Certificate #6613.01

FCC TEST REPORT

(PART 27)

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

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

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

TABLE OF CONTENTS

RELEASE CONTROL RECORD 4
1 SUMMARY OF TEST RESULTS 5
1.1 MEASREMENT UNCERTAINTY 6
1.2 TEST SITE AND INSTRUMENTS 7
2 GENERAL INFORMATION 9
2.1 GENERAL DESCRIPTION OF EUT 9
2.2 CONFIGURATION OF SYSTEM UNDER TEST 12
2.3 DESCRIPTION OF SUPPORT UNITS 13
2.4 TEST ITEM AND TEST CONFIGURATION 13
2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS 17
3 TEST TYPES AND RESULTS 18
3.1 OUTPUT POWER MEASUREMENT 18
3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT 18
3.1.2 TEST PROCEDURES 18
3.1.3 TEST SETUP 19
3.1.4 TEST RESULTS 20
3.2 FREQUENCY STABILITY MEASUREMENT 29
3.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT 29
3.2.2 TEST PROCEDURE 29
3.2.3 TEST SETUP 29
3.2.4 TEST RESULTS 30
3.3 OCCUPIED BANDWIDTH MEASUREMENT 31
3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT 31
3.3.2 TEST SETUP 31
3.3.3 TEST PROCEDURES 31
3.3.4 TEST RESULTS 32
3.4 BAND EDGE MEASUREMENT 33
3.4.1 LIMITS OF BAND EDGE MEASUREMENT 33
3.4.2 TEST SETUP 33
3.4.3 TEST PROCEDURES 34
3.4.4 TEST RESULTS 35
3.5 CONDUCTED SPURIOUS EMISSIONS 36
3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT 36
3.5.2 TEST PROCEDURE 36
3.5.3 TEST SETUP 36
3.5.4 TEST RESULTS 37
3.6 RADIATED EMISSION MEASUREMENT 38
3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT 38
3.6.2 TEST PROCEDURES 38
3.6.3 DEVIATION FROM TEST STANDARD 38
3.6.4 TEST SETUP 39
3.6.5 TEST RESULTS 41
3.7 PEAK TO AVERAGE RATIO 71
3.7.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT 71
3.7.2 TEST SETUP 71
3.7.3 TEST PROCEDURES 71
3.7.4 TEST RESULTS 72
4 INFORMATION ON THE TESTING LABORATORIES 73
5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB 74

6 APPENDIX 75
LTE BAND4 75
PEAK-TO-AVERAGE RATIO(CCDF) 75
TEST RESULT 75
TEST GRAPHS 76
26DB BANDWIDTH AND OCCUPIED BANDWIDTH 94
TEST RESULT 94
BAND EDGE 132
TEST RESULT 132
TEST GRAPHS 133
CONDUCTED SPURIOUS EMISSION 157
TEST RESULT 157
TEST GRAPHS 157
FREQUENCY STABILITY 175
TEST RESULT 175
LTE BAND12 177
PEAK-TO-AVERAGE RATIO(CCDF) 177
TEST RESULT 177
TEST GRAPHS 178
26DB BANDWIDTH AND OCCUPIED BANDWIDTH 190
TEST RESULT 190
BAND EDGE 215
TEST RESULT 215
TEST GRAPHS 215
CONDUCTED SPURIOUS EMISSION 232
TEST RESULT 232
TEST GRAPHS 232
FREQUENCY STABILITY 244
TEST RESULT 244

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
PSU-QBJ2408220111RF03	Original release	Sep. 20, 2024

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

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

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

***Test Lab Information Reference**

Lab A:

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

Lab Address:

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

Accredited Test Lab Cert 6613.01

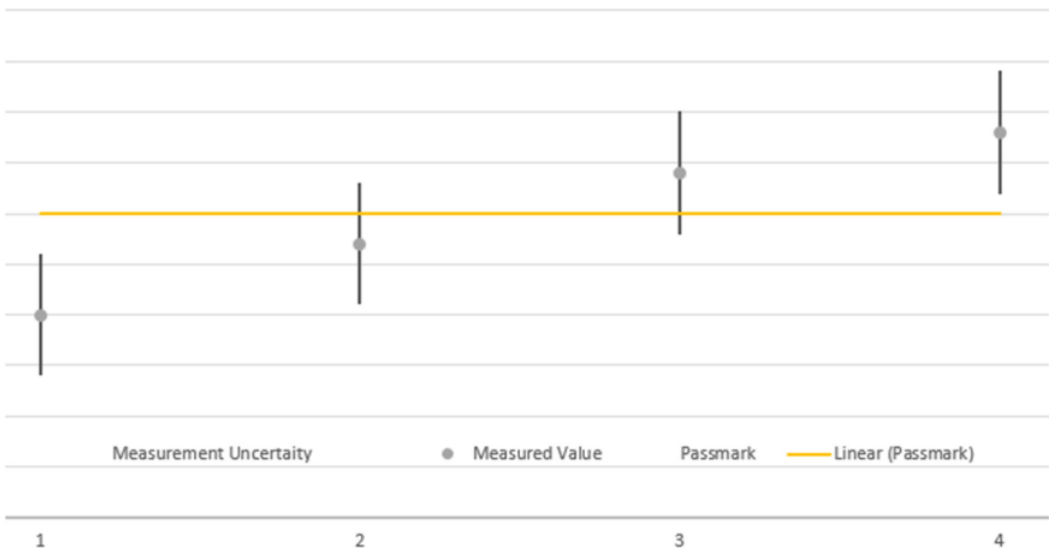
The FCC Site Registration No. is 434559; The Designation No. is CN1325.

1.1 MEASREMENT UNCERTAINTY

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

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

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



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

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

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

1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Pre-Amplifier	R&S	SCU18F1	100815	Aug.30,22	Aug.29,24
Pre-Amplifier	R&S	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-	Apr.27,24	Apr.26,25

			069		
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 TECHNOLOGY	**LTE**	QPSK, 16QAM
FREQUENCY RANGE	**LTE Band 4 Channel Bandwidth: 1.4MHz**	1710.7MHz ~ 1754.3MHz
	LTE Band 4 Channel Bandwidth: 3MHz	1711.5MHz ~ 1753.5MHz
	LTE Band 4 Channel Bandwidth: 5MHz	1712.5MHz ~ 1752.5MHz
	LTE Band 4 Channel Bandwidth: 10MHz	1715MHz ~ 1750MHz
	LTE Band 4 Channel Bandwidth: 15MHz	1717.5MHz ~ 1747.5 MHz
	LTE Band 4 Channel Bandwidth: 20MHz	1720MHz ~ 1745MHz
	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
MAX. ERP/EIRP POWER	**LTE Band 4 Channel Bandwidth: 1.4MHz**	216.27mW
	LTE Band 4 Channel Bandwidth: 3MHz	216.77mW
	LTE Band 4 Channel Bandwidth: 5MHz	217.27mW
	LTE Band 4 Channel Bandwidth: 10MHz	217.27mW
	LTE Band 4 Channel Bandwidth: 15MHz	216.77mW
	LTE Band 4 Channel Bandwidth: 20MHz	217.77mW
	LTE Band 12 Channel Bandwidth: 1.4MHz	115.08mW
	LTE Band 12 Channel Bandwidth: 3MHz	114.29mW

MAX. ERP/EIRP POWER	**LTE Band 12 Channel Bandwidth: 5MHz**	115.08mW
	LTE Band 12 Channel Bandwidth: 10MHz	115.61mW
EMISSION DESIGNATOR	**LTE Band 4 Channel Bandwidth: 1.4MHz**	QPSK: 1M08G7D
		16QAM: 1M08W7D
	LTE Band 4 Channel Bandwidth: 3MHz	QPSK: 1M09G7D
		16QAM: 1M09W7D
	LTE Band 4 Channel Bandwidth: 5MHz	QPSK: 1M10G7D
		16QAM: 1M11W7D
	LTE Band 4 Channel Bandwidth: 10MHz	QPSK: 1M10G7D
		16QAM: 1M12W7D
	LTE Band 4 Channel Bandwidth: 15MHz	QPSK: 1M13G7D
		16QAM: 1M14W7D
	LTE Band 4 Channel Bandwidth: 20MHz	QPSK: 1M13G7D
		16QAM: 1M15W7D
	LTE Band 12 Channel Bandwidth: 1.4MHz	QPSK: 1M08G7D
		16QAM: 1M08W7D
	LTE Band 12 Channel Bandwidth: 3MHz	QPSK: 1M09G7D
		16QAM: 1M09W7D
	LTE Band 12 Channel Bandwidth: 5MHz	QPSK: 1M10G7D
		16QAM: 1M10W7D
	LTE Band 12 Channel Bandwidth: 10MHz	QPSK: 1M10G7D
		16QAM: 1M12W7D
ANTENNA TYPE*	Fixed Internal Antenna with 0.8dBi gain for LTE B4 Fixed Internal Antenna with 0.5dBi gain for LTE B12	
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
LTE	1TX/1RX

4. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in the test report.
5. The differences between model C4D-4MUSAC_V8 and ADC-CC110 are as following.

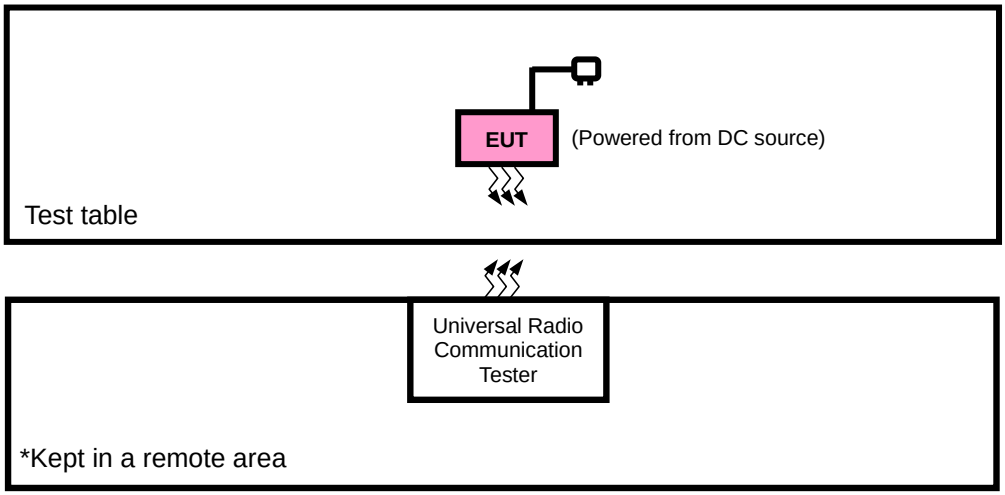
Description	1st	2rd
Product name	Telematic Embedded System	ALARM.COM CAR CONNECTOR
Brand Name	MUNIC	ALARM.COM
Model Name	C4D-4MUSAC_V8	ADC-CC110
Differences	/	Use of a different product name (ALARM.COM CAR CONNECTOR), model name (ADC-CC110) and a different trademark (ALARM.COM) for marketing and client 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 was found when positioned on Y-plane for EIRP and X-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	**EUT + DC source with LTE link**

LTE BAND 4

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	EIRP	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1 RB / 0 RB Offset
A	FREQUENCY STABILITY	19957 to 20393	19957, 20393	1.4MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	19965, 20385	3MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20375	5MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20000, 20350	10MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20025, 20325	15MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20300	20MHz	QPSK	1 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	6 RB / 0 RB Offset
A	PEAK TO AVERAGE RATIO	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1 RB / 0 RB Offset
A	BAND EDGE	19957 to 20393	19957	1.4MHz	QPSK, 16QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			20393	1.4MHz	QPSK, 16QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		19965 to 20385	19965	3MHz	QPSK, 16QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			20385	3MHz	QPSK, 16QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		19975 to 20375	19975	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			20375	5MHz	QPSK, 16QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		20000 to 20350	20000	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			20350	10MHz	QPSK, 16QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset

A	BAND EDGE	20025 to 20325	20025	15MHz	QPSK, 16QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			20325	15MHz	QPSK, 16QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		20050 to 20300	20050	20MHz	QPSK, 16QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			20300	20MHz	QPSK, 16QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
A	CONDCUDETED EMISSION	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK	1 RB / 0 RB Offset
A	RADIATED EMISSION	19957 to 20393	20175	1.4MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	19965,20175,20385	3MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	20175	5MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20175	10MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20175	15MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20175	20MHz	QPSK	1 RB / 0 RB Offset

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

LTE BAND 12 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	ERP	23017 to 23173	23017, 23095 , 23173	1.4MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095 ,23165	3MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095 ,23155	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095 ,23130	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
A	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	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, 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
A	RADIATED EMISSION	23017 to 23173	23095	1.4MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23025,23095,23165	3MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23095	5MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23095	10MHz	QPSK	1 RB / 0 RB Offset

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

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 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC 47 CFR Part 2

FCC 47 CFR Part 27

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-D

ANSI/TIA/EIA-603-E

ANSI C63.26-2015

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

3 TEST TYPES AND RESULTS

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

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

According to the specific rule Part 27.50(c)(10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698–746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

3.1.2 TEST PROCEDURES

EIRP MEASUREMENT:

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

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

Where:

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

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

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

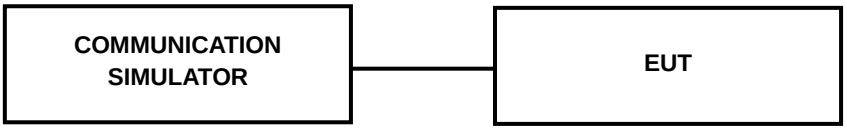
L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

CONDUCTED POWER MEASUREMENT:

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

3.1.3 TEST SETUP

CONDUCTED POWER MEASUREMENT:



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

3.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

LTE Band 4

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20050	20175	20300
		Frequence (MHz)		1720	1732.5	1745
20M	QPSK	1	0	22.16	22.42	**22.58**
		1	5	22.16	22.39	22.42
		3	0	22.26	22.34	22.33
		3	3	22.13	22.36	22.51
		6	0	22.50	22.43	22.55
	16QAM	1	0	22.48	22.17	22.51
		1	5	22.22	22.23	22.47
		3	0	22.50	22.11	22.43
		3	3	22.53	22.41	22.39
		6	0	22.36	22.24	22.48
BW	MCS Index	Channel		20025	20175	20325
		Frequence (MHz)		1717.5	1732.5	1747.5
15M	QPSK	1	0	22.11	22.18	22.47
		1	5	22.27	22.19	22.44
		3	0	22.01	22.09	22.31
		3	3	22.03	22.13	22.53
		6	0	22.35	22.14	22.37
	16QAM	1	0	22.29	22.22	22.56
		1	5	22.20	22.13	22.42
		3	0	22.10	22.05	22.53
		3	3	22.32	22.32	22.31
		6	0	22.26	22.33	22.27
BW	MCS Index	Channel		20000	20175	20350
		Frequence (MHz)		1715	1732.5	1750
10M	QPSK	1	0	22.10	22.19	22.54
		1	5	22.14	22.29	22.56
		3	0	22.15	22.15	22.39
		3	3	22.27	22.17	22.30
		6	0	22.35	22.08	22.57
	16QAM	1	0	22.18	22.07	22.38
		1	5	22.24	22.01	22.49
		3	0	22.17	22.12	22.28
		3	3	22.40	22.11	22.34
		6	0	22.09	22.23	22.24

BW	MCS Index	Channel		19975	20175	20375
		Frequence (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	22.21	22.05	22.36
		1	5	22.37	22.19	22.42
		3	0	22.19	22.23	22.32
		3	3	22.30	22.19	22.38
		6	0	22.39	22.18	22.51
	16QAM	1	0	22.48	22.31	22.32
		1	5	22.10	22.00	22.26
		3	0	22.17	22.22	22.41
		3	3	22.33	22.21	22.21
		6	0	22.12	22.33	22.57
BW	MCS Index	Channel		19965	20175	20385
		Frequence (MHz)		1711.5	1732.5	1753.5
3M	QPSK	1	0	22.04	22.18	22.50
		1	5	22.32	22.12	22.48
		3	0	22.05	22.26	22.35
		3	3	22.27	22.36	22.39
		6	0	22.33	22.28	22.56
	16QAM	1	0	22.42	22.03	22.25
		1	5	22.28	22.02	22.56
		3	0	22.11	22.00	22.35
		3	3	22.20	22.31	22.20
		6	0	22.36	22.03	22.26
BW	MCS Index	Channel		19957	20175	20393
		Frequence (MHz)		1710.7	1732.5	1754.3
1.4M	QPSK	1	0	22.13	22.38	22.46
		1	5	22.48	22.32	22.44
		3	0	22.45	22.38	22.37
		3	3	22.46	22.34	22.52
		6	0	22.46	22.47	22.55
	16QAM	1	0	22.31	22.06	22.46
		1	5	22.45	22.34	22.42
		3	0	22.54	22.15	22.44
		3	3	22.50	22.10	22.47
		6	0	22.54	22.25	22.41

LTE Band 12

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23060	23095	23130
		Frequence (MHz)		704	707.5	711
10M	QPSK	1	0	22.13	21.90	21.93
		1	5	**22.28**	22.01	21.78
		3	0	22.23	22.01	22.23
		3	3	22.17	22.22	22.23
		6	0	22.21	22.07	22.00
	16QAM	1	0	22.21	22.19	22.03
		1	5	22.26	22.03	22.04
		3	0	22.04	22.03	22.22
		3	3	22.21	22.02	22.09
		6	0	22.13	22.00	22.25
BW	MCS Index	Channel		23035	23095	23155
		Frequence (MHz)		701.5	707.5	713.5
5M	QPSK	1	0	22.07	22.03	21.87
		1	5	22.09	22.01	21.78
		3	0	22.25	22.11	22.14
		3	3	22.24	22.21	22.01
		6	0	22.17	21.86	22.04
	16QAM	1	0	22.07	22.06	22.10
		1	5	22.22	22.25	21.96
		3	0	22.26	22.09	21.95
		3	3	22.24	21.97	22.13
		6	0	22.25	21.99	22.26
BW	MCS Index	Channel		23025	23095	23165
		Frequence (MHz)		700.5	707.5	714.5
3M	QPSK	1	0	22.23	21.84	21.88
		1	5	22.07	22.11	21.82
		3	0	22.02	22.03	22.18
		3	3	22.15	22.10	22.00
		6	0	22.15	21.99	21.93
	16QAM	1	0	22.00	21.98	22.13
		1	5	22.23	22.14	21.98
		3	0	22.15	22.01	21.97
		3	3	22.12	22.16	21.98
		6	0	22.07	22.12	21.96

BW	MCS Index	Channel		23017	23095	23173
		Frequence (MHz)		699.7	707.5	715.3
1.4M	QPSK	1	0	22.26	22.08	22.08
		1	5	22.26	21.87	21.97
		3	0	22.13	21.90	21.96
		3	3	22.21	22.23	22.09
		6	0	22.06	21.92	21.89
	16QAM	1	0	22.04	22.21	22.17
		1	5	22.20	22.17	22.06
		3	0	22.24	22.22	22.02
		3	3	22.01	21.99	22.26
		6	0	22.09	22.19	22.18

EIRP /ERP

LTE BAND 4
CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19957	1710.7	22.48	0.8	23.28	212.81	1
20175	1732.5	22.47	0.8	23.27	212.32	1
20393	1754.3	22.55	0.8	23.35	216.27	1

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19957	1710.7	22.54	0.8	23.34	215.77	1
20175	1732.5	22.34	0.8	23.14	206.06	1
20393	1754.3	22.47	0.8	23.27	212.32	1

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19965	1711.5	22.33	0.8	23.13	205.59	1
20175	1732.5	22.36	0.8	23.16	207.01	1
20385	1753.5	22.56	0.8	23.36	216.77	1

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19965	1711.5	22.42	0.8	23.22	209.89	1
20175	1732.5	22.36	0.8	23.16	207.01	1
20385	1753.5	22.36	0.8	23.16	207.01	1

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19975	1712.5	22.39	0.8	23.19	208.45	1
20175	1732.5	22.23	0.8	23.03	200.91	1
20375	1752.5	22.51	0.8	23.31	214.29	1

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19975	1712.5	22.48	0.8	23.28	212.81	1
20175	1732.5	22.33	0.8	23.13	205.59	1
20375	1752.5	22.57	0.8	23.37	217.27	1

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20000	1715	22.35	0.8	23.15	206.54	1
20175	1732.5	22.29	0.8	23.09	203.7	1
20350	1750	22.57	0.8	23.37	217.27	1

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20000	1715	22.4	0.8	23.2	208.93	1
20175	1732.5	22.23	0.8	23.03	200.91	1
20350	1750	22.49	0.8	23.29	213.3	1

CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20025	1717.5	22.35	0.8	23.15	206.54	1
20175	1732.5	22.19	0.8	22.99	199.07	1
20325	1747.5	22.53	0.8	23.33	215.28	1

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20025	1717.5	22.32	0.8	23.12	205.12	1
20175	1732.5	22.33	0.8	23.13	205.59	1
20325	1747.5	22.56	0.8	23.36	216.77	1

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20050	1720	22.5	0.8	23.3	213.8	1
20175	1732.5	22.43	0.8	23.23	210.38	1
20300	1745	22.58	0.8	23.38	217.77	1

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20050	1720	22.53	0.8	23.33	215.28	1
20175	1732.5	22.41	0.8	23.21	209.41	1
20300	1745	22.51	0.8	23.31	214.29	1

LTE BAND 12
CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23017	699.7	22.26	0.5	20.61	115.08	3
23095	707.5	22.23	0.5	20.58	114.29	3
23173	715.3	22.09	0.5	20.44	110.66	3

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23017	699.7	22.24	0.5	20.59	114.55	3
23095	707.5	22.22	0.5	20.57	114.02	3
23173	715.3	22.26	0.5	20.61	115.08	3

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23025	700.5	22.23	0.5	20.58	114.29	3
23095	707.5	22.11	0.5	20.46	111.17	3
23165	714.5	22.18	0.5	20.53	112.98	3

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23025	700.5	22.23	0.5	20.58	114.29	3
23095	707.5	22.16	0.5	20.51	112.46	3
23165	714.5	22.13	0.5	20.48	111.69	3

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23035	701.5	22.25	0.5	20.6	114.82	3
23095	707.5	22.21	0.5	20.56	113.76	3
23155	713.5	22.14	0.5	20.49	111.94	3

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23035	701.5	22.26	0.5	20.61	115.08	3
23095	707.5	22.25	0.5	20.6	114.82	3
23155	713.5	22.26	0.5	20.61	115.08	3

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23060	704	22.28	0.5	20.63	115.61	3
23095	707.5	22.22	0.5	20.57	114.02	3
23130	711	22.23	0.5	20.58	114.29	3

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23060	704	22.26	0.5	20.61	115.08	3
23095	707.5	22.19	0.5	20.54	113.24	3
23130	711	22.25	0.5	20.6	114.82	3

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

3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

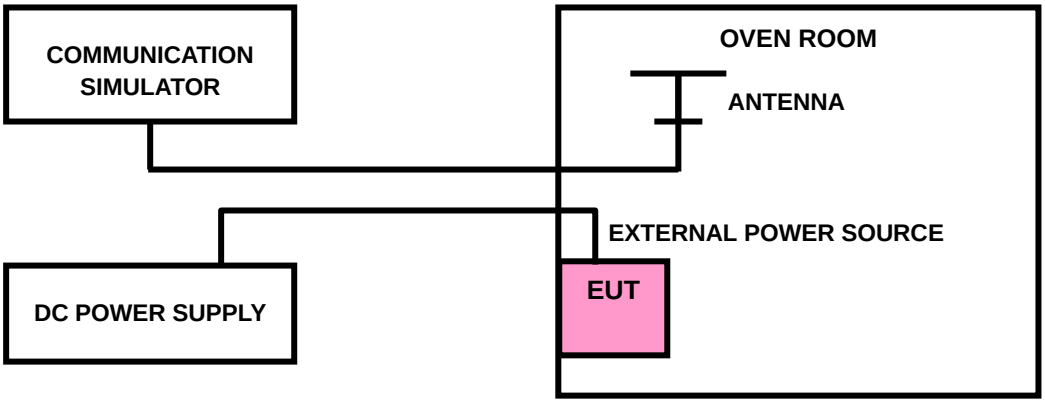
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

3.2.2 TEST PROCEDURE

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

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

3.2.3 TEST SETUP



3.2.4 TEST RESULTS

Please Refer to Appendix Of this test report.

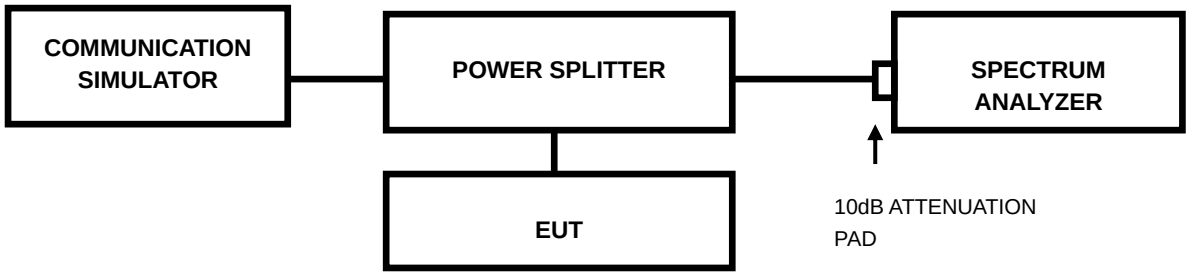
Note: 1.VL = Low voltage(8V); VN/NV = Normal voltage(13.5V/ 27V); VH = High voltage(30V);
NT = Normal temperature (25℃)
2. The frequency fundamental emissions stay within the authorized frequency block.

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.

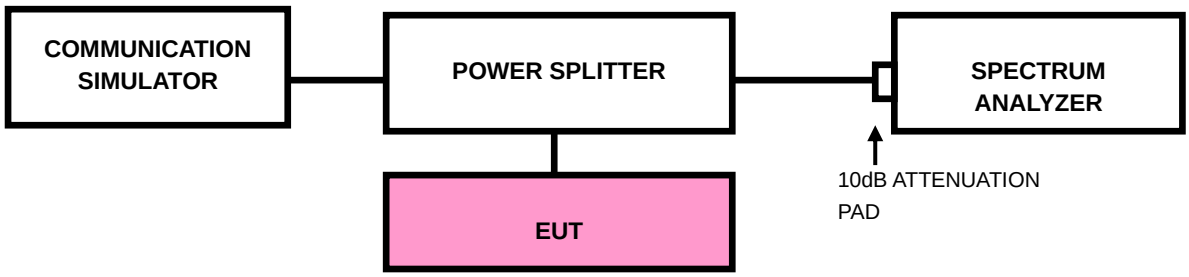
3.4 BAND EDGE MEASUREMENT

3.4.1 LIMITS OF BAND EDGE MEASUREMENT

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

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

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

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

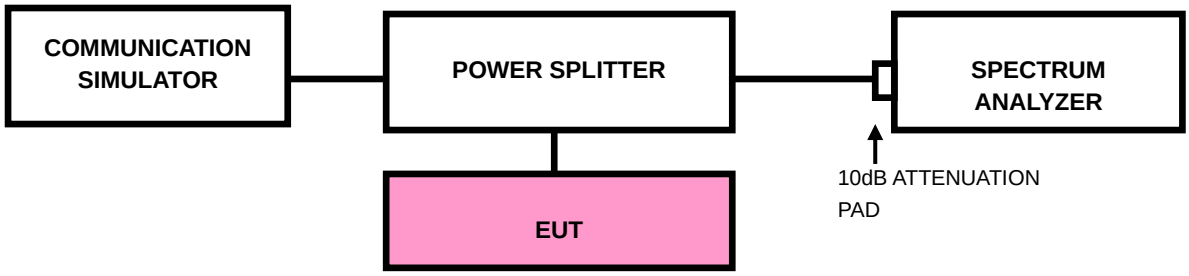
According to FCC 27.53(h) specified that For operations in the 1710-1755 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P)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

3.5.2 TEST PROCEDURE

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

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

3.5.3 TEST SETUP



3.5.4 TEST RESULTS

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

Please Refer to Appendix Of this test report.

