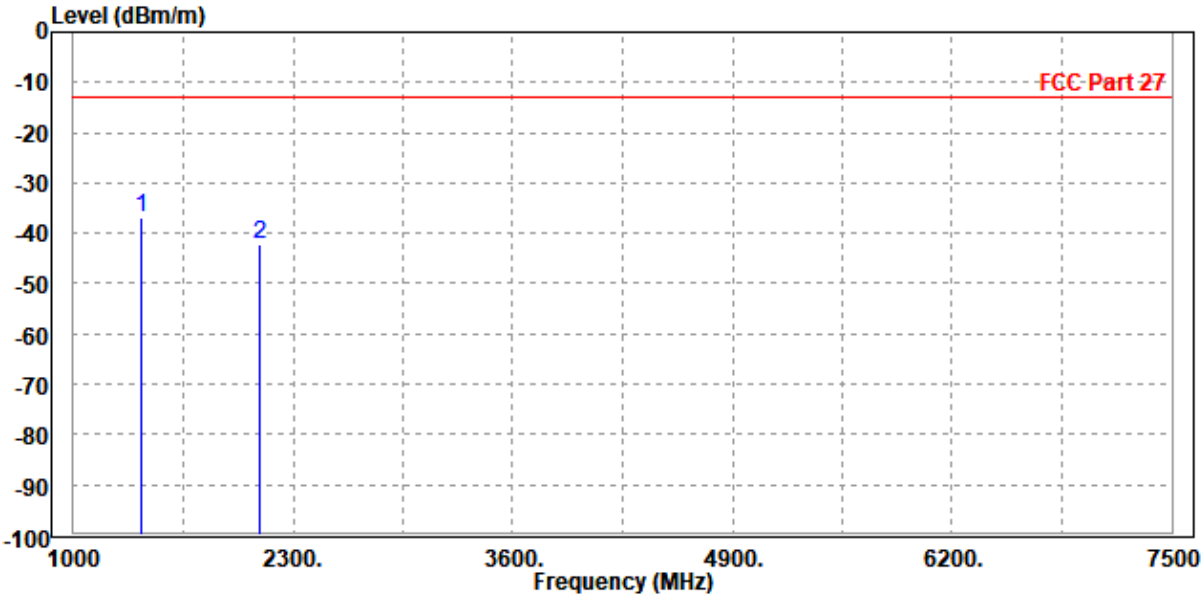
LTE BAND 12

CHANNEL BANDWIDTH: 1.4MHz / QPSK

CH 23017

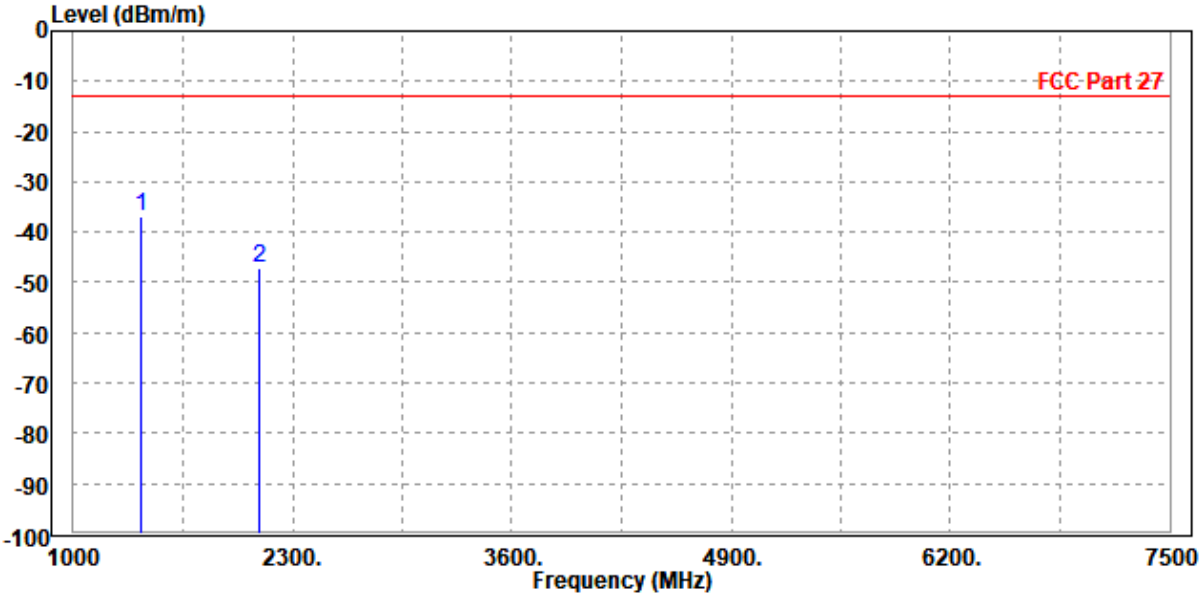
MODE	TX channel 23095	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	1396.500	-36.84	-39.72	-13.00	-23.84	2.88	Peak	Horizontal
2	2100.000	-42.32	-47.34	-13.00	-29.32	5.02	Peak	Horizontal



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

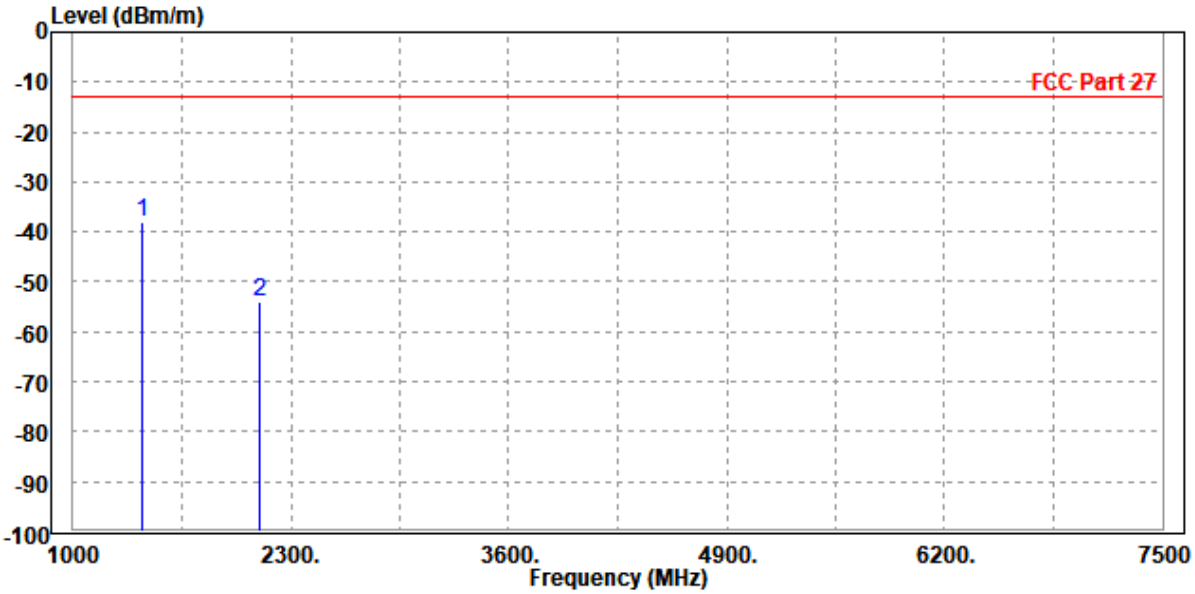
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1403.000	-36.95	-39.85	-13.00	-23.95	2.90	Peak	Vertical
2	2100.000	-47.33	-51.69	-13.00	-34.33	4.36	Peak	Vertical



CH 23095

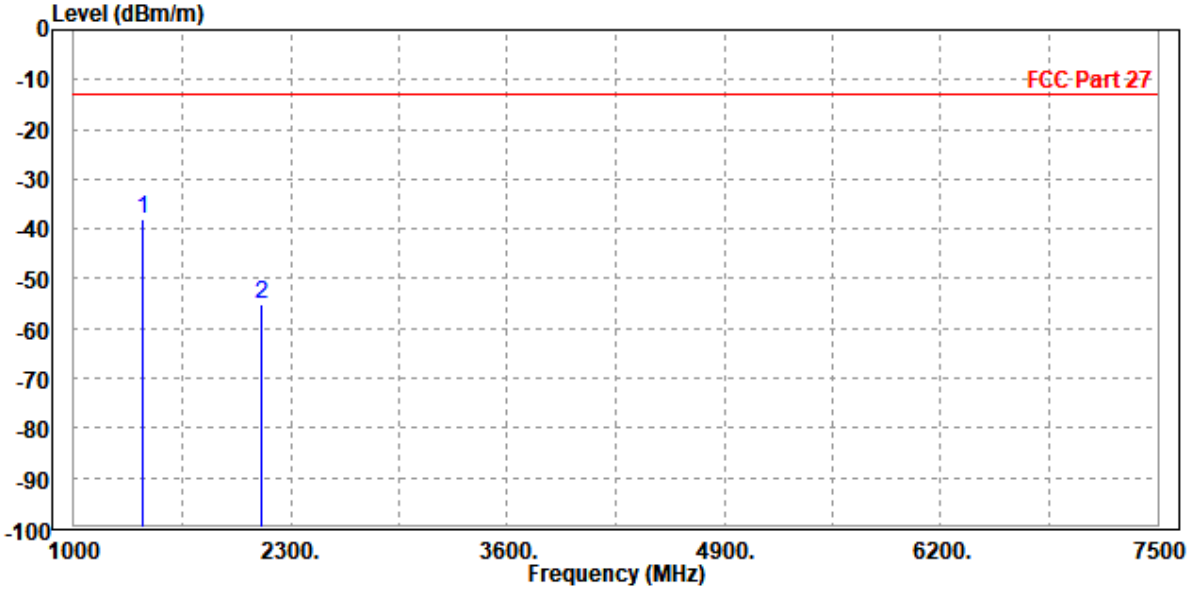
MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1414.000	-37.95	-40.89	-13.00	-24.95	2.94	Peak	Horizontal
2	2118.000	-53.94	-59.01	-13.00	-40.94	5.07	Peak	Horizontal



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

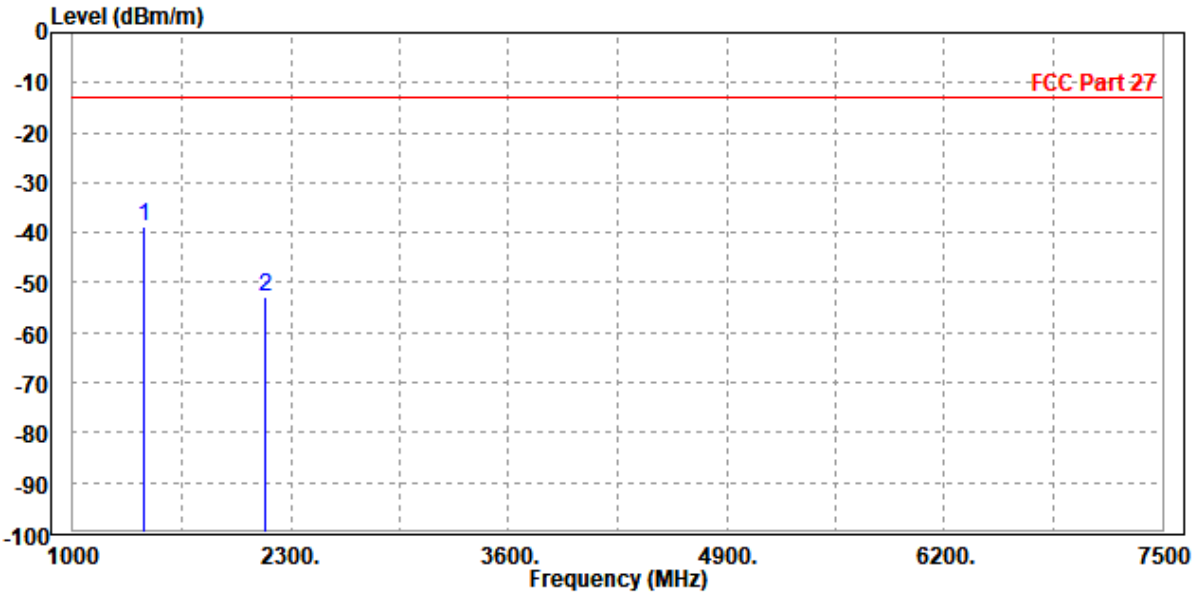
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1416.000	-38.02	-40.95	-13.00	-25.02	2.93	Peak	Vertical
2	2121.000	-55.07	-59.50	-13.00	-42.07	4.43	Peak	Vertical



CH 23173

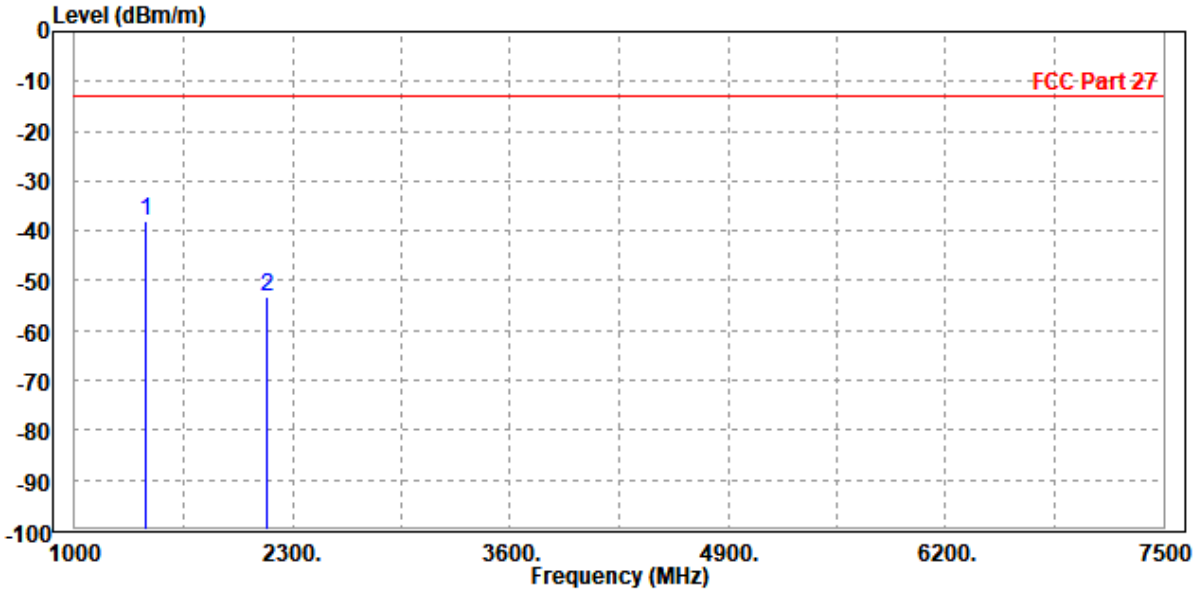
MODE	TX channel 23173	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1429.000	-38.96	-41.94	-13.00	-25.96	2.98	Peak	Horizontal
2	2144.000	-52.84	-57.98	-13.00	-39.84	5.14	Peak	Horizontal



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

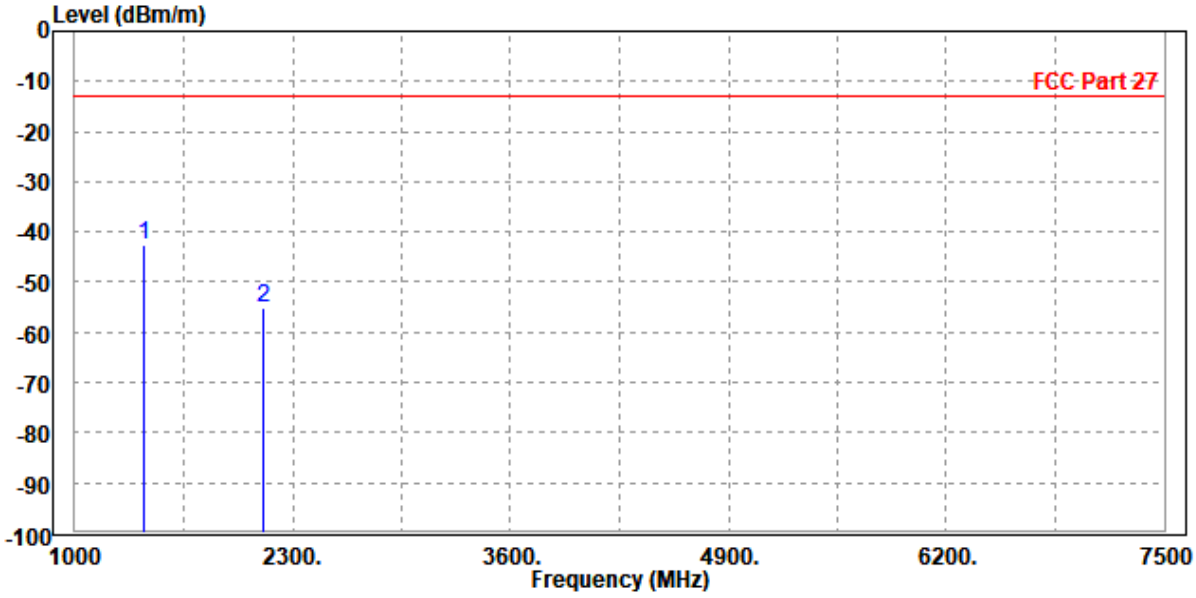
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1429.000	-37.89	-40.85	-13.00	-24.89	2.96	Peak	Vertical
2	2145.000	-53.31	-57.83	-13.00	-40.31	4.52	Peak	Vertical



CHANNEL BANDWIDTH: 3MHz / QPSK

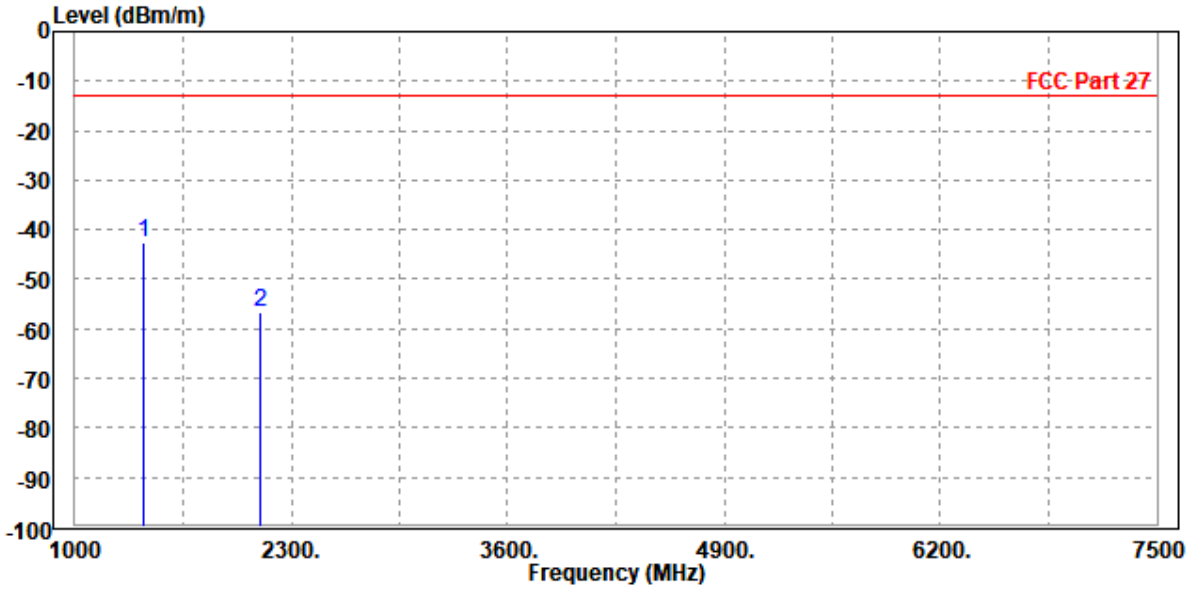
MODE	TX channel 23095	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1416.000	-42.58	-45.52	-13.00	-29.58	2.94	Peak	Horizontal
2	2121.000	-55.07	-60.15	-13.00	-42.07	5.08	Peak	Horizontal



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

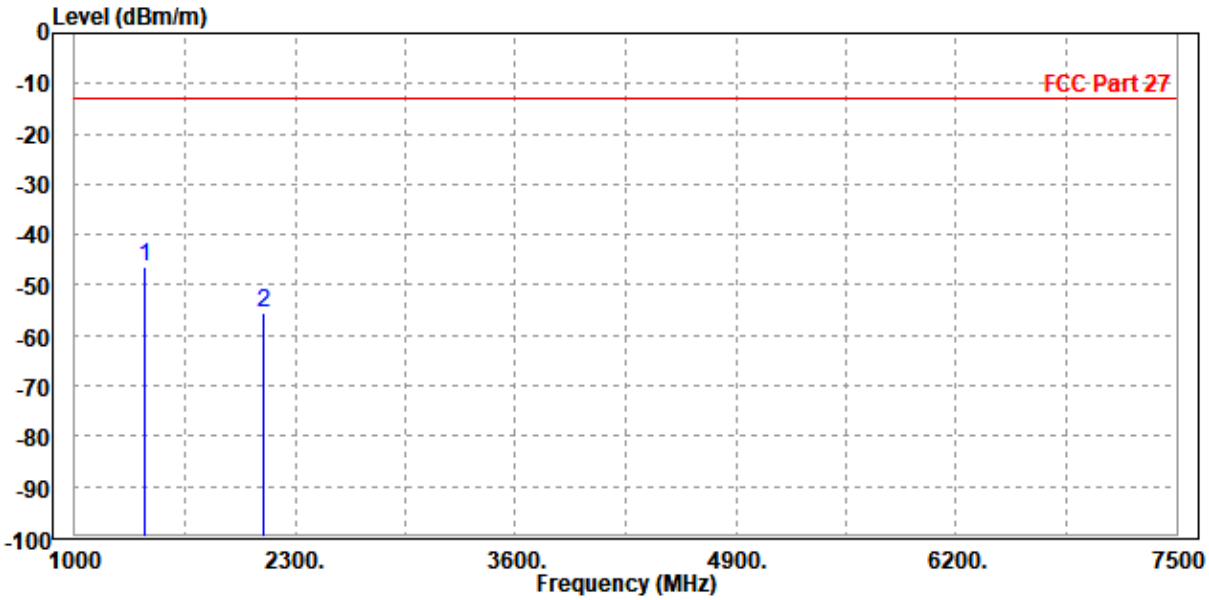
		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1414.000	-42.76	-45.68	-13.00	-29.76	2.92	Peak	Vertical
2		2118.000	-56.82	-61.24	-13.00	-43.82	4.42	Peak	Vertical



CHANNEL BANDWIDTH: 5MHz / QPSK

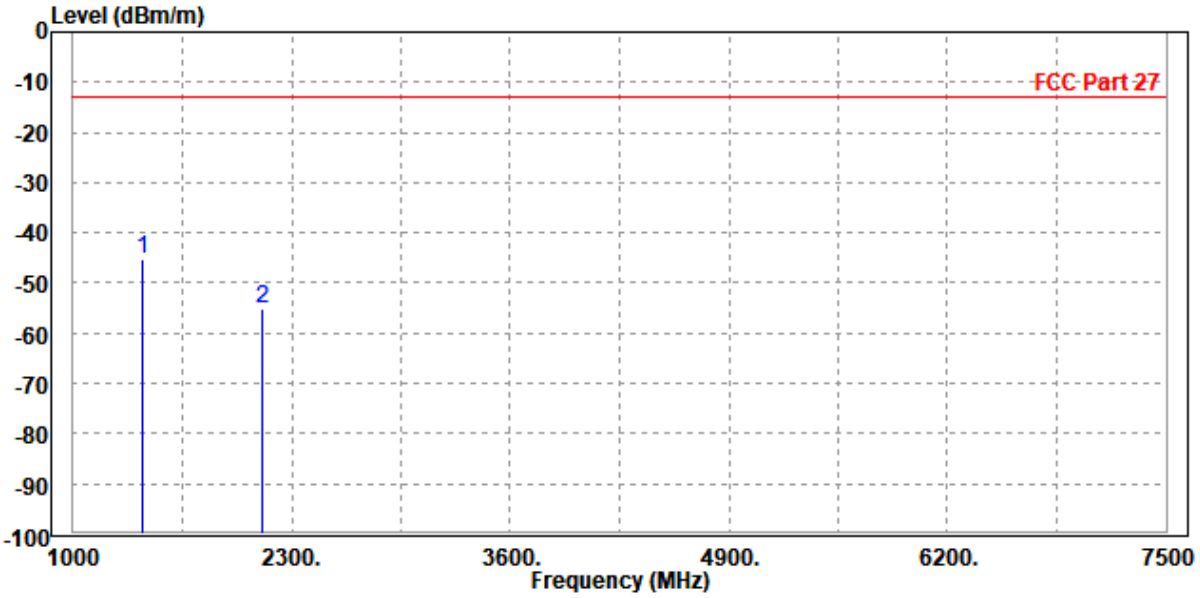
MODE	TX channel 23095	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1414.000	-46.34	-49.28	-13.00	-33.34	2.94	Peak	Horizontal
2	2118.000	-55.33	-60.40	-13.00	-42.33	5.07	Peak	Horizontal



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

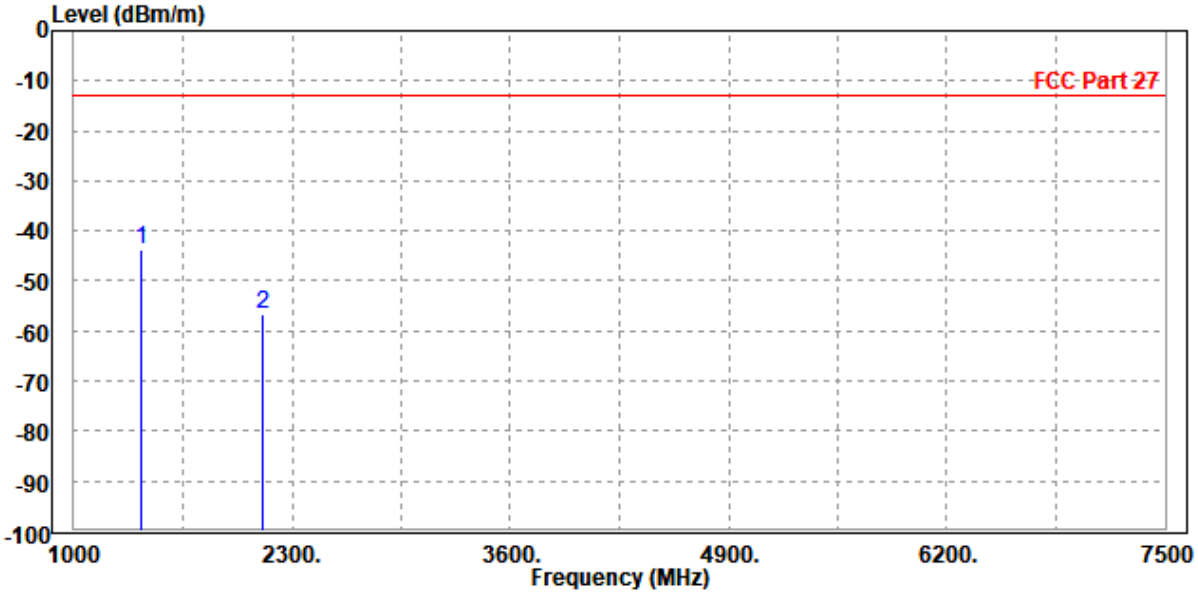
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1416.000	-45.41	-48.34	-13.00	-32.41	2.93	Peak	Vertical
2	2121.000	-55.16	-59.59	-13.00	-42.16	4.43	Peak	Vertical



CHANNEL BANDWIDTH: 10MHz / QPSK

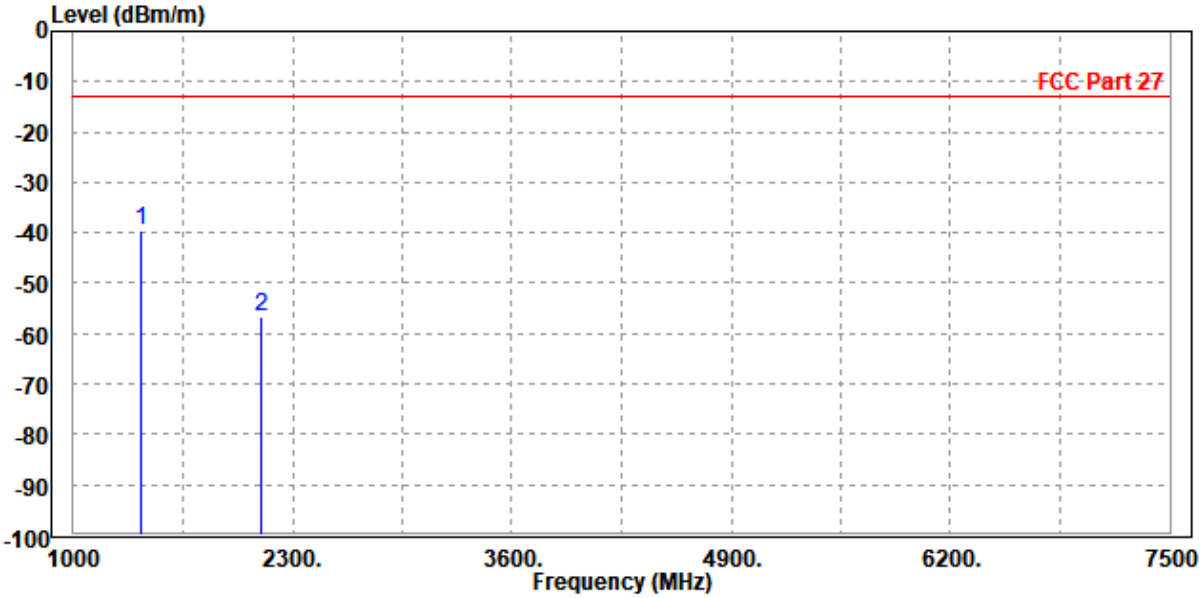
MODE	TX channel 23095	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1403.000	-43.60	-46.50	-13.00	-30.60	2.90	Peak	Horizontal
2	2121.000	-56.57	-61.65	-13.00	-43.57	5.08	Peak	Horizontal



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1403.000	-39.43	-42.33	-13.00	-26.43	2.90	Peak	Vertical
2	2118.000	-56.66	-61.08	-13.00	-43.66	4.42	Peak	Vertical



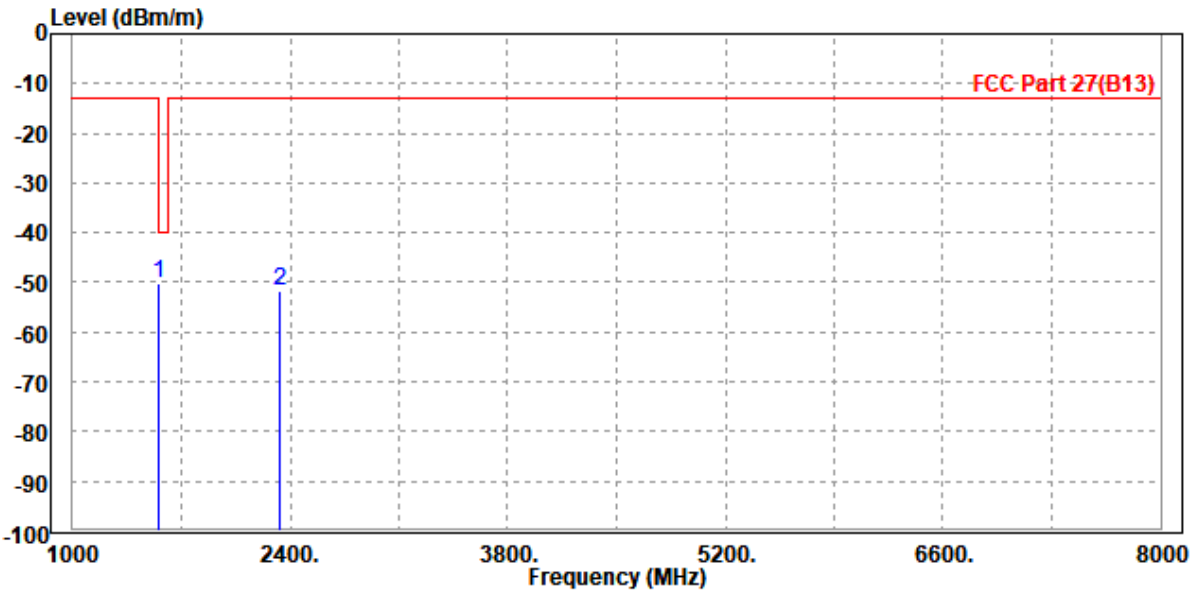
LTE B13

CHANNEL BANDWIDTH: 5MHz / QPSK

CH 23205

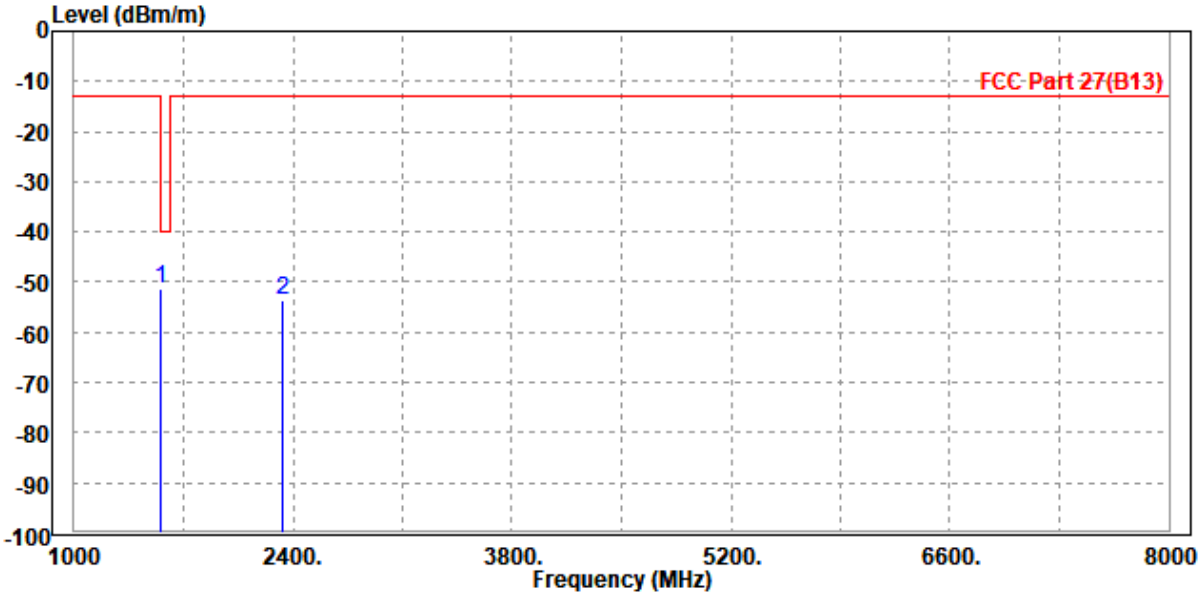
MODE	TX channel 23205	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1558.000	-50.22	-53.60	-13.00	-37.22	3.38	Peak	Horizontal
2	2337.000	-51.79	-57.45	-13.00	-38.79	5.66	Peak	Horizontal



