Certificate #6613.01

FCC TEST REPORT

(PART 24)

Applicant:	MUNIC
Address:	39 Avenue de Paris 94800 Villejuif – France

Manufacturer or Supplier:	MUNIC
Address:	39 Avenue de Paris 94800 Villejuif – France
Product:	telematics embedded system ALARM.COM CAR CONNECTOR
Brand Name:	MUNIC ALARM.COM
Model Name:	C4D-4MUSAC_V8 ADC-CC110
FCC ID	A6GC4D-4MUSACV8
Date of tests	Aug. 23, 2024 ~ Sep. 20, 2024

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

☒ **FCC PART 24, Subpart E** ☒ **FCC PART 2**
☒ **ANSI/TIA/EIA-603-D** ☒ **ANSI/TIA/EIA-603-E** ☒ **ANSI C63.26-2015**

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

Prepared by Hanwen Xu Engineer / Mobile Department	Approved by Peibo Sun Manager / Mobile Department
Xu Hanwen	Sun Peibo
Date: Sep. 20, 2024	Date: Sep. 20, 2024

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

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
PSU-QBJ2408220111RF02	Original release	Sep. 20, 2024

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 24 & Part 2			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**Test lab***
§2.1046	Coduncted Output Power	Compliance	A
§24.232(c)	Equivalent Isotropic Radiated Power	Compliance	A
§2.1055 §24.235	Frequency Stability	Compliance	A
§2.1049	Occupied Bandwidth	Compliance	A
§24.232(d)	Peak to average ratio*	Compliance	A
§24.238(a)(b)	Band Edge Measurements	Compliance	A
§2.1051 §24.238(a)(b)	Conducted Spurious Emissions	Compliance	A
§2.1053 §24.238(a)(b)	Radiated Spurious Emissions	Compliance	A

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

***Test Lab Information Reference**

Lab A:

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

Lab Address:

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

Accredited Test Lab Cert 6613.01

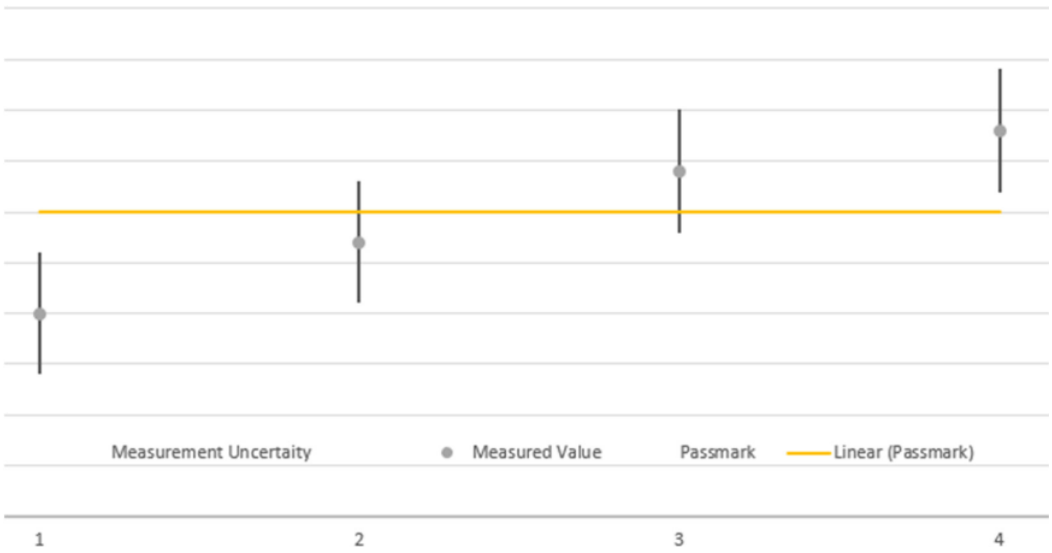
The FCC Site Registration No. is 434559; The Designation No. is CN1325.

1.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	UNCERTAINTY
Frequency Stability	±76.97Hz
Radiated emissions (9KHz~30MHz)	±2.68dB
Radiated emissions & Radiated Power (30MHz~1GHz)	±4.98dB
Radiated emissions & Radiated Power (1GHz ~6GHz)	±4.70dB
Radiated emissions (6GHz ~18GHz)	±4.60dB
Radiated emissions (18GHz ~40GHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±43.58KHz
Conducted Output power	±2.06dB
Band Edge Measurements	±4.70dB
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.30,22	Aug.29,24
Pre-Amplifier	R&S	SCU18F1	100815	Aug.29,24	Aug.28,26
Pre-Amplifier	R&S	SCU08F1	101028	Sep.16,22	Sep.15,24
Pre-Amplifier	R&S	SCU08F1	101028	Sep.15,24	Sep.14,26
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.21,24	Aug.20,26
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.21,24	Aug.20,26
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.22,24	Feb.21,26
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	Oct.01,22	Sep.30,24
DC Source	HYELEC	HY3010B	551016	Aug.31,22	Aug.30,24
DC Source	HYELEC	HY3010B	551016	Aug.30,24	Aug.29,26
Hygrothermograph	DELI	20210528	SZ014	Sep.06,22	Sep.05,24
Hygrothermograph	DELI	20210528	SZ014	Sep.05,24	Sep.04,26
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/ 24/ 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

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

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

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

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT*	telematics embedded system ALARM.COM CAR CONNECTOR	
BRAND NAME*	MUNIC ALARM.COM	
MODEL NAME*	C4D-4MUSAC_V8 ADC-CC110	
NOMINAL VOLTAGE*	DC 13.5V/27V	
MODULATION TYPE*	**GSM/GPRS:** GMSK **EDGE:** 8PSK **LTE Band 2:** QPSK, 16QAM	
FREQUENCY RANGE	**GSM/GPRS/EDGE**	1850.2MHz ~ 1909.8MHz
	LTE Band 2 Channel Bandwidth: 1.4MHz	1850.7MHz ~ 1909.3MHz
	LTE Band 2 Channel Bandwidth: 3MHz	1851.5MHz ~ 1908.5MHz
	LTE Band 2 Channel Bandwidth: 5MHz	1852.5MHz ~ 1907.5MHz
	LTE Band 2 Channel Bandwidth: 10MHz	1855.0MHz ~ 1905.0MHz
	LTE Band 2 Channel Bandwidth: 15MHz	1857.5MHz ~ 1902.5MHz
	LTE Band 2 Channel Bandwidth: 20MHz	1860.0MHz ~ 1900.0MHz
MAX. EIRP POWER	**GSM/GPRS**	1071.52mW
	EDGE	388.15mW
	LTE Band 2 Channel Bandwidth: 1.4MHz	196.34mW
	LTE Band 2 Channel Bandwidth: 3MHz	197.24mW
	LTE Band 2 Channel Bandwidth: 5MHz	196.79mW
	LTE Band 2 Channel Bandwidth: 10MHz	197.7mW
	LTE Band 2 Channel Bandwidth: 15MHz	197.7mW
	LTE Band 2 Channel Bandwidth: 20MHz	198.61mW
EMISSION DESIGNATOR	**GSM**	247KGXW
	EDGE	247KG7W
	LTE Band 2 Channel Bandwidth: 1.4MHz	QPSK: 1M08G7D
		16QAM: 1M10W7D

	LTE Band 2 Channel Bandwidth: 3MHz	QPSK: 1M10G7D
		16QAM: 1M09W7D
	LTE Band 2 Channel Bandwidth: 5MHz	QPSK: 1M10G7D
		16QAM: 1M12W7D
	LTE Band 2 Channel Bandwidth: 10MHz	QPSK: 1M10G7D
		16QAM: 1M12W7D
	LTE Band 2 Channel Bandwidth: 15MHz	QPSK: 1M13G7D
		16QAM: 1M13W7D
	LTE Band 2 Channel Bandwidth: 20MHz	QPSK: 1M13G7D
		16QAM: 1M15W7D
ANTENNA TYPE	Fixed Internal Antenna with 0.8dBi gain for GSM 1900 Fixed Internal Antenna with 0.8dBi gain for LTE Band 2	
HW VERSION	HC4D-4MUSAC_V8.01	
SW VERSION	SC4D-4MUSAC_V8.01	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	N/A	
EXTREME TEMPERATURE	-20-55 ℃	
EXTREME VOLTAGE	8V-30V	

NOTE:

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

2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

3. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

MODULATION MODE	TX FUNCTION
GSM/GPRS/EDGE	1TX/1RX
LTE	1TX/1RX

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

5. The differences between model C4D-4MUSAC_V8 and ADC-CC110 are as following.

Description	1st	2rd
Product name	Telematic Embedded System	ALARM.COM CAR CONNECTOR
Brand Name	MUNIC	ALARM.COM
Model Name	C4D-4MUSAC_V8	ADC-CC110
Differences	/	Use of a different product name (ALARM.COM CAR CONNECTOR), model name (ADC-CC110) and a

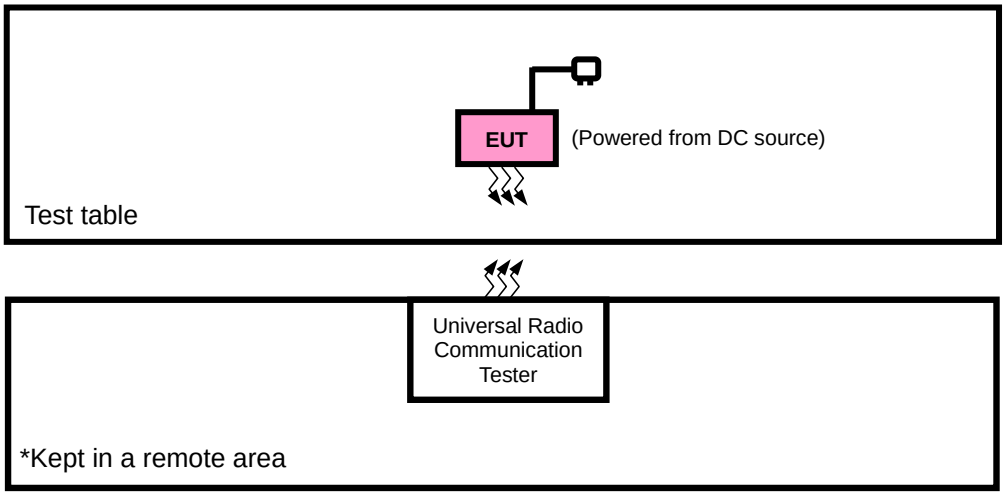
		different trademark (ALARM.COM) for marketing and client requirements.

6. **List of Accessory:**

ACCESSORIES	BRAND	MODEL	SPECIFICATION
Battery	Howell	Li-polymer 552535H	Capacity：Li-ion, 450mAh

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	Laptop	Lenovo	ThinkPad E14	HRSW00024	N/A
2	DC Source	HYELEC	HY3010B	551016	N/A

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

2.4 TEST ITEM AND TEST CONFIGURATION

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

EUT CONFIGURE MODE	DESCRIPTION
A	EUT + DC source with GSM or LTE link

GSM MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
A	EIRP	512 to 810	512, 661, 810	GSM,EDGE
A	FREQUENCY STABILITY	512 to 810	512, 661, 810	GSM,EDGE
A	OCCUPIED BANDWIDTH	512 to 810	512, 661, 810	GSM,EDGE
A	PEAK TO AVERAGE RATIO	512 to 810	512, 661, 810	GSM,EDGE
A	BAND EDGE	512 to 810	512, 810	GSM,EDGE
A	CONDCUDETED EMISSION	512 to 810	512, 661, 810	GSM,EDGE
A	RADIATED EMISSION	512 to 810	512, 661, 810	GSM,EDGE

LTE BAND 2 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	EIRP	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,16QAM,	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK,16QAM	1 RB / 0 RB Offset
A	FREQUENCY STABILITY	18607 to 19193	18607, 19193	1.4MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18615, 19185	3MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625, 19175	5MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18650, 19150	10MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18675, 19125	15MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700, 19100	20MHz	QPSK	1 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,16QAM	6 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK,16QAM	6 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK,16QAM	6 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK,16QAM	6 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK,16QAM	6 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK,16QAM	6 RB / 0 RB Offset
A	PEAK TO AVERAGE RATIO	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK,16QAM	1 RB / 0 RB Offset

A	BAND EDGE	18607 to 19193	18607	1.4MHz	QPSK,16QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			19193	1.4MHz	QPSK,16QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		18615 to 19185	18615	3MHz	QPSK,16QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			19185	3MHz	QPSK,16QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		18625 to 19175	18625	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			19175	5MHz	QPSK,16QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		18650 to 19150	18650	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			19150	10MHz	QPSK,16QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		18675 to 19125	18675	15MHz	QPSK,16QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			19125	15MHz	QPSK,16QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		18700 to 19100	18700	20MHz	QPSK,16QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			19100	20MHz	QPSK,16QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
A	CONDUCTED EMISSION	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK	1 RB / 0 RB Offset
A	RADIATED EMISSION	18607 to 19193	18607,18900,19193	1.4MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18900	3MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18900	5MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18900	10MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18900	15MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18900	20MHz	QPSK	1 RB / 0 RB Offset

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

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP	23deg. C, 70%RH	DC 13.5V/27V By DC Source	Hanwen Xu
FREQUENCY STABILITY	23deg. C, 70%RH	DC 13.5V/27V By DC Source	Hanwen Xu
OCCUPIED BANDWIDTH	23deg. C, 70%RH	DC 13.5V/27V By DC Source	Hanwen Xu
BAND EDGE	23deg. C, 70%RH	DC 13.5V/27V By DC Source	Hanwen Xu
CONDCUDETED EMISSION	23deg. C, 70%RH	DC 13.5V/27V By DC Source	Hanwen Xu
RADIATED EMISSION	23deg. C, 70%RH	DC 13.5V/27V By DC Source	Hanwen Xu
PEAK TO AVERAGE RATIO	23deg. C, 70%RH	DC 13.5V/27V By DC Source	Hanwen Xu

2.5 EUT OPERATING CONDITIONS

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

2.6 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC 47 CFR Part 2

FCC 47 CFR Part 24

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-D

ANSI/TIA/EIA-603-E

ANSI C63.26-2015

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

3 TEST TYPES AND RESULTS

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Mobile and portable stations are limited to 2 watts EIRP.

3.1.2 TEST PROCEDURES

EIRP MEASUREMENT:

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

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

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, typically dBW or dBm);

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

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

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

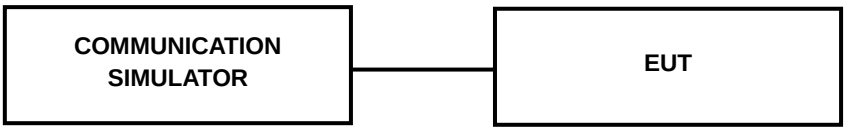
CONDUCTED POWER MEASUREMENT:

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

3.1.3 TEST SETUP

EIRP / ERP Measurement:

CONDUCTED POWER MEASUREMENT:



3.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm) :

Band	GSM1900		
Channel	512	661	810
Frequency	1850.2	1880	1909.8
GPRS 1Tx Slot	29.05	29.03	**29.50**
GPRS 2Tx Slot	29.06	29.19	29.22
GPRS 3Tx Slot	28.88	29.00	29.24
GPRS 4Tx Slot	28.65	28.78	29.01
EDGE 1Tx Slot	25.01	25.09	25.09
EDGE 2Tx Slot	24.92	24.70	25.09
EDGE 3Tx Slot	24.28	24.54	24.61
EDGE 4Tx Slot	24.22	24.26	24.68

LTE BAND 2

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18700	18900	19100
		Frequence (MHz)		1860	1880	1900
20M	QPSK	1	0	22.05	21.86	21.77
		1	5	**22.18**	21.78	21.98
		3	0	22.06	21.76	21.95
		3	3	22.03	21.78	21.89
		6	0	21.94	22.03	21.87
	16QAM	1	0	22.06	21.87	22.02
		1	5	22.06	21.89	21.98
		3	0	21.90	21.84	22.01
		3	3	22.06	22.08	22.09
		6	0	22.00	21.83	21.89
BW	MCS Index	Channel		18675	18900	19125
		Frequence (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	21.89	21.96	21.69
		1	5	21.99	21.87	21.70
		3	0	22.11	21.97	21.93
		3	3	22.16	21.96	22.00
		6	0	21.90	21.79	21.74
	16QAM	1	0	21.98	21.77	21.89
		1	5	21.81	21.86	22.10
		3	0	22.14	21.96	21.96
		3	3	21.90	21.81	22.07
		6	0	22.06	21.89	21.84
BW	MCS Index	Channel		18650	18900	19150
		Frequence (MHz)		1855	1880	1905
10M	QPSK	1	0	21.87	22.05	21.83
		1	5	22.14	22.00	21.79
		3	0	21.90	21.78	21.76
		3	3	21.88	21.86	22.01
		6	0	22.07	21.92	21.92
	16QAM	1	0	22.12	21.74	21.97
		1	5	21.84	22.00	21.79
		3	0	21.97	21.83	21.96
		3	3	22.15	21.90	21.96
		6	0	22.16	21.96	21.86

BW	MCS Index	Channel		18625	18900	19175
		Frequence (MHz)		1852.5	1880	1907.5
5M	QPSK	1	0	22.14	21.93	21.97
		1	5	21.95	22.03	21.91
		3	0	22.07	22.08	21.92
		3	3	21.92	21.78	21.89
		6	0	22.01	21.78	21.89
	16QAM	1	0	22.00	21.83	21.85
		1	5	21.97	21.87	21.89
		3	0	22.00	21.86	21.95
		3	3	22.08	22.06	21.83
		6	0	22.00	21.91	21.89
BW	MCS Index	Channel		18615	18900	19185
		Frequence (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	21.98	21.76	21.81
		1	5	22.14	22.10	22.02
		3	0	21.95	22.08	21.96
		3	3	21.92	21.73	21.94
		6	0	21.88	21.96	21.85
	16QAM	1	0	22.15	21.82	22.00
		1	5	22.09	21.86	21.94
		3	0	21.85	21.92	21.73
		3	3	21.84	22.07	21.75
		6	0	21.99	21.93	21.78
BW	MCS Index	Channel		18607	18900	19193
		Frequence (MHz)		1850.7	1880	1909.3
1.4M	QPSK	1	0	21.99	22.04	21.67
		1	5	22.01	21.82	21.72
		3	0	22.13	21.99	21.82
		3	3	21.92	21.75	21.92
		6	0	22.05	21.96	21.74
	16QAM	1	0	21.97	21.81	22.02
		1	5	22.02	21.96	21.80
		3	0	21.94	21.96	21.85
		3	3	22.13	22.04	21.88
		6	0	21.89	21.95	22.04

EIRP POWER (dBm)

GSM 1900

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
512	1850.2	29.06	0.8	29.86	968.28	2
661	1880	29.19	0.8	29.99	997.7	2
810	1909.8	29.5	0.8	30.3	1071.52	2

EDGE 1900

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
512	1850.2	25.01	0.8	25.81	381.07	2
661	1880	25.09	0.8	25.89	388.15	2
810	1909.8	25.09	0.8	25.89	388.15	2

LTE BAND 2

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18607	1850.7	22.13	0.8	22.93	196.34	2
18900	1880.0	22.04	0.8	22.84	192.31	2
19193	1909.3	21.92	0.8	22.72	187.07	2

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18607	1850.7	22.13	0.8	22.93	196.34	2
18900	1880.0	22.04	0.8	22.84	192.31	2
19193	1909.3	22.04	0.8	22.84	192.31	2

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18615	1851.5	22.14	0.8	22.94	196.79	2
18900	1880	22.1	0.8	22.9	194.98	2
19185	1908.5	22.02	0.8	22.82	191.43	2

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18615	1851.5	22.15	0.8	22.95	197.24	2
18900	1880	22.07	0.8	22.87	193.64	2
19185	1908.5	22	0.8	22.8	190.55	2

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18625	1852.5	22.14	0.8	22.94	196.79	2
18900	1880	22.08	0.8	22.88	194.09	2
19175	1907.5	21.97	0.8	22.77	189.23	2

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18625	1852.5	22.08	0.8	22.88	194.09	2
18900	1880	22.06	0.8	22.86	193.2	2
19175	1907.5	21.95	0.8	22.75	188.36	2

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18650	1855	22.14	0.8	22.94	196.79	2
18900	1880	22.05	0.8	22.85	192.75	2
19150	1905	22.01	0.8	22.81	190.99	2

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18650	1855	22.16	0.8	22.96	197.7	2
18900	1880	22	0.8	22.8	190.55	2
19150	1905	21.97	0.8	22.77	189.23	2

CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18675	1857.5	22.16	0.8	22.96	197.7	2
18900	1880	21.97	0.8	22.77	189.23	2
19125	1902.5	22	0.8	22.8	190.55	2

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18675	1857.5	22.14	0.8	22.94	196.79	2
18900	1880	21.96	0.8	22.76	188.8	2
19125	1902.5	22.1	0.8	22.9	194.98	2

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18700	1860	22.18	0.8	22.98	198.61	2
18900	1880	22.03	0.8	22.83	191.87	2
19100	1900	21.98	0.8	22.78	189.67	2

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18700	1860	22.06	0.8	22.86	193.2	2
18900	1880	22.08	0.8	22.88	194.09	2
19100	1900	22.09	0.8	22.89	194.54	2

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 emission stays within the authorized frequency block.

3.2.2 TEST PROCEDURE

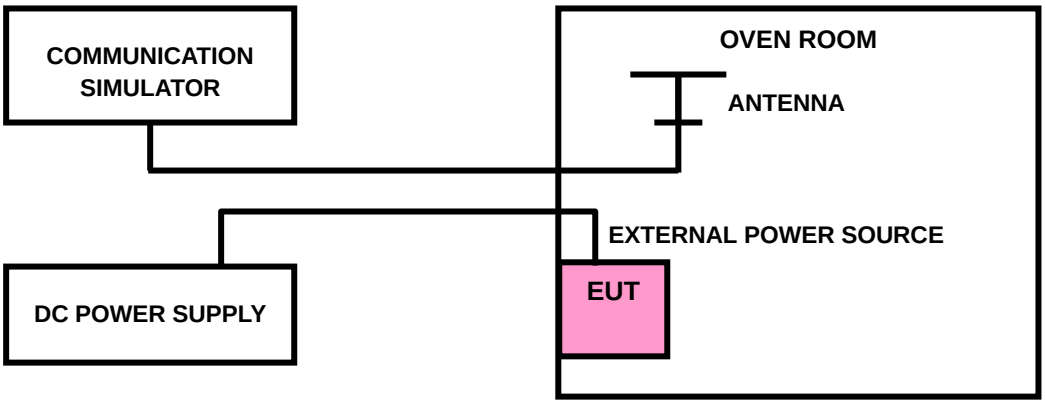
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

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

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

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

3.2.3 TEST SETUP



3.2.4 TEST RESULTS

Please Refer to Appendix Of this test report.

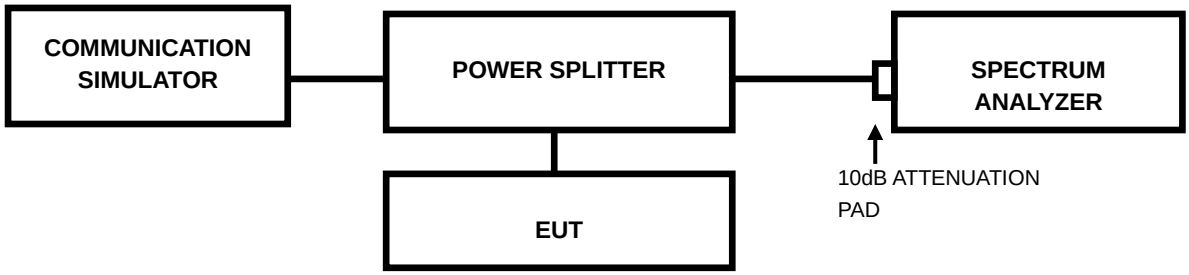
Note: 1.VL = Low voltage(8V); VN/NV = Normal voltage(13.5V/ 27V); VH = High voltage(30V);
NT = Normal temperature (25℃)
2. The frequency fundamental emissions stay within the authorized frequency block.

3.3 OCCUPIED BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

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

3.3.2 TEST SETUP



3.3.3 TEST PROCEDURES

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

3.3.4 TEST RESULTS

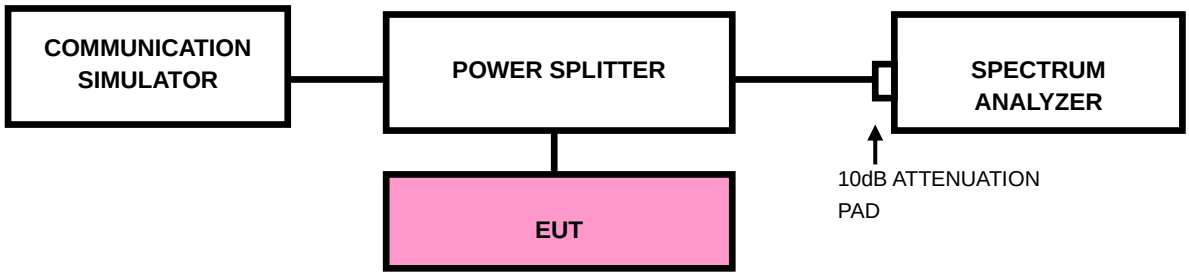
Please Refer to Appendix Of this test report.

3.4 BAND EDGE MEASUREMENTC

3.4.1 LIMITS OF BAND EDGE MEASUREMENT

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

3.4.2 TEST SETUP



3.4.3 TEST PROCEDURES

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

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

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

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

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

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

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

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

i) Use auto-coupled sweep time.

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

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

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

3.4.4. TEST RESULTS

Please Refer to Appendix Of this test report.

3.5 CONDUCTED SPURIOUS EMISSIONS

3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

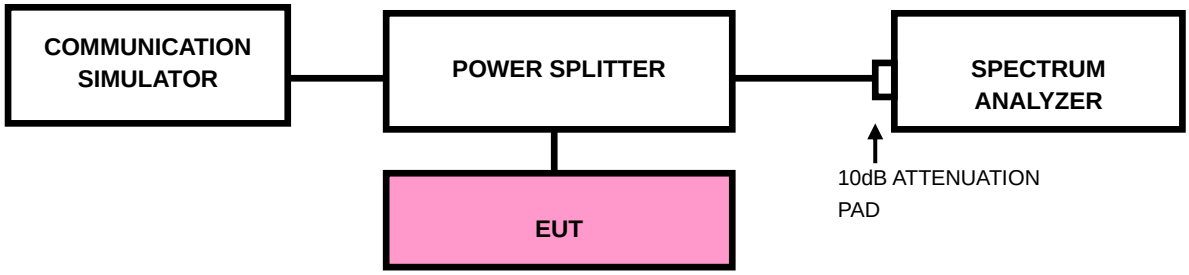
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

3.5.2 TEST PROCEDURE

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

b. Measuring frequency range is from 30MHz up to a frequency including its 10th harmonic. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

3.5.3 TEST SETUP



3.5.4 TEST RESULTS

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

Please Refer to Appendix Of this test report.

3.6 RADIATED EMISSION MEASUREMENT

3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

3.6.2 TEST PROCEDURES

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

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

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

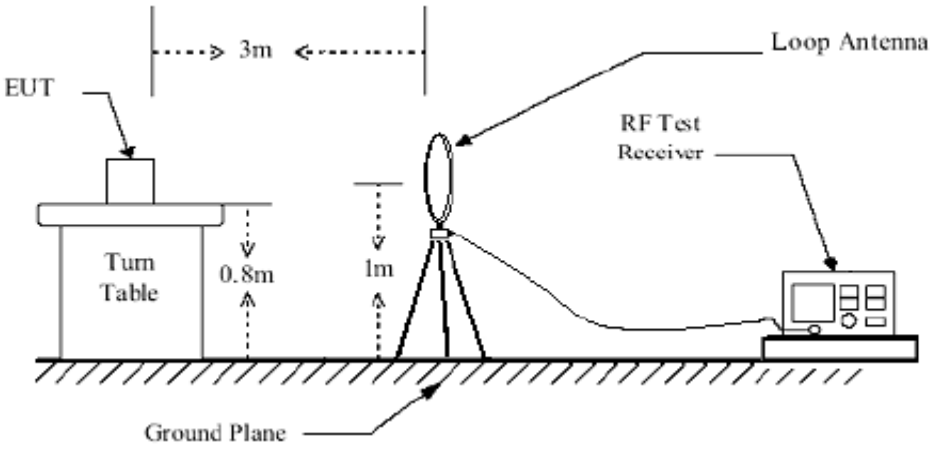
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

3.6.3 DEVIATION FROM TEST STANDARD

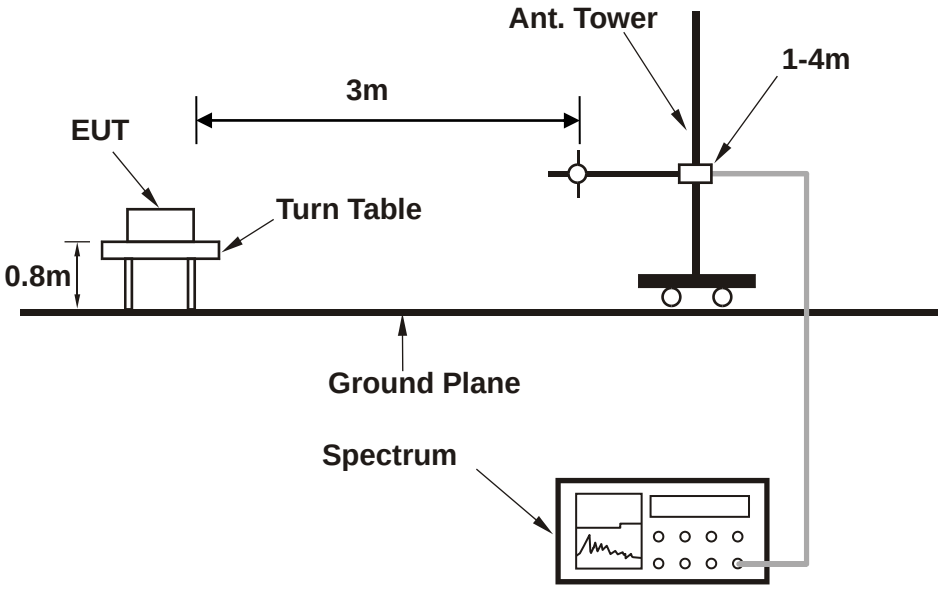
No deviation

3.6.4 TEST SETUP

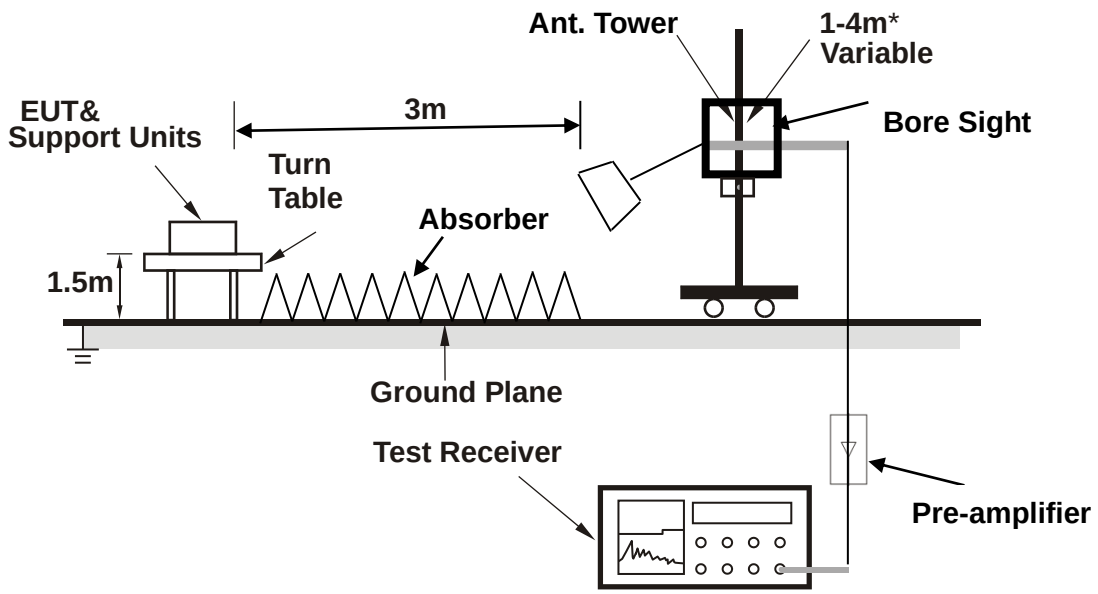
< Frequency Range below 30MHz >



< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna

Depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

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

3.6.5 TEST RESULTS

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

BELOW 1GHz WORST-CASE DATA

30 MHz – 1GHz data:

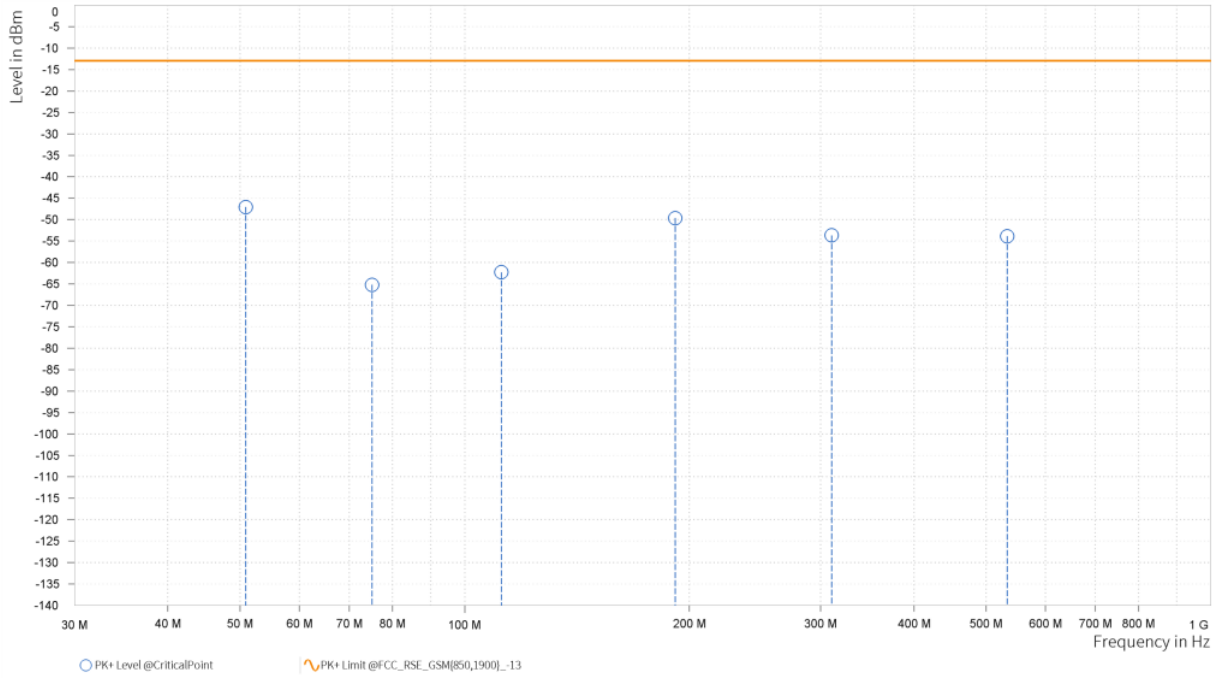
EDGE 1900：

CHANNEL BANDWIDTH:

MODE	TX channel 661	**FREQUENCY RANGE**	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 27V
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	50.855	-47.06	-13.0	34.06	2.61	H	359.1	1.0
1	75.105	-65.23	-13.0	52.23	-7.91	H	198.2	2.0
1	111.965	-62.3	-13.0	49.3	-5.48	H	359.1	1.0
1	191.505	-49.66	-13.0	36.66	0.66	H	216.8	1.0
1	310.33	-53.68	-13.0	40.68	1.59	H	50.7	1.0
1	533.43	-53.89	-13.0	40.89	5.45	H	355.1	2.0

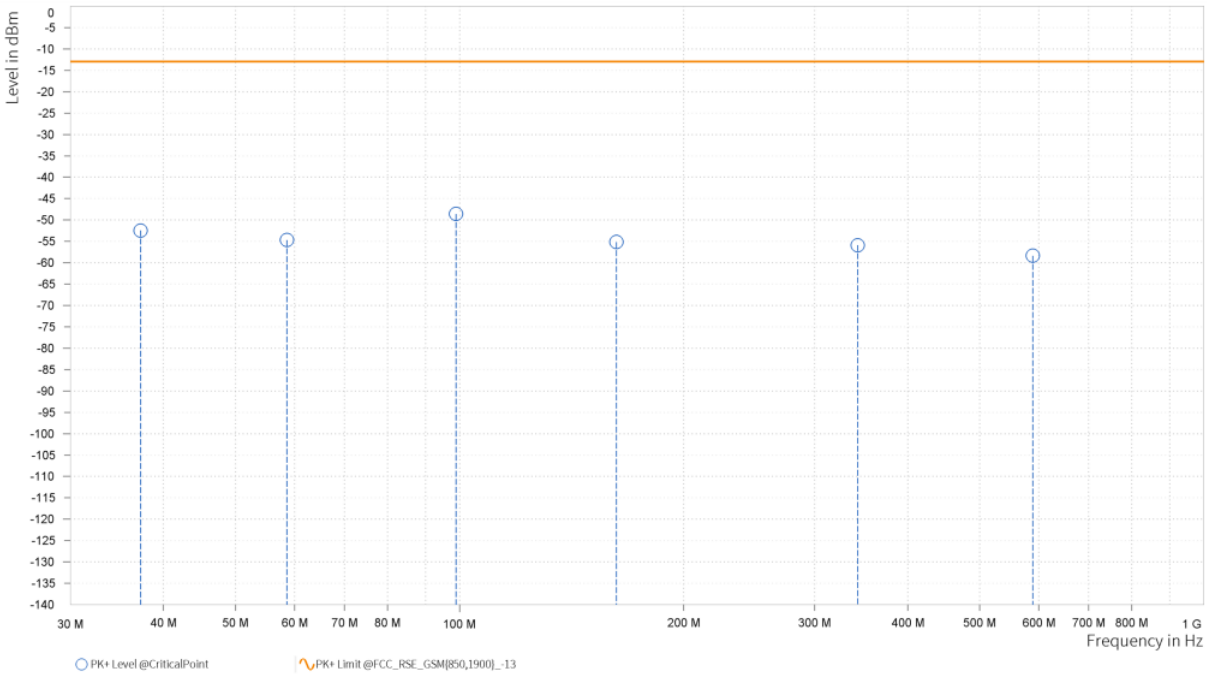


MODE	TX channel 661	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 27V
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

DD

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	37.275	-52.48	-13.0	39.48	-2.86	V	330.4	1.0
1	58.615	-54.68	-13.0	41.68	1.98	V	357.8	1.0
1	98.87	-48.57	-13.0	35.57	10.66	V	359.1	1.0
1	162.405	-55.16	-13.0	42.16	-5.0	V	253.1	2.0
1	342.825	-55.92	-13.0	42.92	5.43	V	163.0	1.0
1	589.205	-58.37	-13.0	45.37	7.11	V	219.2	1.0



ABOVE 1GHz DATA

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

WORST-CASE DATA

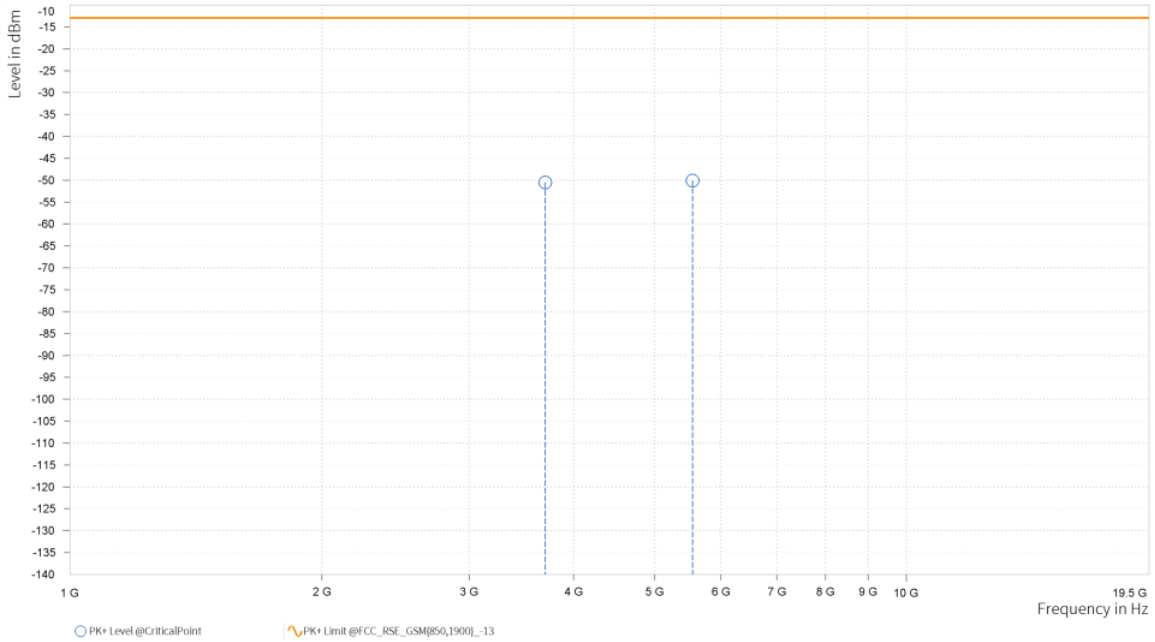
PCS 1900:

CH 512

MODE	TX channel 512	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

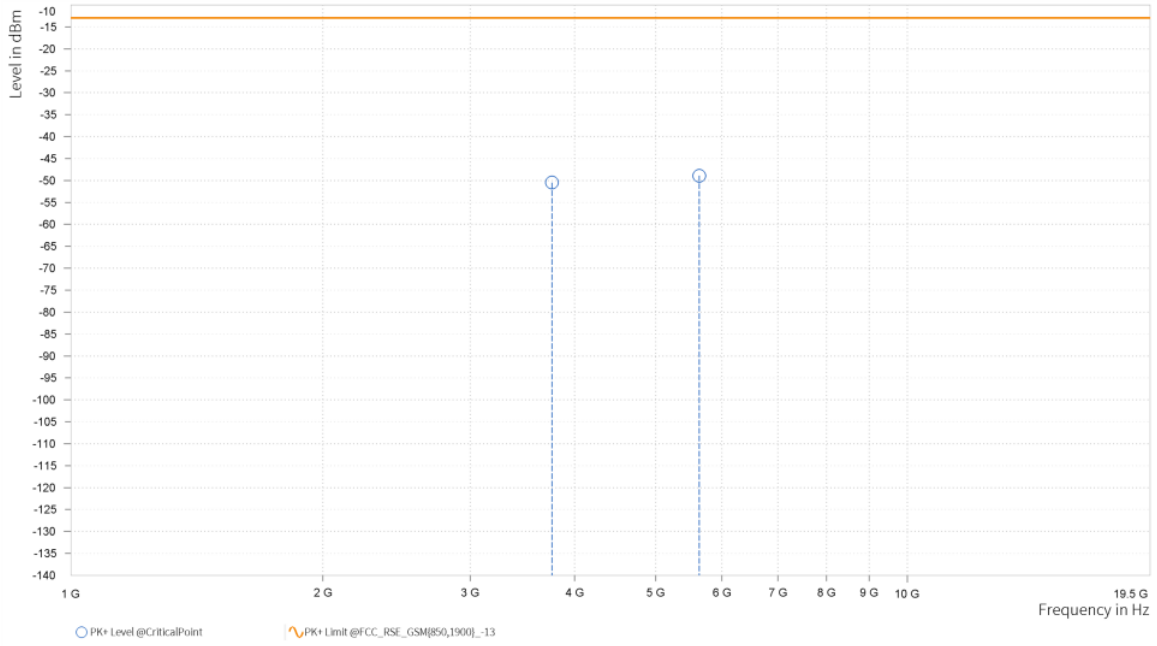
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,700.400	-50.52	-13.0	37.52	20.98	H	1.0	2.0
4	5,550.600	-50.06	-13.0	37.06	23.76	H	125.3	2.0



MODE	TX channel 512	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,760.000	-50.48	-13.0	37.48	21.68	V	0.9	2.0
4	5,640.000	-48.9	-13.0	35.9	24.46	V	0.9	2.0