3.6 RADIATED EMISSION MEASUREMENT

3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

3.6.2 TEST PROCEDURES

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

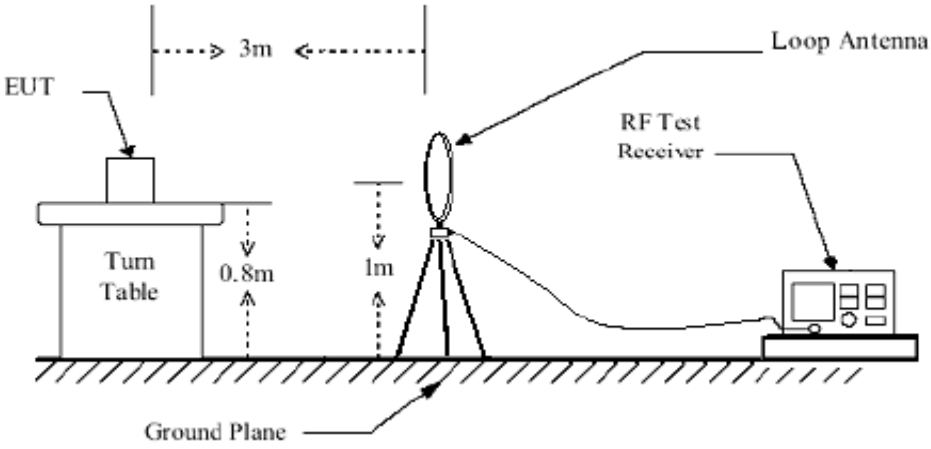
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

3.6.3 DEVIATION FROM TEST STANDARD

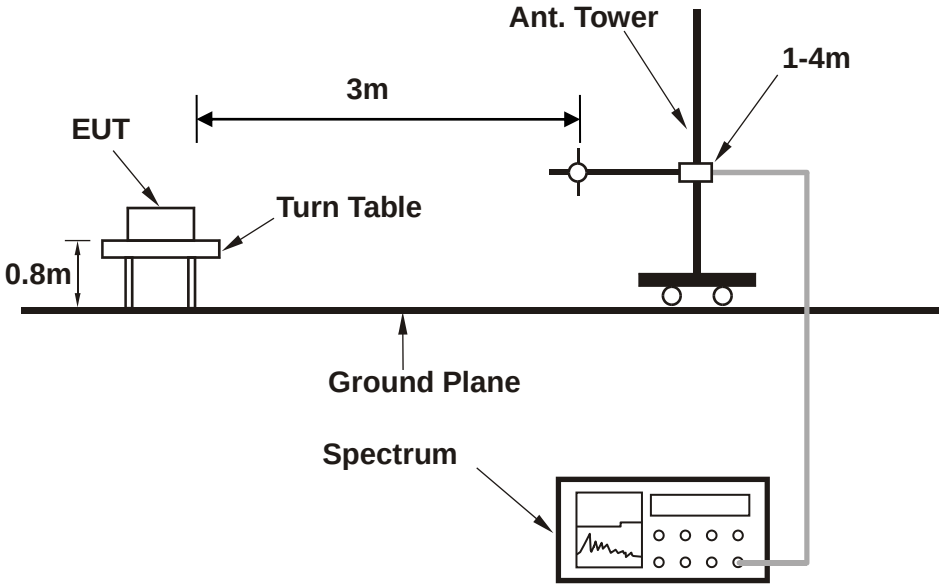
No deviation

3.6.4 TEST SETUP

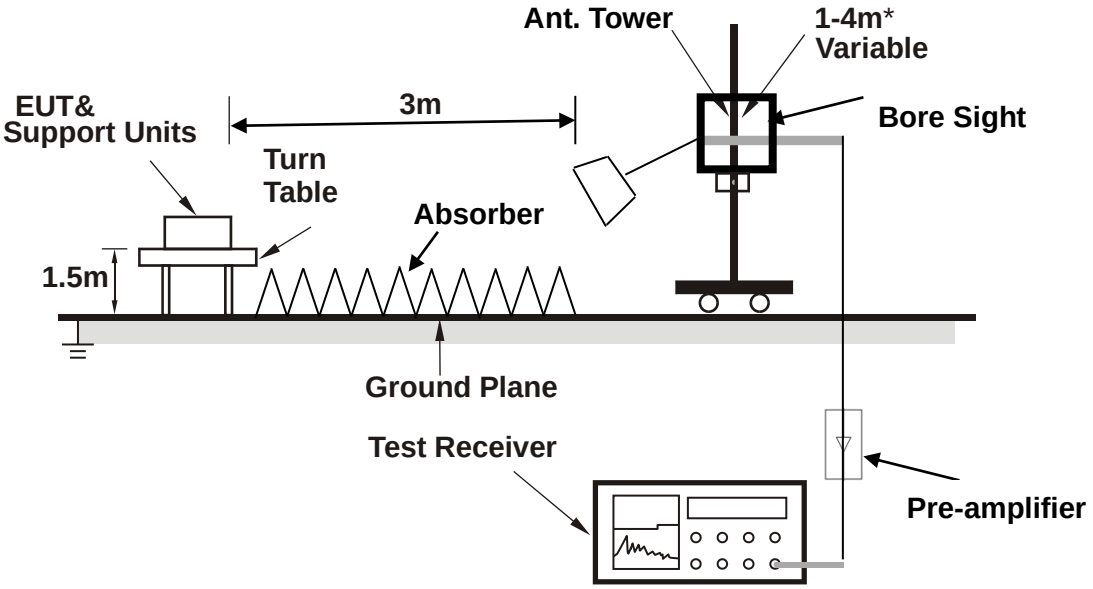
< Frequency Range below 30MHz >



< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



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

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

3.6.5 TEST RESULTS

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

BELOW 1GHz WORST-CASE DATA

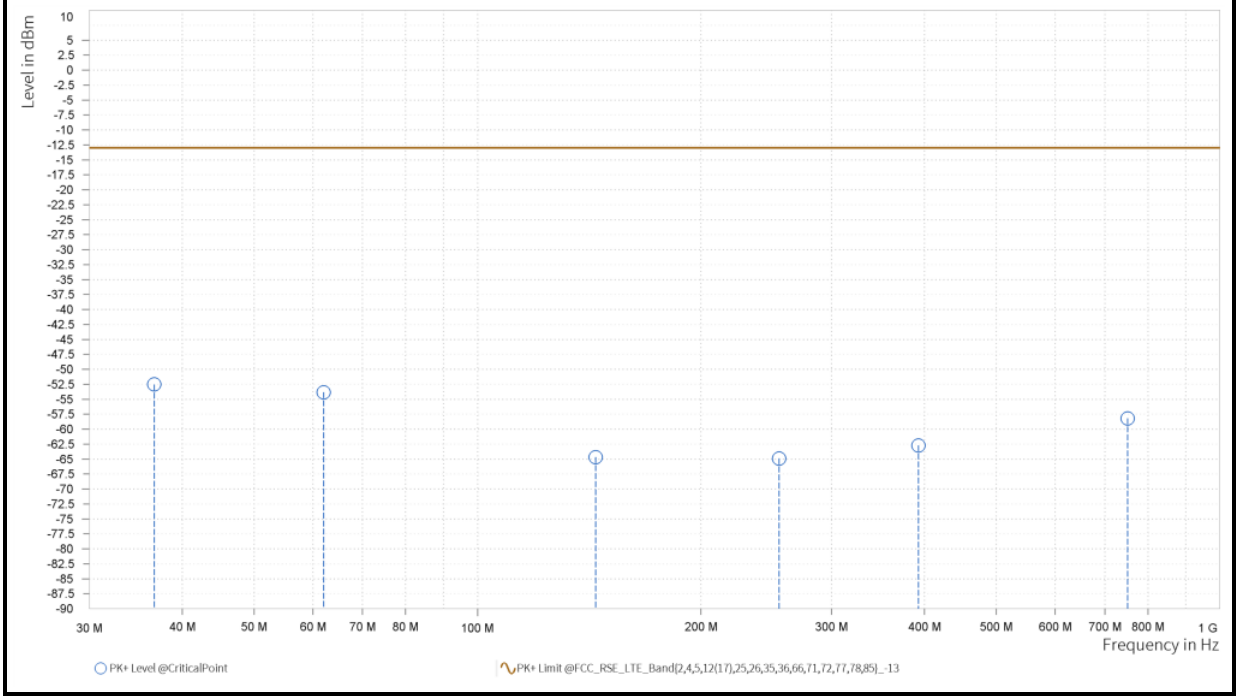
30 MHz – 1GHz data:

LTE Band 4
CHANNEL BANDWIDTH: 3MHz / QPSK

MODE	TX channel 20385	**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

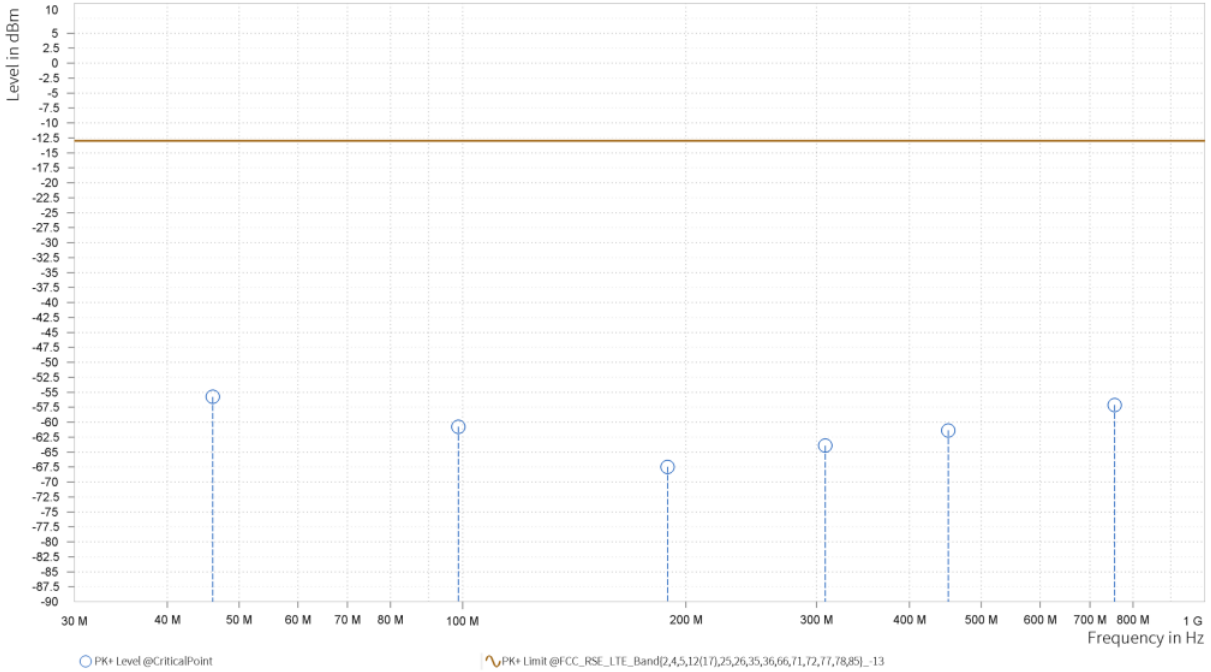
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	36.693	-52.52	-13.0	39.52	6.36	H	215.9	2.0
1	62.01	-53.84	-13.0	40.84	7.65	H	115.5	2.0
1	144.266	-64.69	-13.0	51.69	0.05	H	65.3	2.0
1	254.895	-64.91	-13.0	51.91	7.93	H	145.3	1.0
1	392.635	-62.73	-13.0	49.73	11.53	H	244.6	1.0
1	751.098	-58.21	-13.0	45.21	17.47	H	358.5	1.0



MODE	TX channel 20385	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

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	46.054	-55.77	-13.0	42.77	9.84	V	196.7	1.0
1	98.676	-60.78	-13.0	47.78	9.77	V	0.9	2.0
1	188.886	-67.48	-13.0	54.48	5.69	V	359.0	1.0
1	308.196	-63.91	-13.0	50.91	9.53	V	215.8	2.0
1	451.32	-61.39	-13.0	48.39	11.79	V	16.3	2.0
1	756.142	-57.14	-13.0	44.14	17.53	V	343.8	1.0



ABOVE 1GHz

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

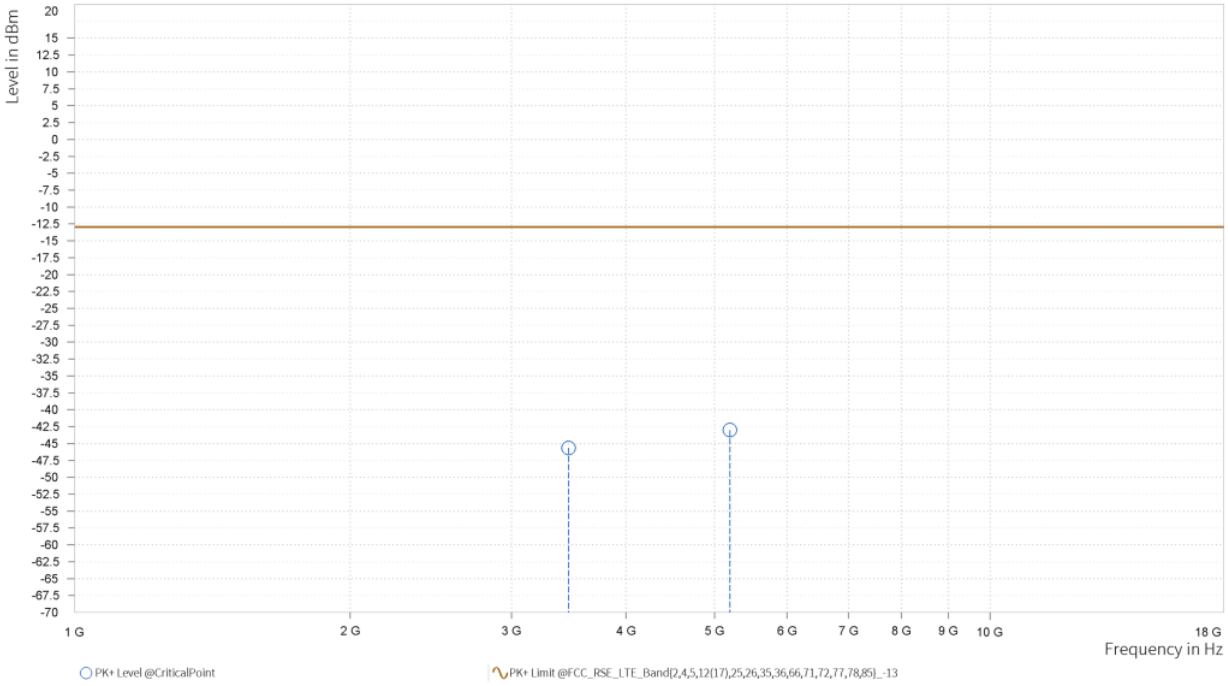
WORST-CASE DATA

LTE Band 4
CHANNEL BANDWIDTH: 1.4MHz / QPSK
CH 20175

MODE	TX channel 20175	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 27V
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

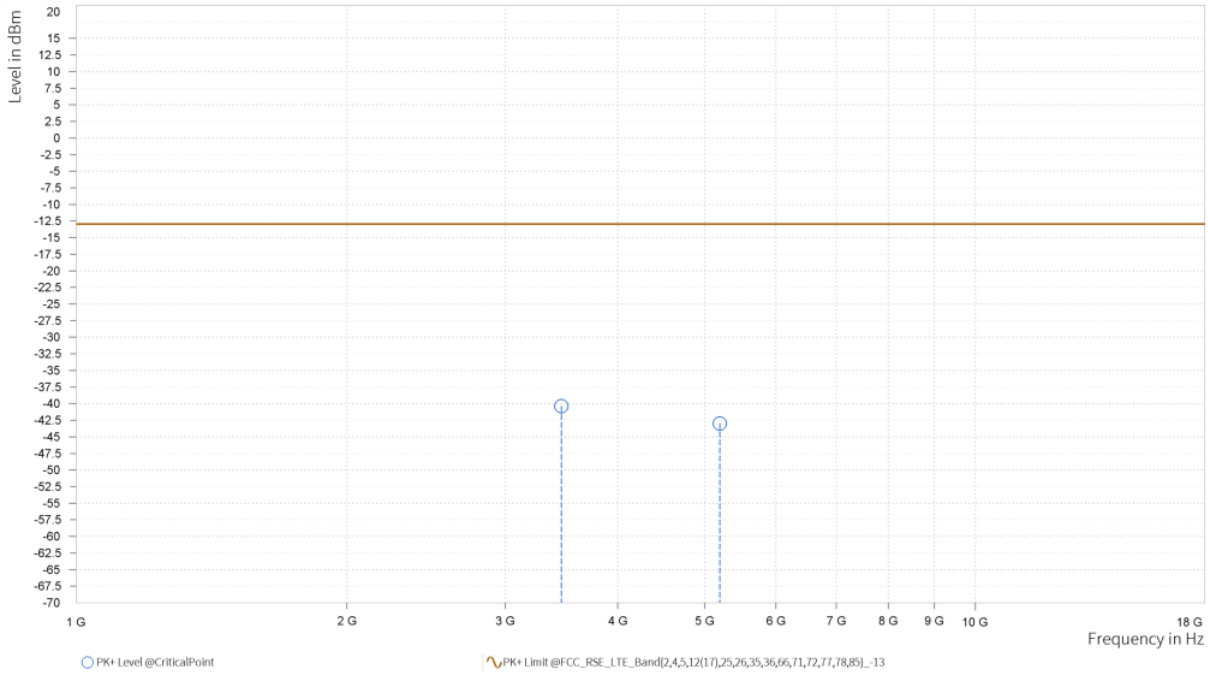
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,463.740	-45.66	-13.0	32.66	26.95	H	359.1	1.0
4	5,195.610	-43.0	-13.0	30.0	29.96	H	1.0	1.0



MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 27V
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	3,464.000	-40.38	-13.0	27.38	26.68	V	359.0	2.0
4	5,195.610	-43.0	-13.0	30.0	29.92	V	242.2	1.0



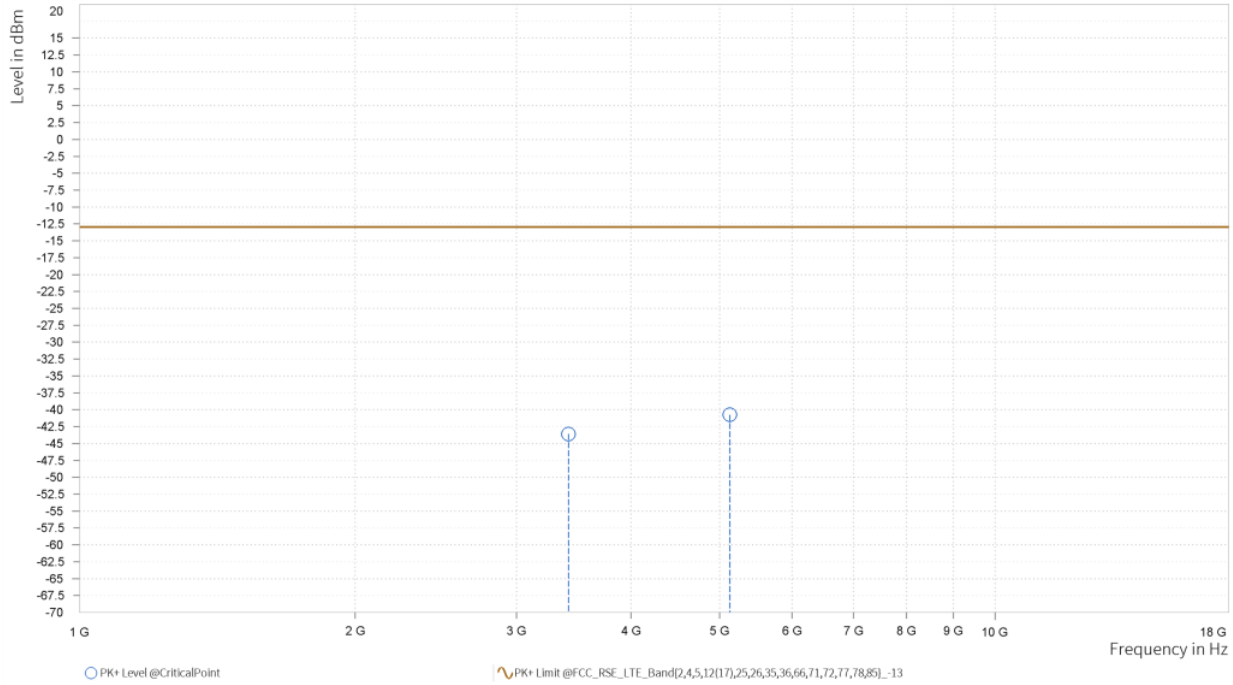
CHANNEL BANDWIDTH: 3MHz / QPSK

CH 19965

MODE	TX channel 19965	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 27V
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

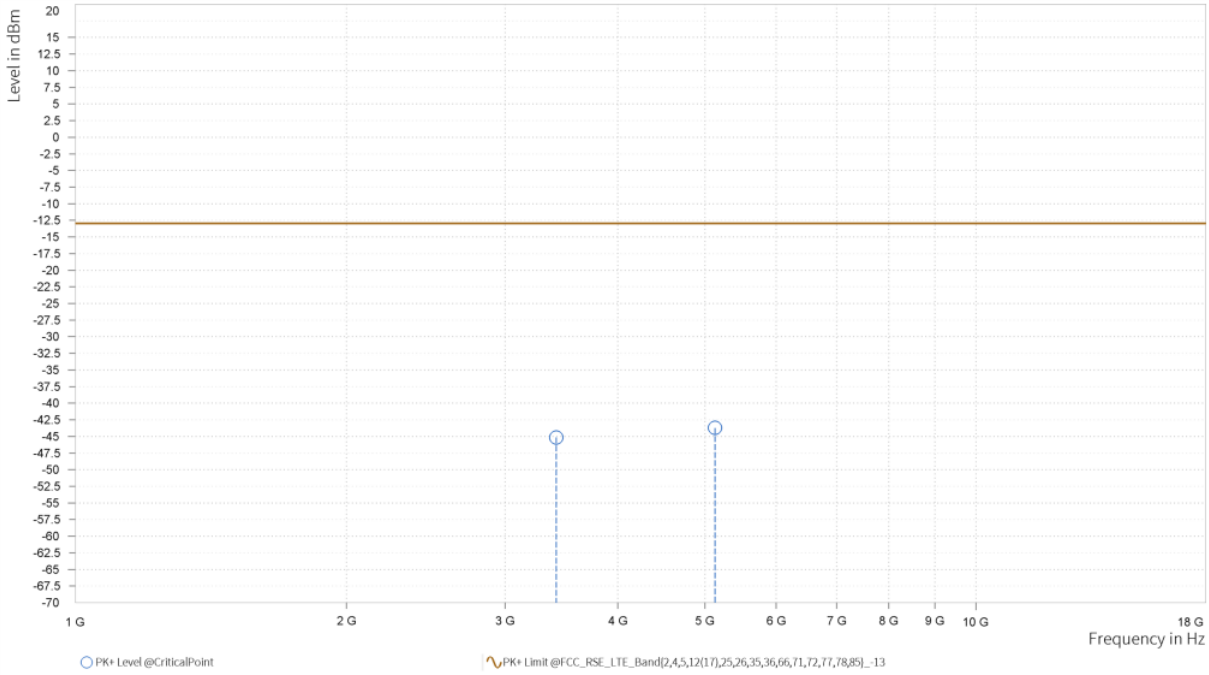
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,420.300	-43.59	-13.0	30.59	28.27	H	1	1.0
4	5,130.450	-40.74	-13.0	27.74	30.48	H	359	2.0



MODE	TX channel 19965	FREQUENCY RANGE	Above 1000MHz
	23deg. C, 70%RH	INPUT POWER	DC 27V
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	3,420.300	-45.14	-13.0	32.14	28.07	V	359.1	1.0
4	5,130.450	-43.72	-13.0	30.72	30.34	V	0.9	2.0

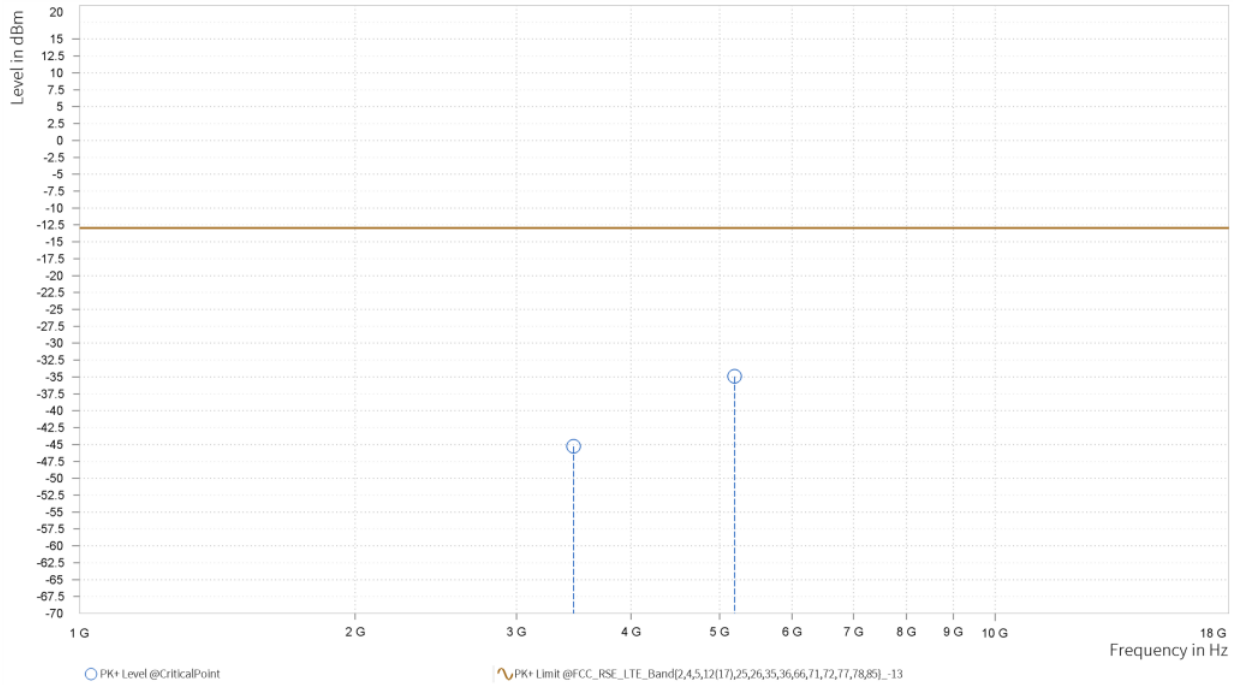


CH 20175

MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 27V
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

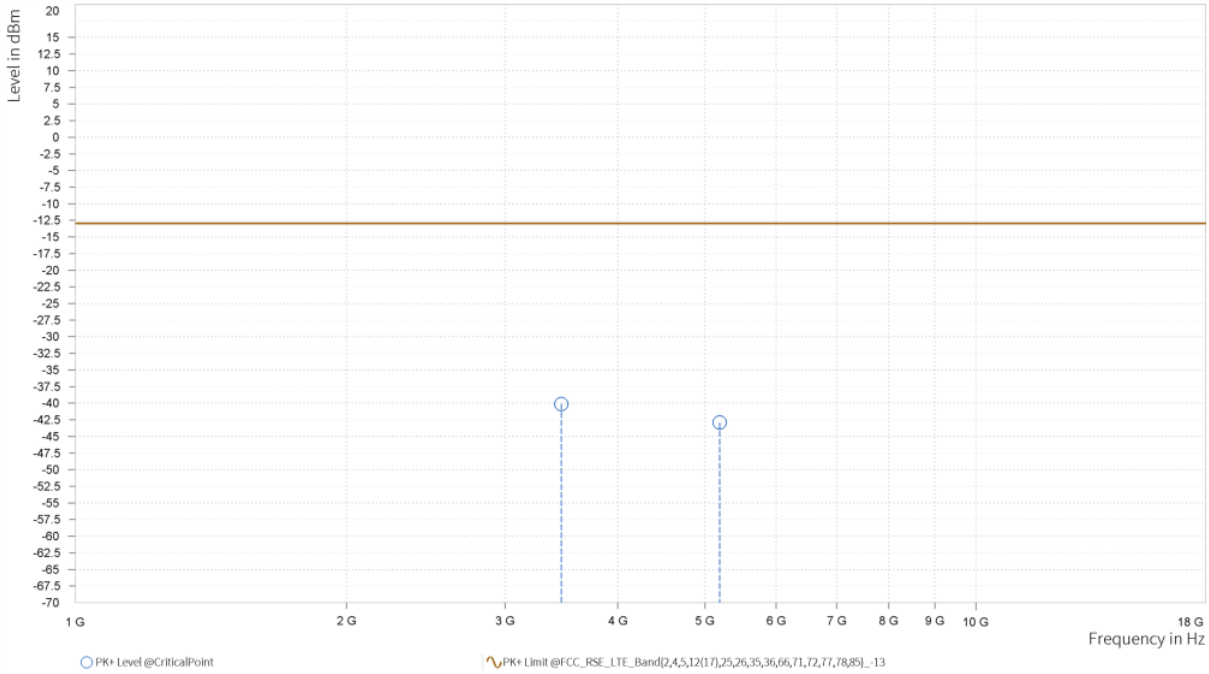
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,462.300	-45.26	-13.0	32.26	26.91	H	238.7	1.0
4	5,194.500	-34.91	-13.0	21.91	29.94	H	359.1	1.0



MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 27V
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	3,462.500	-40.12	-13.0	27.12	26.62	V	359	2.0
4	5,193.450	-42.92	-13.0	29.92	29.89	V	1	1.0