MODE	TX channel 23205	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

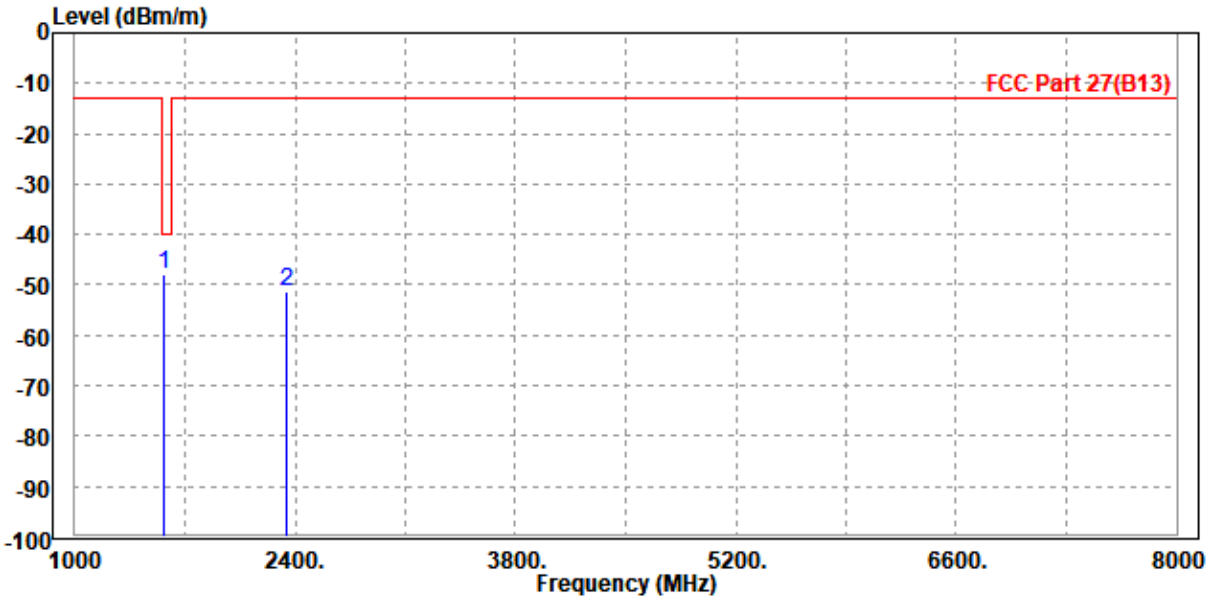
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1560.000	-51.27	-54.50	-40.00	-11.27	3.23	Peak	Vertical
2	2337.000	-53.68	-58.88	-13.00	-40.68	5.20	Peak	Vertical



CH 23230

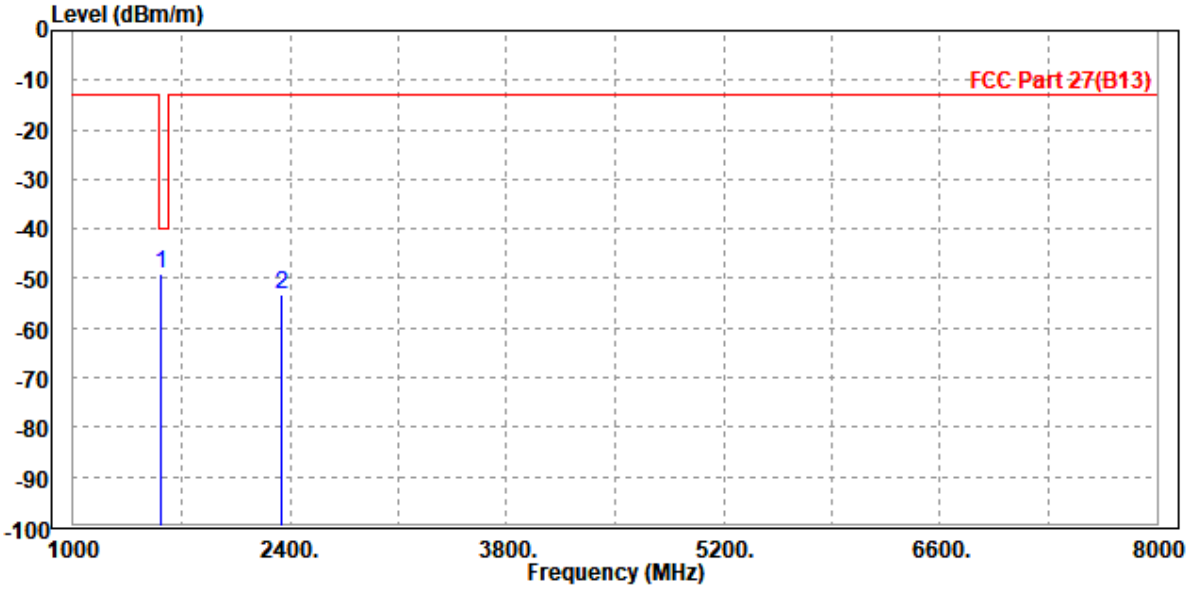
MODE	TX channel 23230	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1567.000	-47.80	-51.21	-40.00	-7.80	3.41	Peak	Horizontal
2		2346.000	-51.47	-57.15	-13.00	-38.47	5.68	Peak	Horizontal



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

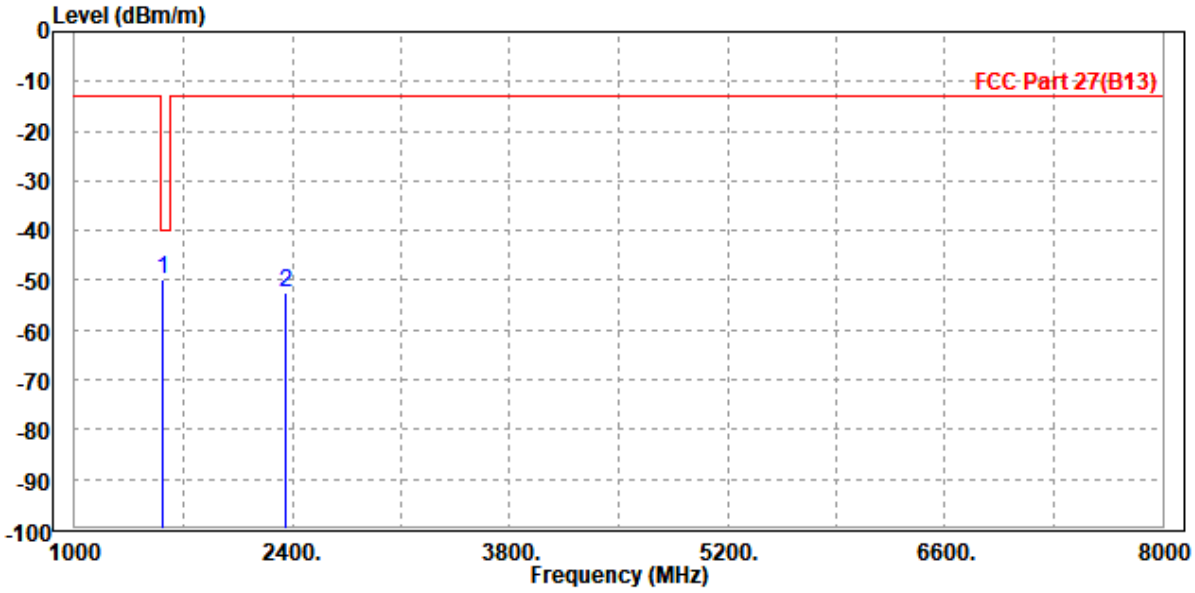
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1564.000	-48.90	-52.14	-40.00	-8.90	3.24	Peak	Vertical
2	2344.000	-53.35	-58.57	-13.00	-40.35	5.22	Peak	Vertical



CH 23255

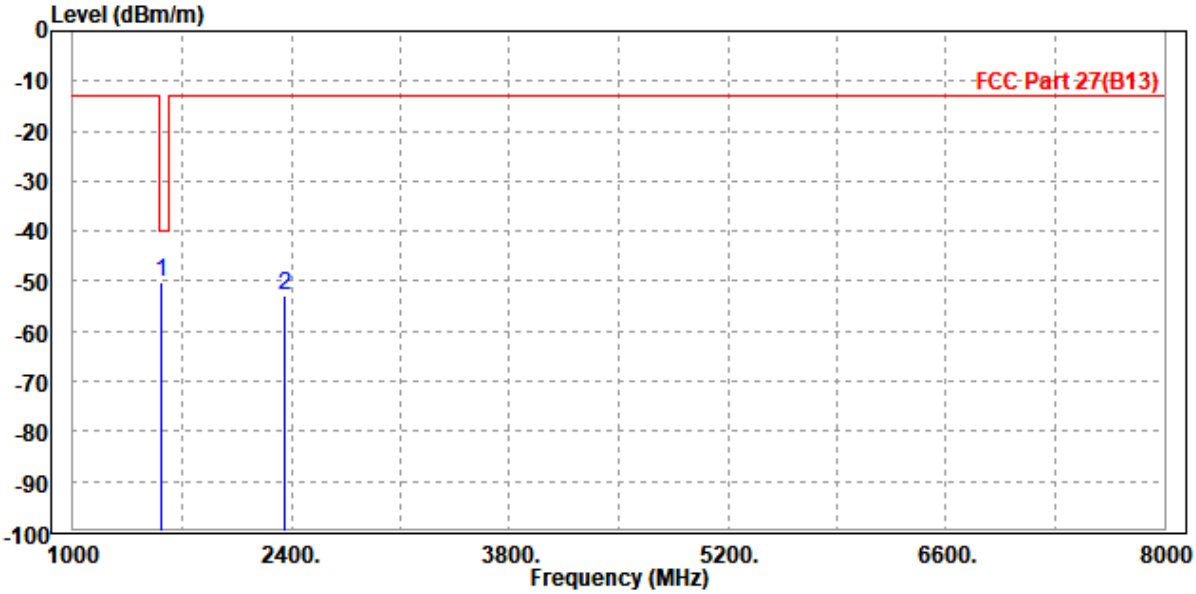
MODE	TX channel 23255	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1567.000	-49.84	-53.25	-40.00	-9.84	3.41	Peak	Horizontal
2		2353.500	-52.39	-58.09	-13.00	-39.39	5.70	Peak	Horizontal



MODE	TX channel 23255	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

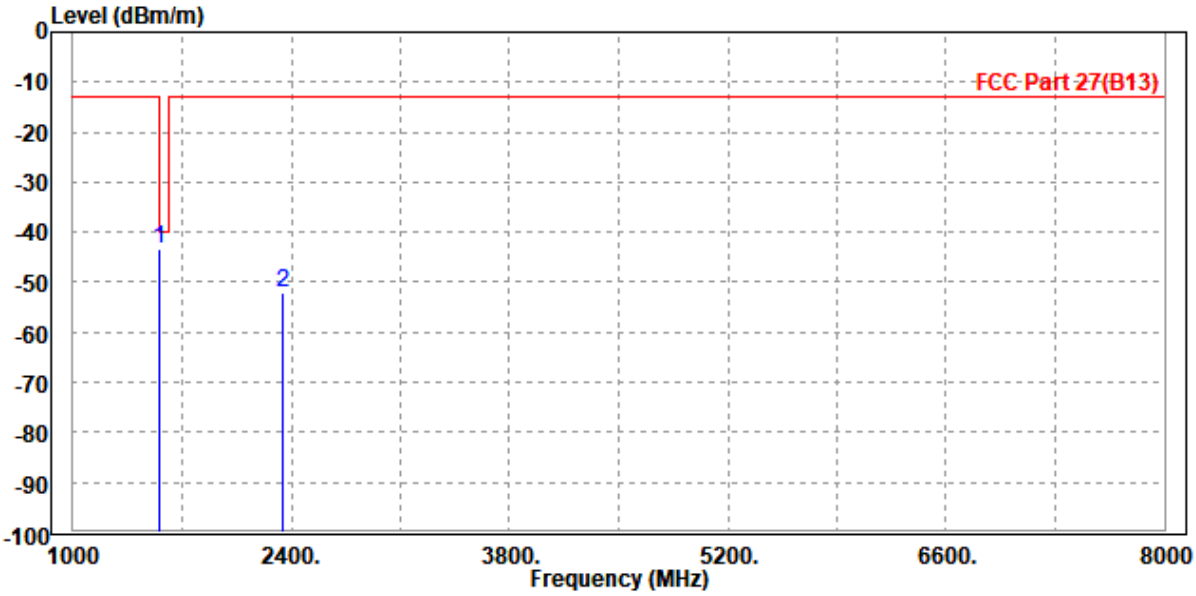
		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1569.000	-50.02	-53.27	-40.00	-10.02	3.25	Peak	Vertical
2		2353.500	-52.69	-57.95	-13.00	-39.69	5.26	Peak	Vertical



CHANNEL BANDWIDTH: 10MHz /QPSK

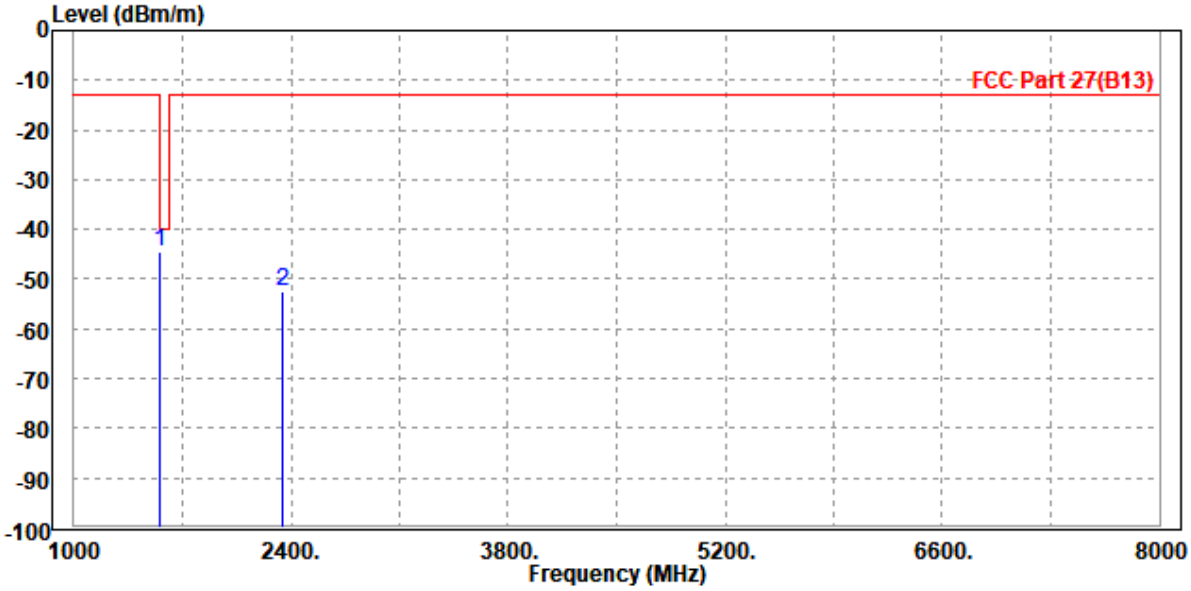
MODE	TX channel 23230	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1553.000	-43.46	-46.82	-13.00	-30.46	3.36	Peak	Horizontal
2	2346.000	-52.08	-57.76	-13.00	-39.08	5.68	Peak	Horizontal



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

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1553.000	-44.33	-47.55	-13.00	-31.33	3.22	Peak	Vertical
2		2344.000	-52.38	-57.60	-13.00	-39.38	5.22	Peak	Vertical



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 Centre 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province, P.R.C.
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 modifications were made to the EUT by the lab during the test.

6 Appendix :

LTE BAND12

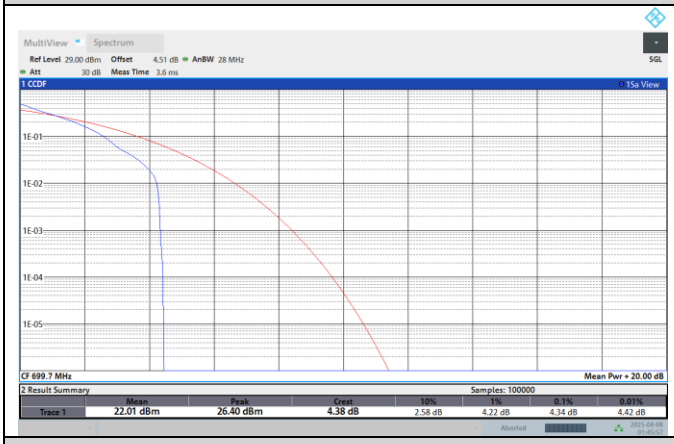
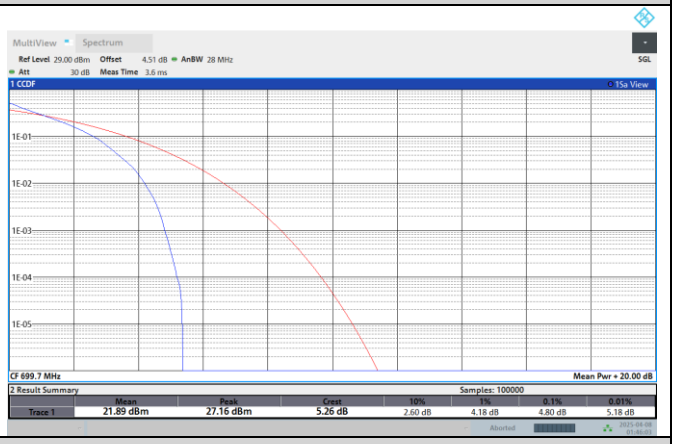
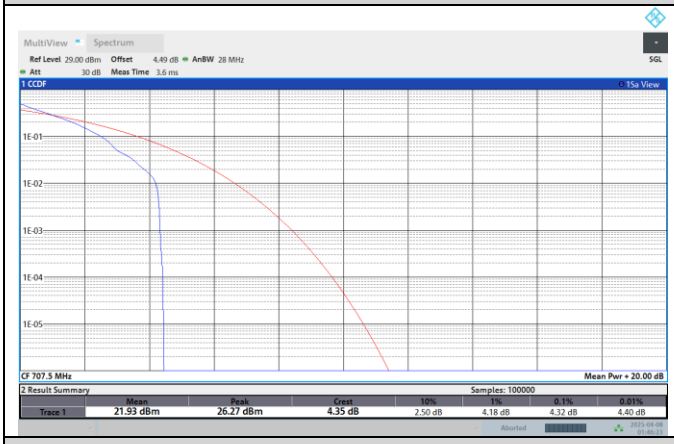
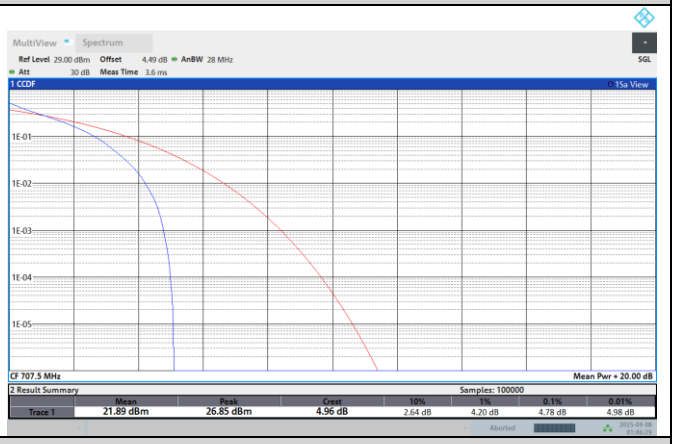
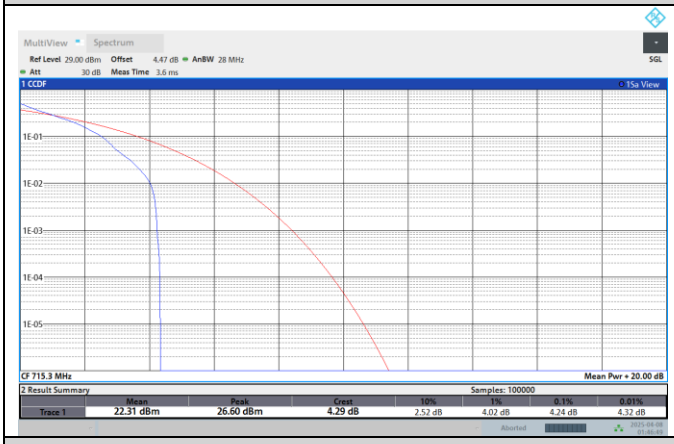
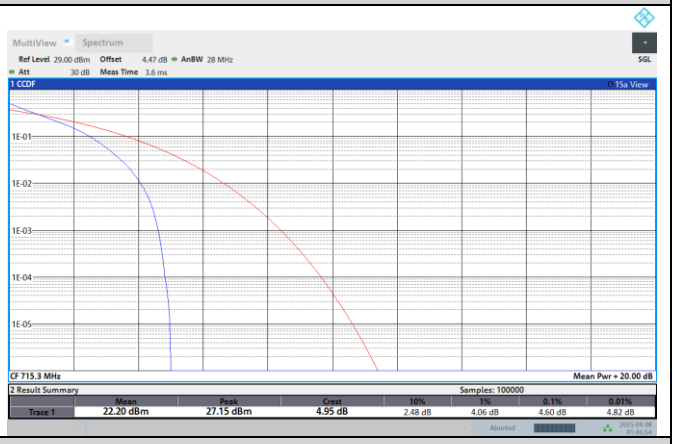
PEAK-TO-AVERAGE RATIO(CCDF)

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band12	1.4MHz	QPSK	23017	1RB#0	4.34	13	PASS
Band12	1.4MHz	QPSK	23017	6RB#0	4.80	13	PASS
Band12	1.4MHz	QPSK	23095	1RB#0	4.32	13	PASS
Band12	1.4MHz	QPSK	23095	6RB#0	4.78	13	PASS
Band12	1.4MHz	QPSK	23173	1RB#0	4.24	13	PASS
Band12	1.4MHz	QPSK	23173	6RB#0	4.60	13	PASS
Band12	1.4MHz	16QAM	23017	1RB#0	4.88	13	PASS
Band12	1.4MHz	16QAM	23017	6RB#0	5.60	13	PASS
Band12	1.4MHz	16QAM	23095	1RB#0	5.10	13	PASS
Band12	1.4MHz	16QAM	23095	6RB#0	5.60	13	PASS
Band12	1.4MHz	16QAM	23173	1RB#0	5.08	13	PASS
Band12	1.4MHz	16QAM	23173	6RB#0	5.50	13	PASS
Band12	3MHz	QPSK	23025	1RB#0	4.30	13	PASS
Band12	3MHz	QPSK	23025	15RB#0	4.88	13	PASS
Band12	3MHz	QPSK	23095	1RB#0	4.40	13	PASS
Band12	3MHz	QPSK	23095	15RB#0	4.70	13	PASS
Band12	3MHz	QPSK	23165	1RB#0	4.40	13	PASS
Band12	3MHz	QPSK	23165	15RB#0	4.76	13	PASS
Band12	3MHz	16QAM	23025	1RB#0	4.90	13	PASS
Band12	3MHz	16QAM	23025	15RB#0	5.70	13	PASS
Band12	3MHz	16QAM	23095	1RB#0	5.12	13	PASS
Band12	3MHz	16QAM	23095	15RB#0	5.70	13	PASS
Band12	3MHz	16QAM	23165	1RB#0	5.24	13	PASS
Band12	3MHz	16QAM	23165	15RB#0	5.66	13	PASS
Band12	5MHz	QPSK	23035	1RB#0	4.24	13	PASS
Band12	5MHz	QPSK	23035	25RB#0	4.90	13	PASS
Band12	5MHz	QPSK	23095	1RB#0	4.42	13	PASS
Band12	5MHz	QPSK	23095	25RB#0	4.84	13	PASS
Band12	5MHz	QPSK	23155	1RB#0	4.32	13	PASS
Band12	5MHz	QPSK	23155	25RB#0	4.78	13	PASS
Band12	5MHz	16QAM	23035	1RB#0	5.04	13	PASS
Band12	5MHz	16QAM	23035	25RB#0	5.78	13	PASS
Band12	5MHz	16QAM	23095	1RB#0	4.92	13	PASS
Band12	5MHz	16QAM	23095	25RB#0	5.58	13	PASS
Band12	5MHz	16QAM	23155	1RB#0	4.70	13	PASS
Band12	5MHz	16QAM	23155	25RB#0	5.68	13	PASS
Band12	10MHz	QPSK	23060	1RB#0	4.24	13	PASS
Band12	10MHz	QPSK	23060	50RB#0	4.94	13	PASS
Band12	10MHz	QPSK	23095	1RB#0	4.32	13	PASS
Band12	10MHz	QPSK	23095	50RB#0	5.02	13	PASS
Band12	10MHz	QPSK	23130	1RB#0	4.12	13	PASS
Band12	10MHz	QPSK	23130	50RB#0	4.90	13	PASS

Band12	10MHz	16QAM	23060	1RB#0	5.04	13	PASS
Band12	10MHz	16QAM	23060	27RB#0	5.66	13	PASS
Band12	10MHz	16QAM	23095	1RB#0	5.16	13	PASS
Band12	10MHz	16QAM	23095	27RB#0	5.58	13	PASS
Band12	10MHz	16QAM	23130	1RB#0	5.16	13	PASS
Band12	10MHz	16QAM	23130	27RB#0	5.50	13	PASS

Test Graphs

Band12-1.4MHz-QPSK-23017-1RB#0	Band12-1.4MHz-QPSK-23017-6RB#0
	
Band12-1.4MHz-QPSK-23095-1RB#0	Band12-1.4MHz-QPSK-23095-6RB#0
	
Band12-1.4MHz-QPSK-23173-1RB#0	Band12-1.4MHz-QPSK-23173-6RB#0
	
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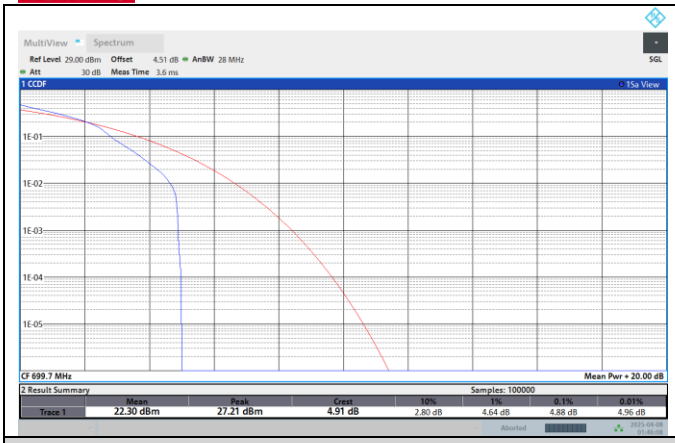

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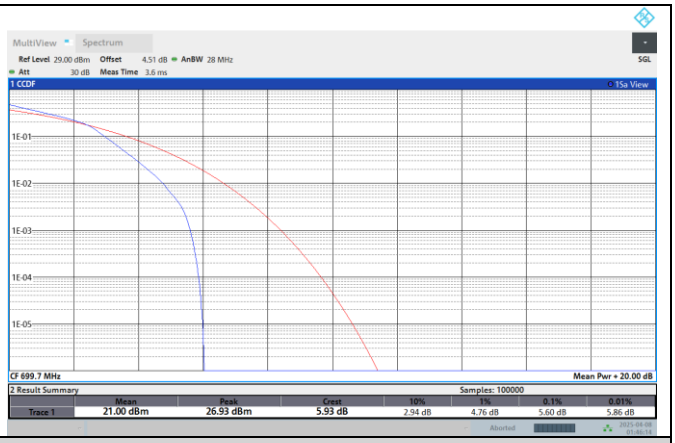

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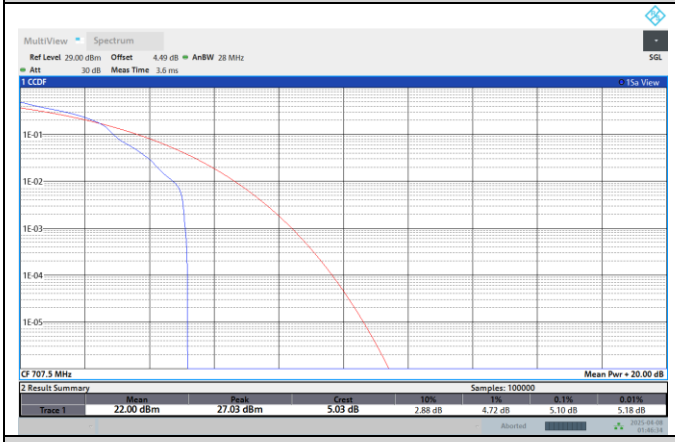

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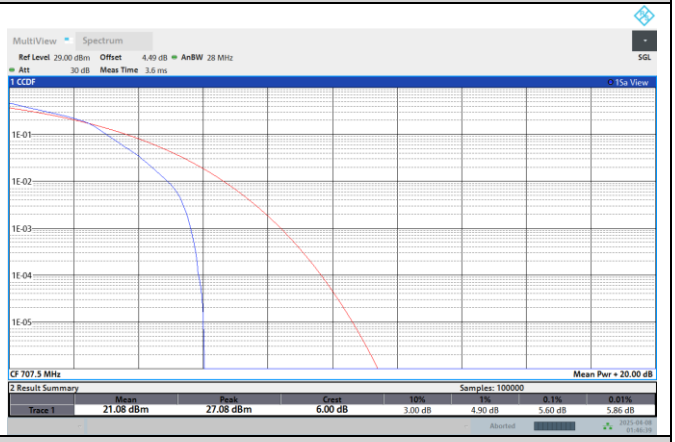

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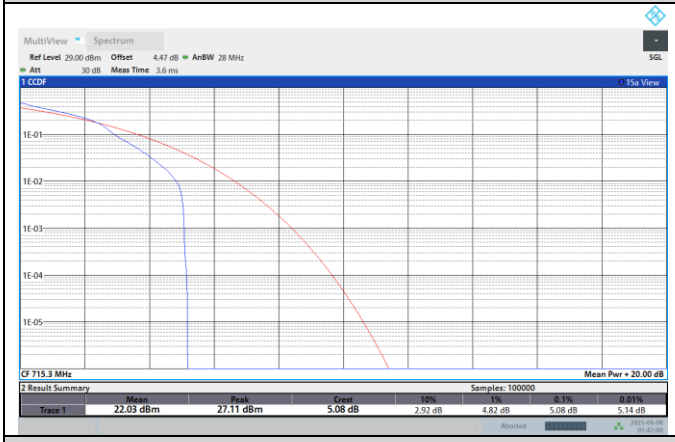

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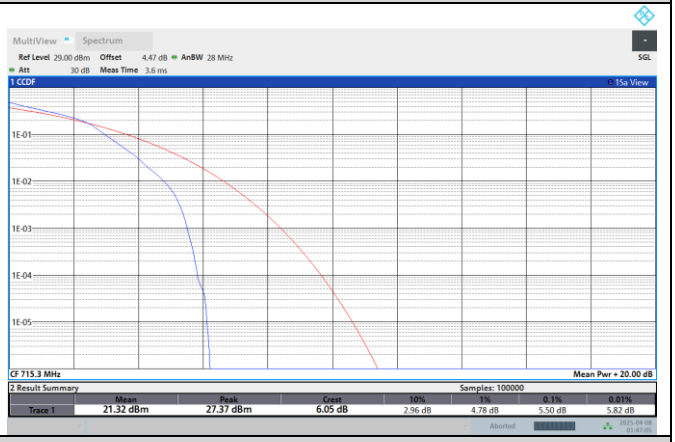

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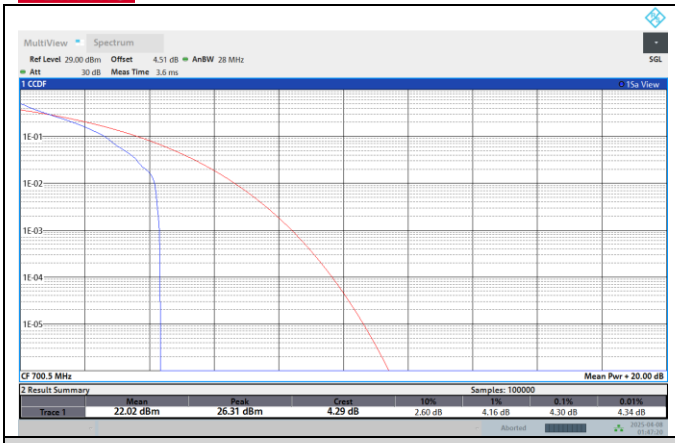

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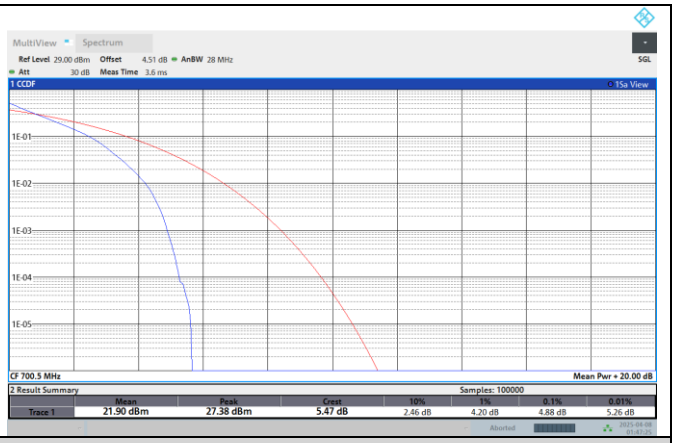

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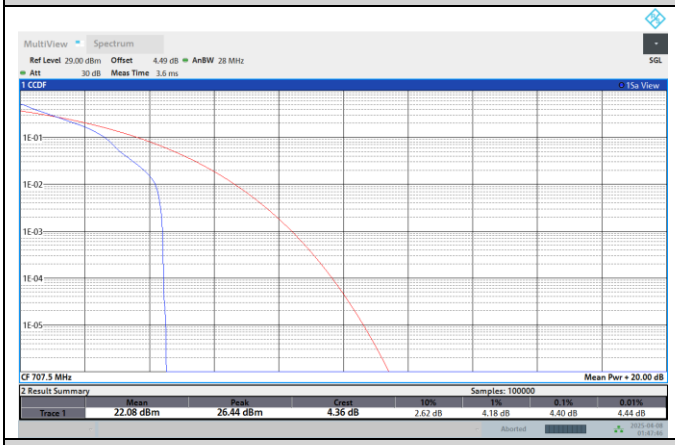

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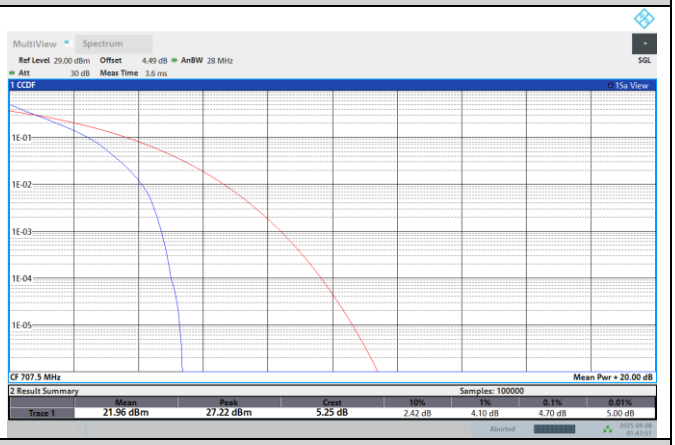