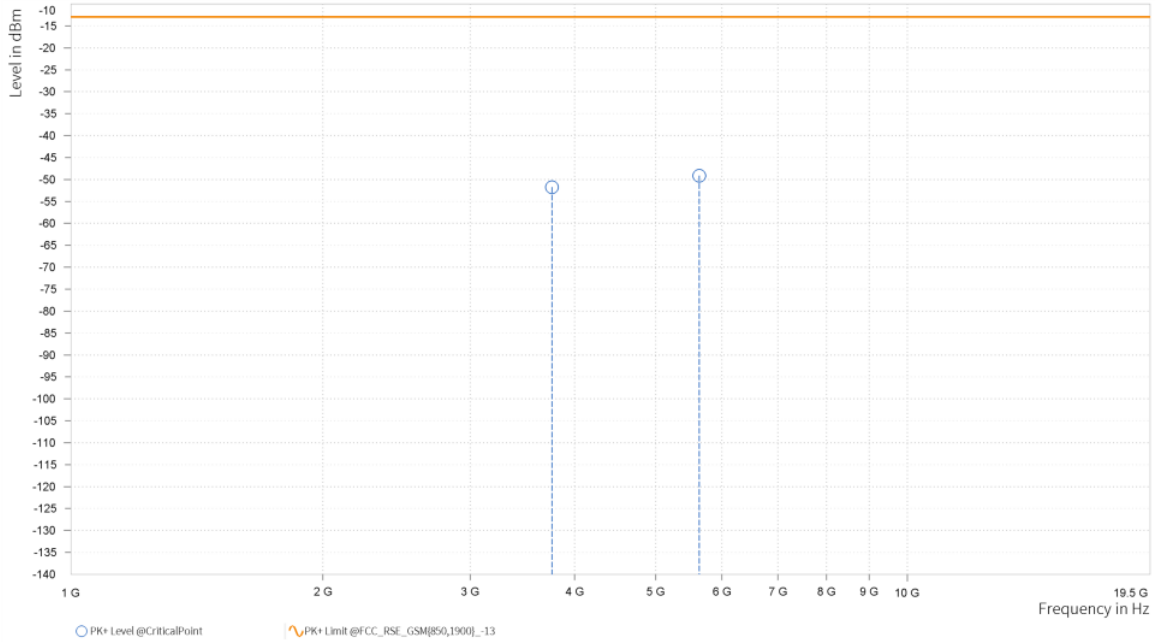


CH 661

MODE	TX channel 661	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

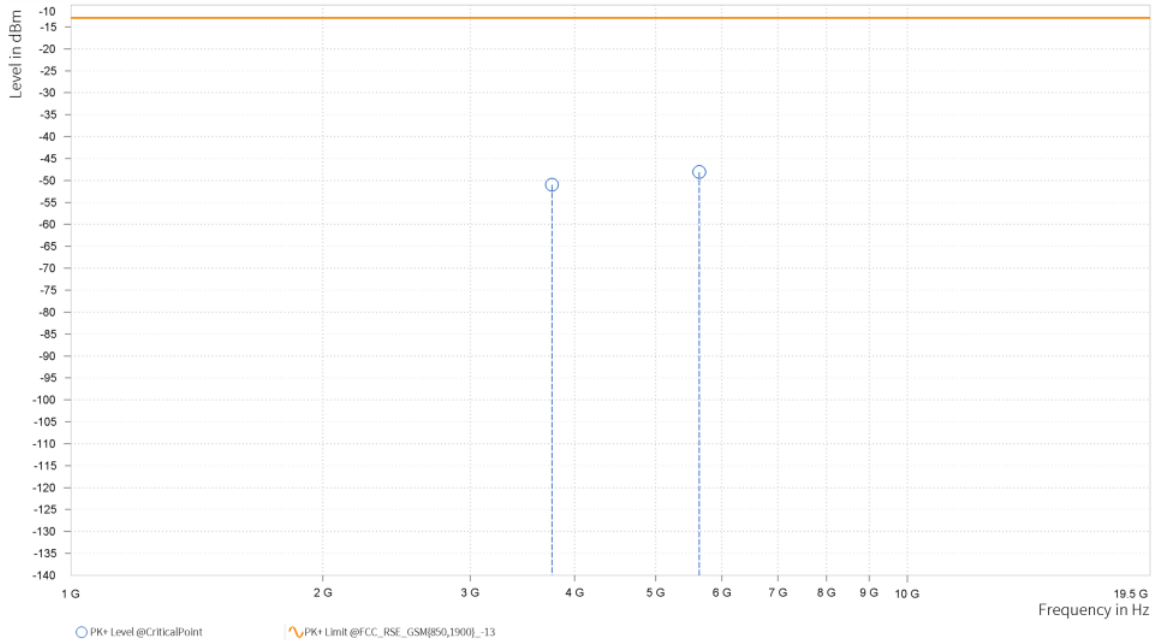
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,760.000	-51.76	-13.0	38.76	21.19	H	122.8	2.0
4	5,640.000	-49.11	-13.0	36.11	24.12	H	359.0	1.0



MODE	TX channel 661	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,760.000	-50.98	-13.0	37.98	21.68	V	257.4	1.0
4	5,640.000	-48.08	-13.0	35.08	24.46	V	1.0	2.0

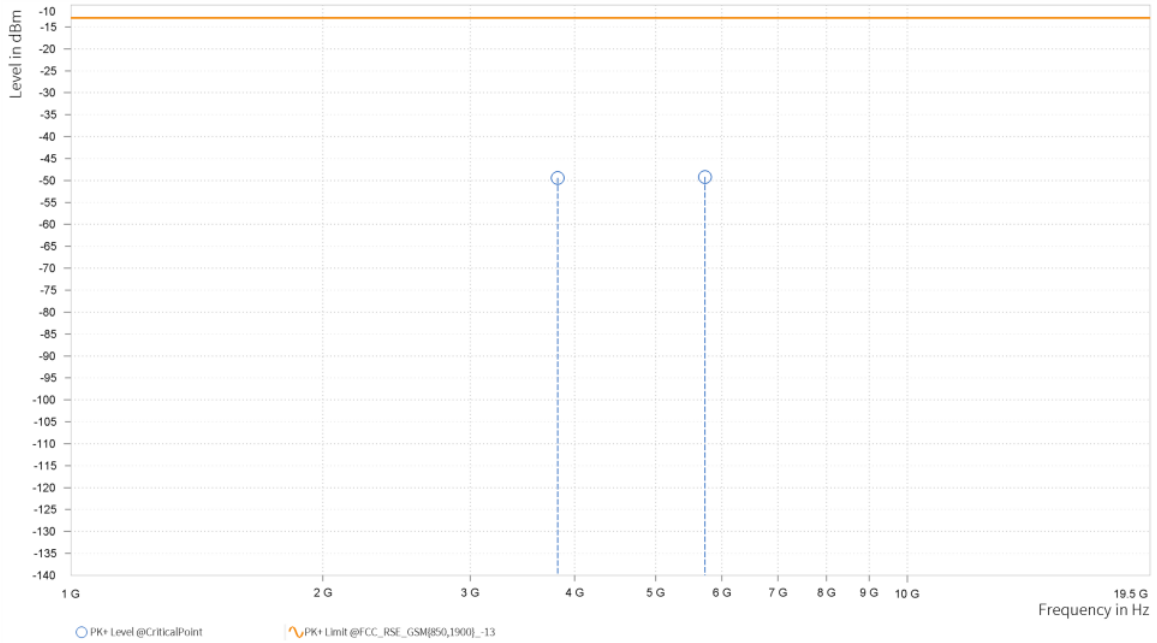


CH 810

MODE	TX channel 810	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

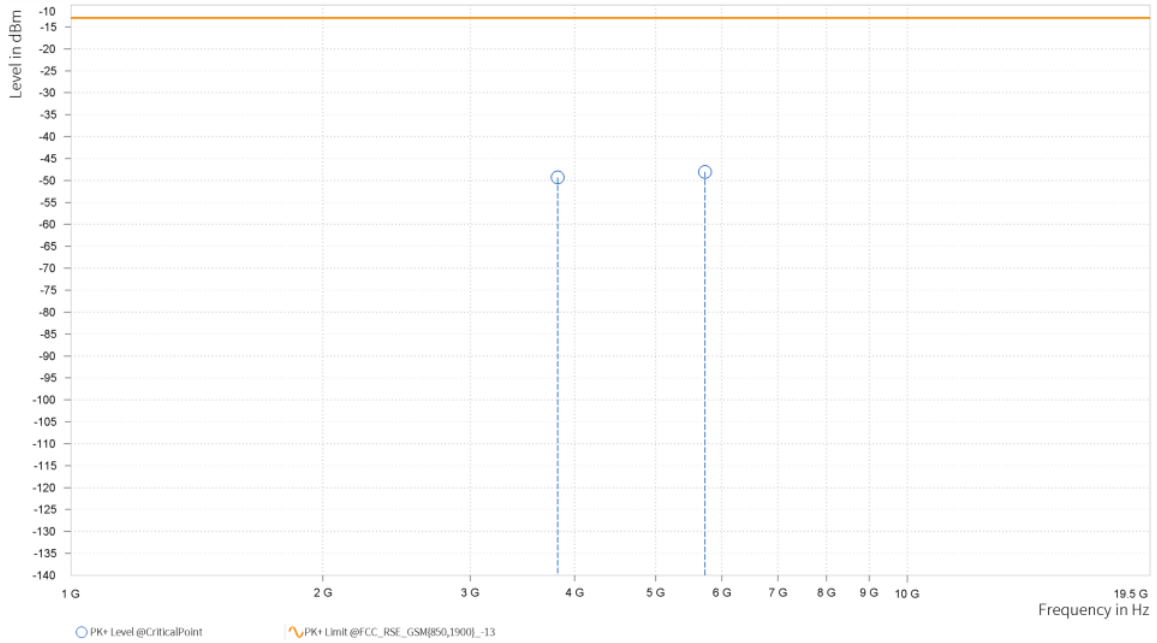
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,819.600	-49.43	-13.0	36.43	21.85	H	359.0	2.0
4	5,729.400	-49.22	-13.0	36.22	24.45	H	122.8	2.0



MODE	TX channel 810	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,819.600	-49.3	-13.0	36.3	22.2	V	238.3	1.0
4	5,729.400	-48.03	-13.0	35.03	24.92	V	1.0	1.0



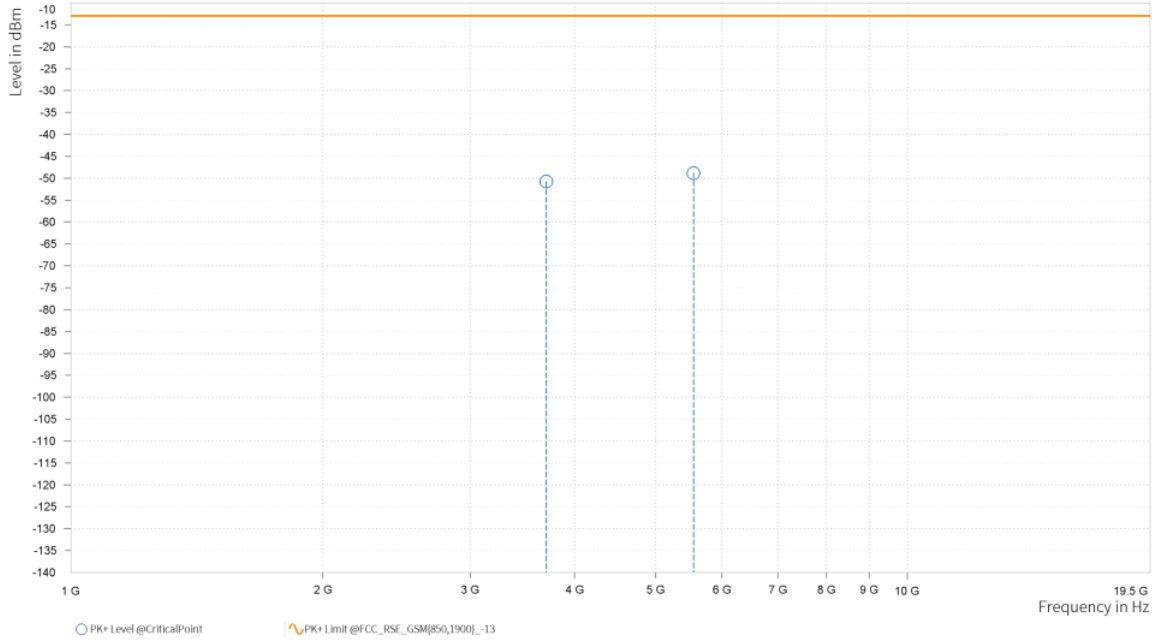
EDGE 1900:

CH 512

MODE	TX channel 512	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

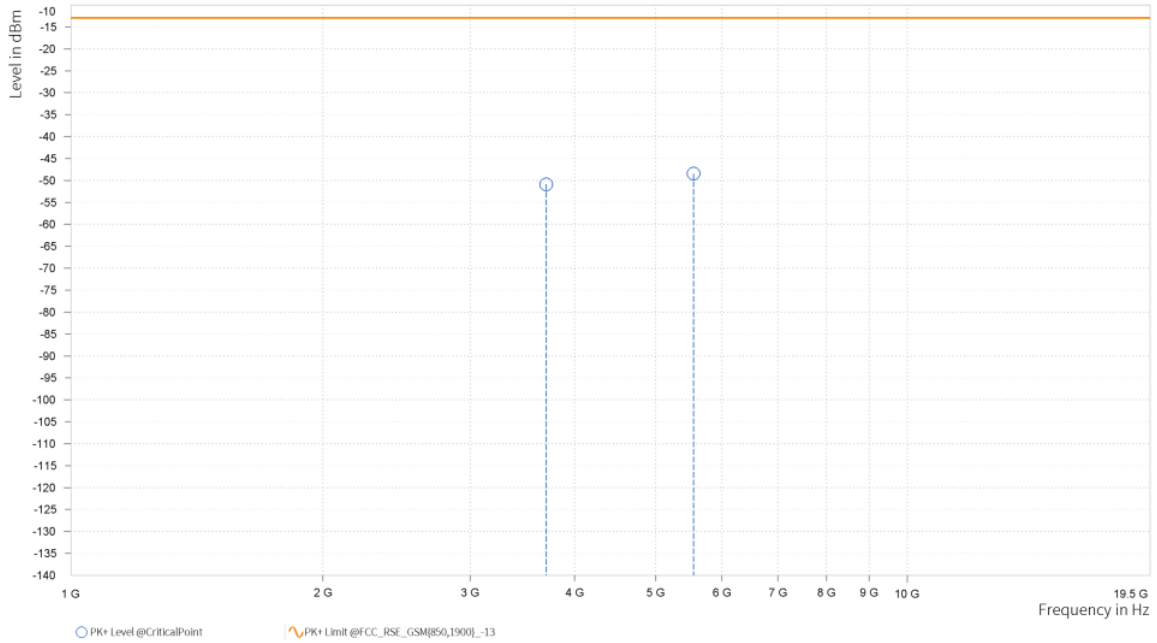
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,700.400	-50.74	-13.0	37.74	20.98	H	359.0	2.0
4	5,550.600	-48.84	-13.0	35.84	23.76	H	359.1	1.0



MODE	TX channel 512	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,700.400	-50.87	-13.0	37.87	21.57	V	359.1	1.0
4	5,550.600	-48.44	-13.0	35.44	24.45	V	112.1	2.0

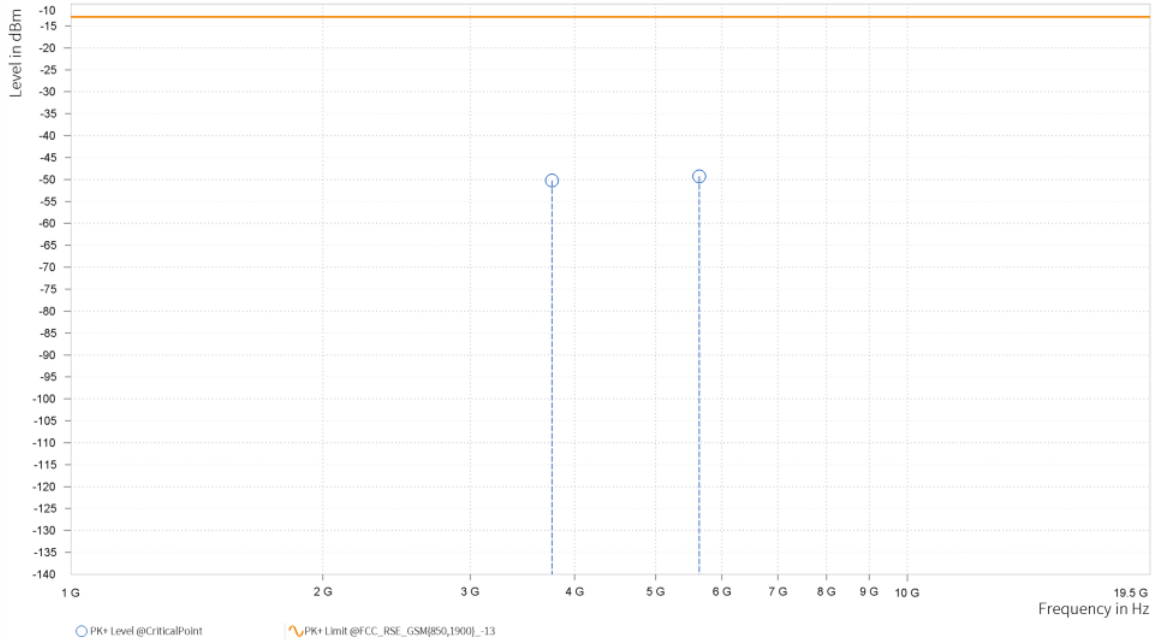


CH 661

MODE	TX channel 661	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

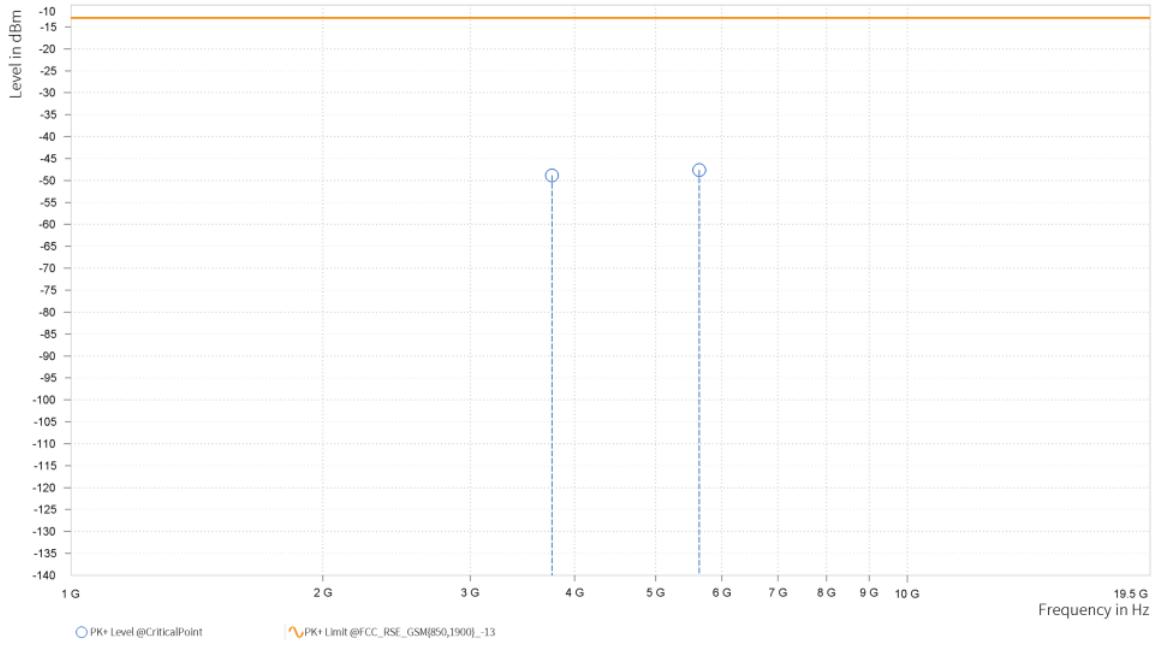
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,760.000	-50.25	-13.0	37.25	21.19	H	1	2.0
4	5,640.000	-49.28	-13.0	36.28	24.12	H	236	1.0



MODE	TX channel 661	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,760.000	-48.85	-13.0	35.85	21.68	V	121.6	2.0
4	5,640.000	-47.59	-13.0	34.59	24.46	V	121.6	2.0

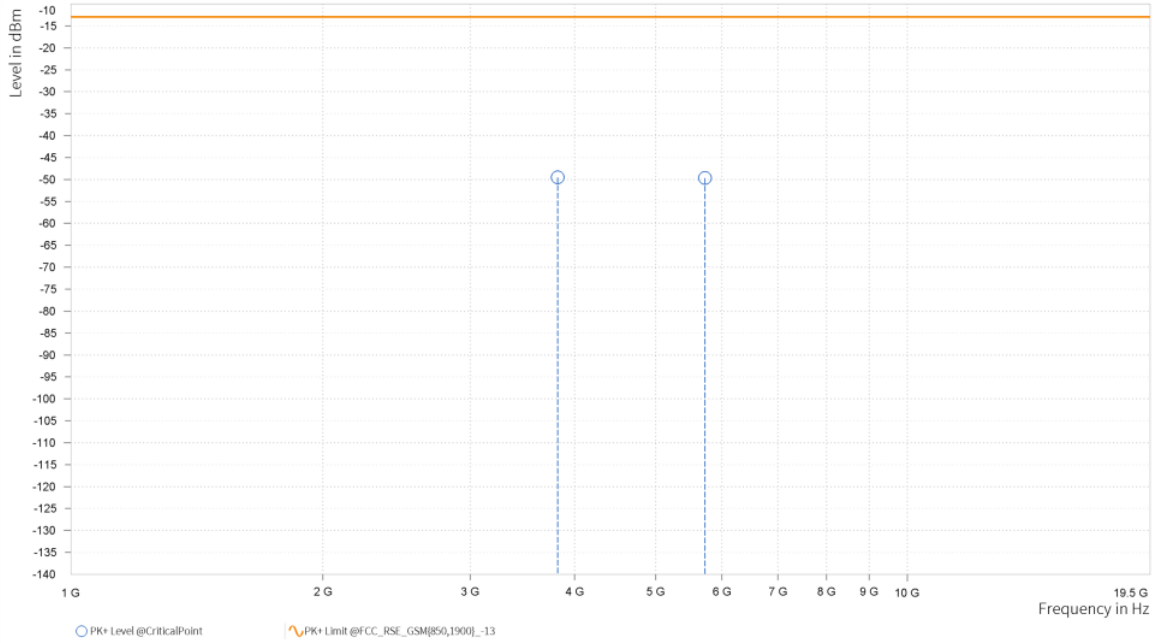


CH 810

MODE	TX channel 810	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

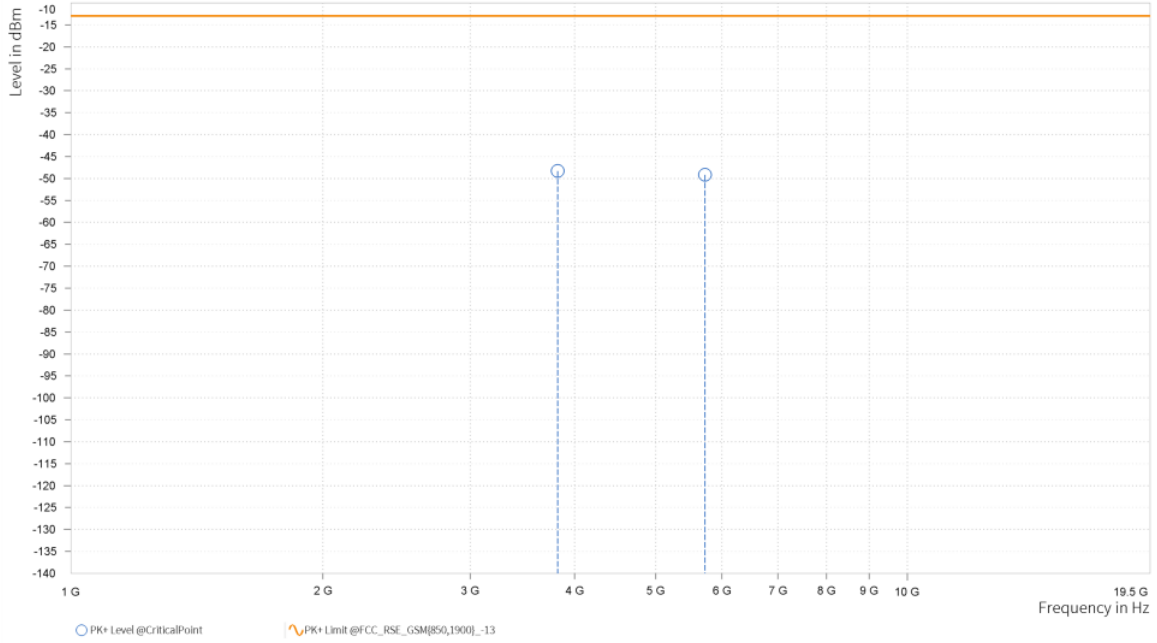
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,819.600	-49.53	-13.0	36.53	21.85	H	99.0	2.0
4	5,729.400	-49.68	-13.0	36.68	24.45	H	0.9	2.0



MODE	TX channel 810	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,819.600	-48.28	-13.0	35.28	22.2	V	251.4	1.0
4	5,729.400	-49.18	-13.0	36.18	24.92	V	359.1	1.0



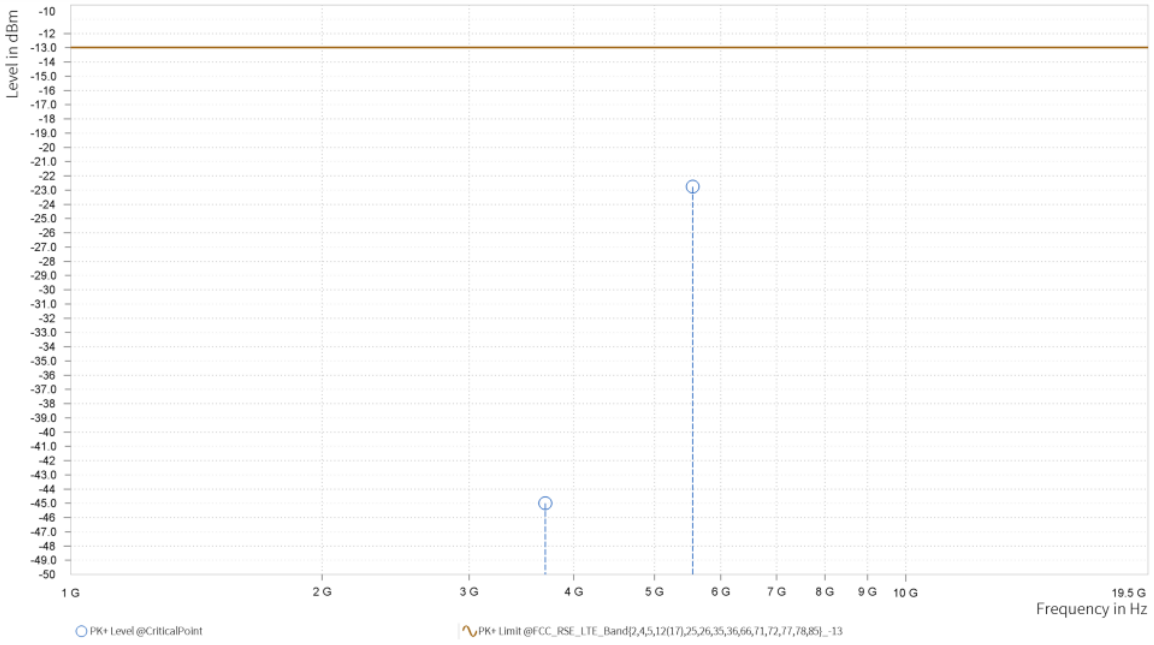
LTE Band 2

CHANNEL BANDWIDTH: 1.4MHz / QPSK

MODE	TX channel 18607	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

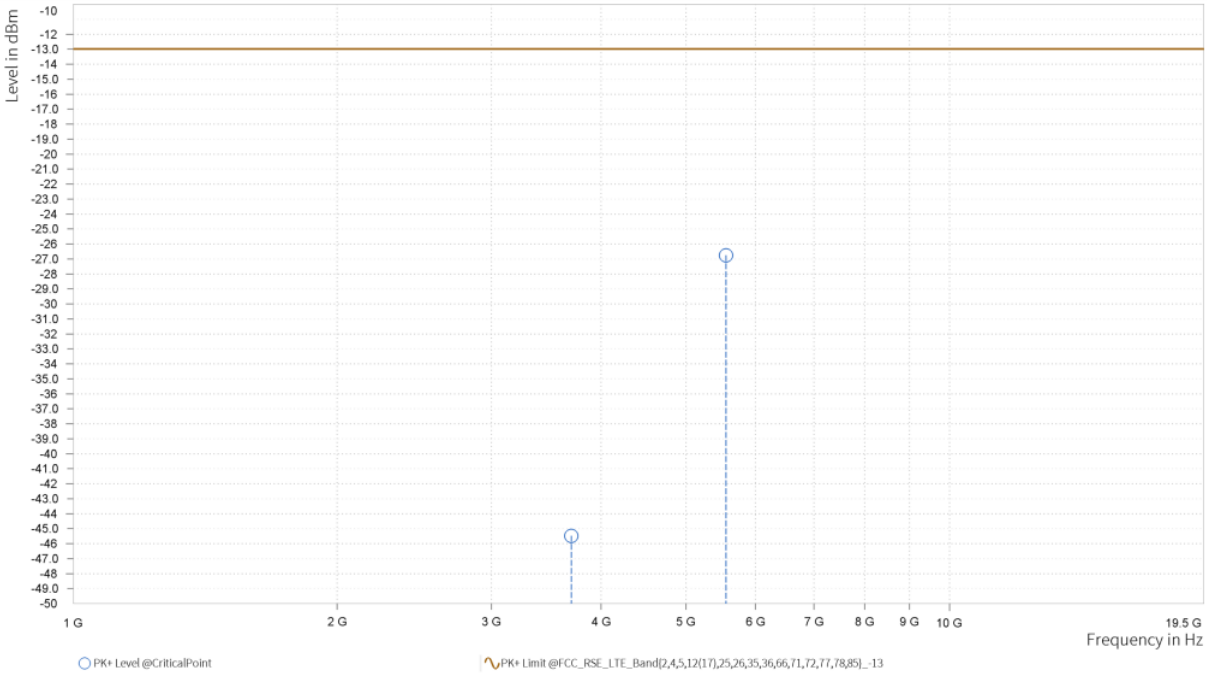
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,700.000	-45.0	-13.0	32.0	27.67	H	0.9	2.0
4	5,553.500	-22.77	-13.0	9.77	31.31	H	102.4	2.0



MODE	TX channel 18607	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

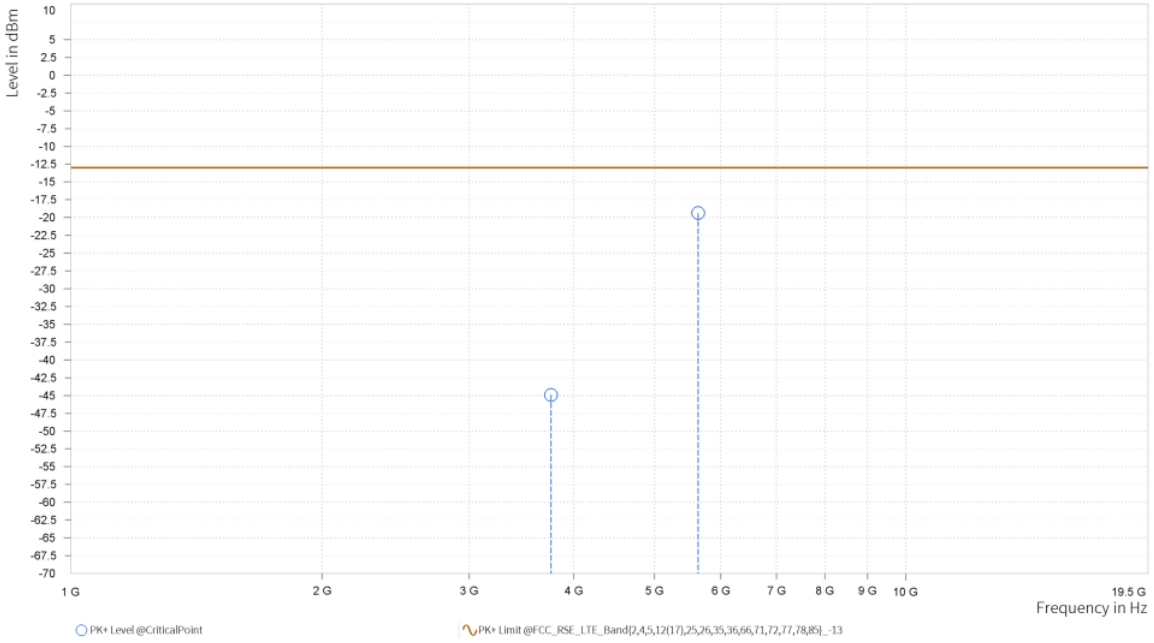
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,700.140	-45.48	-13.0	32.48	27.49	V	300.8	1.0
4	5,553.500	-26.75	-13.0	13.75	31.06	V	359.0	2.0



MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

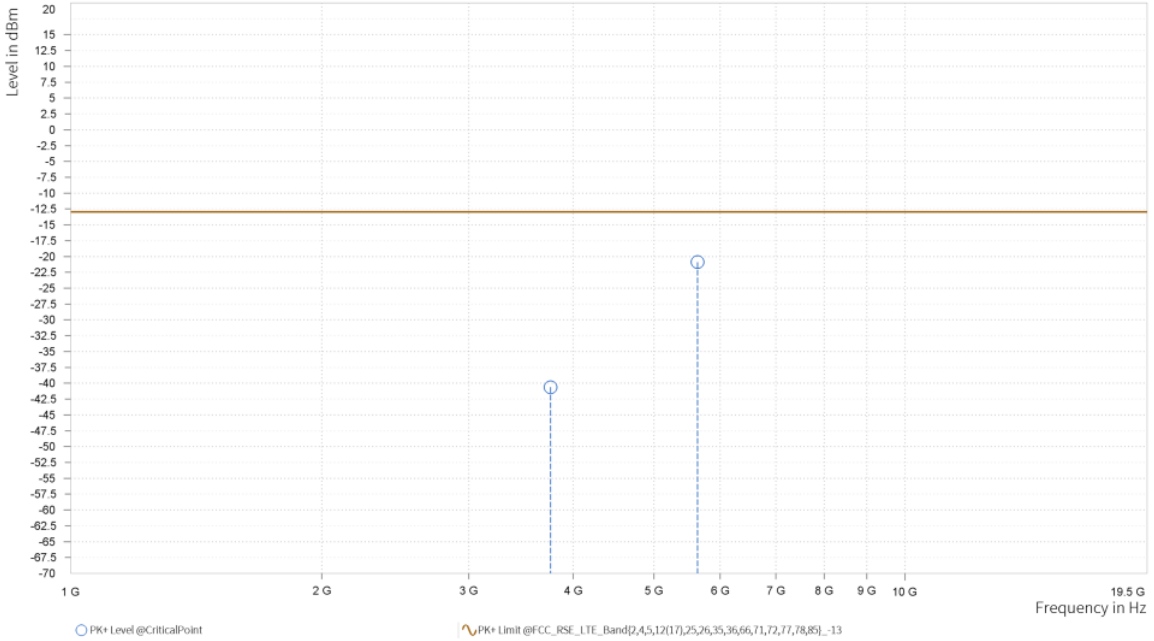
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,758.740	-44.93	-13.0	31.93	27.6	H	1.0	1.0
4	5,639.000	-19.36	-13.0	6.36	32.05	H	109.5	2.0



MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

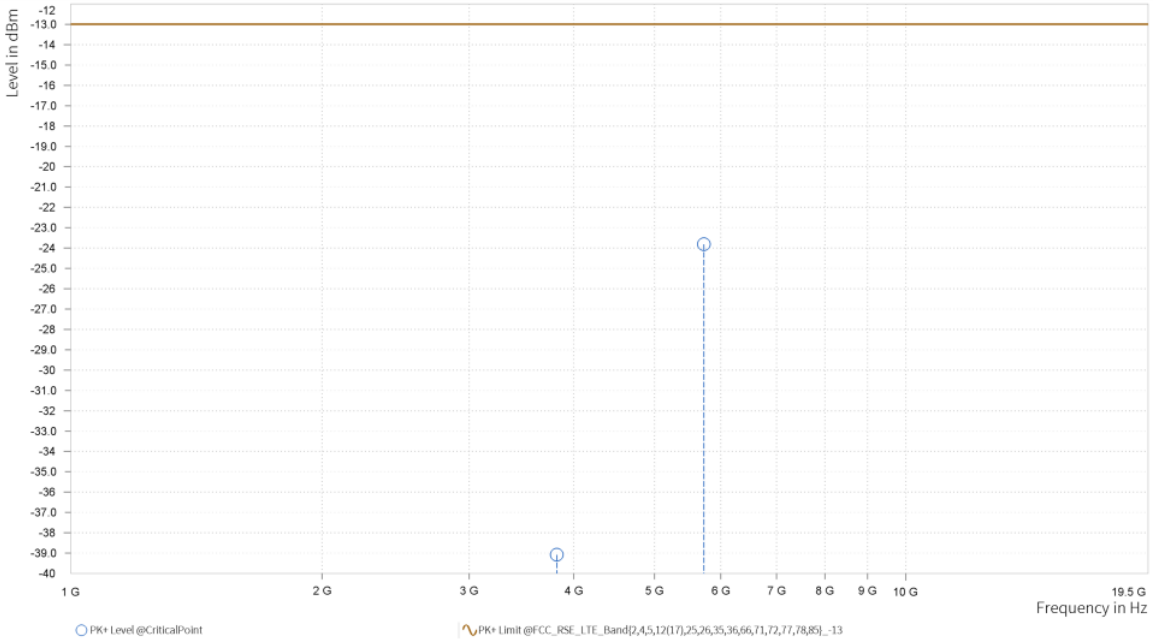
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,758.740	-40.62	-13.0	27.62	27.3	V	1	1.0
4	5,639.000	-20.88	-13.0	7.88	31.79	V	359	2.0



MODE	TX channel 19193	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

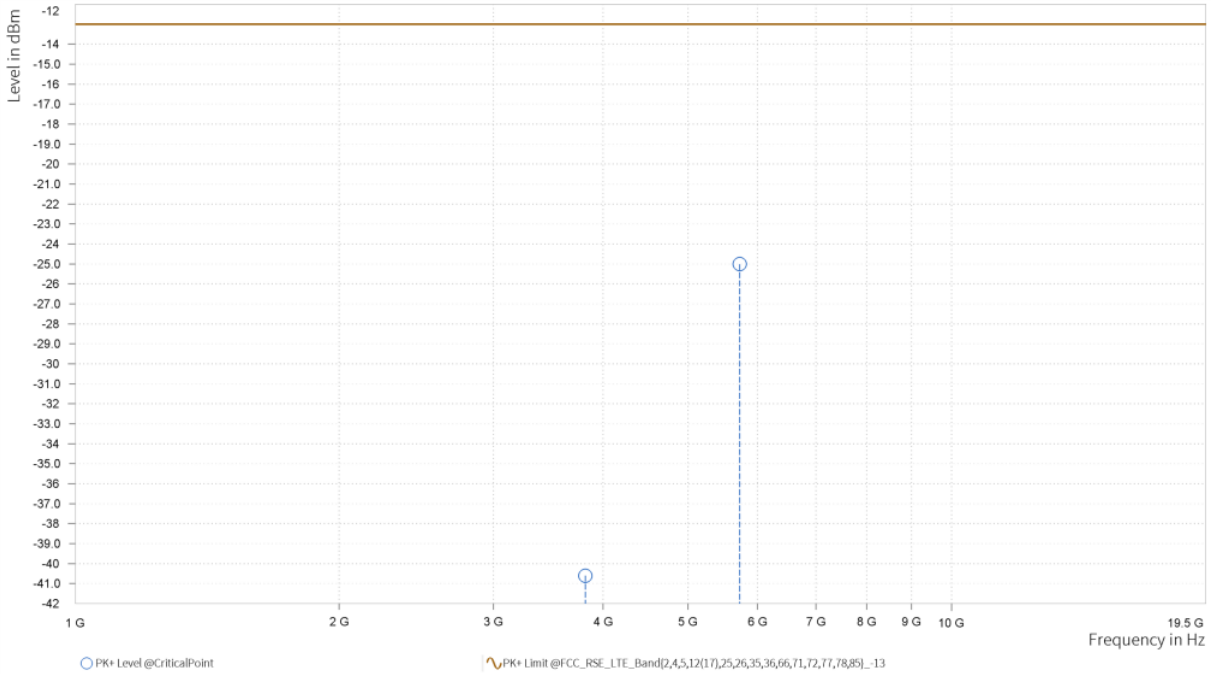
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,819.500	-39.08	-13.0	26.08	27.77	H	359.0	2.0
4	5,729.000	-23.82	-13.0	10.82	34.04	H	108.3	2.0



MODE	TX channel 19193	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,817.340	-40.61	-13.0	27.61	27.55	V	359.1	1.0
4	5,727.000	-25.01	-13.0	12.01	33.76	V	0.8	2.0

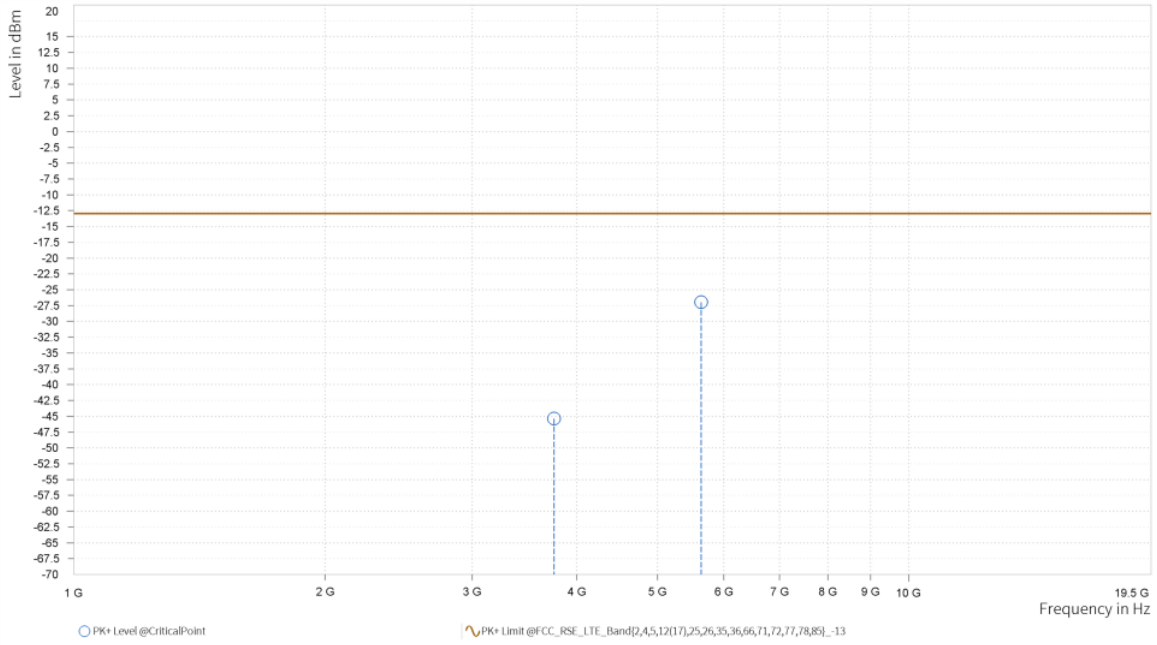


CHANNEL BANDWIDTH: 3MHz / QPSK

MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

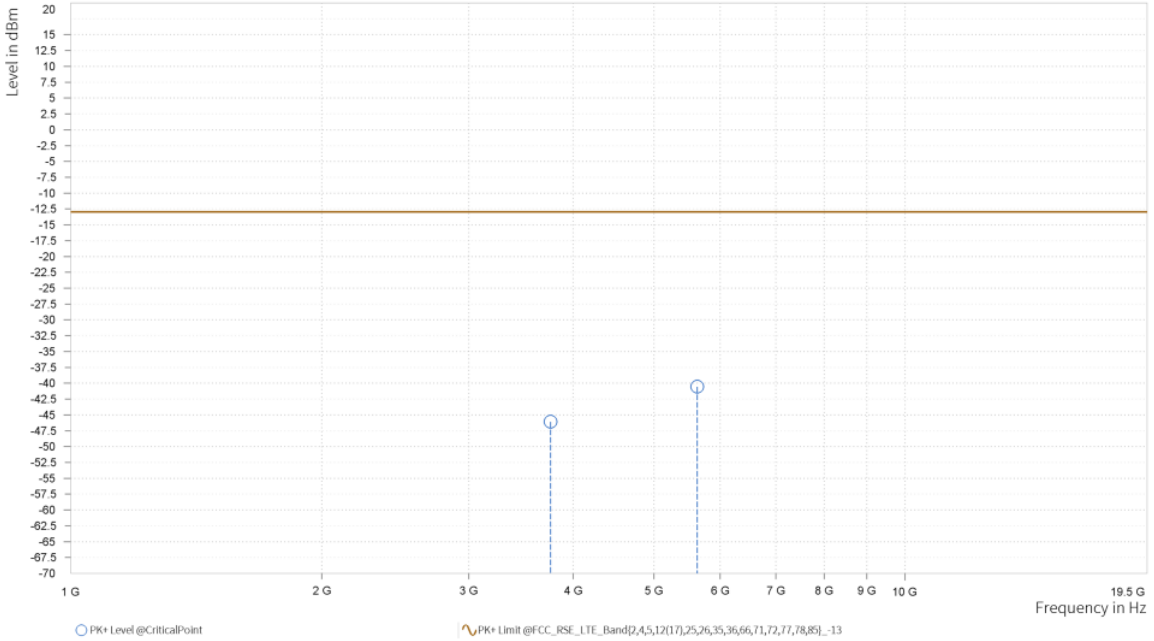
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,757.300	-45.37	-13.0	32.37	27.58	H	1.0	1.0
4	5,637.000	-26.96	-13.0	13.96	32.39	H	248.2	1.0



MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,757.300	-46.08	-13.0	33.08	27.27	V	1.0	2.0
4	5,635.950	-40.54	-13.0	27.54	32.29	V	256.6	1.0

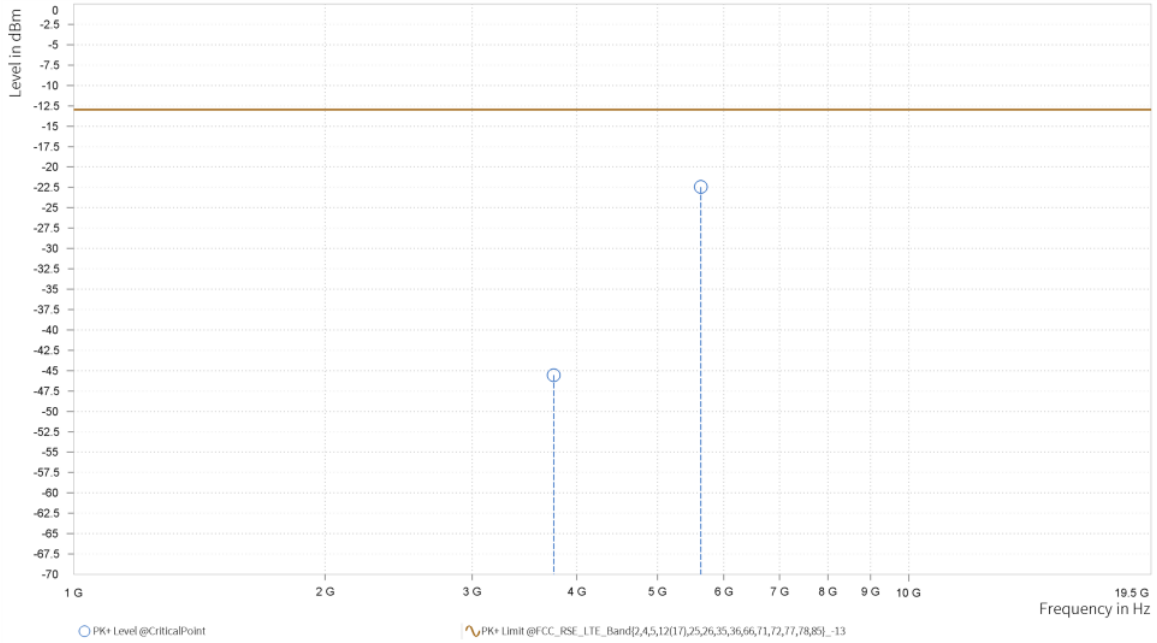


CHANNEL BANDWIDTH: 5MHz / QPSK

MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

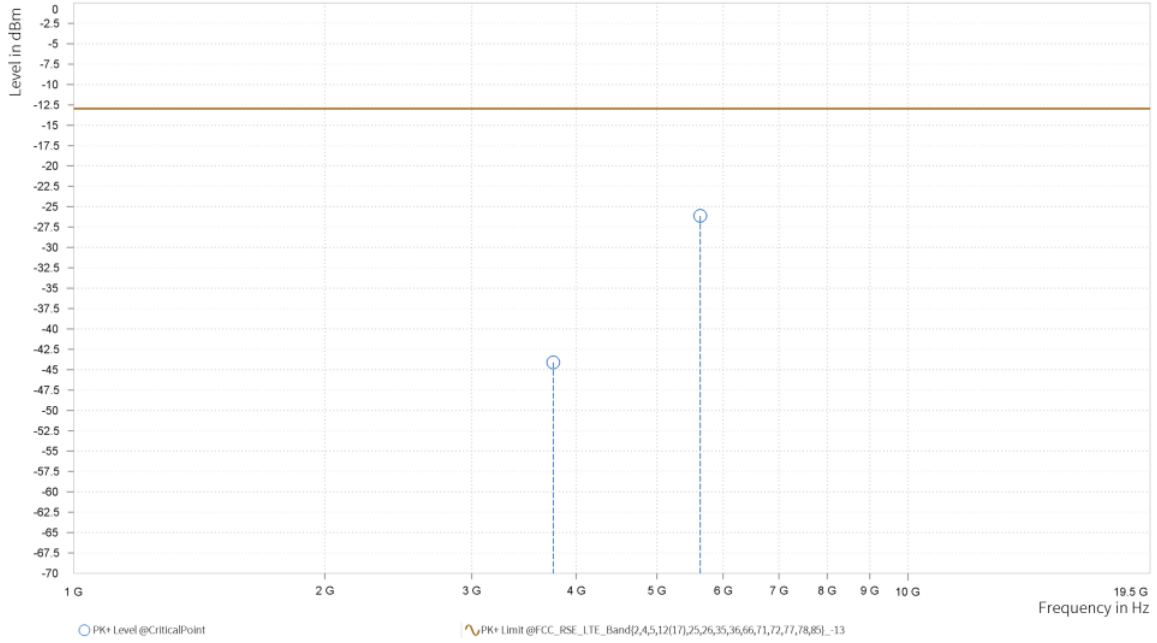
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,755.500	-45.54	-13.0	32.54	27.53	H	359.1	1.0
4	5,634.000	-22.46	-13.0	9.46	32.89	H	359.1	1.0



MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,755.500	-44.09	-13.0	31.09	27.23	V	359	2.0
4	5,633.000	-26.13	-13.0	13.13	32.79	V	359	2.0

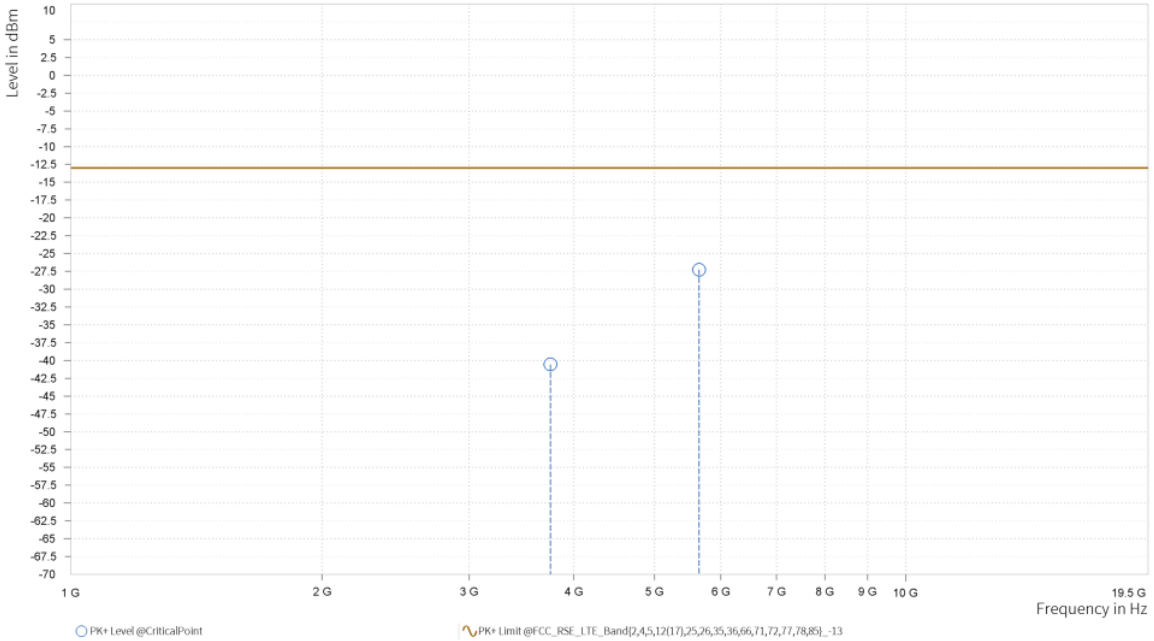


CHANNEL BANDWIDTH: 10MHz / QPSK

MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

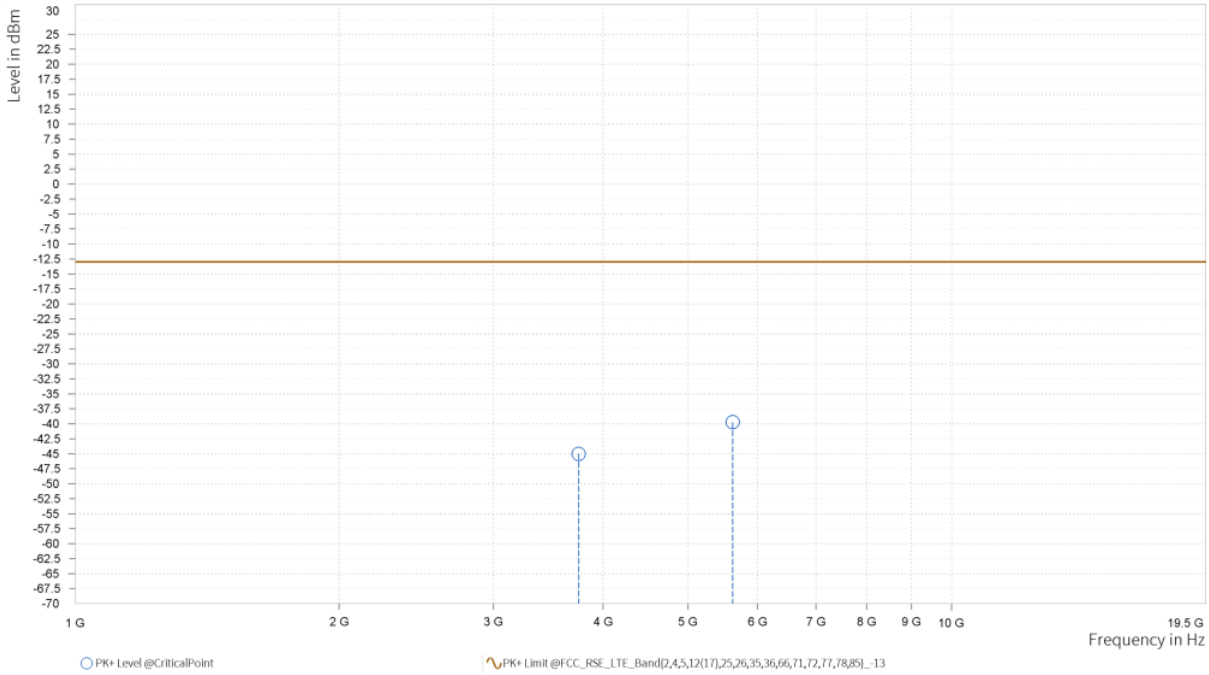
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,751.000	-40.55	-13.0	27.55	27.42	H	359.1	1.0
4	5,653.000	-27.25	-13.0	14.25	32.34	H	359.1	1.0



MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,751.000	-45.0	-13.0	32.0	27.13	V	1.0	1.0
4	5,626.500	-39.74	-13.0	26.74	33.0	V	99.9	2.0



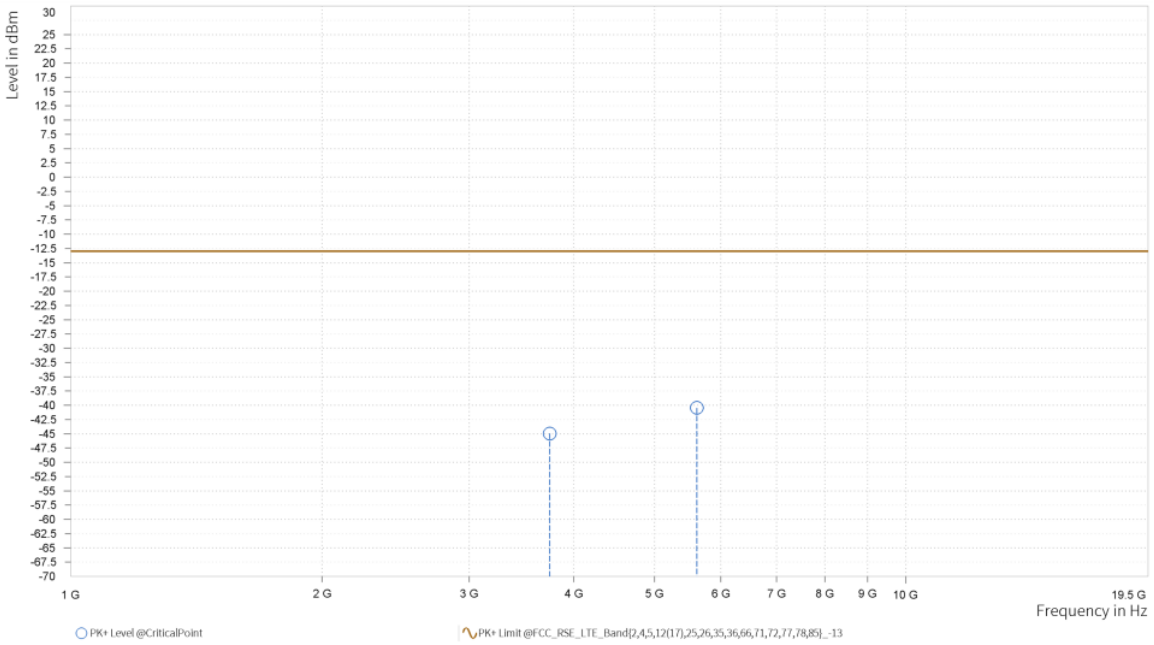
CHANNEL BANDWIDTH: 15MHz / QPSK

CH18900

MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

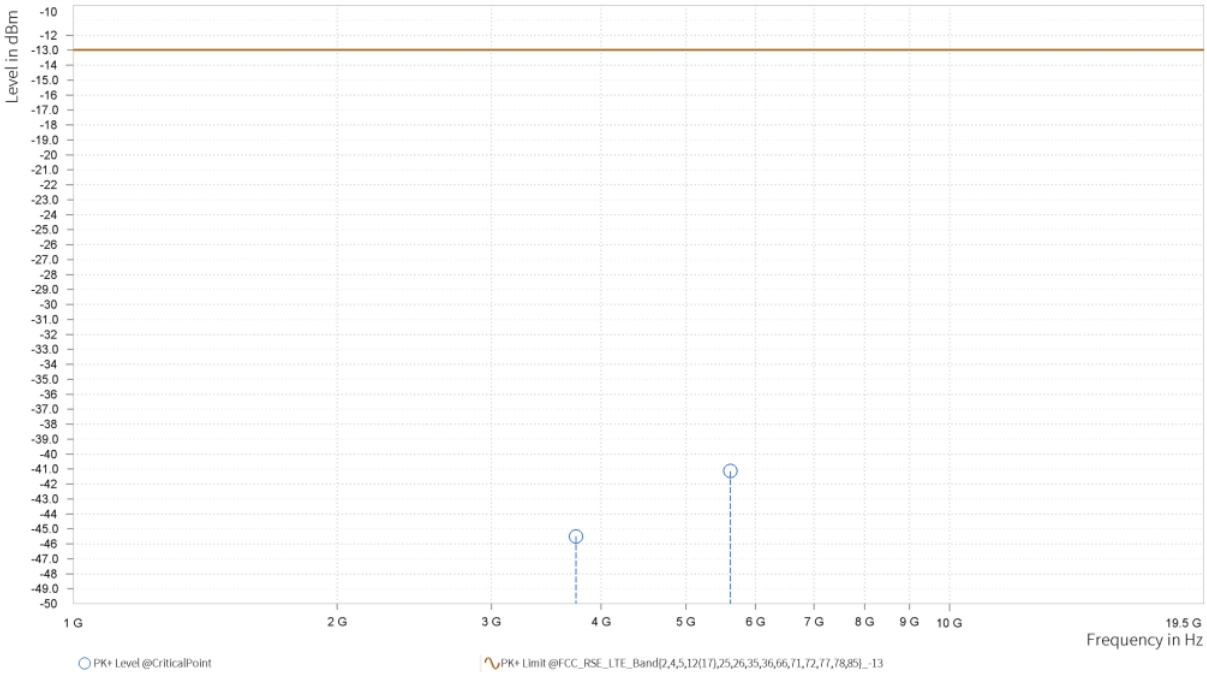
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,746.500	-44.95	-13.0	31.95	27.26	H	359.0	1.0
4	5,619.750	-40.45	-13.0	27.45	32.7	H	0.9	2.0



MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,746.500	-45.5	-13.0	32.5	26.98	V	0.9	2.0
4	5,619.750	-41.14	-13.0	28.14	32.44	V	256.5	1.0

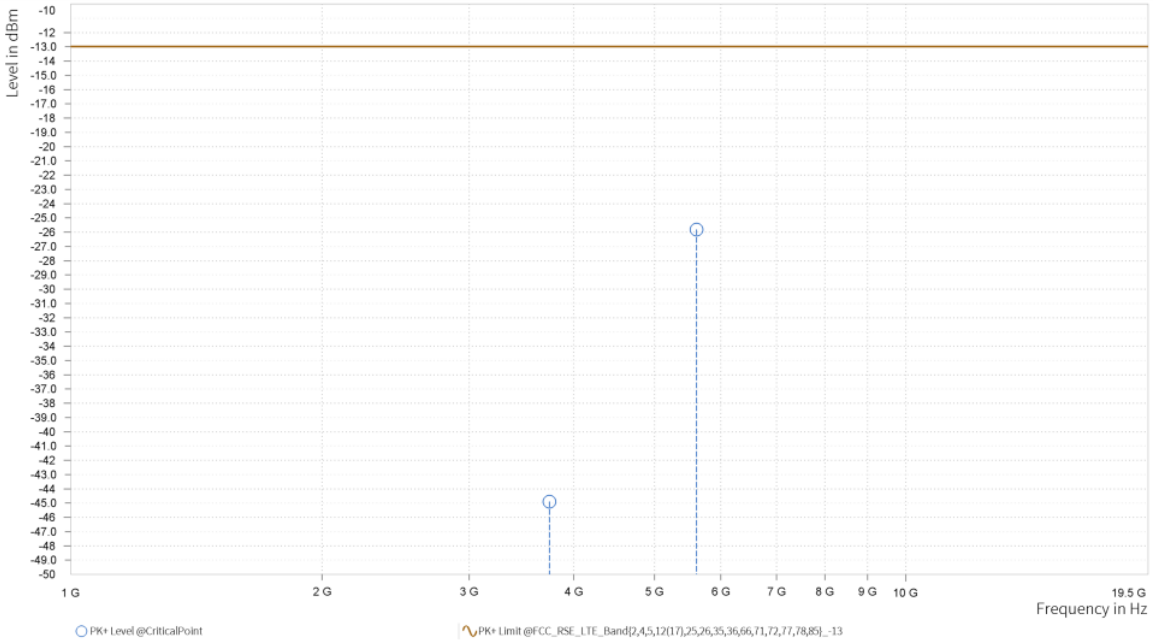


CHANNEL BANDWIDTH: 20MHz / QPSK

MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

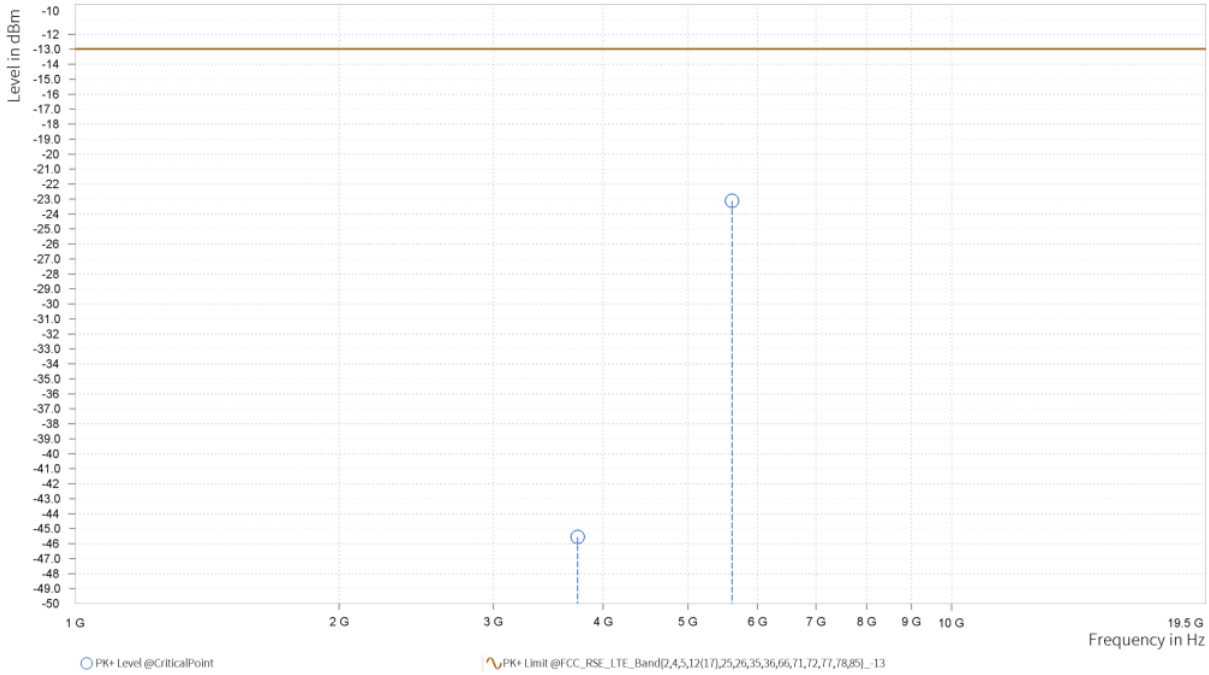
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,742.000	-44.9	-13.0	31.9	27.1	H	359.1	1.0
4	5,614.500	-25.82	-13.0	12.82	32.57	H	291.2	1.0



MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,742.000	-45.56	-13.0	32.56	26.83	V	1.0	1.0
4	5,614.500	-23.13	-13.0	10.13	32.31	V	105.9	2.0

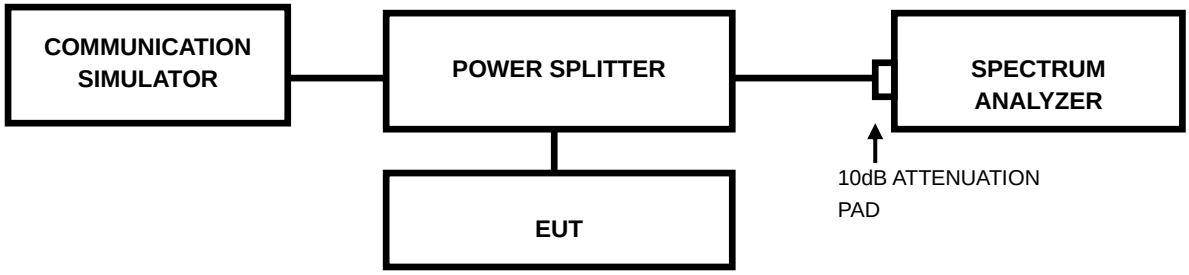


3.7 PEAK TO AVERAGE RATIO

3.7.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

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

3.7.2 TEST SETUP



3.7.3 TEST PROCEDURES

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

3.7.4 TEST RESULTS

Please Refer to Appendix Of this test report.

4 INFORMATION ON THE TESTING LABORATORIES

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

Huarui 7Layers High Technology (Suzhou) Co., Ltd.
Lab Address:
Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province
Accredited Test Lab Cert 6613.01

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

Suzhou EMC/RF Lab:
Tel: +86 (0557) 368 1008

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

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

6 Appendix

GSM1900

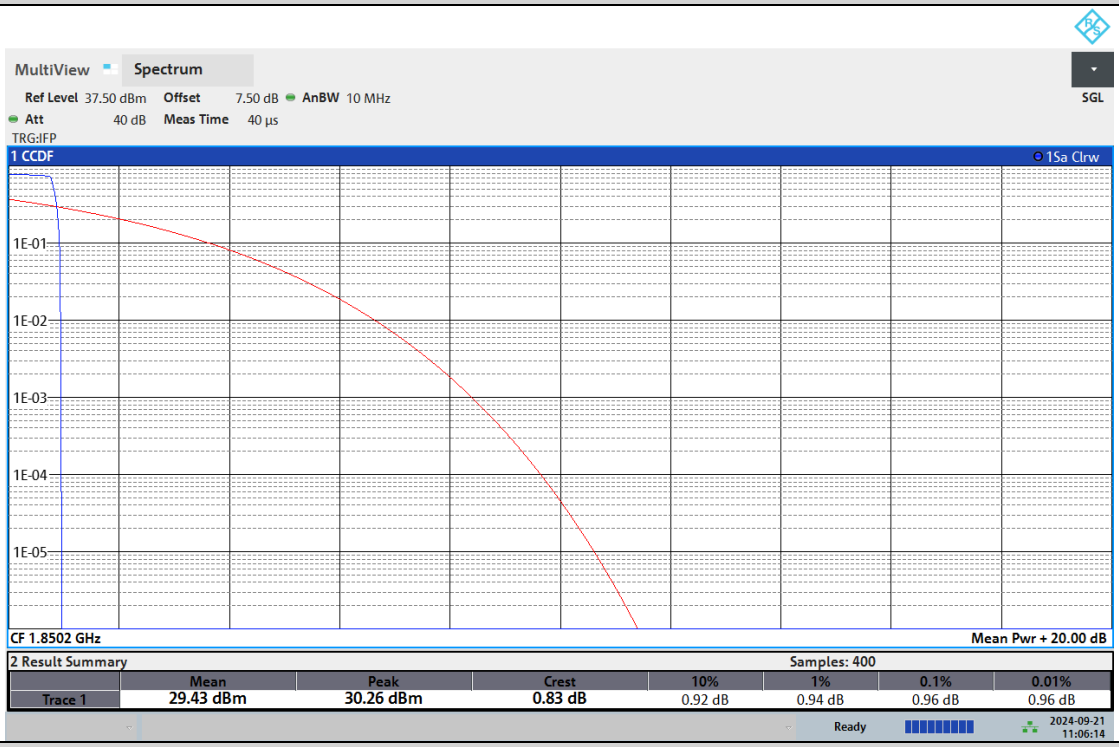
PEAK-TO-AVERAGE RATIO(CCDF)

Test Result

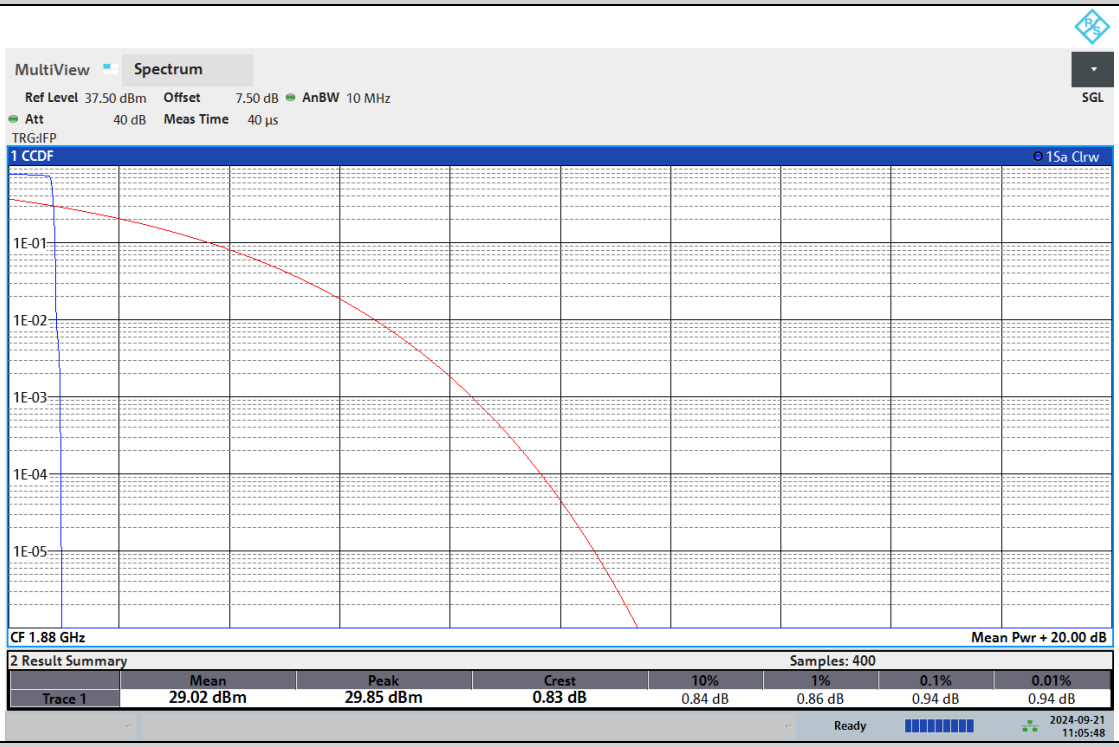
Band	Channel	Result(dB)	Limit(dB)	Verdict
GPRS1900	512	0.96	13	PASS
GPRS1900	661	0.94	13	PASS
GPRS1900	810	0.96	13	PASS
EGPRS1900	512	3.38	13	PASS
EGPRS1900	661	3.10	13	PASS
EGPRS1900	810	3.30	13	PASS

Test Graphs

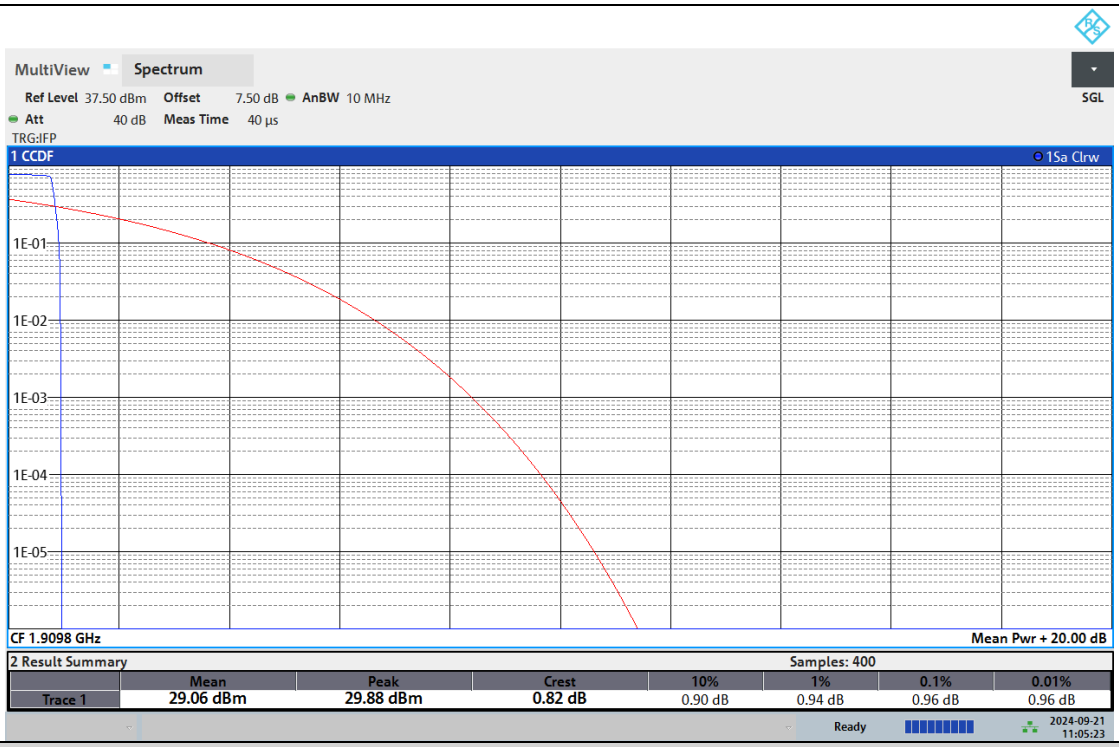
GPRS1900-512



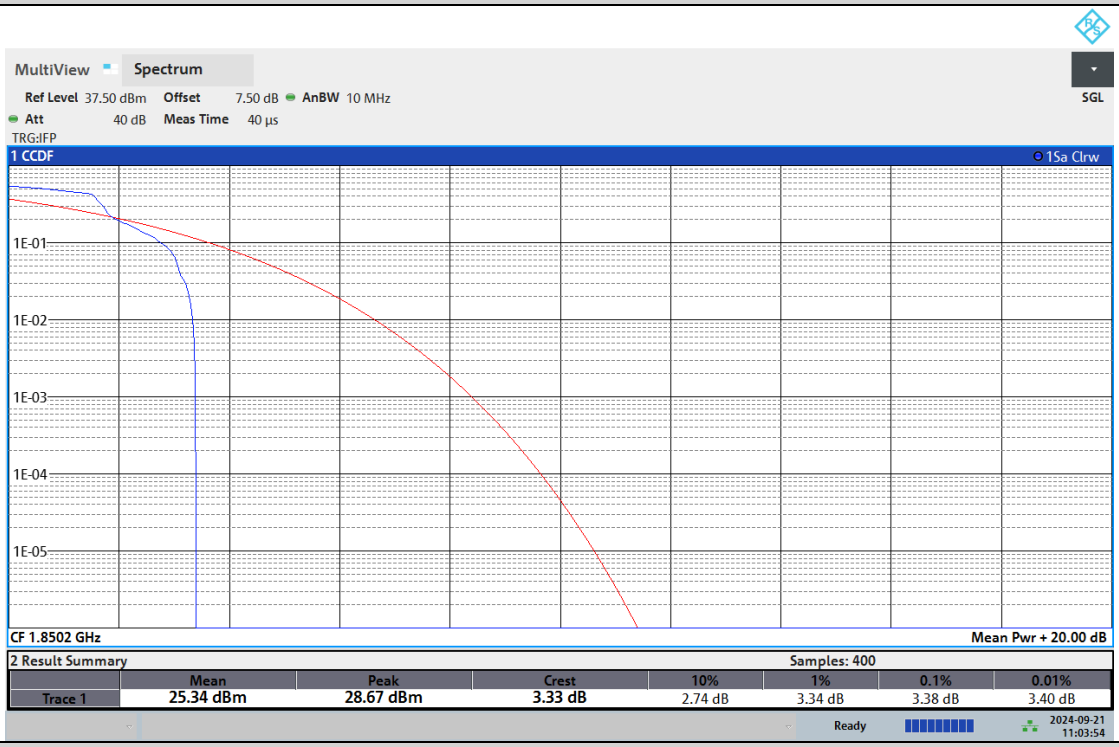
GPRS1900-661



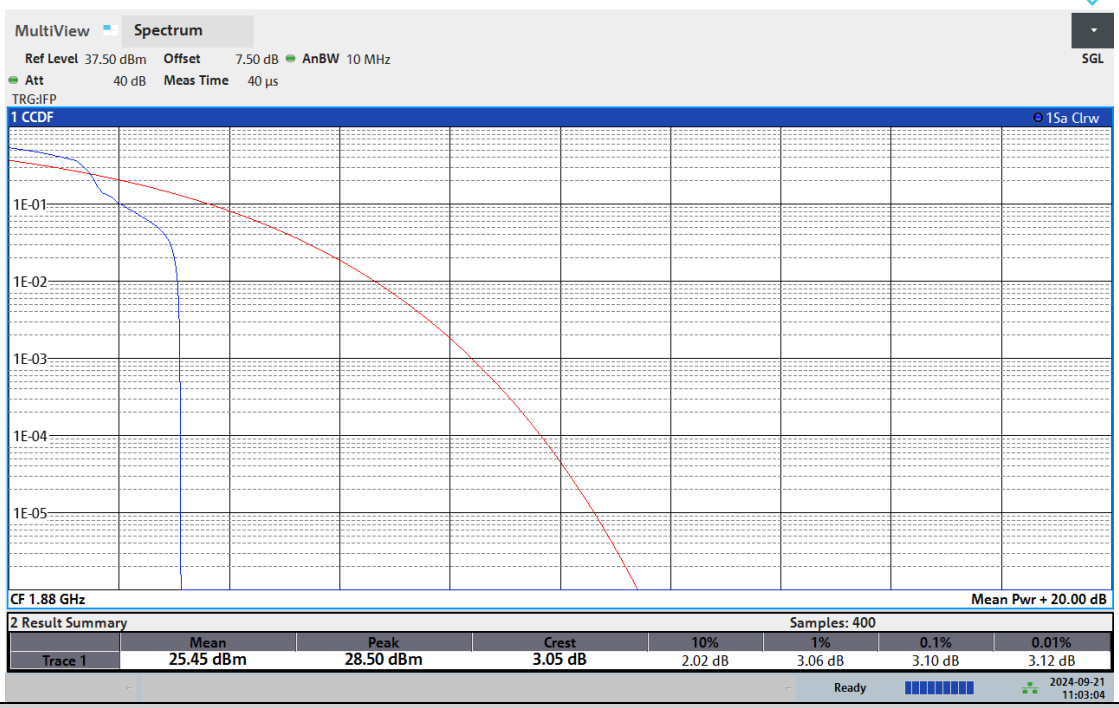
GPRS1900-810



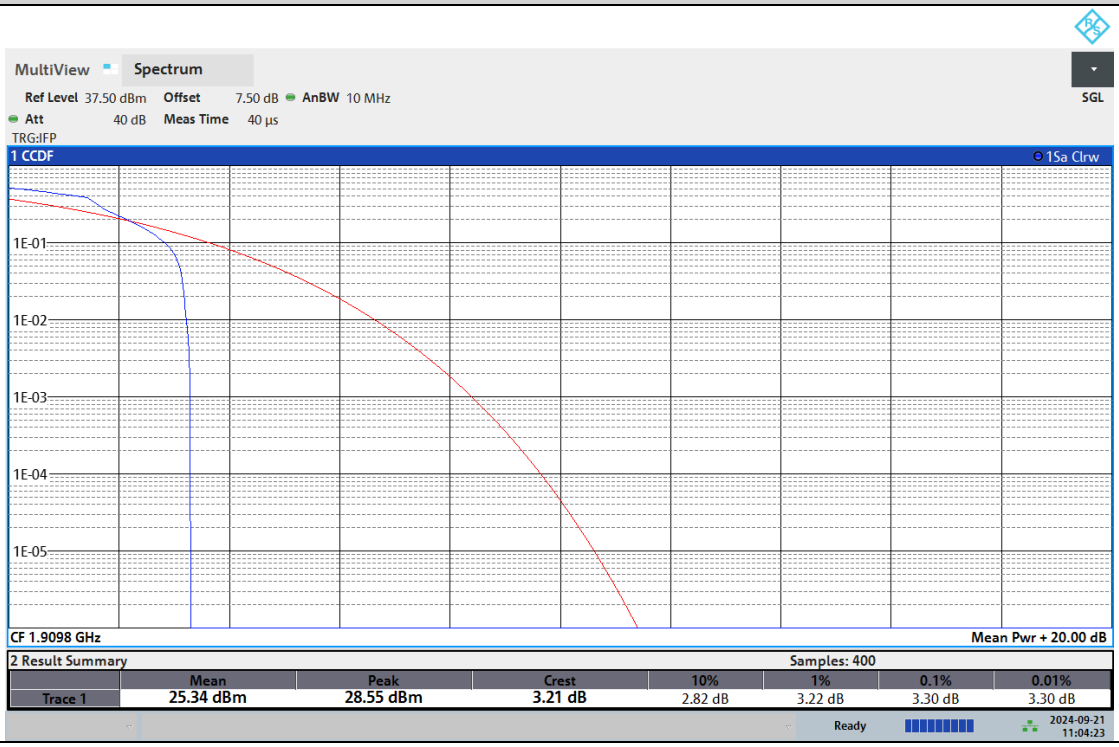
EGPRS1900-512



EGPRS1900-661



EGPRS1900-810



26DB BANDWIDTH AND OCCUPIED BANDWIDTH

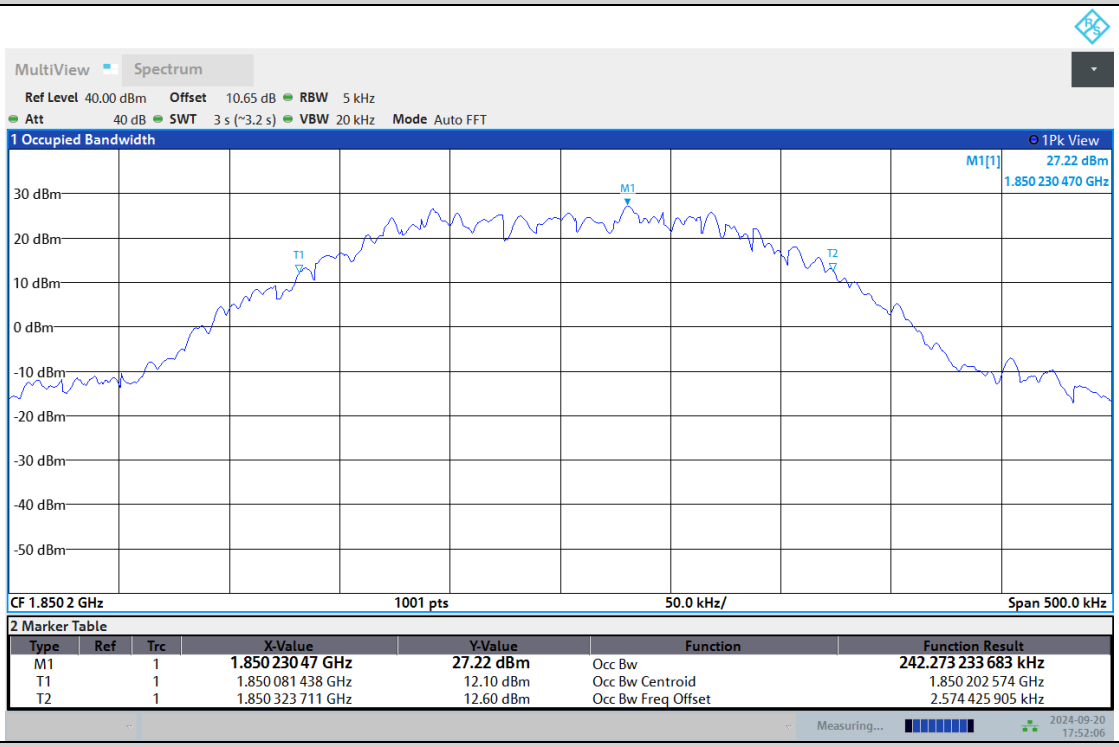
Test Result

Band	Channel	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
GPRS1900	512	242.273	315.18	PASS
GPRS1900	661	246.661	319.18	PASS
GPRS1900	810	245.276	319.18	PASS
EGPRS1900	512	245.865	314.69	PASS
EGPRS1900	661	244.067	313.19	PASS
EGPRS1900	810	246.583	313.19	PASS