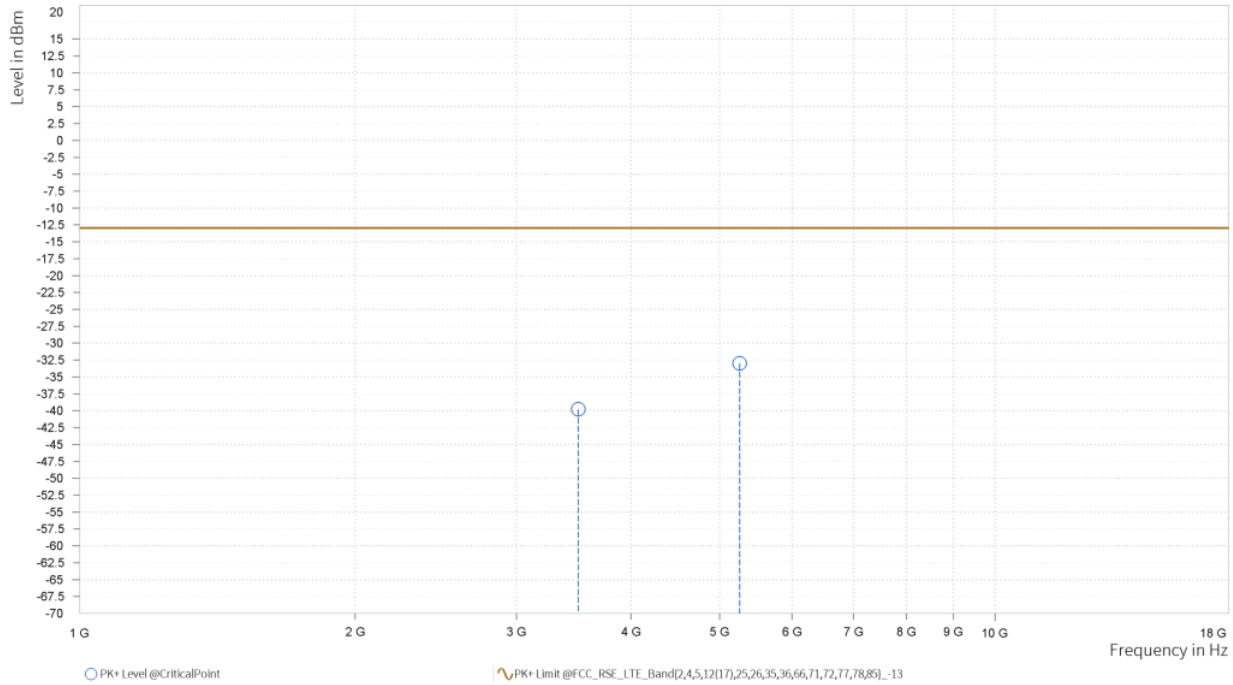


CH 20385

MODE	TX channel 20385	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 27V
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

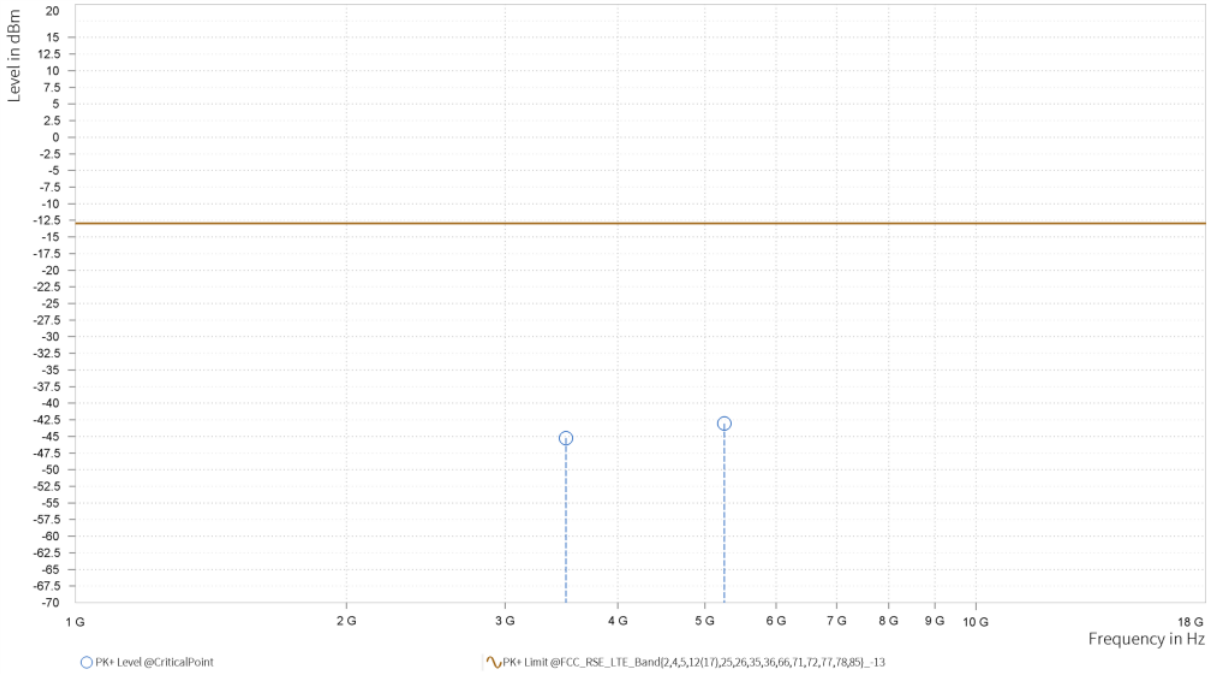
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,504.500	-39.79	-13.0	26.79	27.72	H	113.1	2.0
4	5,258.000	-33.0	-13.0	20.0	30.47	H	359.1	1.0



MODE	TX channel 20385	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 27V
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	3,504.300	-45.24	-13.0	32.24	27.53	V	248.2	1.0
4	5,256.450	-43.05	-13.0	30.05	30.34	V	359.1	1.0



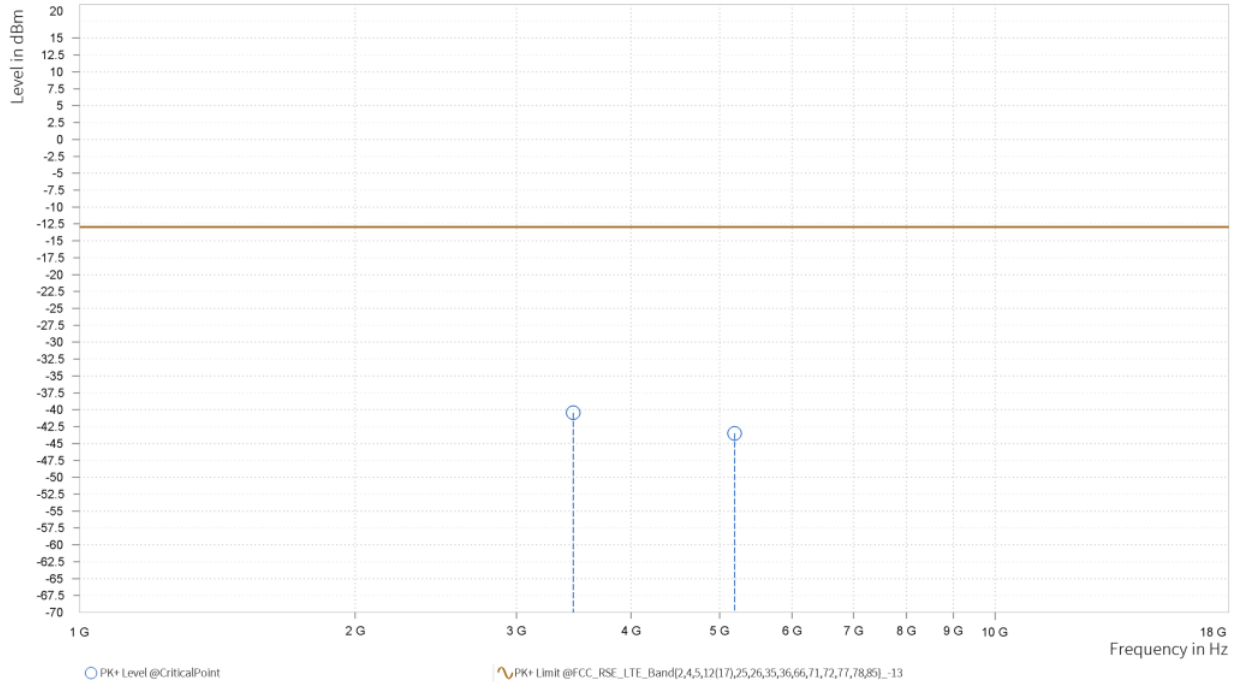
CHANNEL BANDWIDTH: 5MHz / QPSK

CH 20175

MODE	TX channel 20175	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 27V
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

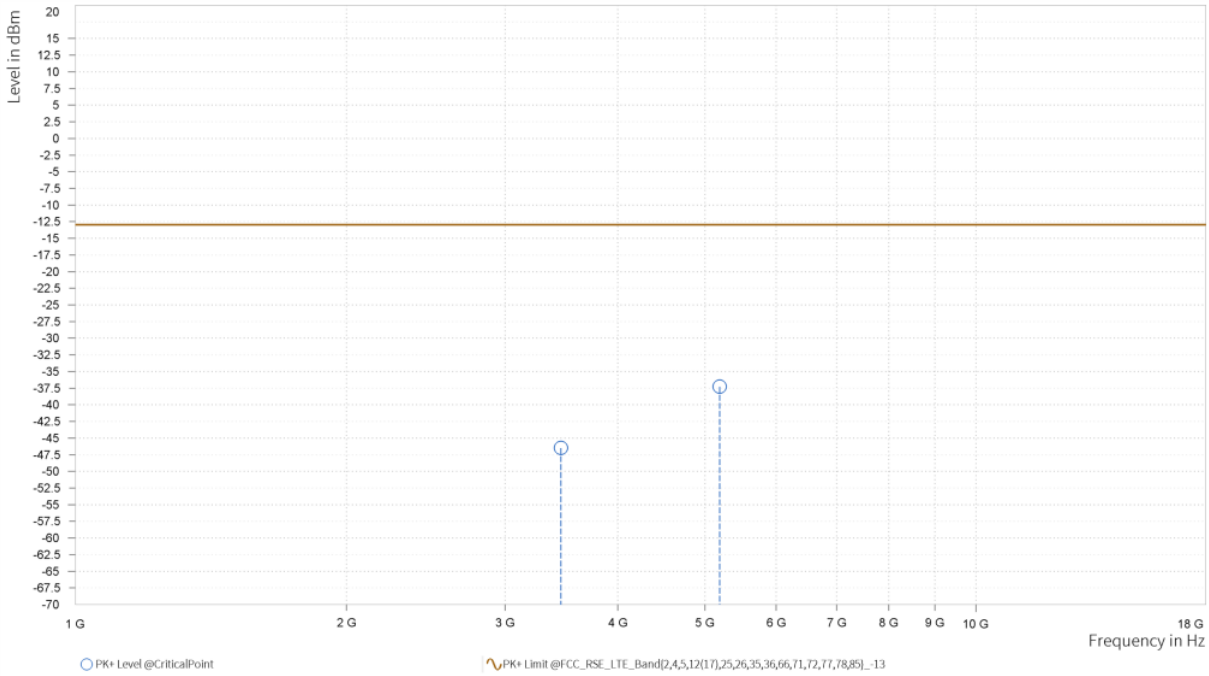
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,460.500	-40.45	-13.0	27.45	26.84	H	1.0	1.0
4	5,190.750	-43.49	-13.0	30.49	29.89	H	114.3	2.0



MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 27V
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	3,460.500	-46.48	-13.0	33.48	26.55	V	241	1.0
4	5,191.500	-37.28	-13.0	24.28	29.86	V	241	1.0

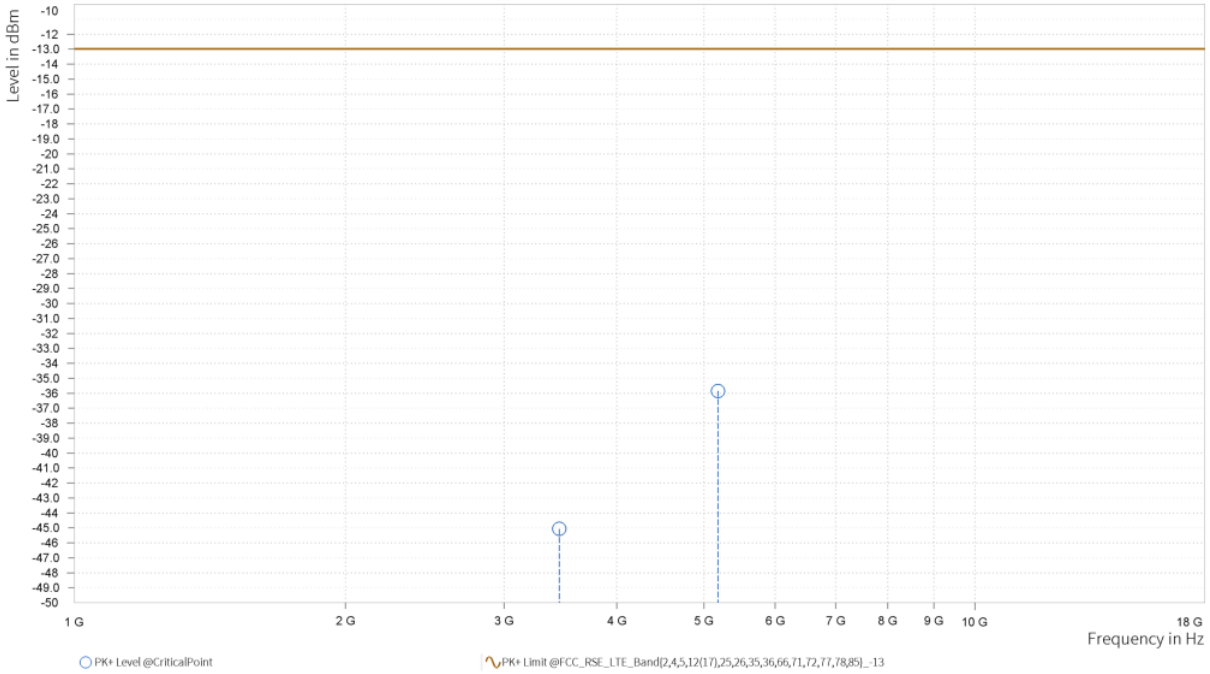


CHANNEL BANDWIDTH: 10MHz / QPSK

MODE	TX channel 20175	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 27V
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

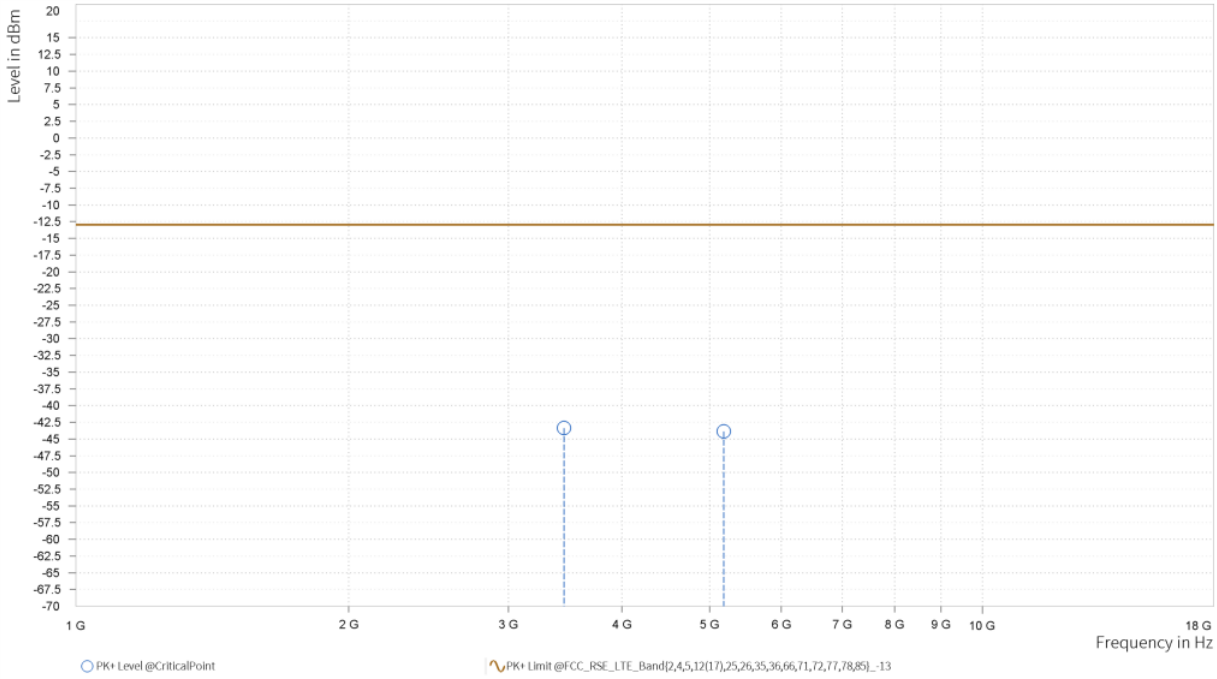
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,456.000	-45.07	-13.0	32.07	26.91	H	0.8	2.0
4	5,185.000	-35.85	-13.0	22.85	30.02	H	1.0	1.0



MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 27V
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	3,456.000	-43.37	-13.0	30.37	26.61	V	0.9	2.0
4	5,184.000	-43.86	-13.0	30.86	29.99	V	0.9	2.0



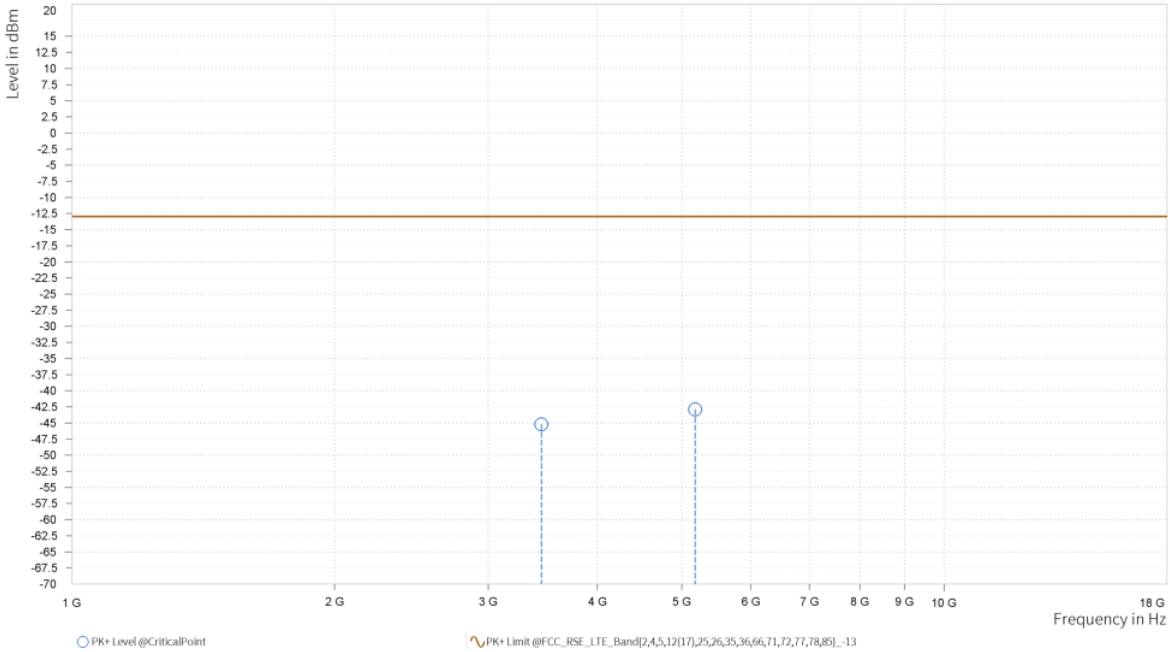
CHANNEL BANDWIDTH: 15MHz / QPSK

CH20175

MODE	TX channel 20175	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 27V
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

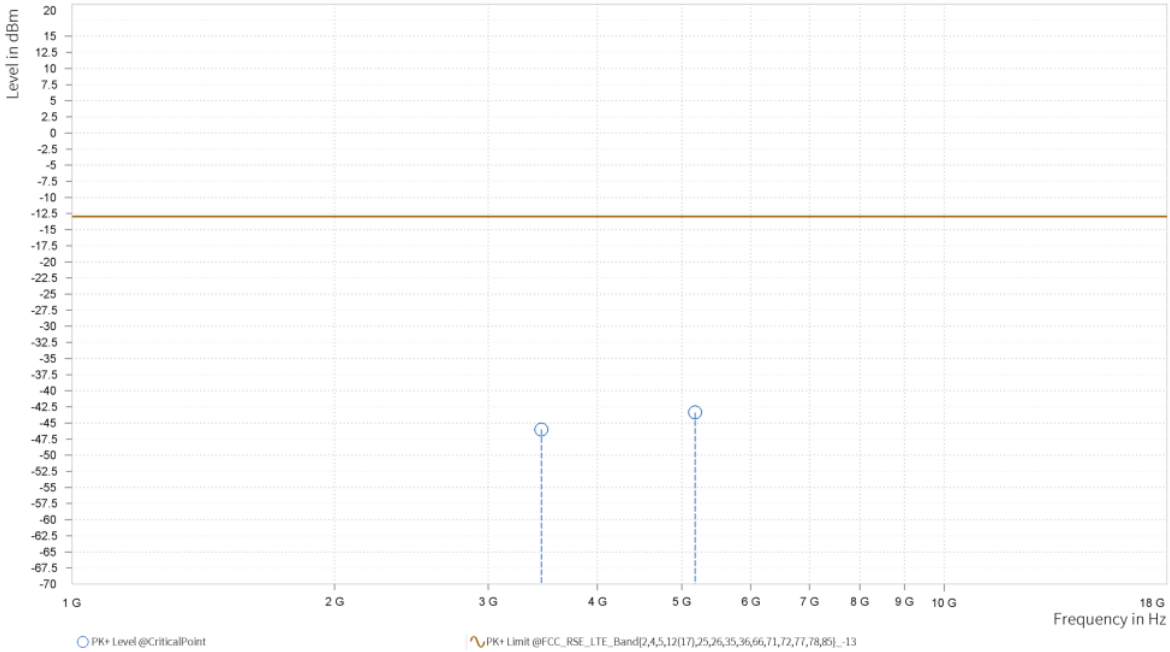
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,451.500	-45.21	-13.0	32.21	27.01	H	1.0	1.0
4	5,177.250	-42.88	-13.0	29.88	30.24	H	359.1	1.0



MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 27V
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	3,451.500	-46.01	-13.0	33.01	26.7	V	1.0	1.0
4	5,177.250	-43.35	-13.0	30.35	30.17	V	111.9	2.0



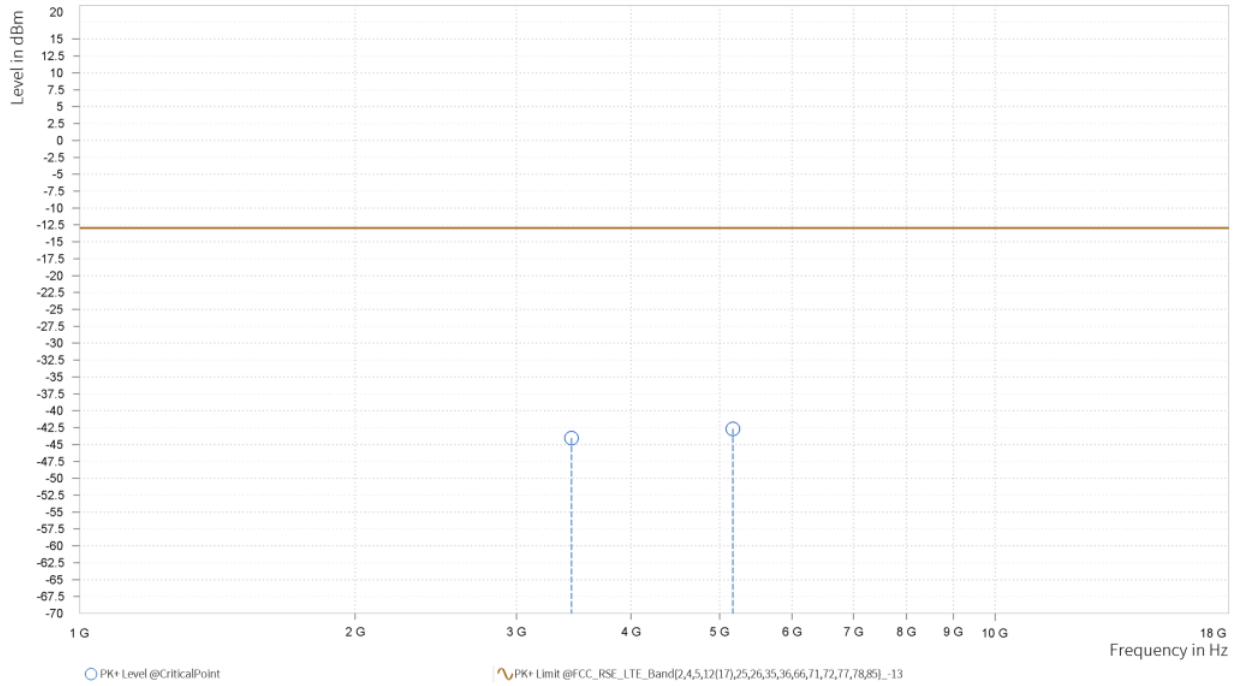
CHANNEL BANDWIDTH: 20MHz / QPSK

CH 20175

MODE	TX channel 20175	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 27V
TESTED BY	Hanwen Xu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

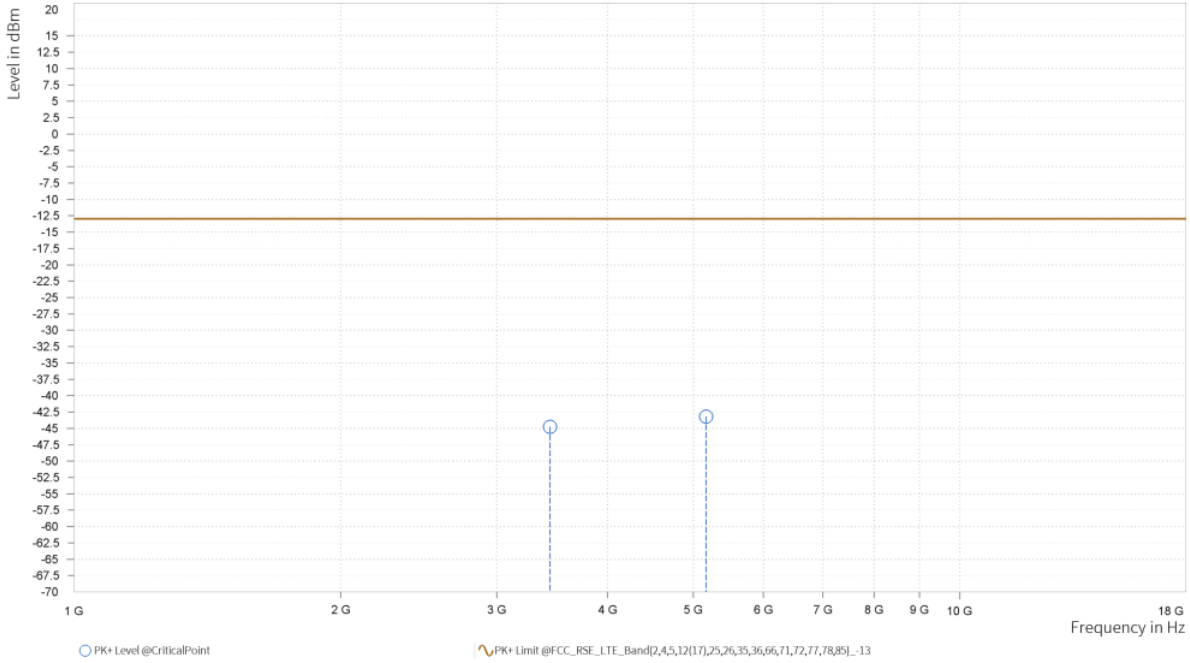
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,447.000	-44.05	-13.0	31.05	27.35	H	110.8	2.0
4	5,170.500	-42.68	-13.0	29.68	30.44	H	1.0	2.0



MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 27V
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	3,447.000	-44.74	-13.0	31.74	27.05	V	359	1.0
4	5,170.500	-43.19	-13.0	30.19	30.36	V	1	1.0