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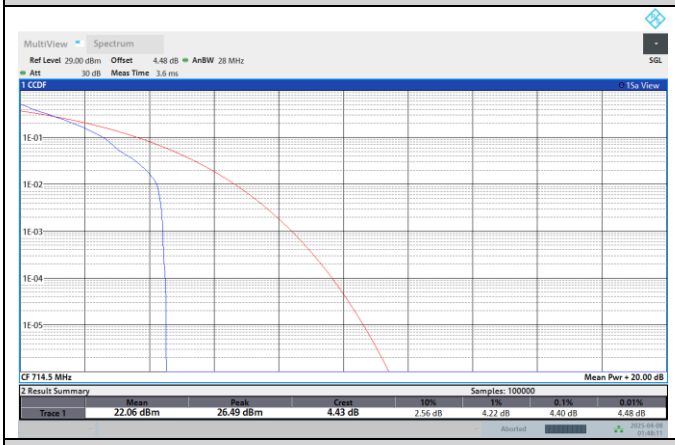

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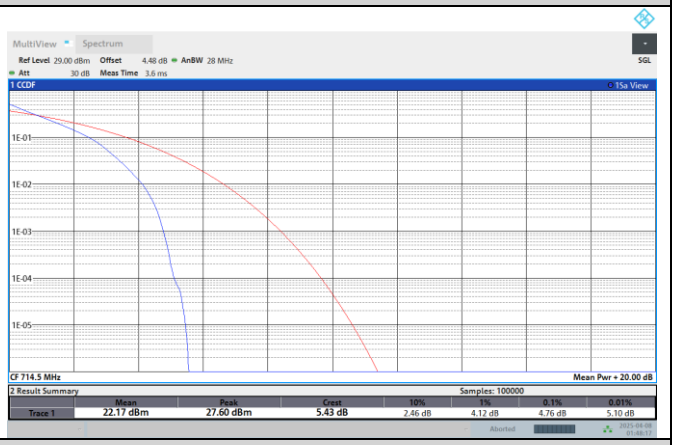

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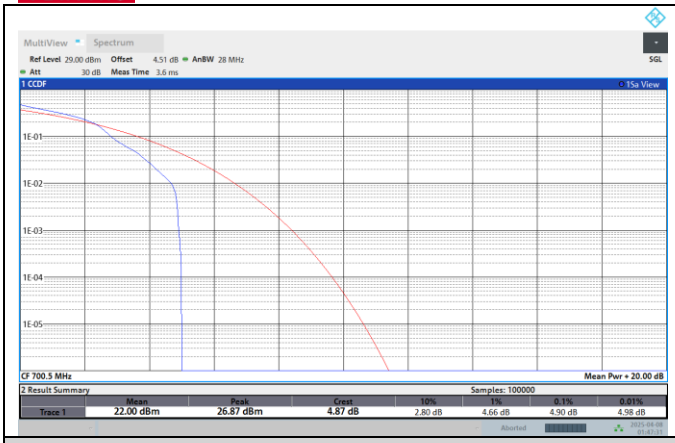

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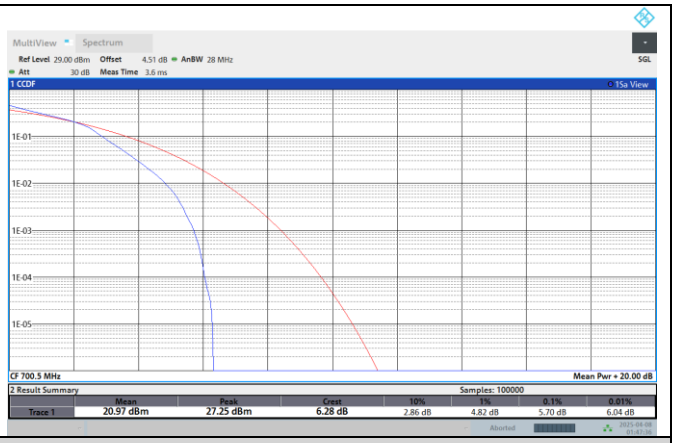

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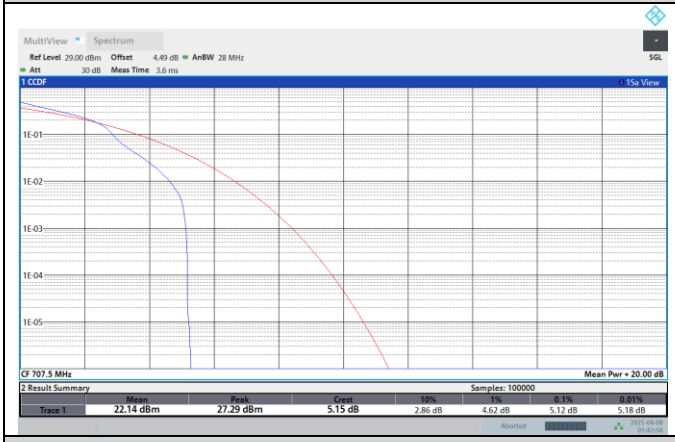

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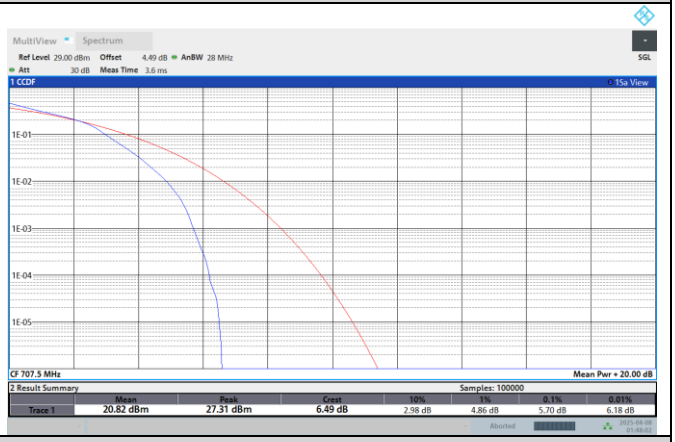

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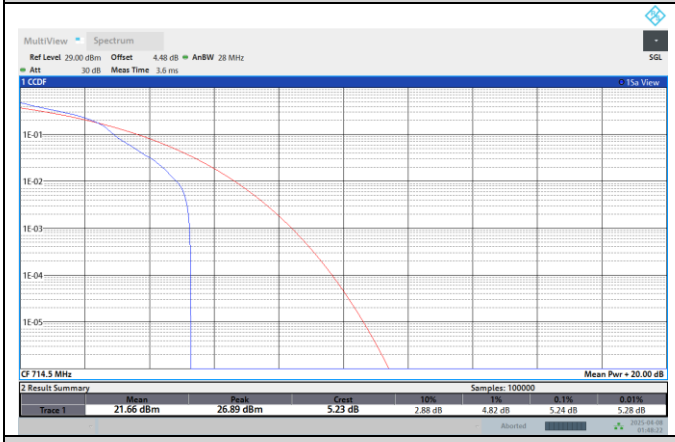

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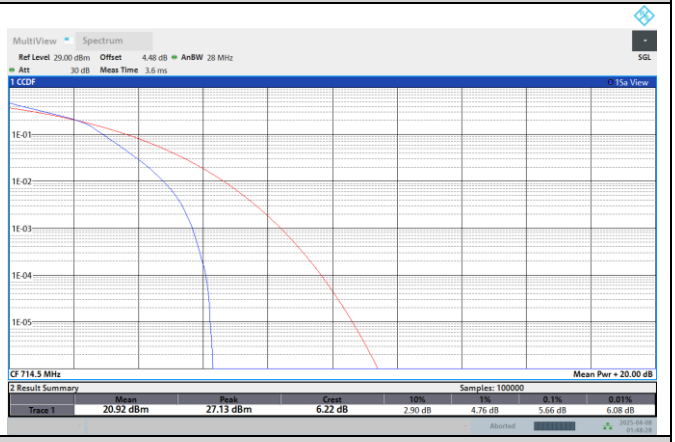

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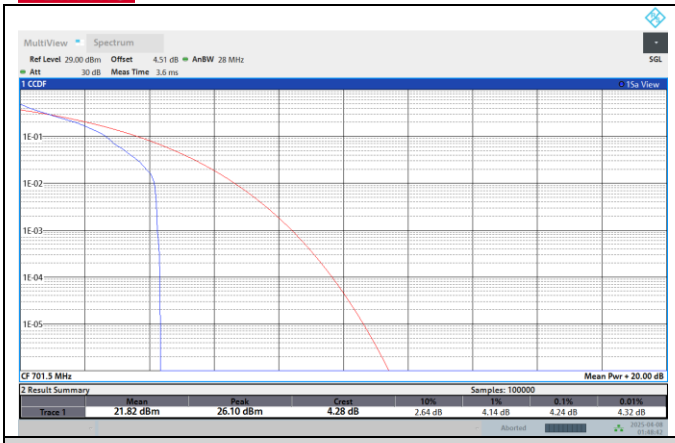

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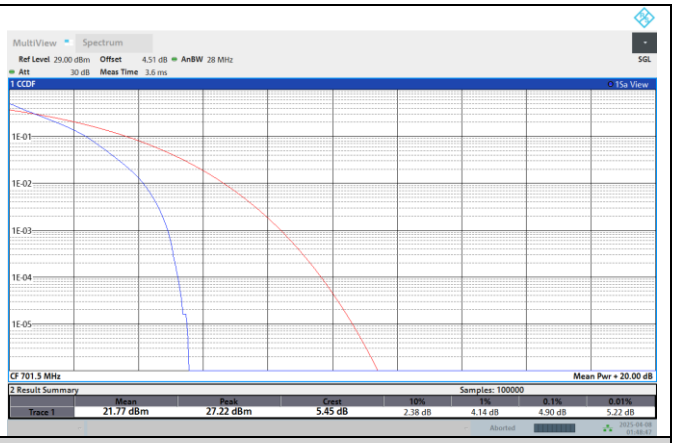

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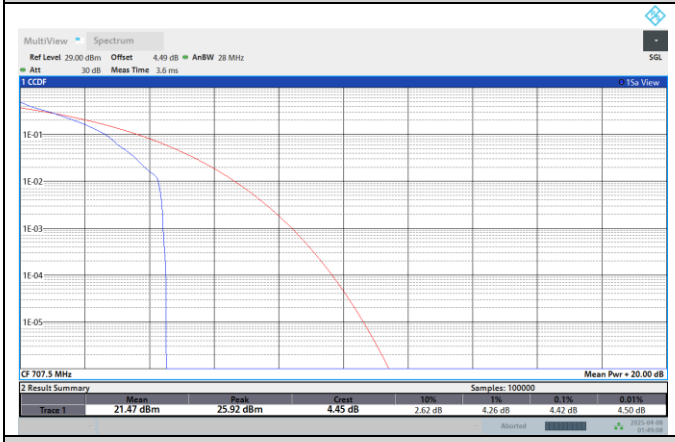

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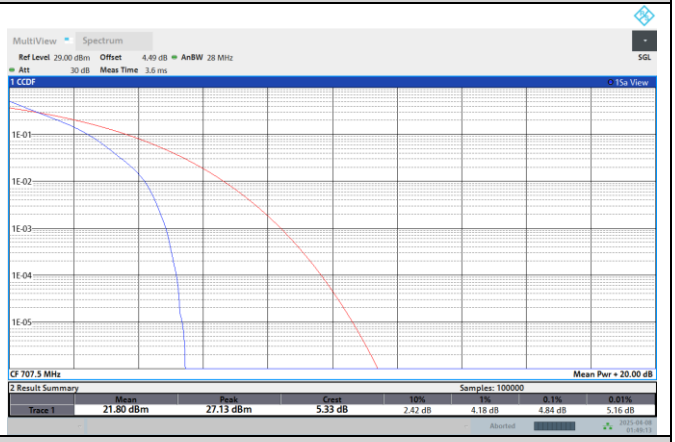

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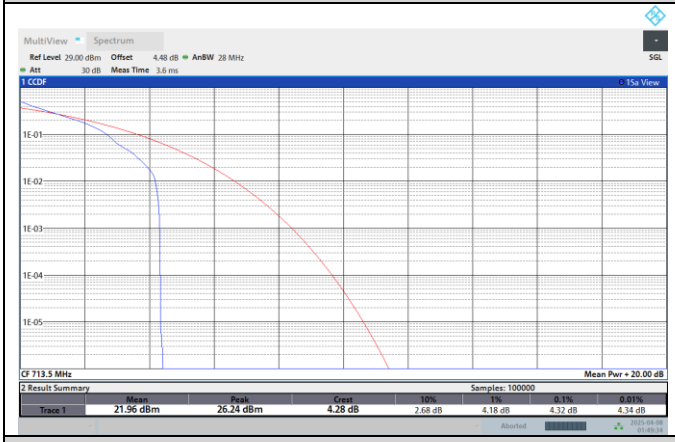

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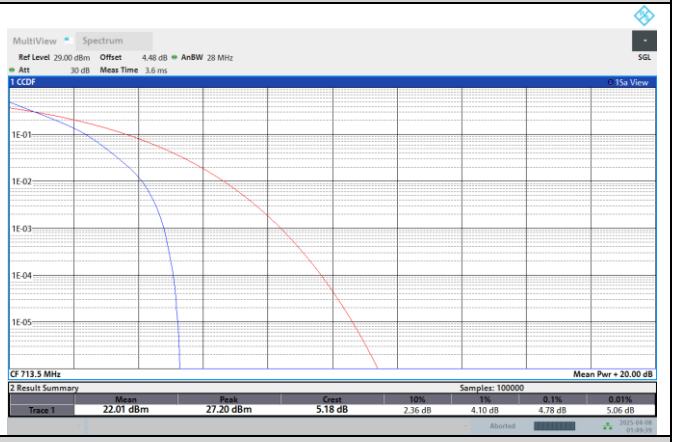

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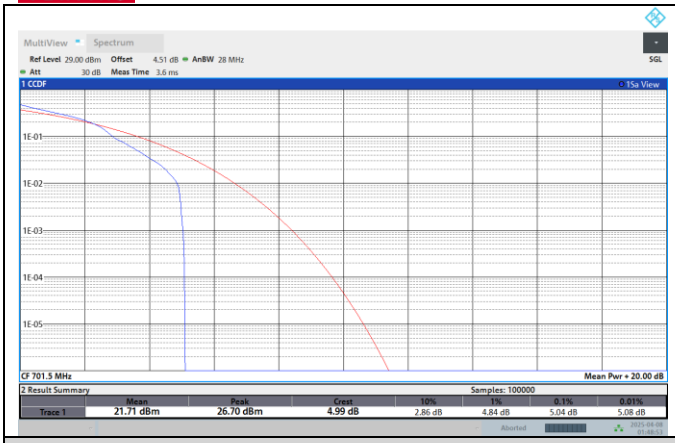

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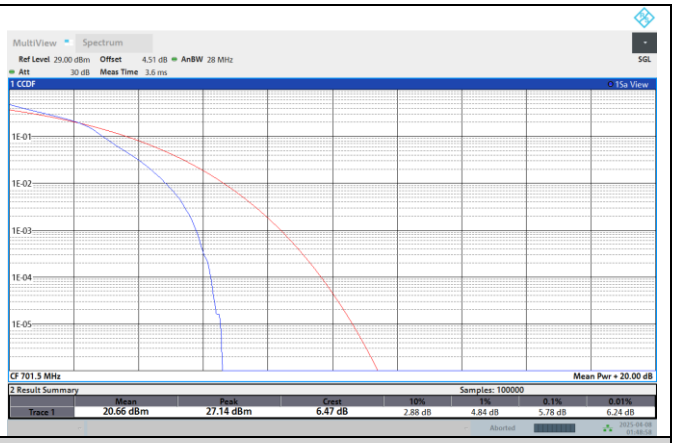

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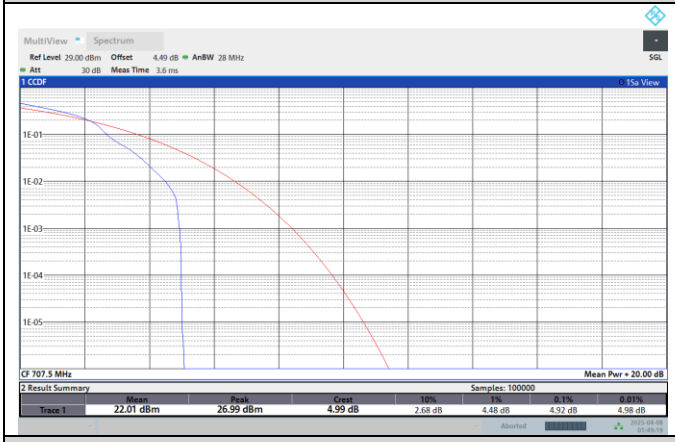

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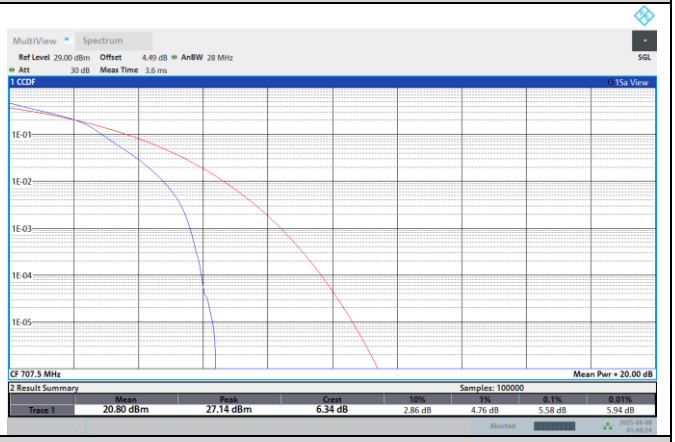

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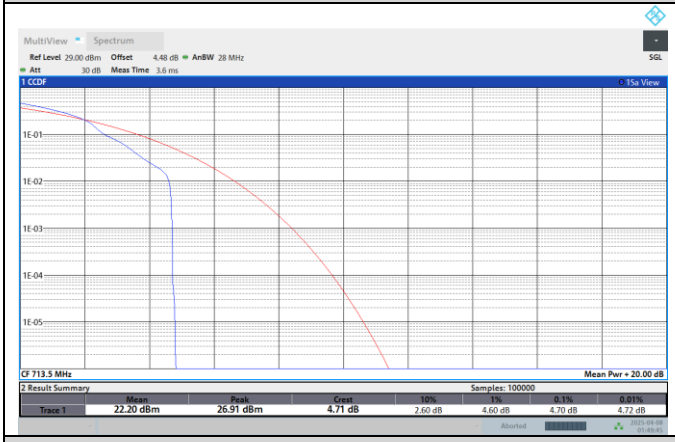

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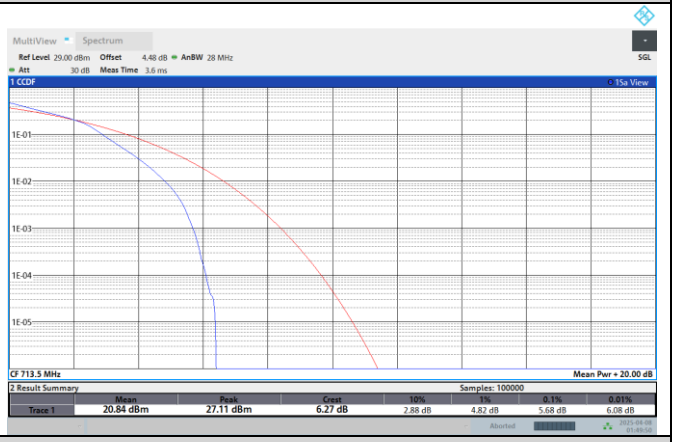

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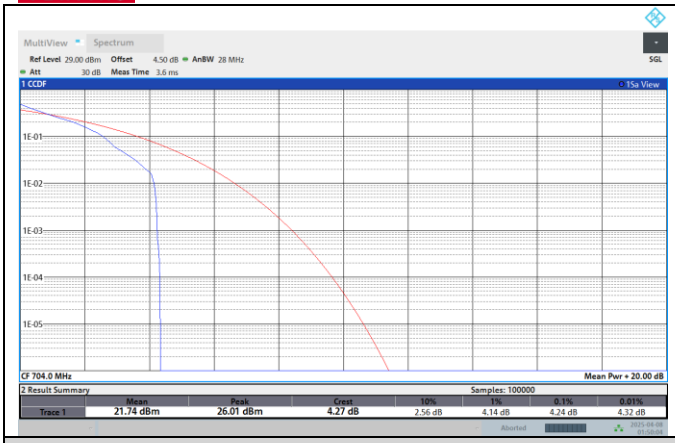

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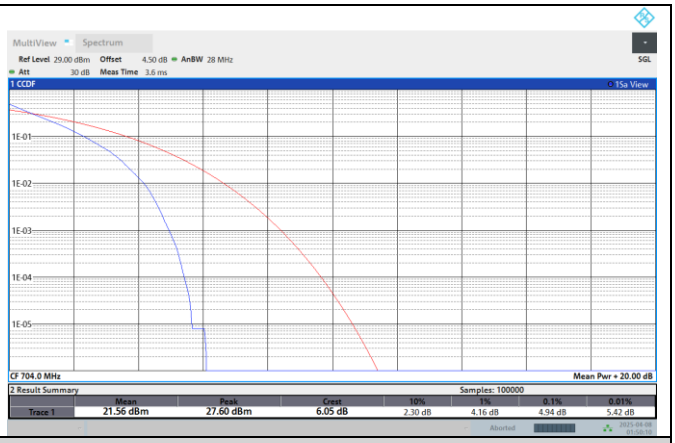

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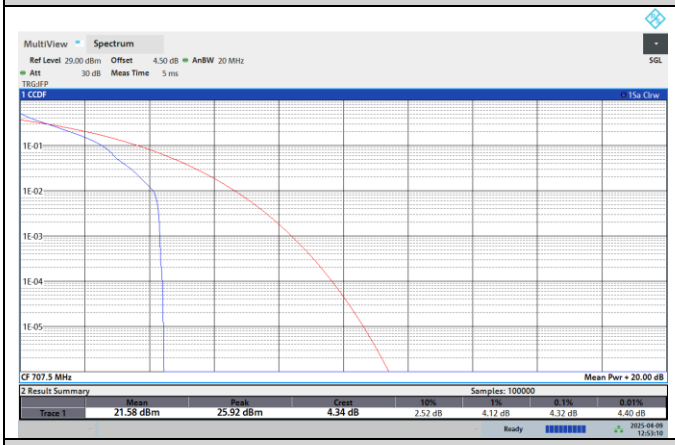

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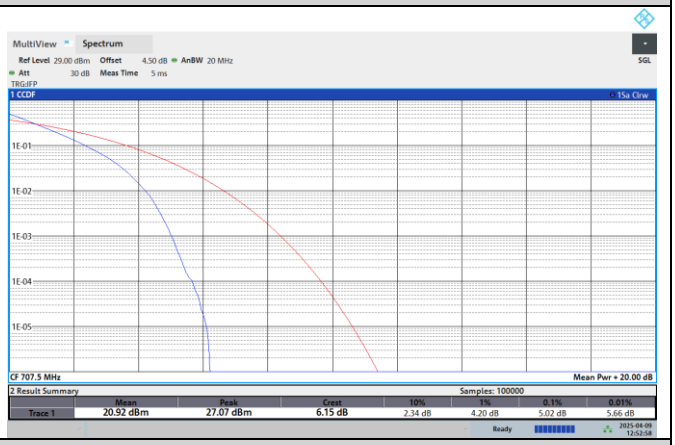

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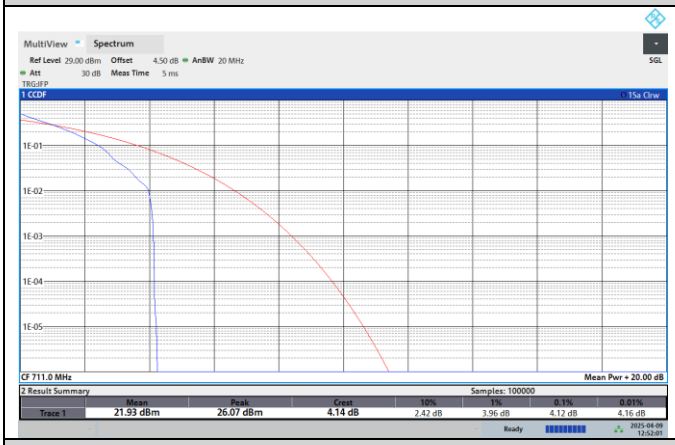

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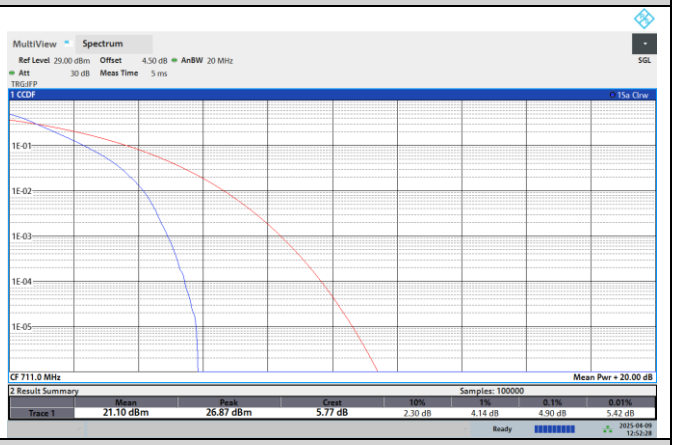

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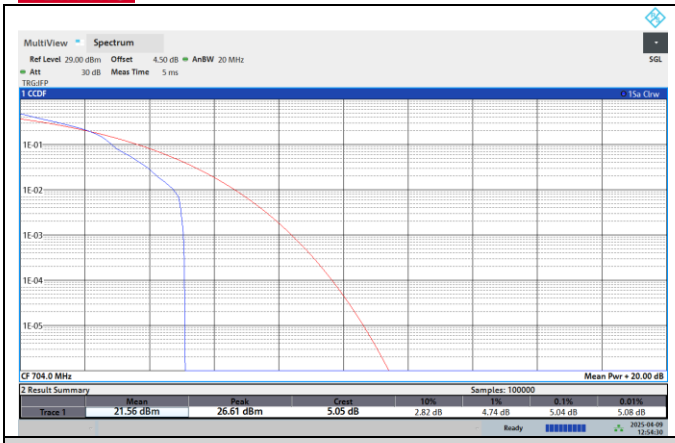

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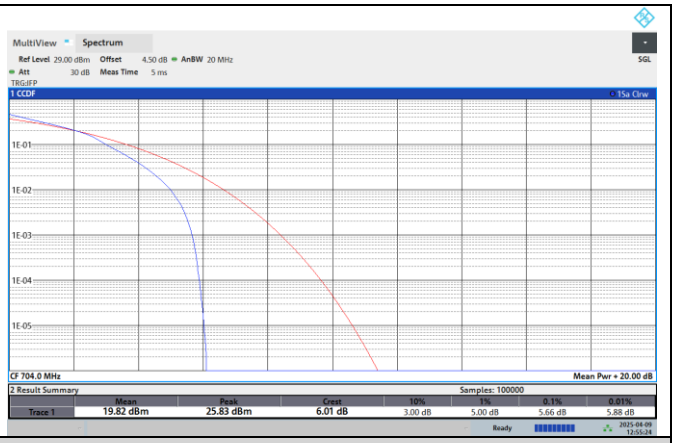

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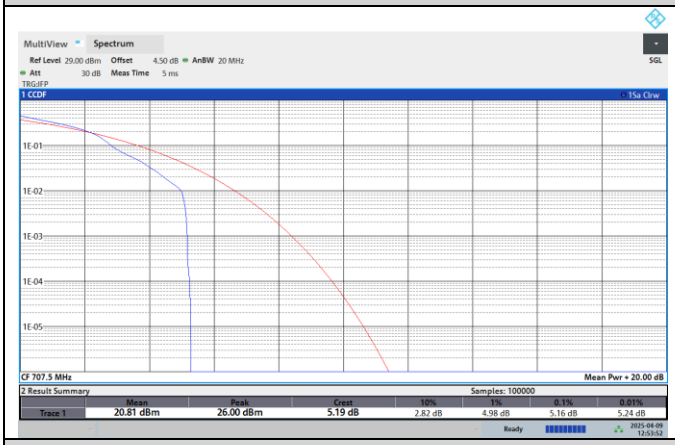

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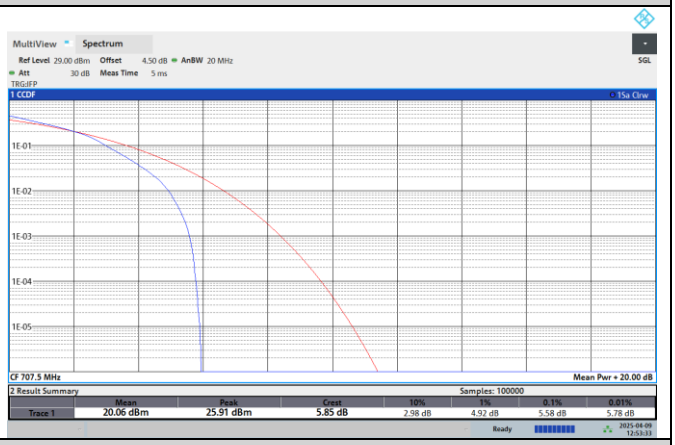

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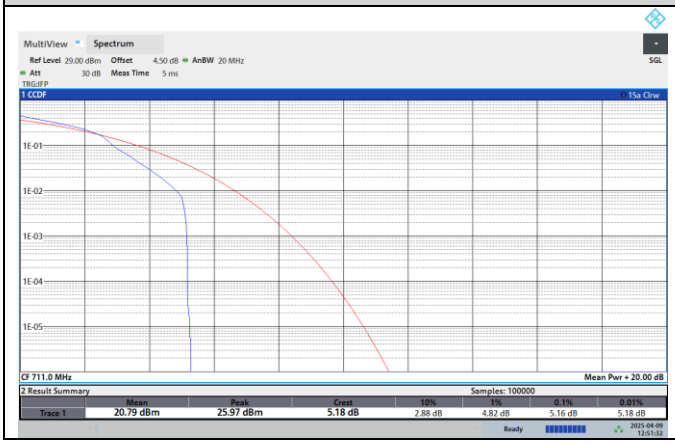
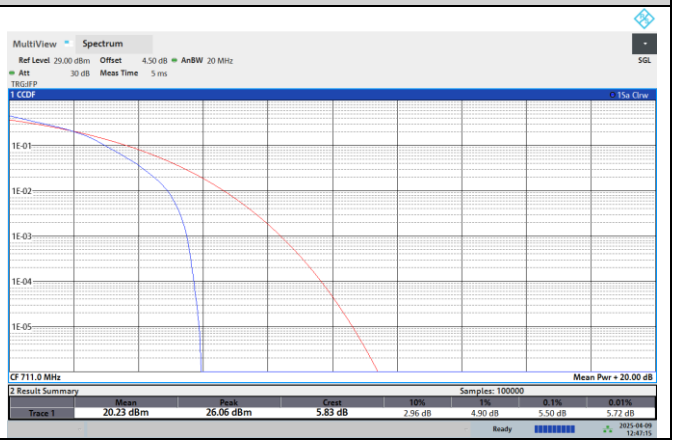




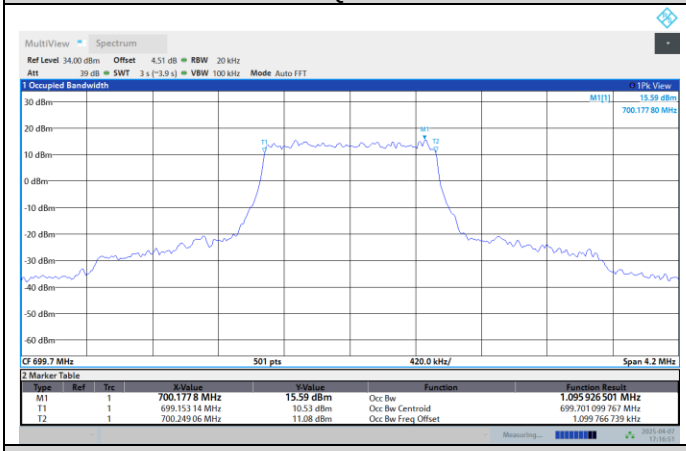
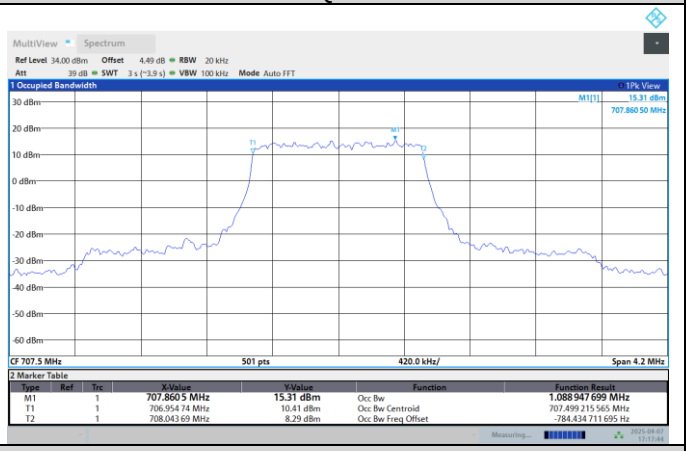
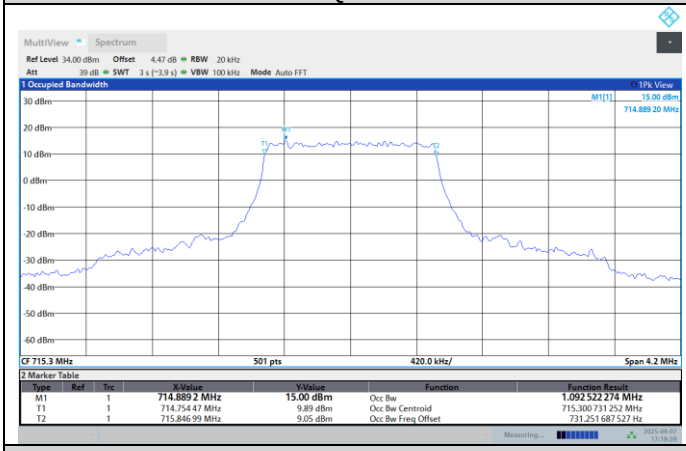
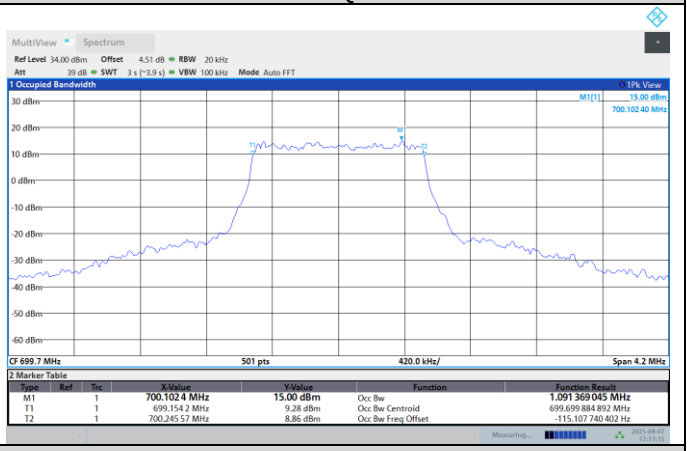
26DB BANDWIDTH AND OCCUPIED BANDWIDTH