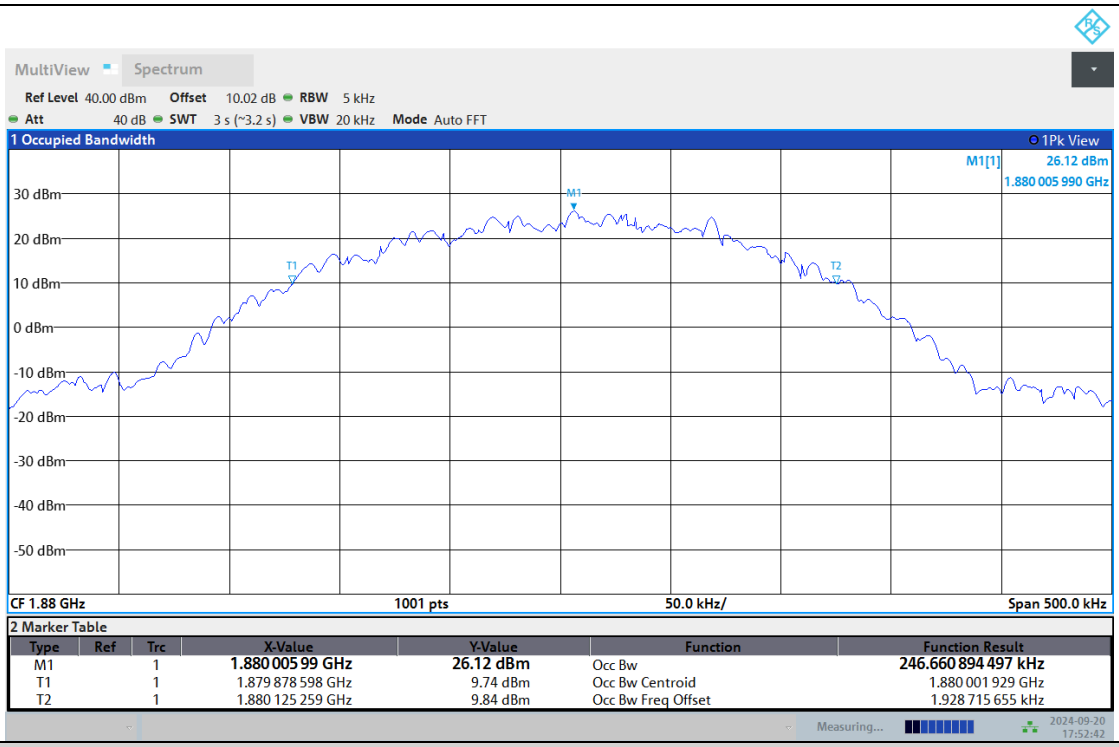
Test Graphs

Occupied Bandwidth

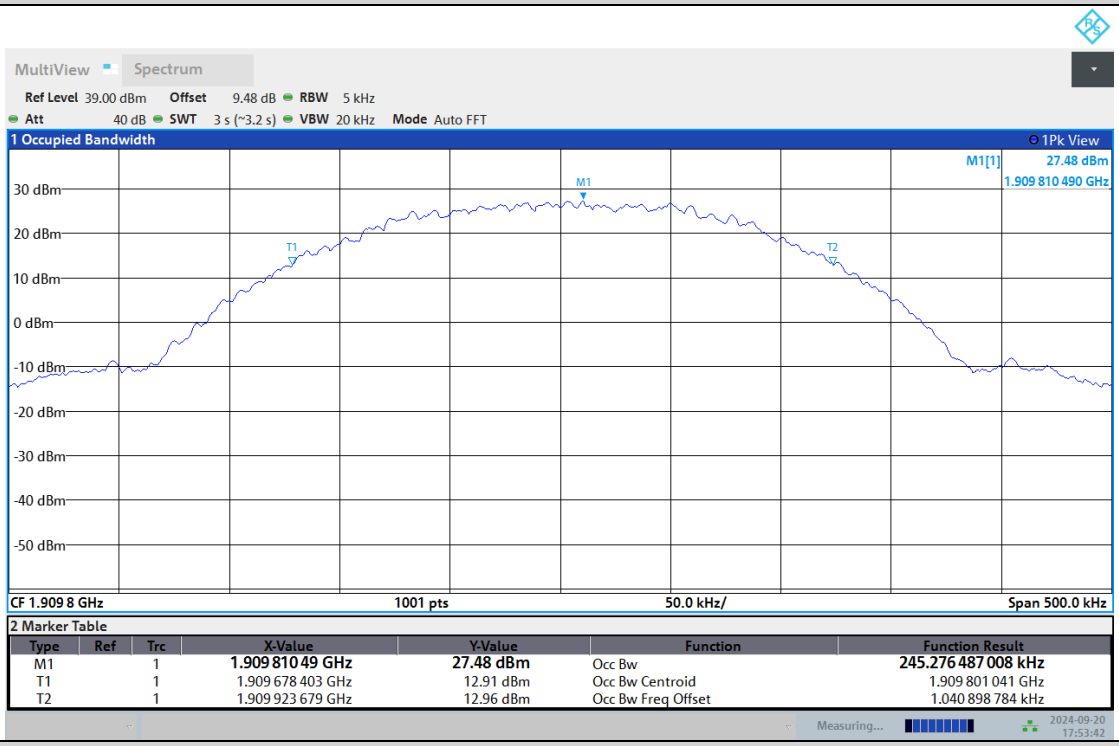
GPRS1900-512



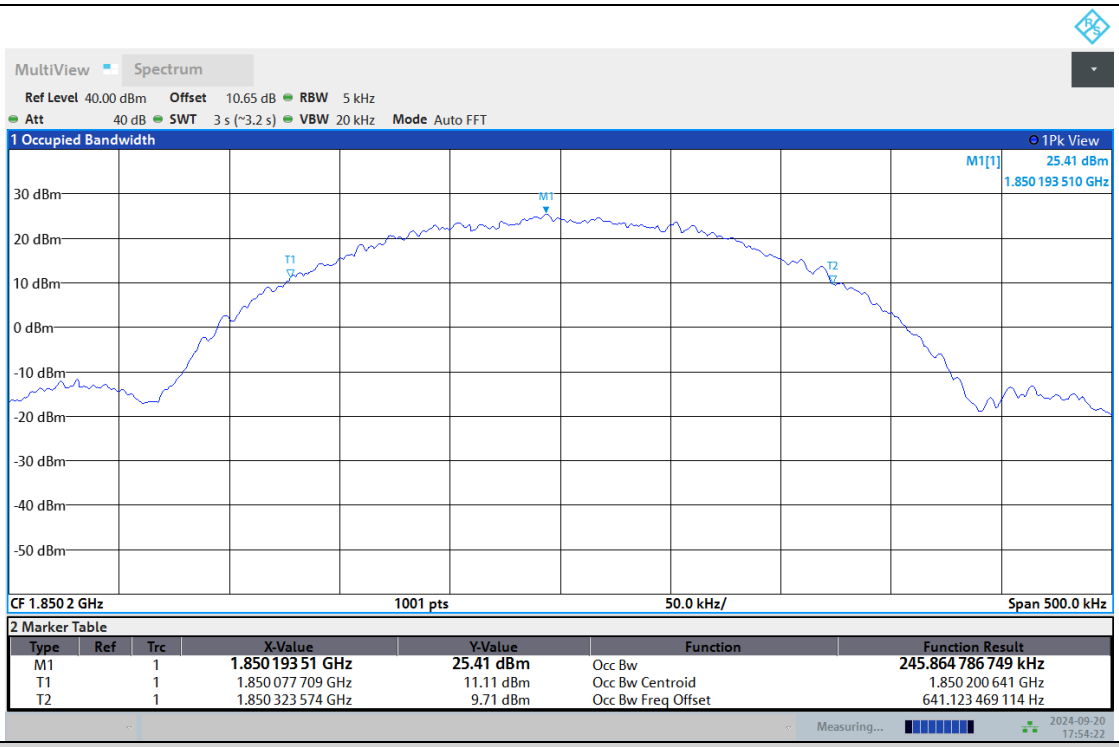
GPRS1900-661



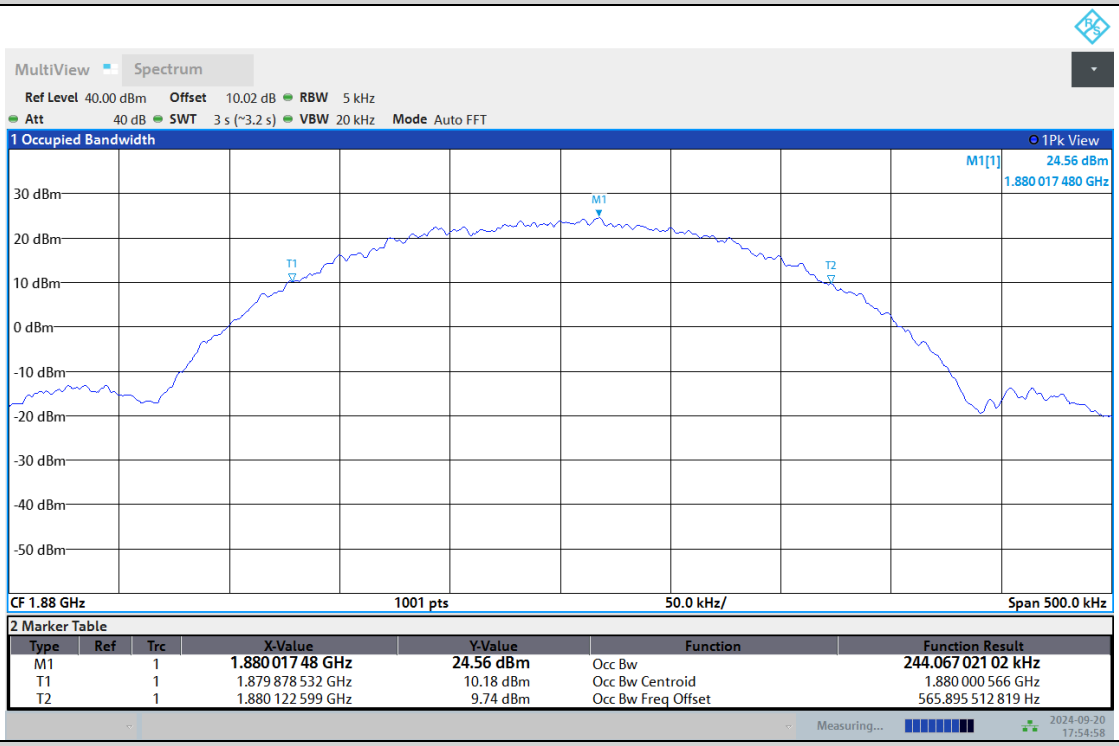
GPRS1900-810



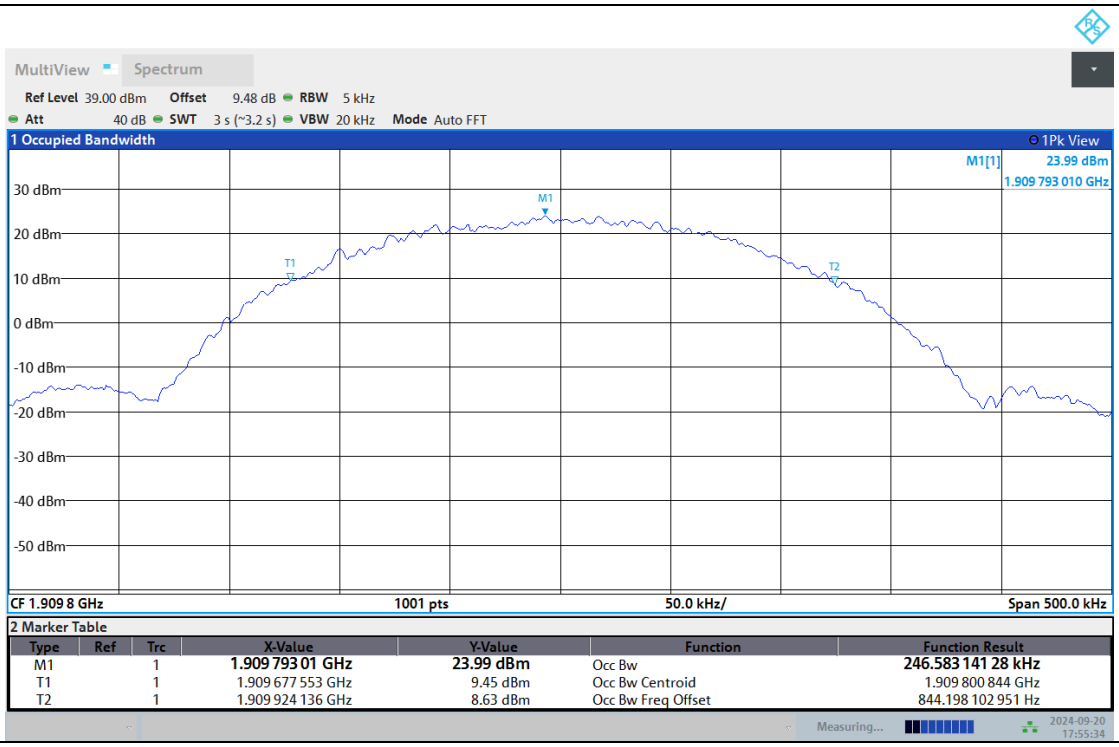
EGPRS1900-512



EGPRS1900-661

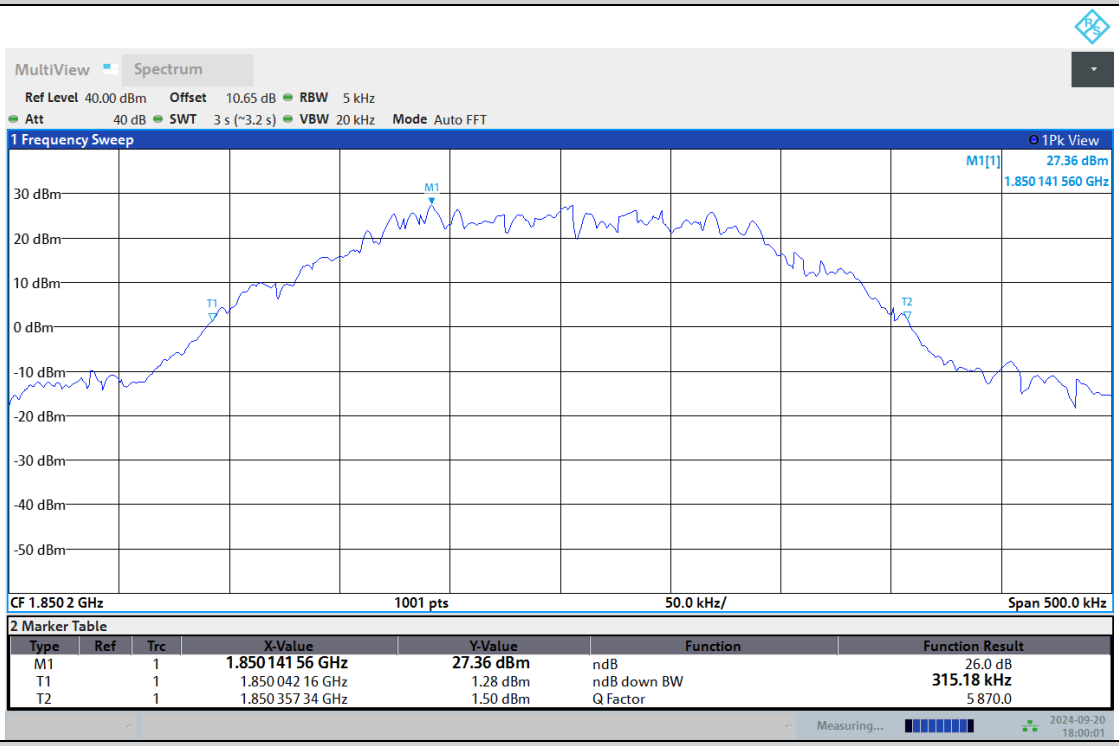


EGPRS1900-810

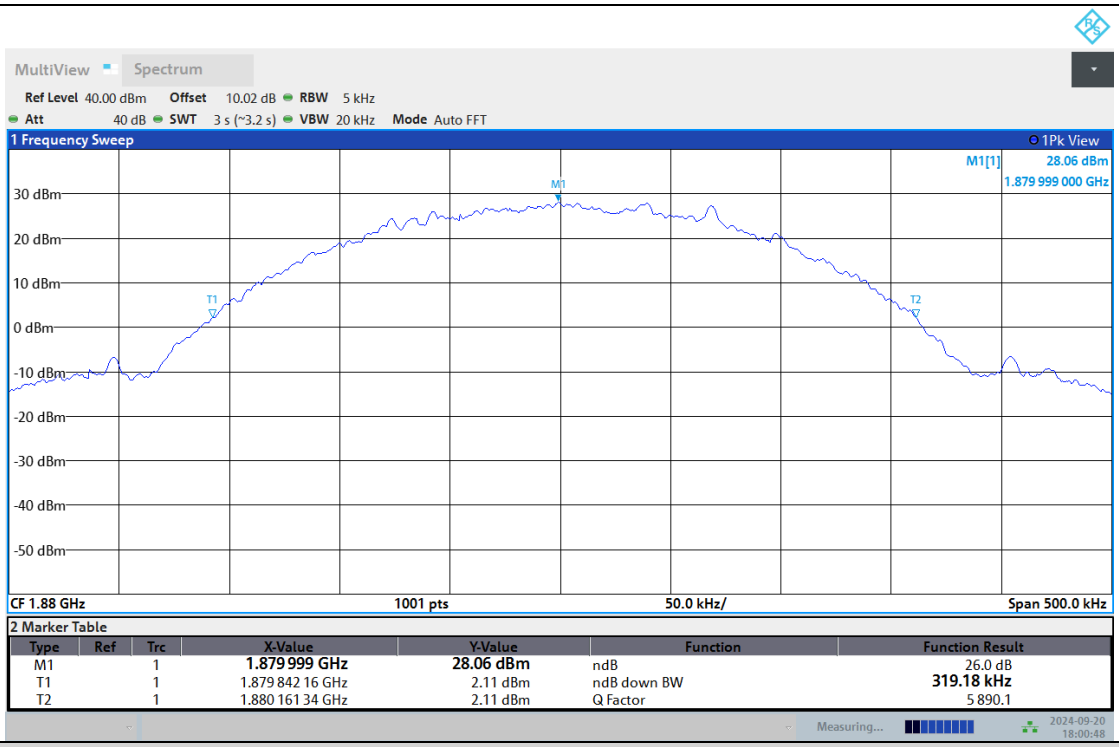


26dB Bandwidth

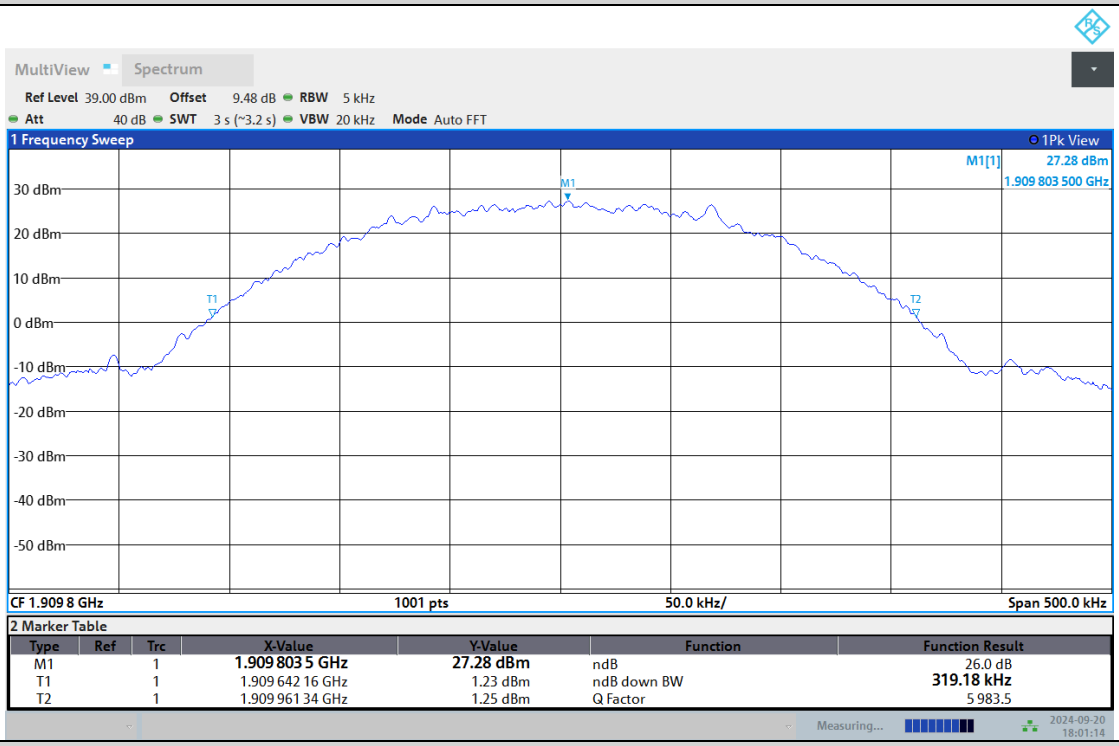
GPRS1900-512



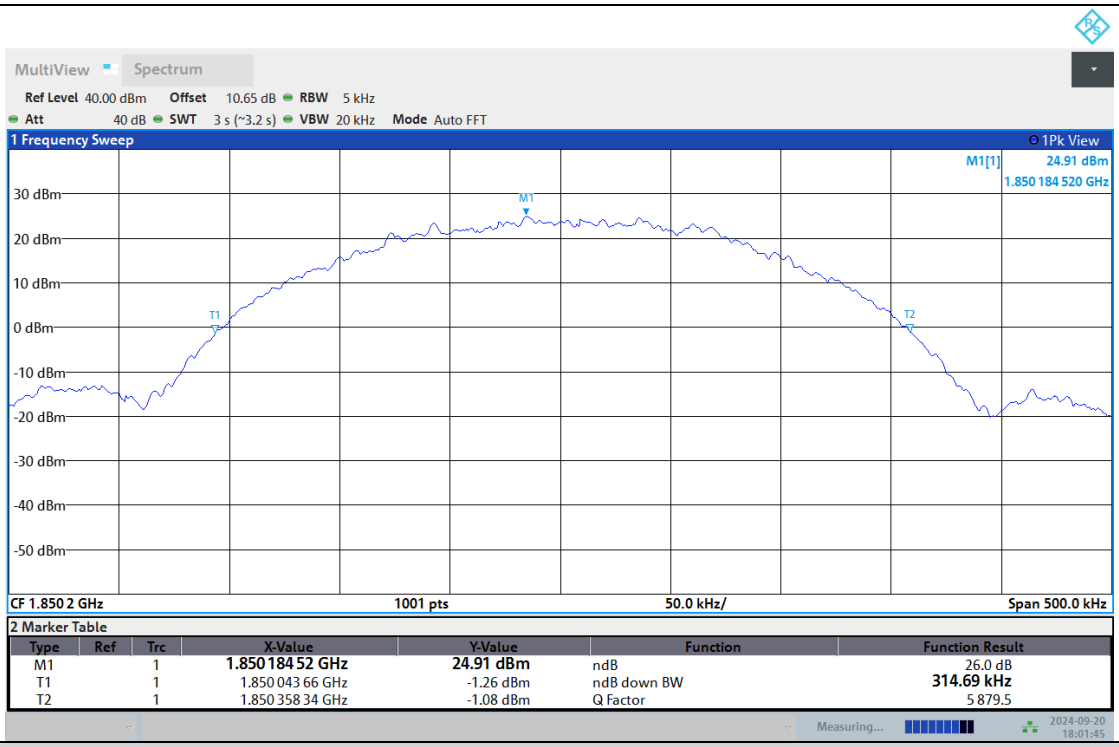
GPRS1900-661



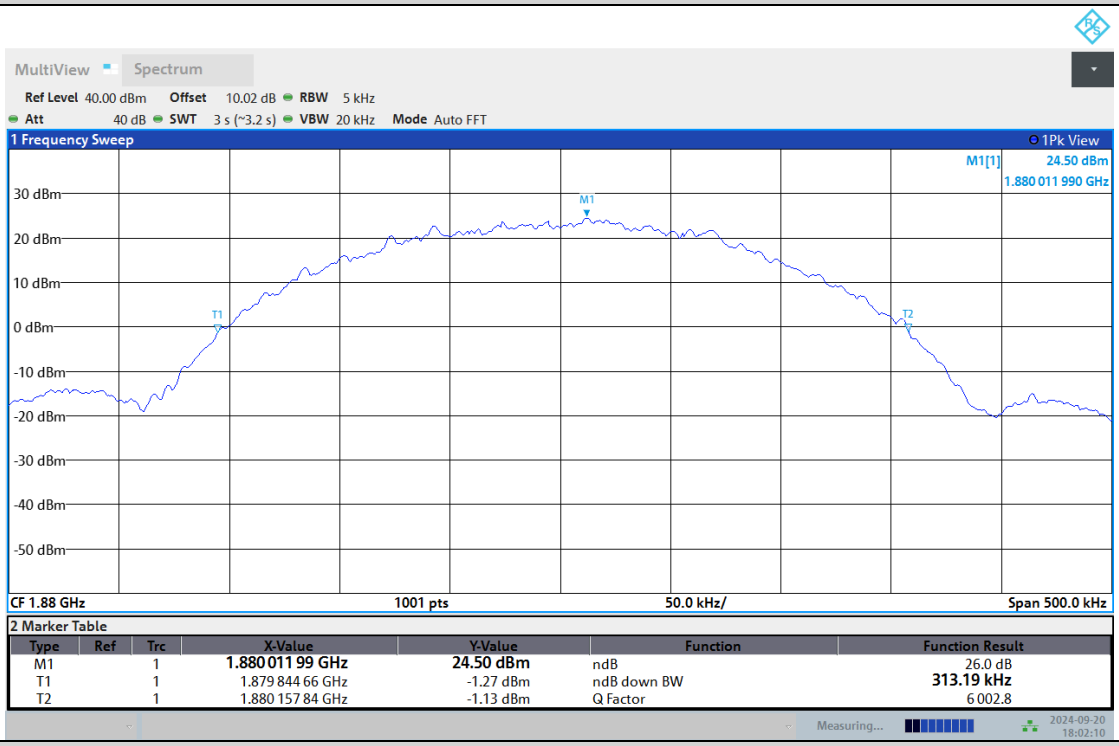
GPRS1900-810



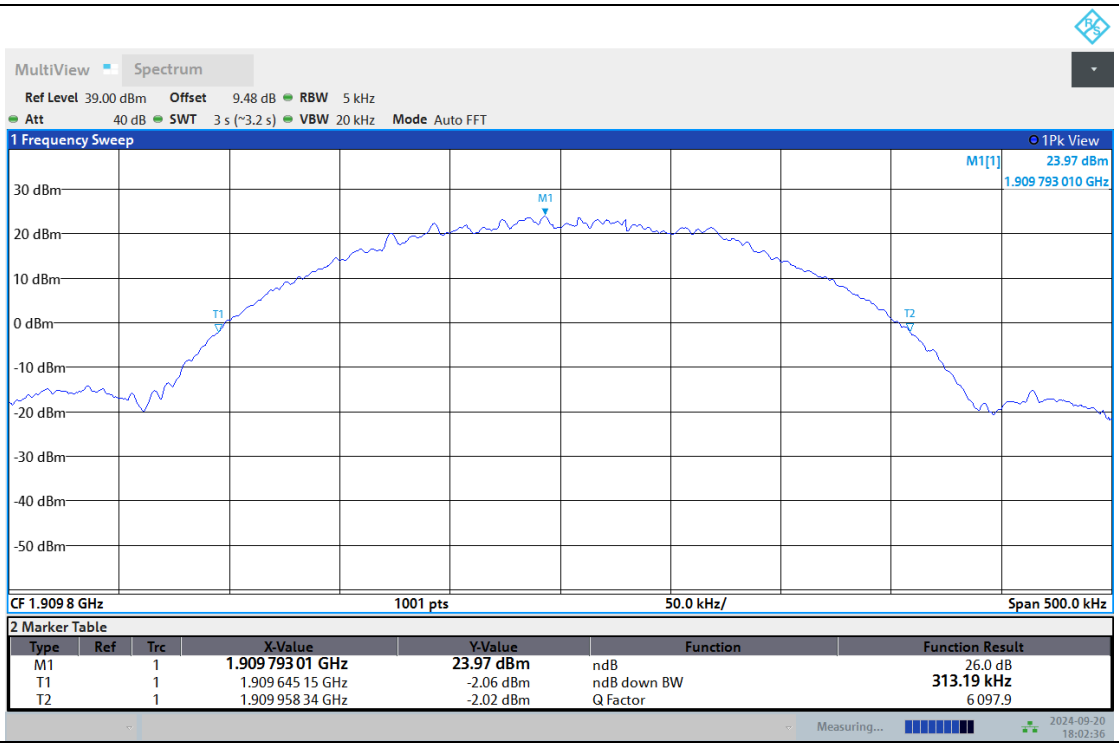
EGPRS1900-512



EGPRS1900-661



EGPRS1900-810


MultiView
Spectrum
Ref Level 39.00 dBm Offset 9.48 dB RBW 5 kHz
Att 40 dB SWT 3 s (~3.2 s) VBW 20 kHz Mode Auto FFT
1 Frequency Sweep
1Pk View
M1[1] 23.97 dBm
1.909 793 010 GHz
30 dBm
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
M1
T1
T2
CF 1.909 8 GHz
1001 pts
50.0 kHz/
Span 500.0 kHz
2 Marker Table
Type Ref Trc X-Value Y-Value Function Function Result
M1 1 1.909 793 01 GHz 23.97 dBm ndB 26.0 dB
T1 1 1.909 645 15 GHz -2.06 dBm ndB down BW 313.19 kHz
T2 1 1.909 958 34 GHz -2.02 dBm Q Factor 6 097.9
Measuring...
2024-09-20
18:07:36

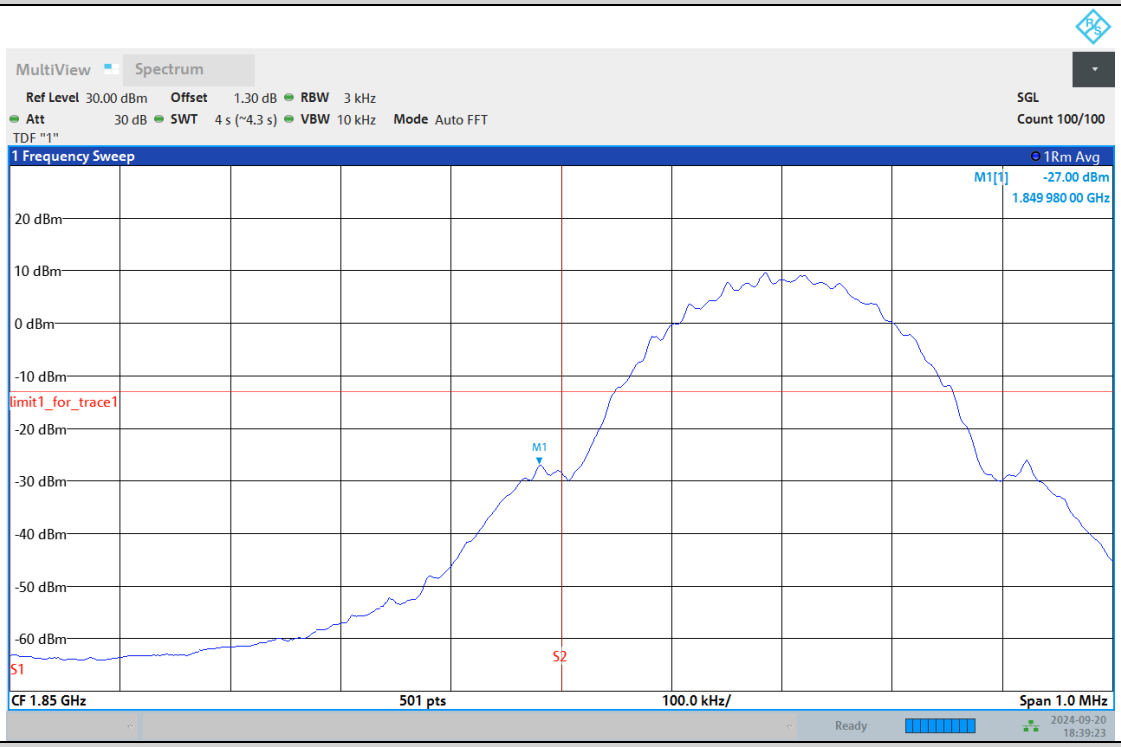
BAND EDGE

Test Result

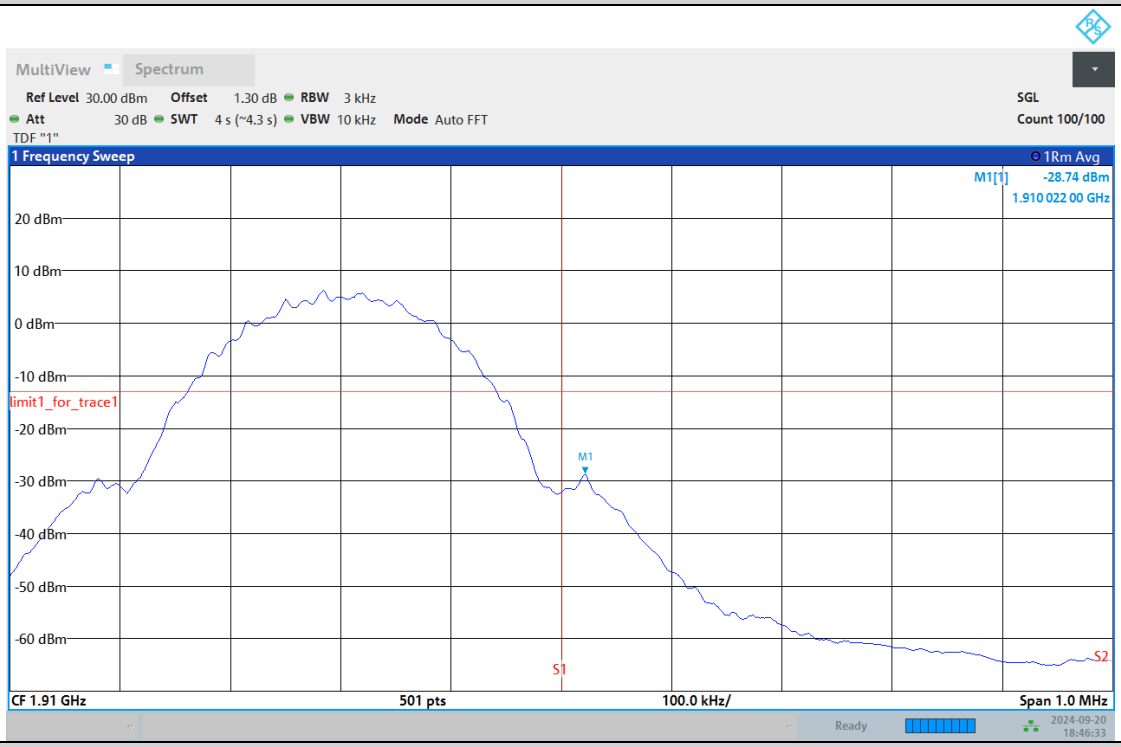
Band	Channel	Freq (MHz)	Result (dBm)	Limit(dBm)	Verdict
GPRS1900	512	1849.9800	-27.00	-13	PASS
GPRS1900	810	1910.0220	-28.74	-13	PASS
EGPRS1900	512	1849.9880	-32.08	-13	PASS
EGPRS1900	810	1910.0359	-36.55	-13	PASS

Test Graphs

GPRS1900-512



GPRS1900-810



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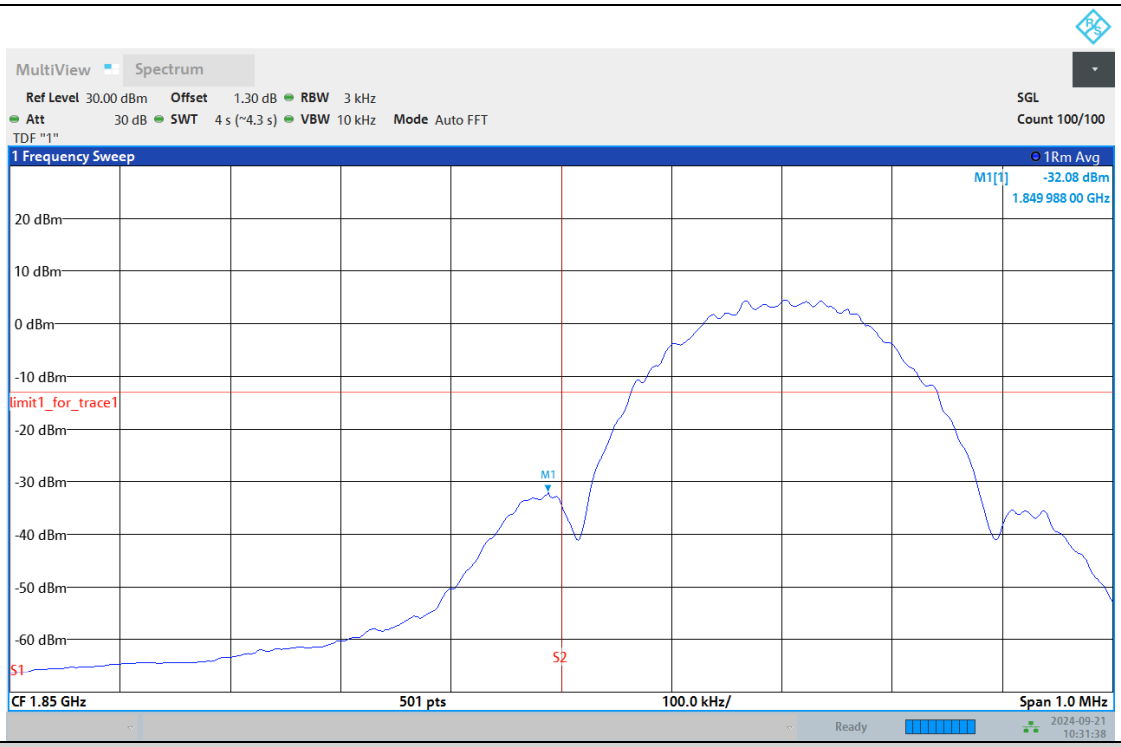
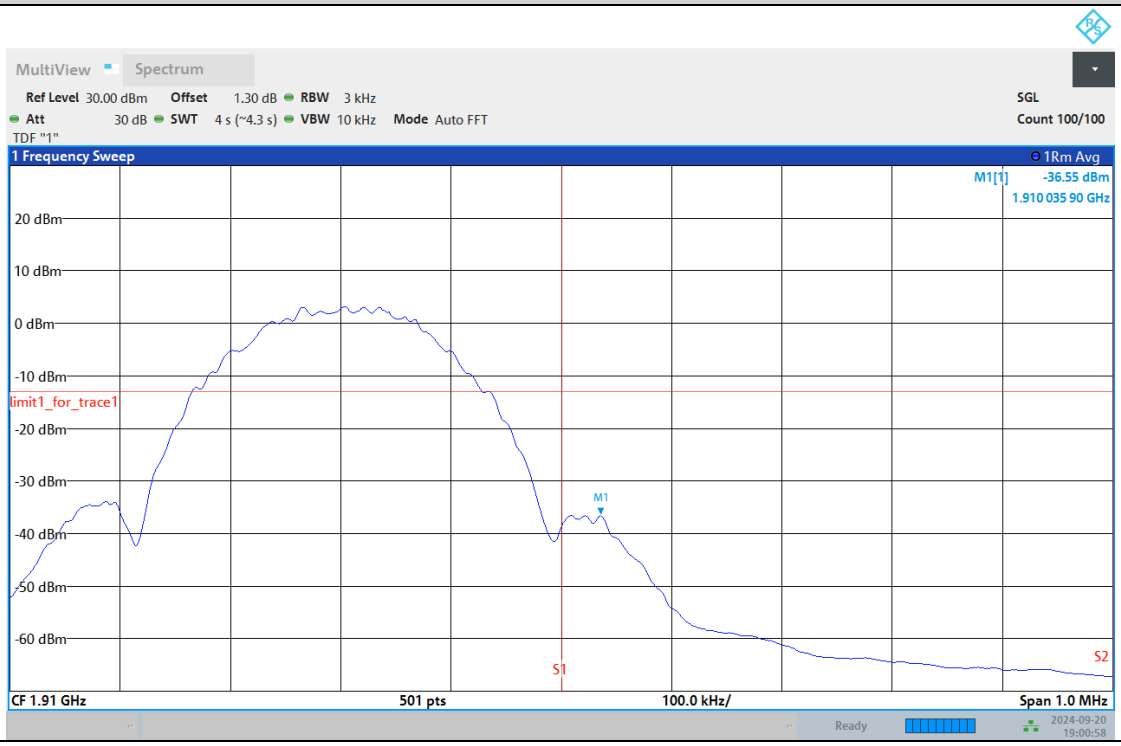


EGPRS1900-810



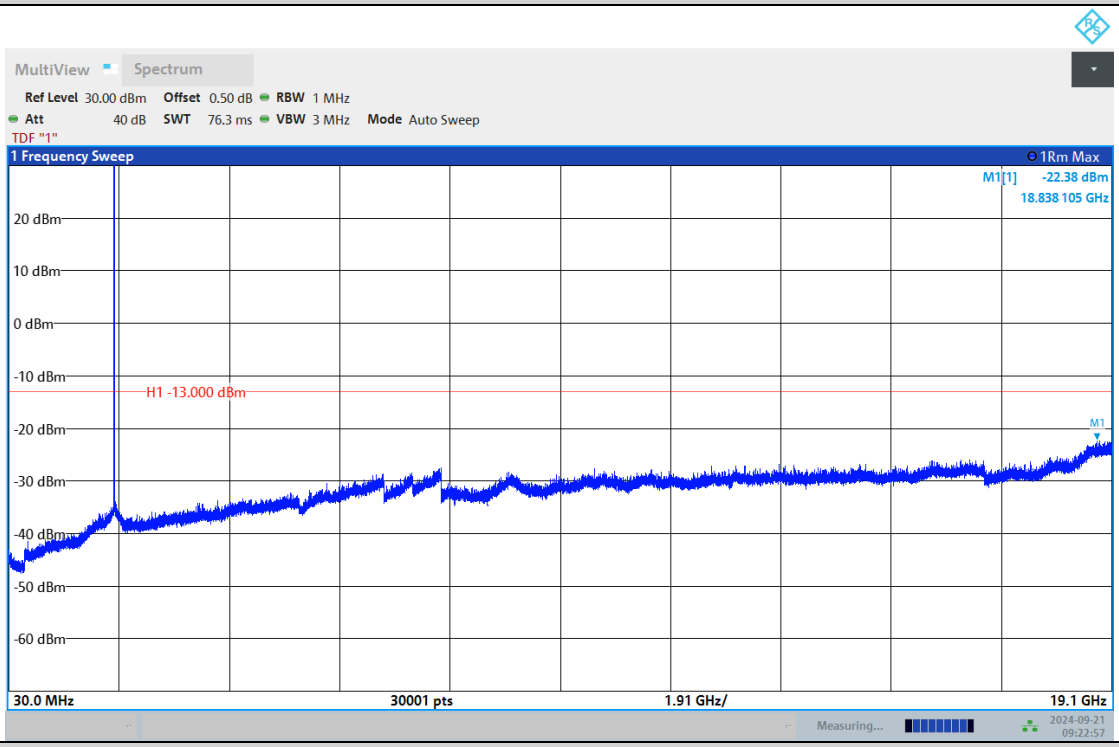
CONDUCTED SPURIOUS EMISSION

Test Result

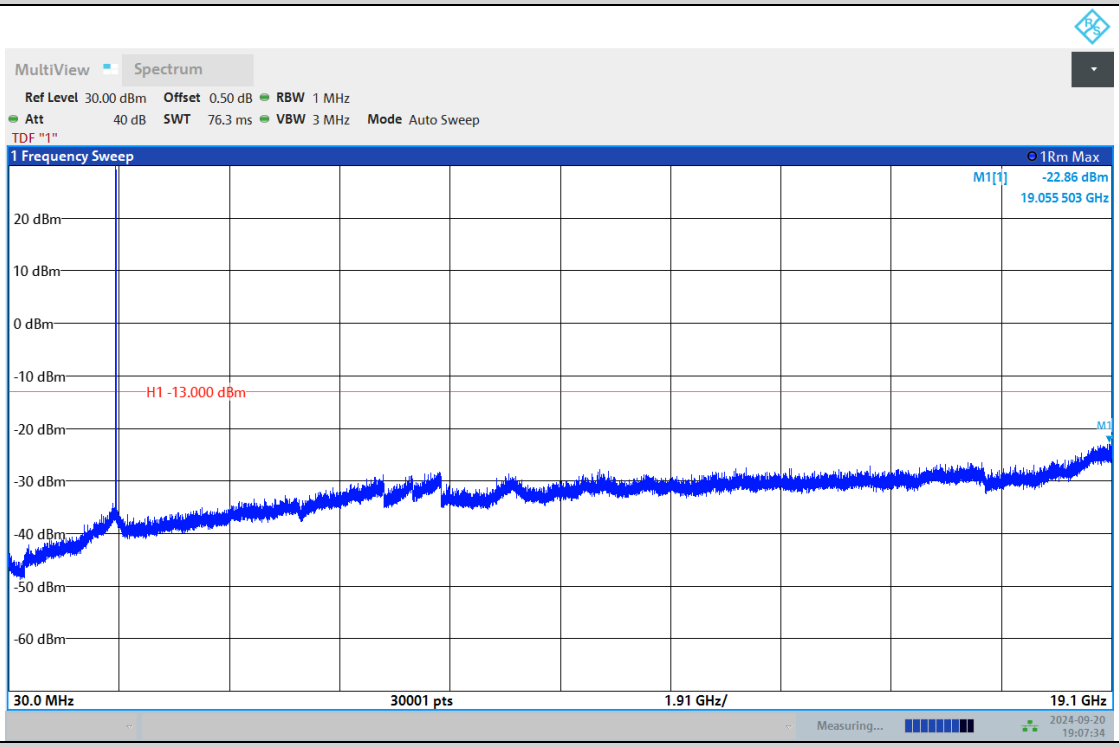
Band	Channel	Frequency Range(MHz)	Max.Freq. (MHz)	Result (dBm)	Limit (dBm)	Verdict
GPRS1900	512	30~19100MHz	18838.105	-22.38	-13	PASS
GPRS1900	661	30~19100MHz	19055.503	-22.86	-13	PASS
GPRS1900	810	30~19100MHz	18956.339	-22.84	-13	PASS
EGPRS1900	512	30~19100MHz	18966.510	-22.51	-13	PASS
EGPRS1900	661	30~19100MHz	18975.409	-22.70	-13	PASS
EGPRS1900	810	30~19100MHz	18994.479	-22.66	-13	PASS