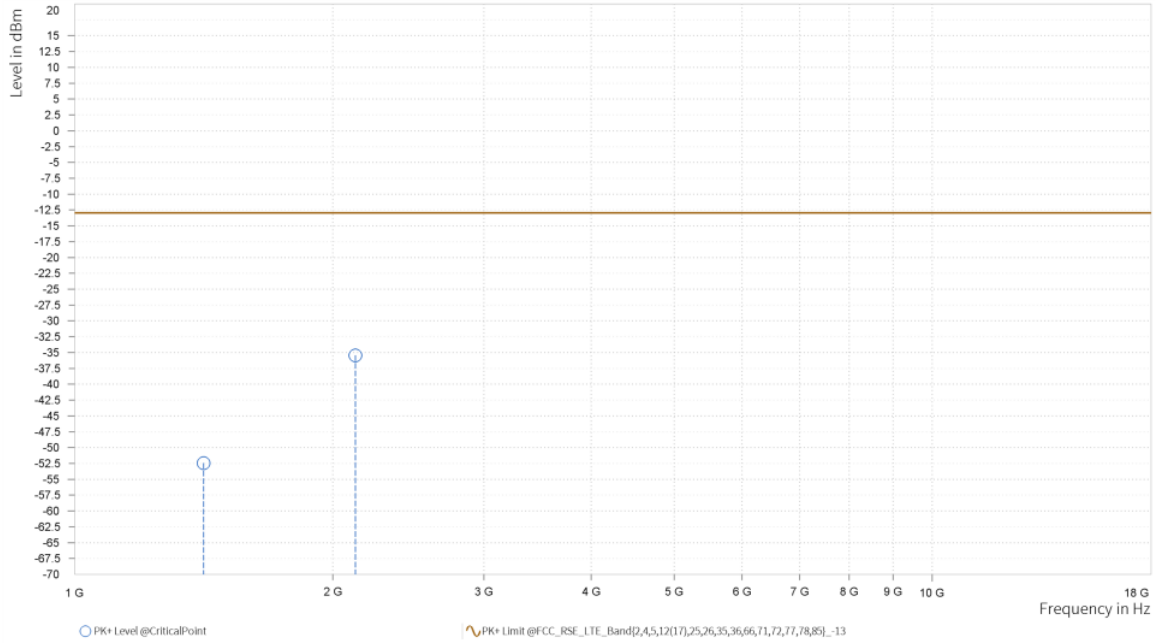
LTE BAND 12

CHANNEL BANDWIDTH: 1.4MHz / QPSK

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

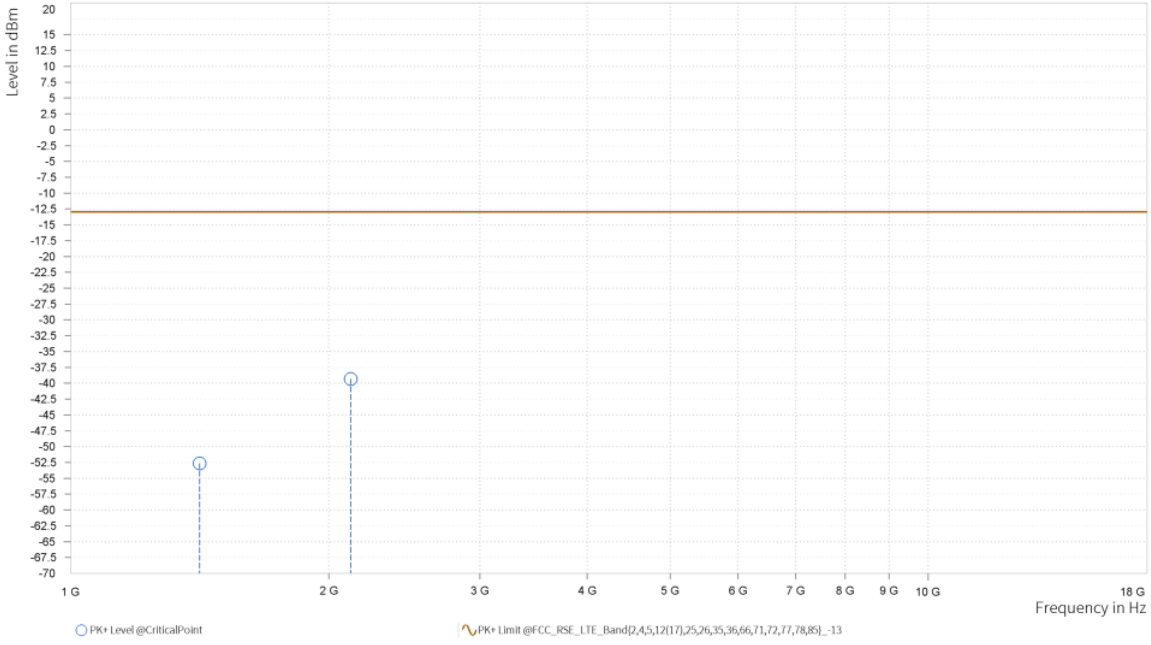
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,413.740	-52.44	-13.0	39.44	18.38	H	73.6	1.0
2	2,124.000	-35.44	-13.0	22.44	25.66	H	0.8	2.0



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

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,413.740	-52.64	-13.0	39.64	18.28	V	359	2.0
2	2,121.500	-39.31	-13.0	26.31	25.19	V	359	2.0



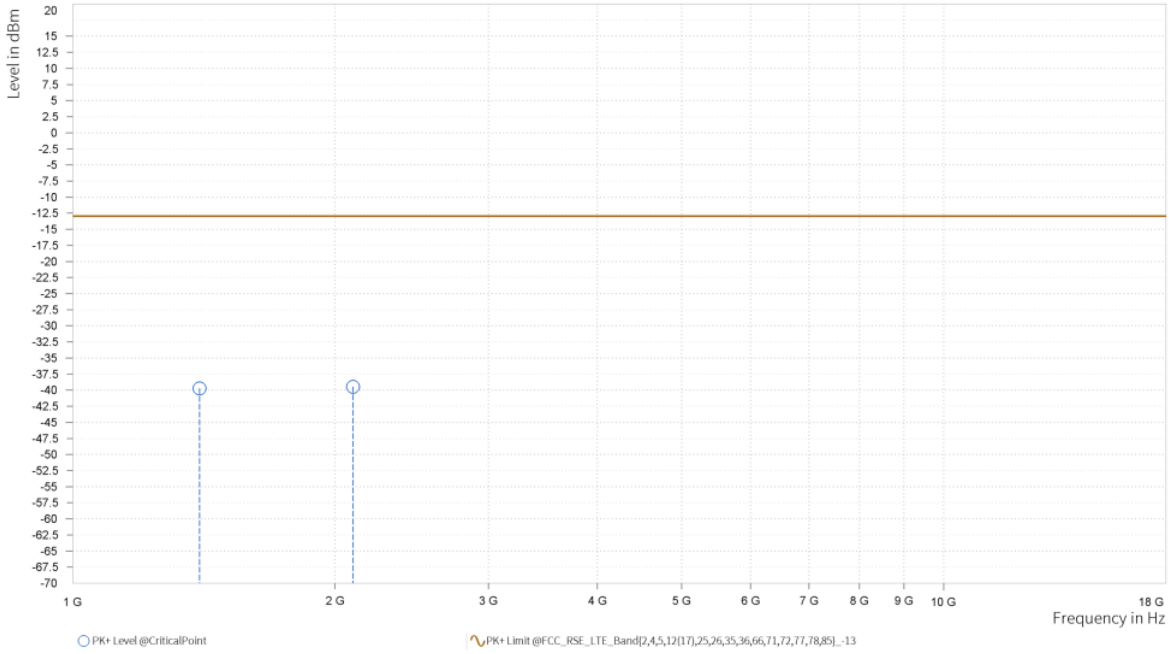
CHANNEL BANDWIDTH: 3MHz / QPSK

CH23025

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

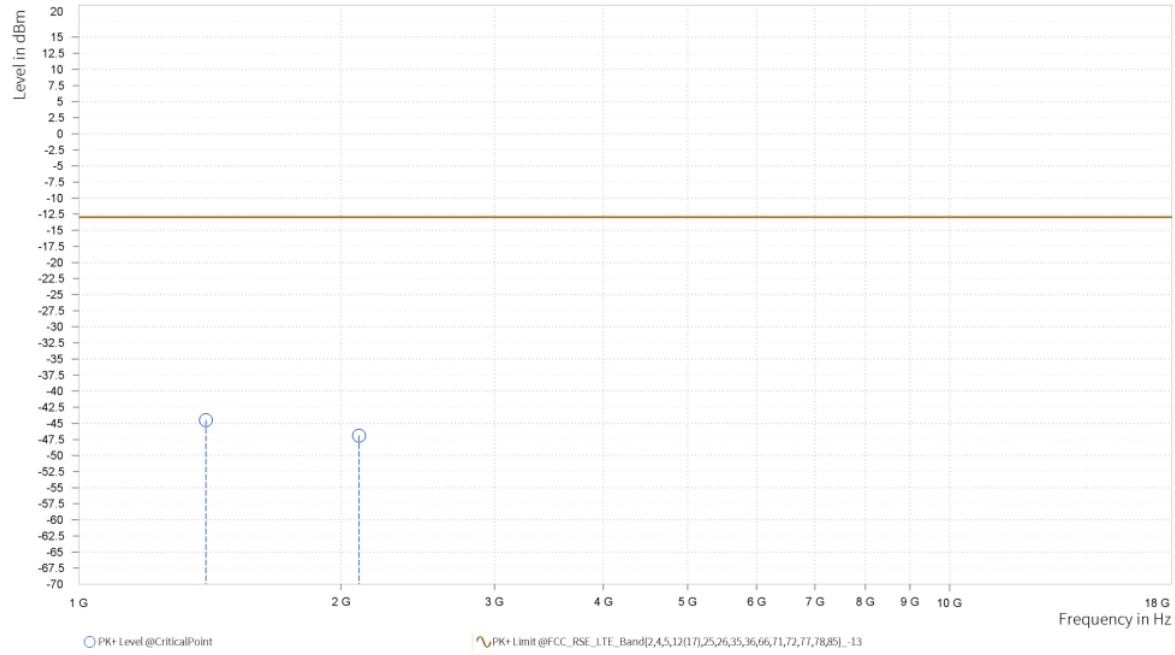
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,398.300	-39.72	-13.0	26.72	19.16	H	359.1	1.0
2	2,097.500	-39.48	-13.0	26.48	24.68	H	359.1	1.0



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

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,398.500	-44.5	-13.0	31.5	19.6	V	359.0	2.0
2	2,097.450	-46.9	-13.0	33.9	24.63	V	0.9	2.0

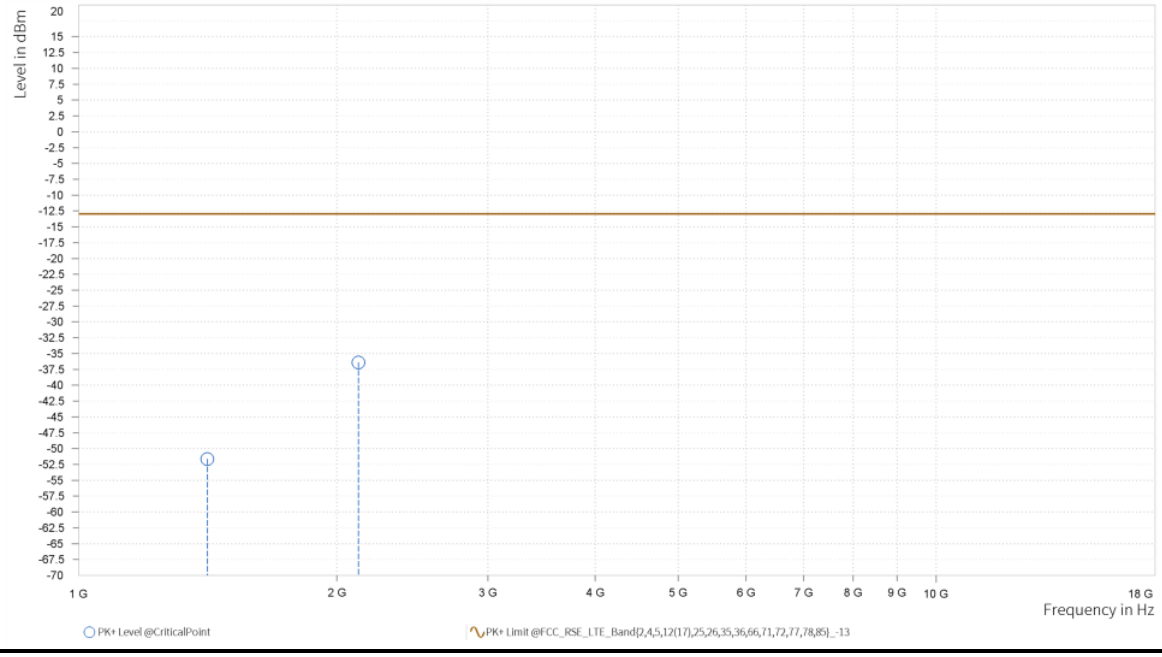


CH23095

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

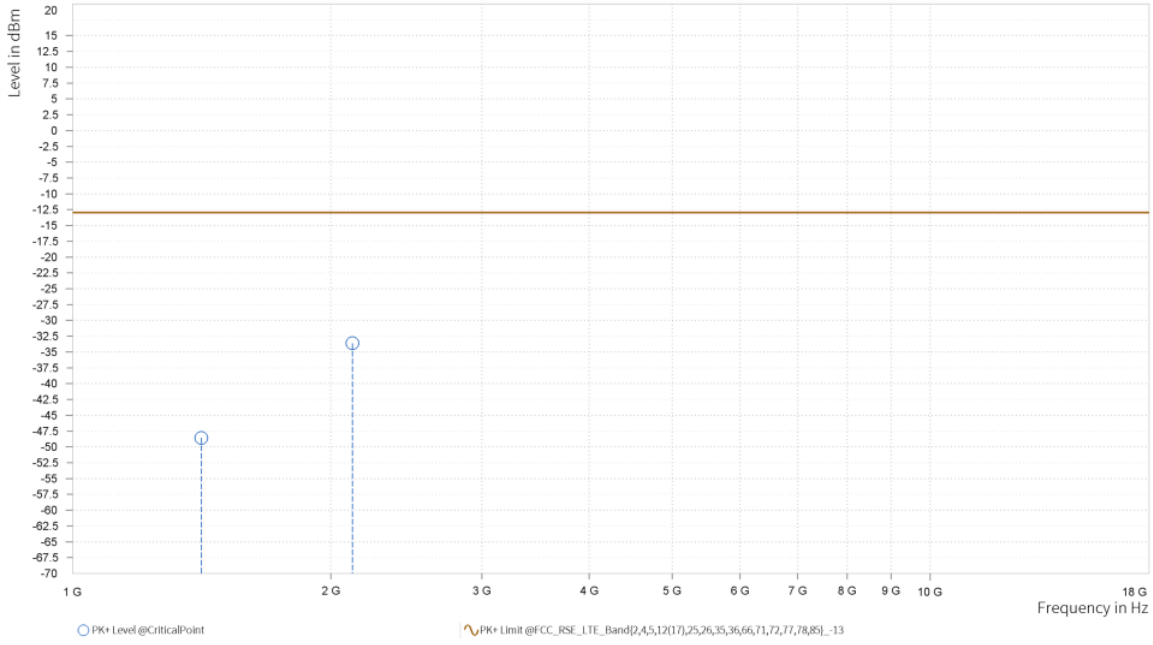
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,412.300	-51.62	-13.0	38.62	18.47	H	287.6	2.0
2	2,120.000	-36.4	-13.0	23.4	25.5	H	359.0	1.0



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

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,412.300	-48.57	-13.0	35.57	18.47	V	1	1.0
2	2,119.500	-33.61	-13.0	20.61	25.46	V	359	2.0

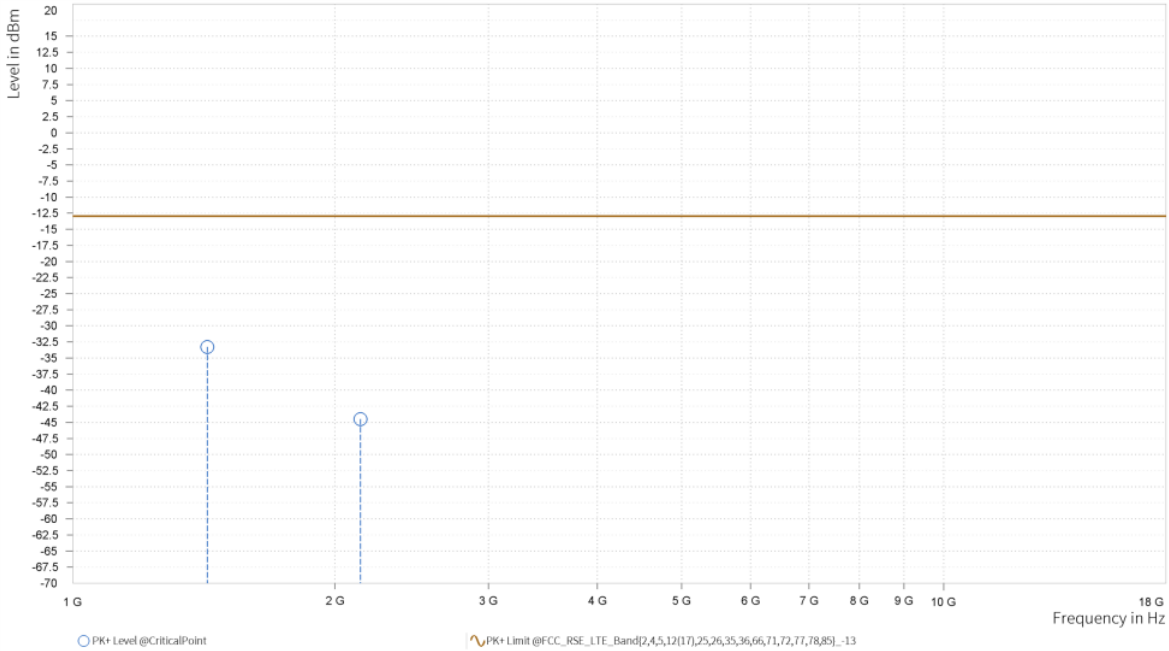


CH23165

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

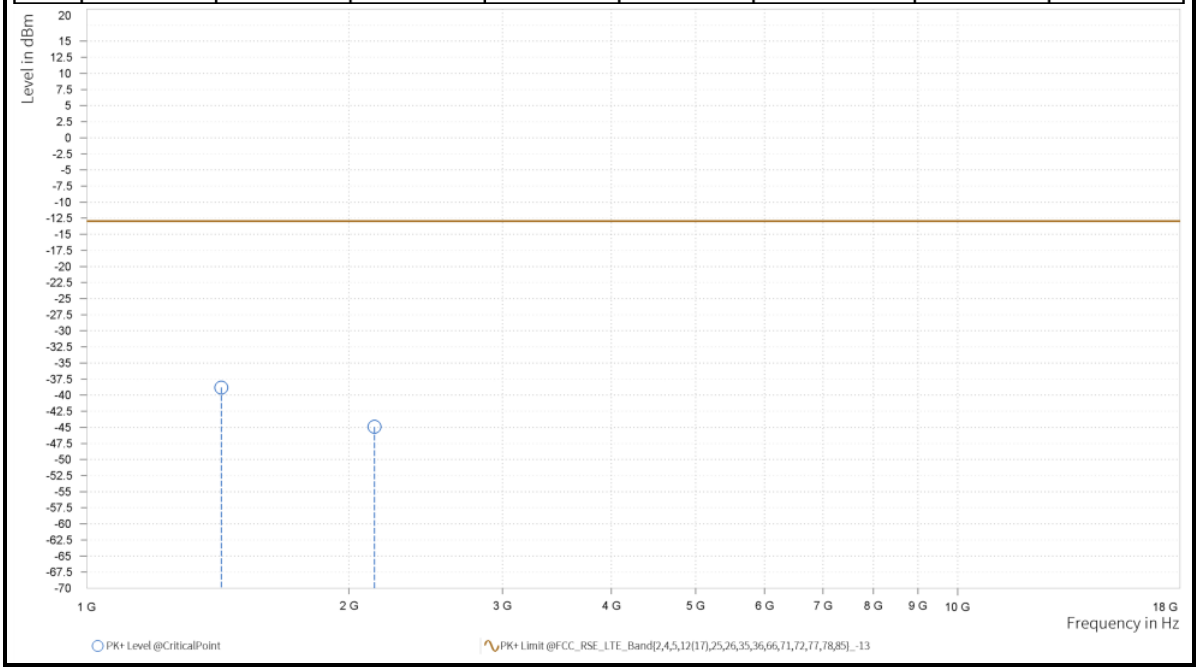
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,427.000	-33.27	-13.0	20.27	16.53	H	67.6	1.0
2	2,139.450	-44.51	-13.0	31.51	26.76	H	67.6	1.0



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

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,426.300	-38.81	-13.0	25.81	16.73	V	70	1.0
2	2,139.450	-44.92	-13.0	31.92	26.19	V	1	2.0

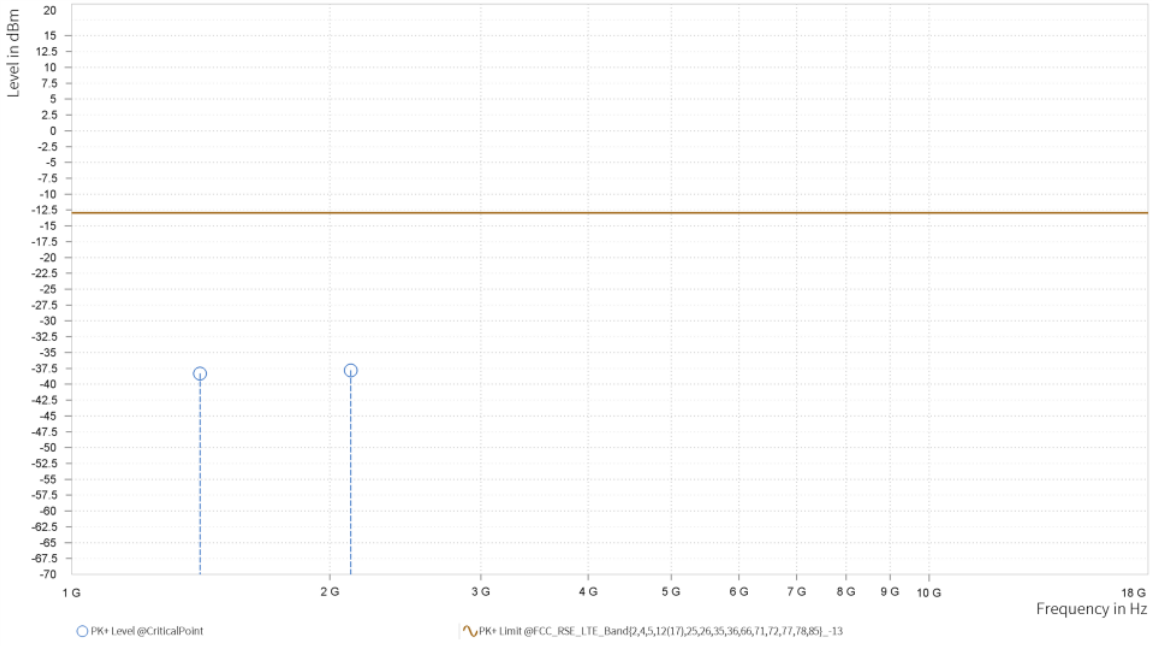


CHANNEL BANDWIDTH: 5MHz / QPSK

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

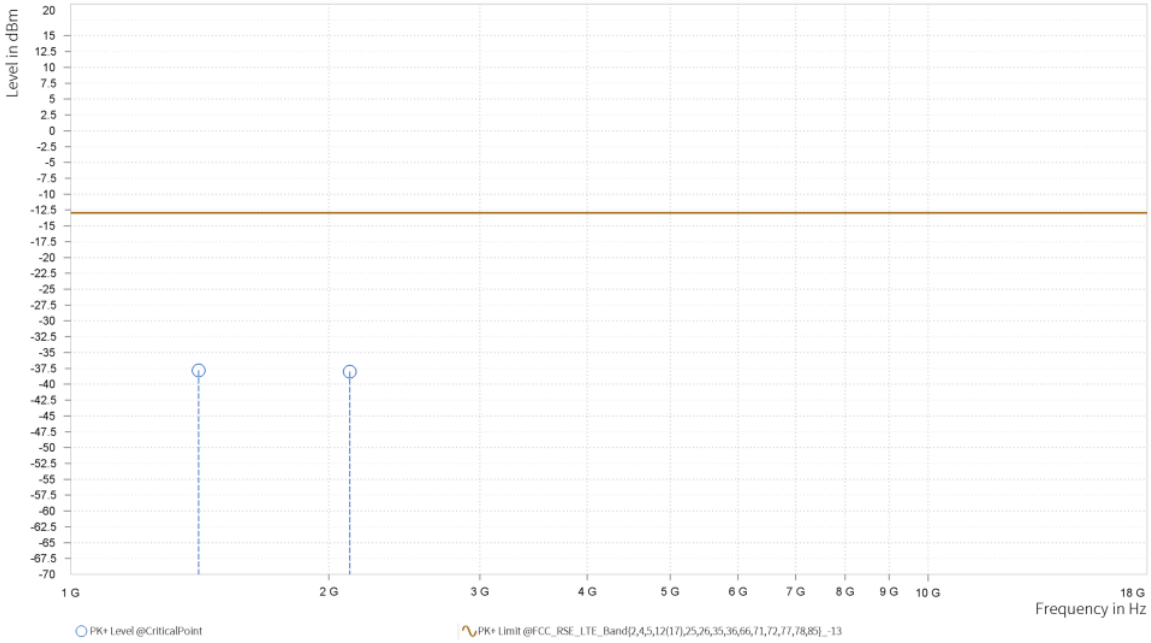
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,411.000	-38.3	-13.0	25.3	18.6	H	359.1	1.0
2	2,115.750	-37.82	-13.0	24.82	25.13	H	0.9	2.0



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

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,410.000	-37.82	-13.0	24.82	18.61	V	359.0	2.0
2	2,115.750	-38.01	-13.0	25.01	24.94	V	293.7	2.0

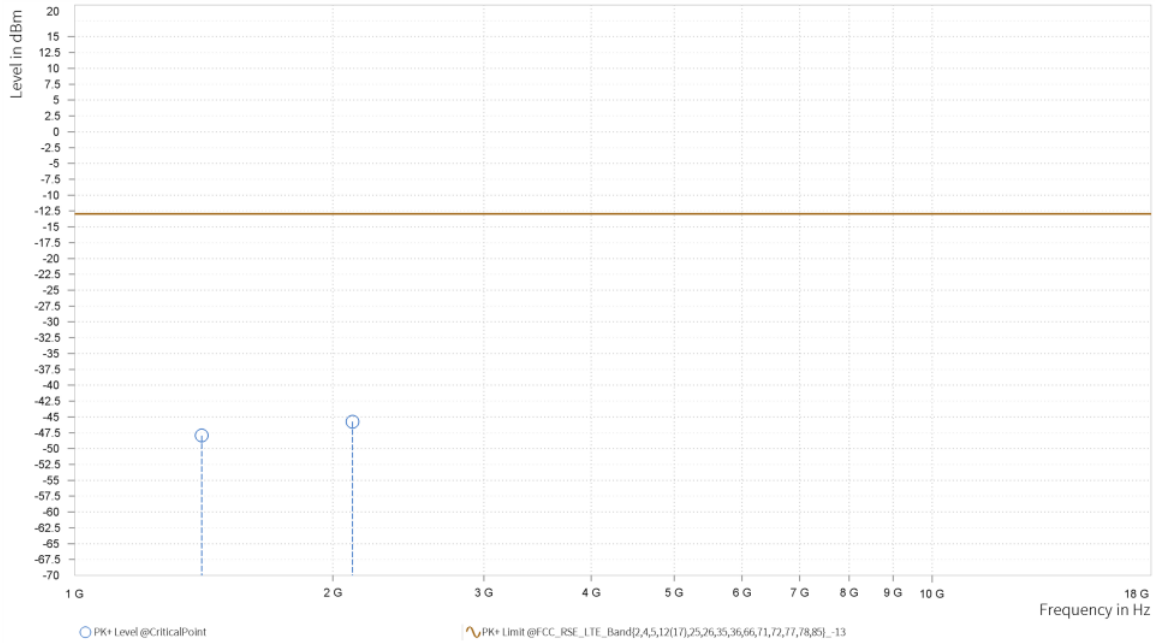


CHANNEL BANDWIDTH: 10MHz / QPSK

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

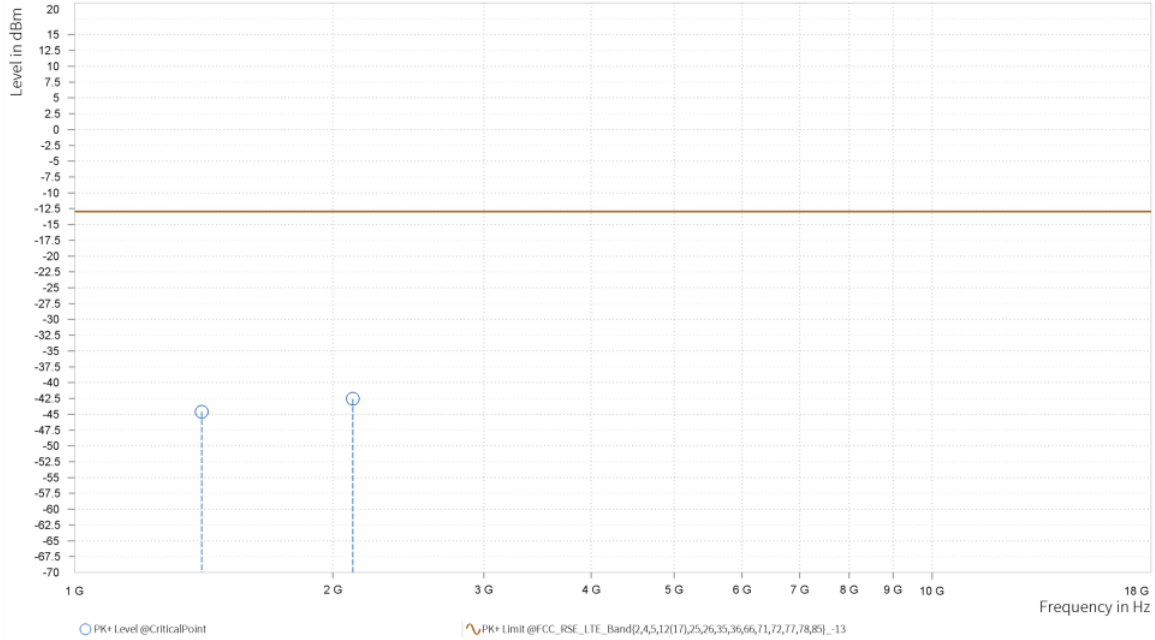
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,406.000	-47.93	-13.0	34.93	18.95	H	1	1.0
2	2,109.000	-45.76	-13.0	32.76	24.67	H	1	1.0