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band12	1.4MHz	QPSK	23017	6RB#0	1.096	1.27	PASS
Band12	1.4MHz	QPSK	23095	6RB#0	1.089	1.28	PASS
Band12	1.4MHz	QPSK	23173	6RB#0	1.093	1.28	PASS
Band12	1.4MHz	16QAM	23017	6RB#0	1.091	1.28	PASS
Band12	1.4MHz	16QAM	23095	6RB#0	1.093	1.29	PASS
Band12	1.4MHz	16QAM	23173	6RB#0	1.090	1.28	PASS
Band12	3MHz	QPSK	23025	15RB#0	2.696	2.93	PASS
Band12	3MHz	QPSK	23095	15RB#0	2.697	2.93	PASS
Band12	3MHz	QPSK	23165	15RB#0	2.696	2.96	PASS
Band12	3MHz	16QAM	23025	15RB#0	2.694	2.96	PASS
Band12	3MHz	16QAM	23095	15RB#0	2.692	2.95	PASS
Band12	3MHz	16QAM	23165	15RB#0	2.691	2.95	PASS
Band12	5MHz	QPSK	23035	25RB#0	4.492	4.92	PASS
Band12	5MHz	QPSK	23095	25RB#0	4.499	4.93	PASS
Band12	5MHz	QPSK	23155	25RB#0	4.483	4.92	PASS
Band12	5MHz	16QAM	23035	25RB#0	4.482	4.88	PASS
Band12	5MHz	16QAM	23095	25RB#0	4.494	4.93	PASS
Band12	5MHz	16QAM	23155	25RB#0	4.493	4.96	PASS
Band12	10MHz	QPSK	23060	50RB#0	8.967	9.80	PASS
Band12	10MHz	QPSK	23095	50RB#0	8.934	9.68	PASS
Band12	10MHz	QPSK	23130	50RB#0	8.922	9.62	PASS
Band12	10MHz	16QAM	23060	27RB#0	4.845	5.50	PASS
Band12	10MHz	16QAM	23095	27RB#0	4.849	5.42	PASS
Band12	10MHz	16QAM	23130	27RB#0	4.837	5.39	PASS

Test Graphs

Occupied Bandwidth

Band12-1.4MHz-QPSK-23017-6RB#0	Band12-1.4MHz-QPSK-23095-6RB#0
	
Band12-1.4MHz-QPSK-23173-6RB#0	Band12-1.4MHz-16QAM-23017-6RB#0
	
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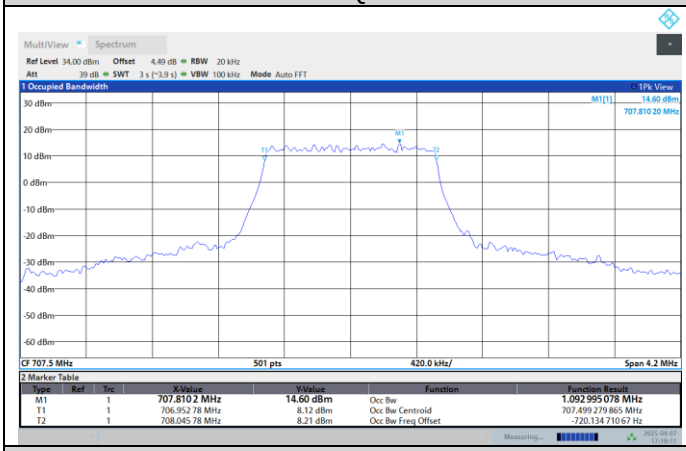	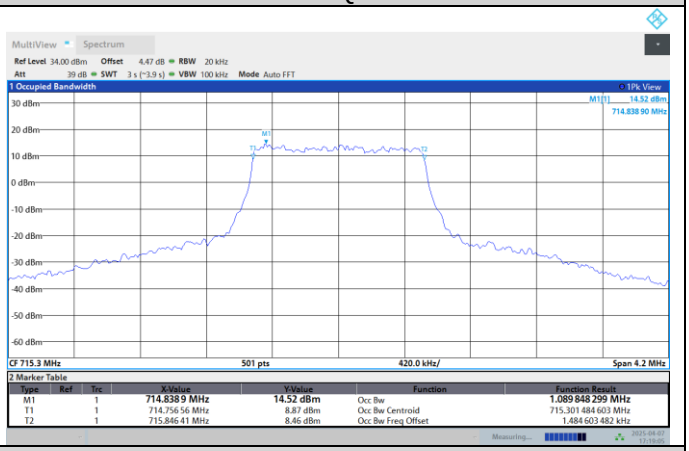
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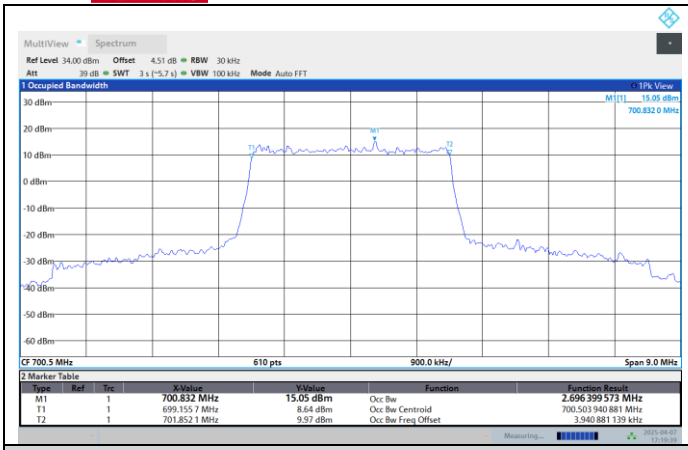

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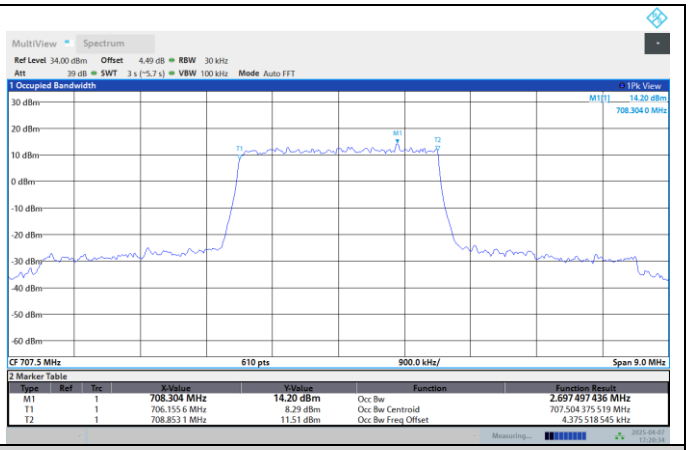
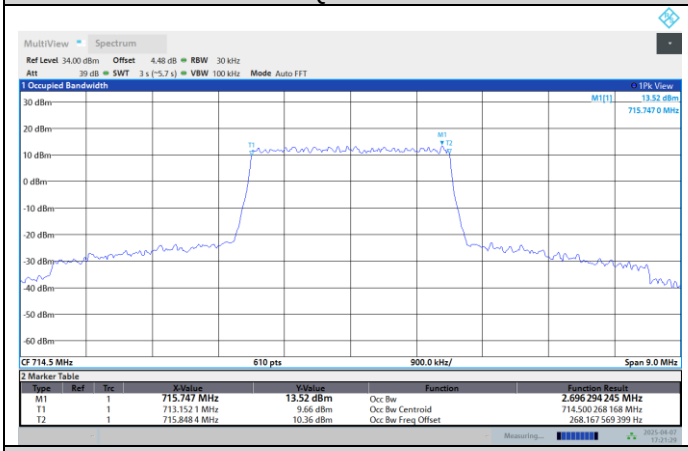


Band12-3MHz-16QAM-23025-15RB#0



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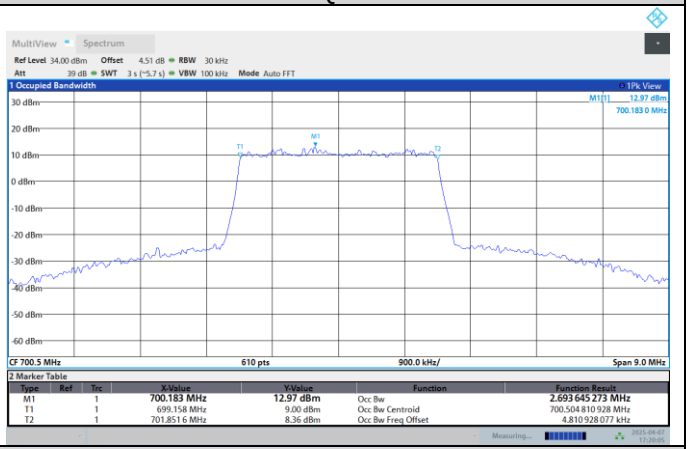

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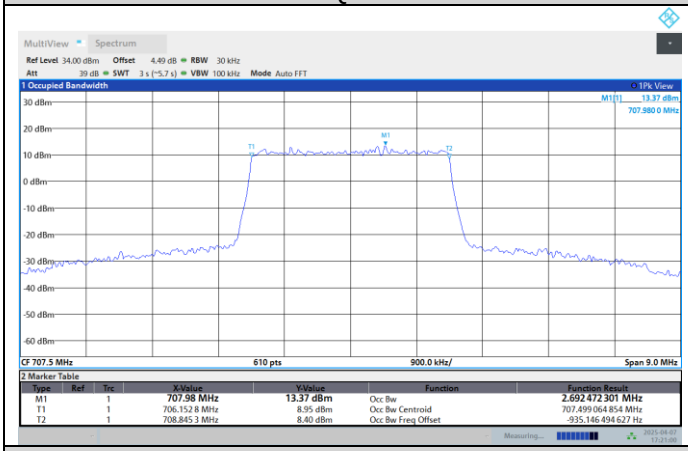
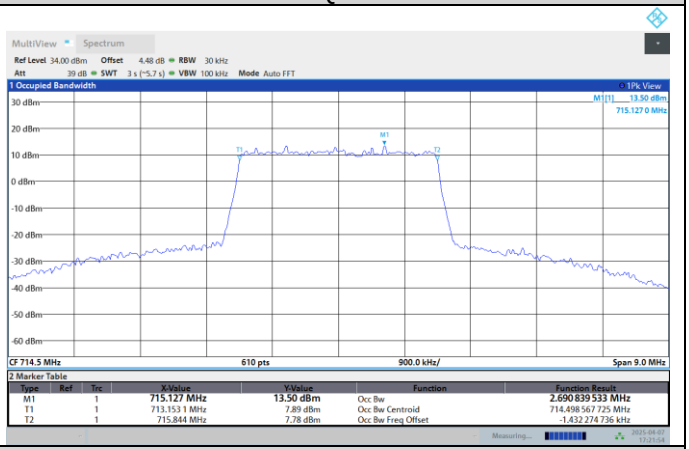
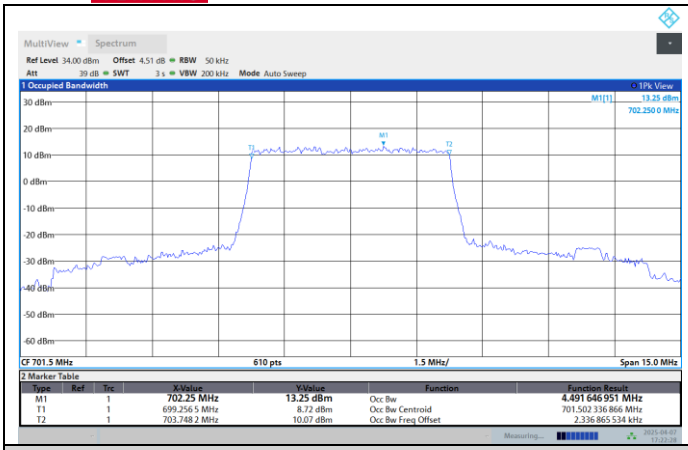


Band12-5MHz-QPSK-23035-25RB#0



Band12-5MHz-QPSK-23095-25RB#0



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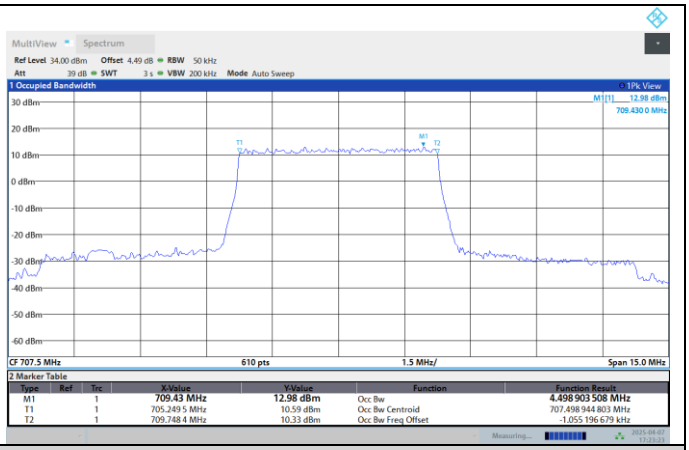

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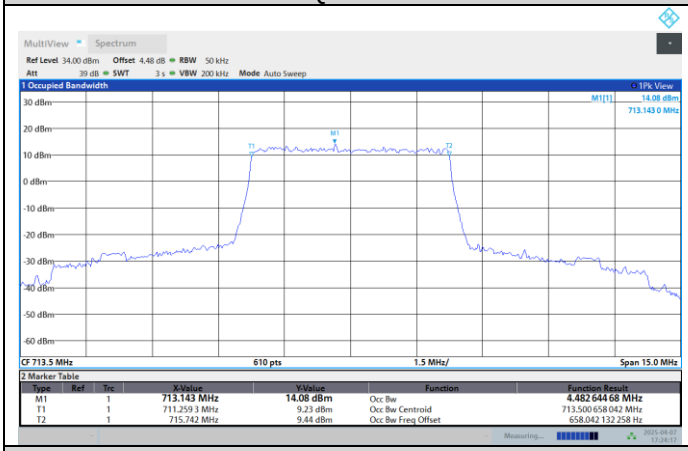

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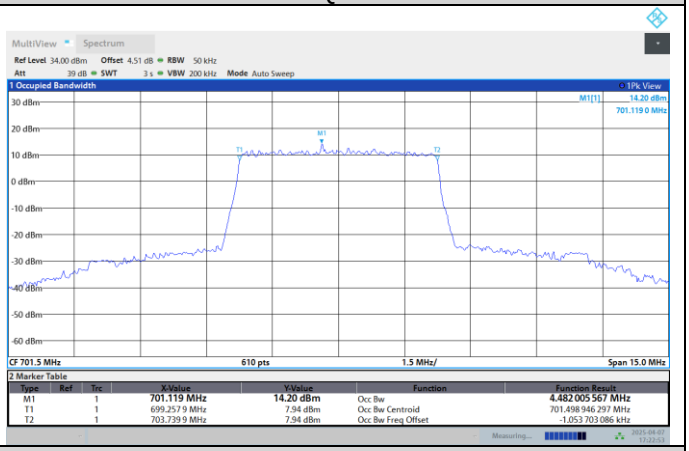
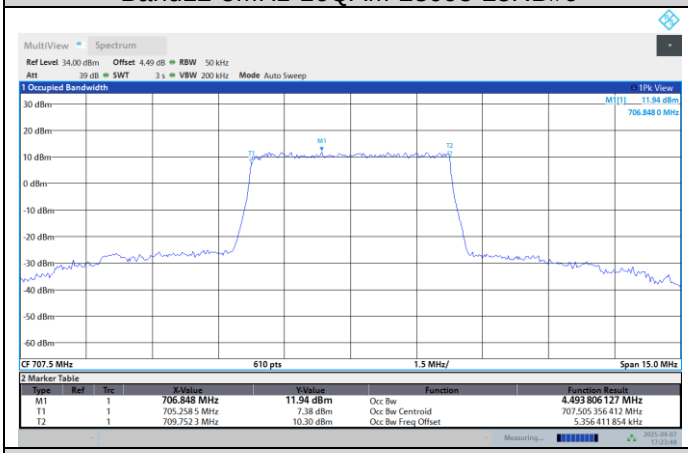
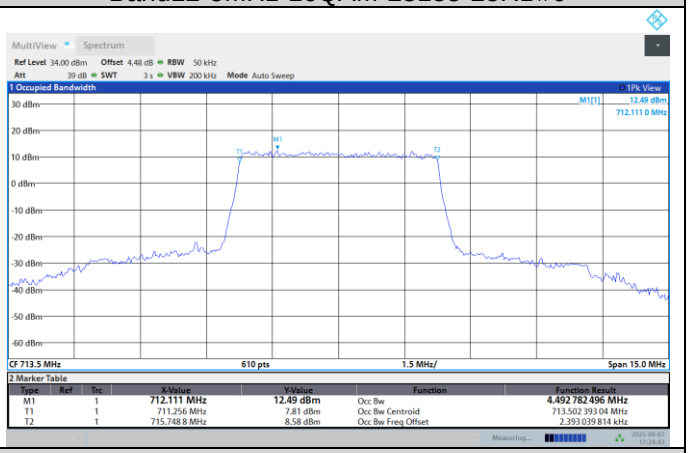


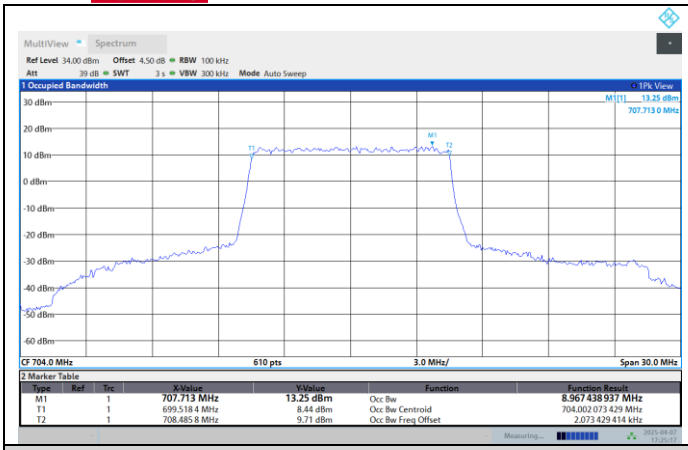
Band12-5MHz-16QAM-23155-25RB#0



Band12-10MHz-QPSK-23060-50RB#0



Band12-10MHz-QPSK-23095-50RB#0



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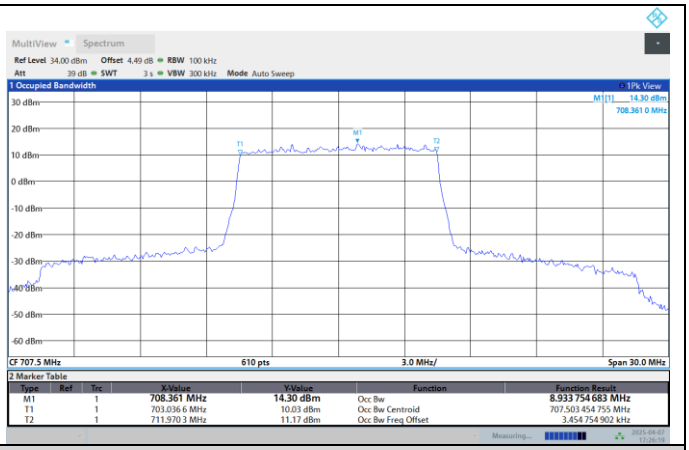

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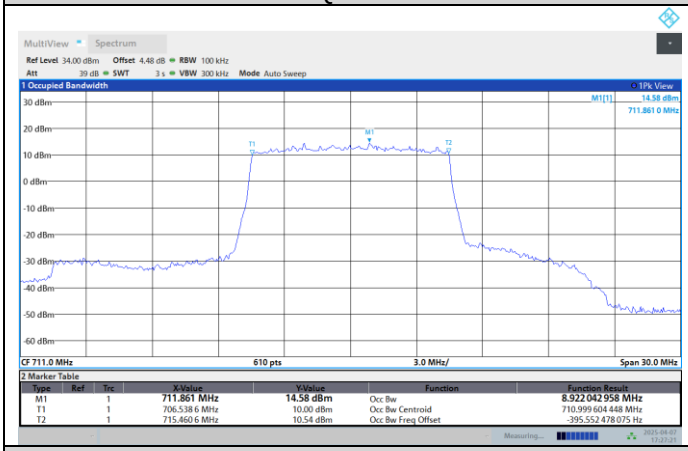

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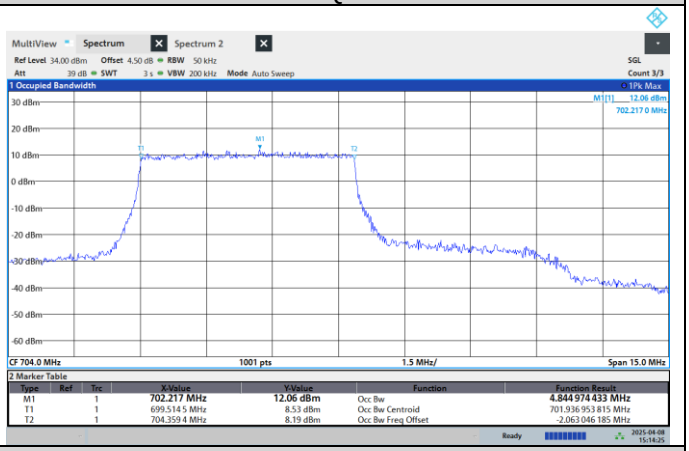
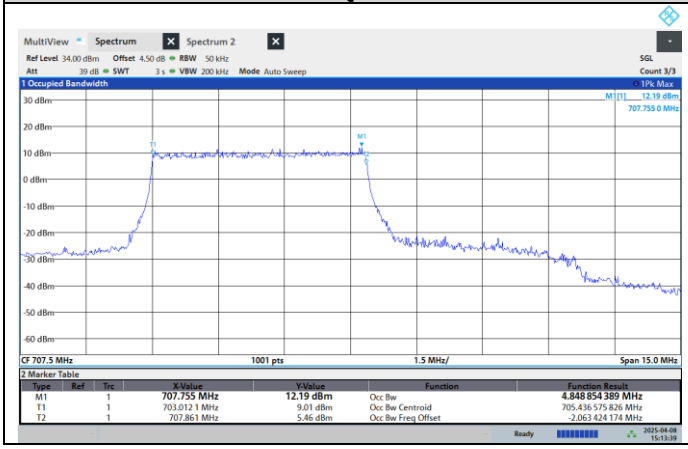
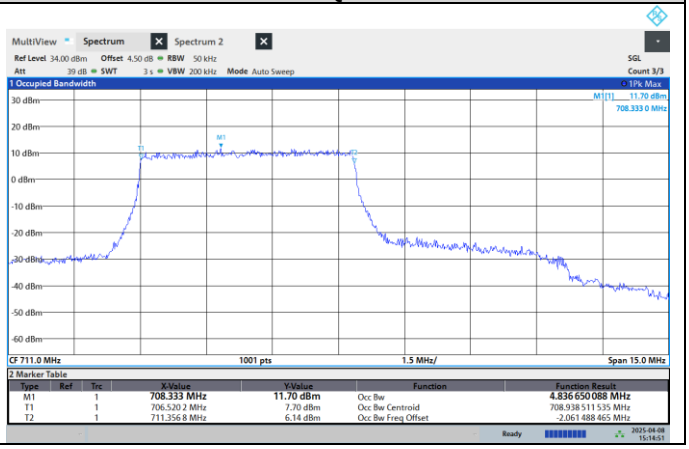
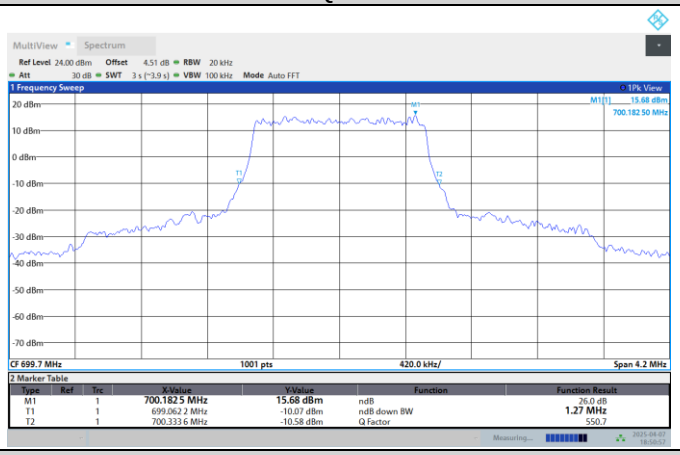
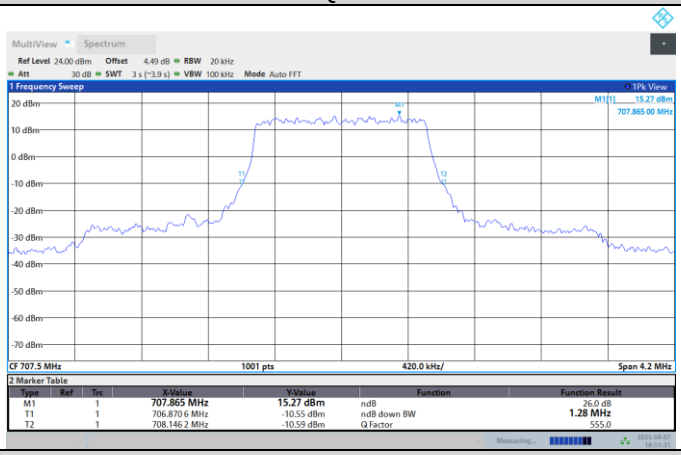
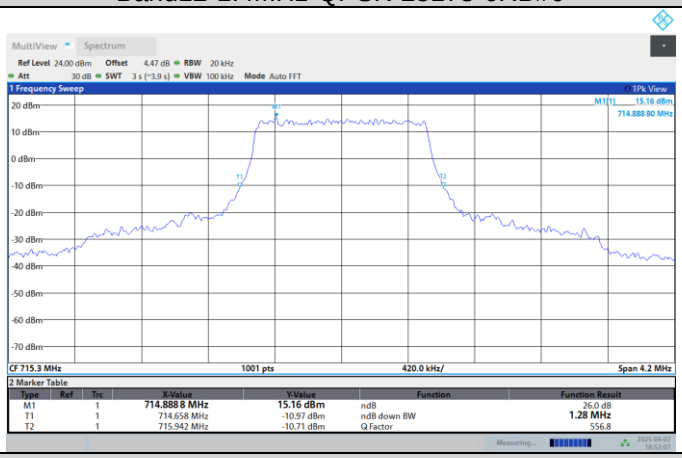
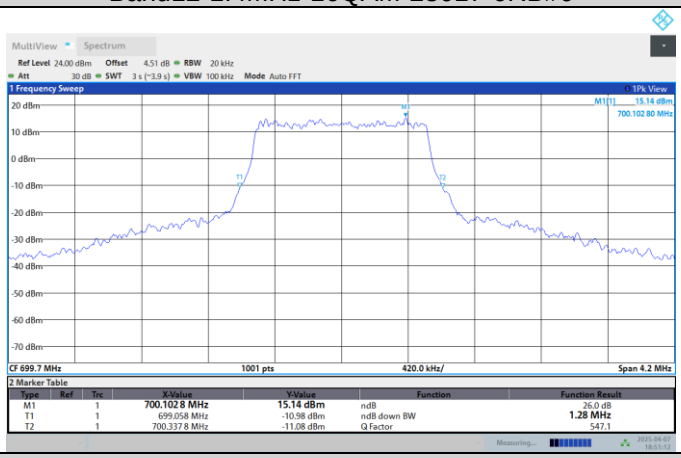


Band12-10MHz-16QAM-23130-27RB#0





26dB Bandwidth

Band12-1.4MHz-QPSK-23017-6RB#0	Band12-1.4MHz-QPSK-23095-6RB#0
	
Band12-1.4MHz-QPSK-23173-6RB#0	Band12-1.4MHz-16QAM-23017-6RB#0
	
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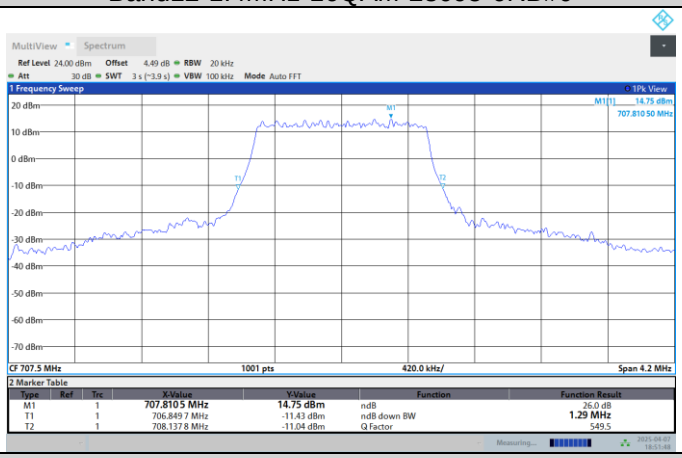
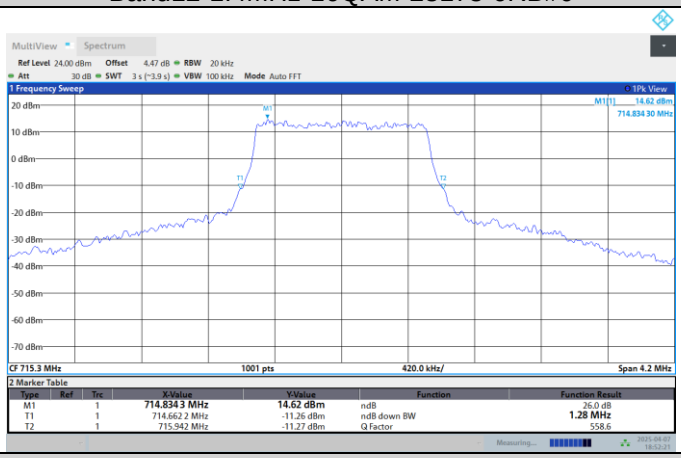
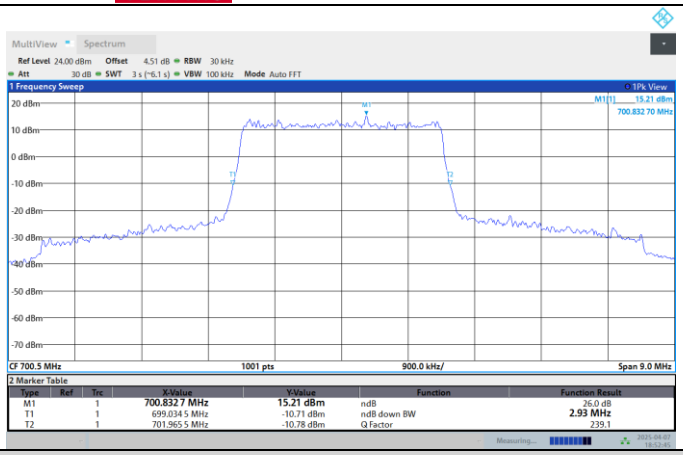
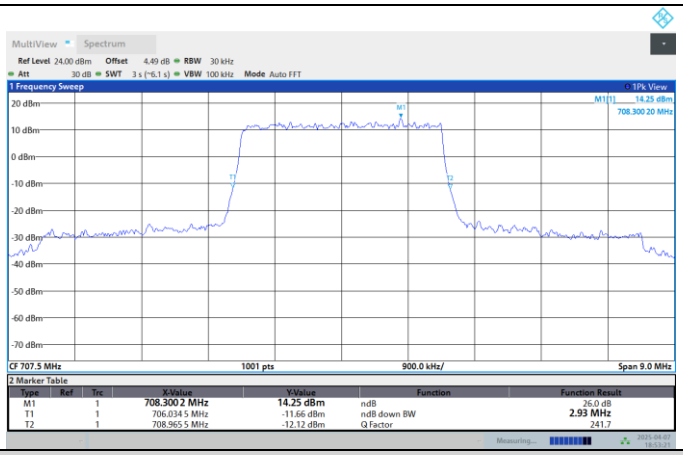
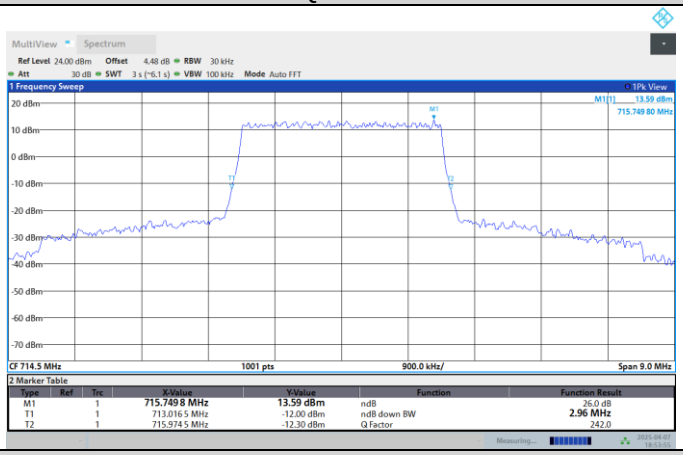
	