Test Graphs

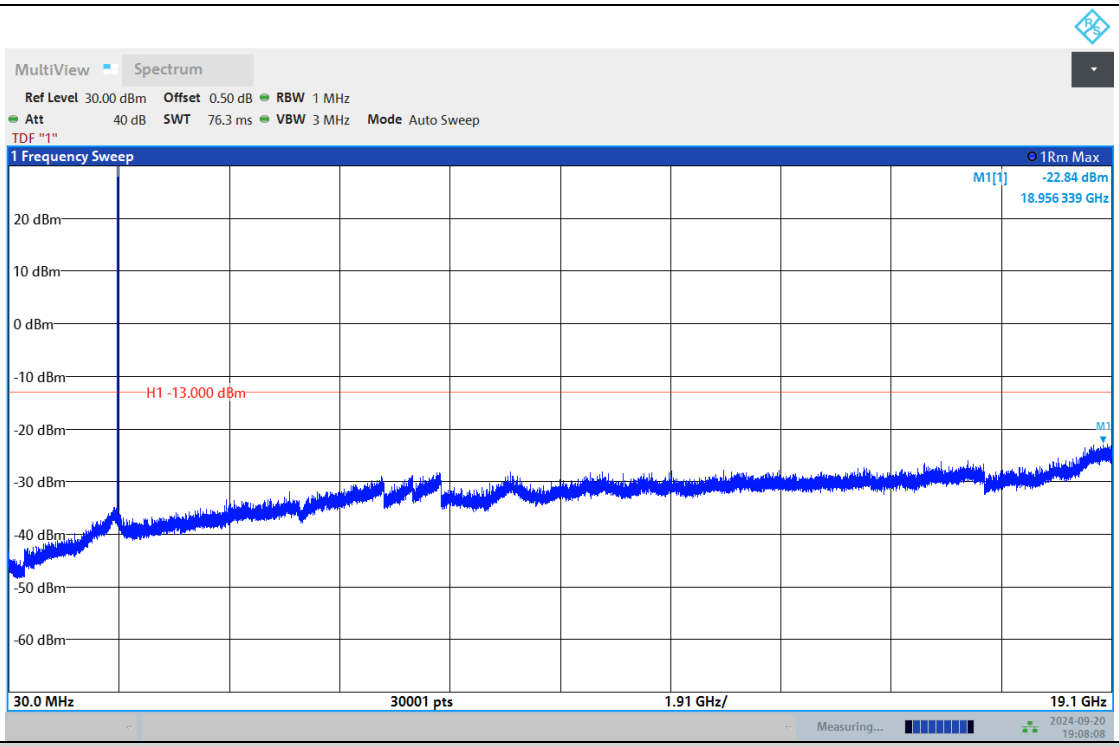
GPRS1900-512-30~19100MHz



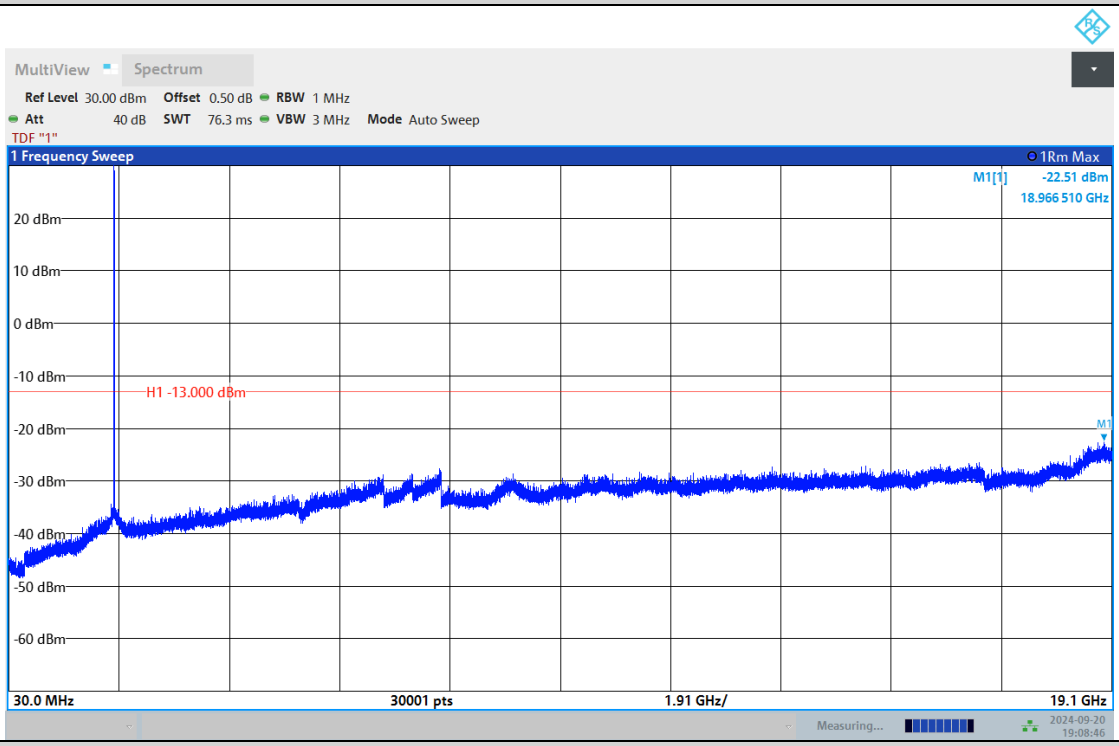
GPRS1900-661-30~19100MHz



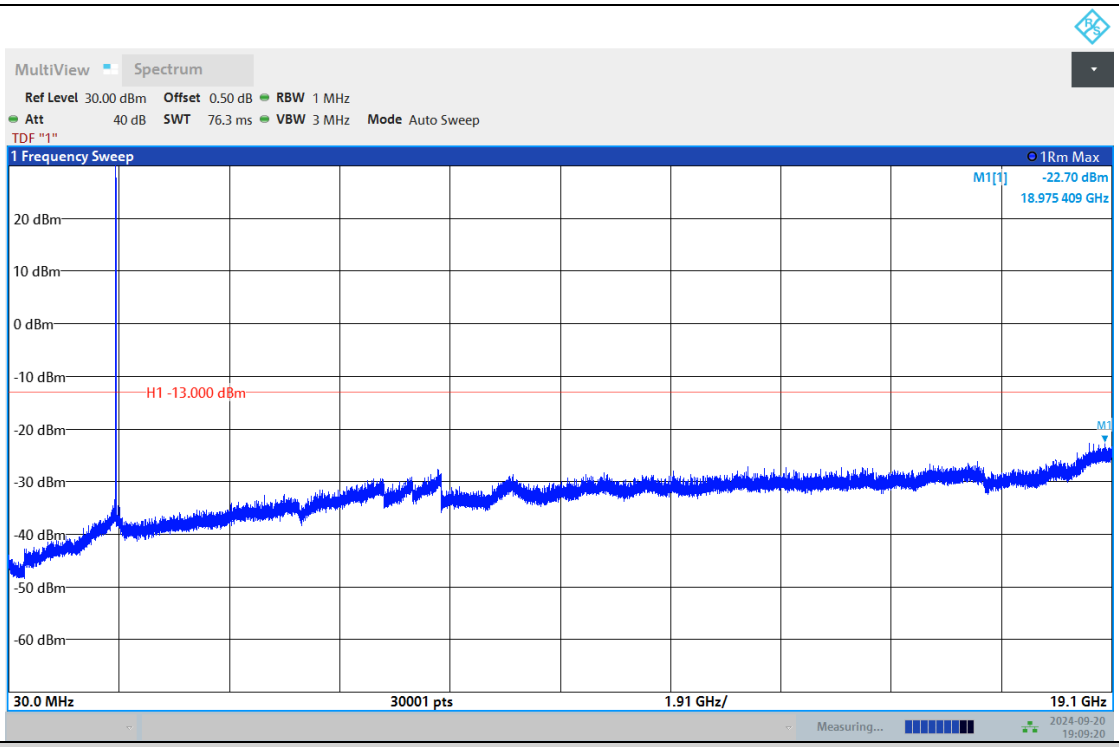
GPRS1900-810-30~19100MHz



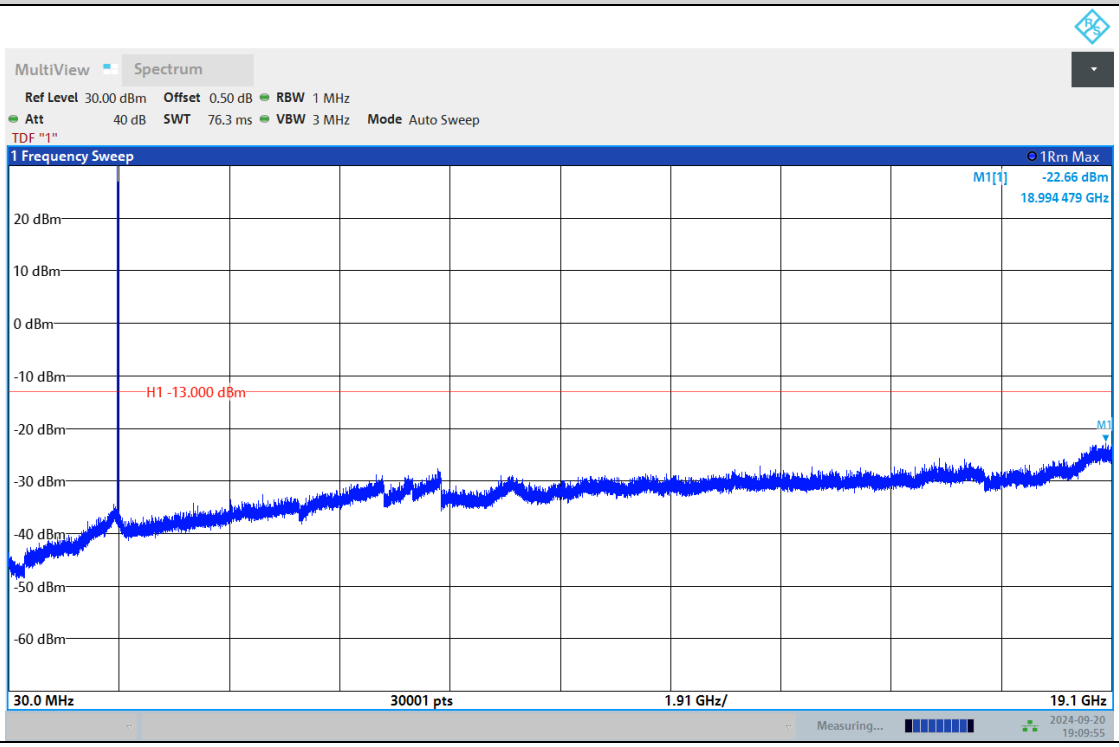
EGPRS1900-512-30~19100MHz



EGPRS1900-661-30~19100MHz



EGPRS1900-810-30~19100MHz



FREQUENCY STABILITY

Test Result

Voltage							
Band	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
GPRS1900	512	LV	NT	8.71	0.0047	±2.5	PASS
GPRS1900	512	NV	NT	-7.62	-0.0041	±2.5	PASS
GPRS1900	512	HV	NT	3.56	0.0019	±2.5	PASS
GPRS1900	661	LV	NT	-5.92	-0.0031	±2.5	PASS
GPRS1900	661	NV	NT	0.99	0.0005	±2.5	PASS
GPRS1900	661	HV	NT	6.53	0.0035	±2.5	PASS
GPRS1900	810	LV	NT	-9.53	-0.0050	±2.5	PASS
GPRS1900	810	NV	NT	-7.69	-0.0040	±2.5	PASS
GPRS1900	810	HV	NT	6.01	0.0031	±2.5	PASS

Temperature							
Band	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
GPRS1900	512	NV	-30	-9.15	-0.0049	±2.5	PASS
GPRS1900	512	NV	-20	-1.88	0.0020	±2.5	PASS
GPRS1900	512	NV	-10	-5.10	-0.0028	±2.5	PASS
GPRS1900	512	NV	0	-3.14	-0.0017	±2.5	PASS
GPRS1900	512	NV	10	6.37	0.0034	±2.5	PASS
GPRS1900	512	NV	20	8.47	0.0046	±2.5	PASS
GPRS1900	512	NV	30	8.93	0.0048	±2.5	PASS
GPRS1900	512	NV	40	-3.05	-0.0016	±2.5	PASS
GPRS1900	512	NV	50	-6.91	-0.0037	±2.5	PASS
GPRS1900	661	NV	-30	-1.37	-0.0007	±2.5	PASS
GPRS1900	661	NV	-20	-0.12	-0.0001	±2.5	PASS
GPRS1900	661	NV	-10	-1.30	-0.0007	±2.5	PASS
GPRS1900	661	NV	0	-8.42	-0.0045	±2.5	PASS
GPRS1900	661	NV	10	-6.62	-0.0035	±2.5	PASS
GPRS1900	661	NV	20	-0.47	-0.0003	±2.5	PASS
GPRS1900	661	NV	30	4.92	0.0026	±2.5	PASS
GPRS1900	661	NV	40	0.15	0.0001	±2.5	PASS
GPRS1900	661	NV	50	9.46	0.0050	±2.5	PASS
GPRS1900	810	NV	-30	6.09	0.0032	±2.5	PASS
GPRS1900	810	NV	-20	-9.06	-0.0047	±2.5	PASS
GPRS1900	810	NV	-10	6.19	0.0032	±2.5	PASS
GPRS1900	810	NV	0	-7.42	-0.0039	±2.5	PASS
GPRS1900	810	NV	10	-4.30	-0.0023	±2.5	PASS
GPRS1900	810	NV	20	5.30	0.0028	±2.5	PASS
GPRS1900	810	NV	30	-3.38	-0.0018	±2.5	PASS
GPRS1900	810	NV	40	9.43	0.0049	±2.5	PASS
GPRS1900	810	NV	50	-1.41	-0.0007	±2.5	PASS

MAX Deviation calculation

Frequency Stability	Frequency (MHz)	Limit Line(MHz)	Result
fL-|MAX(△f)|	1850.078854	≥1850	PASS
fH+|MAX(△f)|	1909.677372	≤1910	

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)| =9.53 Hz.

LTE BAND2

PEAK-TO-AVERAGE RATIO(CCDF)

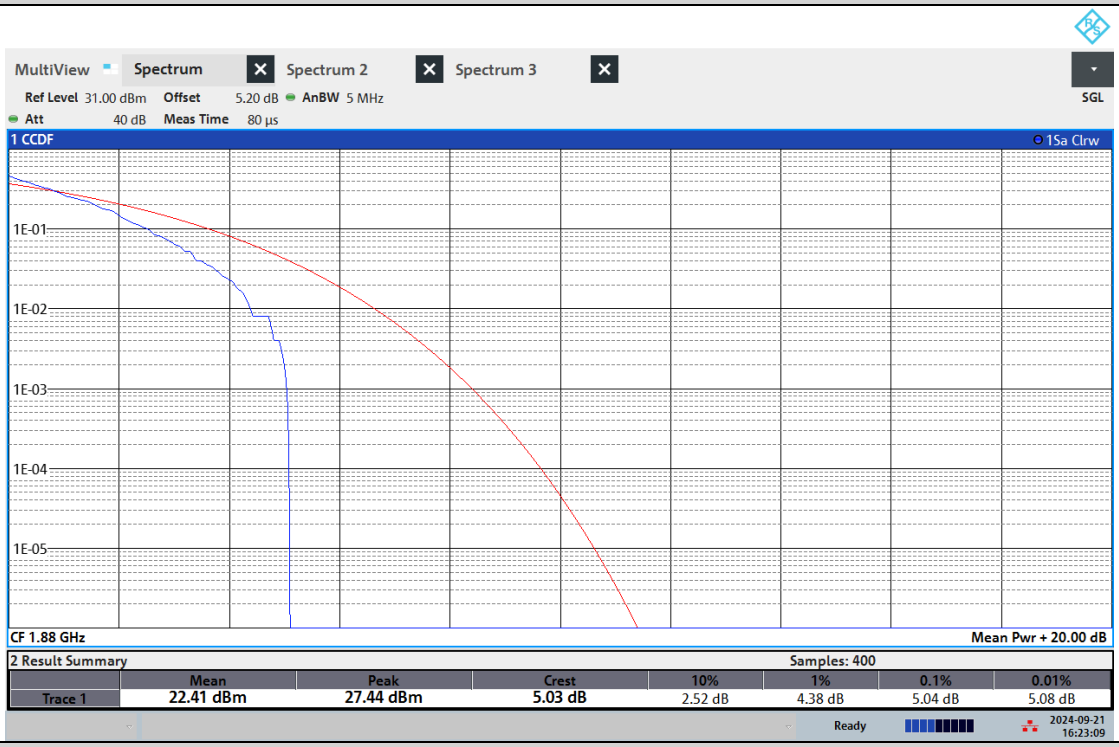
Test Result

Band	Bandwidth	Modulation	Channel	Result(dB)	Limit(dB)	Verdict
Band2	1.4MHz	QPSK	18607	4.68	13	PASS
Band2	1.4MHz	QPSK	18900	6.04	13	PASS
Band2	1.4MHz	QPSK	19193	3.64	13	PASS
Band2	1.4MHz	16QAM	18607	5.50	13	PASS
Band2	1.4MHz	16QAM	18900	5.14	13	PASS
Band2	1.4MHz	16QAM	19193	5.60	13	PASS
Band2	3MHz	QPSK	18615	4.66	13	PASS
Band2	3MHz	QPSK	18900	4.48	13	PASS
Band2	3MHz	QPSK	19185	5.22	13	PASS
Band2	3MHz	16QAM	18615	5.80	13	PASS
Band2	3MHz	16QAM	18900	5.44	13	PASS
Band2	3MHz	16QAM	19185	5.42	13	PASS
Band2	5MHz	QPSK	18625	4.94	13	PASS
Band2	5MHz	QPSK	18900	5.42	13	PASS
Band2	5MHz	QPSK	19175	4.56	13	PASS
Band2	5MHz	16QAM	18625	5.70	13	PASS
Band2	5MHz	16QAM	18900	5.06	13	PASS
Band2	5MHz	16QAM	19175	5.22	13	PASS
Band2	10MHz	QPSK	18650	4.68	13	PASS
Band2	10MHz	QPSK	18900	4.88	13	PASS
Band2	10MHz	QPSK	19150	4.60	13	PASS
Band2	10MHz	16QAM	18650	5.62	13	PASS
Band2	10MHz	16QAM	18900	4.10	13	PASS
Band2	10MHz	16QAM	19150	5.44	13	PASS
Band2	15MHz	QPSK	18675	4.70	13	PASS
Band2	15MHz	QPSK	18900	4.42	13	PASS
Band2	15MHz	QPSK	19125	4.42	13	PASS
Band2	15MHz	16QAM	18675	5.46	13	PASS
Band2	15MHz	16QAM	18900	5.56	13	PASS
Band2	15MHz	16QAM	19125	5.36	13	PASS
Band2	20MHz	QPSK	18700	4.70	13	PASS
Band2	20MHz	QPSK	18900	3.46	13	PASS
Band2	20MHz	QPSK	19100	4.90	13	PASS
Band2	20MHz	16QAM	18700	6.02	13	PASS
Band2	20MHz	16QAM	18900	4.60	13	PASS
Band2	20MHz	16QAM	19100	4.14	13	PASS