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

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,406.500	-44.59	-13.0	31.59	18.87	V	288.8	2.0
2	2,110.000	-42.56	-13.0	29.56	24.44	V	1.0	2.0

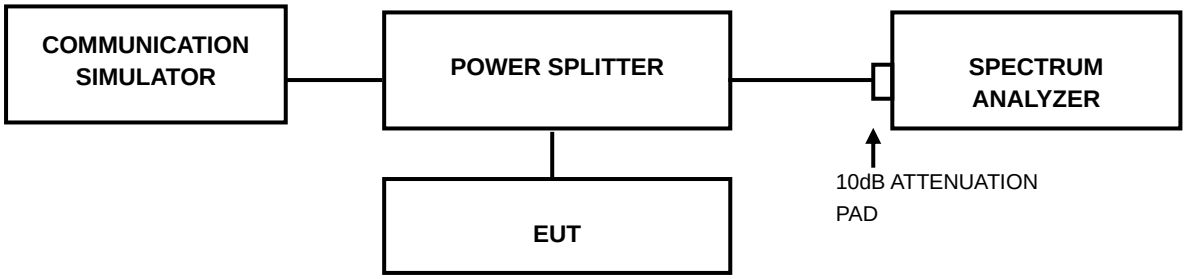


3.7 PEAK TO AVERAGE RATIO

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

LTE BAND4

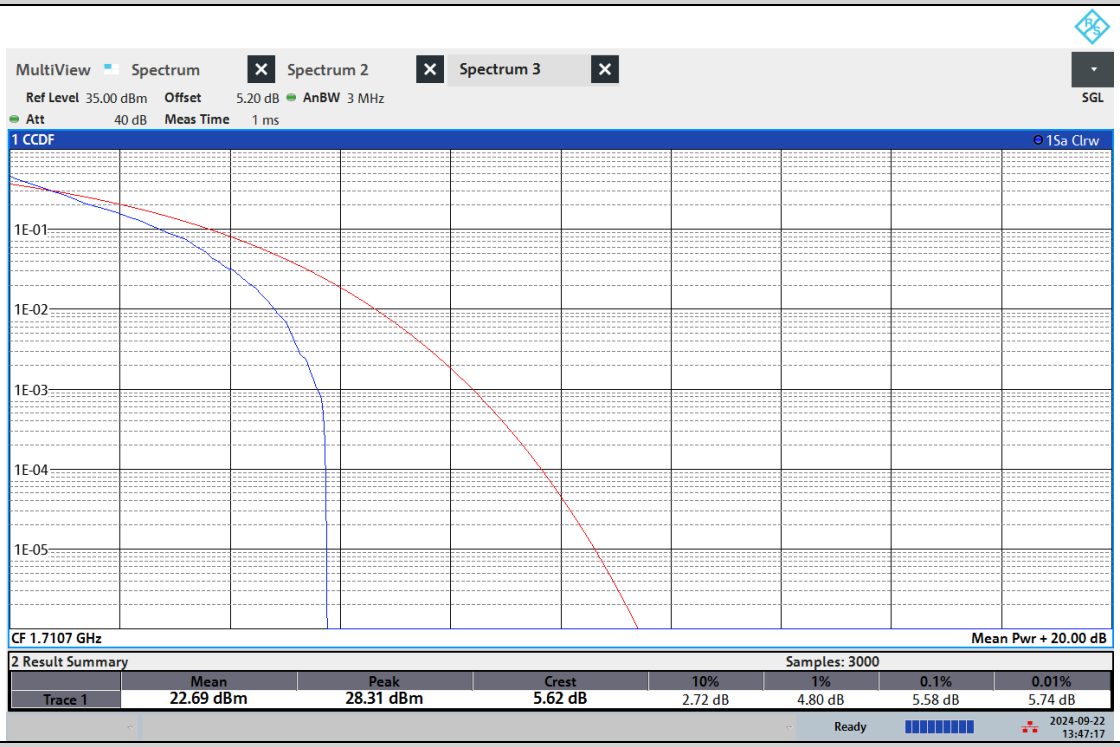
PEAK-TO-AVERAGE RATIO(CCDF)

Test Result

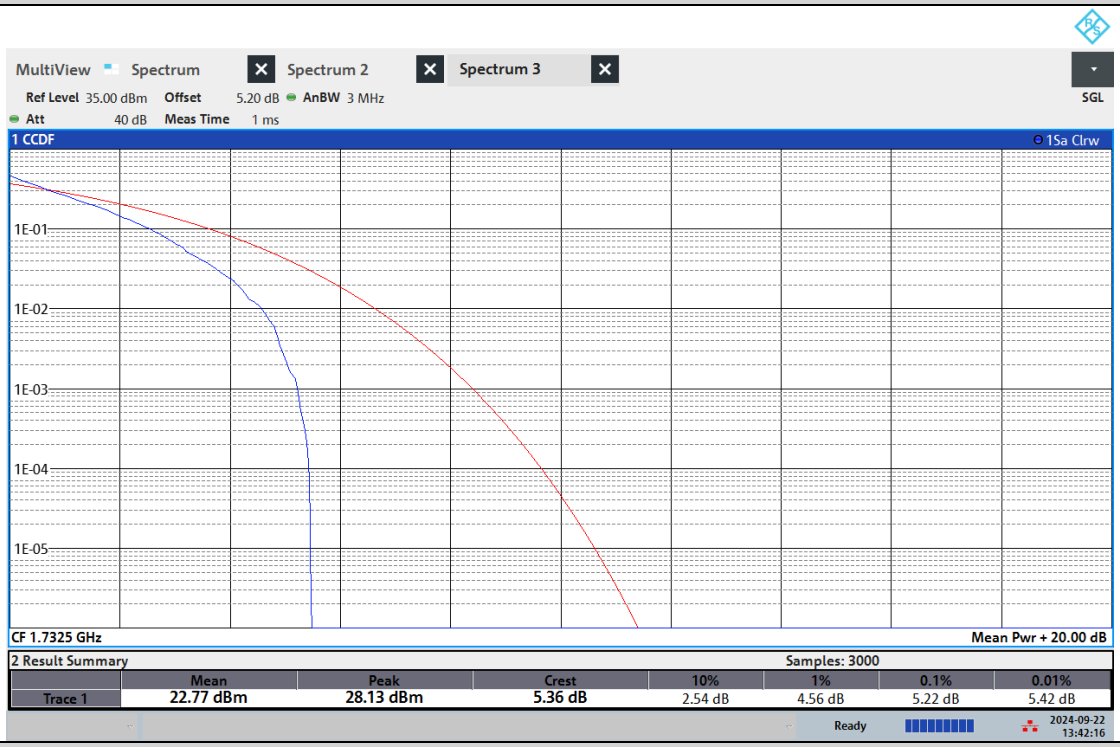
Band	Bandwidth	Modulation	Channel	Result(dB)	Limit(dB)	Verdict
Band4	1.4MHz	QPSK	19957	5.58	13	PASS
Band4	1.4MHz	QPSK	20175	5.22	13	PASS
Band4	1.4MHz	QPSK	20393	5.94	13	PASS
Band4	1.4MHz	16QAM	19957	6.00	13	PASS
Band4	1.4MHz	16QAM	20175	5.78	13	PASS
Band4	1.4MHz	16QAM	20393	6.10	13	PASS
Band4	3MHz	QPSK	19965	5.06	13	PASS
Band4	3MHz	QPSK	20175	4.98	13	PASS
Band4	3MHz	QPSK	20385	5.26	13	PASS
Band4	3MHz	16QAM	19965	6.28	13	PASS
Band4	3MHz	16QAM	20175	5.56	13	PASS
Band4	3MHz	16QAM	20385	5.64	13	PASS
Band4	5MHz	QPSK	19975	5.06	13	PASS
Band4	5MHz	QPSK	20175	4.98	13	PASS
Band4	5MHz	QPSK	20375	5.64	13	PASS
Band4	5MHz	16QAM	19975	5.62	13	PASS
Band4	5MHz	16QAM	20175	5.60	13	PASS
Band4	5MHz	16QAM	20375	5.98	13	PASS
Band4	10MHz	QPSK	20000	5.28	13	PASS
Band4	10MHz	QPSK	20175	4.88	13	PASS
Band4	10MHz	QPSK	20350	5.52	13	PASS
Band4	10MHz	16QAM	20000	5.82	13	PASS
Band4	10MHz	16QAM	20175	5.52	13	PASS
Band4	10MHz	16QAM	20350	5.98	13	PASS
Band4	15MHz	QPSK	20025	4.76	13	PASS
Band4	15MHz	QPSK	20175	4.76	13	PASS
Band4	15MHz	QPSK	20325	4.62	13	PASS
Band4	15MHz	16QAM	20025	5.64	13	PASS
Band4	15MHz	16QAM	20175	5.42	13	PASS
Band4	15MHz	16QAM	20325	6.00	13	PASS
Band4	20MHz	QPSK	20050	4.72	13	PASS
Band4	20MHz	QPSK	20175	4.80	13	PASS
Band4	20MHz	QPSK	20300	4.66	13	PASS
Band4	20MHz	16QAM	20050	5.44	13	PASS
Band4	20MHz	16QAM	20175	5.44	13	PASS
Band4	20MHz	16QAM	20300	5.36	13	PASS