Band12-3MHz-QPSK-23025-15RB#	Band12-3MHz-QPSK-23025-15RB#



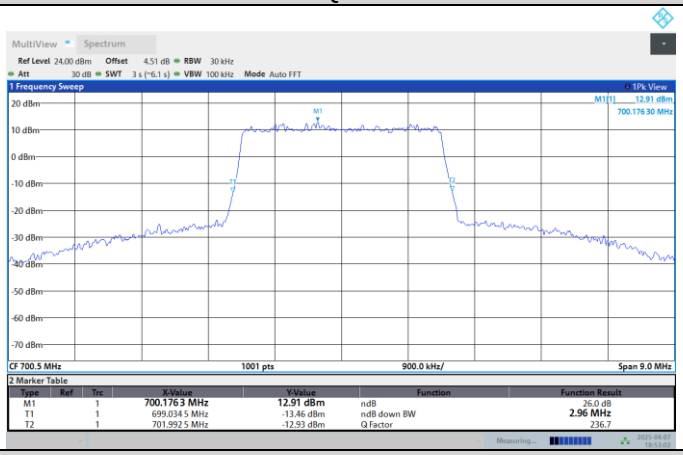
Band12-3MHz-QPSK-23165-15RB#0



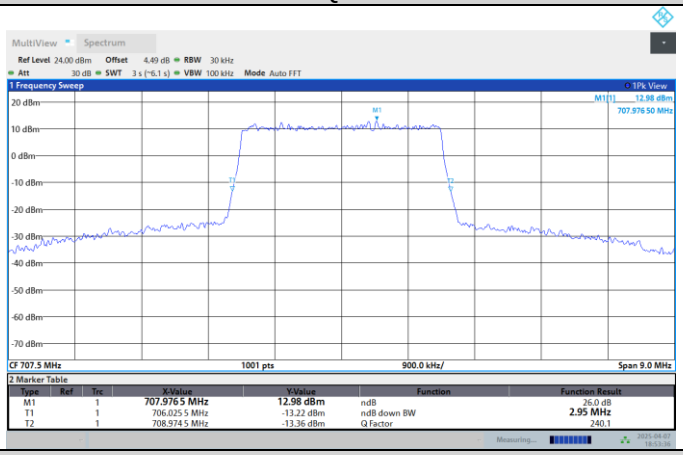
Band12-3MHz-16QAM-23025-15RB#0



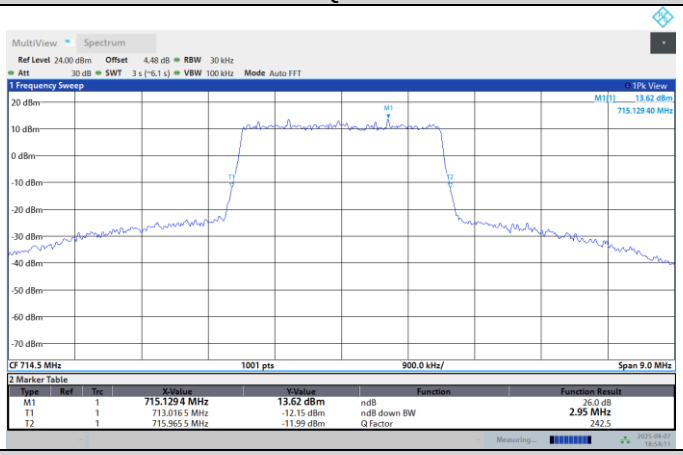
Band12-3MHz-16QAM-23095-15RB#0



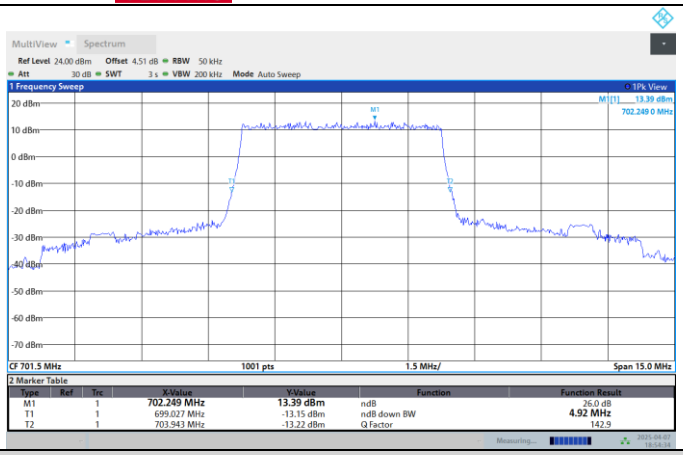
Band12-3MHz-16QAM-23165-15RB#0



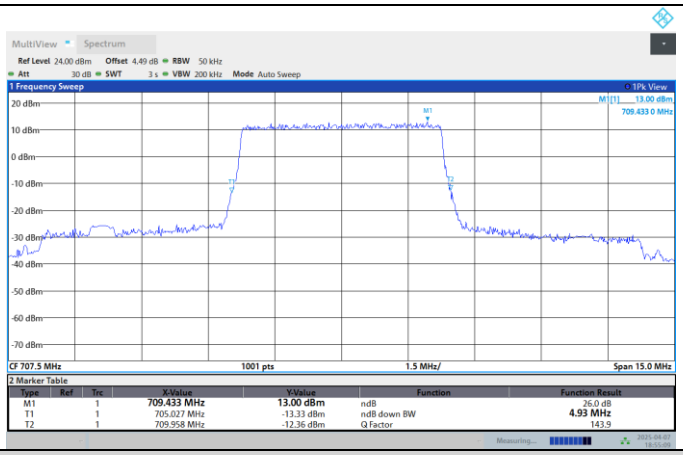
Band12-5MHz-QPSK-23035-25RB#0



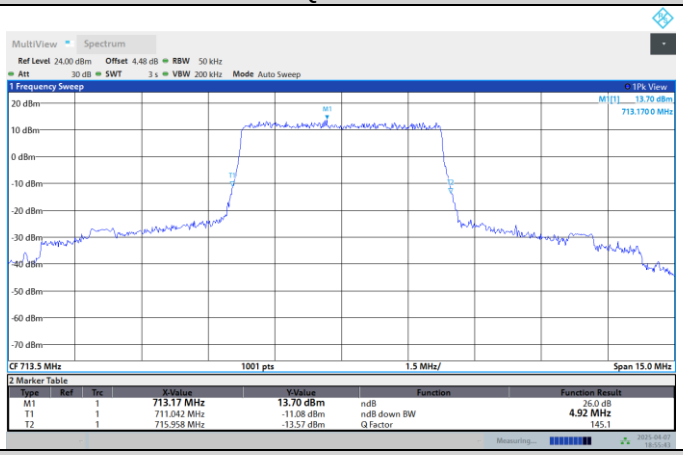
Band12-5MHz-QPSK-23095-25RB#0



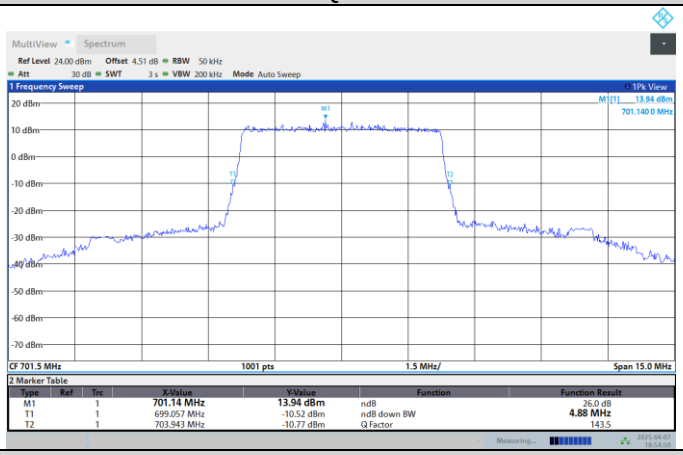
Band12-5MHz-QPSK-23155-25RB#0



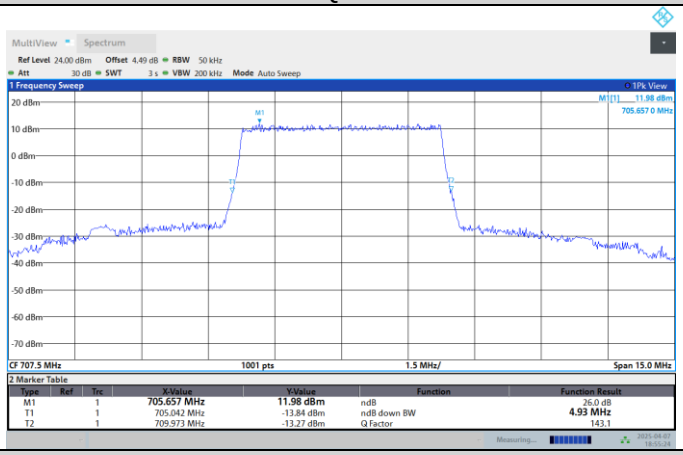
Band12-5MHz-16QAM-23035-25RB#0



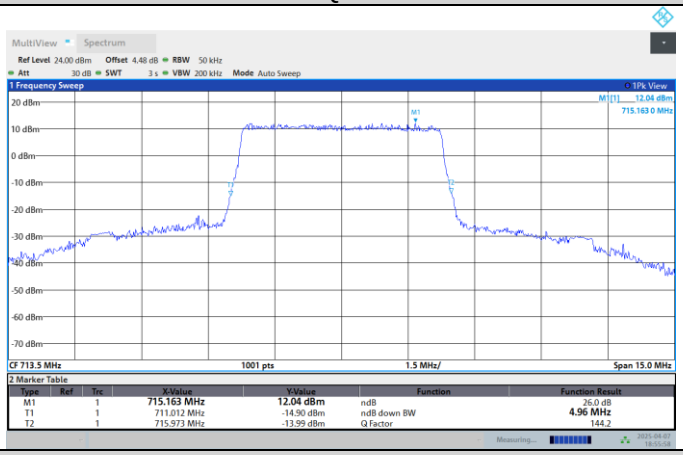
Band12-5MHz-16QAM-23095-25RB#0



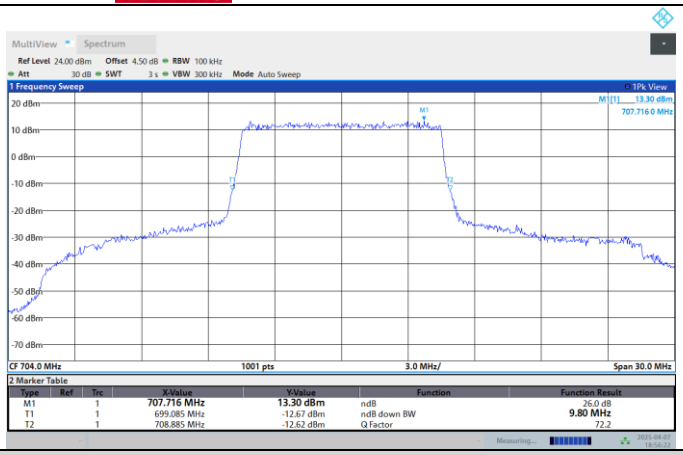
Band12-5MHz-16QAM-23155-25RB#0



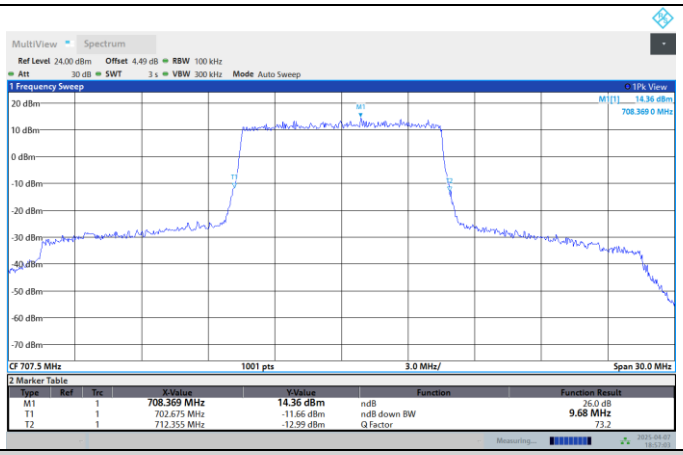
Band12-10MHz-QPSK-23060-50RB#0



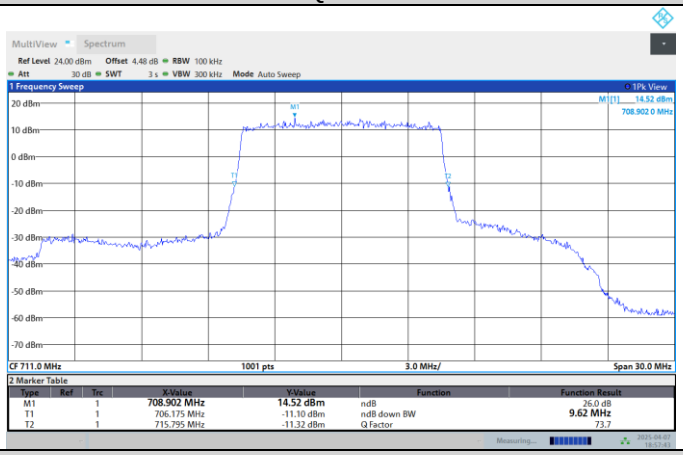
Band12-10MHz-QPSK-23095-50RB#0



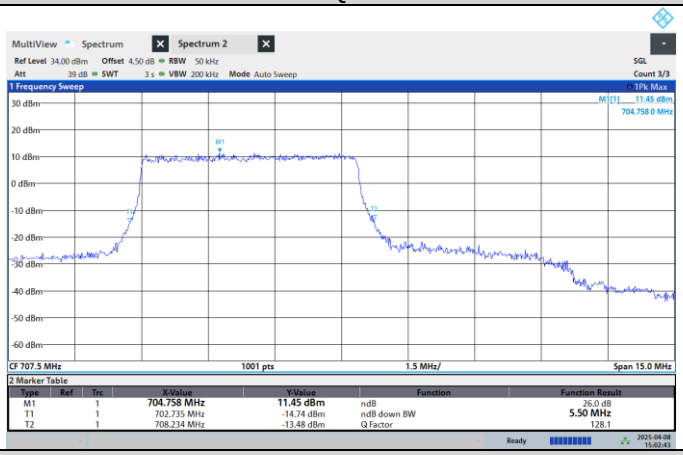
Band12-10MHz-QPSK-23095-50RB#0



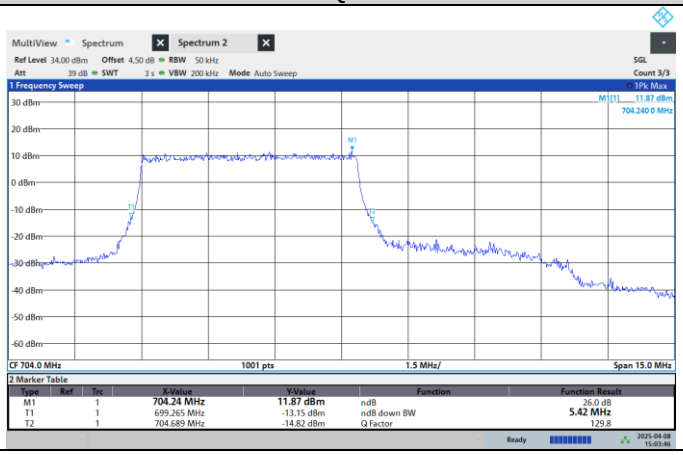
Band12-10MHz-16QAM-23060-27RB#0

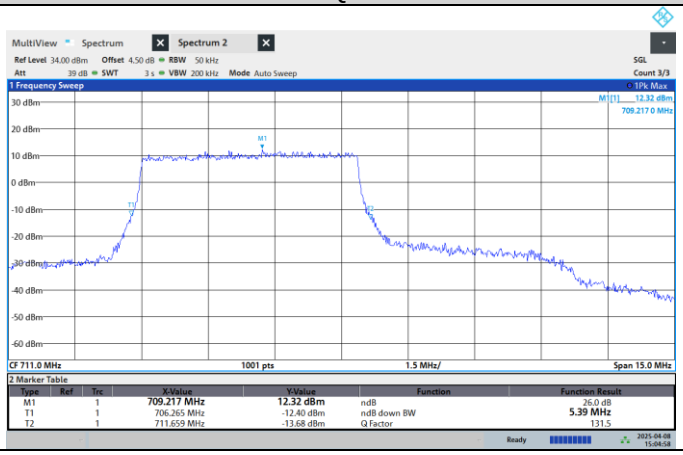


Band12-10MHz-16QAM-23095-27RB#0



Band12-10MHz-16QAM-23130-27RB#0



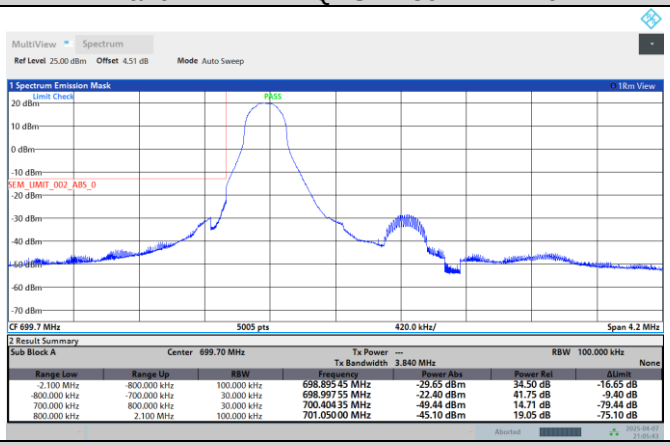
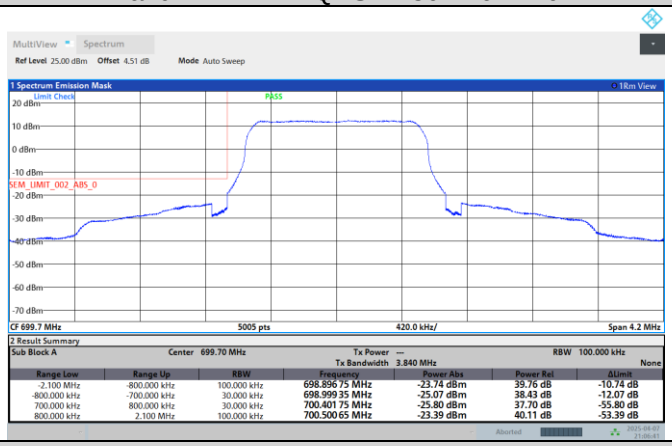
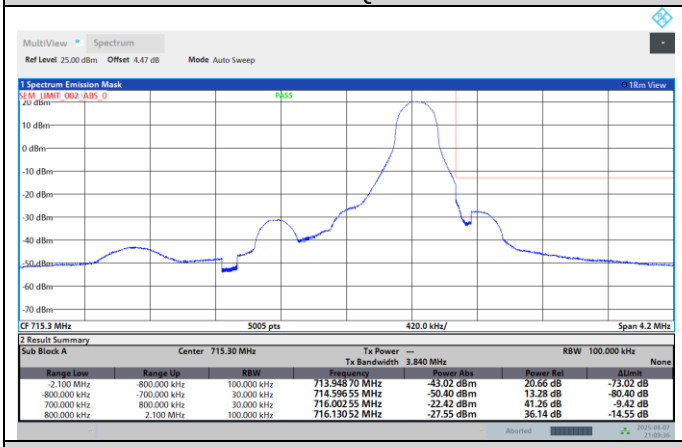
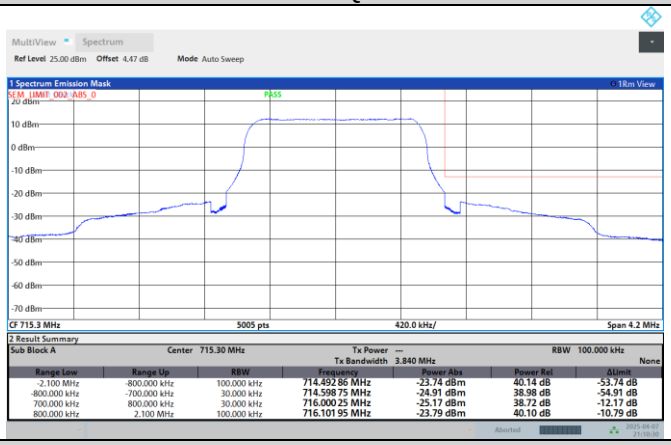
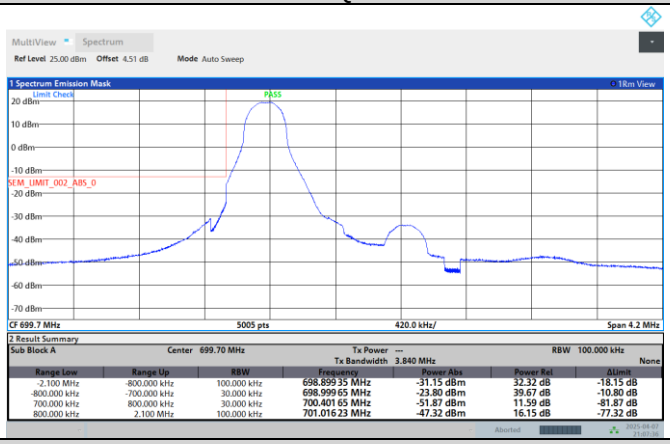
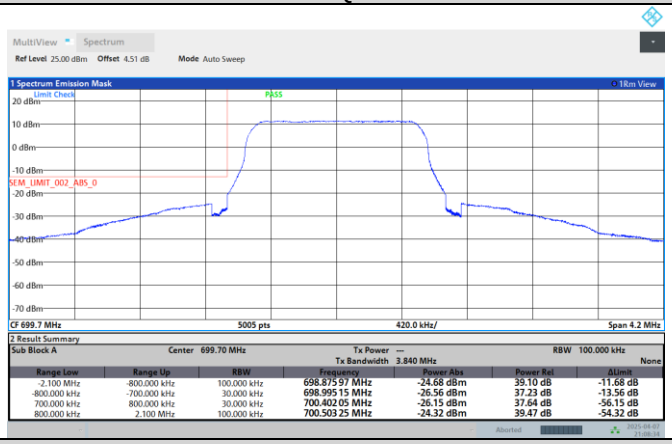


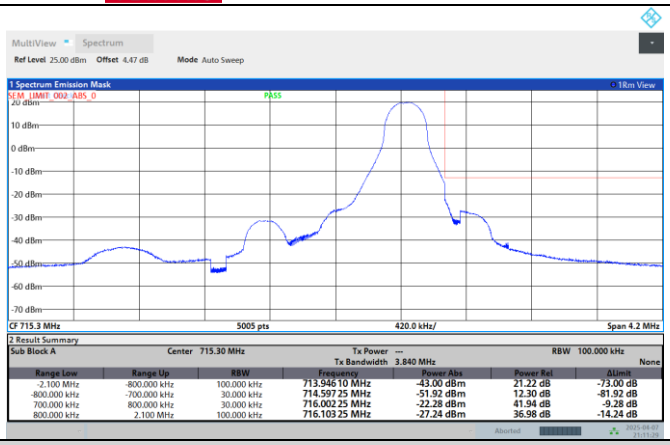
BAND EDGE

Test Result

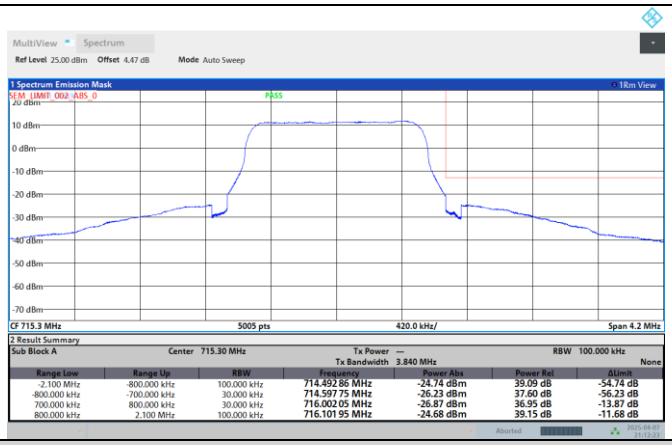
Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dBm)	Verdict
Band12	1.4MHz	QPSK	23017	1RB#0	See Graph	PASS
Band12	1.4MHz	QPSK	23017	6RB#0	See Graph	PASS
Band12	1.4MHz	QPSK	23173	1RB#5	See Graph	PASS
Band12	1.4MHz	QPSK	23173	6RB#0	See Graph	PASS
Band12	1.4MHz	16QAM	23017	1RB#0	See Graph	PASS
Band12	1.4MHz	16QAM	23017	6RB#0	See Graph	PASS
Band12	1.4MHz	16QAM	23173	1RB#5	See Graph	PASS
Band12	1.4MHz	16QAM	23173	6RB#0	See Graph	PASS
Band12	3MHz	QPSK	23025	1RB#0	See Graph	PASS
Band12	3MHz	QPSK	23025	15RB#0	See Graph	PASS
Band12	3MHz	QPSK	23165	1RB#14	See Graph	PASS
Band12	3MHz	QPSK	23165	15RB#0	See Graph	PASS
Band12	3MHz	16QAM	23025	1RB#0	See Graph	PASS
Band12	3MHz	16QAM	23025	15RB#0	See Graph	PASS
Band12	3MHz	16QAM	23165	1RB#14	See Graph	PASS
Band12	3MHz	16QAM	23165	15RB#0	See Graph	PASS
Band12	5MHz	QPSK	23035	1RB#0	See Graph	PASS
Band12	5MHz	QPSK	23035	25RB#0	See Graph	PASS
Band12	5MHz	QPSK	23155	1RB#24	See Graph	PASS
Band12	5MHz	QPSK	23155	25RB#0	See Graph	PASS
Band12	5MHz	16QAM	23035	1RB#0	See Graph	PASS
Band12	5MHz	16QAM	23035	25RB#0	See Graph	PASS
Band12	5MHz	16QAM	23155	1RB#24	See Graph	PASS
Band12	5MHz	16QAM	23155	25RB#0	See Graph	PASS
Band12	10MHz	QPSK	23060	1RB#0	See Graph	PASS
Band12	10MHz	QPSK	23060	50RB#0	See Graph	PASS
Band12	10MHz	QPSK	23130	1RB#49	See Graph	PASS
Band12	10MHz	QPSK	23130	50RB#0	See Graph	PASS
Band12	10MHz	16QAM	23060	1RB#0	See Graph	PASS
Band12	10MHz	16QAM	23060	27RB#0	See Graph	PASS
Band12	10MHz	16QAM	23130	1RB#49	See Graph	PASS
Band12	10MHz	16QAM	23130	27RB#23	See Graph	PASS

Test Graphs

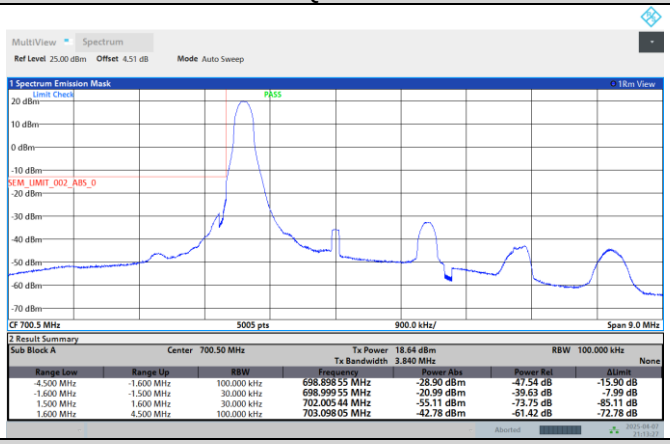
Band12-1.4MHz-QPSK-23017-1RB#0	Band12-1.4MHz-QPSK-23017-6RB#0
	
Band12-1.4MHz-QPSK-23173-1RB#5	**Band12-1.4MHz-QPSK-23173-6RB#0**
	
Band12-1.4MHz-16QAM-23017-1RB#0	**Band12-1.4MHz-16QAM-23017-6RB#0**
	
Band12-1.4MHz-16QAM-23173-1RB#5	**Band12-1.4MHz-16QAM-23173-6RB#0**



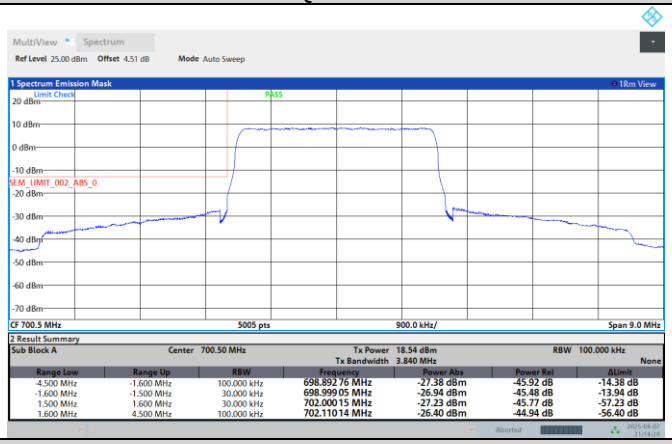
Band12-3MHz-QPSK-23025-1RB#0



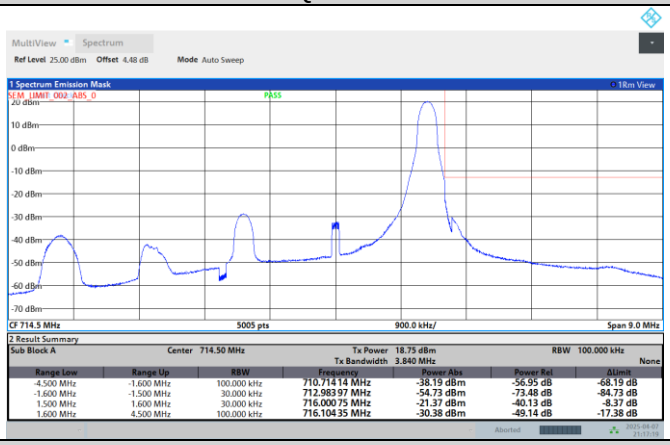
Band12-3MHz-QPSK-23025-15RB#0



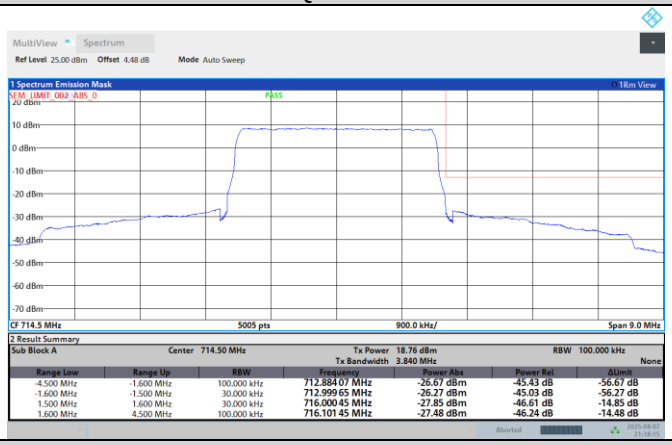
Band12-3MHz-QPSK-23165-1RB#14



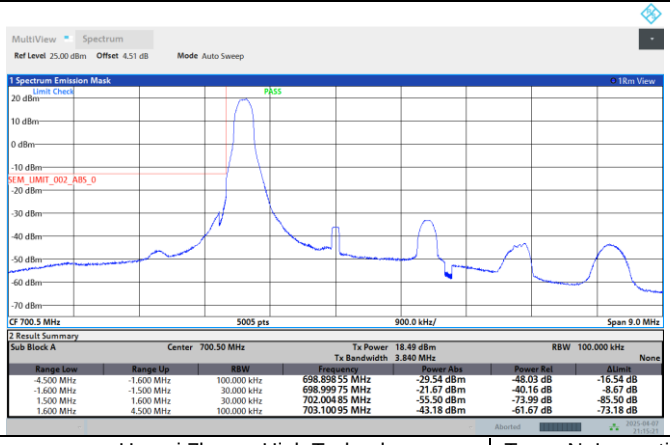
Band12-3MHz-QPSK-23165-15RB#0

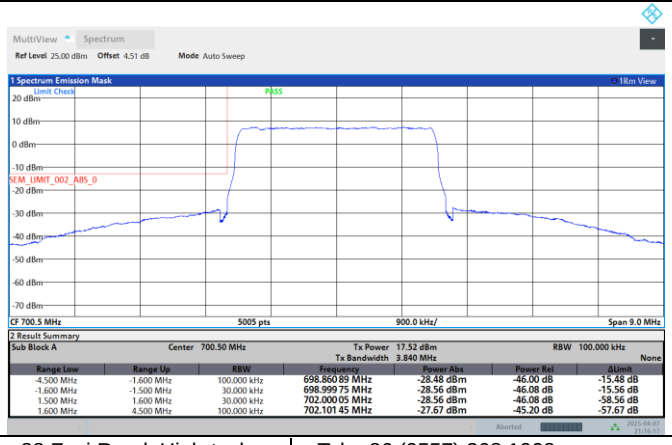


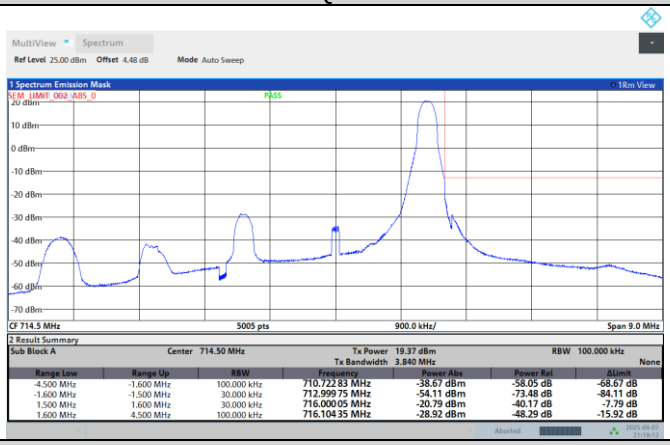
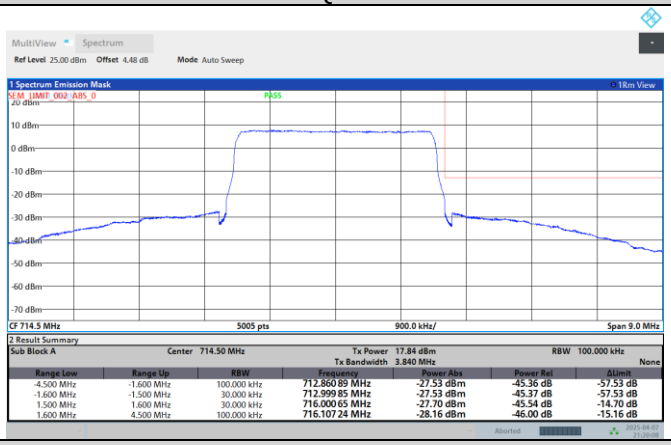
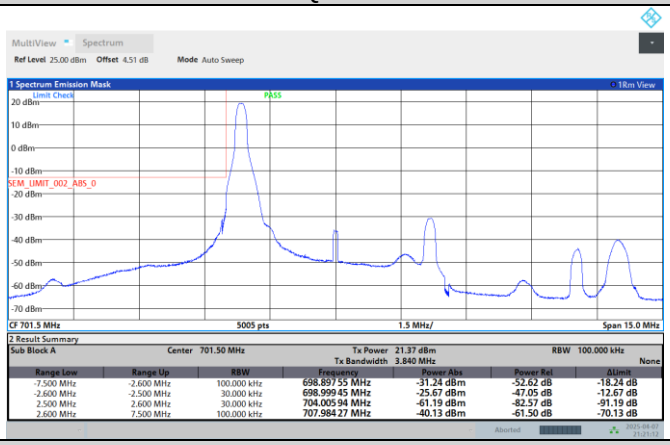
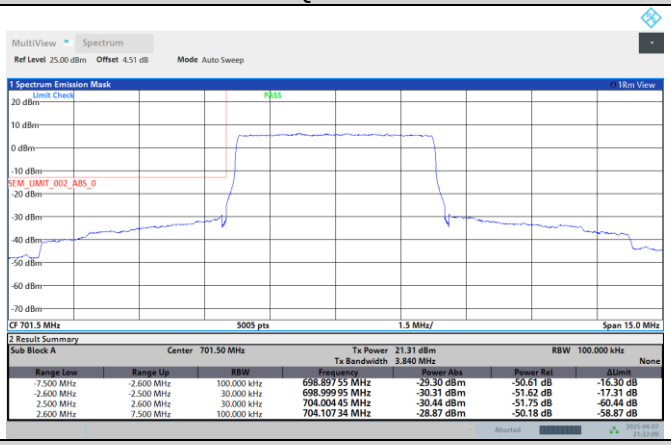
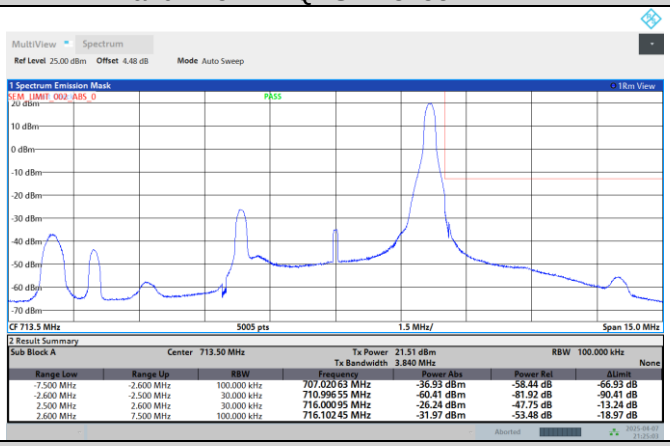
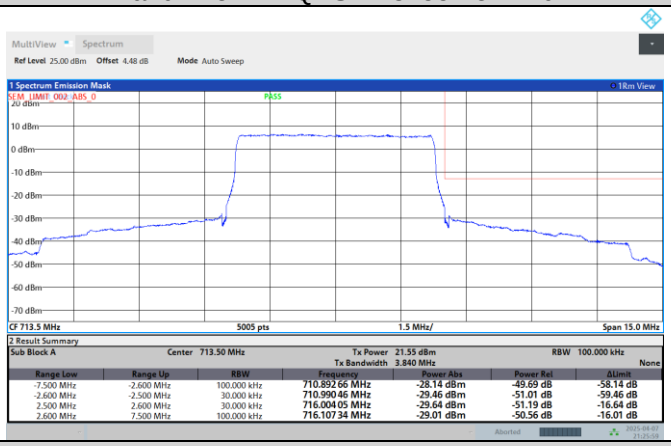
Band12-3MHz-16QAM-23025-1RB#0