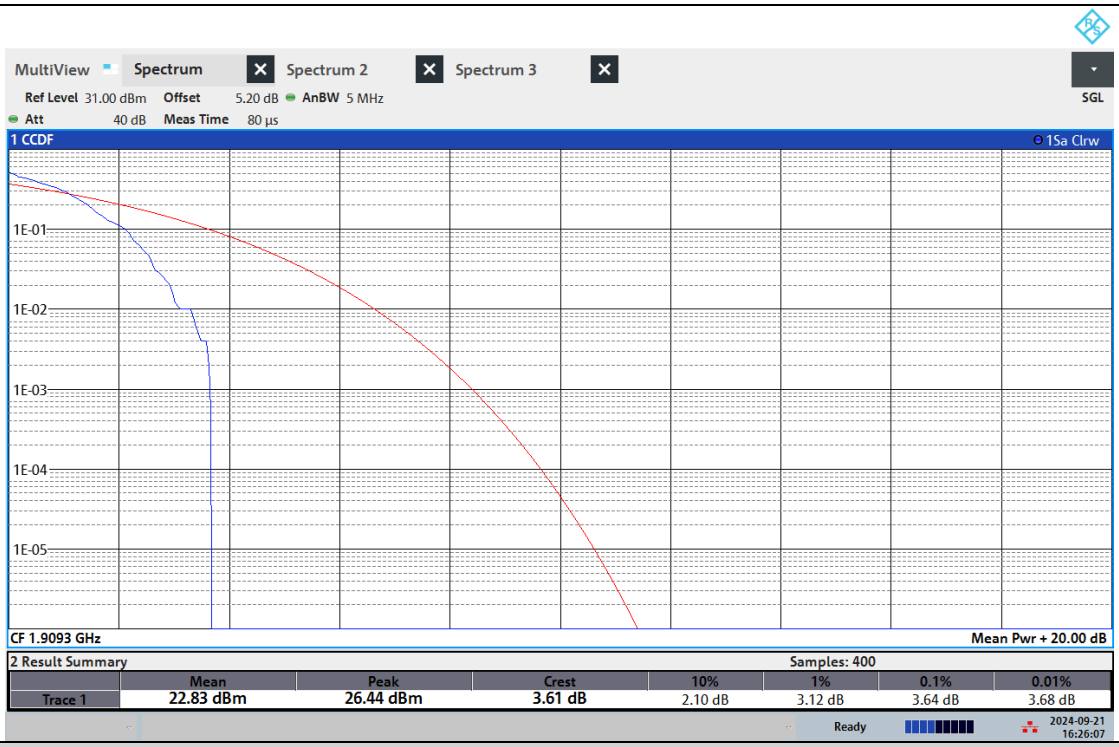
Test Graphs

Band2-1.4MHz-QPSK-18607

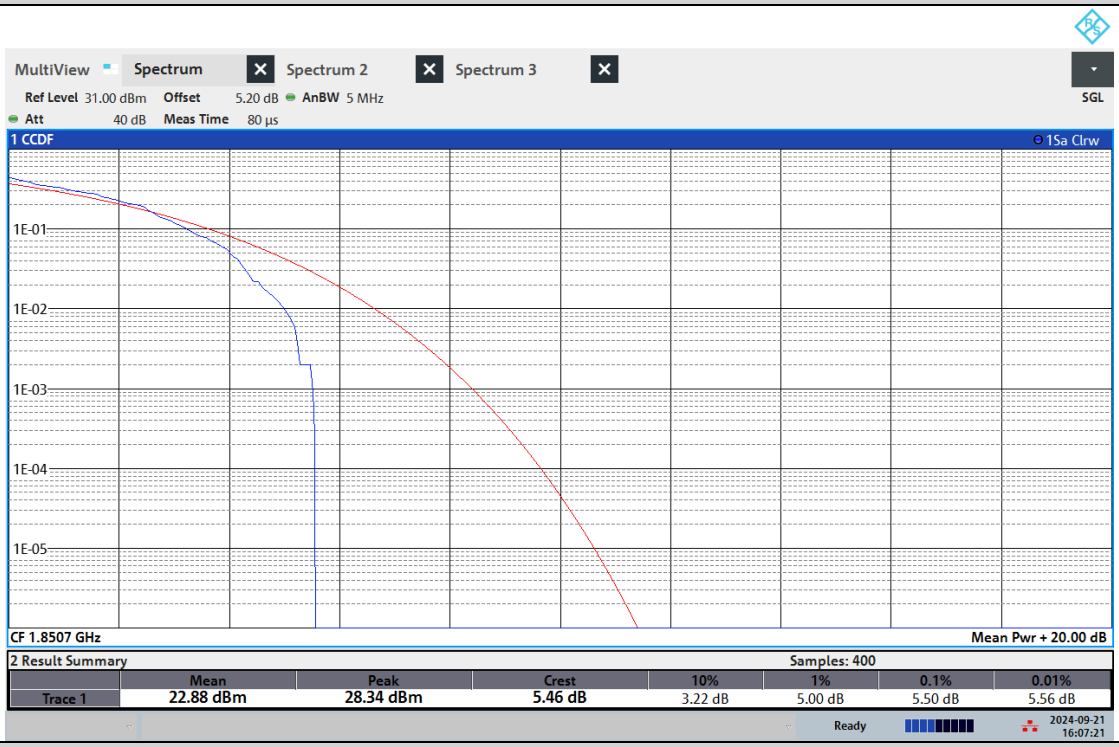
Band2-1.4MHz-QPSK-18900



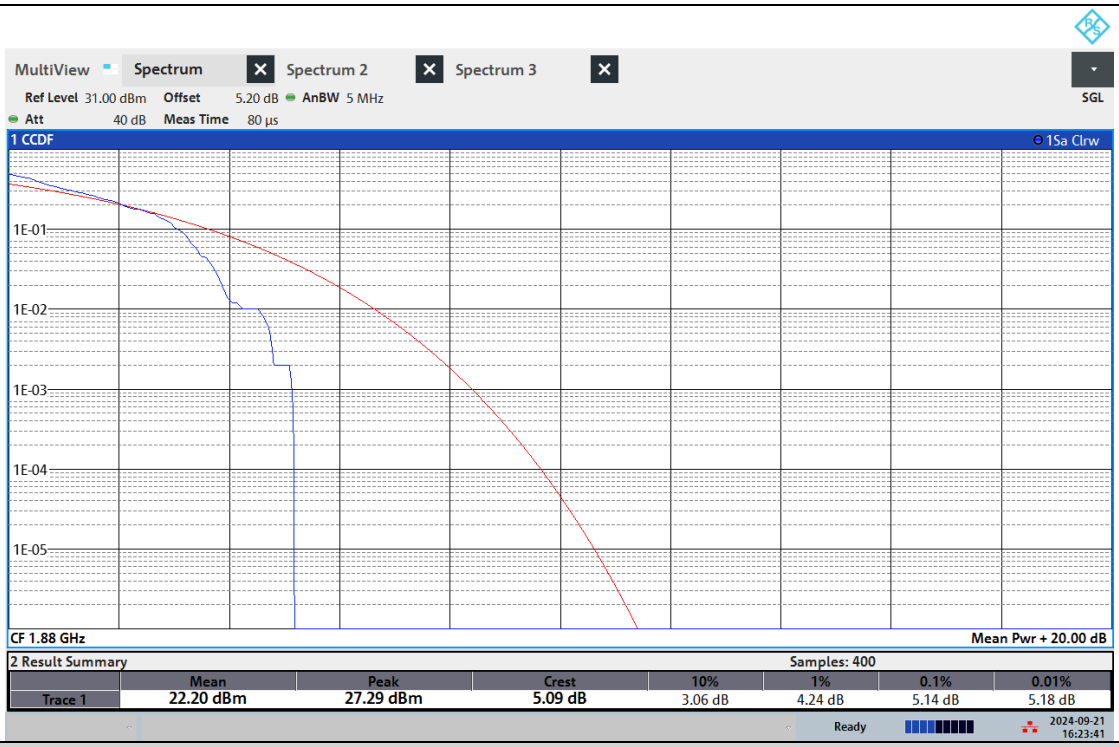
Band2-1.4MHz-QPSK-19193



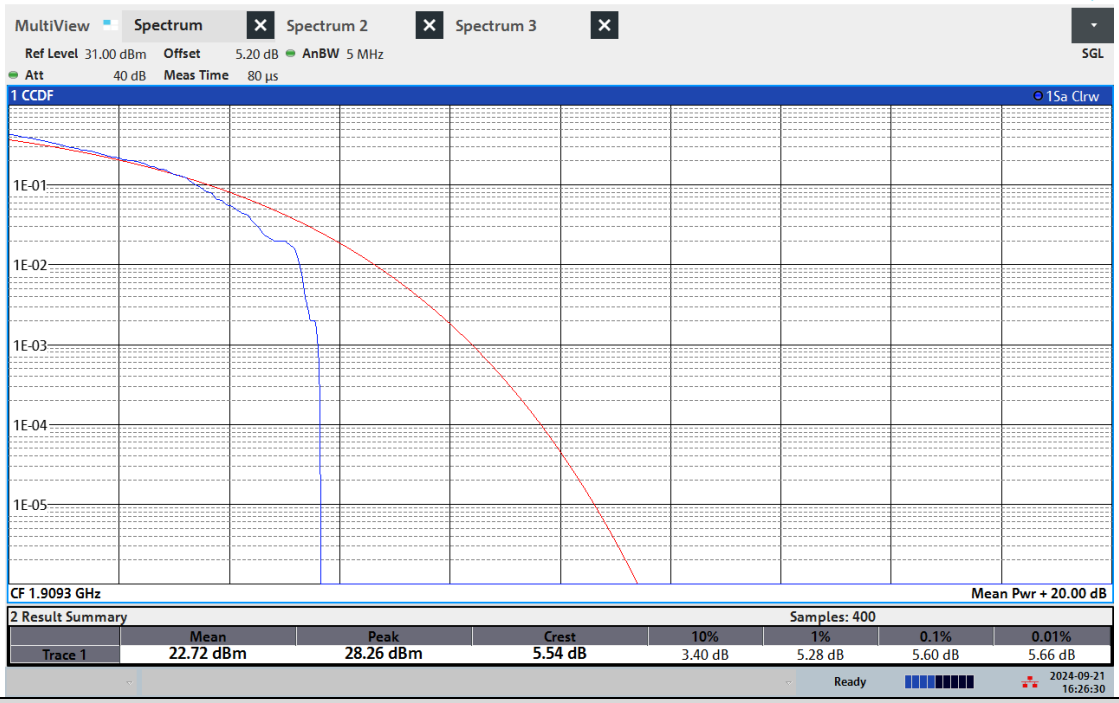
Band2-1.4MHz-16QAM-18607



Band2-1.4MHz-16QAM-18900

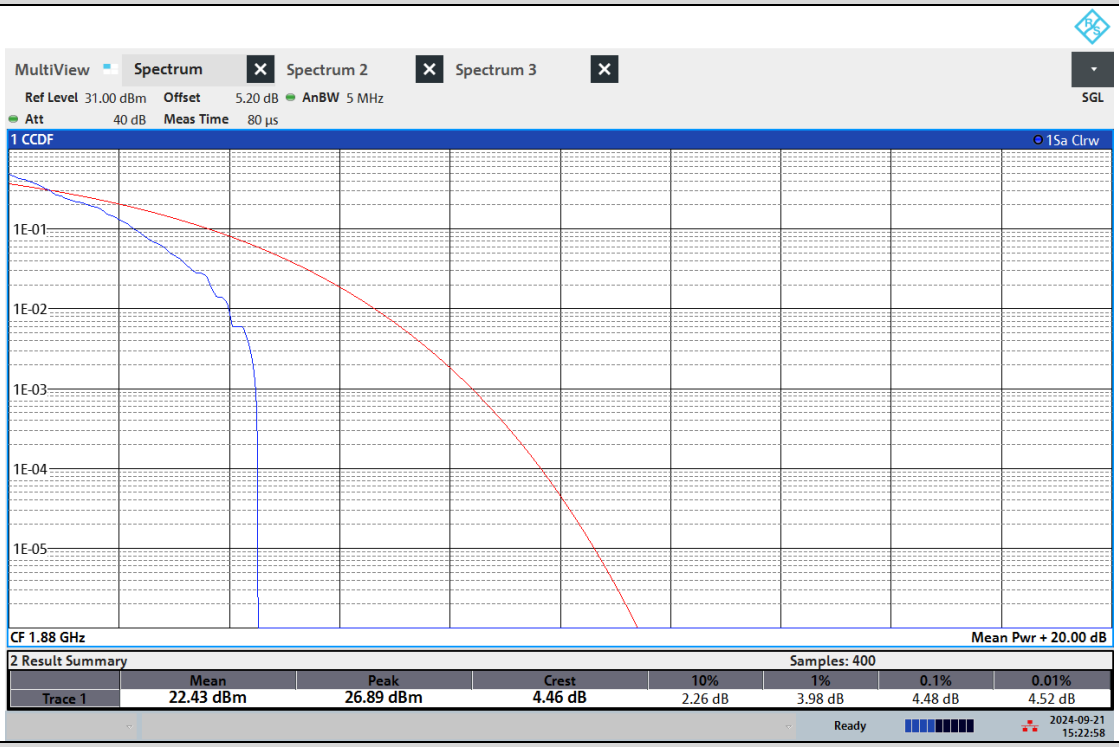


Band2-1.4MHz-16QAM-19193



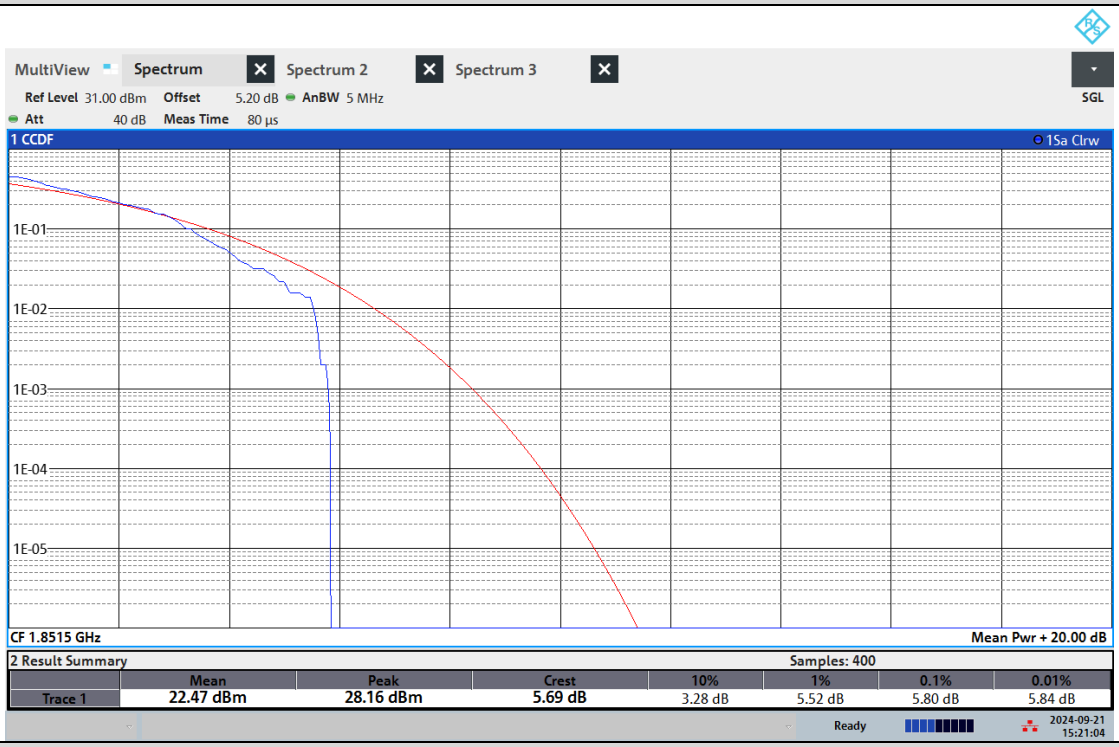
Band2-3MHz-QPSK-18615

Band2-3MHz-QPSK-18900

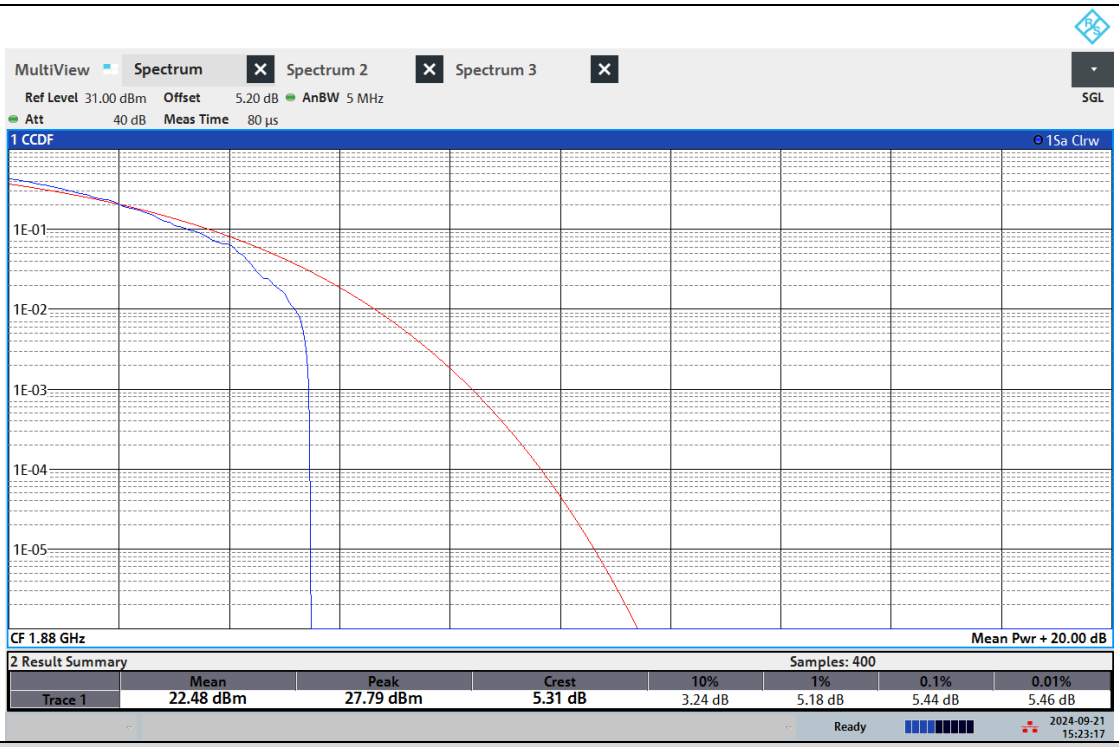


Band2-3MHz-QPSK-19185

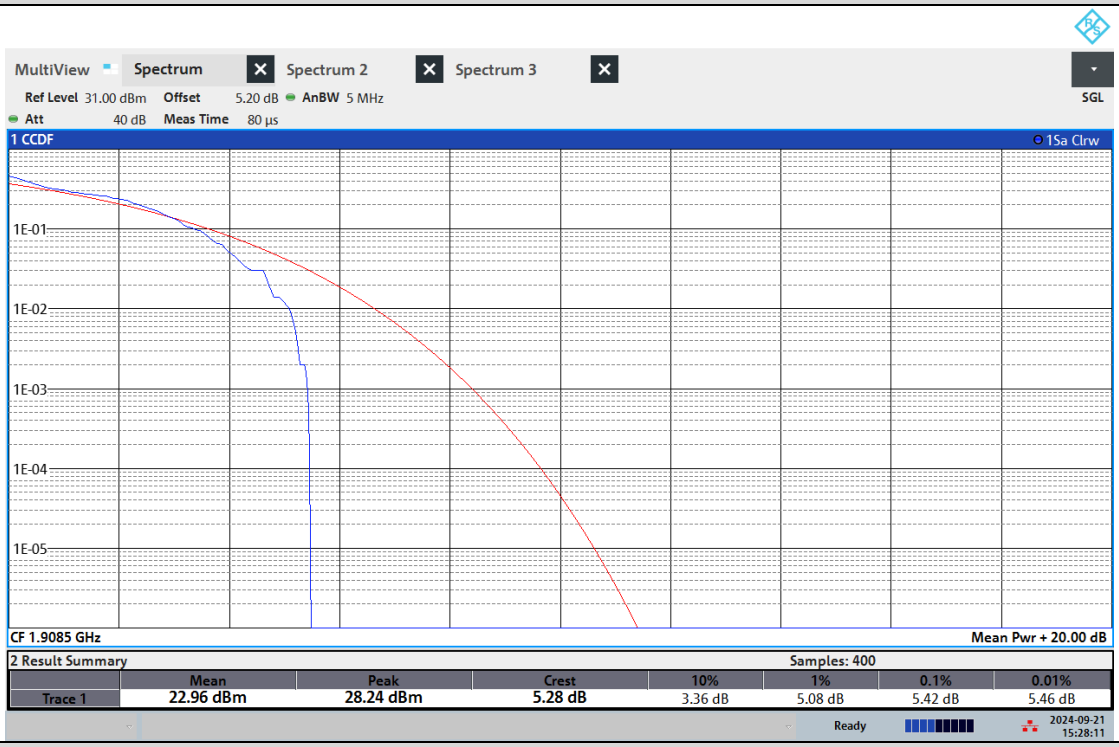
Band2-3MHz-16QAM-18615



Band2-3MHz-16QAM-18900

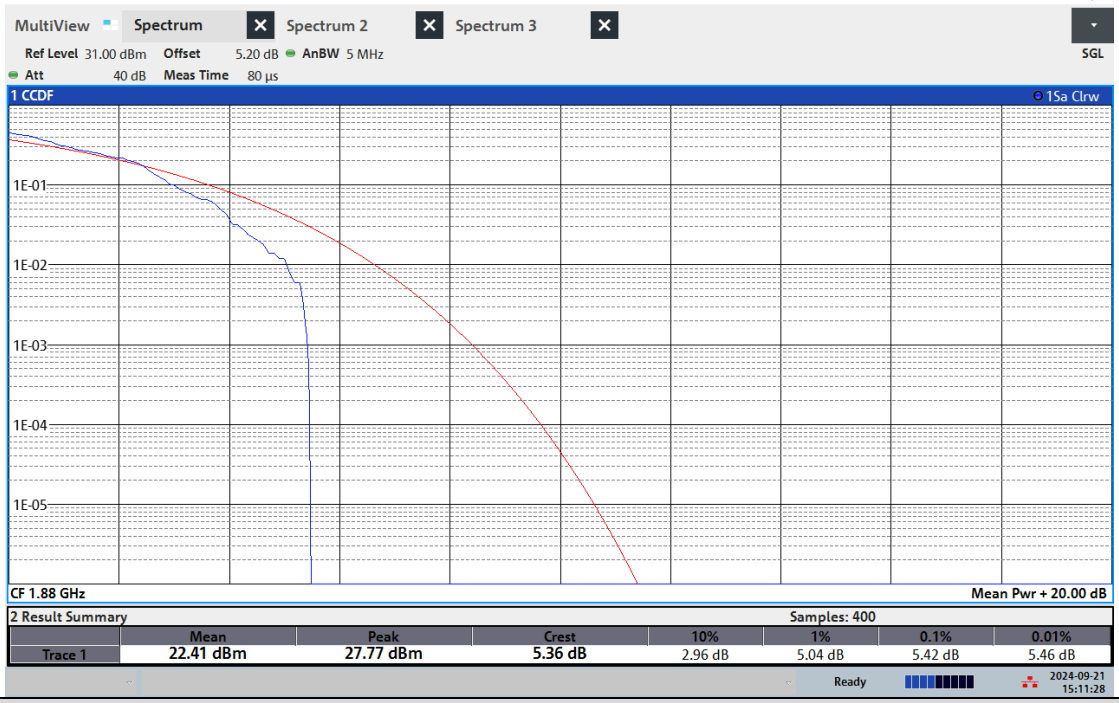


Band2-3MHz-16QAM-19185



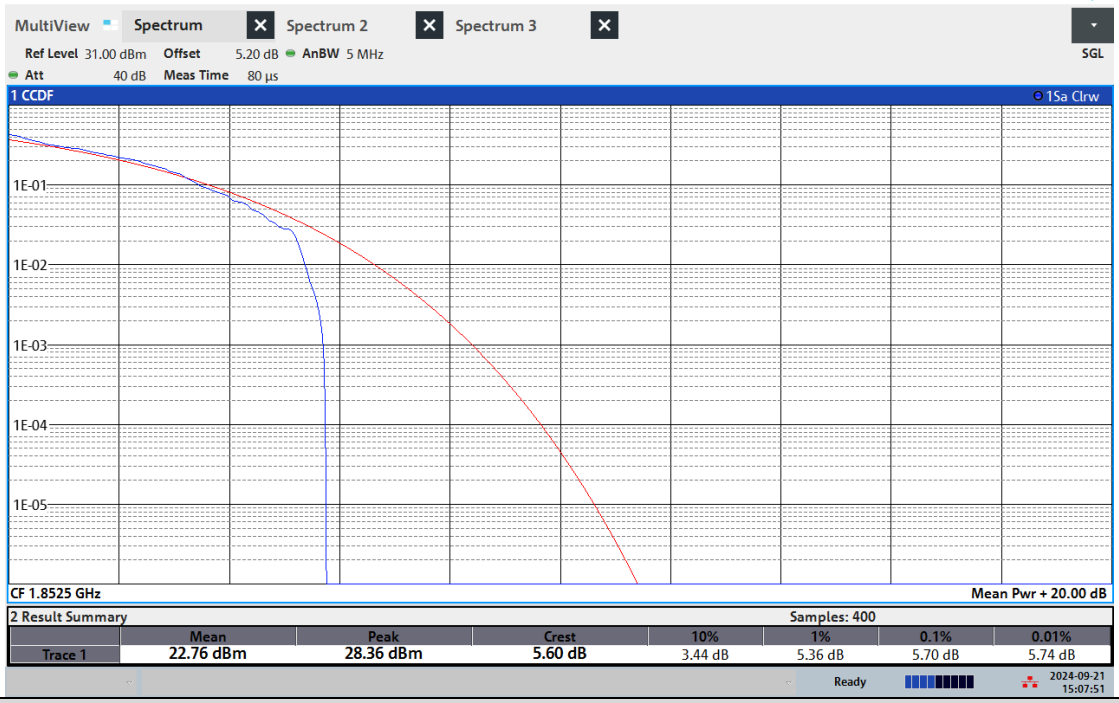
Band2-5MHz-QPSK-18625

Band2-5MHz-QPSK-18900

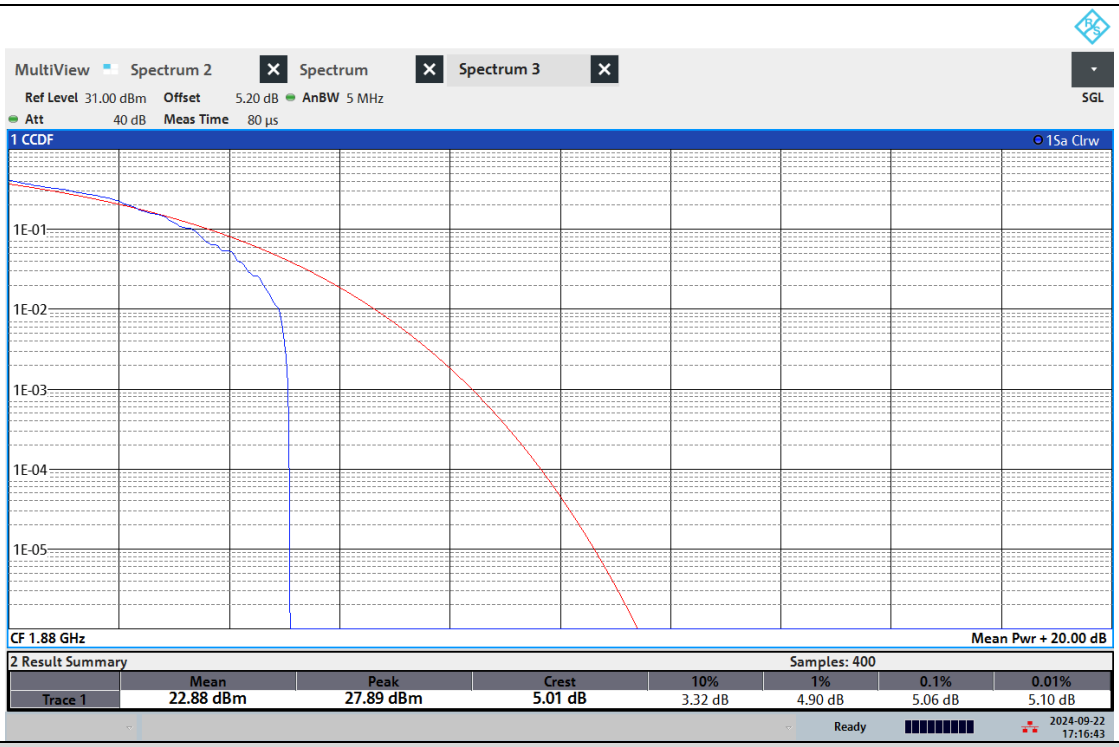


Band2-5MHz-QPSK-19175

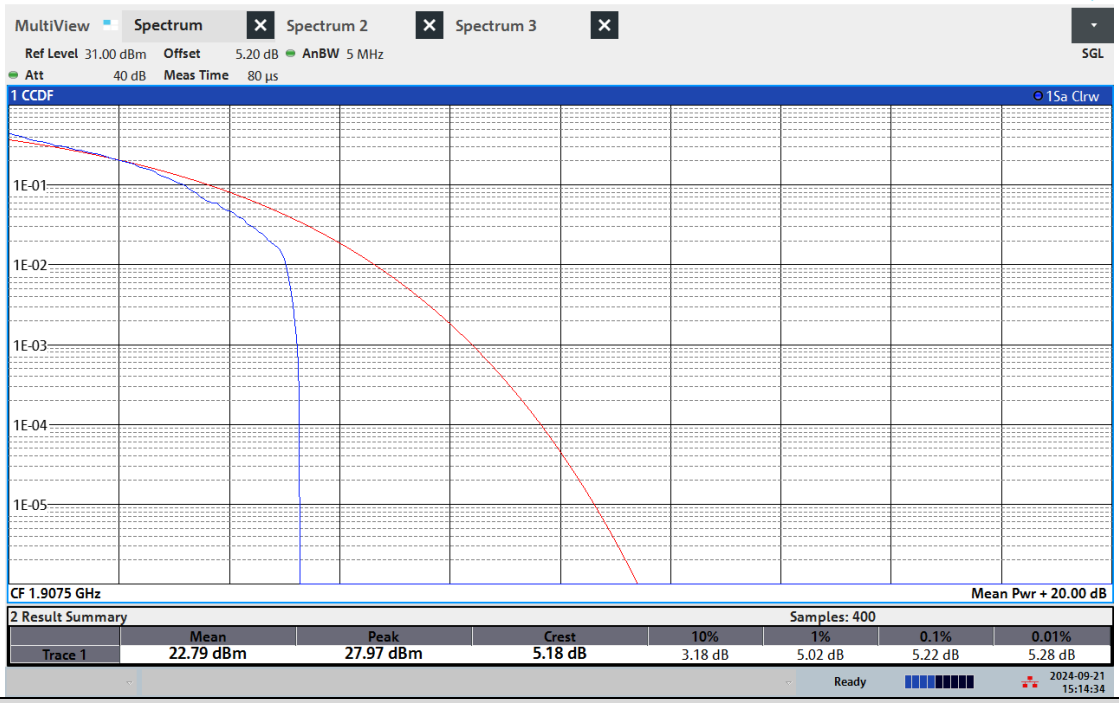
Band2-5MHz-16QAM-18625



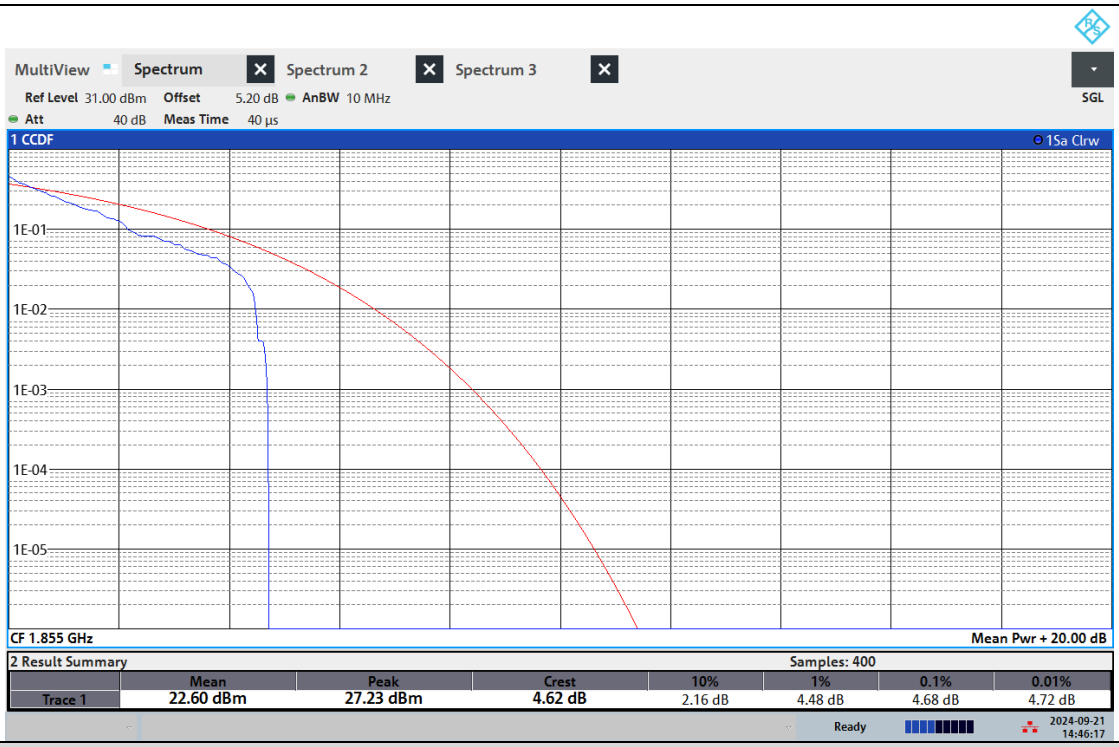
Band2-5MHz-16QAM-18900



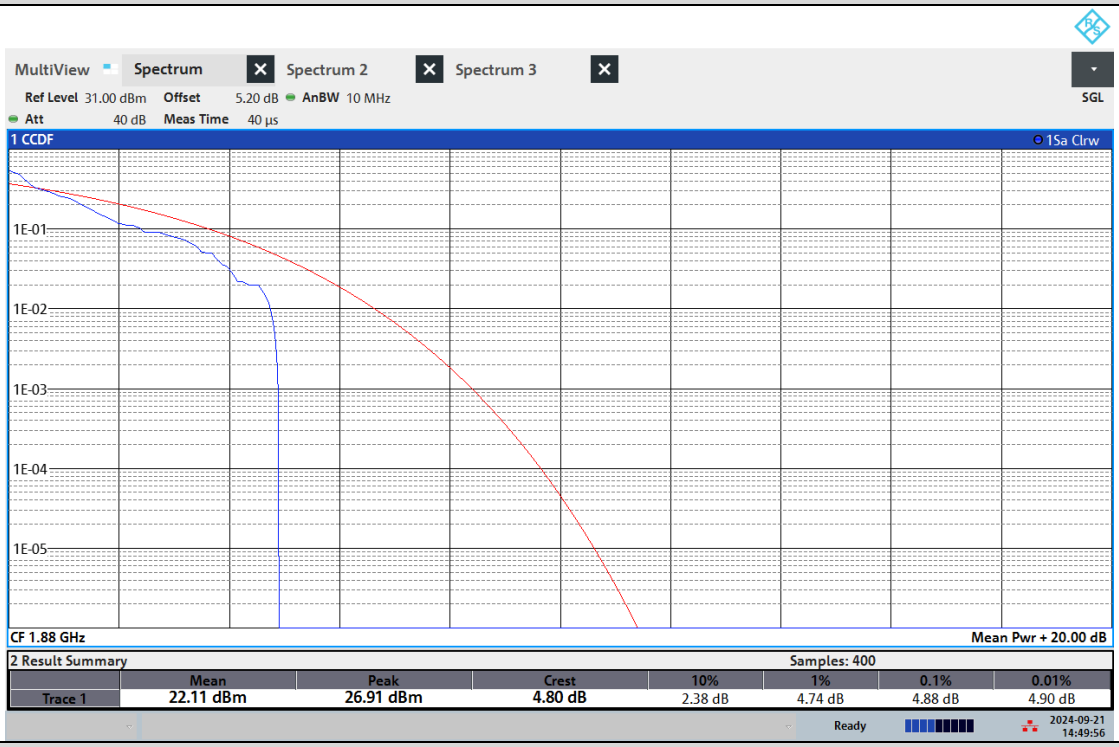
Band2-5MHz-16QAM-19175



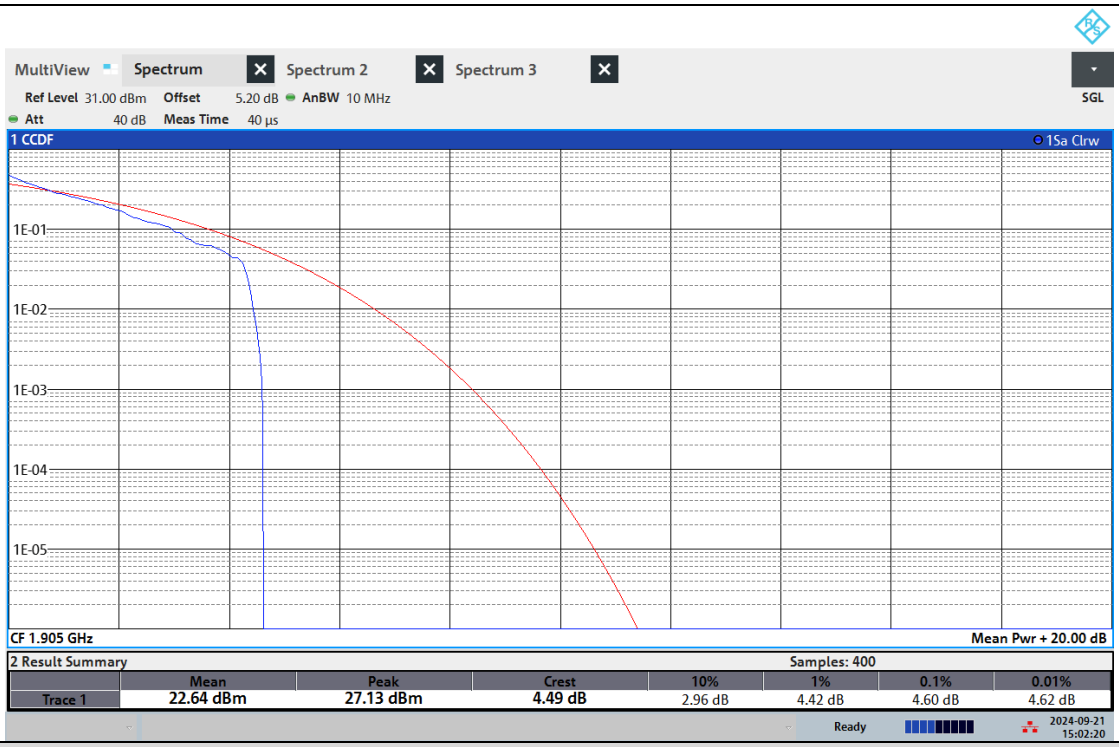
Band2-10MHz-QPSK-18650



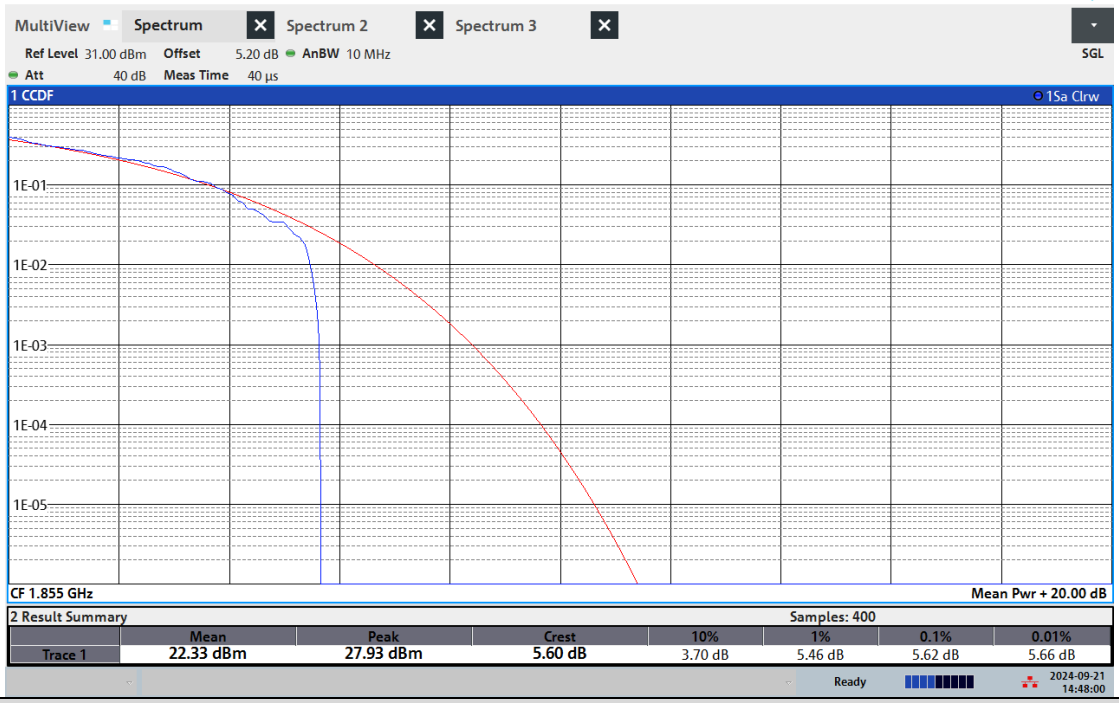
Band2-10MHz-QPSK-18900



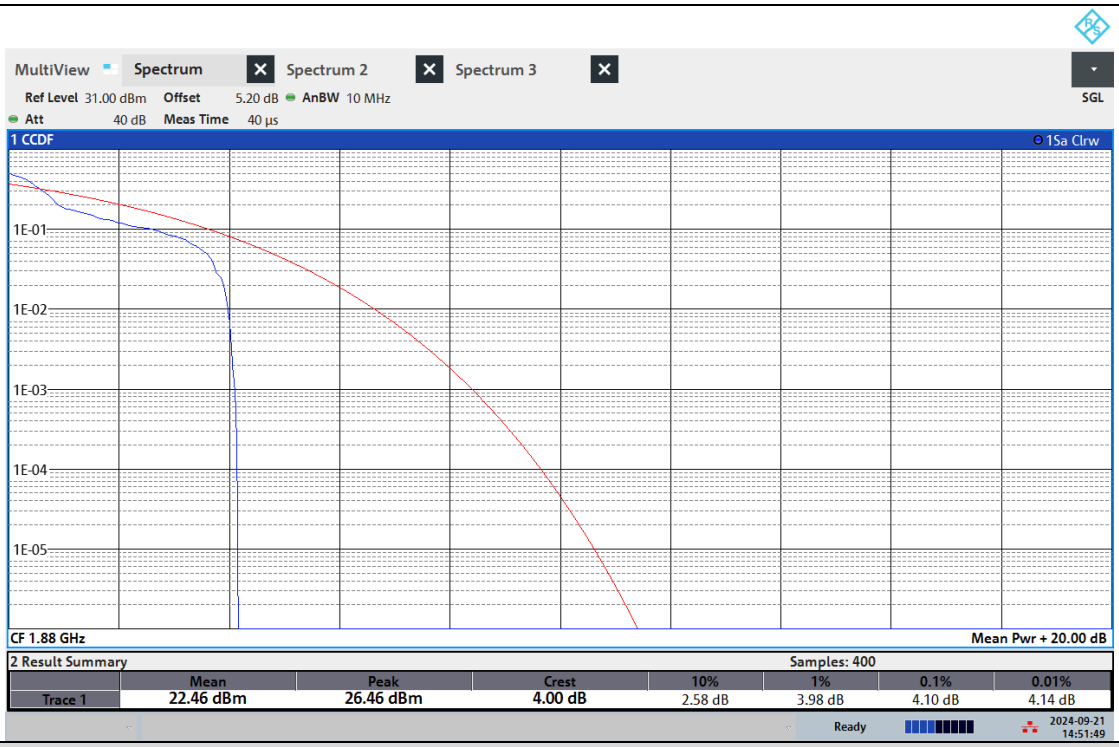
Band2-10MHz-QPSK-19150



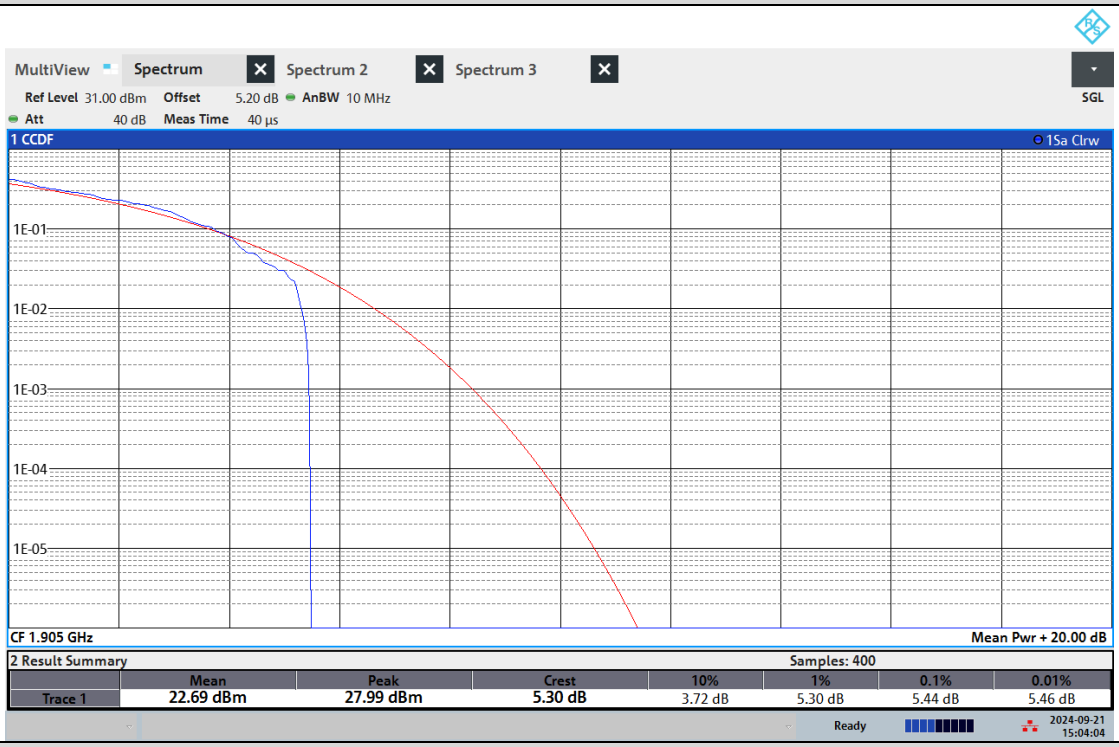
Band2-10MHz-16QAM-18650



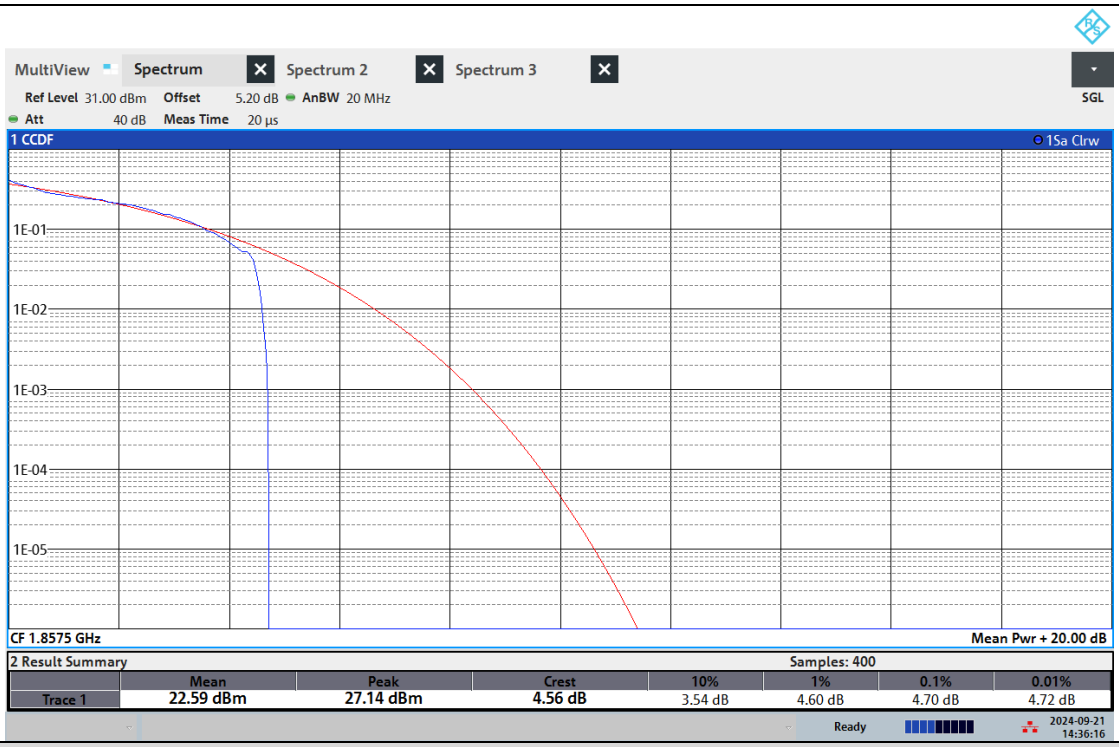
Band2-10MHz-16QAM-18900



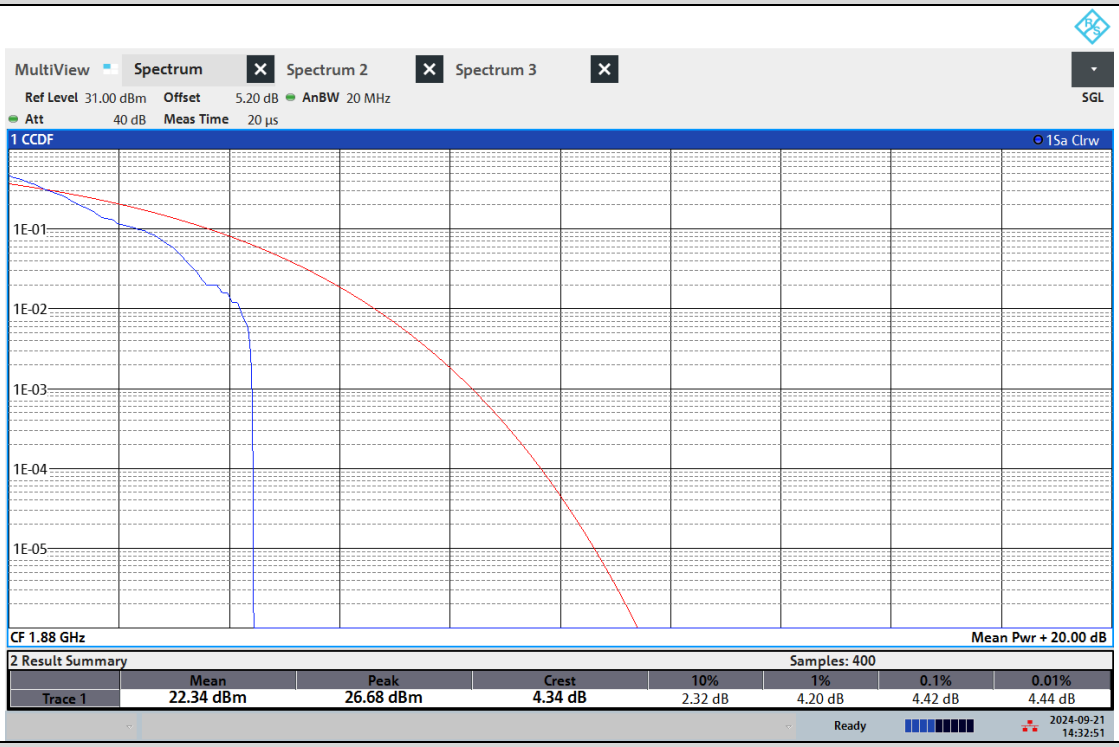
Band2-10MHz-16QAM-19150



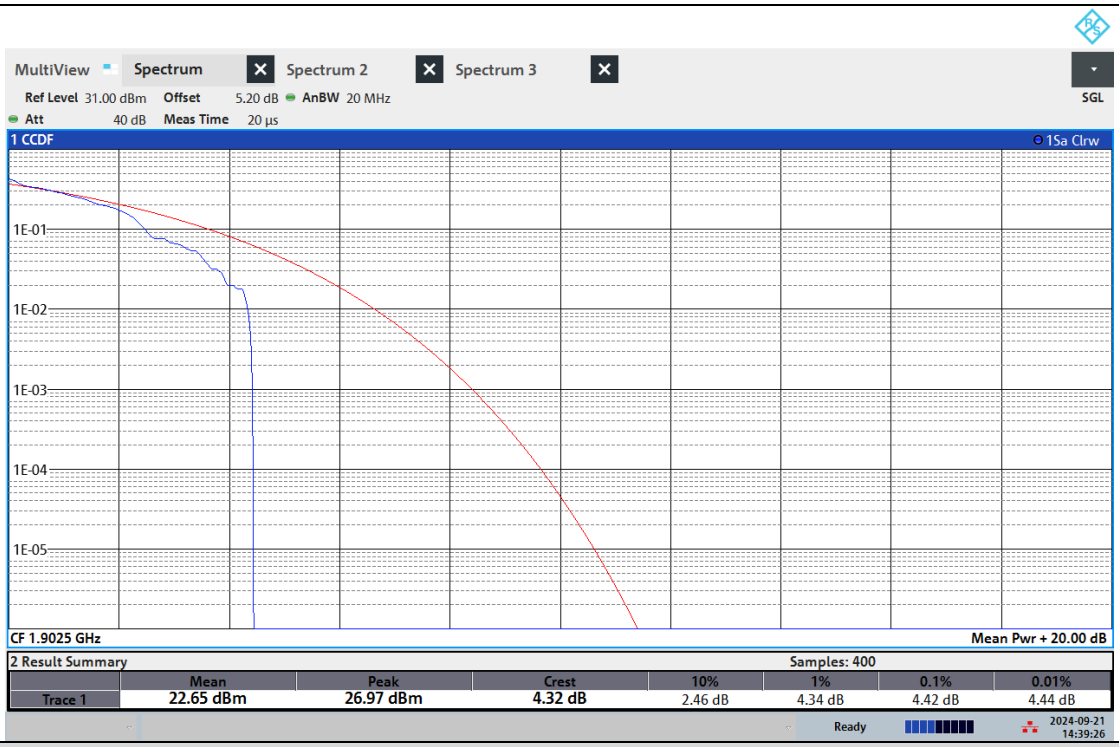
Band2-15MHz-QPSK-18675



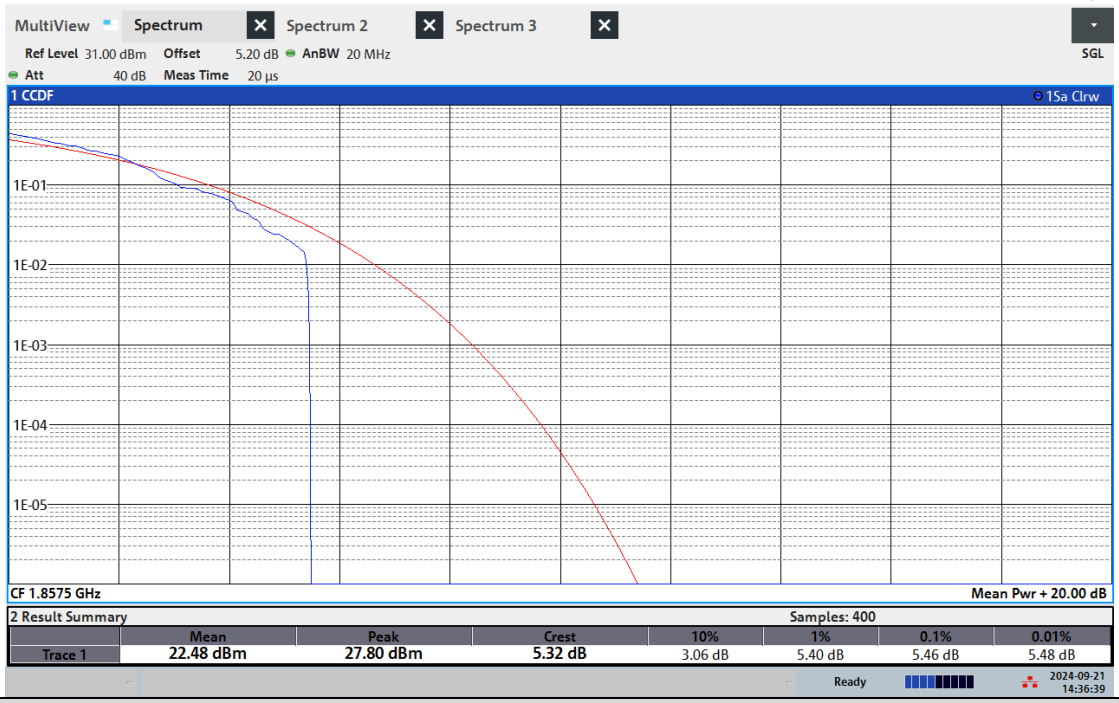
Band2-15MHz-QPSK-18900



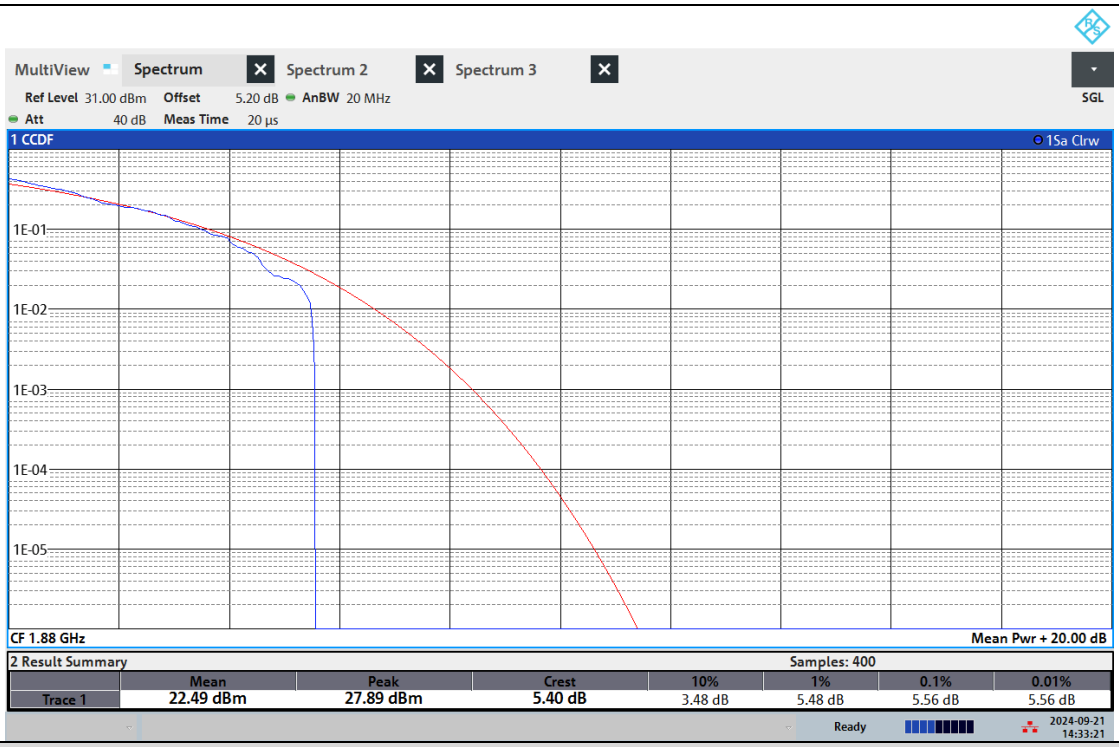
Band2-15MHz-QPSK-19125



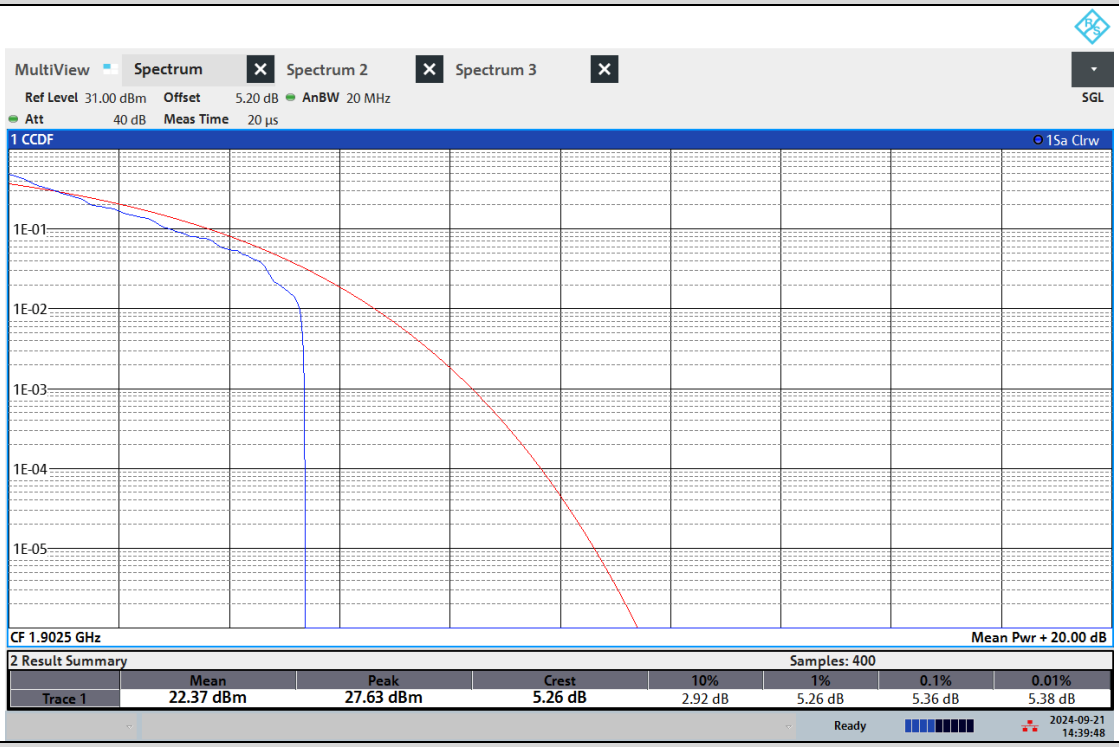
Band2-15MHz-16QAM-18675



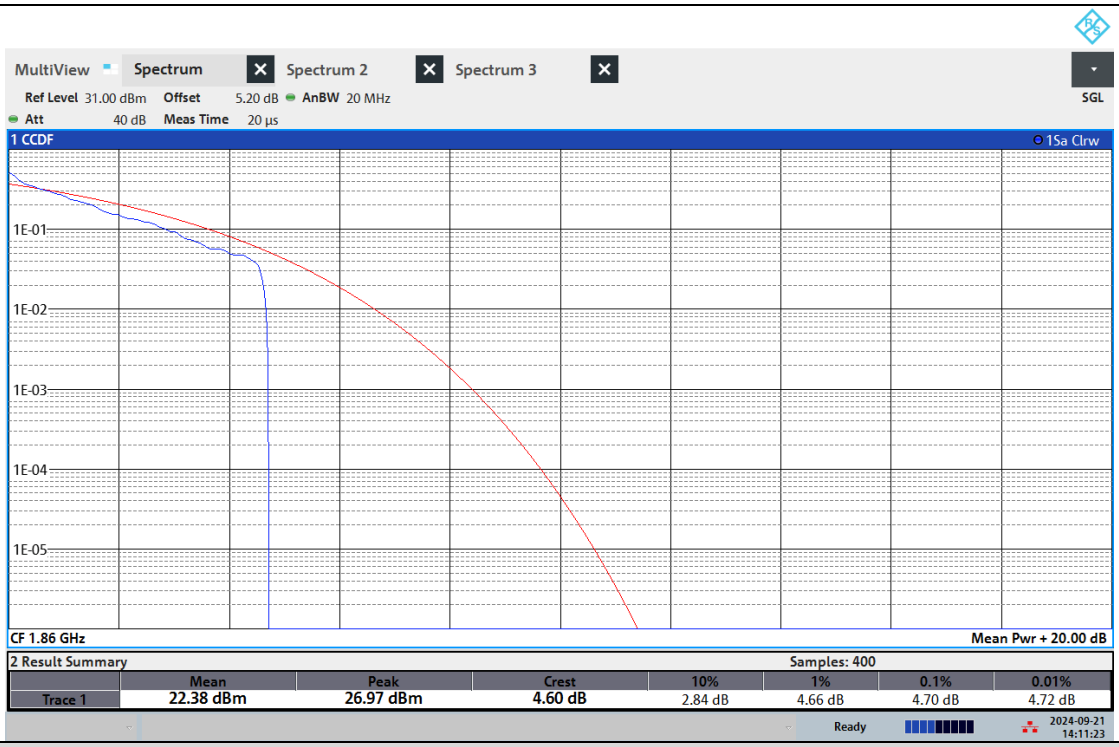
Band2-15MHz-16QAM-18900



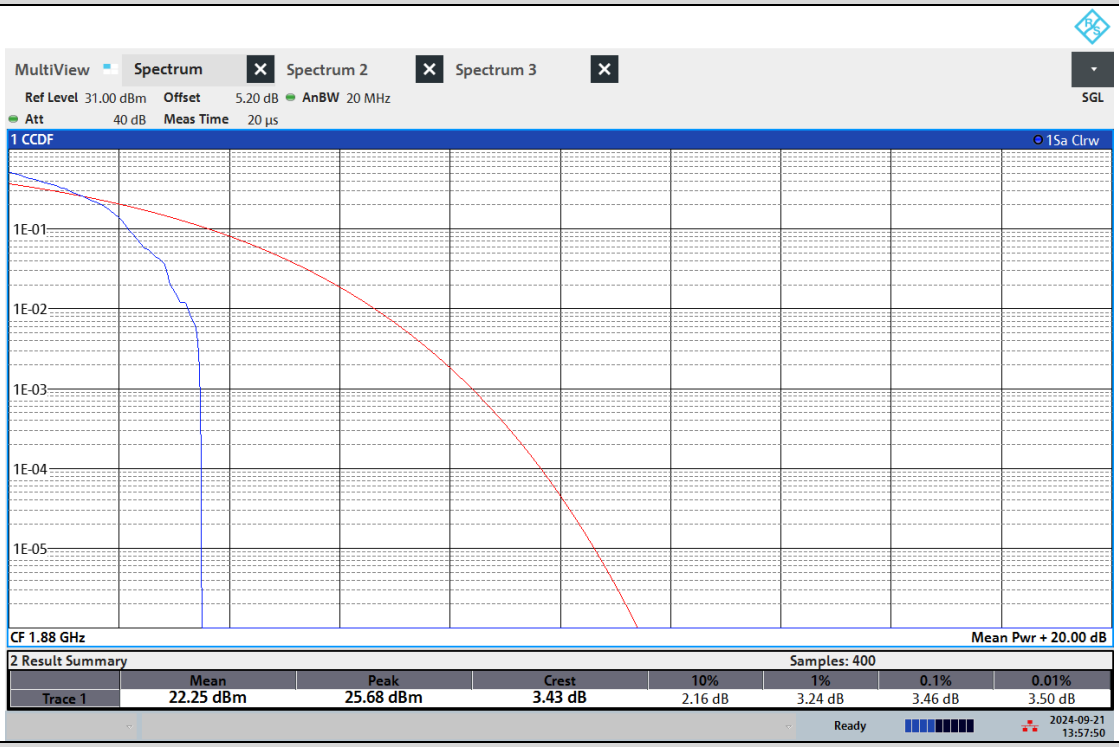
Band2-15MHz-16QAM-19125



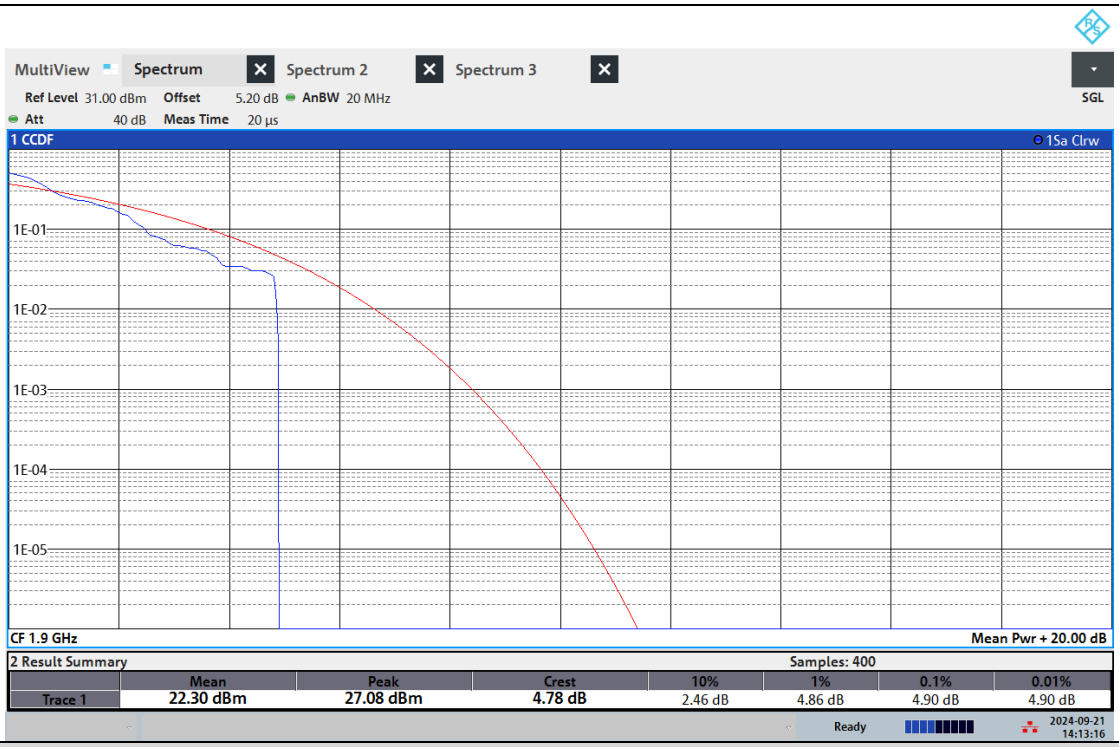
Band2-20MHz-QPSK-18700



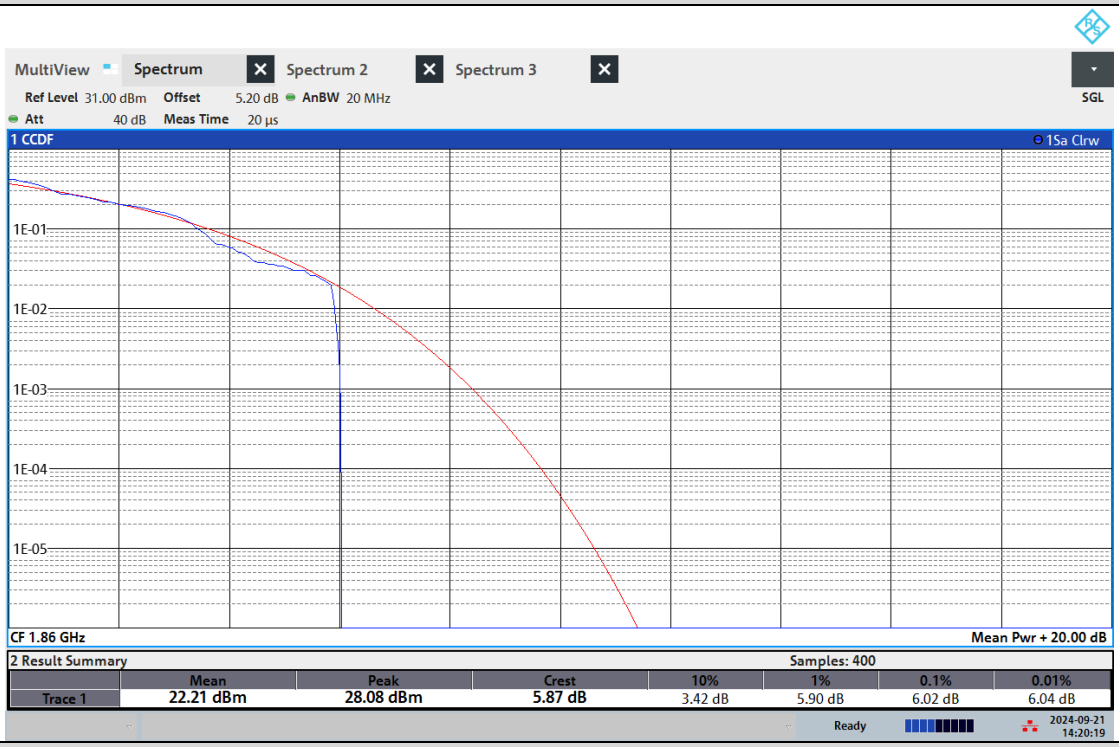
Band2-20MHz-QPSK-18900



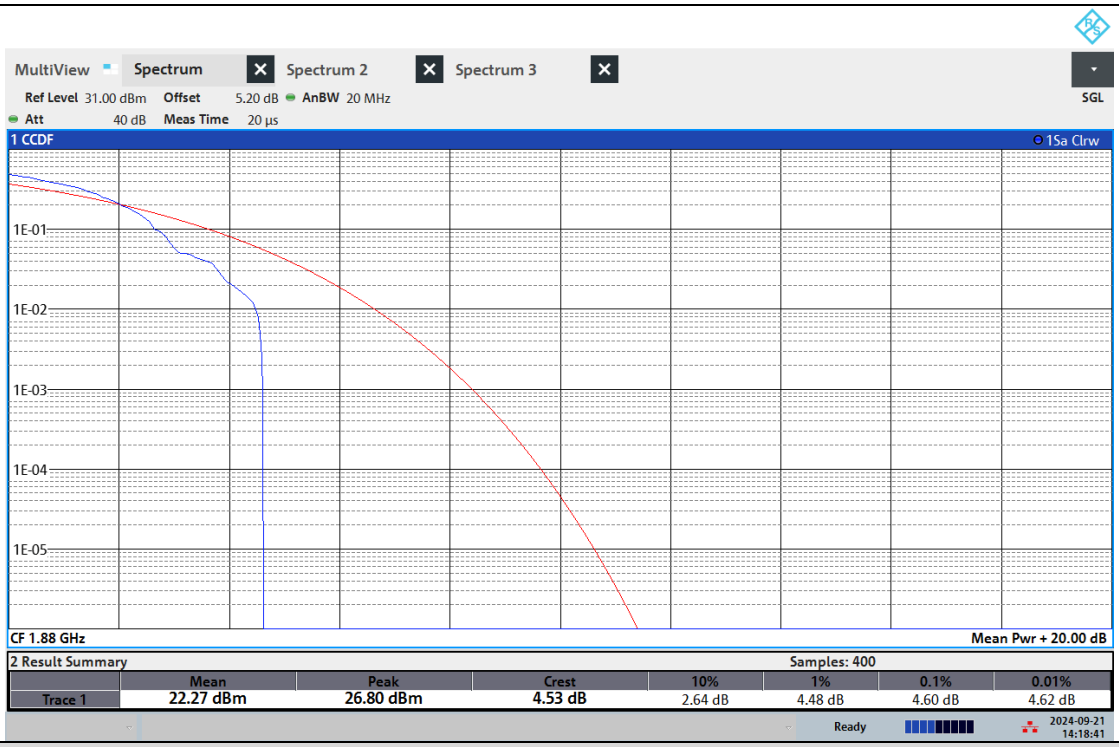
Band2-20MHz-QPSK-19100



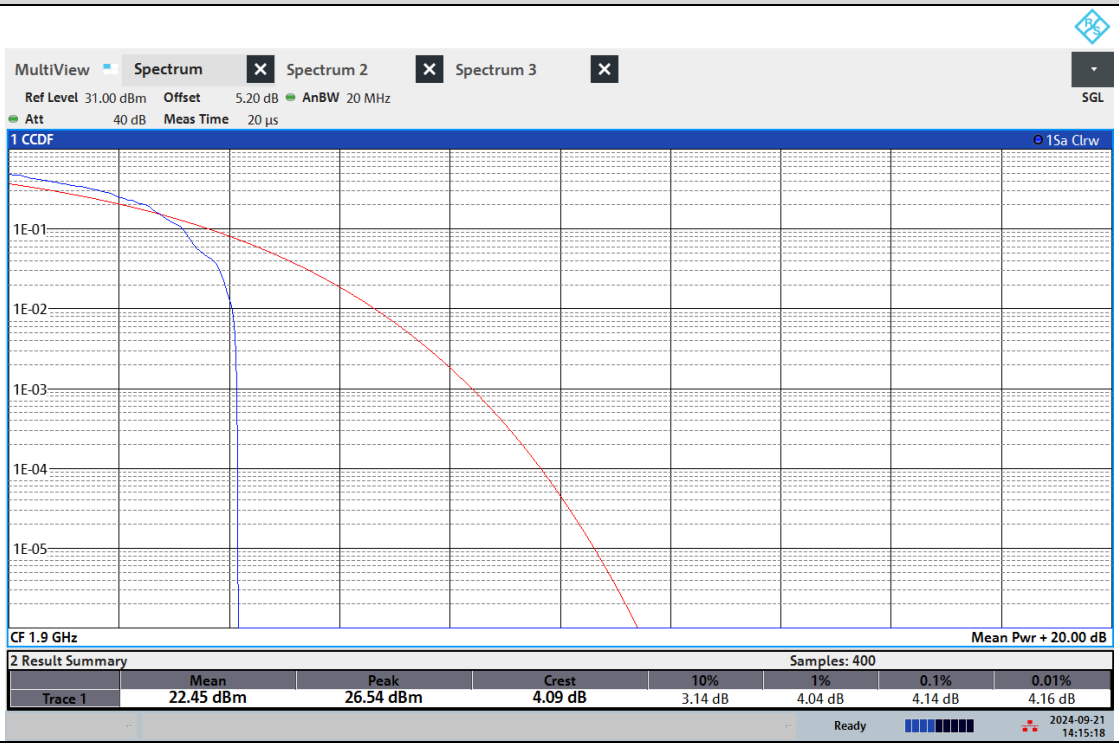
Band2-20MHz-16QAM-18700



Band2-20MHz-16QAM-18900



Band2-20MHz-16QAM-19100



26DB BANDWIDTH AND OCCUPIED BANDWIDTH

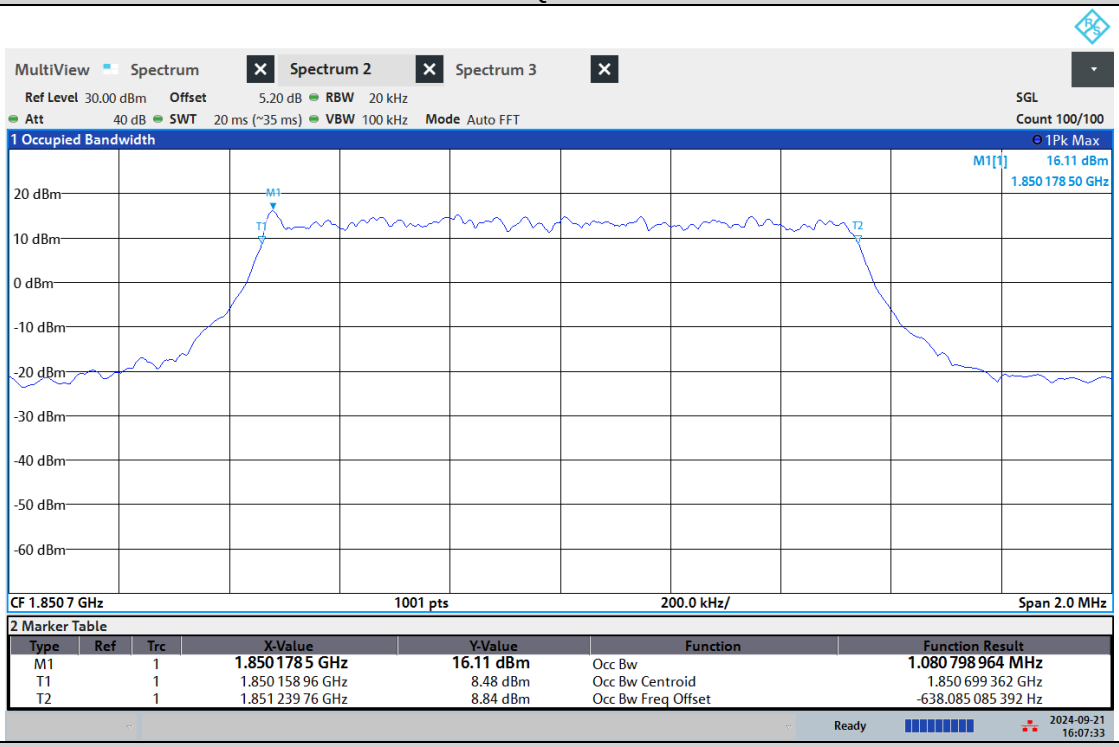
Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band2	1.4MHz	QPSK	18607	6RB#0	1.081	1.25	PASS
Band2	1.4MHz	QPSK	18900	6RB#0	1.080	1.26	PASS