Test Graphs

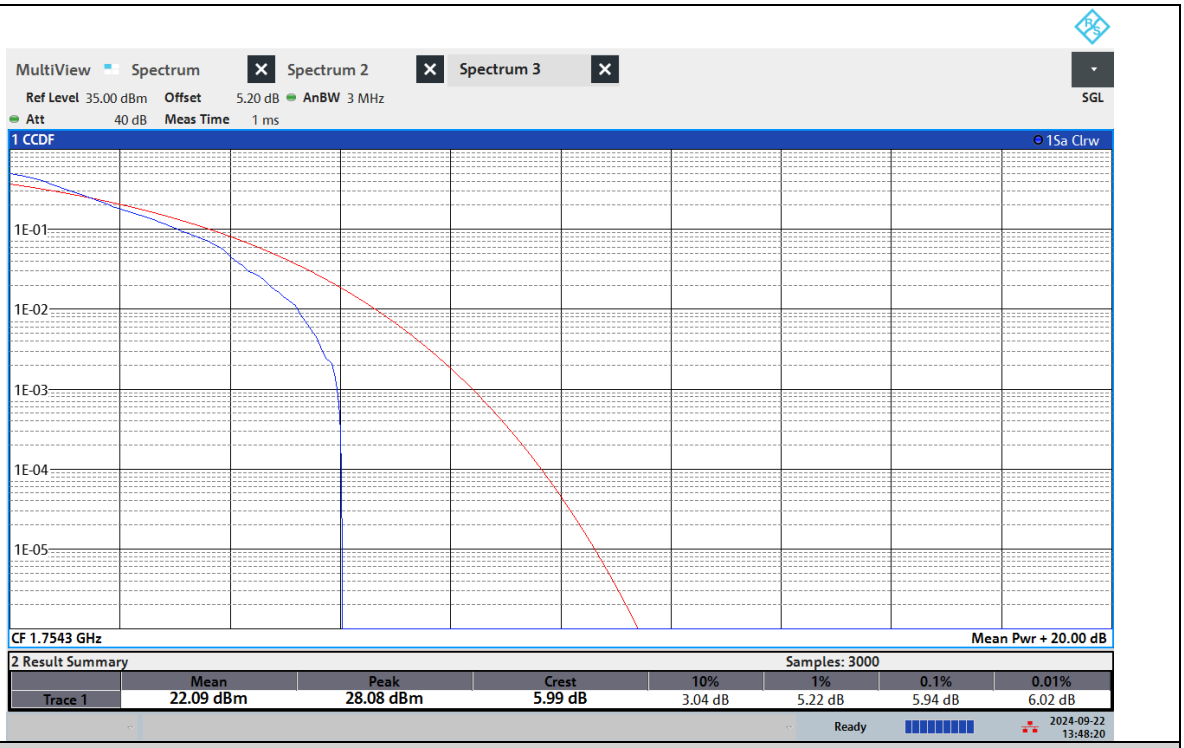
Band4-1.4MHz-QPSK-19957



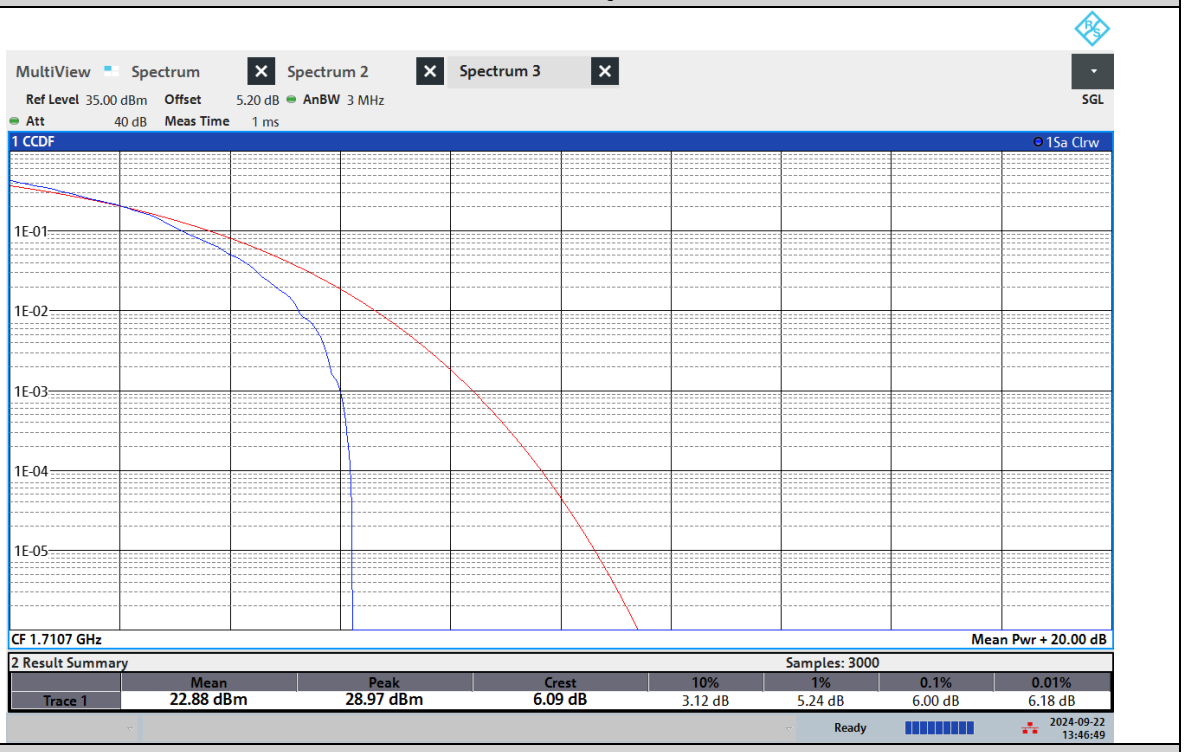
Band4-1.4MHz-QPSK-20175



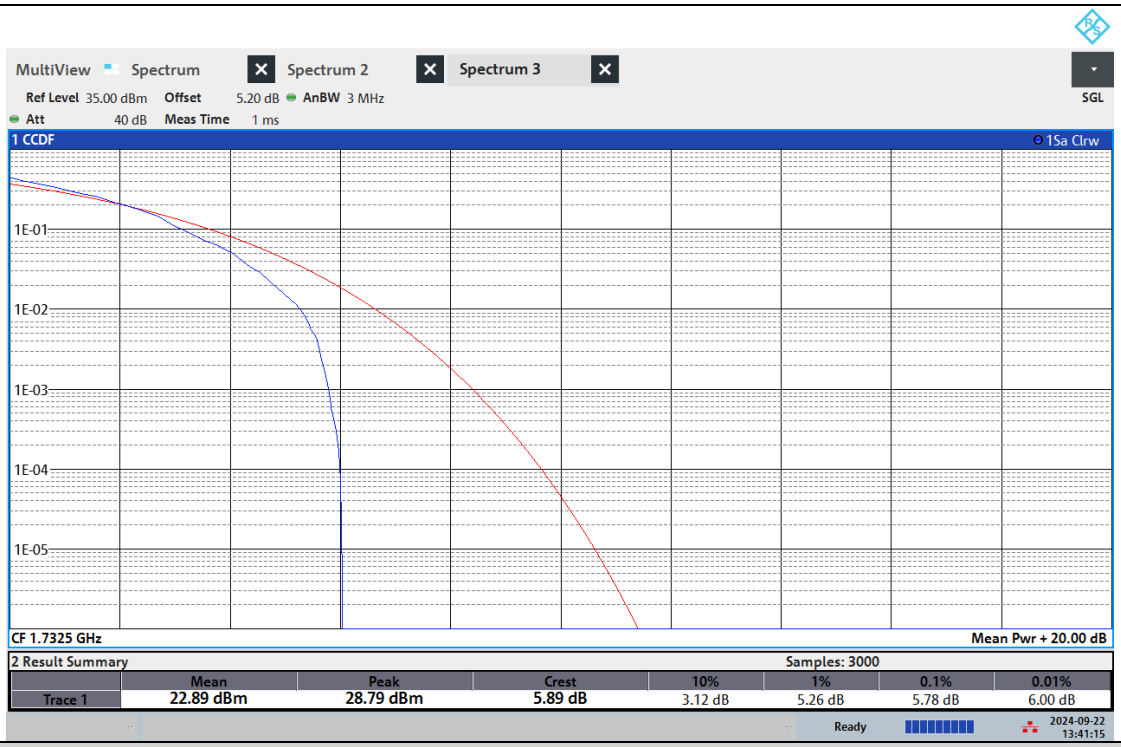
Band4-1.4MHz-QPSK-20393



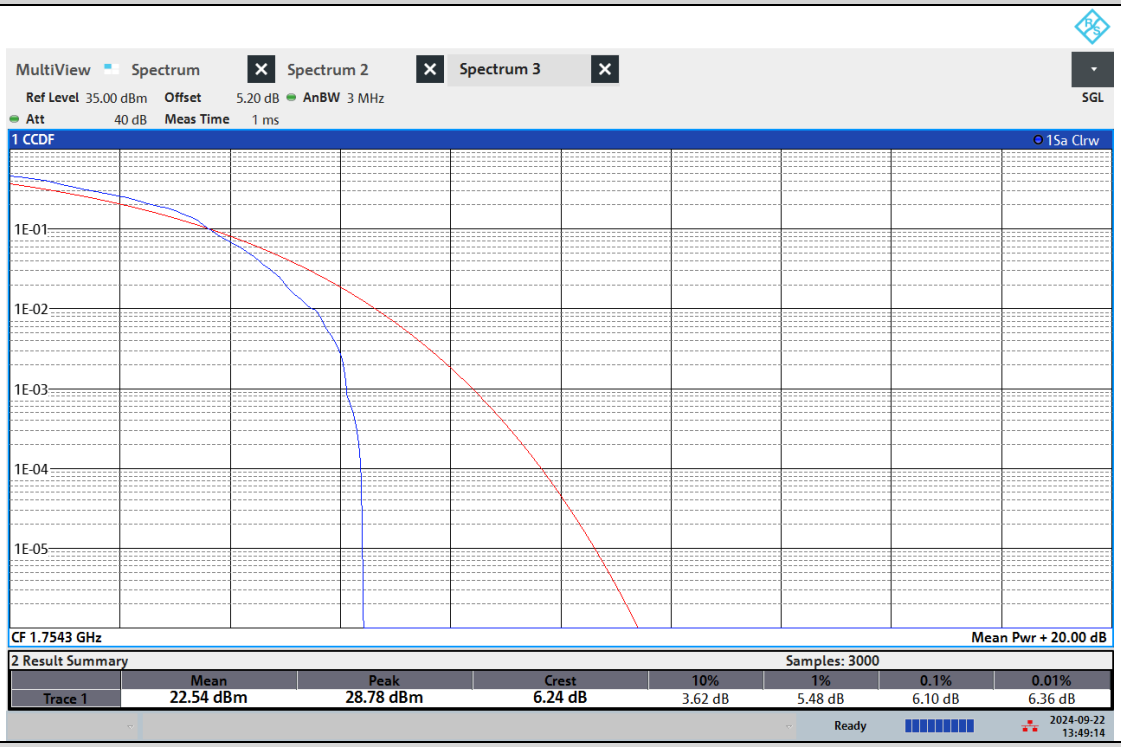
Band4-1.4MHz-16QAM-19957



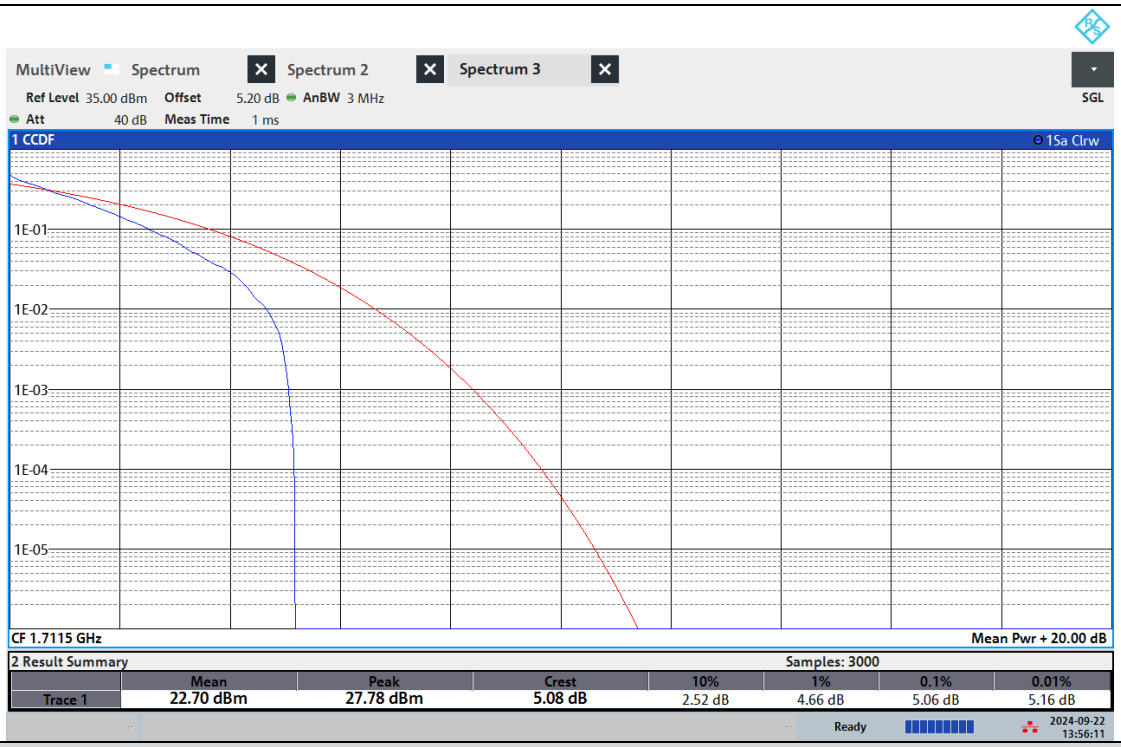
Band4-1.4MHz-16QAM-20175



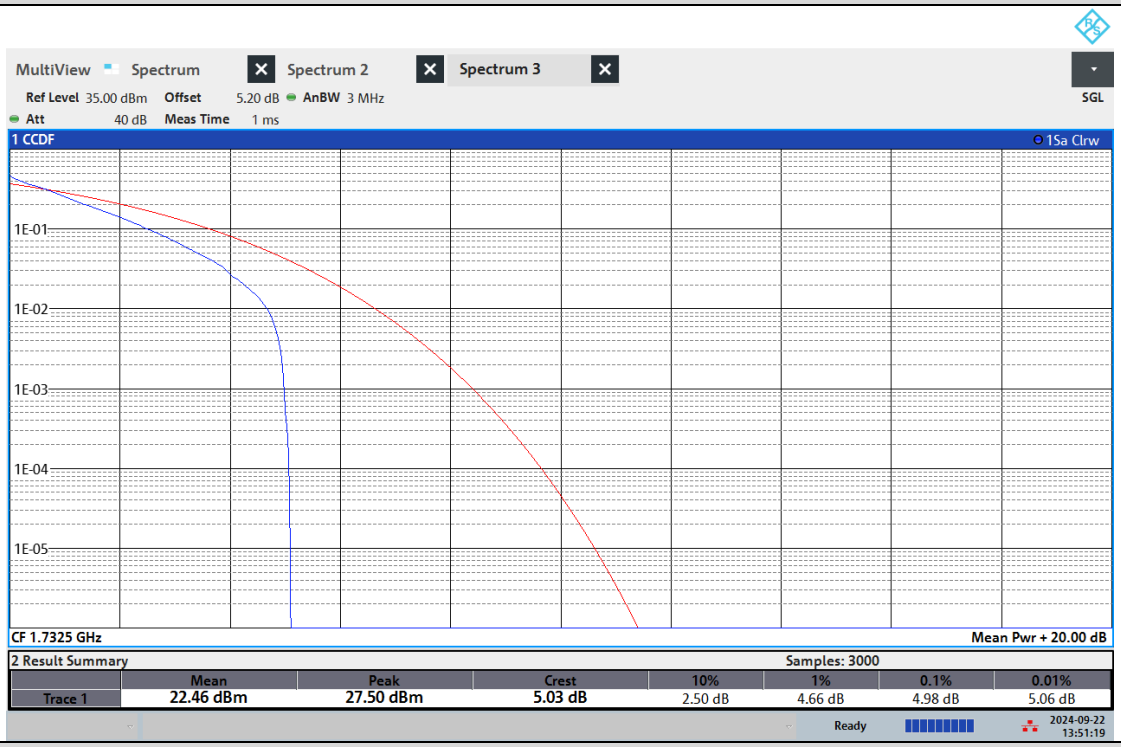
Band4-1.4MHz-16QAM-20393



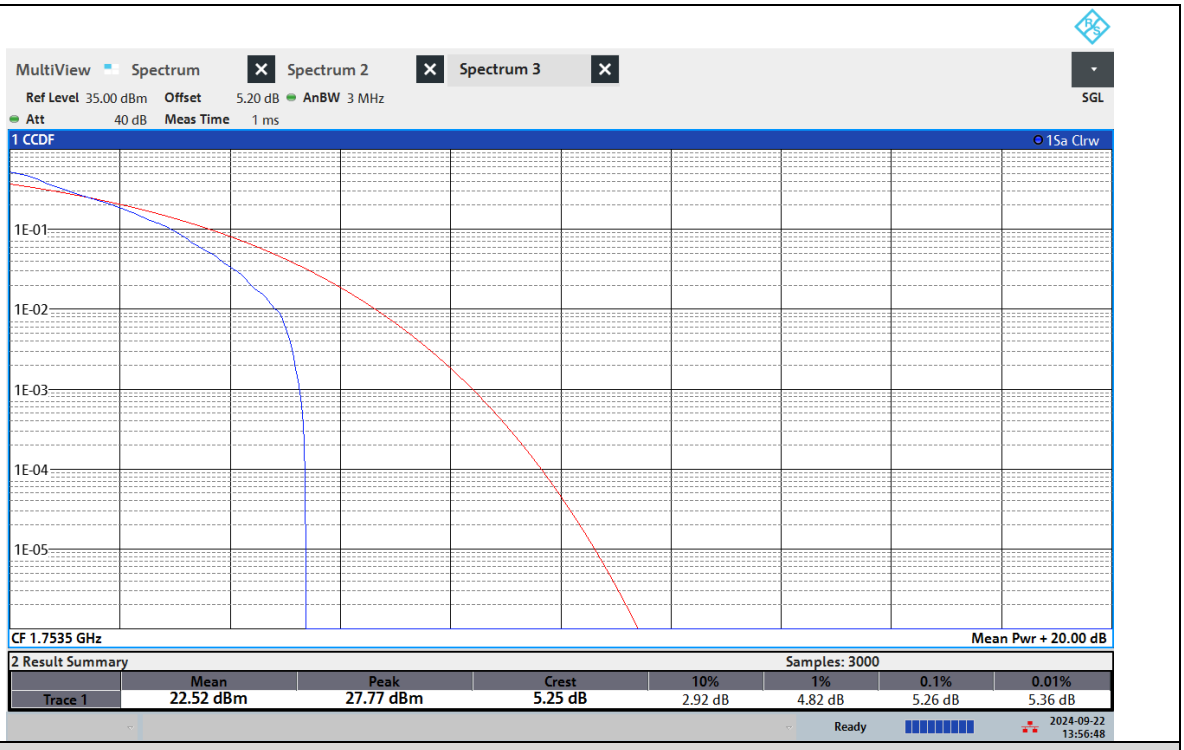
Band4-3MHz-QPSK-19965



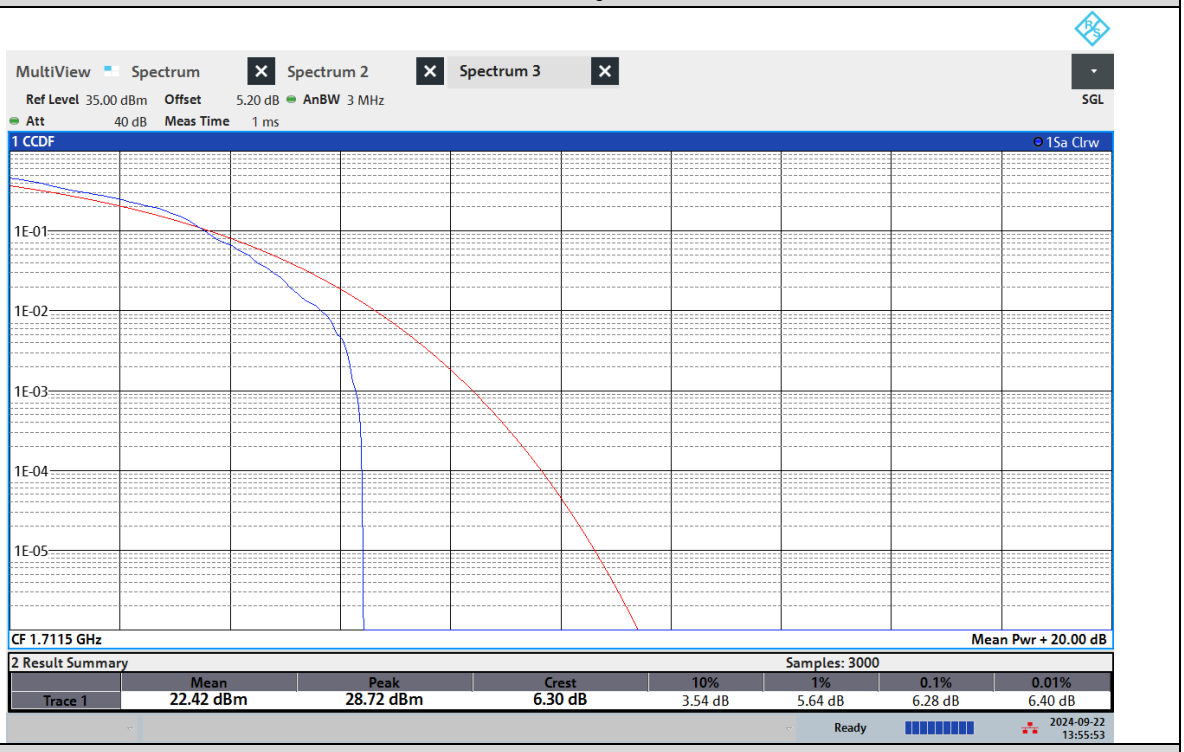
Band4-3MHz-QPSK-20175



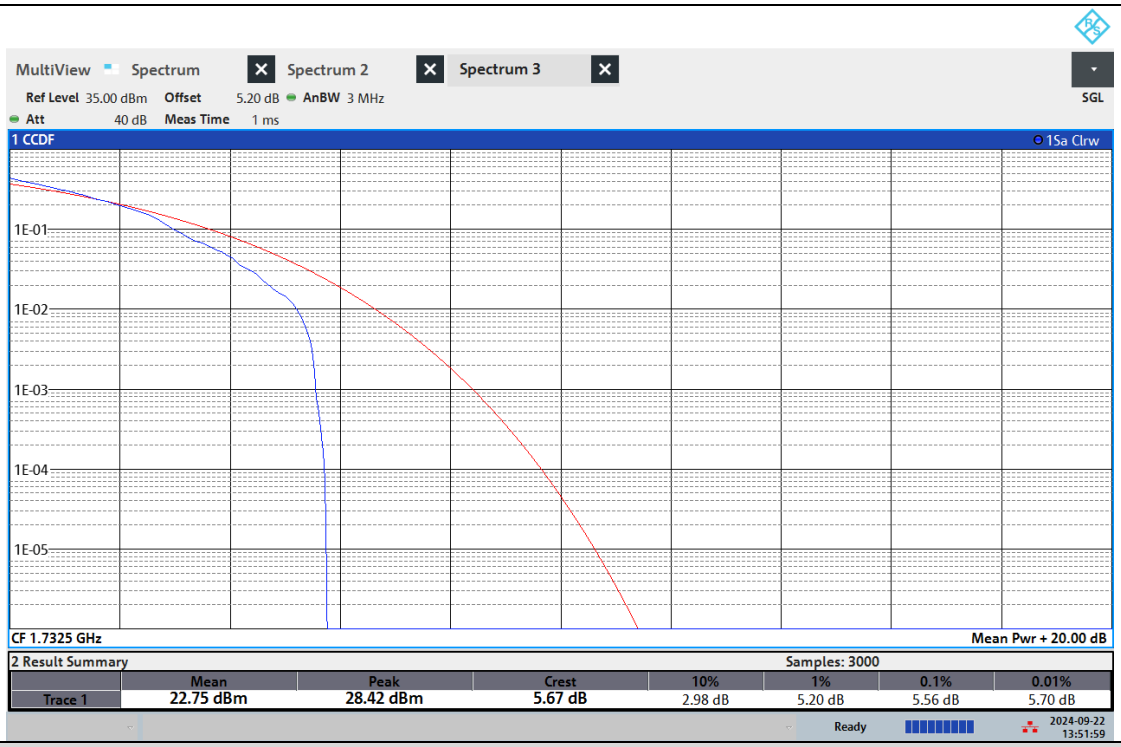
Band4-3MHz-QPSK-20385



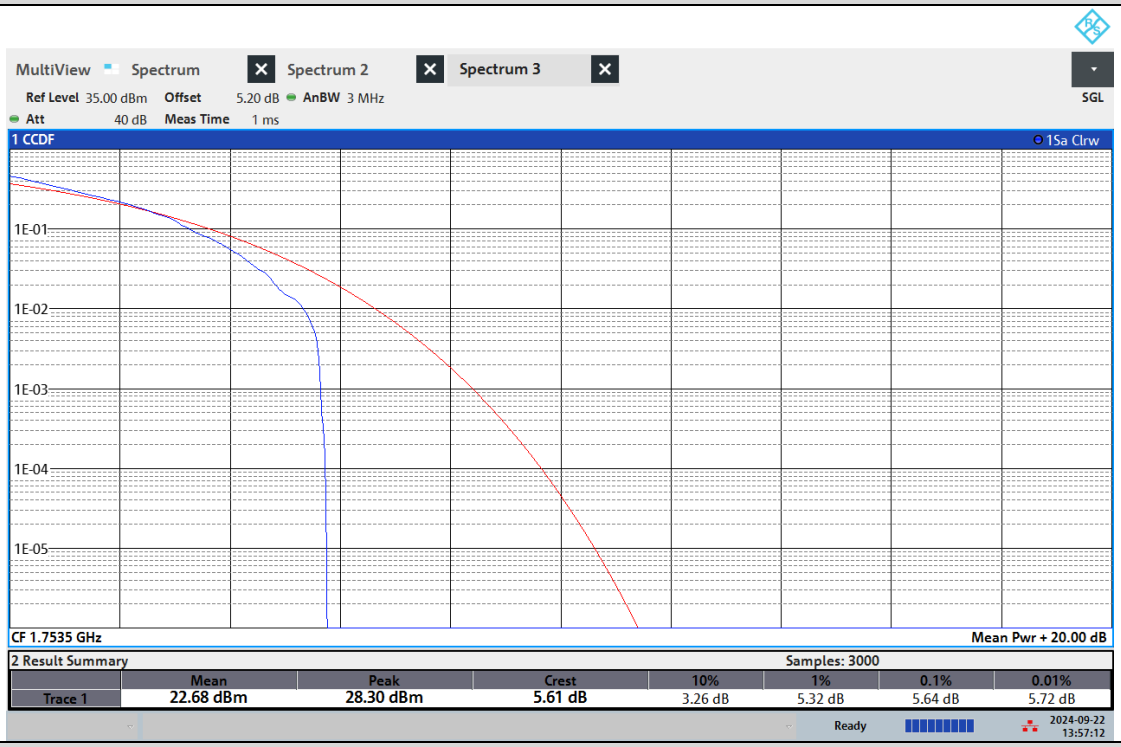
Band4-3MHz-16QAM-19965



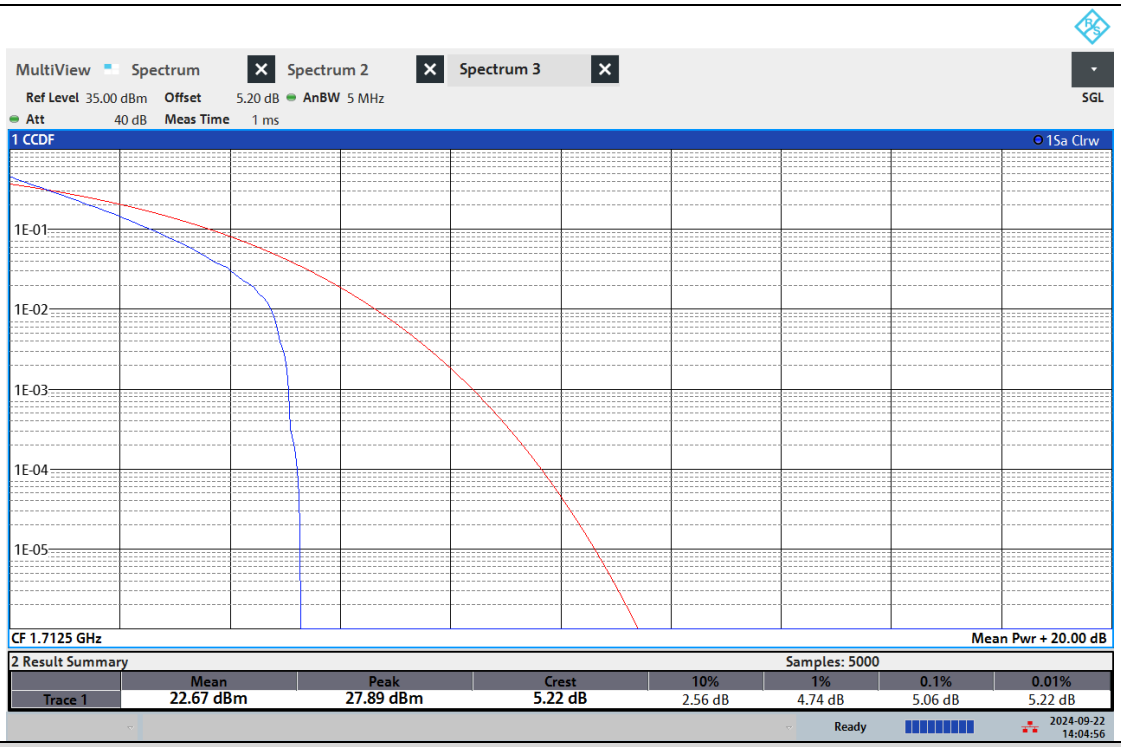
Band4-3MHz-16QAM-20175



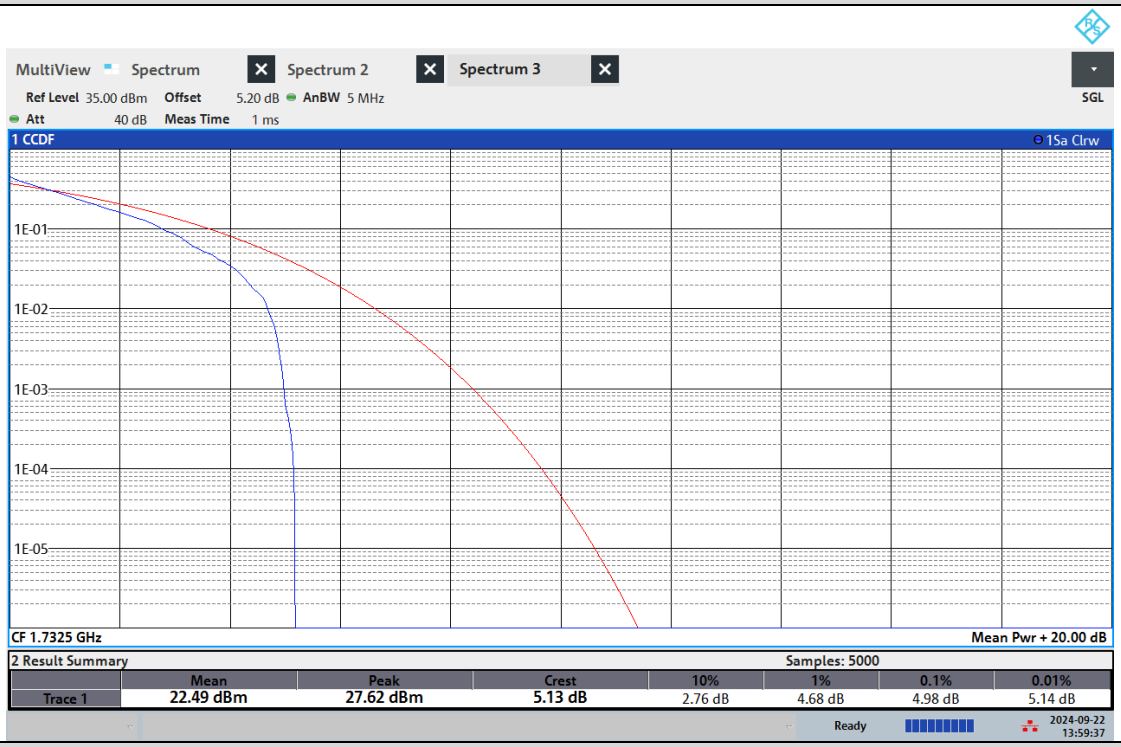
Band4-3MHz-16QAM-20385



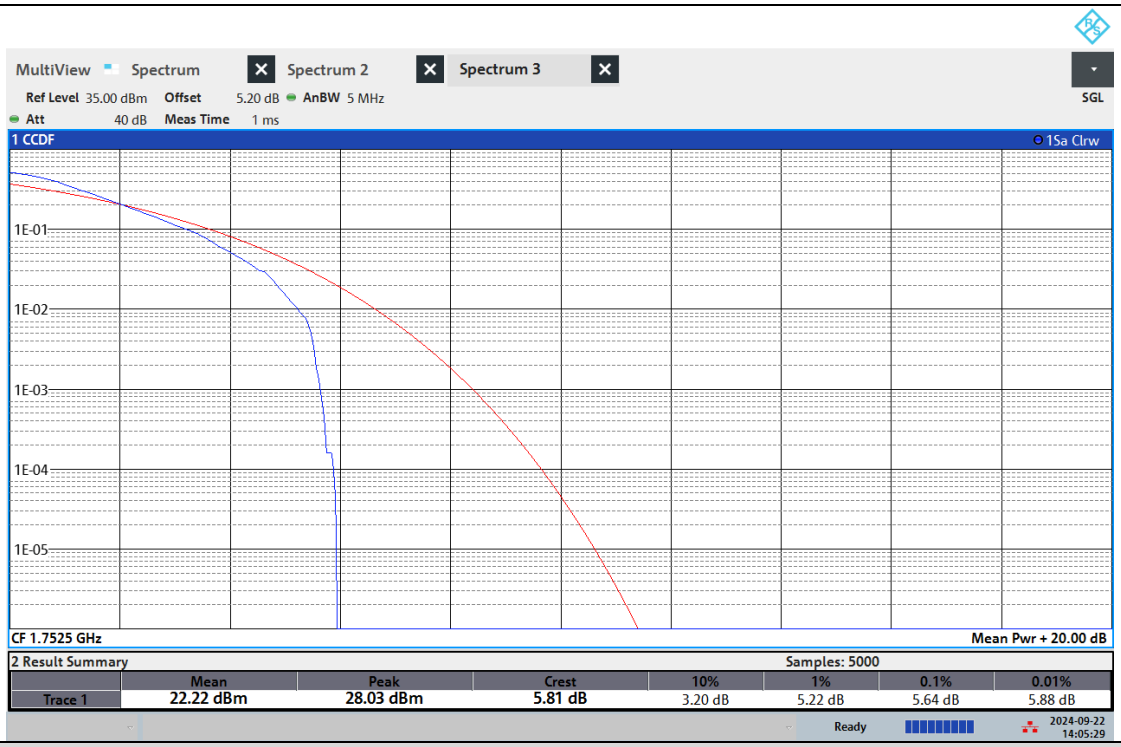
Band4-5MHz-QPSK-19975



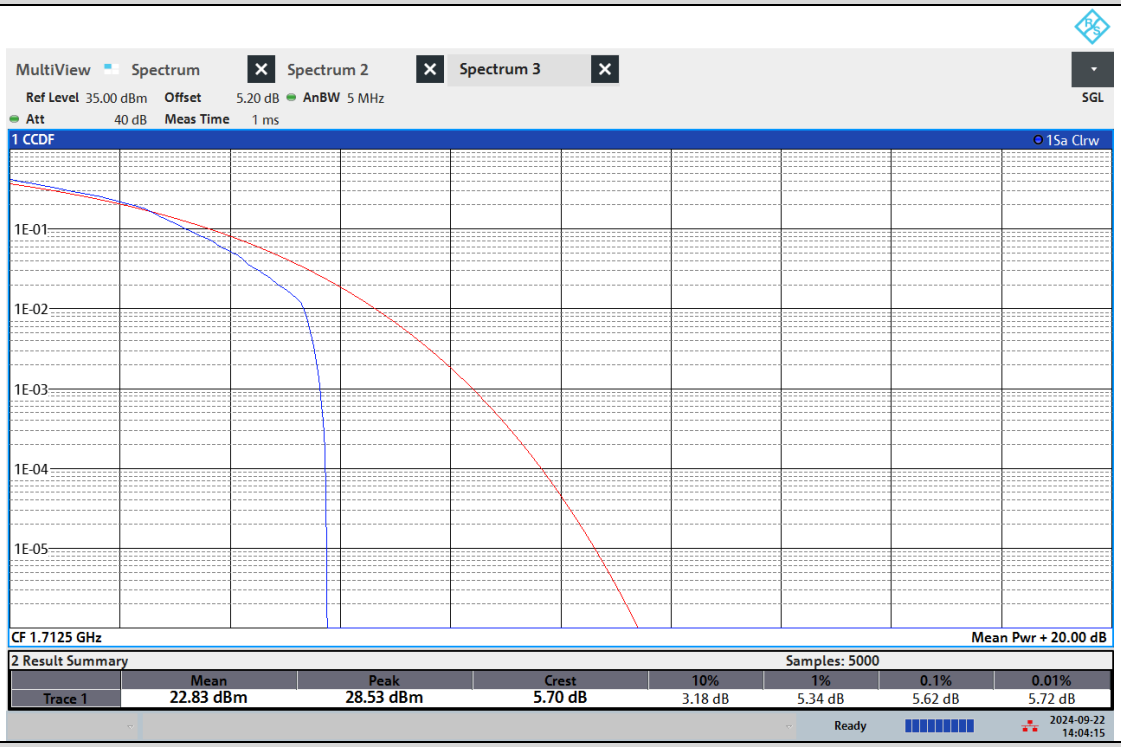
Band4-5MHz-QPSK-20175



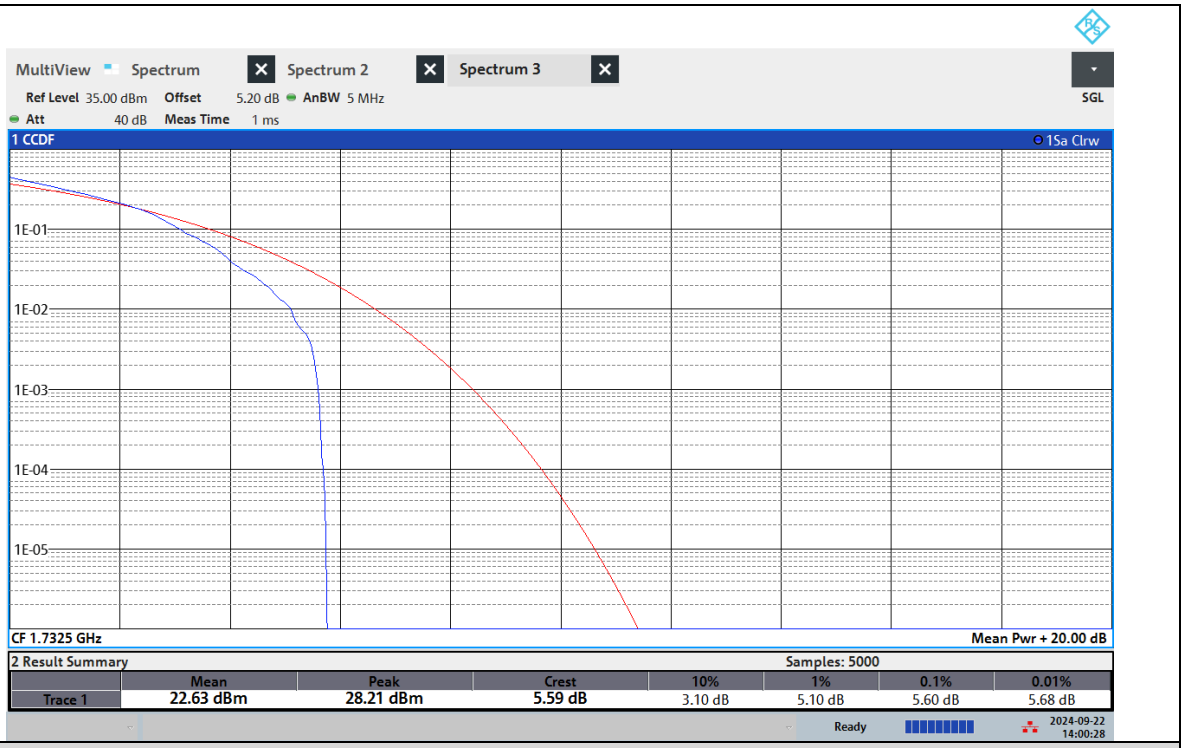
Band4-5MHz-QPSK-20375



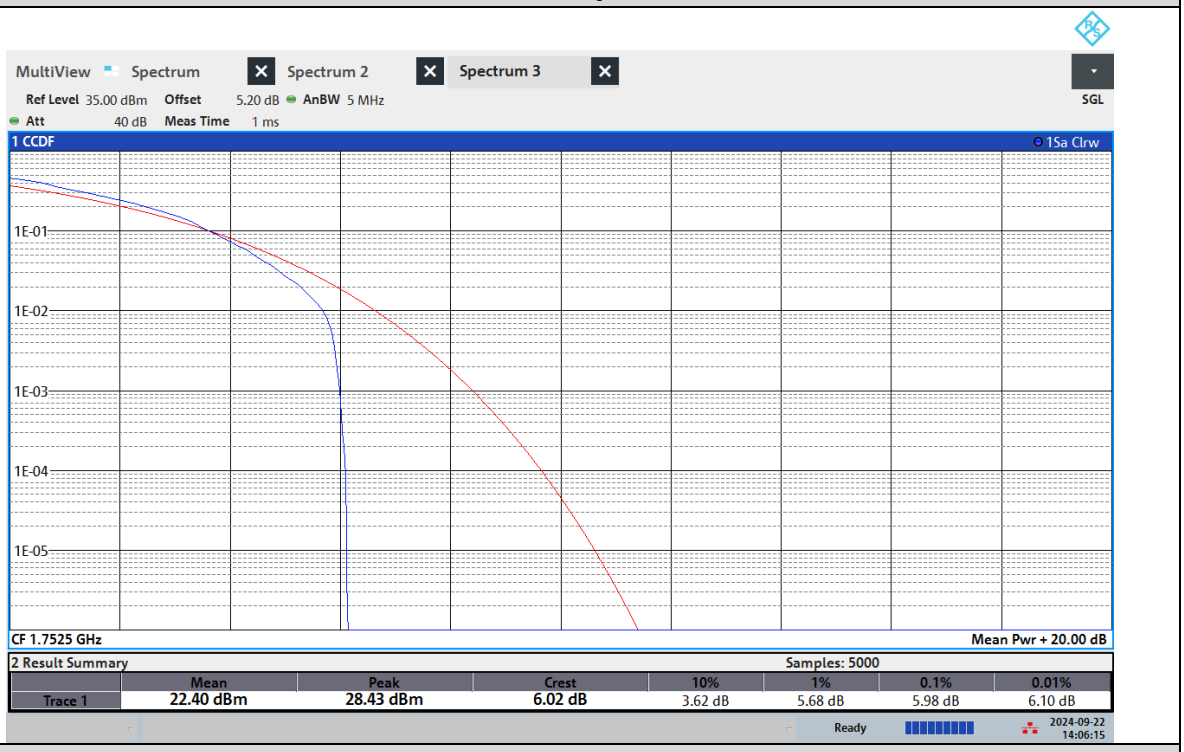
Band4-5MHz-16QAM-19975



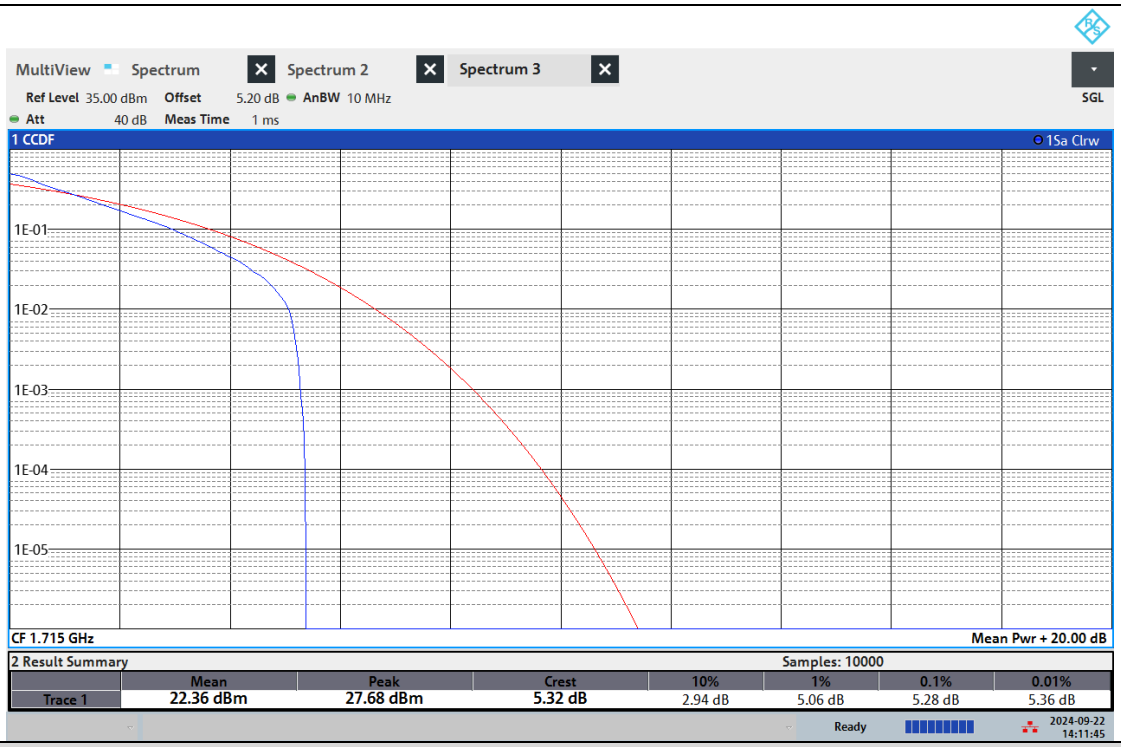
Band4-5MHz-16QAM-20175



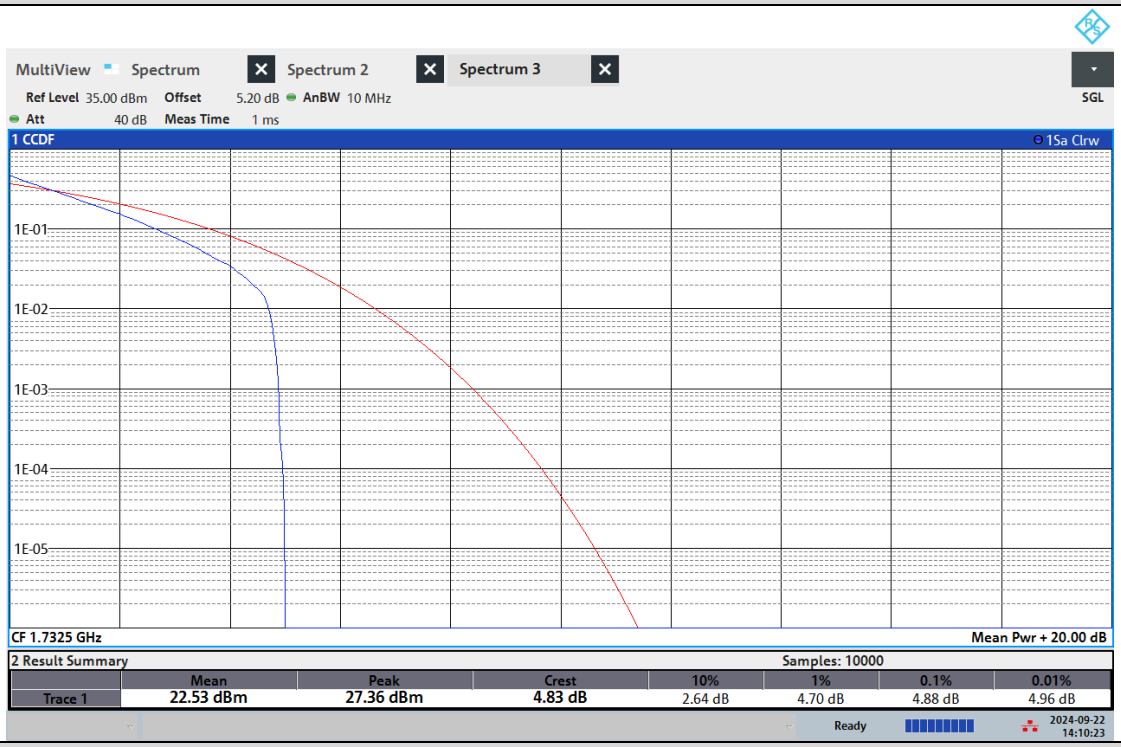
Band4-5MHz-16QAM-20375



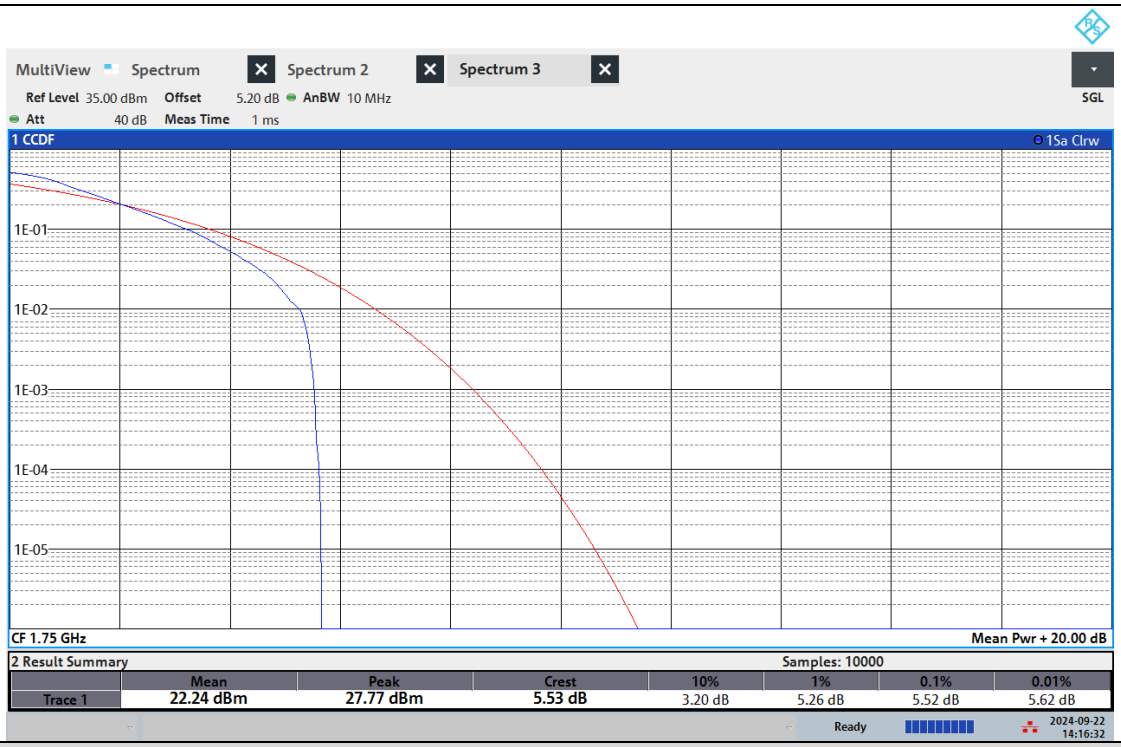
Band4-10MHz-QPSK-20000



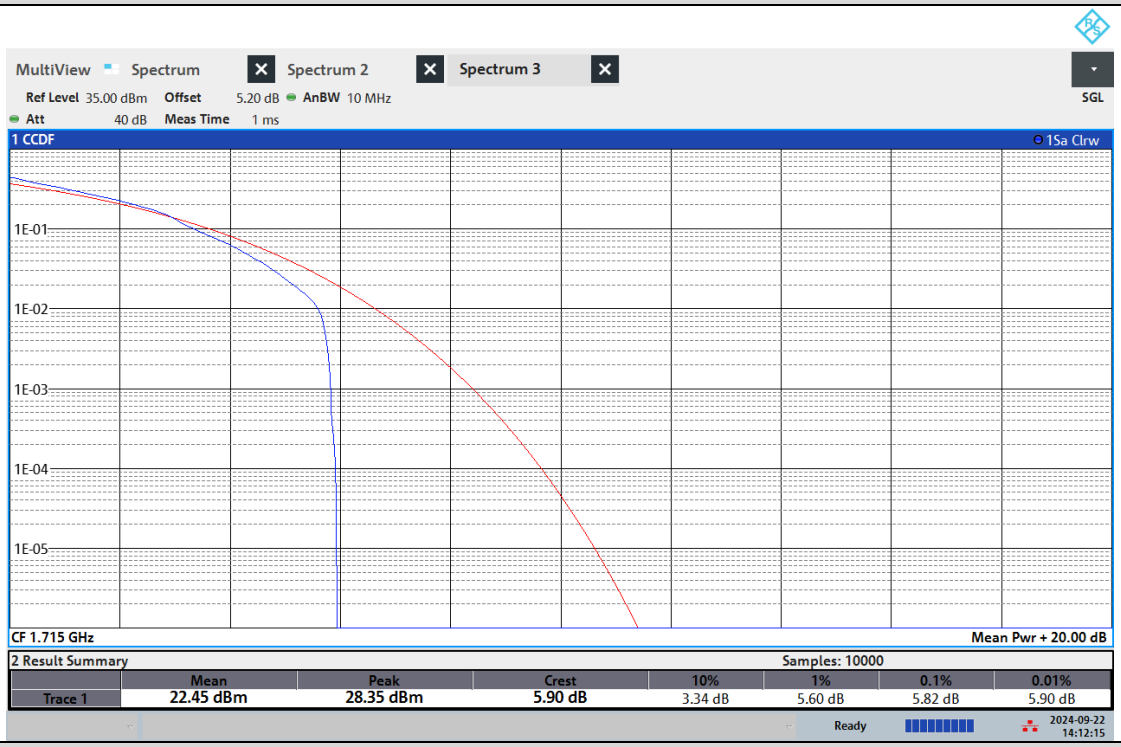
Band4-10MHz-QPSK-20175



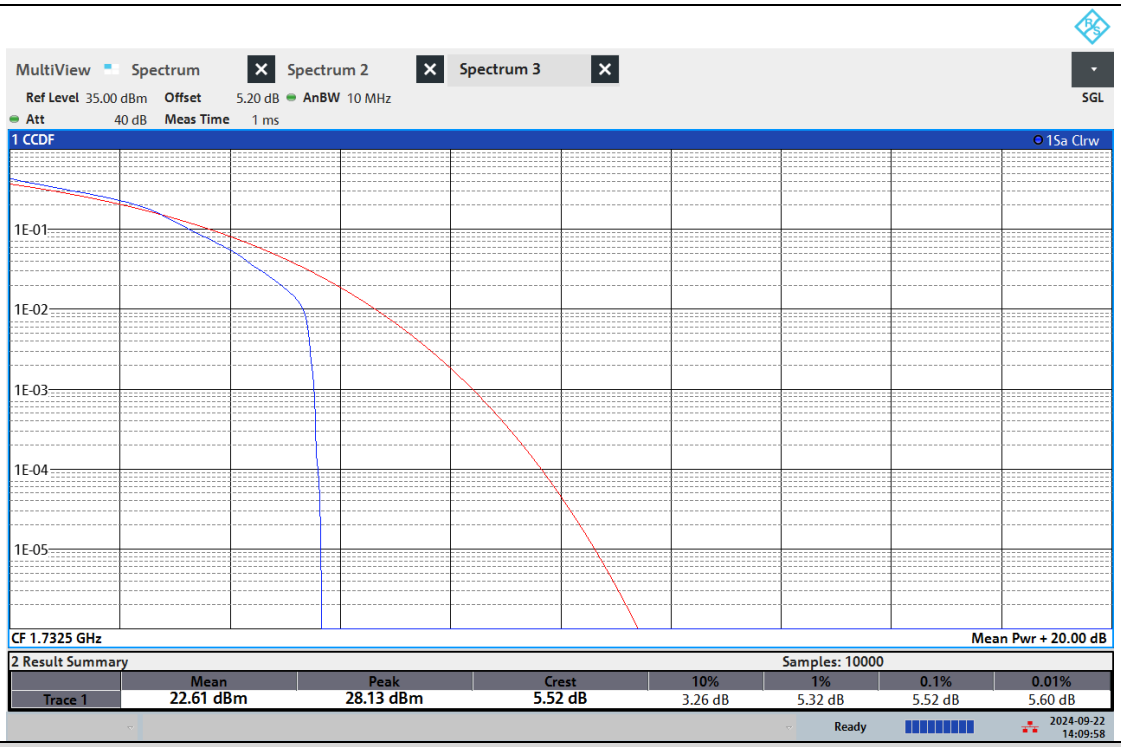
Band4-10MHz-QPSK-20350



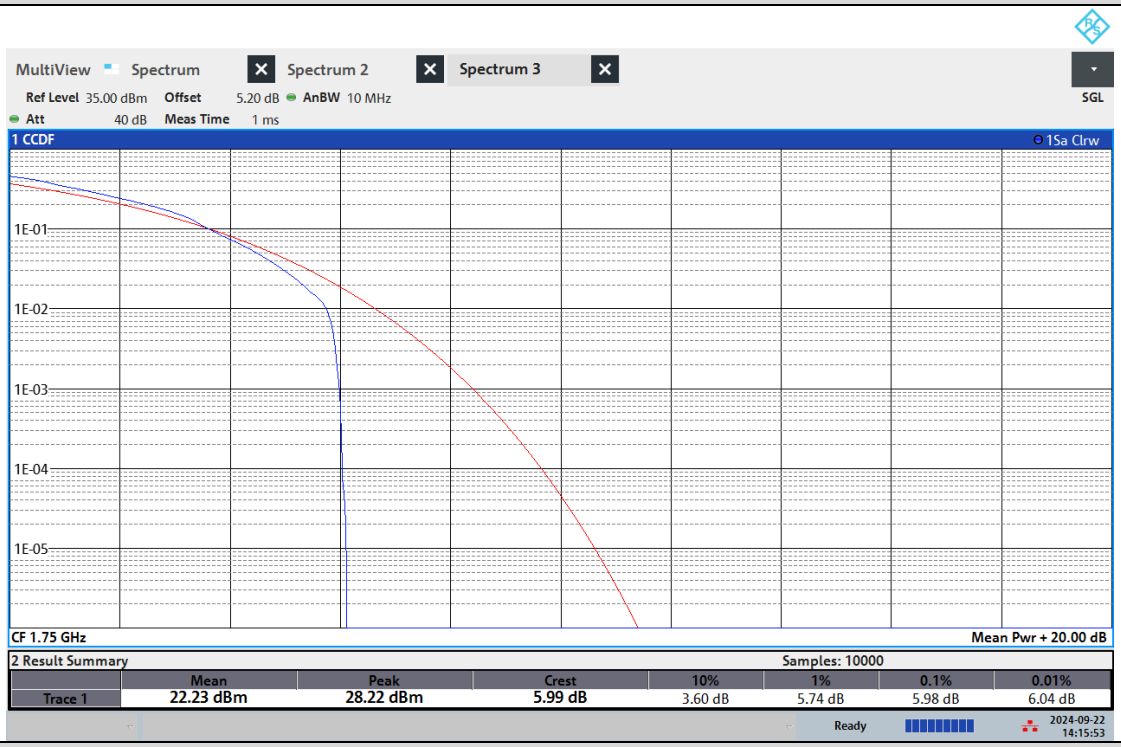