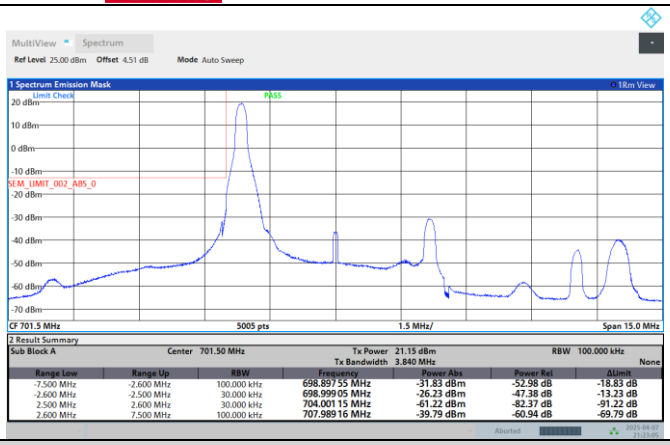


Band12-3MHz-16QAM-23025-15RB#0

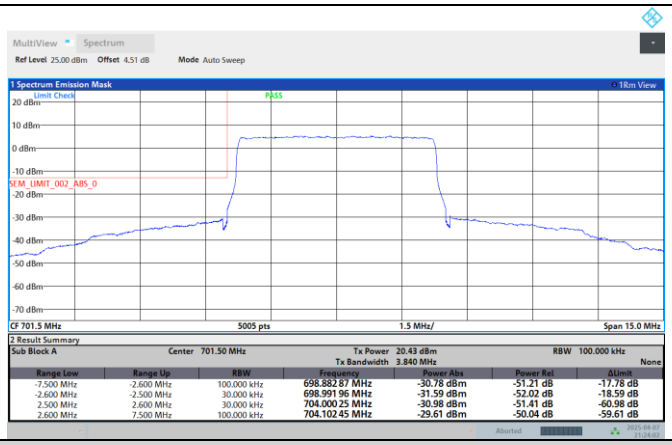




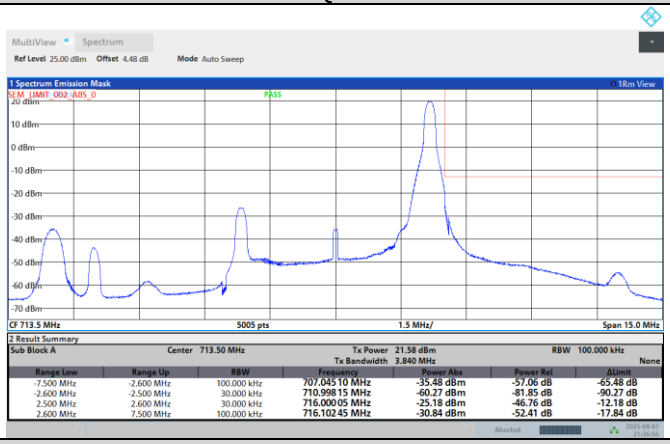
Band12-3MHz-16QAM-23165-1RB#14	Band12-3MHz-16QAM-23165-15RB#0
	
Band12-5MHz-QPSK-23035-1RB#0	**Band12-5MHz-QPSK-23035-25RB#0**
	
Band12-5MHz-QPSK-23155-1RB#24	**Band12-5MHz-QPSK-23155-25RB#0**
	
Band12-5MHz-16QAM-23035-1RB#0	**Band12-5MHz-16QAM-23035-25RB#0**



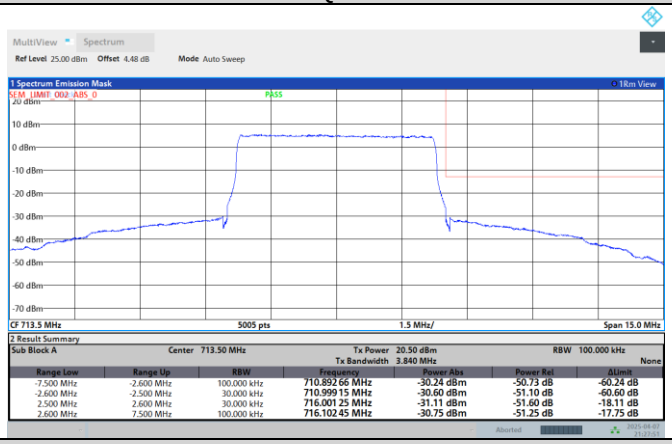
Band12-5MHz-16QAM-23155-1RB#24



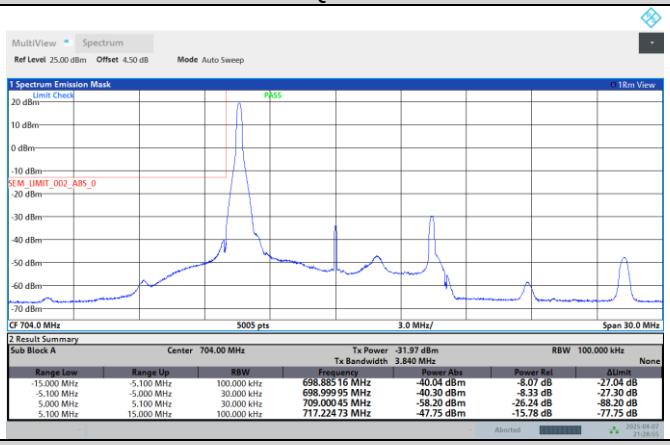
Band12-5MHz-16QAM-23155-25RB#0



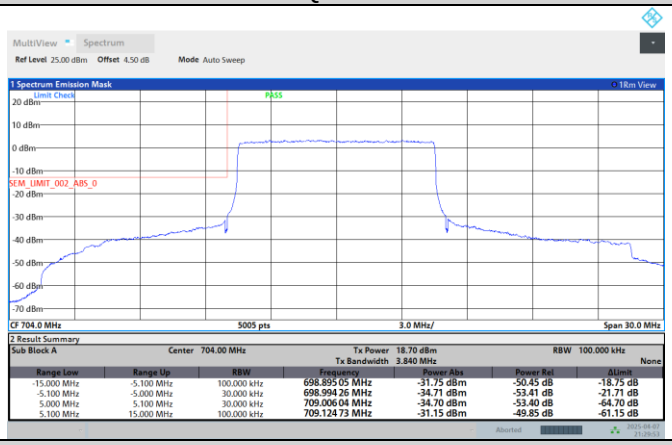
Band12-10MHz-QPSK-23060-1RB#0



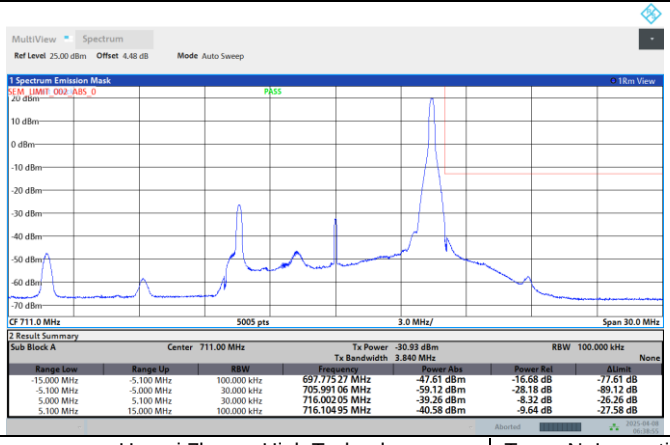
Band12-10MHz-QPSK-23060-50RB#0

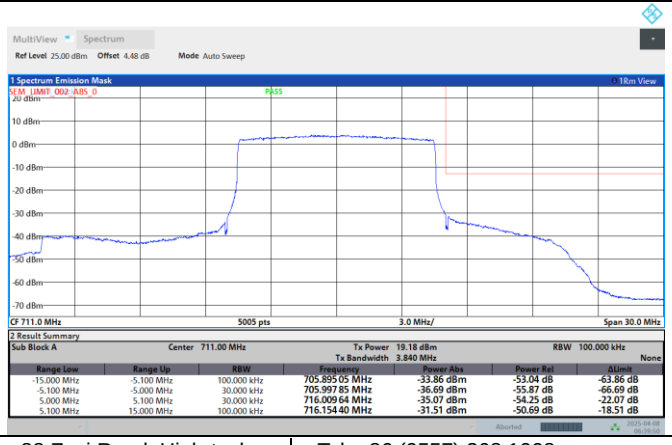


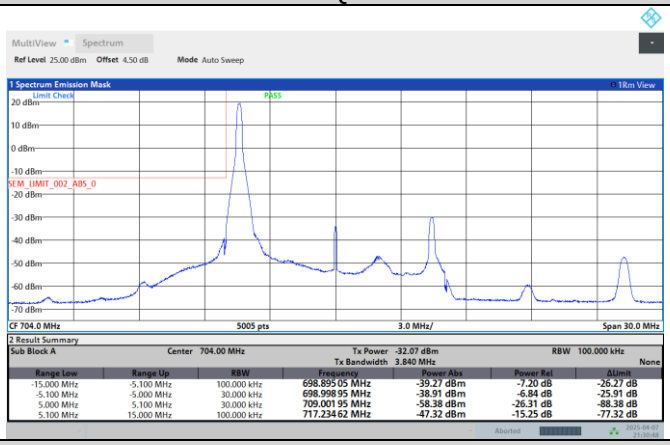
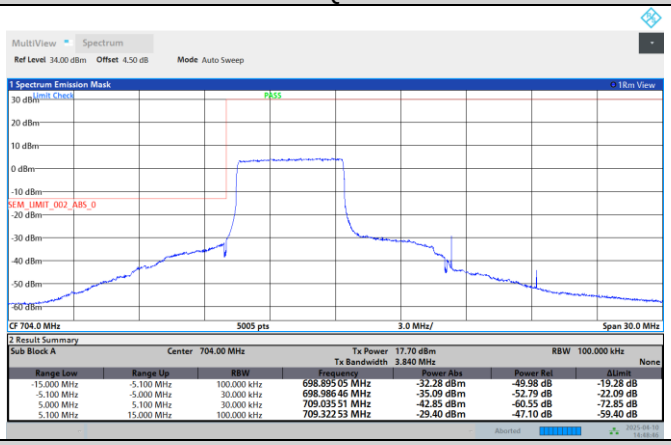
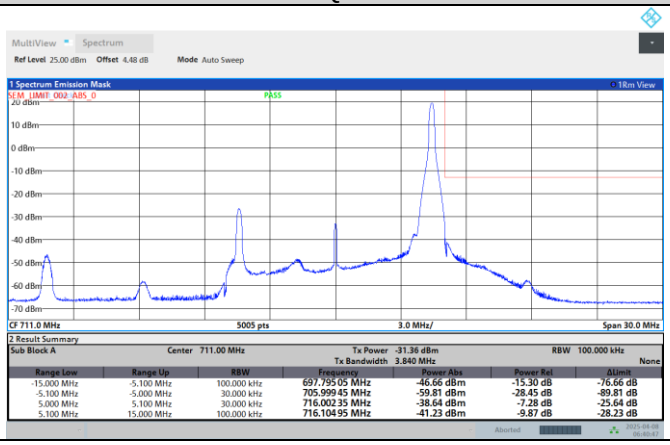
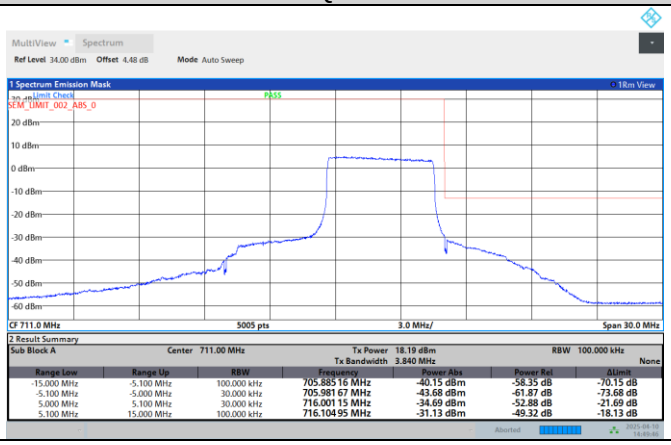
Band12-10MHz-QPSK-23130-1RB#49



Band12-10MHz-QPSK-23130-50RB#0





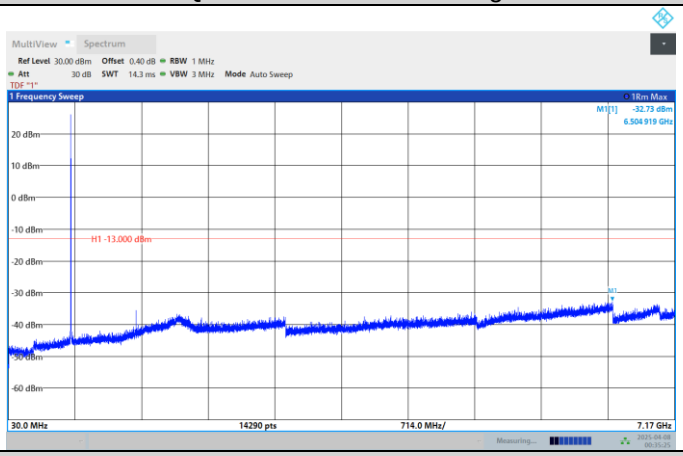
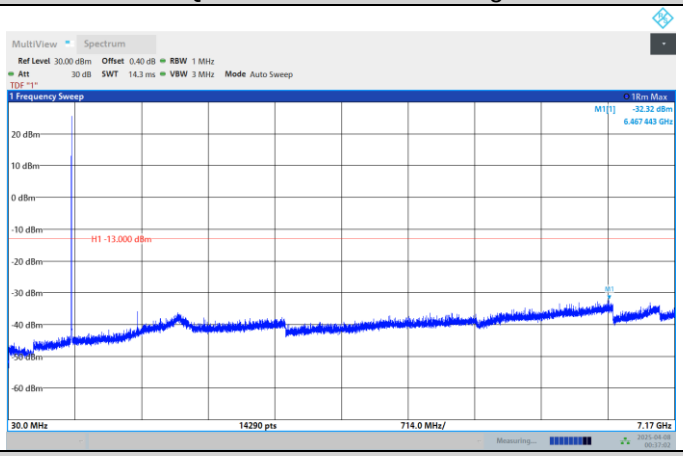
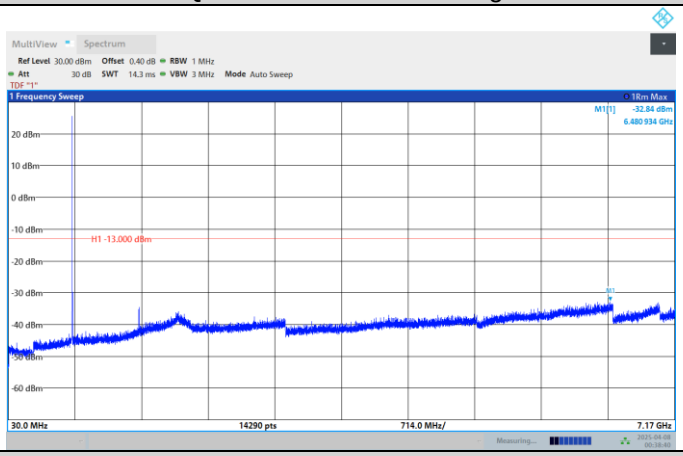
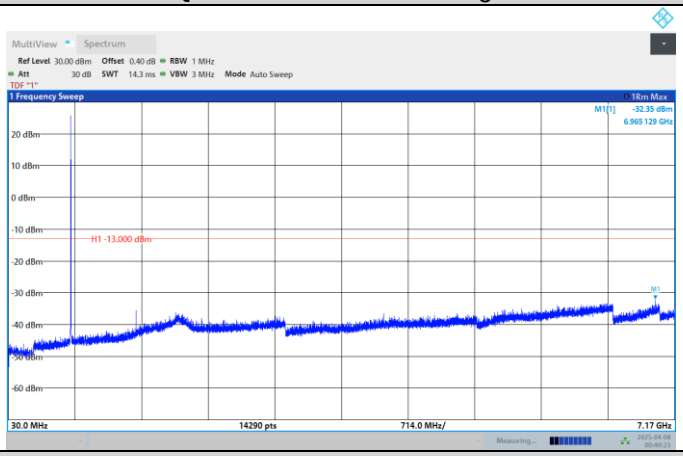
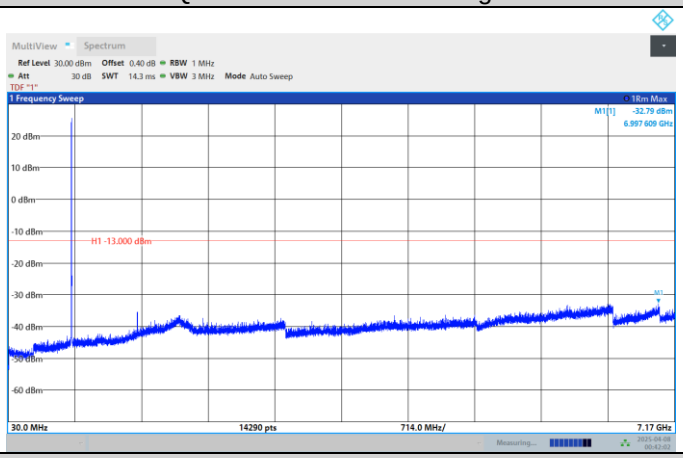
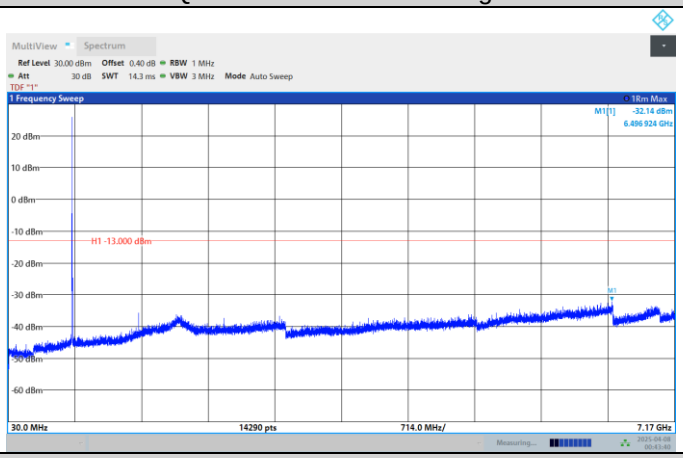
Band12-10MHz-16QAM-23060-1RB#0	Band12-10MHz-16QAM-23060-27RB#0
	
Band12-10MHz-16QAM-23130-1RB#49	**Band12-10MHz-16QAM-23130-27RB#23**
	

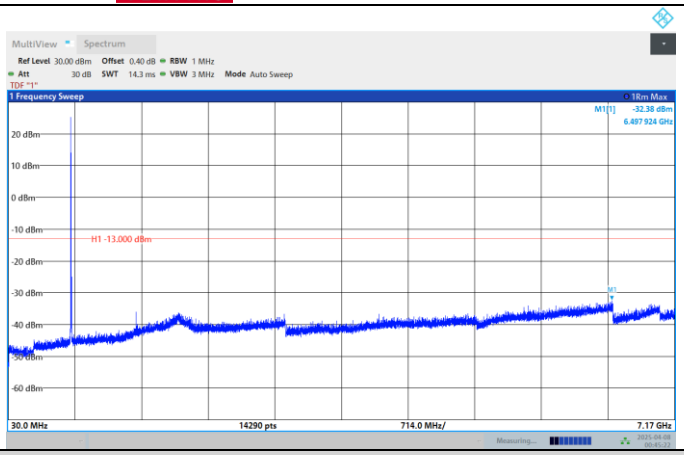
CONDUCTED SPURIOUS EMISSION

Test Result

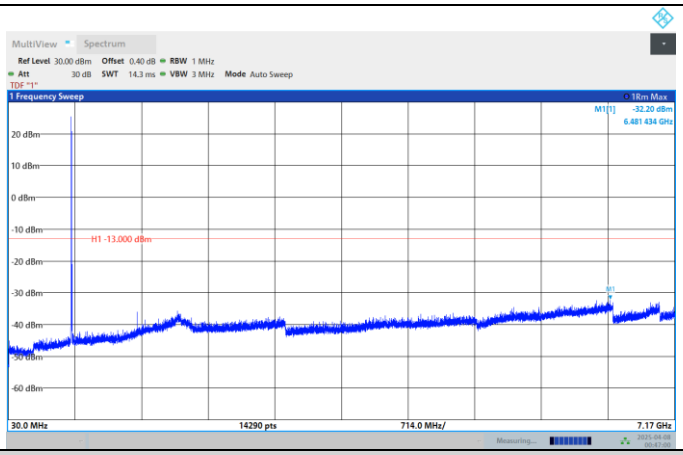
Band	Bandwidth	Modulation	Channel	RB Configuration	Frequency Range	Result (dBm)	Verdict
Band12	1.4MHz	QPSK	23017	1RB#0	Range:30~15000MHz	See Graph	PASS
Band12	1.4MHz	QPSK	23095	1RB#0	Range:30~15000MHz	See Graph	PASS
Band12	1.4MHz	QPSK	23173	1RB#0	Range:30~15000MHz	See Graph	PASS
Band12	3MHz	QPSK	23025	1RB#0	Range:30~15000MHz	See Graph	PASS
Band12	3MHz	QPSK	23095	1RB#0	Range:30~15000MHz	See Graph	PASS
Band12	3MHz	QPSK	23165	1RB#0	Range:30~15000MHz	See Graph	PASS
Band12	5MHz	QPSK	23035	1RB#0	Range:30~15000MHz	See Graph	PASS
Band12	5MHz	QPSK	23095	1RB#0	Range:30~15000MHz	See Graph	PASS
Band12	5MHz	QPSK	23155	1RB#0	Range:30~15000MHz	See Graph	PASS
Band12	10MHz	QPSK	23060	1RB#0	Range:30~15000MHz	See Graph	PASS
Band12	10MHz	QPSK	23095	1RB#0	Range:30~15000MHz	See Graph	PASS
Band12	10MHz	QPSK	23130	1RB#0	Range:30~15000MHz	See Graph	PASS

Test Graphs

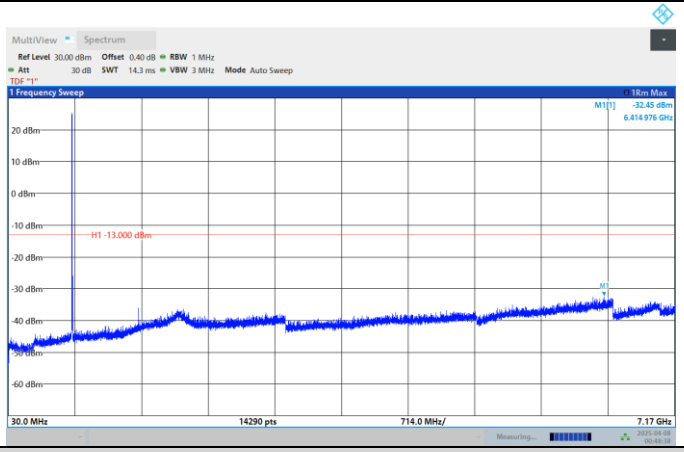
Band12-1.4MHz-QPSK-23017-1RB#0-Range:30~15000MHz	Band12-1.4MHz-QPSK-23095-1RB#0-Range:30~15000MHz
	
Band12-1.4MHz-QPSK-23173-1RB#0-Range:30~15000MHz	Band12-3MHz-QPSK-23025-1RB#0-Range:30~15000MHz
	
Band12-3MHz-QPSK-23095-1RB#0-Range:30~15000MHz	Band12-3MHz-QPSK-23165-1RB#0-Range:30~15000MHz
	
Band12-5MHz-QPSK-23035-1RB#0-Range:30~15000MHz	Band12-5MHz-QPSK-23095-1RB#0-Range:30~15000MHz



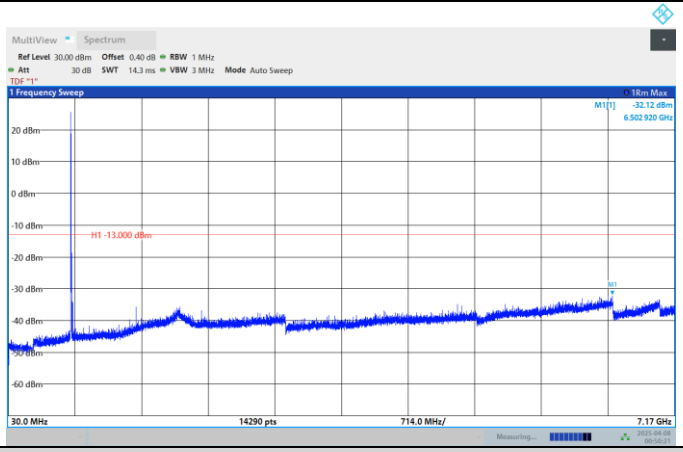
Band12-5MHz-QPSK-23155-1RB#0-Range:30~15000MHz



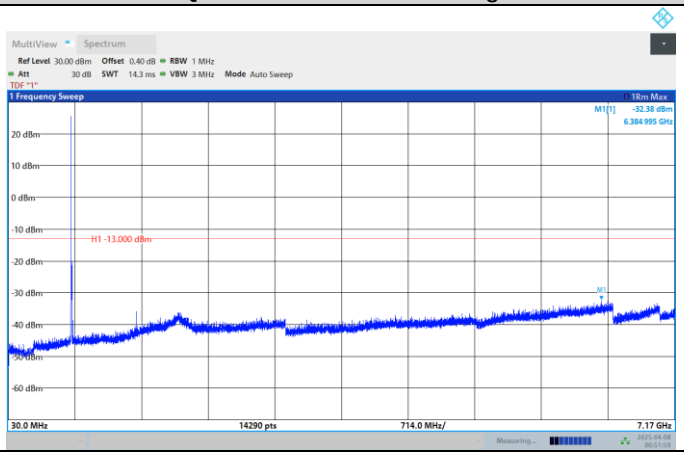
Band12-10MHz-QPSK-23060-1RB#0-Range:30~15000MHz

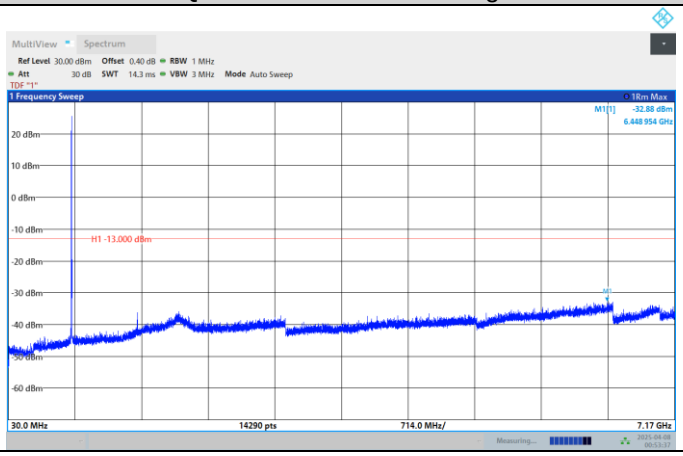


Band12-10MHz-QPSK-23095-1RB#0-Range:30~15000MHz



Band12-10MHz-QPSK-23130-1RB#0-Range:30~15000MHz





FREQUENCY STABILITY

Test Result

Voltage									
Band	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Verdict
Band12	10MHz	QPSK	23060	50RB#0	LV	NT	-4.1	-0.0058	PASS
Band12	10MHz	QPSK	23060	50RB#0	NV	NT	15.10	0.0214	PASS
Band12	10MHz	QPSK	23060	50RB#0	HV	NT	24.60	0.0349	PASS
Band12	10MHz	QPSK	23095	50RB#0	LV	NT	8.20	0.0116	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	NT	17.20	0.0243	PASS
Band12	10MHz	QPSK	23095	50RB#0	HV	NT	23.70	0.0335	PASS
Band12	10MHz	QPSK	23130	50RB#0	LV	NT	-4.30	-0.0060	PASS
Band12	10MHz	QPSK	23130	50RB#0	NV	NT	23.10	0.0325	PASS
Band12	10MHz	QPSK	23130	50RB#0	HV	NT	-1.90	-0.0027	PASS

Temperature									
Band	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Verdict
Band12	10MHz	QPSK	23060	50RB#0	NV	-30	24.70	0.0351	PASS
Band12	10MHz	QPSK	23060	50RB#0	NV	-20	-8.30	-0.0118	PASS
Band12	10MHz	QPSK	23060	50RB#0	NV	-10	16.50	0.0234	PASS
Band12	10MHz	QPSK	23060	50RB#0	NV	0	11.70	0.0166	PASS
Band12	10MHz	QPSK	23060	50RB#0	NV	10	22.30	0.0317	PASS
Band12	10MHz	QPSK	23060	50RB#0	NV	20	-14.80	-0.0210	PASS
Band12	10MHz	QPSK	23060	50RB#0	NV	30	-5.40	-0.0077	PASS
Band12	10MHz	QPSK	23060	50RB#0	NV	40	-24.30	-0.0345	PASS
Band12	10MHz	QPSK	23060	50RB#0	NV	50	-11.70	-0.0166	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	-30	-10.60	-0.0150	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	-20	18.00	0.0254	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	-10	-16.30	-0.0230	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	0	-12.90	-0.0182	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	10	9.60	0.0136	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	20	20.20	0.0286	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	30	4.50	0.0064	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	40	-11.20	-0.0158	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	50	-14.40	-0.0204	PASS
Band12	10MHz	QPSK	23130	50RB#0	NV	-30	1.50	0.0021	PASS
Band12	10MHz	QPSK	23130	50RB#0	NV	-20	17.30	0.0243	PASS
Band12	10MHz	QPSK	23130	50RB#0	NV	-10	-7.20	-0.0101	PASS
Band12	10MHz	QPSK	23130	50RB#0	NV	0	0.50	0.0007	PASS
Band12	10MHz	QPSK	23130	50RB#0	NV	10	18.20	0.0256	PASS
Band12	10MHz	QPSK	23130	50RB#0	NV	20	-1.10	-0.0015	PASS
Band12	10MHz	QPSK	23130	50RB#0	NV	30	1.60	0.0023	PASS
Band12	10MHz	QPSK	23130	50RB#0	NV	40	-6.30	-0.0089	PASS

Band12	10MHz	QPSK	23130	50RB#0	NV	50	-8.10	-0.0114	PASS

MAX Deviation calculation

Frequency Stability	Frequency (MHz)	Limit Line(MHz)	Result
fL-|MAX(△f)|	699.5164	≥699	PASS
fH+|MAX(△f)|	715.4609	≤716	

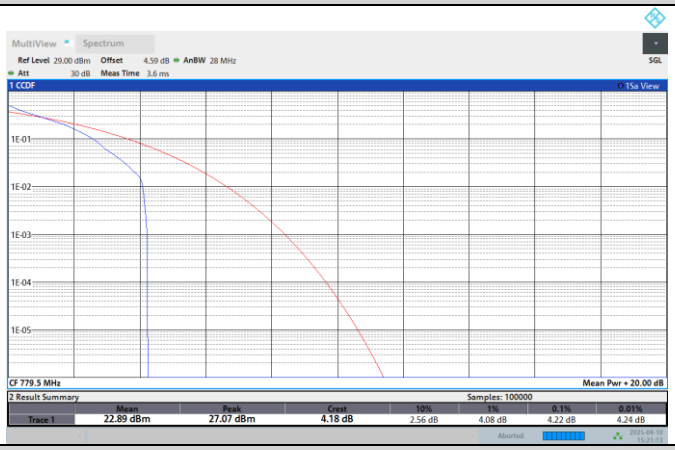
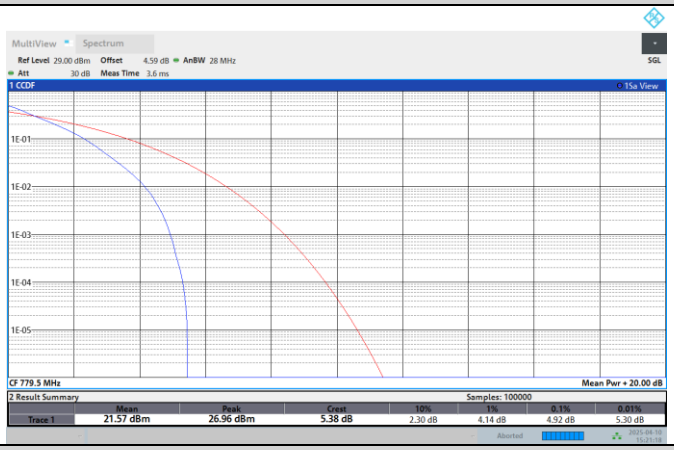
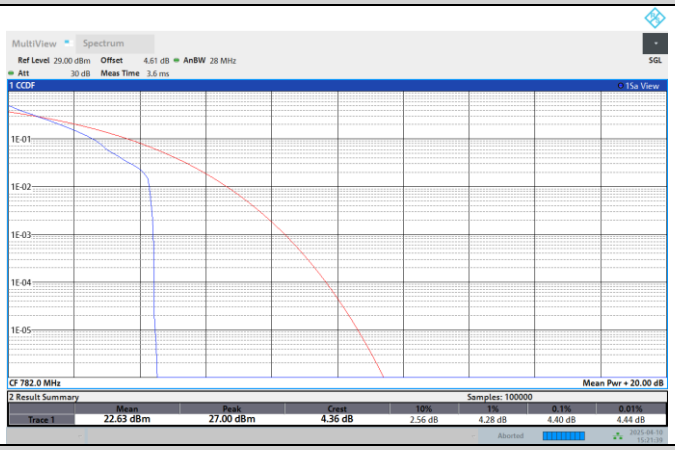
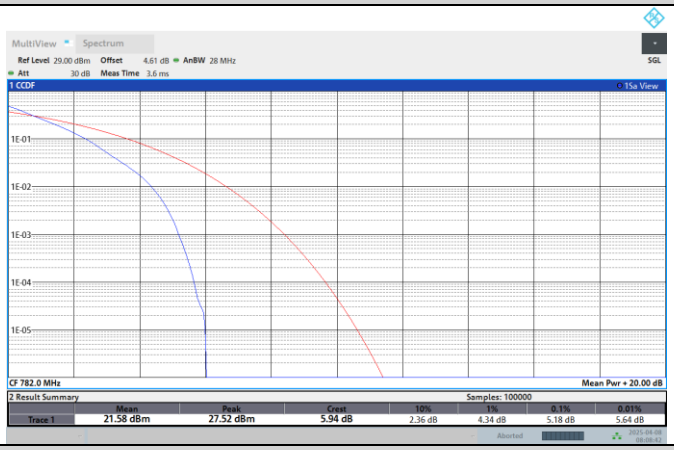
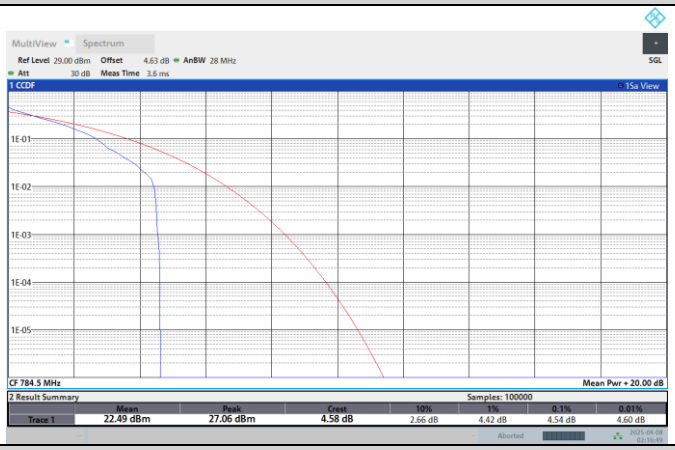
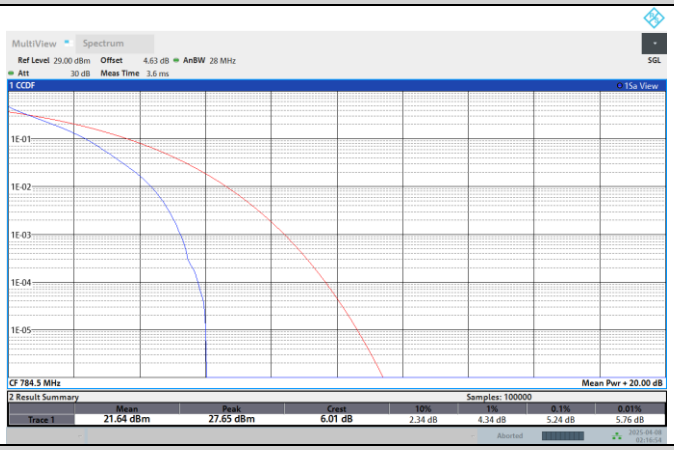
Note: 1. |MAX(△f)| = Max Deviation
2. fL = Occ low channel fl(-13dBm/MHz)
3. fH = Occ High channel fH(-13dBm/MHz)
4. |MAX(△f)| = 24.70Hz.