Band2	1.4MHz	QPSK	19193	6RB#0	1.083	1.26	PASS
Band2	1.4MHz	16QAM	18607	6RB#0	1.079	1.29	PASS
Band2	1.4MHz	16QAM	18900	6RB#0	1.080	1.28	PASS
Band2	1.4MHz	16QAM	19193	6RB#0	1.079	1.29	PASS
Band2	3MHz	QPSK	18615	6RB#0	1.098	1.36	PASS
Band2	3MHz	QPSK	18900	6RB#0	1.098	1.35	PASS
Band2	3MHz	QPSK	19185	6RB#0	1.088	1.36	PASS
Band2	3MHz	16QAM	18615	6RB#0	1.089	1.39	PASS
Band2	3MHz	16QAM	18900	6RB#0	1.088	1.37	PASS
Band2	3MHz	16QAM	19185	6RB#0	1.091	1.38	PASS
Band2	5MHz	QPSK	18625	6RB#0	1.102	1.39	PASS
Band2	5MHz	QPSK	18900	6RB#0	1.105	1.38	PASS
Band2	5MHz	QPSK	19175	6RB#0	1.100	1.38	PASS
Band2	5MHz	16QAM	18625	6RB#0	1.105	1.39	PASS
Band2	5MHz	16QAM	18900	6RB#0	1.107	1.39	PASS
Band2	5MHz	16QAM	19175	6RB#0	1.120	1.39	PASS
Band2	10MHz	QPSK	18650	6RB#0	1.097	1.61	PASS
Band2	10MHz	QPSK	18900	6RB#0	1.099	1.41	PASS
Band2	10MHz	QPSK	19150	6RB#0	1.097	1.51	PASS
Band2	10MHz	16QAM	18650	6RB#0	1.122	1.47	PASS
Band2	10MHz	16QAM	18900	6RB#0	1.124	1.57	PASS
Band2	10MHz	16QAM	19150	6RB#0	1.120	1.59	PASS
Band2	15MHz	QPSK	18675	6RB#0	1.133	1.59	PASS
Band2	15MHz	QPSK	18900	6RB#0	1.134	1.59	PASS
Band2	15MHz	QPSK	19125	6RB#0	1.130	1.60	PASS
Band2	15MHz	16QAM	18675	6RB#0	1.126	1.60	PASS
Band2	15MHz	16QAM	18900	6RB#0	1.130	1.63	PASS
Band2	15MHz	16QAM	19125	6RB#0	1.134	1.60	PASS
Band2	20MHz	QPSK	18700	6RB#0	1.128	1.54	PASS
Band2	20MHz	QPSK	18900	6RB#0	1.134	1.60	PASS
Band2	20MHz	QPSK	19100	6RB#0	1.129	1.60	PASS
Band2	20MHz	16QAM	18700	6RB#0	1.143	1.70	PASS
Band2	20MHz	16QAM	18900	6RB#0	1.152	1.70	PASS
Band2	20MHz	16QAM	19100	6RB#0	1.146	1.64	PASS

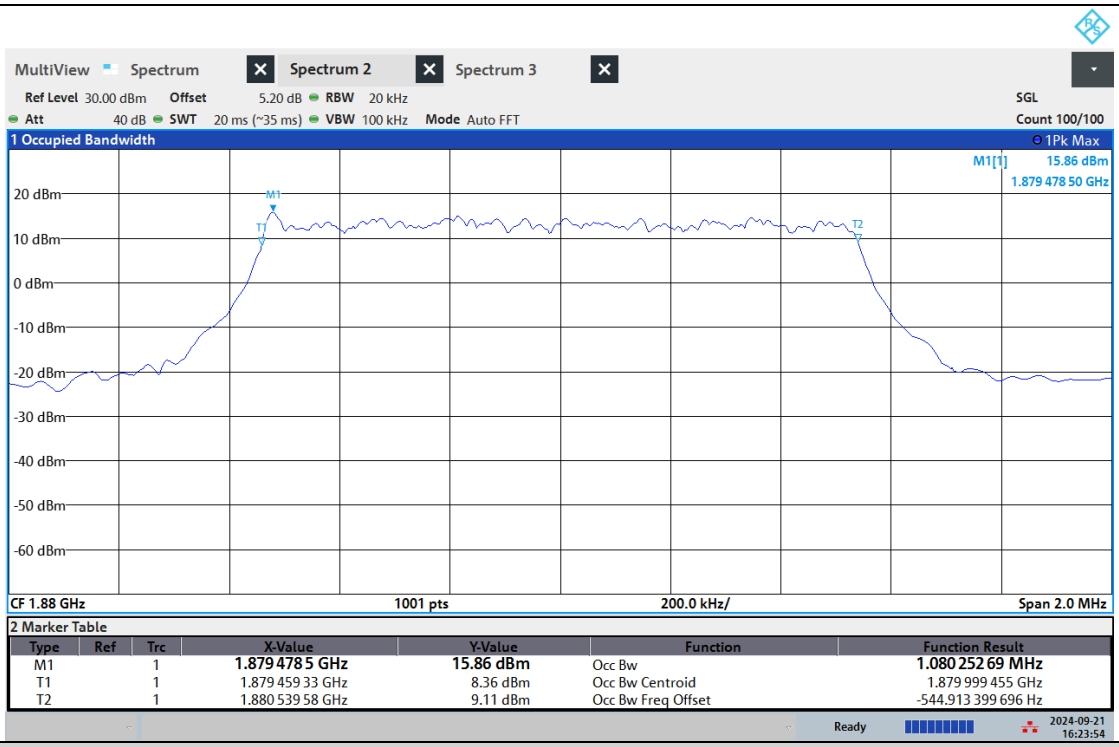
Test Graphs

Occupied Bandwidth

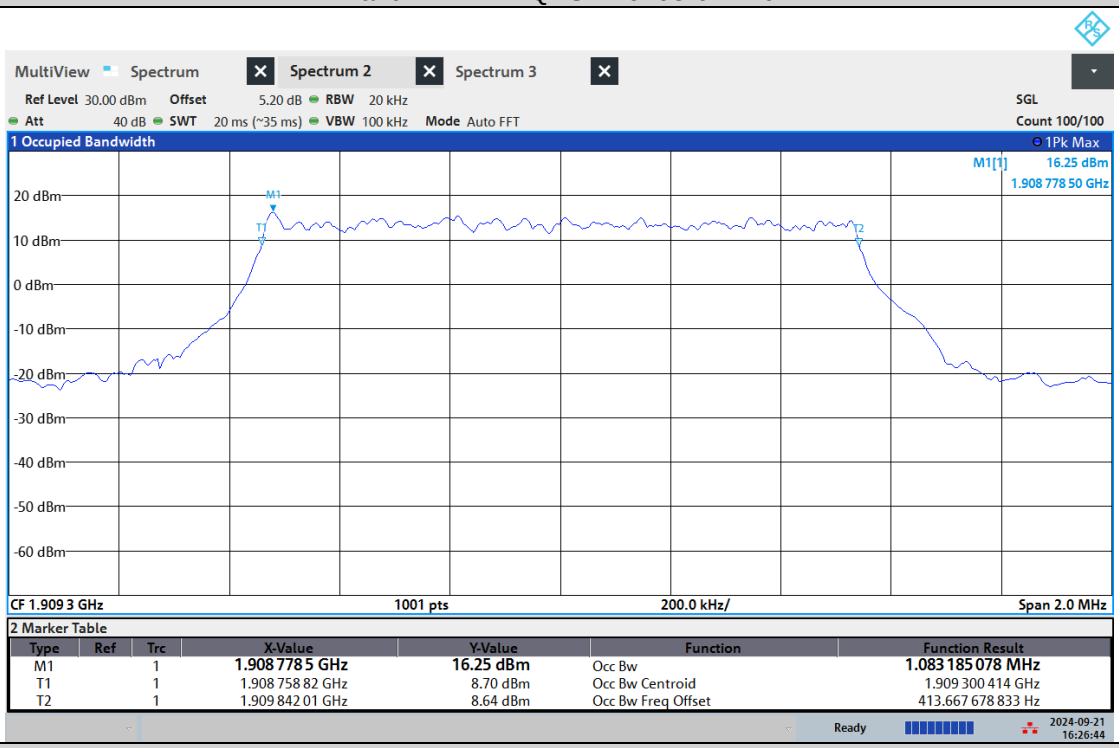
Band2-1.4MHz-QPSK-18607-6RB#0



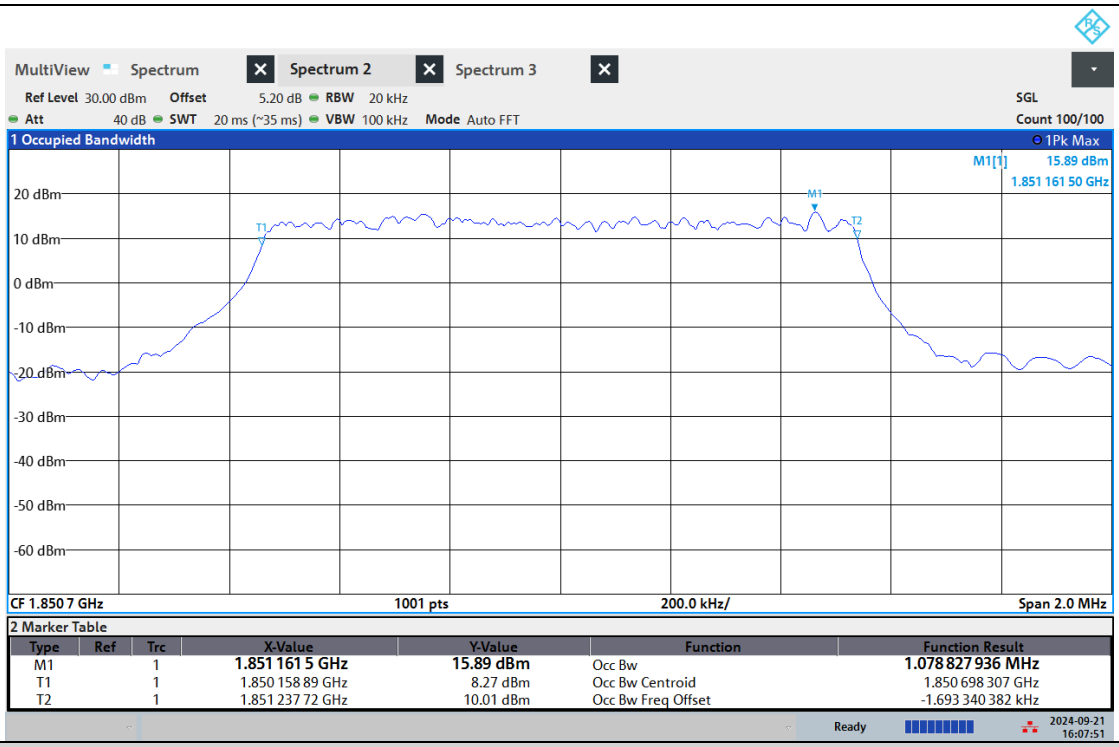
Band2-1.4MHz-QPSK-18900-6RB#0



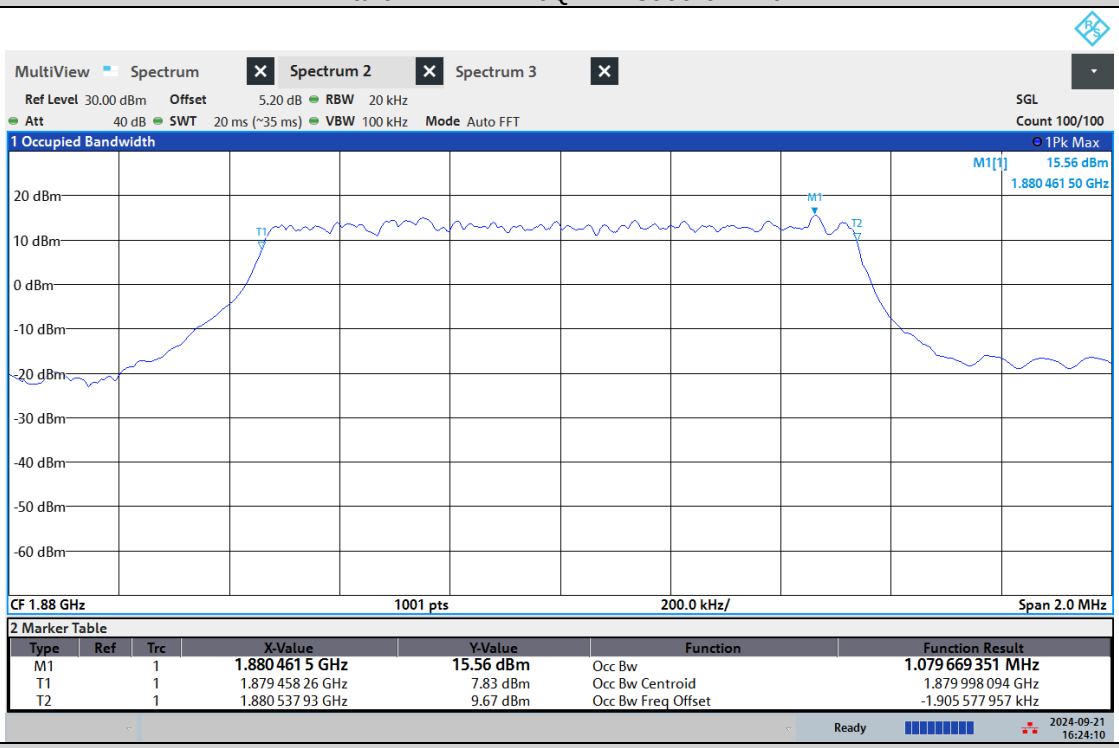
Band2-1.4MHz-QPSK-19193-6RB#0



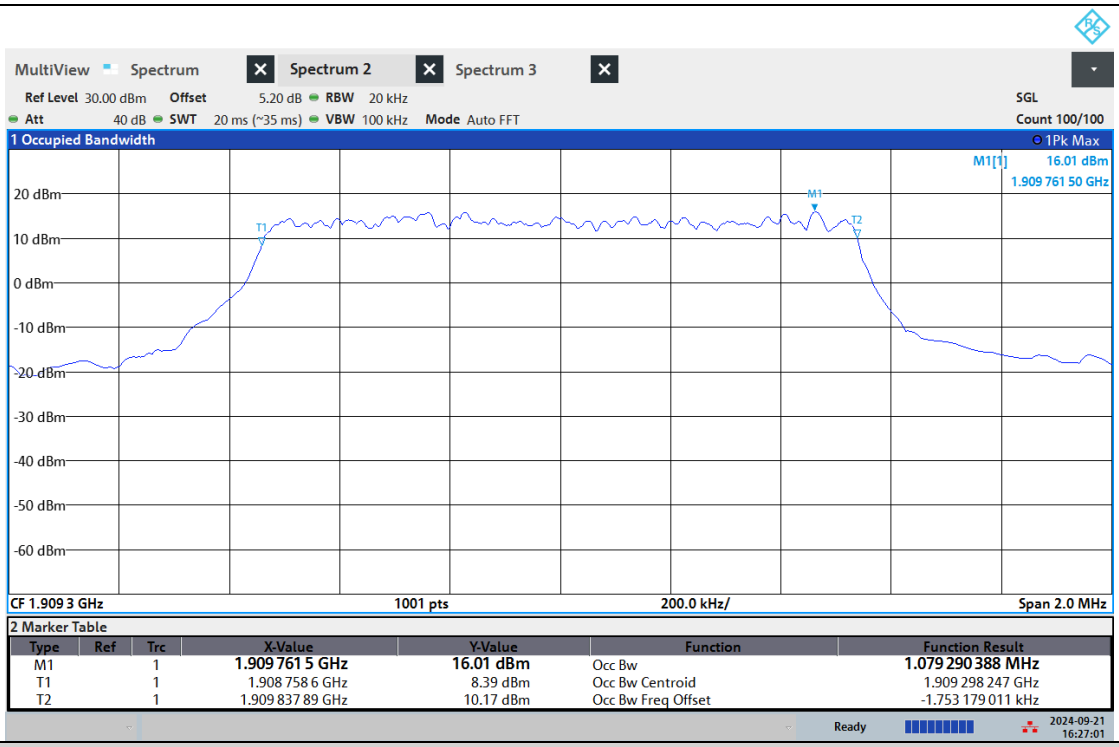
Band2-1.4MHz-16QAM-18607-6RB#0



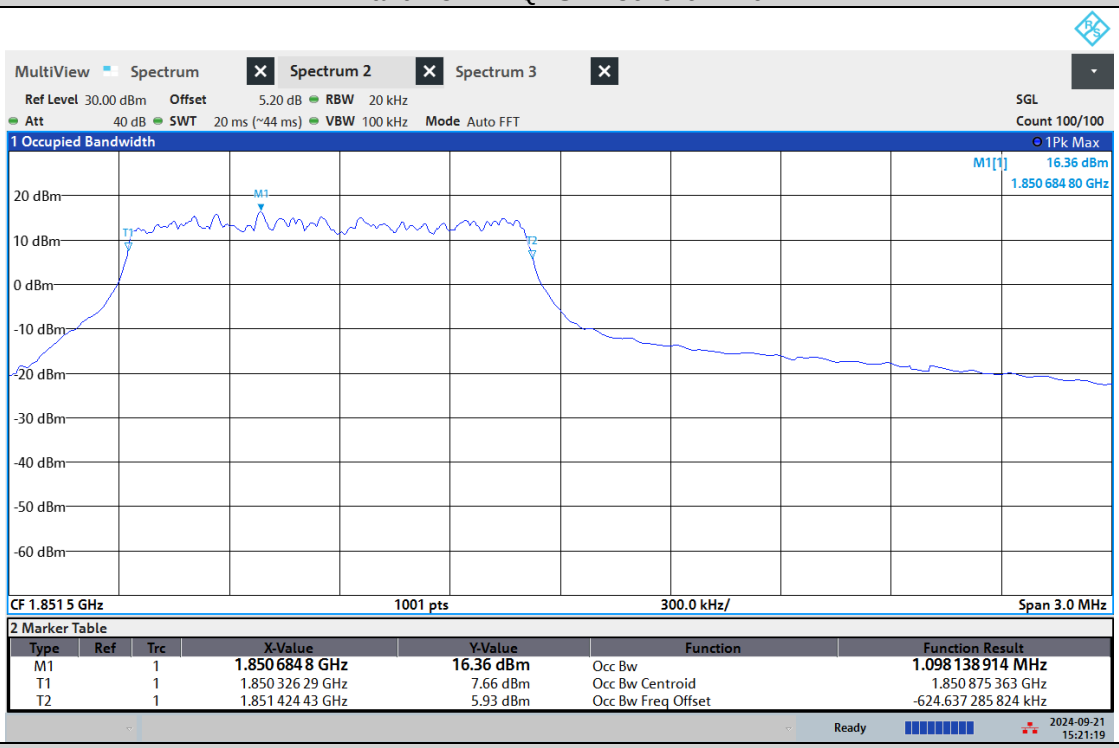
Band2-1.4MHz-16QAM-18900-6RB#0



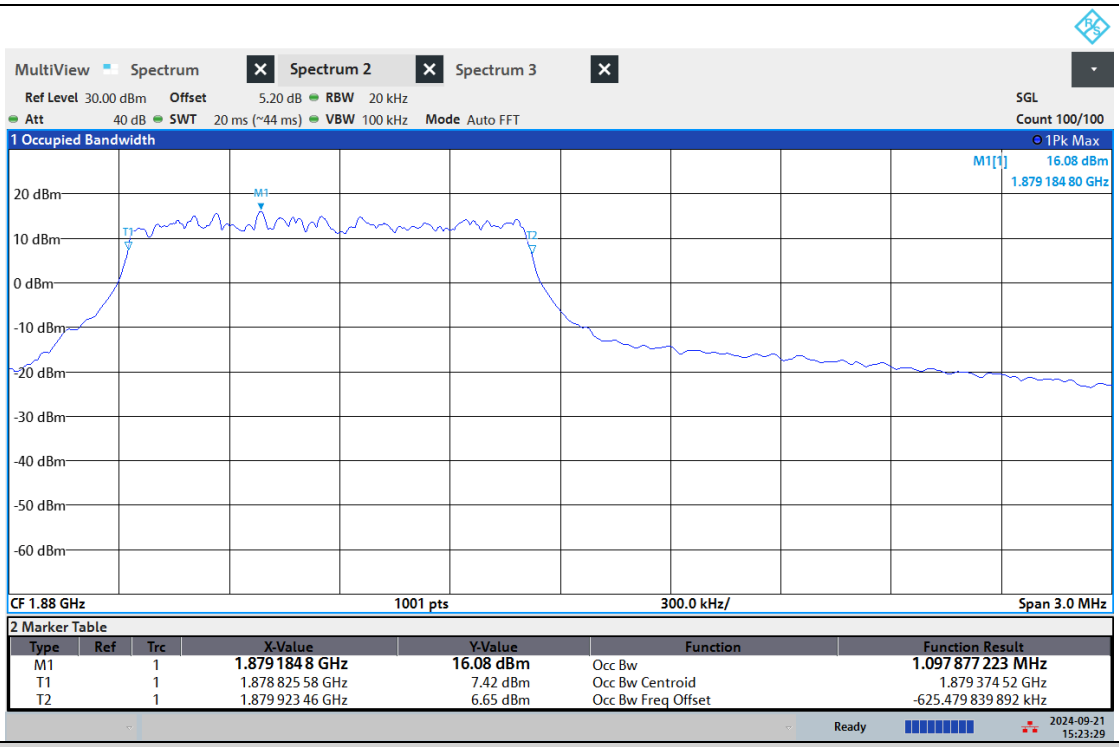
Band2-1.4MHz-16QAM-19193-6RB#0



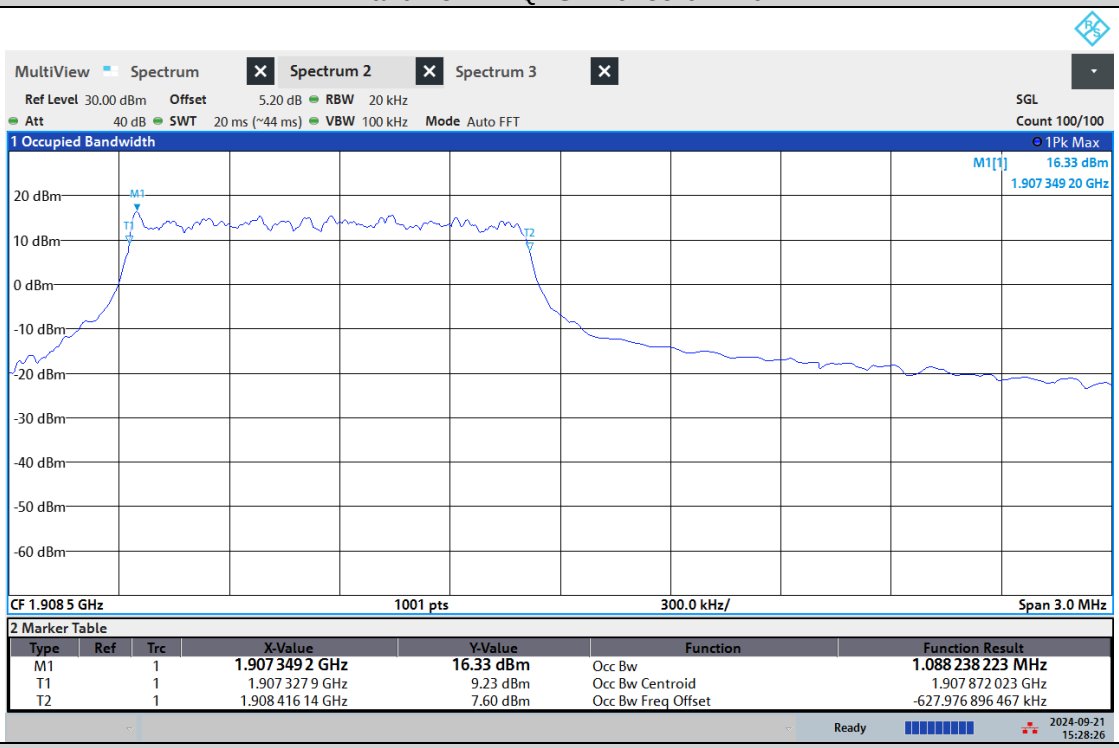
Band2-3MHz-QPSK-18615-6RB#0



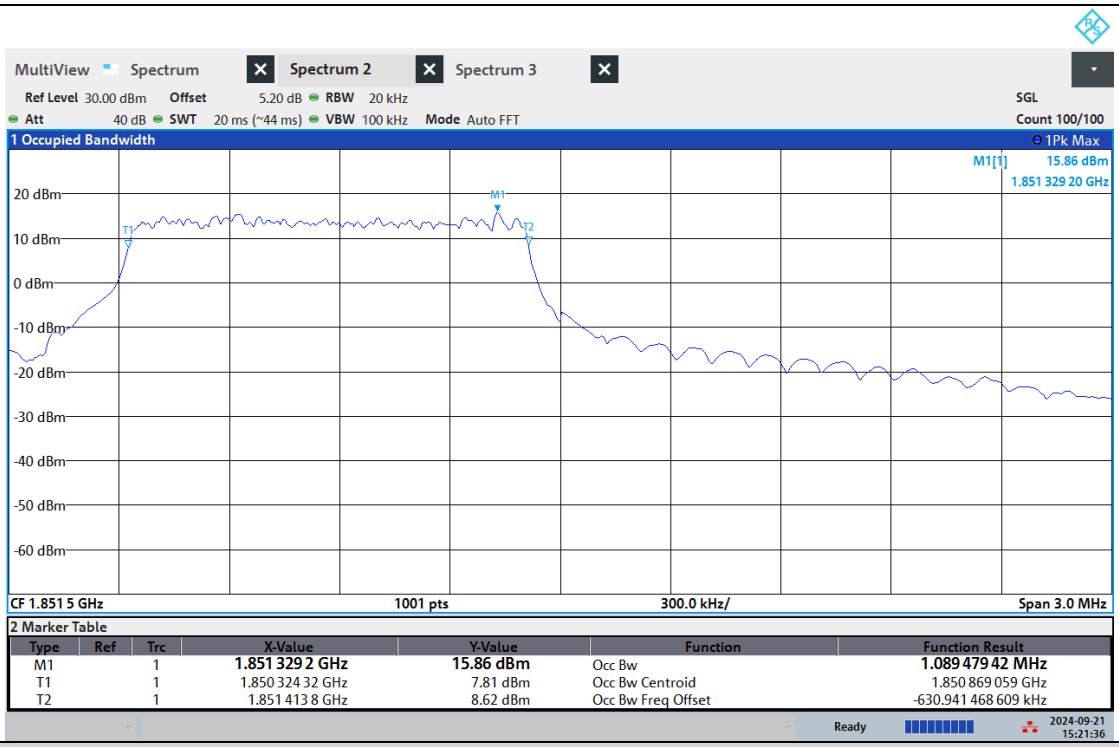
Band2-3MHz-QPSK-18900-6RB#0



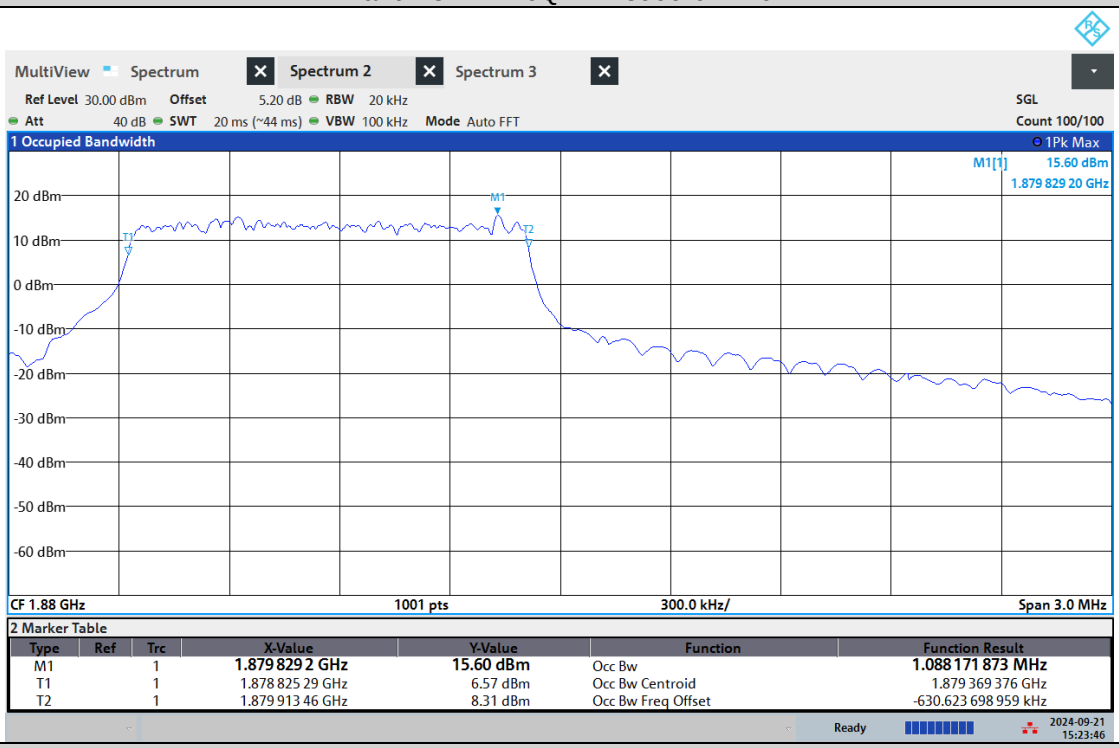
Band2-3MHz-QPSK-19185-6RB#0



Band2-3MHz-16QAM-18615-6RB#0



Band2-3MHz-16QAM-18900-6RB#0



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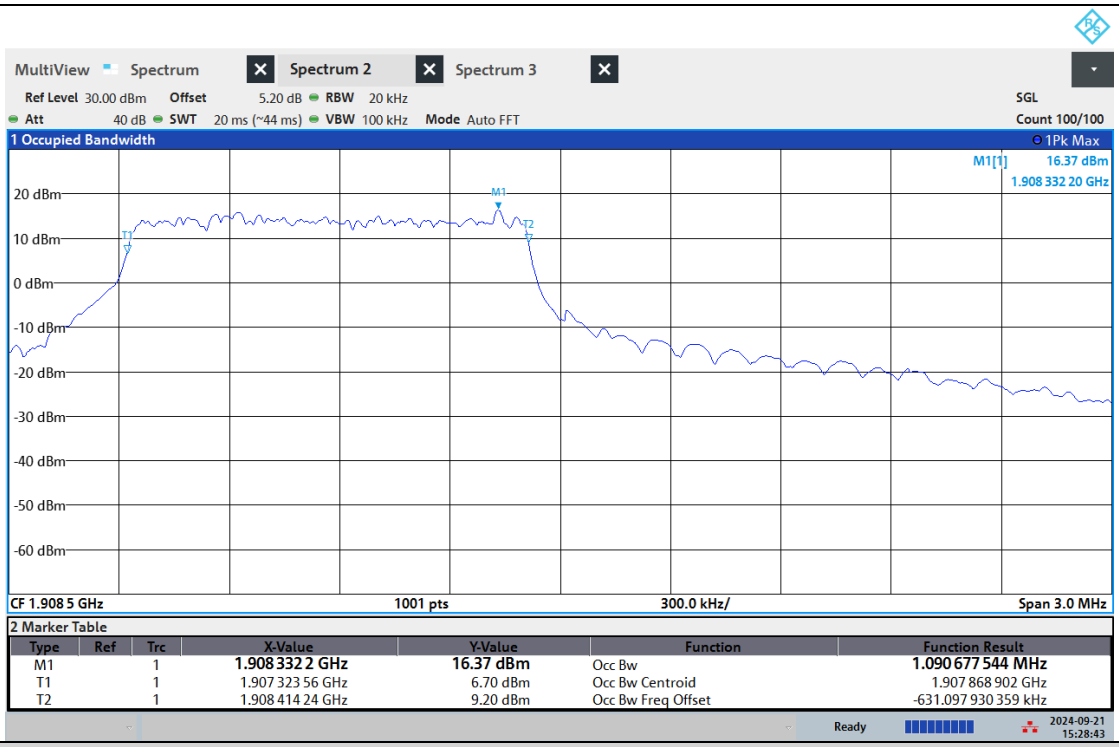