Band4-10MHz-16QAM-20000



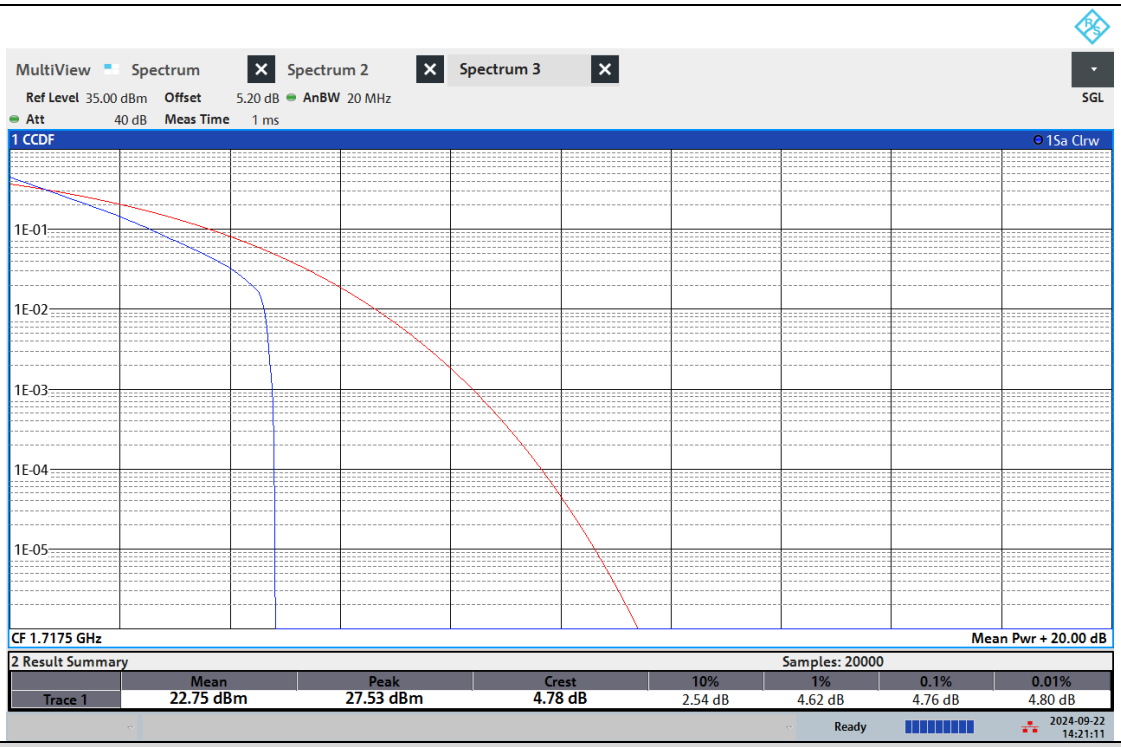
Band4-10MHz-16QAM-20175



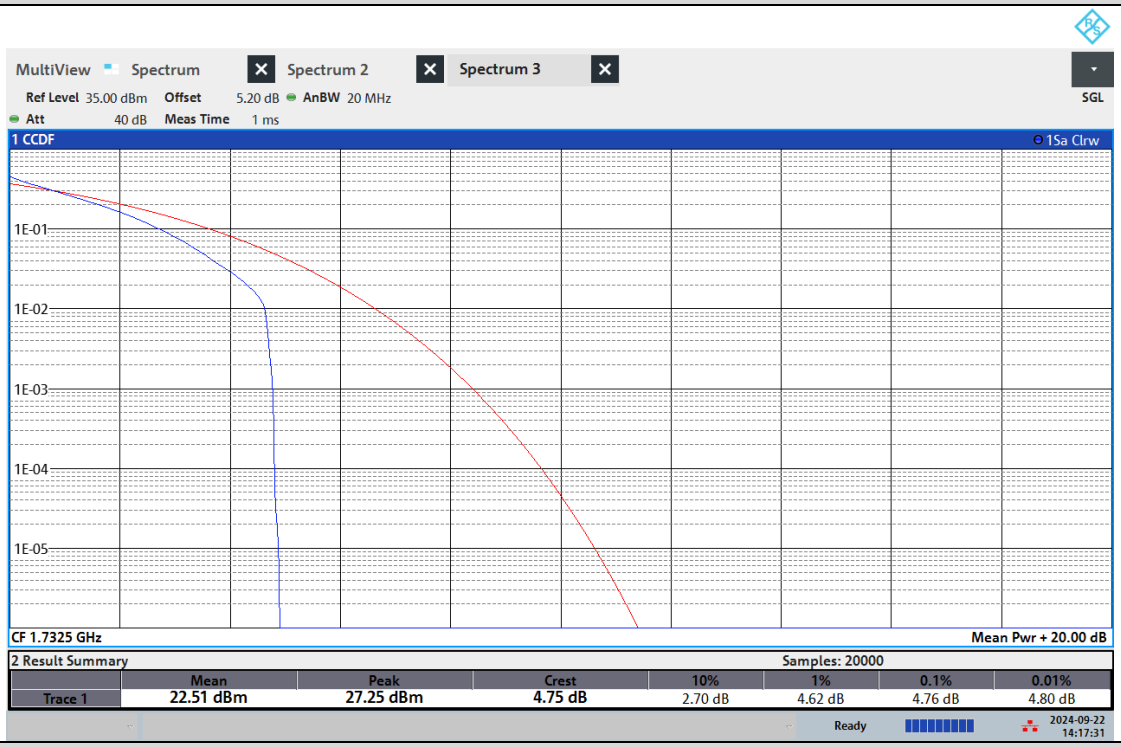
Band4-10MHz-16QAM-20350



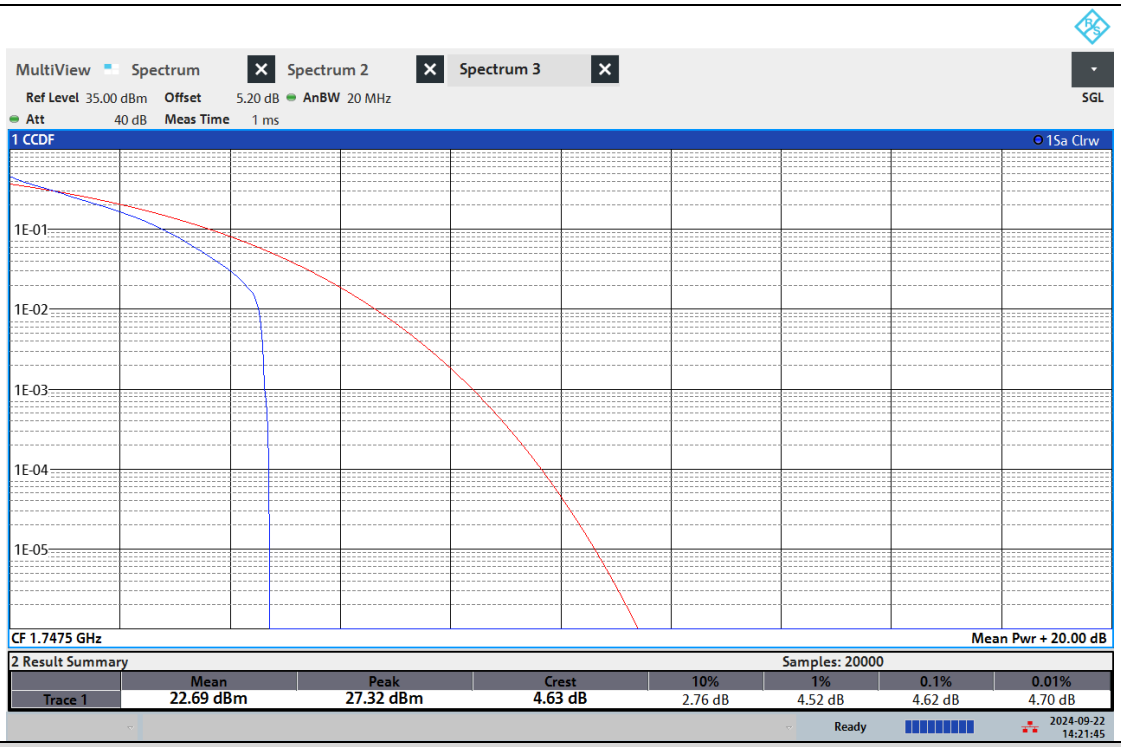
Band4-15MHz-QPSK-20025



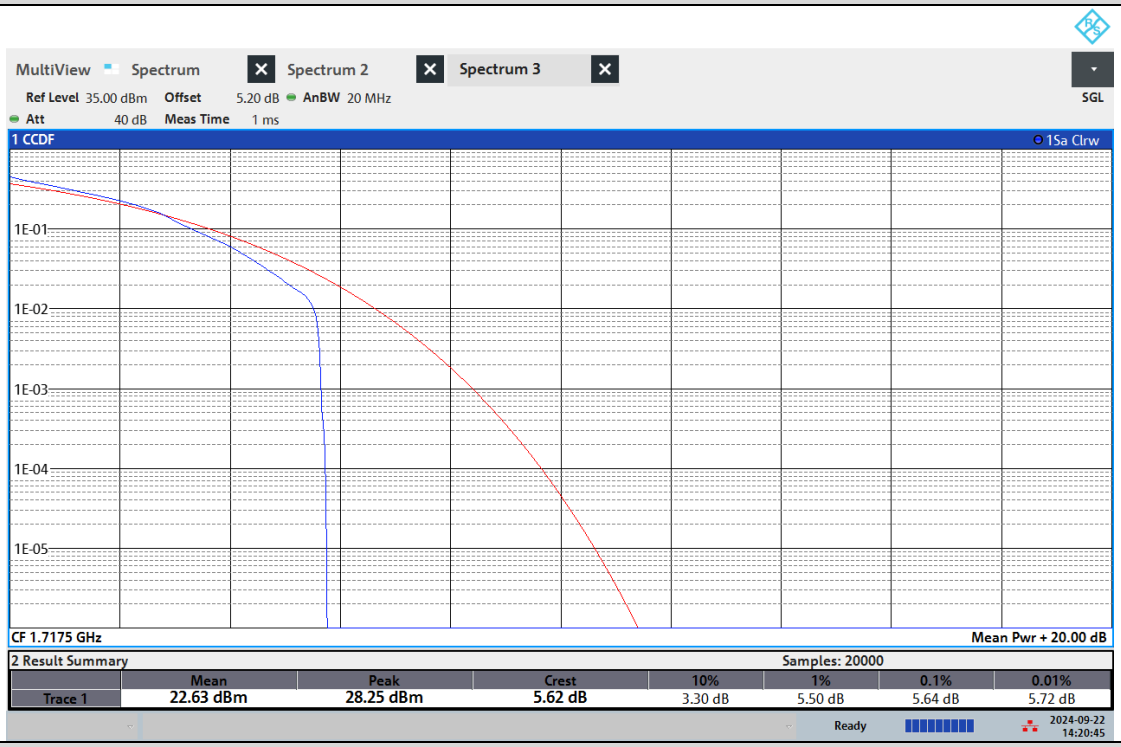
Band4-15MHz-QPSK-20175



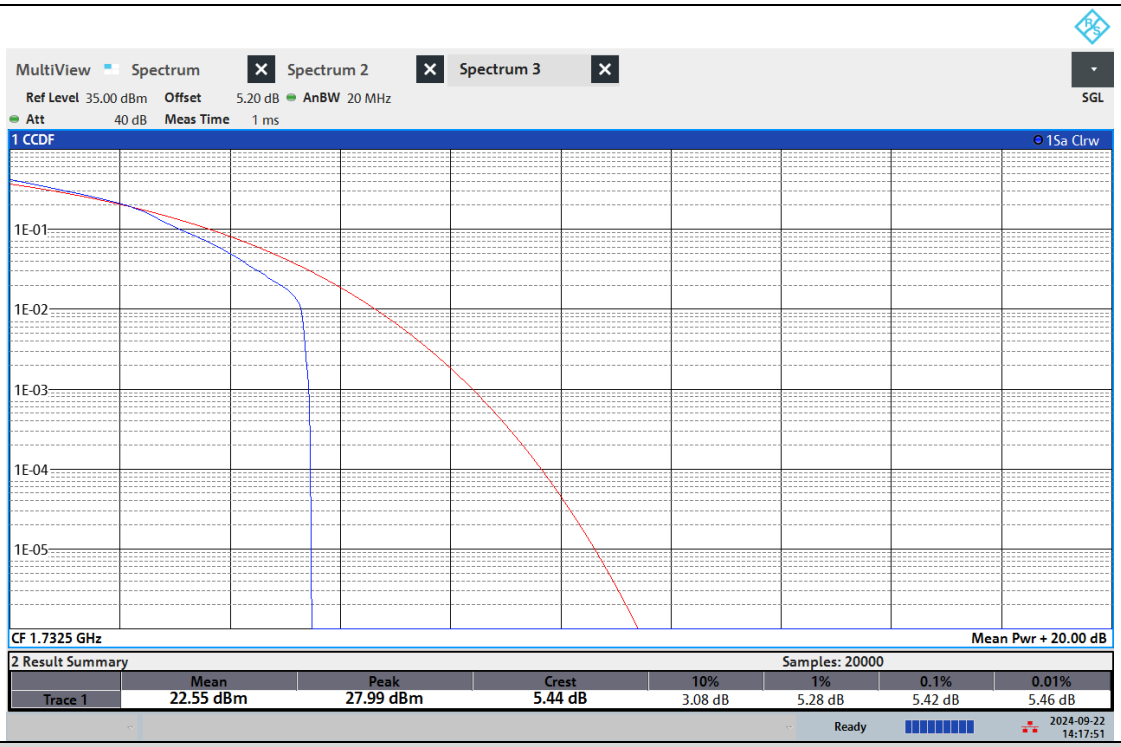
Band4-15MHz-QPSK-20325



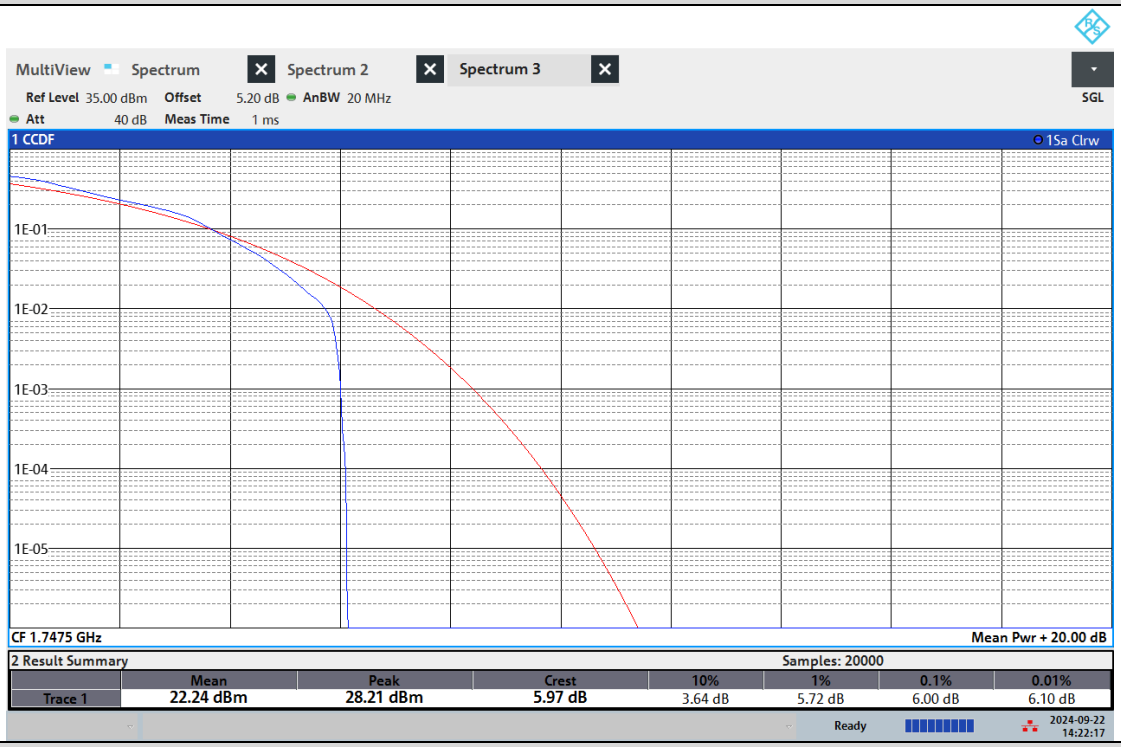
Band4-15MHz-16QAM-20025



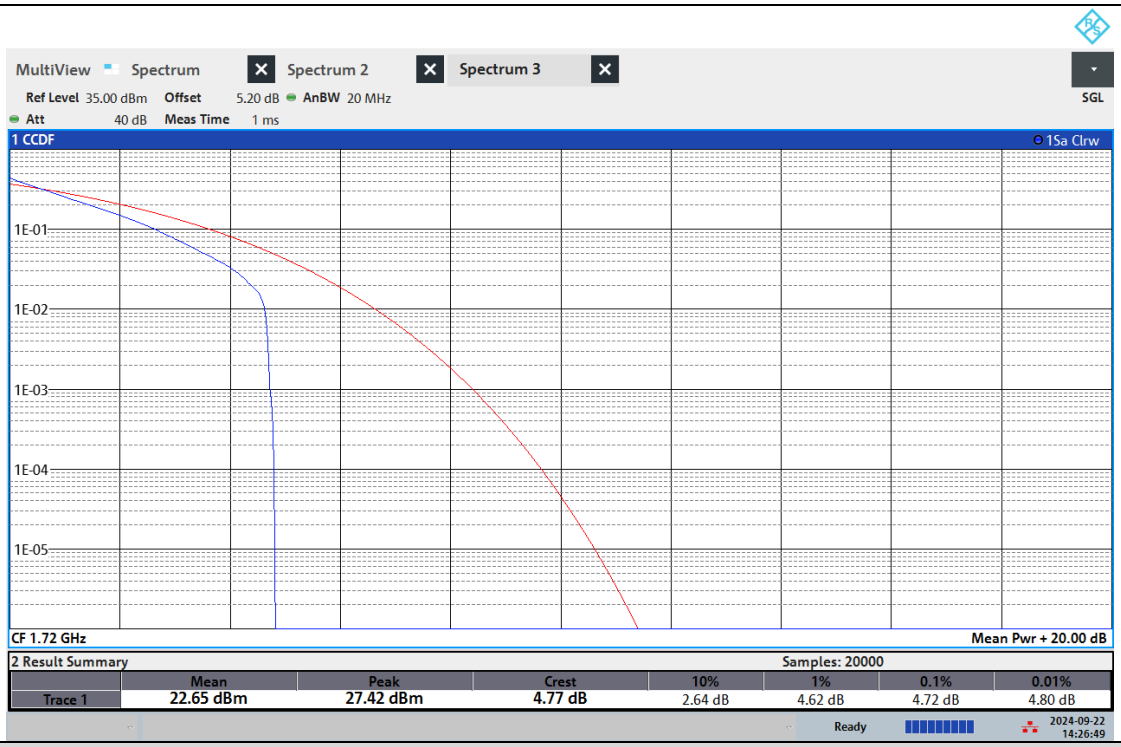
Band4-15MHz-16QAM-20175



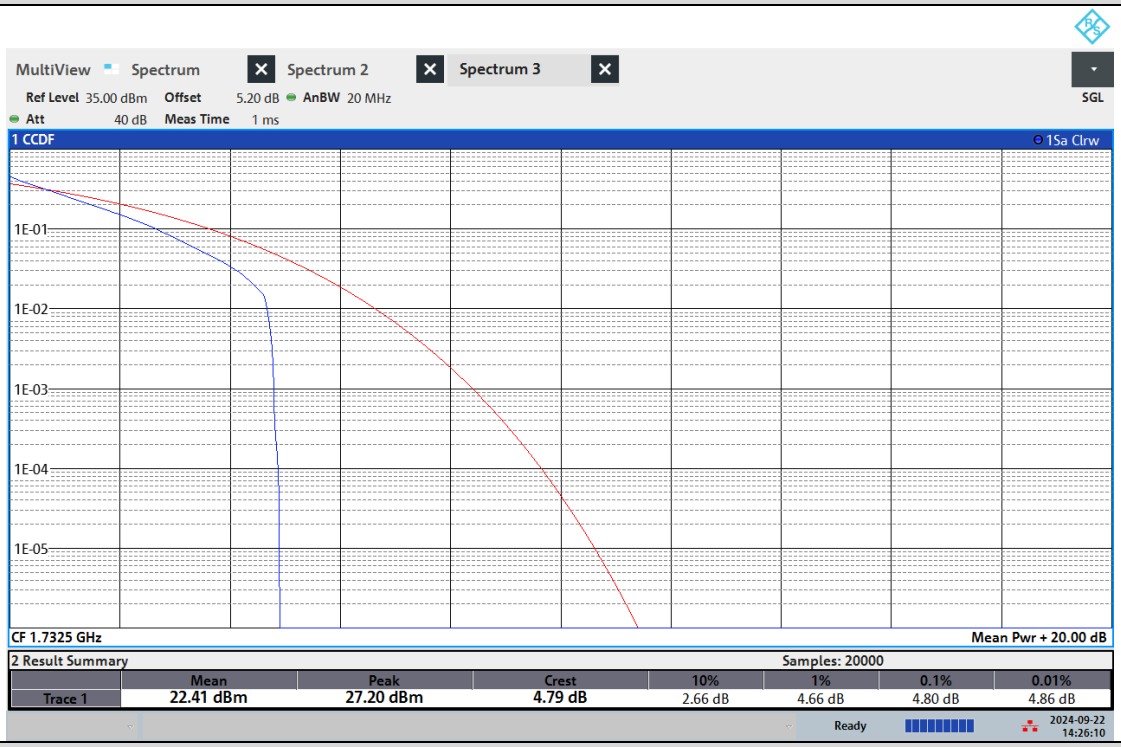
Band4-15MHz-16QAM-20325



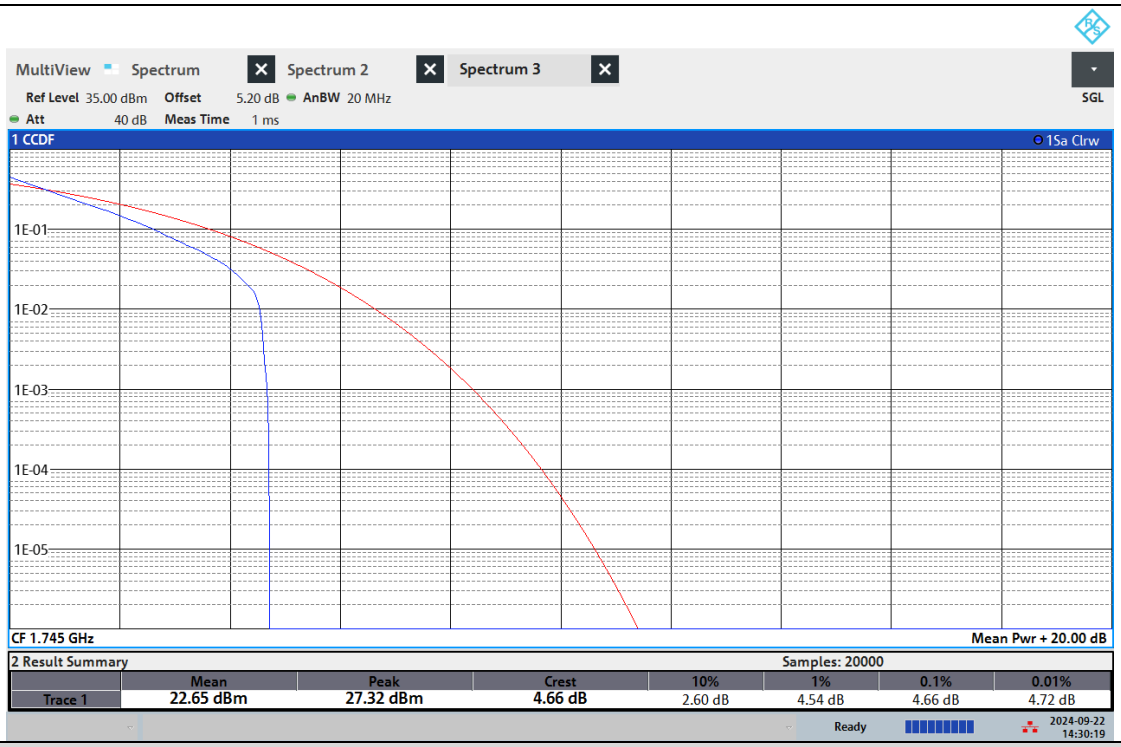
Band4-20MHz-QPSK-20050



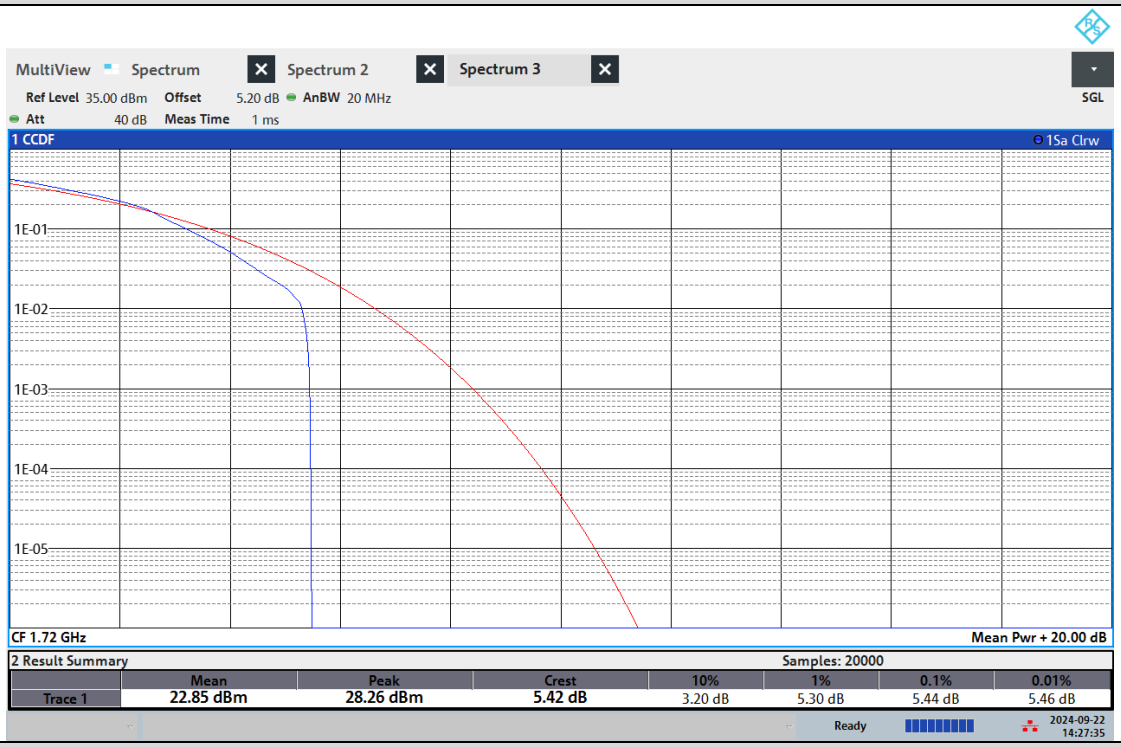
Band4-20MHz-QPSK-20175



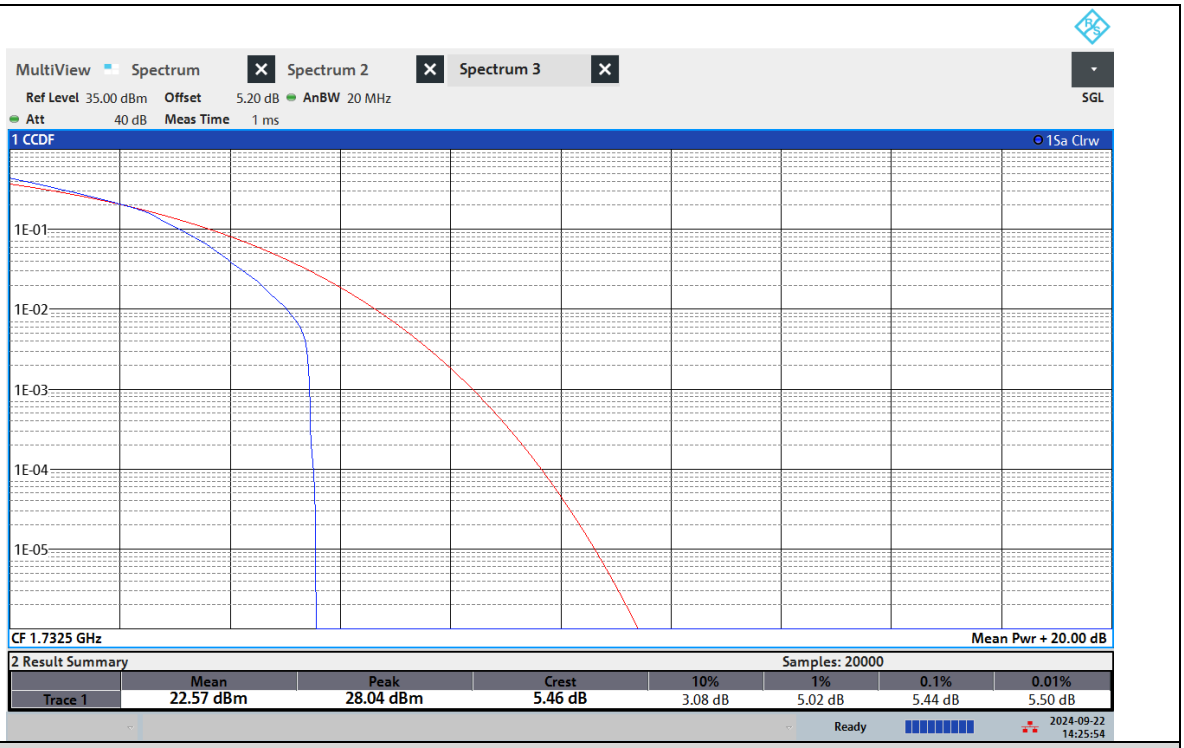
Band4-20MHz-QPSK-20300



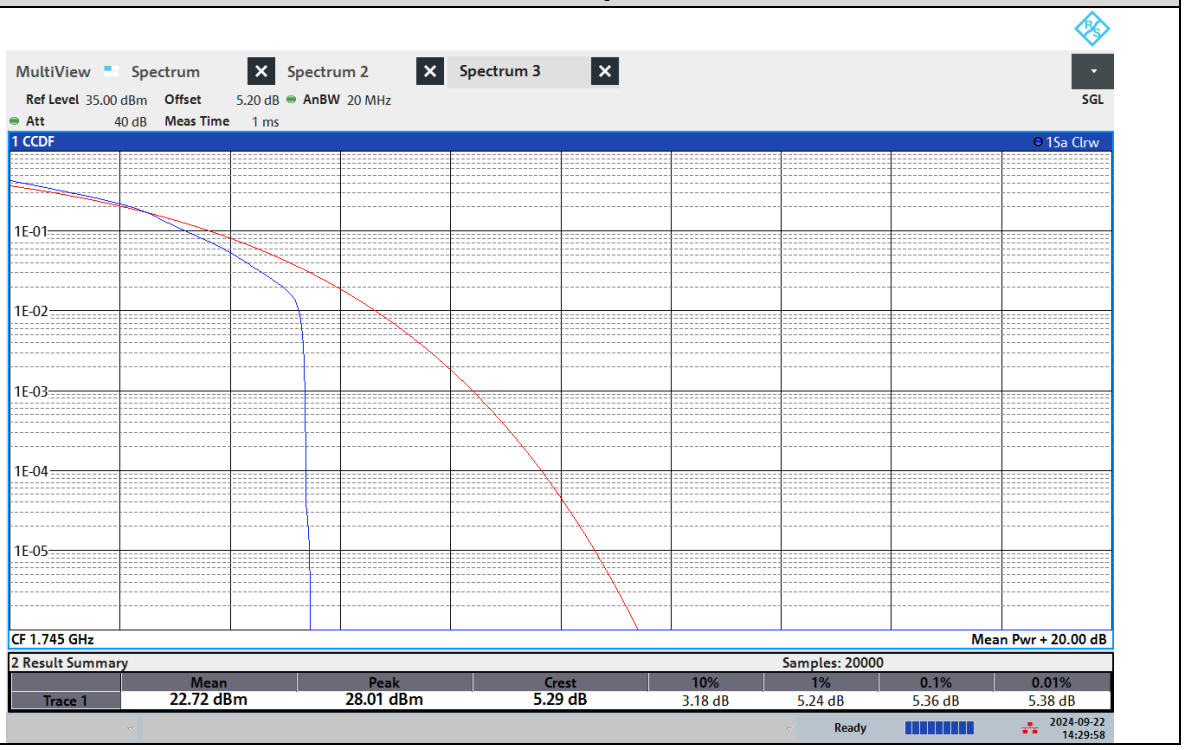
Band4-20MHz-16QAM-20050



Band4-20MHz-16QAM-20175



Band4-20MHz-16QAM-20300



26DB BANDWIDTH AND OCCUPIED BANDWIDTH

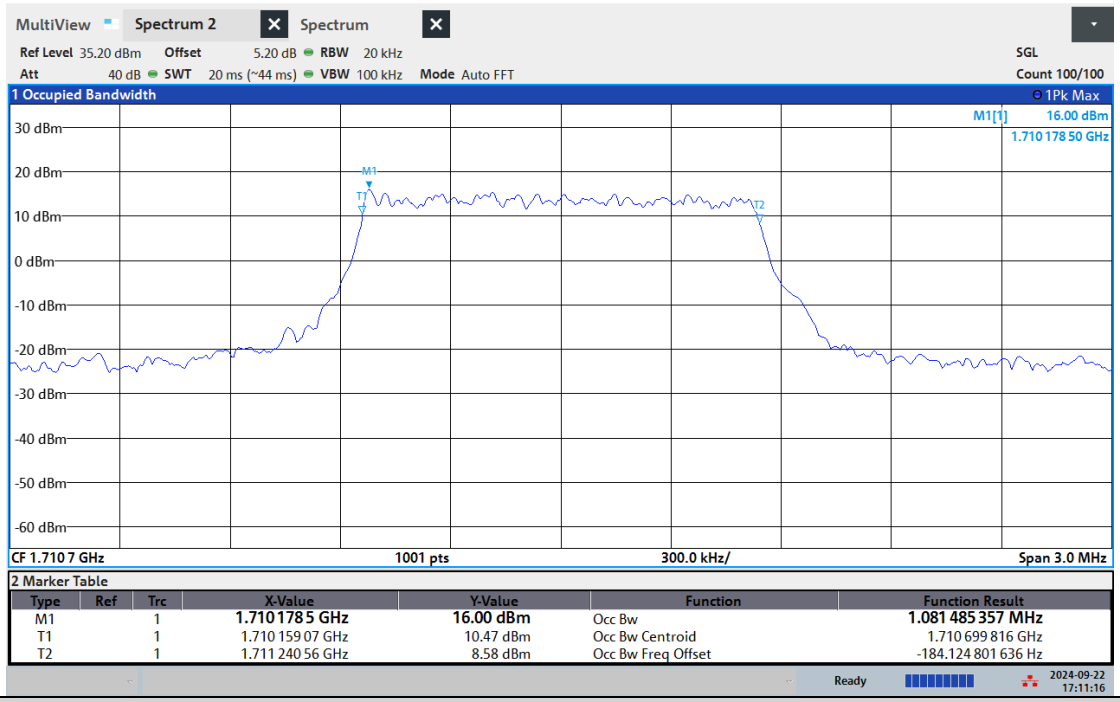
Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band4	1.4MHz	QPSK	19957	6RB#0	1.081	1.26	PASS
Band4	1.4MHz	QPSK	20175	6RB#0	1.082	1.26	PASS
Band4	1.4MHz	QPSK	20393	6RB#0	1.083	1.26	PASS
Band4	1.4MHz	16QAM	19957	6RB#0	1.083	1.30	PASS
Band4	1.4MHz	16QAM	20175	6RB#0	1.082	1.30	PASS
Band4	1.4MHz	16QAM	20393	6RB#0	1.082	1.30	PASS
Band4	3MHz	QPSK	19965	6RB#0	1.087	1.35	PASS
Band4	3MHz	QPSK	20175	6RB#0	1.087	1.38	PASS
Band4	3MHz	QPSK	20385	6RB#0	1.087	1.34	PASS