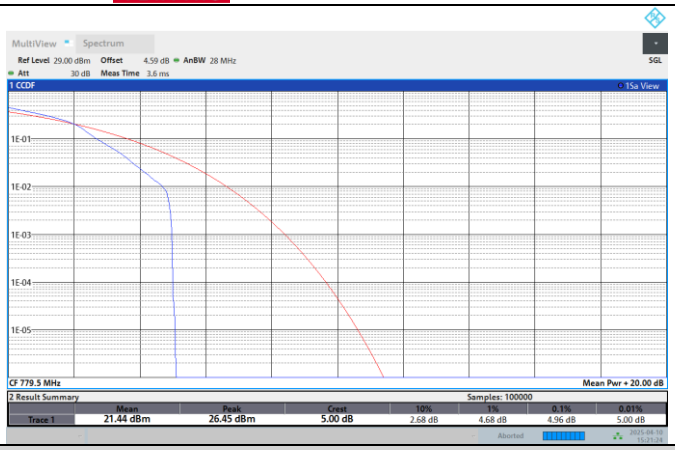
LTE BAND13
PEAK-TO-AVERAGE RATIO(CCDF)

Test Result

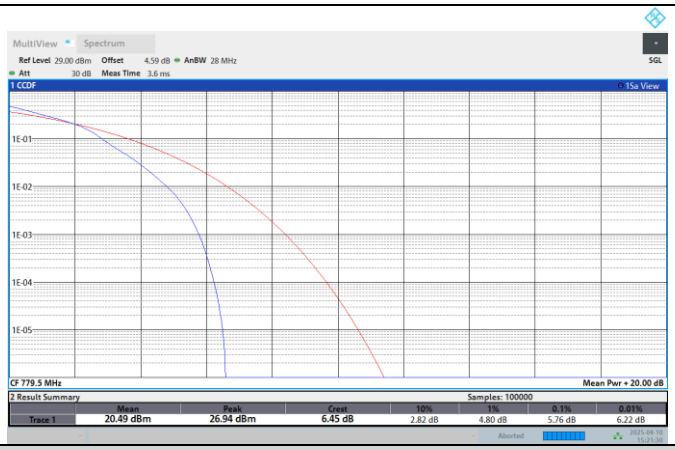
Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band13	5MHz	QPSK	23205	1RB#0	4.22	13	PASS
Band13	5MHz	QPSK	23205	25RB#0	4.92	13	PASS
Band13	5MHz	QPSK	23230	1RB#0	4.40	13	PASS
Band13	5MHz	QPSK	23230	25RB#0	5.18	13	PASS
Band13	5MHz	QPSK	23255	1RB#0	4.54	13	PASS
Band13	5MHz	QPSK	23255	25RB#0	5.24	13	PASS
Band13	5MHz	16QAM	23205	1RB#0	4.96	13	PASS
Band13	5MHz	16QAM	23205	25RB#0	5.76	13	PASS
Band13	5MHz	16QAM	23230	1RB#0	5.16	13	PASS
Band13	5MHz	16QAM	23230	25RB#0	6.04	13	PASS
Band13	5MHz	16QAM	23255	1RB#0	5.48	13	PASS
Band13	5MHz	16QAM	23255	25RB#0	5.96	13	PASS
Band13	10MHz	QPSK	23230	1RB#0	4.40	13	PASS
Band13	10MHz	QPSK	23230	50RB#0	5.16	13	PASS
Band13	10MHz	16QAM	23230	1RB#0	4.34	13	PASS
Band13	10MHz	16QAM	23230	27RB#0	5.62	13	PASS

Test Graphs

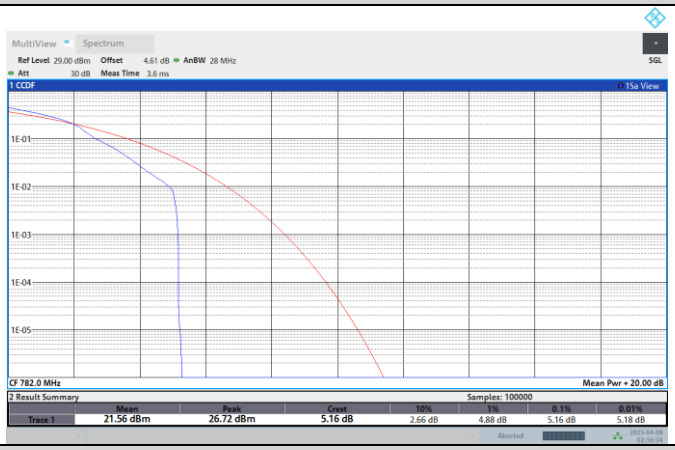
Band13-5MHz-QPSK-23205-1RB#0	Band13-5MHz-QPSK-23205-25RB#0
	
Band13-5MHz-QPSK-23230-1RB#0	**Band13-5MHz-QPSK-23230-25RB#0**
	
Band13-5MHz-QPSK-23255-1RB#0	**Band13-5MHz-QPSK-23255-25RB#0**
	
Band13-5MHz-16QAM-23205-1RB#0	**Band13-5MHz-16QAM-23205-25RB#0**



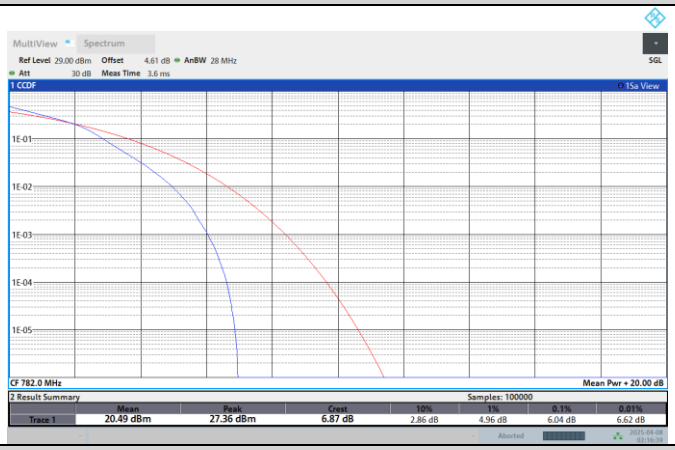
Band13-5MHz-16QAM-23230-1RB#0



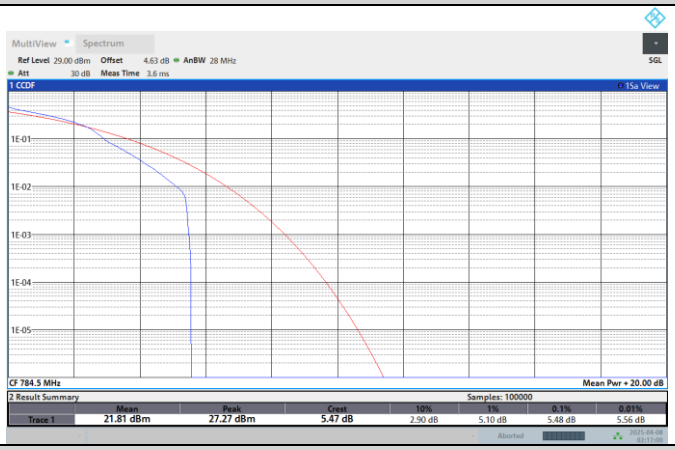
Band13-5MHz-16QAM-23230-25RB#0



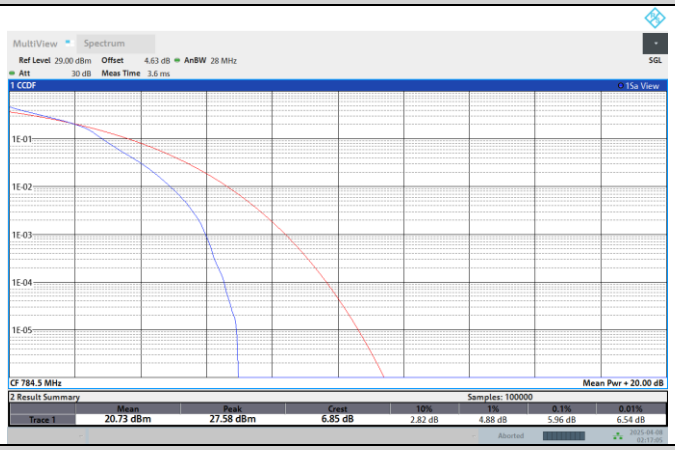
Band13-5MHz-16QAM-23255-1RB#0



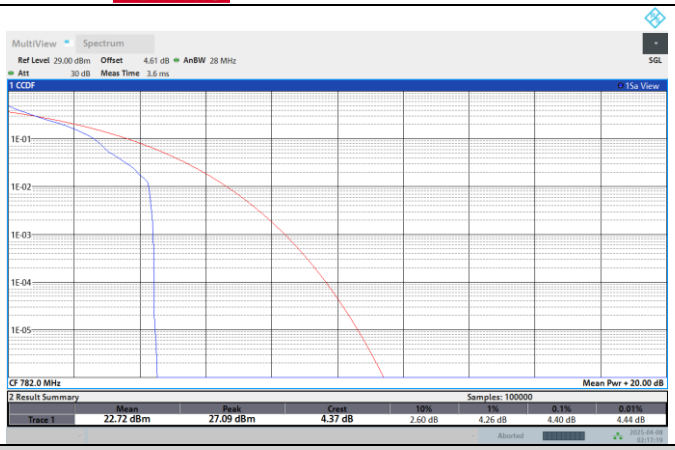
Band13-5MHz-16QAM-23255-25RB#0



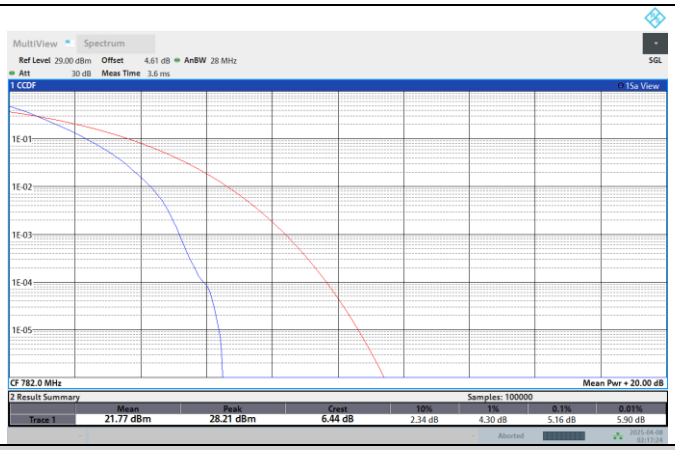
Band13-10MHz-QPSK-23230-1RB#0



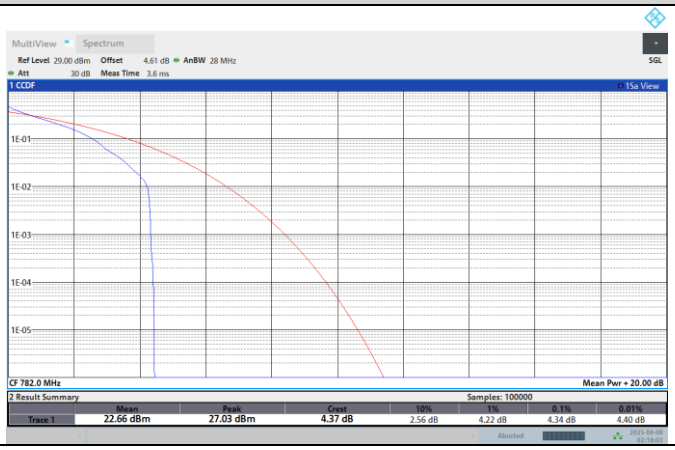
Band13-10MHz-QPSK-23230-25RB#0

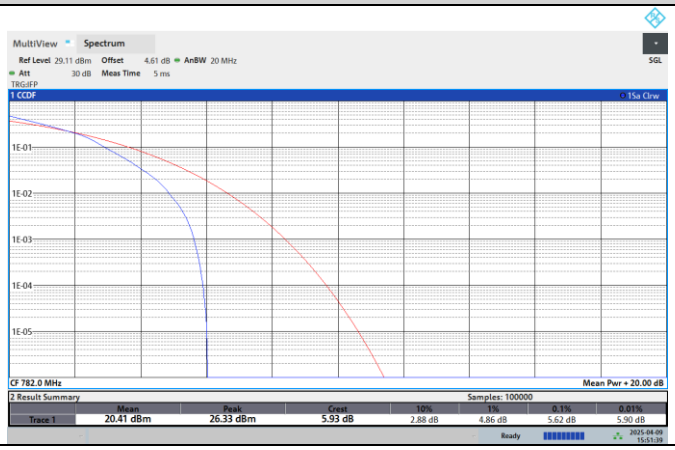


Band13-10MHz-16QAM-23230-1RB#0



Band13-10MHz-16QAM-23230-27RB#0





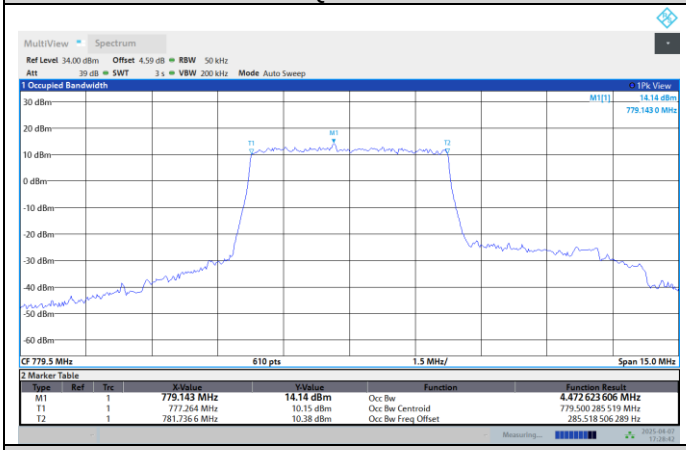
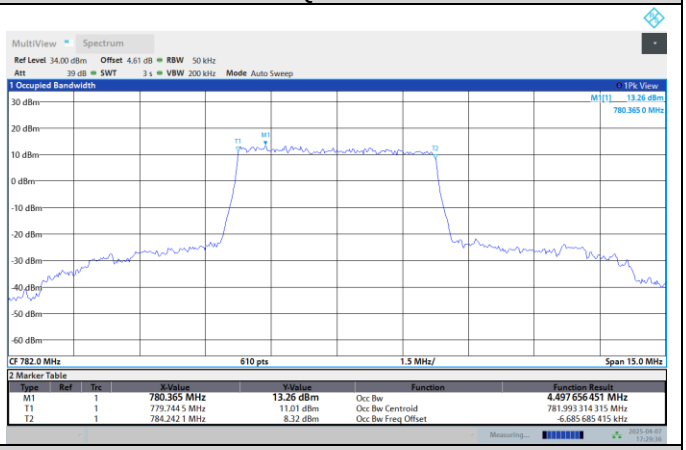
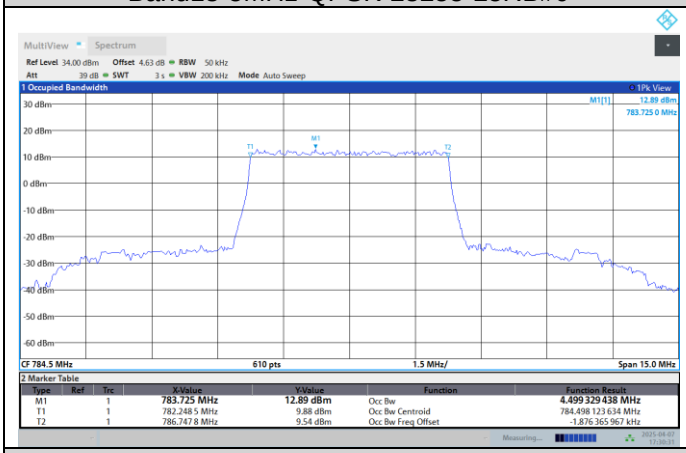
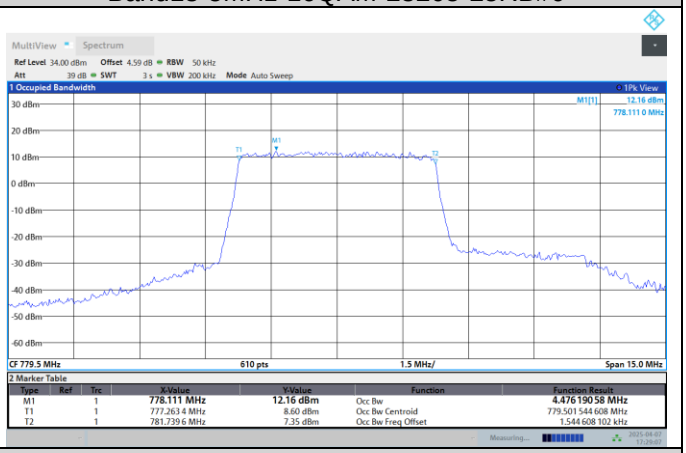
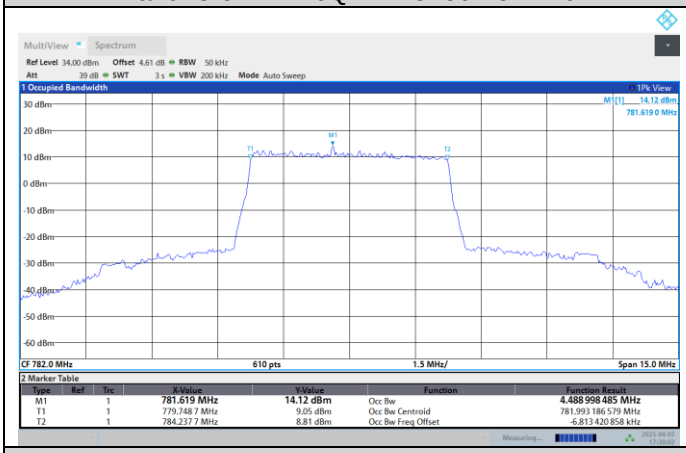
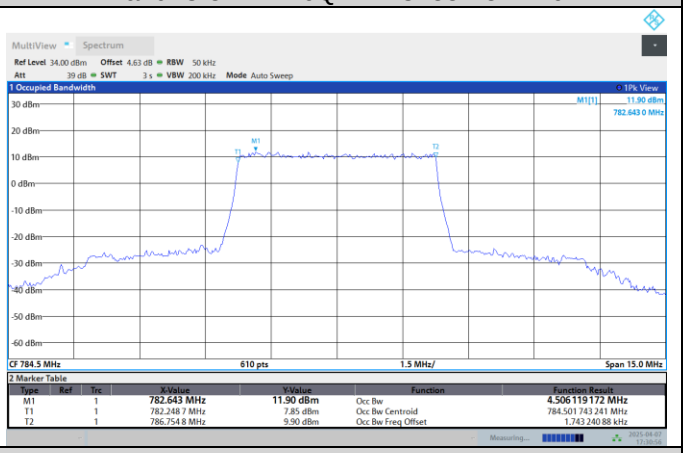
26DB BANDWIDTH AND OCCUPIED BANDWIDTH

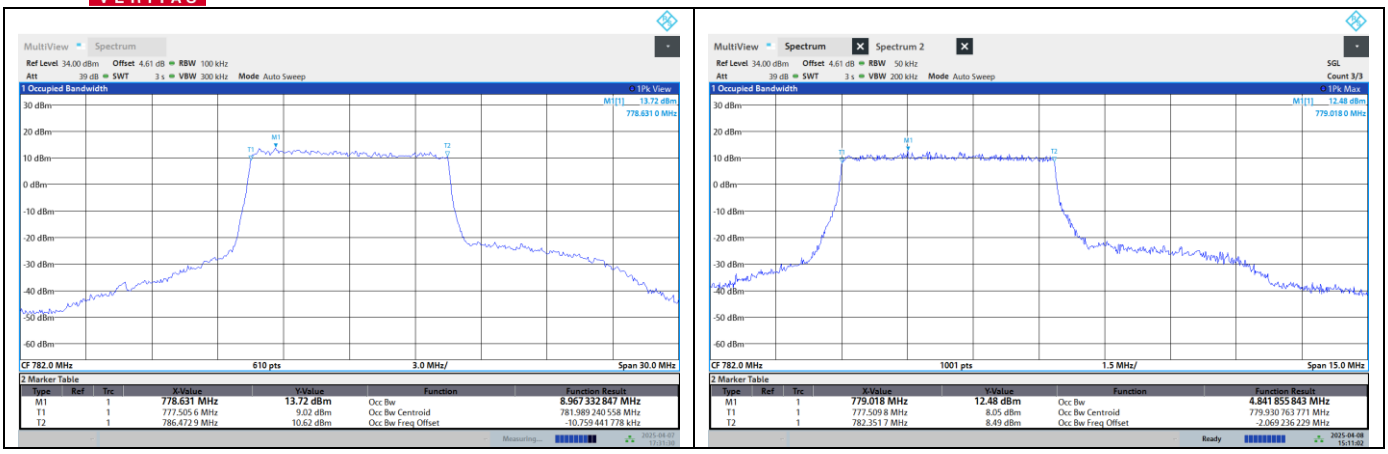
Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band13	5MHz	QPSK	23205	25RB#0	4.473	4.88	PASS
Band13	5MHz	QPSK	23230	25RB#0	4.498	4.93	PASS
Band13	5MHz	QPSK	23255	25RB#0	4.499	4.92	PASS
Band13	5MHz	16QAM	23205	25RB#0	4.476	4.93	PASS
Band13	5MHz	16QAM	23230	25RB#0	4.489	4.90	PASS
Band13	5MHz	16QAM	23255	25RB#0	4.506	4.93	PASS
Band13	10MHz	QPSK	23230	50RB#0	8.967	9.71	PASS
Band13	10MHz	16QAM	23230	27RB#0	4.842	5.352	PASS

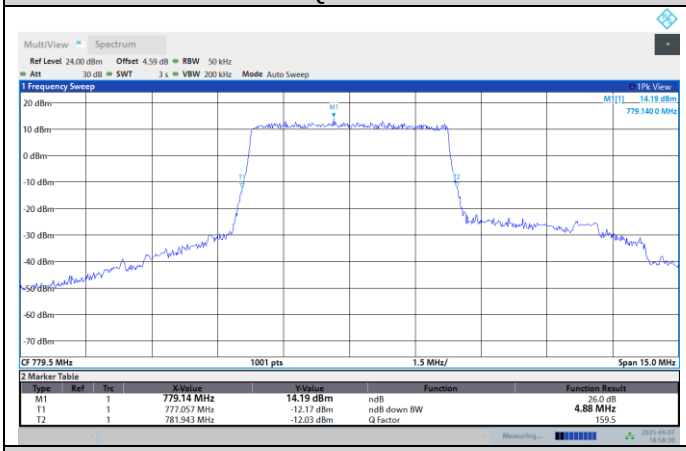
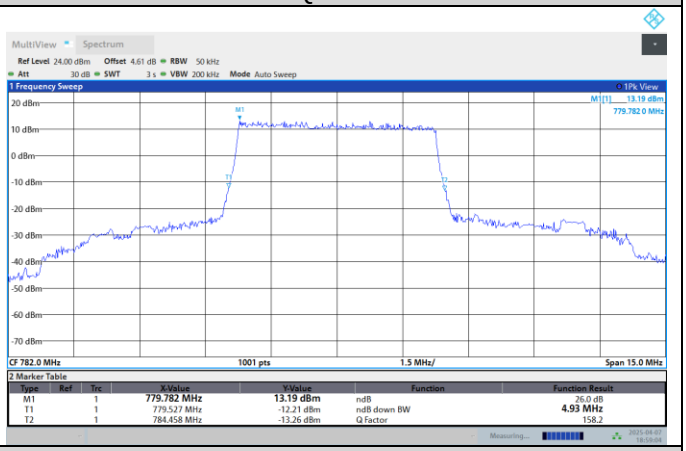
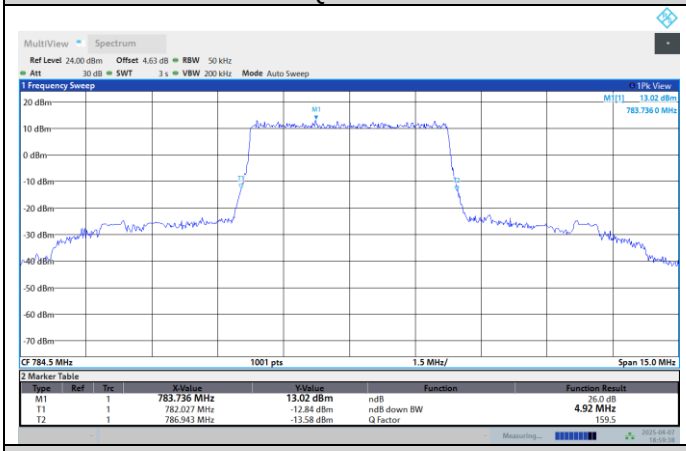
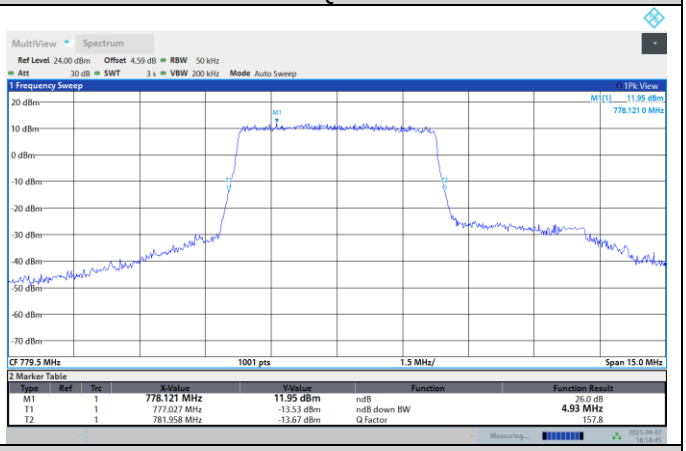
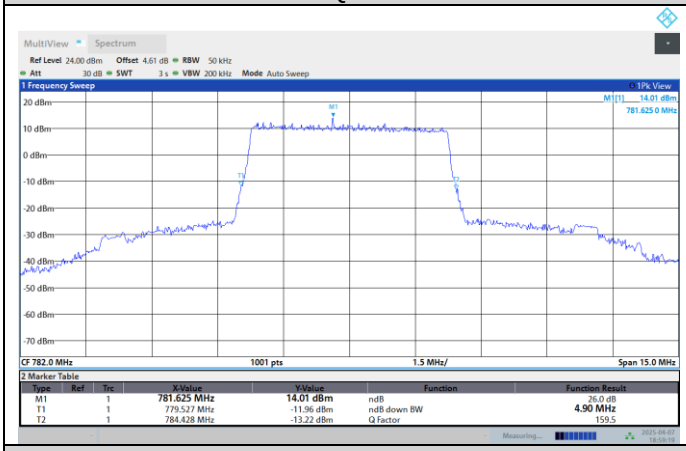
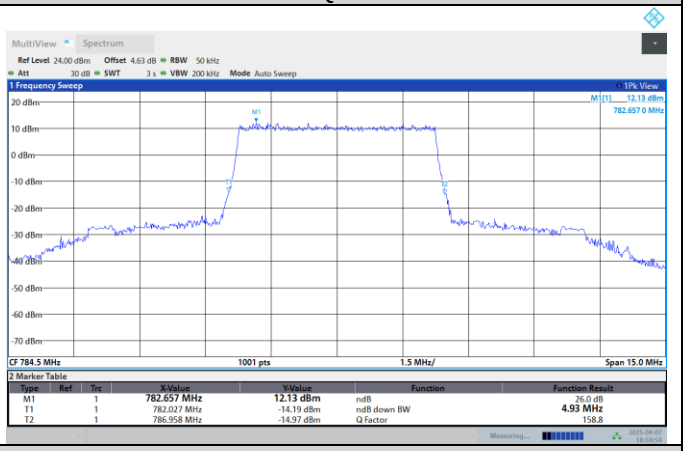
Test Graphs

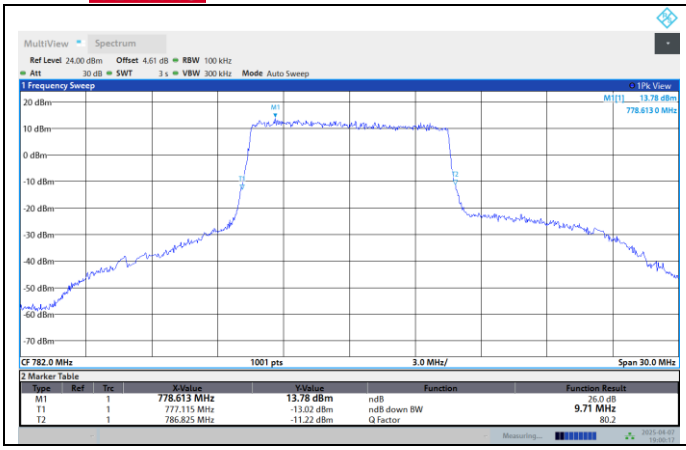
Occupied Bandwidth

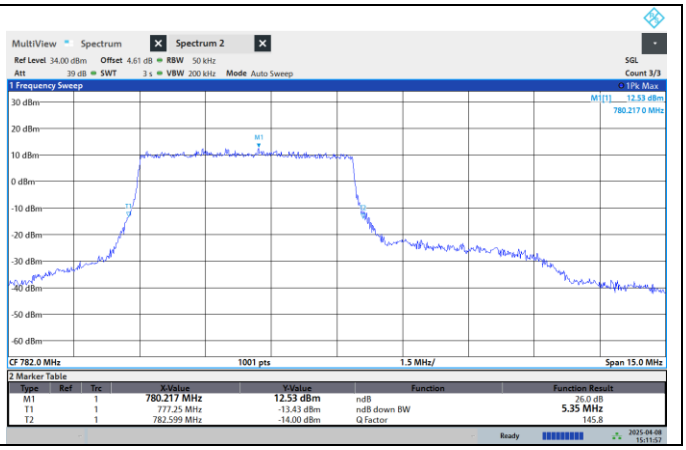
Band13-5MHz-QPSK-23205-25RB#0	Band13-5MHz-QPSK-23230-25RB#0
	
Band13-5MHz-QPSK-23255-25RB#0	Band13-5MHz-16QAM-23205-25RB#0
	
Band13-5MHz-16QAM-23230-25RB#0	Band13-5MHz-16QAM-23255-25RB#0
	
Band13-10MHz-QPSK-23230-50RB#0	Band13-10MHz-16QAM-23230-27RB#0


MultiView
Spectrum
Ref Level 34.00 dBm Offset 4.61 dB RBW 100 kHz
Att 39 dB SWT 3 s VBW 300 kHz Mode Auto Sweep
1 Occupied Bandwidth
1Pk View
M1[1] 13.72 dBm
778.631 0 MHz
CF 782.0 MHz 610 pts 3.0 MHz/ Span 30.0 MHz
2 Marker Table
Type Ref Trc X-Value Y-Value Function Function Result
M1 1 778.631 MHz 13.72 dBm Occ Bw 8.967 332 847 MHz
T1 1 777.505 6 MHz 9.02 dBm Occ Bw Centroid 781.989 240 558 MHz
T2 1 786.472 9 MHz 10.62 dBm Occ Bw Freq Offset -10.759 441 778 kHz
MultiView
Spectrum
Spectrum 2
Ref Level 34.00 dBm Offset 4.61 dB RBW 50 kHz
Att 39 dB SWT 3 s VBW 200 kHz Mode Auto Sweep
SGL
Count 3/3
1 Occupied Bandwidth
1Pk Max
M1[1] 12.48 dBm
779.018 0 MHz
CF 782.0 MHz 1001 pts 1.5 MHz/ Span 15.0 MHz
2 Marker Table
Type Ref Trc X-Value Y-Value Function Function Result
M1 1 779.018 MHz 12.48 dBm Occ Bw 4.841 855 843 MHz
T1 1 777.509 8 MHz 8.05 dBm Occ Bw Centroid 779.930 763 771 MHz
T2 1 782.351 7 MHz 8.49 dBm Occ Bw Freq Offset -2.069 236 229 MHz
Ready