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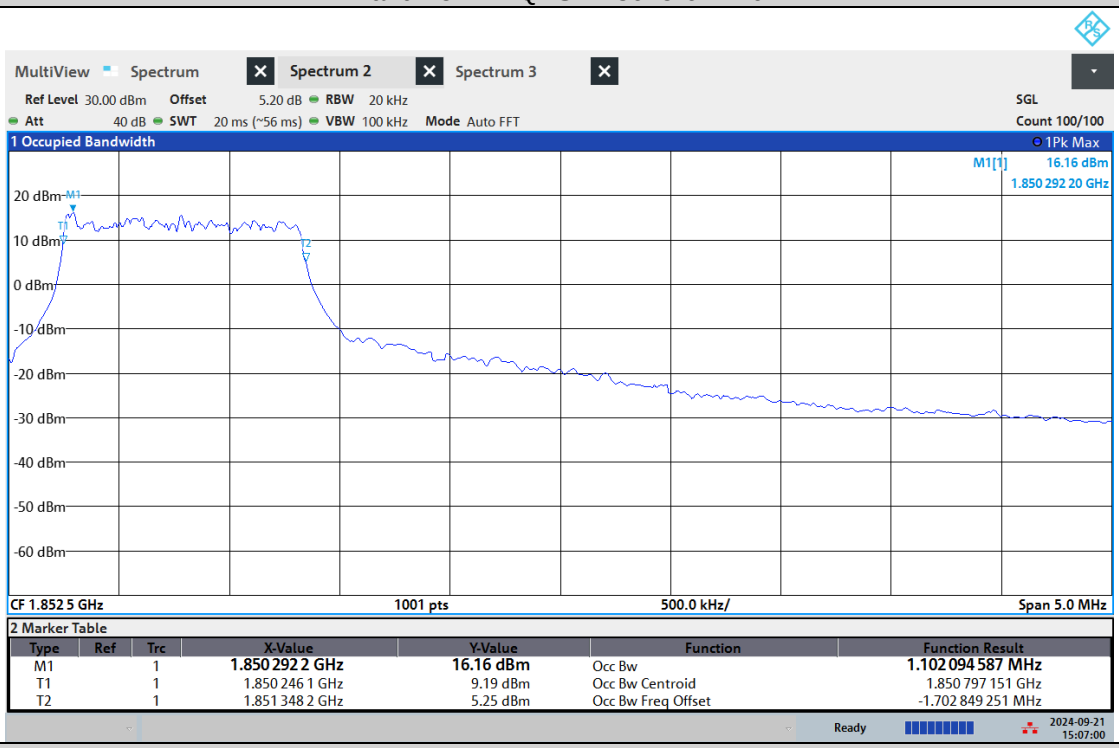
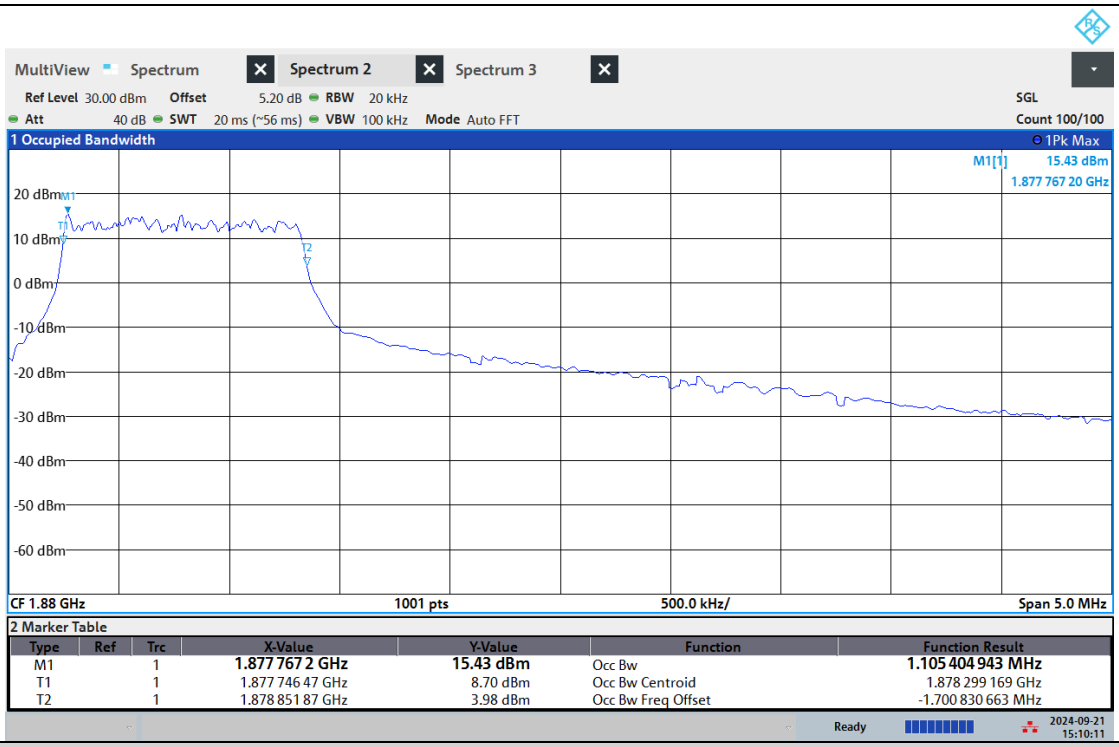
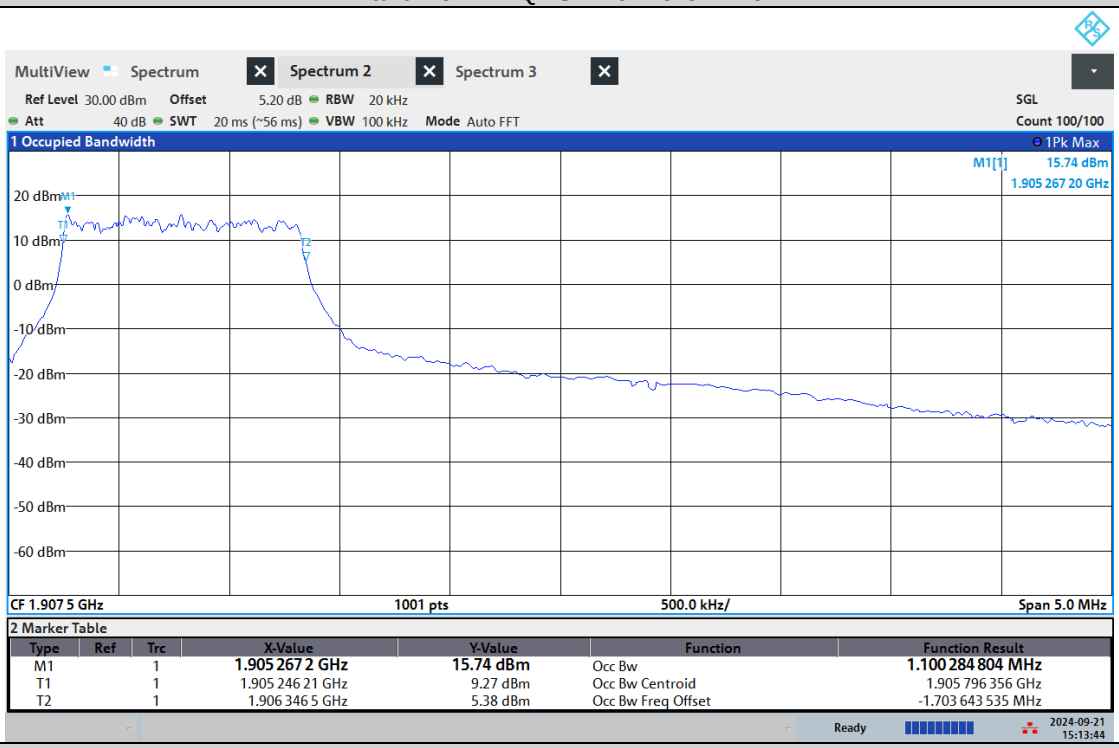


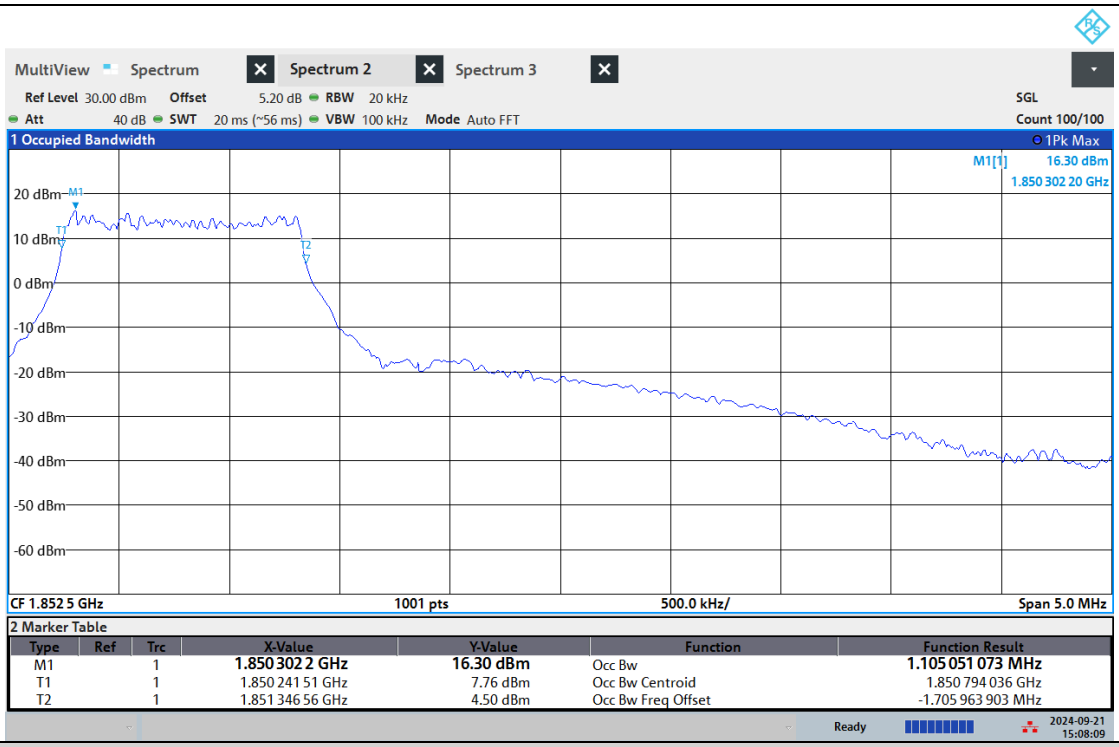
Band2-5MHz-QPSK-18900-6RB#0



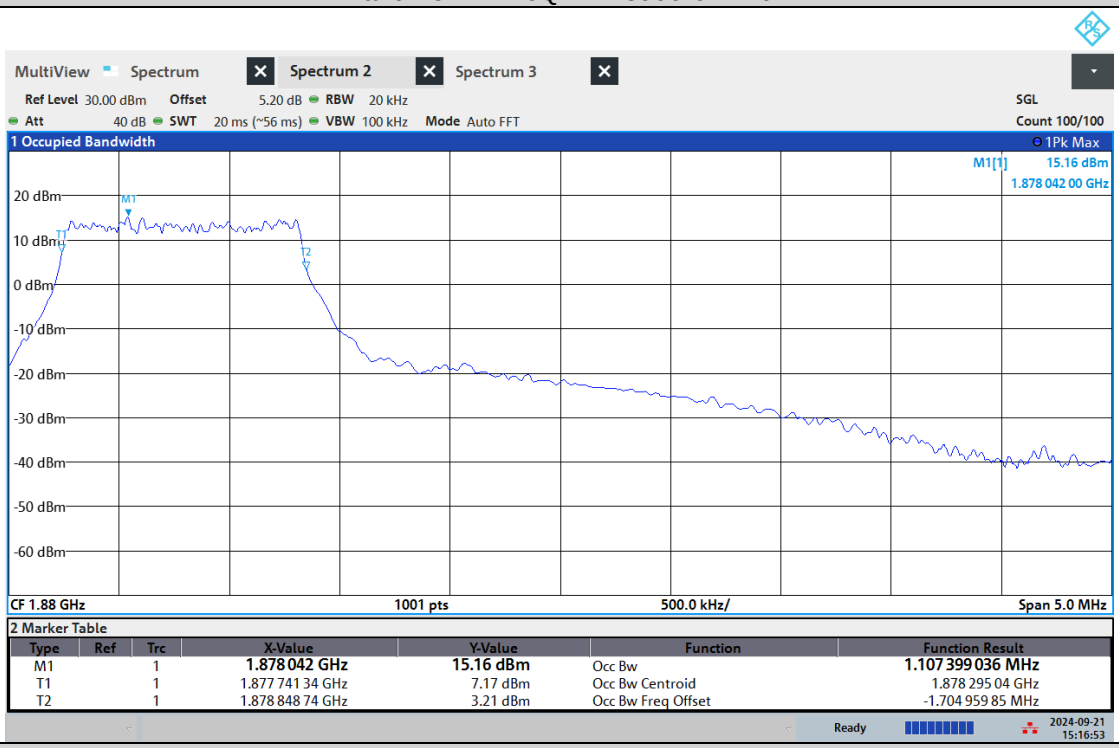
Band2-5MHz-QPSK-19175-6RB#0



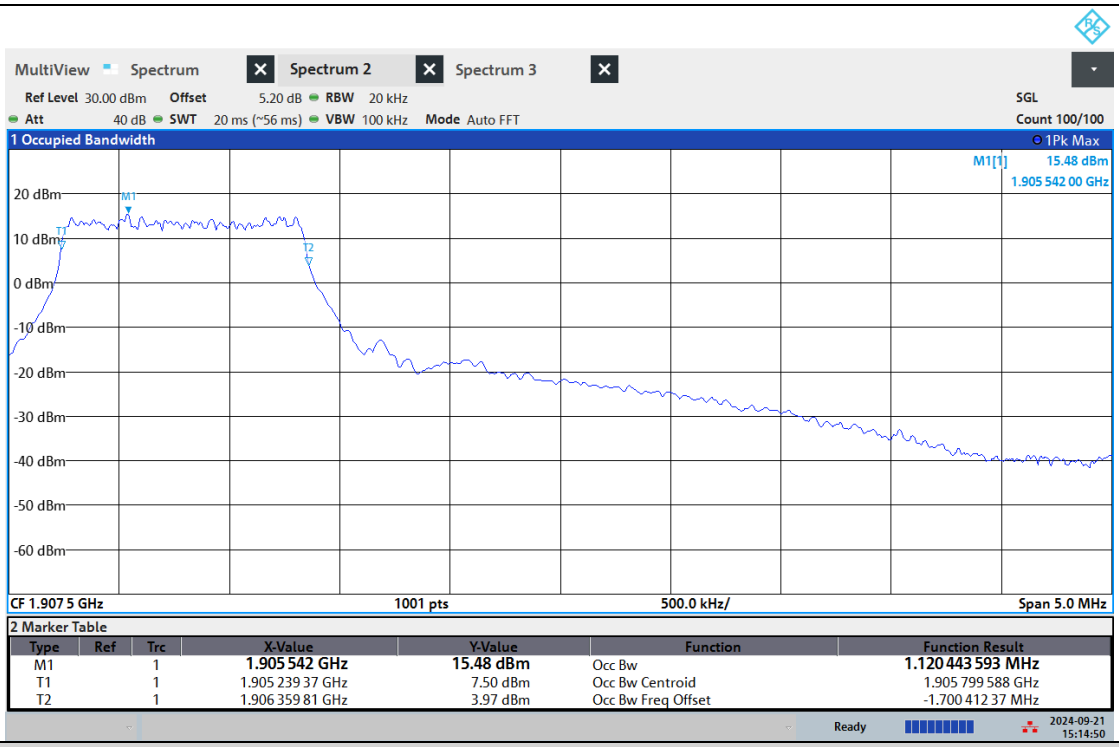
Band2-5MHz-16QAM-18625-6RB#0



Band2-5MHz-16QAM-18900-6RB#0



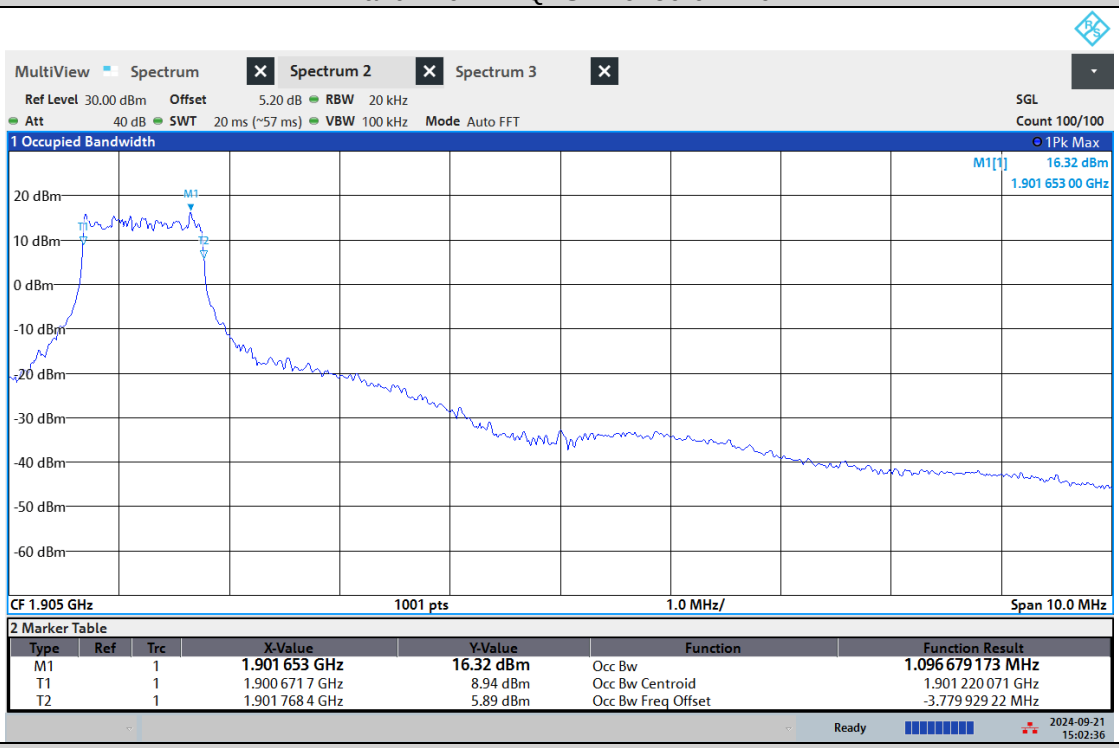
Band2-5MHz-16QAM-19175-6RB#0



Band2-10MHz-QPSK-18650-6RB#0

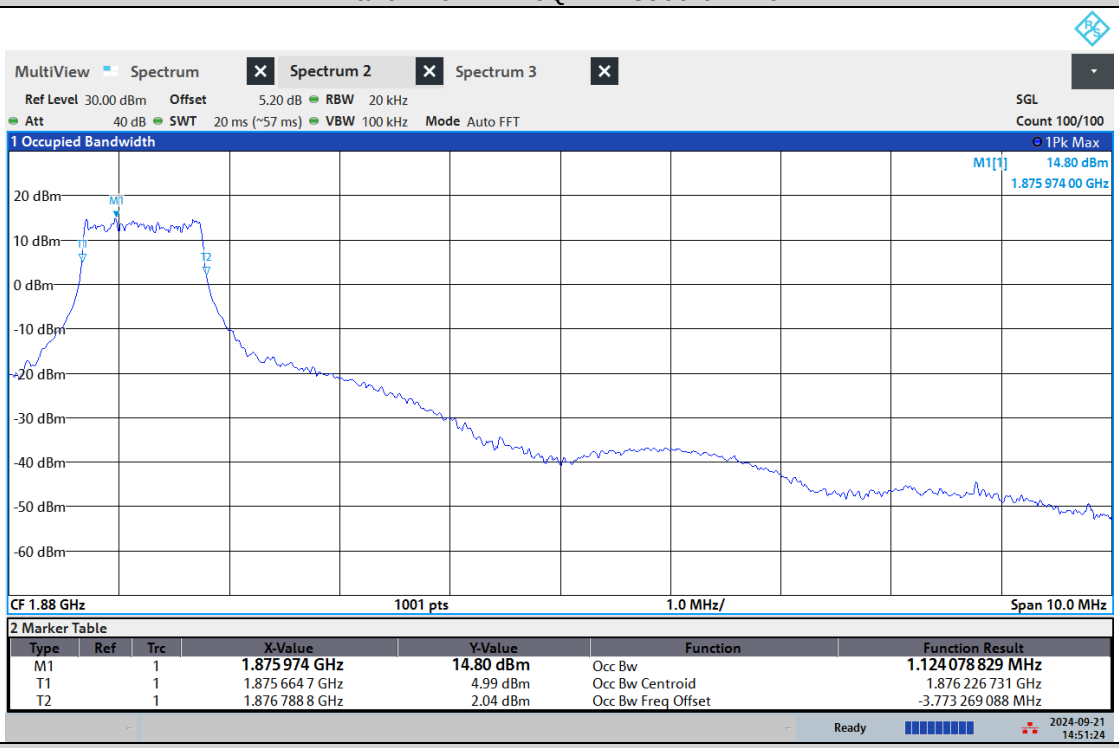
Band2-10MHz-QPSK-18900-6RB#0

Band2-10MHz-QPSK-19150-6RB#0



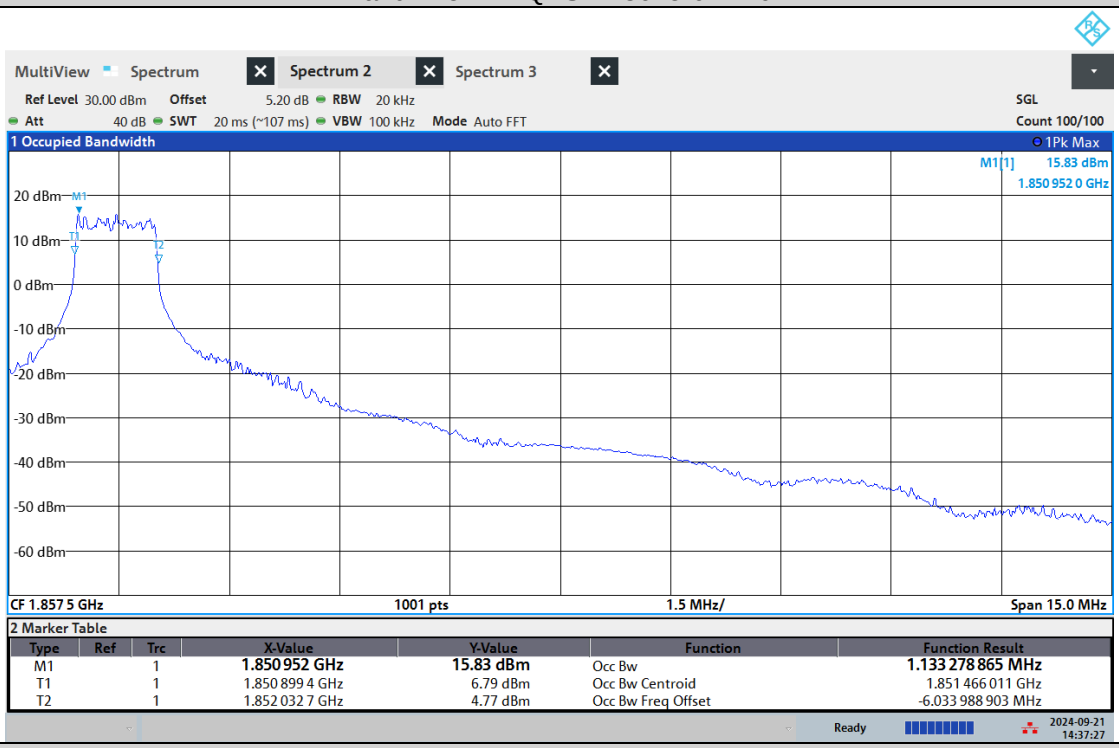
Band2-10MHz-16QAM-18650-6RB#0

Band2-10MHz-16QAM-18900-6RB#0

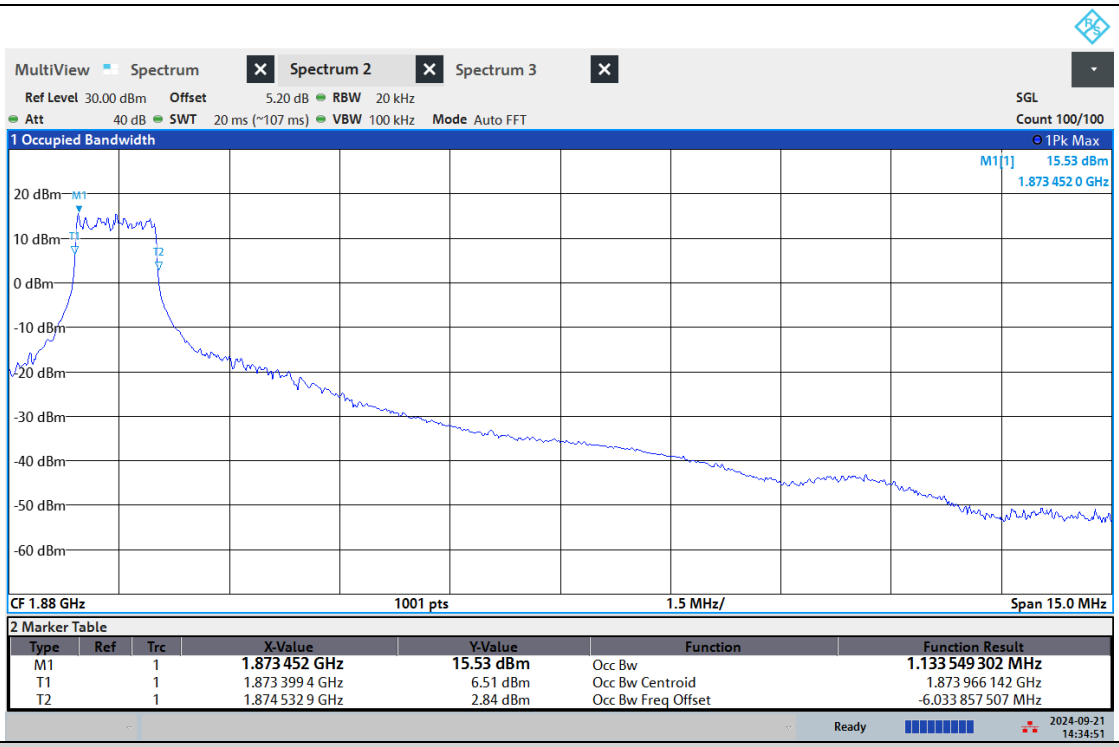


Band2-10MHz-16QAM-19150-6RB#0

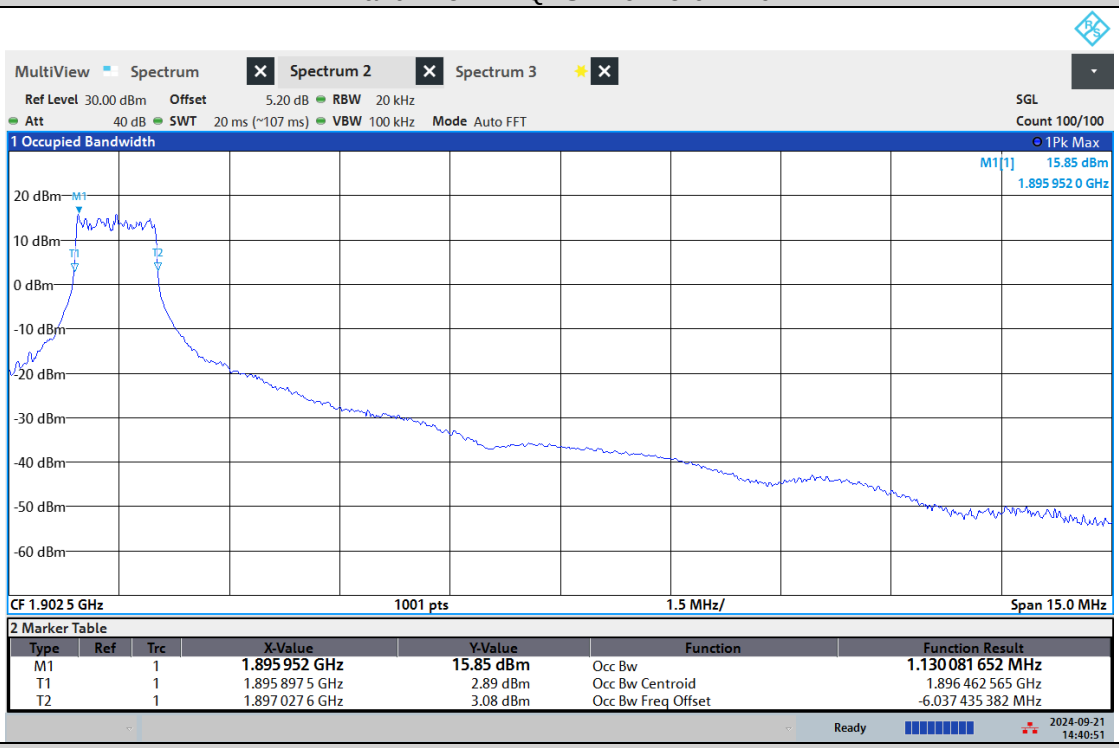
Band2-15MHz-QPSK-18675-6RB#0



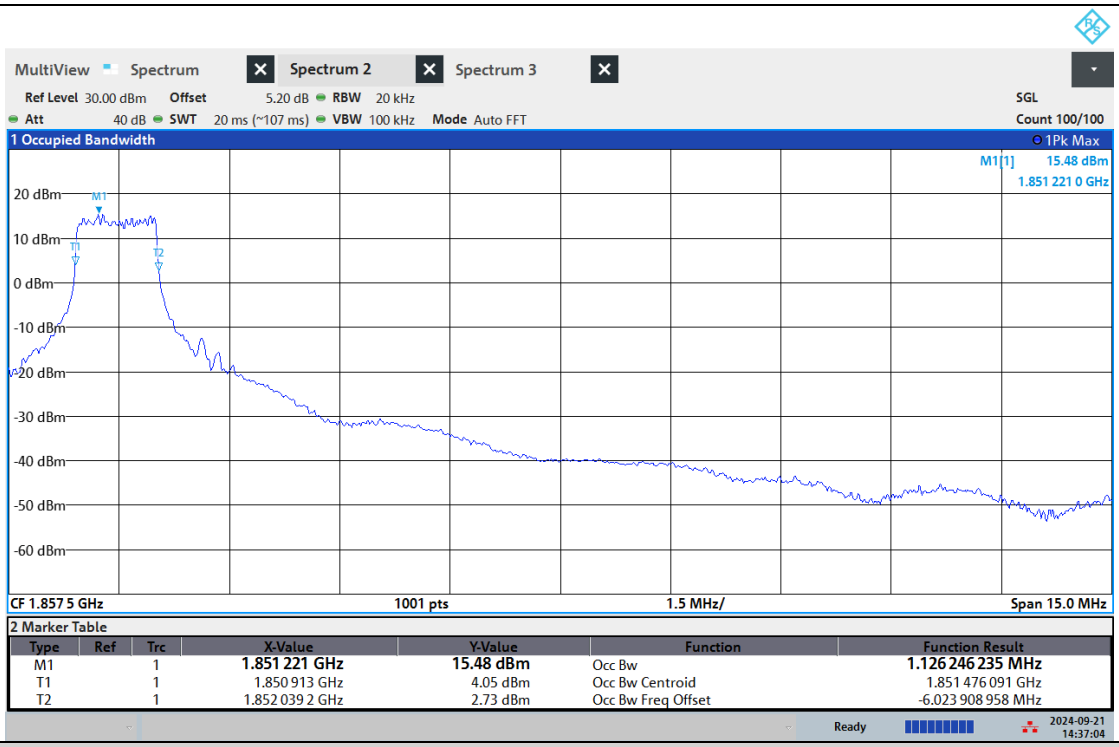
Band2-15MHz-QPSK-18900-6RB#0



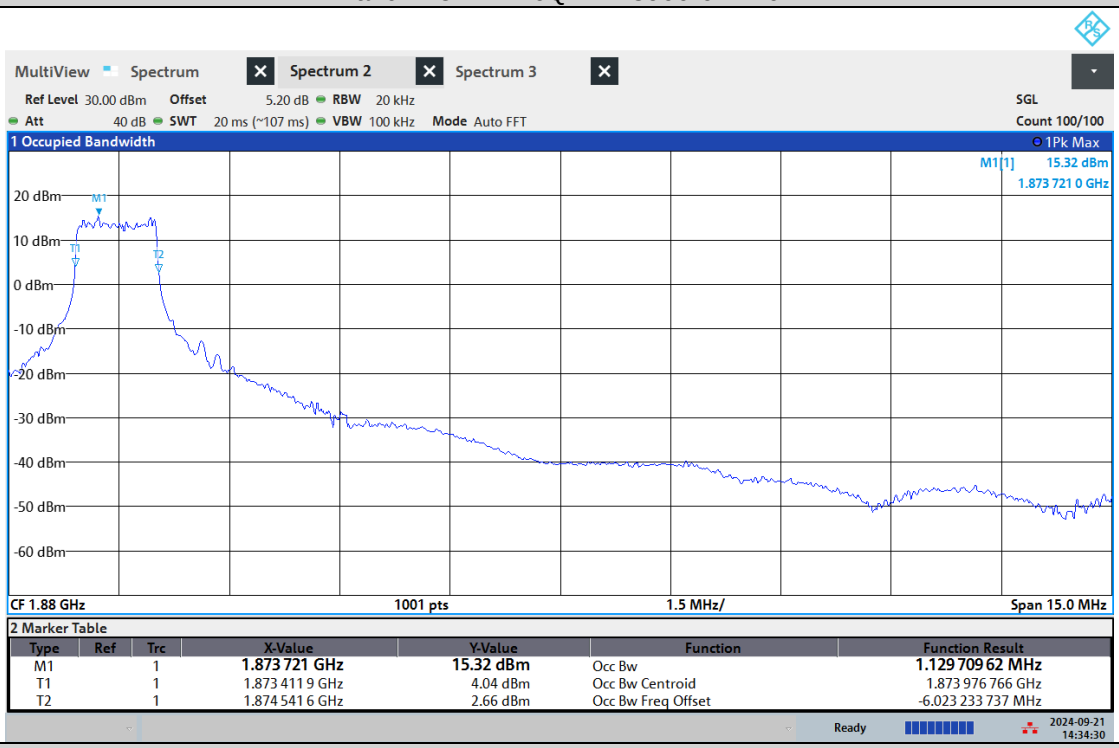
Band2-15MHz-QPSK-19125-6RB#0



Band2-15MHz-16QAM-18675-6RB#0

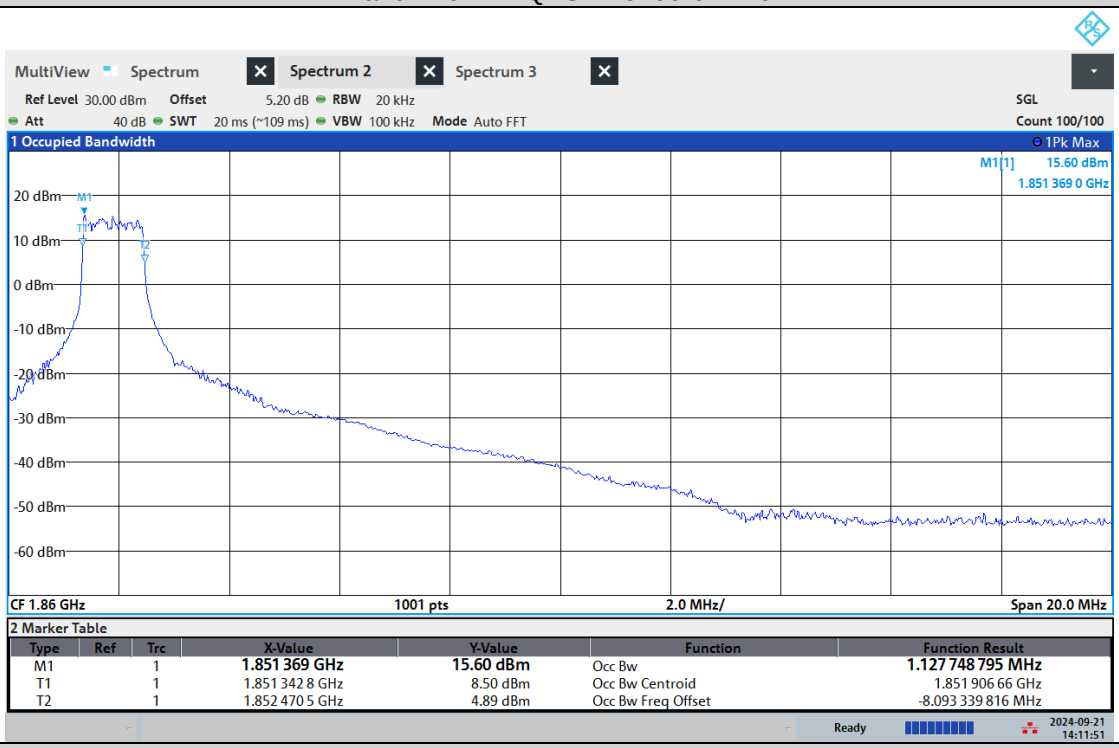


Band2-15MHz-16QAM-18900-6RB#0

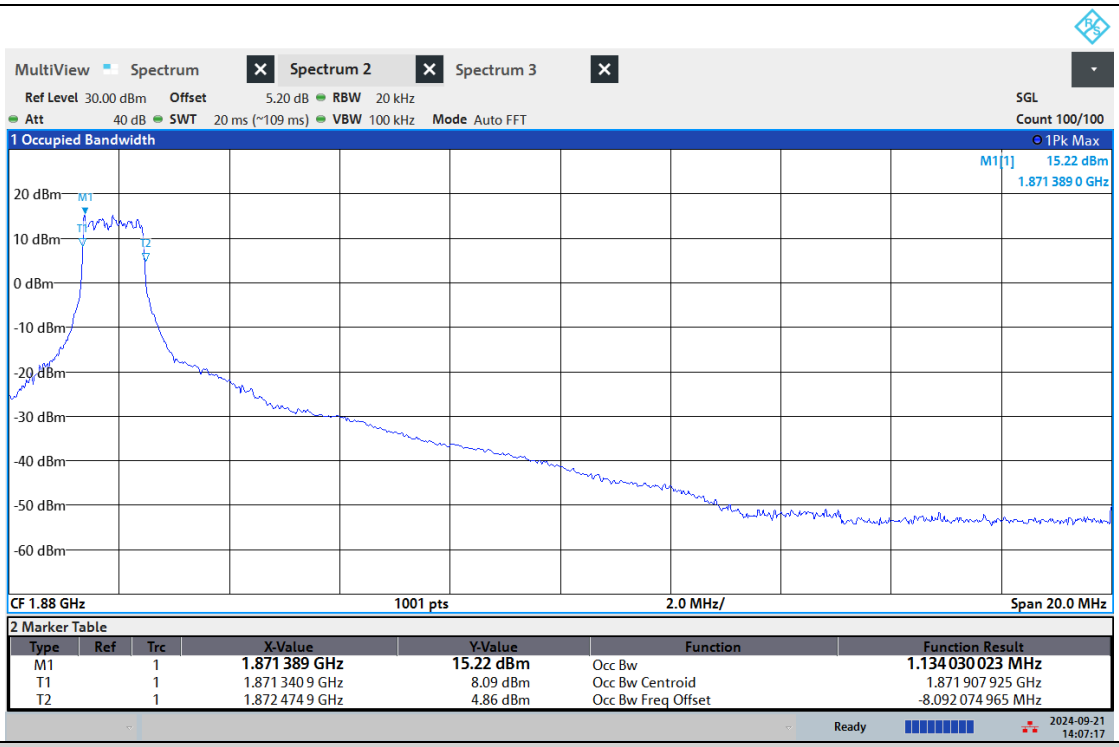


Band2-15MHz-16QAM-19125-6RB#0

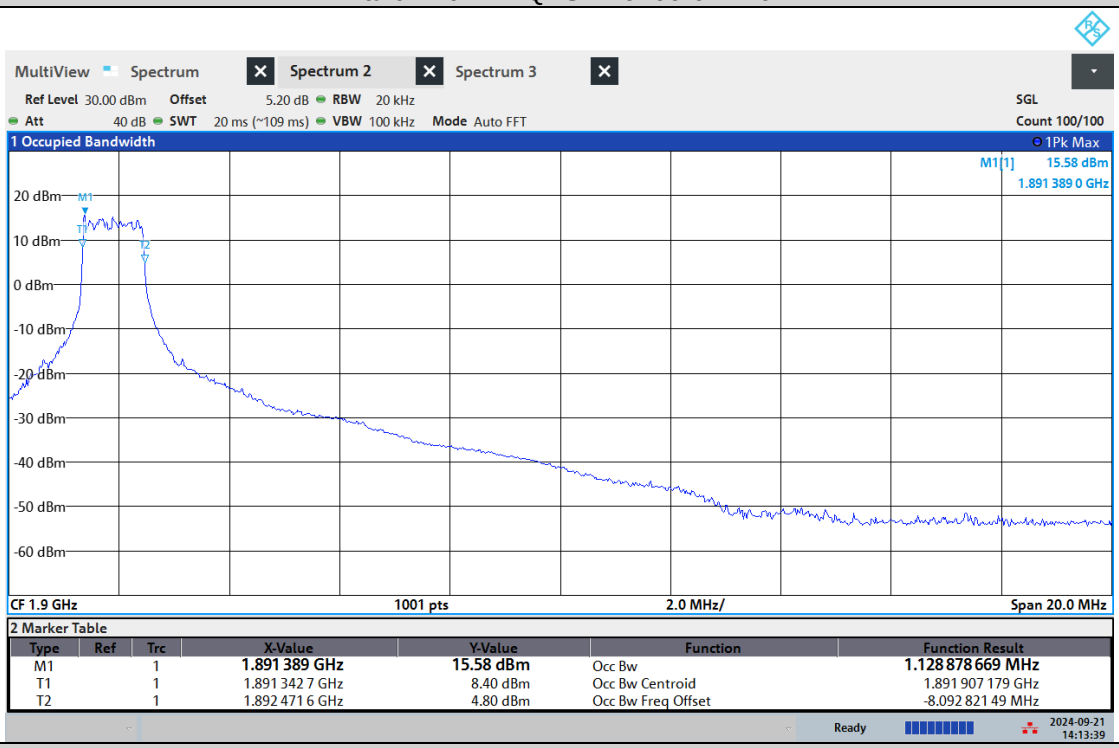
Band2-20MHz-QPSK-18700-6RB#0



Band2-20MHz-QPSK-18900-6RB#0



Band2-20MHz-QPSK-19100-6RB#0



Band2-20MHz-16QAM-18700-6RB#0