26dB Bandwidth

Band13-5MHz-QPSK-23205-25RB#0	Band13-5MHz-QPSK-23230-25RB#0
	
Band13-5MHz-QPSK-23255-25RB#0	**Band13-5MHz-16QAM-23205-25RB#0**
	
Band13-5MHz-16QAM-23230-25RB#0	**Band13-5MHz-16QAM-23255-25RB#0**
	
Band13-10MHz-QPSK-23230-50RB#0	**Band13-10MHz-16QAM-23230-27RB#0**


MultiView
Spectrum
Ref Level 24.00 dBm Offset 4.61 dB RBW 100 kHz
Att 30 dB SWT 3 s VBW 300 kHz Mode Auto Sweep
1 Frequency Sweep
1Pk View
M1[1] 13.78 dBm
778.613 0 MHz
CF 782.0 MHz 1001 pts 3.0 MHz/ Span 30.0 MHz
2 Marker Table
Type Ref Trc X-Value Y-Value Function Function Result
M1 1 778.613 MHz 13.78 dBm ndB 26.0 dB
T1 1 777.115 MHz -13.02 dBm ndB down BW 9.71 MHz
T2 1 786.825 MHz -11.22 dBm Q Factor 80.2

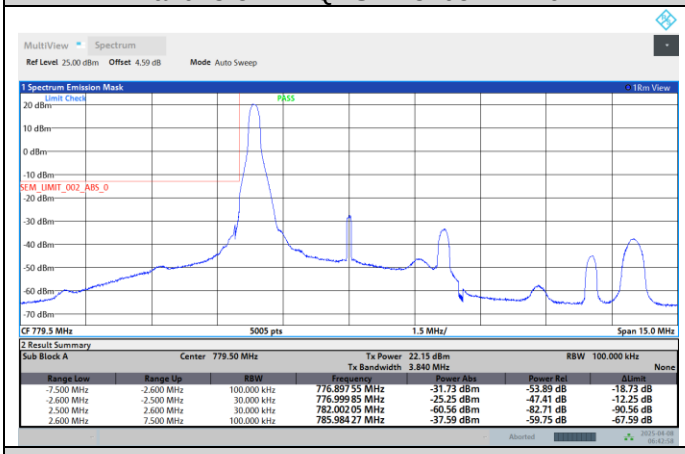
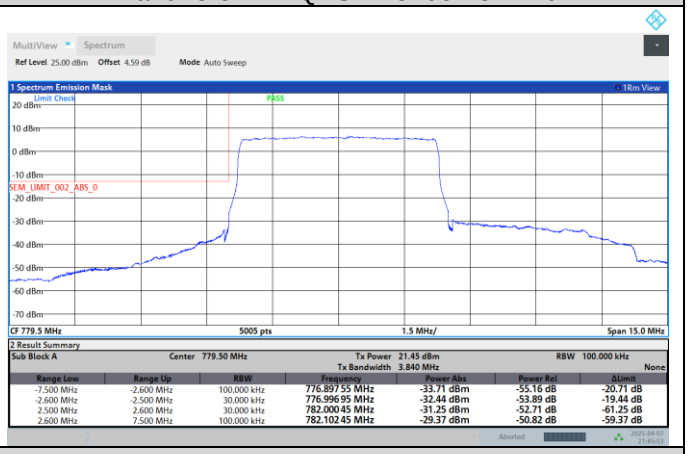
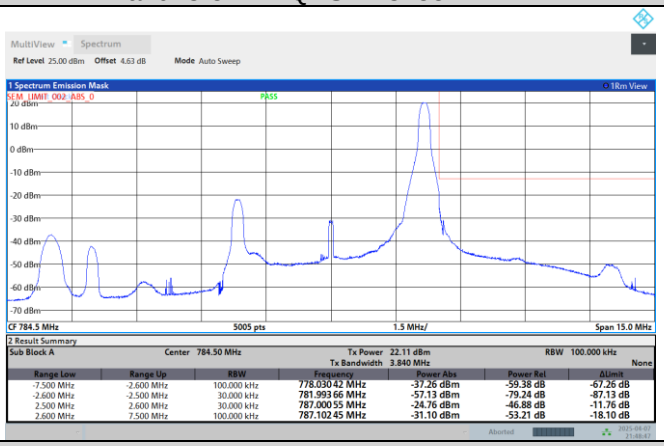
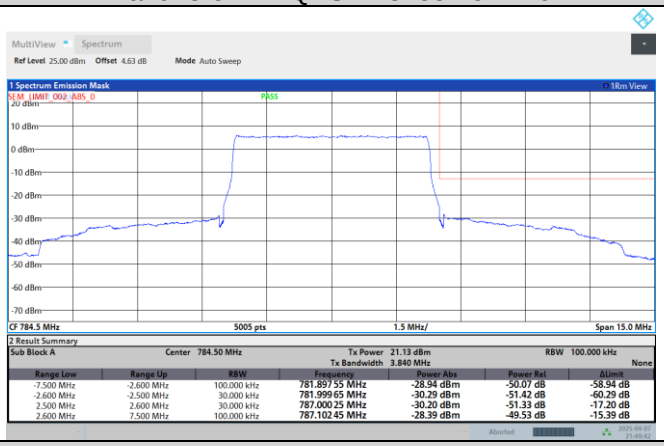
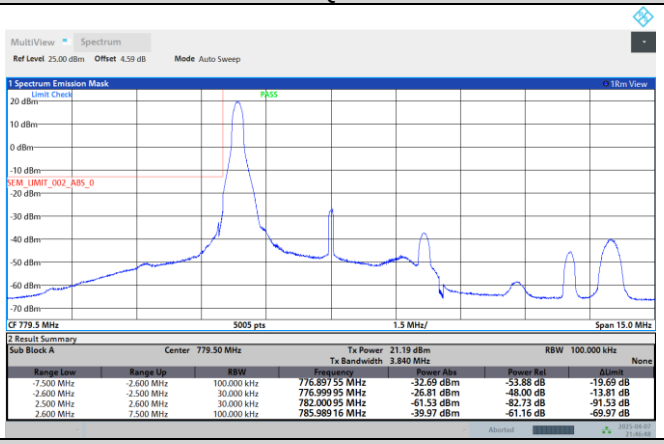
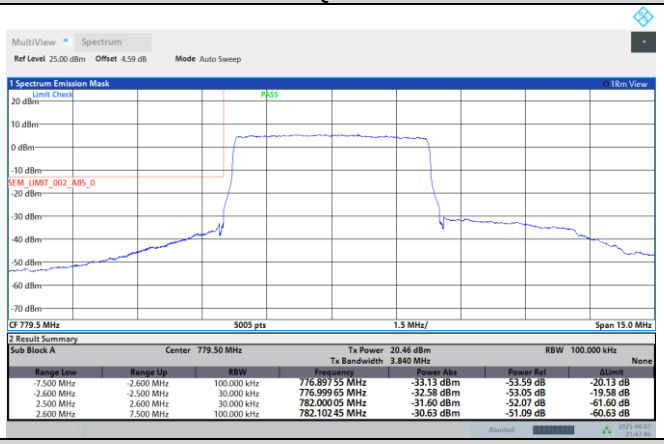

MultiView
Spectrum
Spectrum 2
Ref Level 34.00 dBm Offset 4.61 dB RBW 50 kHz
Att 39 dB SWT 3 s VBW 200 kHz Mode Auto Sweep
SGL
Count 3/3
1 Frequency Sweep
1Pk Max
M1[1] 12.53 dBm
780.217 0 MHz
CF 782.0 MHz 1001 pts 1.5 MHz/ Span 15.0 MHz
2 Marker Table
Type Ref Trc X-Value Y-Value Function Function Result
M1 1 780.217 MHz 12.53 dBm ndB 26.0 dB
T1 1 777.25 MHz -13.43 dBm ndB down BW 5.35 MHz
T2 1 782.599 MHz -14.00 dBm Q Factor 145.8

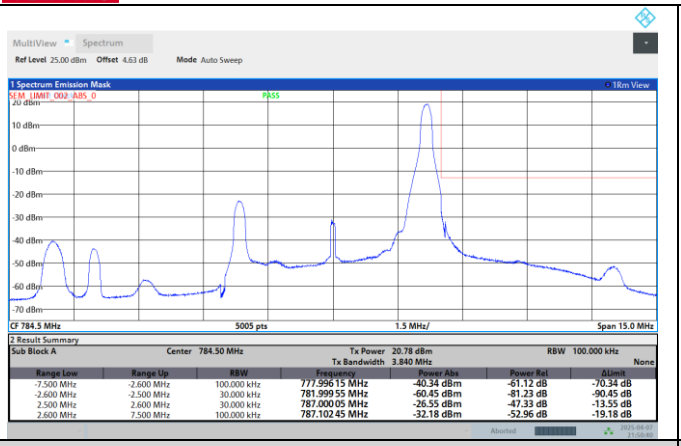
BAND EDGE

Test Result

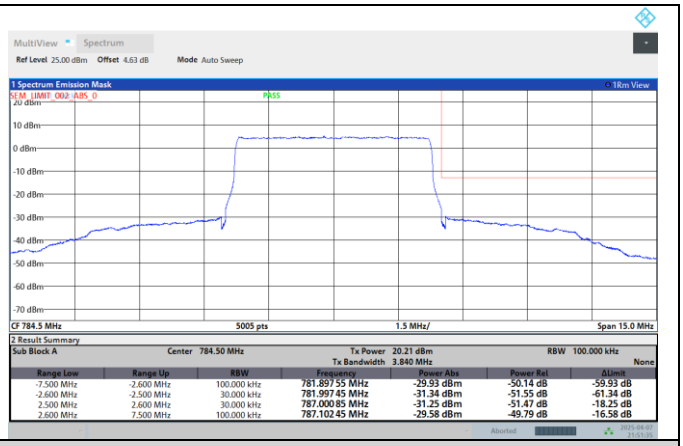
Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dBm)	Verdict
Band13	5MHz	QPSK	23205	1RB#0	See Graph	PASS
Band13	5MHz	QPSK	23205	25RB#0	See Graph	PASS
Band13	5MHz	QPSK	23255	1RB#24	See Graph	PASS
Band13	5MHz	QPSK	23255	25RB#0	See Graph	PASS
Band13	5MHz	16QAM	23205	1RB#0	See Graph	PASS
Band13	5MHz	16QAM	23205	25RB#0	See Graph	PASS
Band13	5MHz	16QAM	23255	1RB#24	See Graph	PASS
Band13	5MHz	16QAM	23255	25RB#0	See Graph	PASS
Band13	10MHz	QPSK	23230	1RB#0	See Graph	PASS
Band13	10MHz	QPSK	23230	1RB#49	See Graph	PASS
Band13	10MHz	QPSK	23230	50RB#0	See Graph	PASS
Band13	10MHz	16QAM	23230	1RB#0	See Graph	PASS
Band13	10MHz	16QAM	23230	1RB#49	See Graph	PASS
Band13	10MHz	16QAM	23230	27RB#0	See Graph	PASS
Band13	10MHz	16QAM	23230	27RB#23	See Graph	PASS

Test Graphs

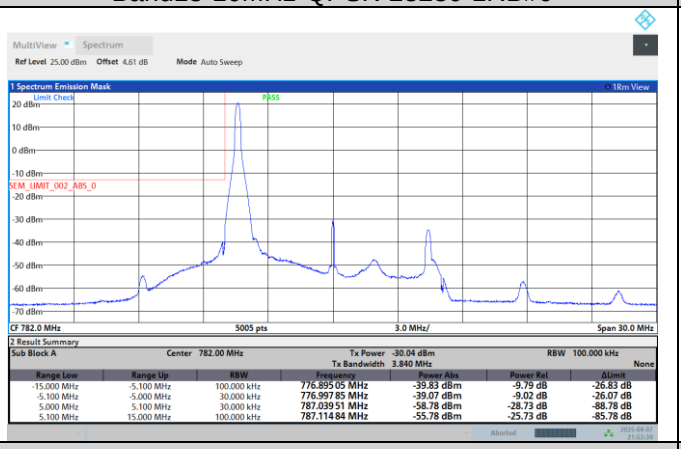
Band13-5MHz-QPSK-23205-1RB#0	Band13-5MHz-QPSK-23205-25RB#0
	
Band13-5MHz-QPSK-23255-1RB#24	**Band13-5MHz-QPSK-23255-25RB#0**
	
Band13-5MHz-16QAM-23205-1RB#0	**Band13-5MHz-16QAM-23205-25RB#0**
	
Band13-5MHz-16QAM-23255-1RB#24	**Band13-5MHz-16QAM-23255-25RB#0**



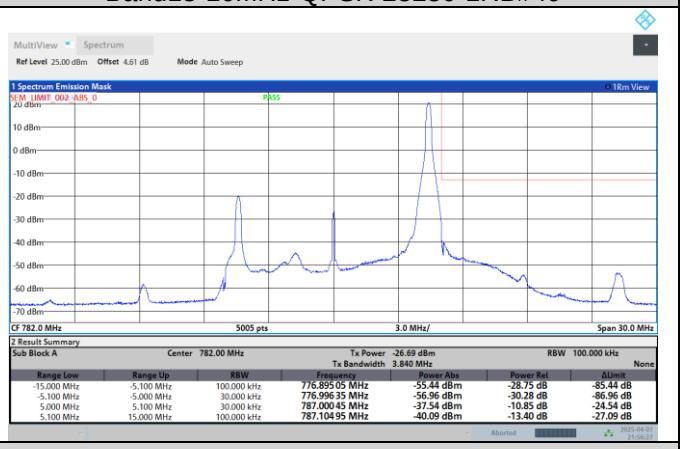
Band13-10MHz-QPSK-23230-1RB#0



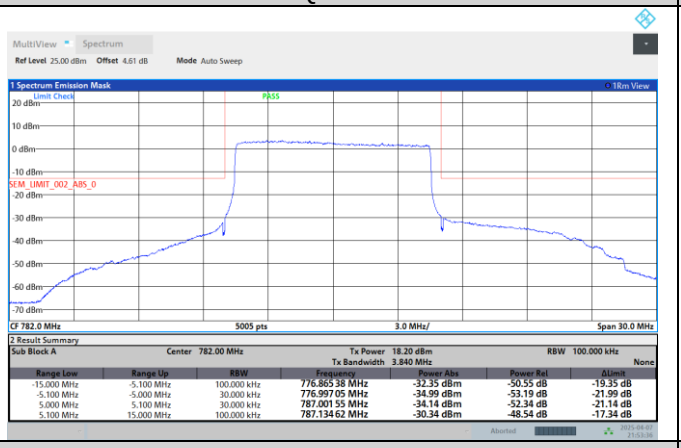
Band13-10MHz-QPSK-23230-1RB#49



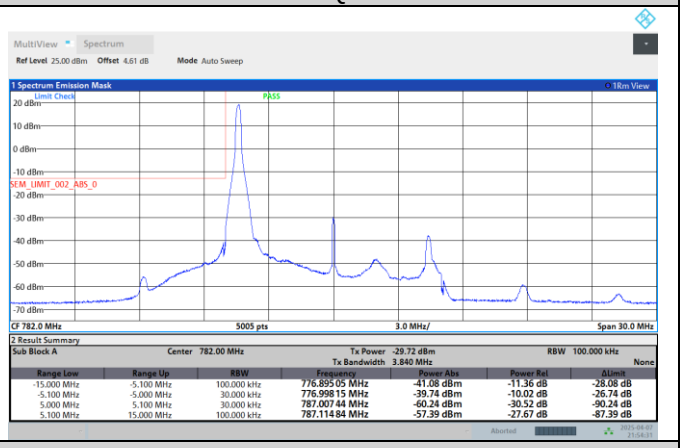
Band13-10MHz-QPSK-23230-50RB#0



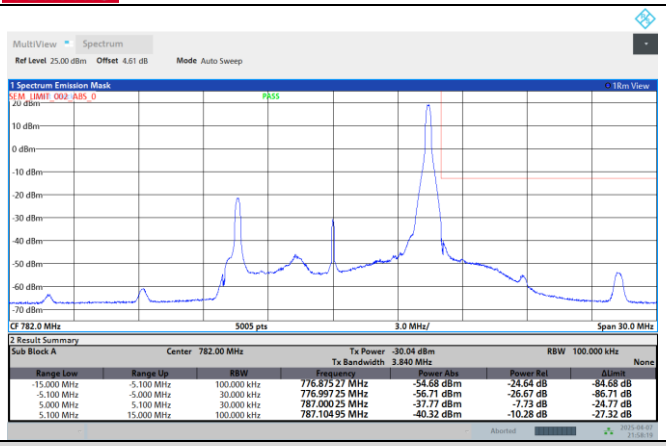
Band13-10MHz-16QAM-23230-1RB#0

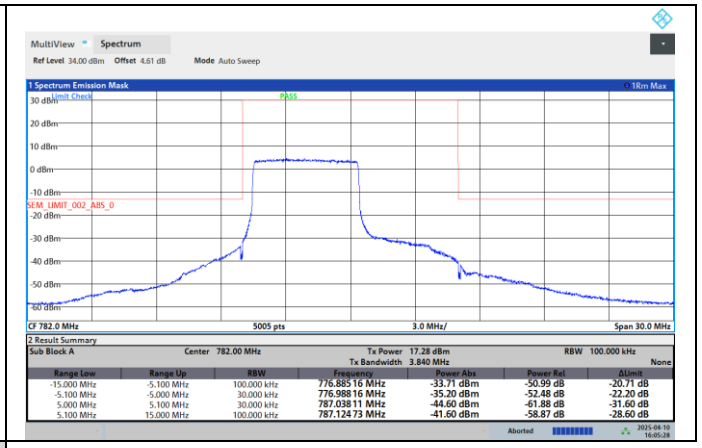


Band13-10MHz-16QAM-23230-1RB#49

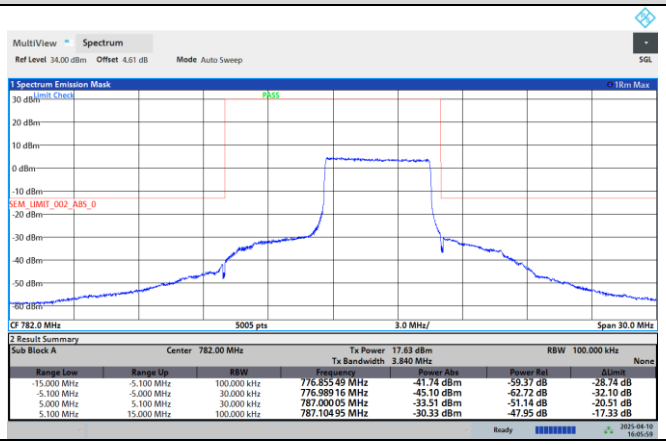


Band13-10MHz-16QAM-23230-27RB#0





Band13-10MHz-16QAM-23230-27RB#23

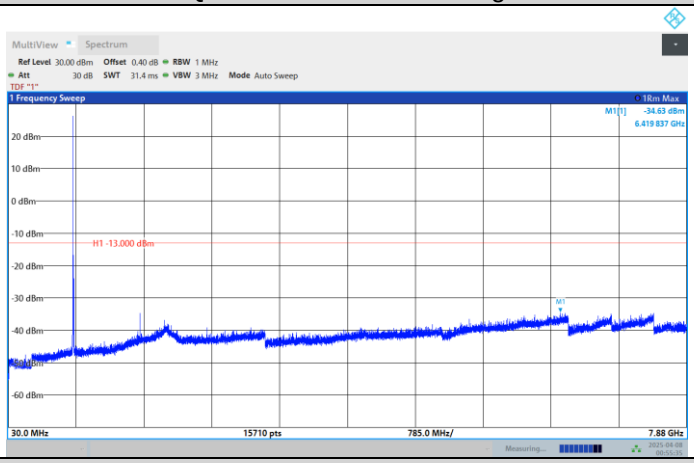
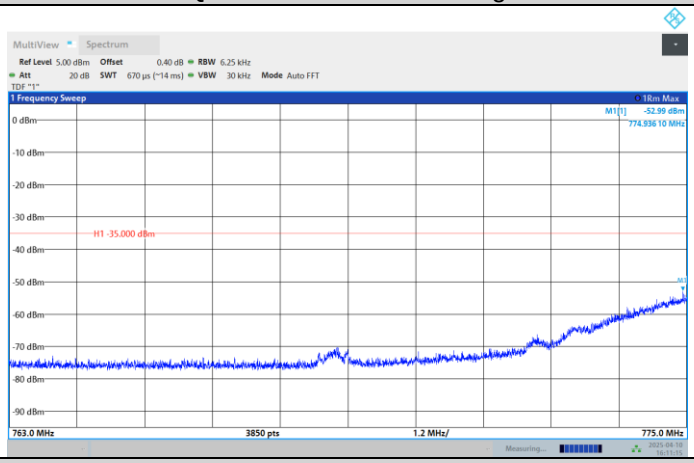
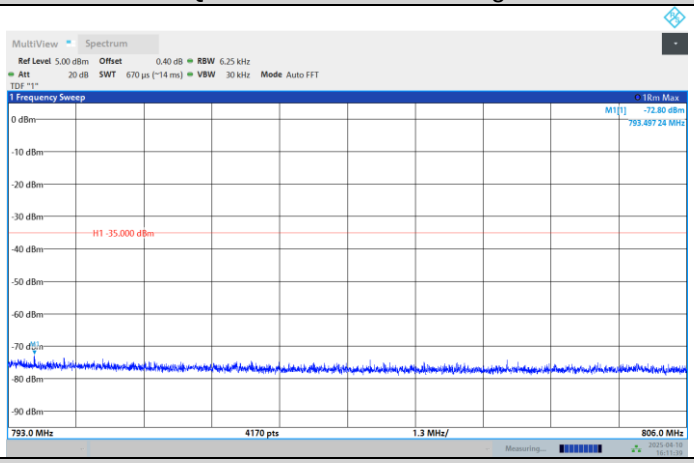
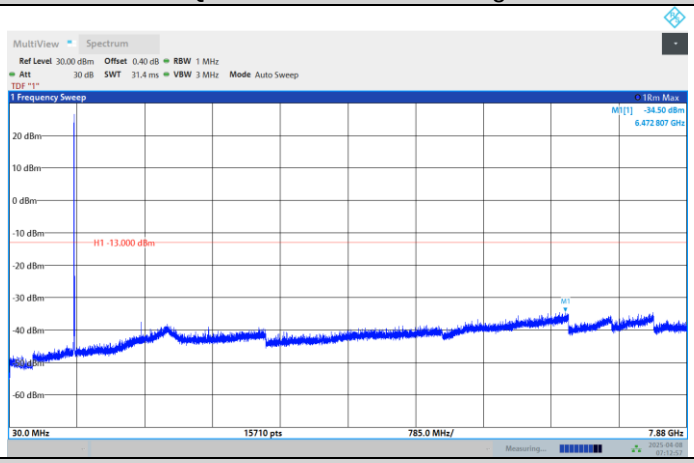
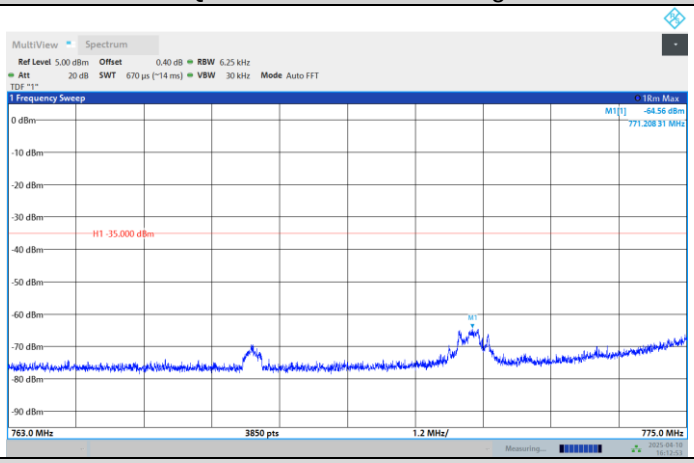
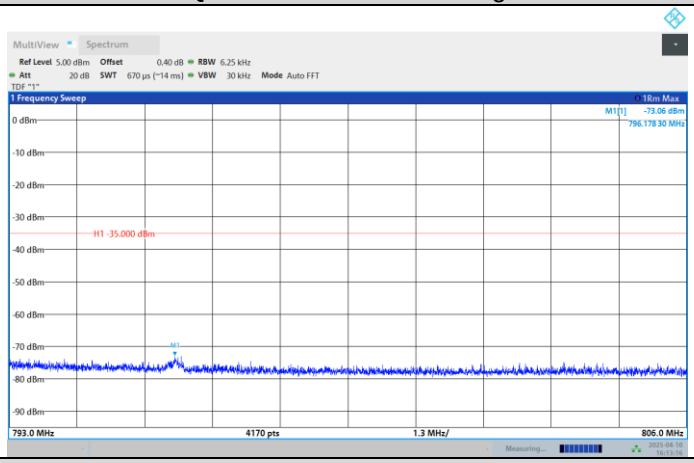


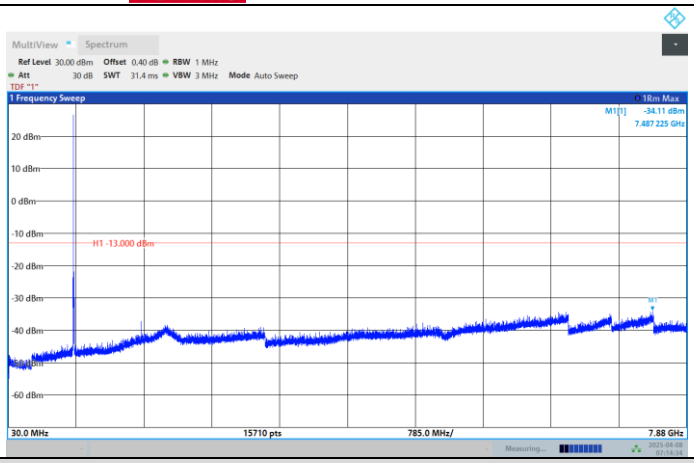
CONDUCTED SPURIOUS EMISSION

Test Result

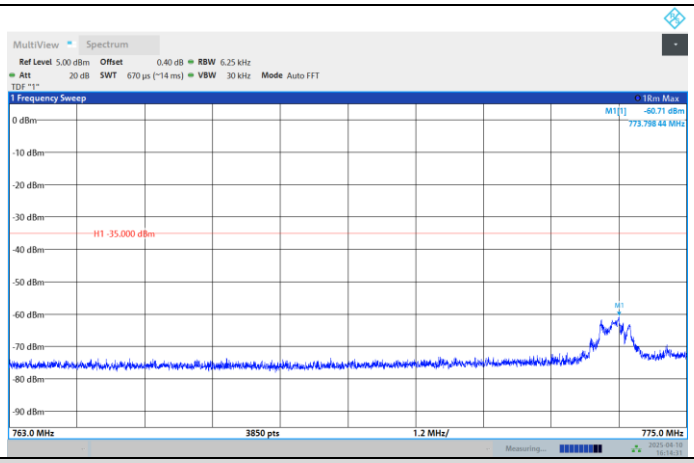
Band	Bandwidth	Modulation	Channel	RB Configuration	Frequency Range	Result (dBm)	Verdict
Band13	5MHz	QPSK	23205	1RB#0	Range:30~7880MHz	See Graph	PASS
Band13	5MHz	QPSK	23205	1RB#0	Range:763~775MHz	See Graph	PASS
Band13	5MHz	QPSK	23205	1RB#0	Range:793~806MHz	See Graph	PASS
Band13	5MHz	QPSK	23230	1RB#0	Range:30~7880MHz	See Graph	PASS
Band13	5MHz	QPSK	23230	1RB#0	Range:763~775MHz	See Graph	PASS
Band13	5MHz	QPSK	23230	1RB#0	Range:793~806MHz	See Graph	PASS
Band13	5MHz	QPSK	23255	1RB#0	Range:30~7880MHz	See Graph	PASS
Band13	5MHz	QPSK	23255	1RB#0	Range:763~775MHz	See Graph	PASS
Band13	5MHz	QPSK	23255	1RB#0	Range:793~806MHz	See Graph	PASS
Band13	10MHz	QPSK	23230	1RB#0	Range:30~7880MHz	See Graph	PASS
Band13	10MHz	QPSK	23230	1RB#0	Range:763~775MHz	See Graph	PASS
Band13	10MHz	QPSK	23230	1RB#0	Range:793~806MHz	See Graph	PASS

Test Graphs

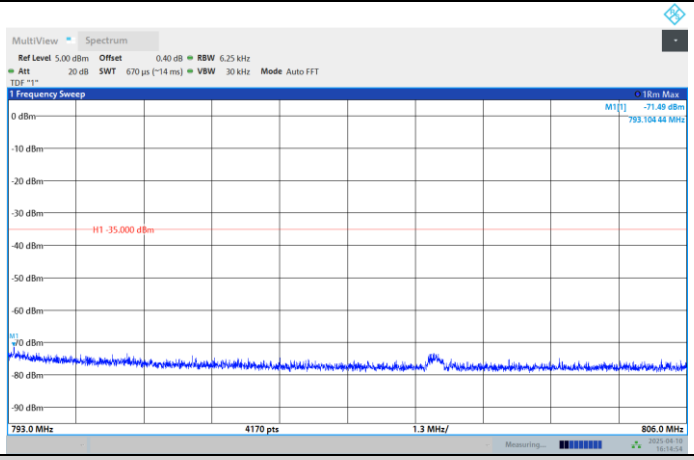
Band13-5MHz-QPSK-23205-1RB#0-Range:30~7880MHz	Band13-5MHz-QPSK-23205-1RB#0-Range:763~775MHz
	
Band13-5MHz-QPSK-23205-1RB#0-Range:793~806MHz	Band13-5MHz-QPSK-23230-1RB#0-Range:30~7870MHz
	
Band13-5MHz-QPSK-23230-1RB#0-Range:763~775MHz	Band13-5MHz-QPSK-23230-1RB#0-Range:793~806MHz
	
Band13-5MHz-QPSK-23255-1RB#0-Range:30~7870MHz	Band13-5MHz-QPSK-23255-1RB#0-Range:763~775MHz



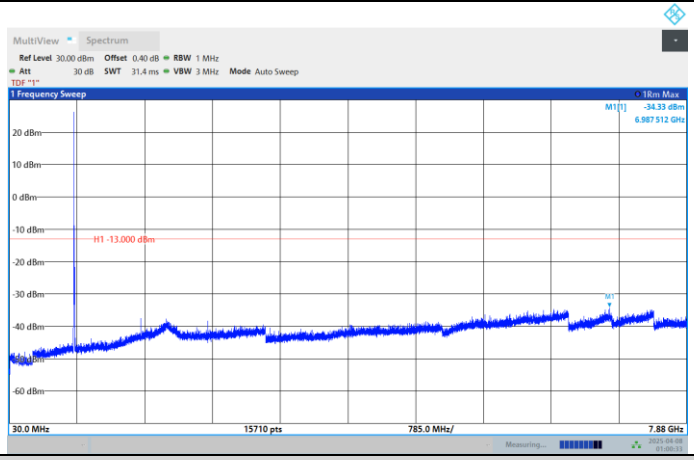
Band13-5MHz-QPSK-23255-1RB#0-Range:793~806MHz



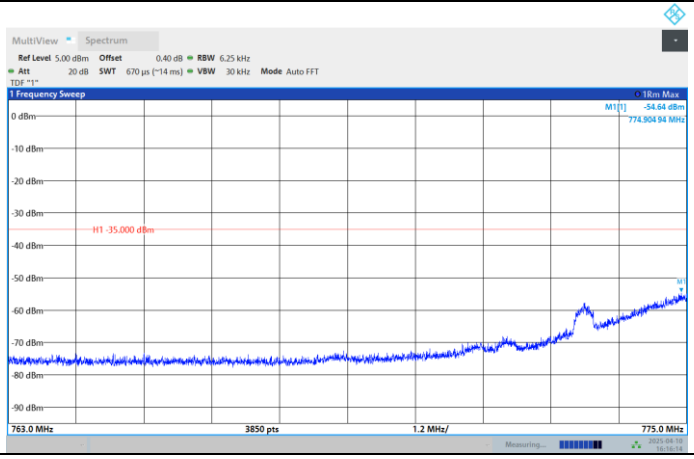
Band13-10MHz-QPSK-23230-1RB#0-Range:30~7870MHz

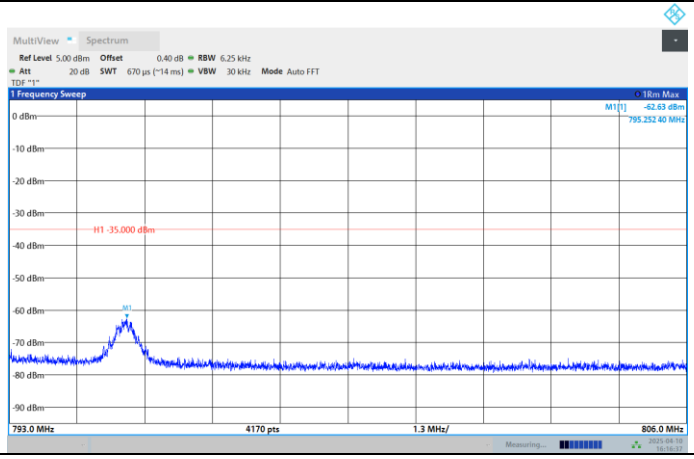


Band13-10MHz-QPSK-23230-1RB#0-Range:763~775MHz



Band13-10MHz-QPSK-23230-1RB#0-Range:793~806MHz





FREQUENCY STABILITY

Test Result

Voltage									
Band	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Verdict
Band13	10MHz	QPSK	23230	50RB#0	LV	NT	-17.56	-0.0225	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	NT	-21.20	-0.0271	PASS
Band13	10MHz	QPSK	23230	50RB#0	HV	NT	0.27	0.0003	PASS

Temperature									
Band	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Verdict
Band13	10MHz	QPSK	23230	50RB#0	NV	-30	-10.95	-0.0140	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	-20	4.37	0.0056	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	-10	-24.28	-0.0310	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	0	-6.43	-0.0082	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	10	-18.26	-0.0234	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	20	17.54	0.0224	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	30	-24.59	-0.0314	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	40	-17.89	-0.0229	PASS
Band13	10MHz	QPSK	23230	50RB#0	NV	50	24.48	0.0313	PASS

MAX Deviation calculation

Frequency Stability	Frequency (MHz)	Limit Line(MHz)	Result
fL-|MAX(△f)|	777.5165	≥777	PASS
fH+|MAX(△f)|	786.4835	≤787	

Note: 1. |MAX(△f)| = Max Deviation
2. fL = Occ low channel fl(-13dBm/MHz)
3. fH = Occ High channel fH(-13dBm/MHz)
4. |MAX(△f)| = 24.59Hz.

--END--