Band4	3MHz	16QAM	19965	6RB#0	1.089	1.38	PASS
Band4	3MHz	16QAM	20175	6RB#0	1.089	1.38	PASS
Band4	3MHz	16QAM	20385	6RB#0	1.088	1.37	PASS
Band4	5MHz	QPSK	19975	6RB#0	1.101	1.36	PASS
Band4	5MHz	QPSK	20175	6RB#0	1.103	1.37	PASS
Band4	5MHz	QPSK	20375	6RB#0	1.101	1.39	PASS
Band4	5MHz	16QAM	19975	6RB#0	1.102	1.42	PASS
Band4	5MHz	16QAM	20175	6RB#0	1.105	1.41	PASS
Band4	5MHz	16QAM	20375	6RB#0	1.106	1.42	PASS
Band4	10MHz	QPSK	20000	6RB#0	1.096	1.47	PASS
Band4	10MHz	QPSK	20175	6RB#0	1.096	1.48	PASS
Band4	10MHz	QPSK	20350	6RB#0	1.097	1.48	PASS
Band4	10MHz	16QAM	20000	6RB#0	1.122	1.61	PASS
Band4	10MHz	16QAM	20175	6RB#0	1.123	1.61	PASS
Band4	10MHz	16QAM	20350	6RB#0	1.121	1.57	PASS
Band4	15MHz	QPSK	20025	6RB#0	1.130	1.62	PASS
Band4	15MHz	QPSK	20175	6RB#0	1.129	1.66	PASS
Band4	15MHz	QPSK	20325	6RB#0	1.128	1.65	PASS
Band4	15MHz	16QAM	20025	6RB#0	1.126	1.60	PASS
Band4	15MHz	16QAM	20175	6RB#0	1.127	1.60	PASS
Band4	15MHz	16QAM	20325	6RB#0	1.137	1.63	PASS
Band4	20MHz	QPSK	20050	6RB#0	1.128	1.58	PASS
Band4	20MHz	QPSK	20175	6RB#0	1.129	1.62	PASS
Band4	20MHz	QPSK	20300	6RB#0	1.126	1.60	PASS
Band4	20MHz	16QAM	20050	6RB#0	1.144	1.76	PASS
Band4	20MHz	16QAM	20175	6RB#0	1.129	1.72	PASS
Band4	20MHz	16QAM	20300	6RB#0	1.148	1.74	PASS

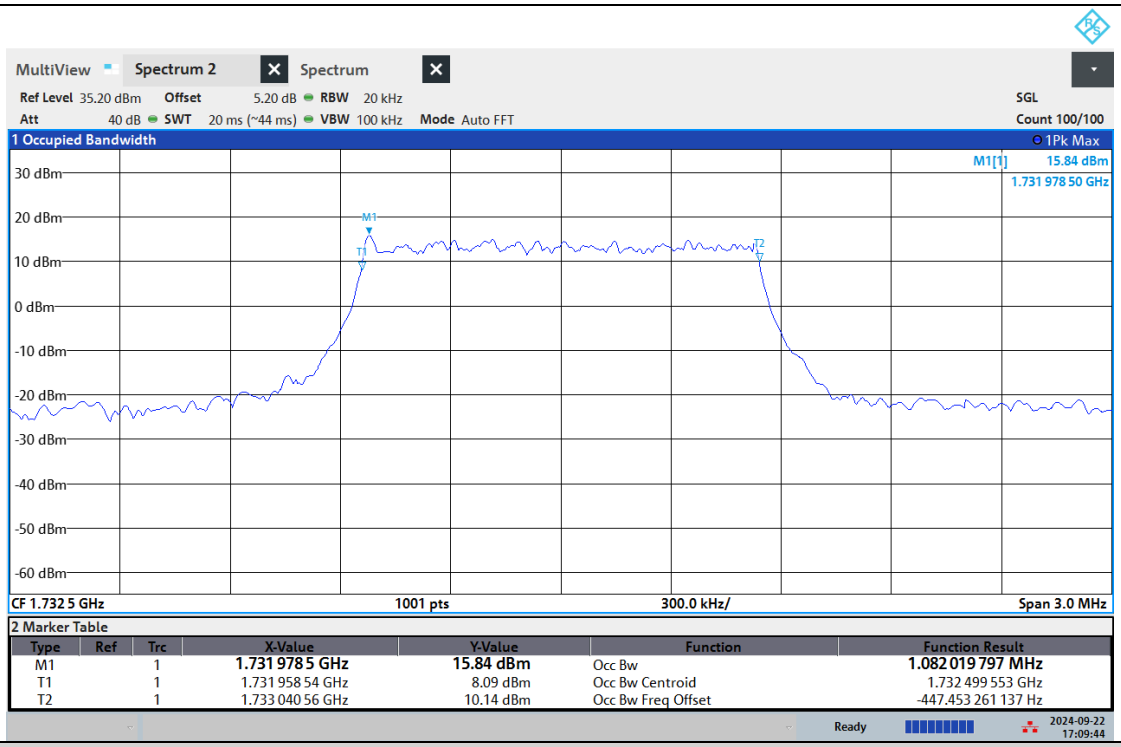
Test Graphs

Occupied Bandwidth

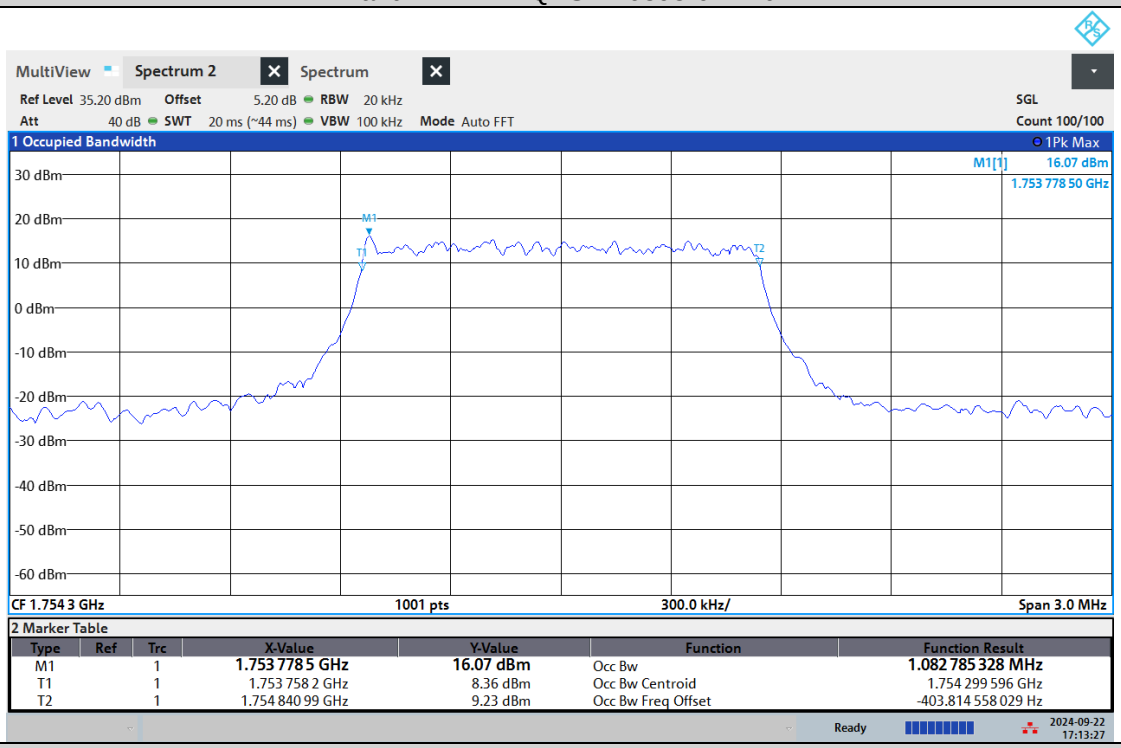
Band4-1.4MHz-QPSK-19957-6RB#0



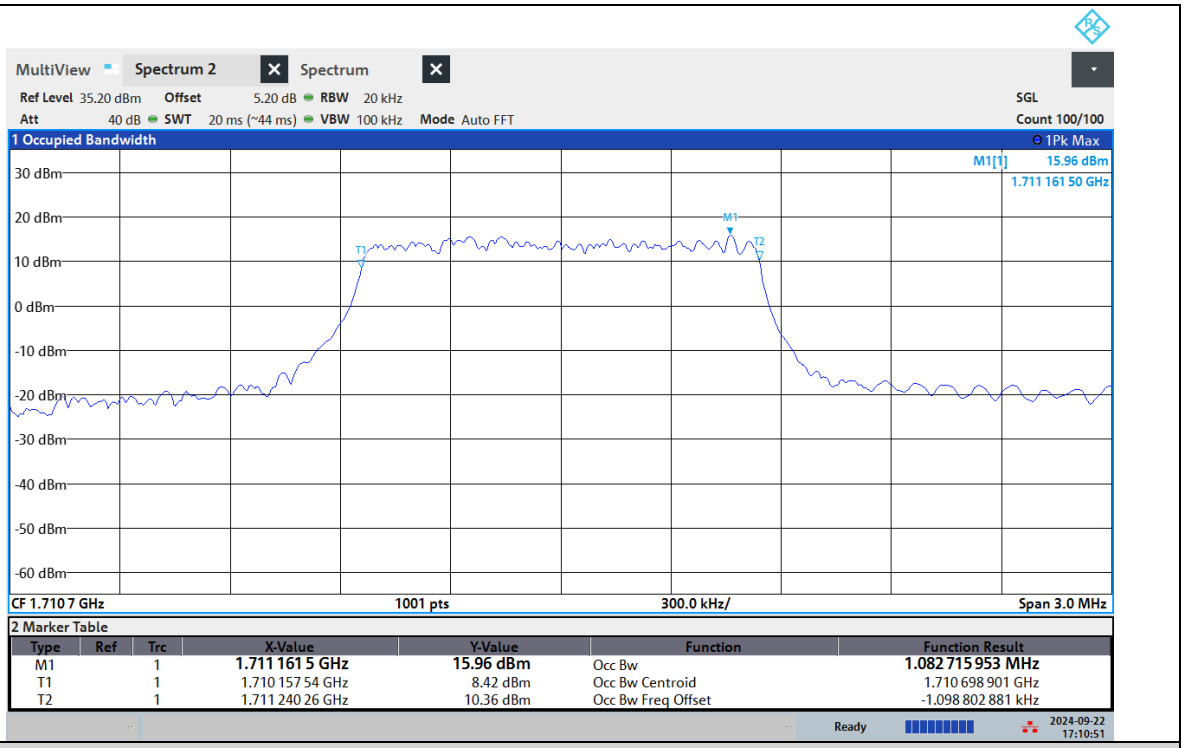
Band4-1.4MHz-QPSK-20175-6RB#0



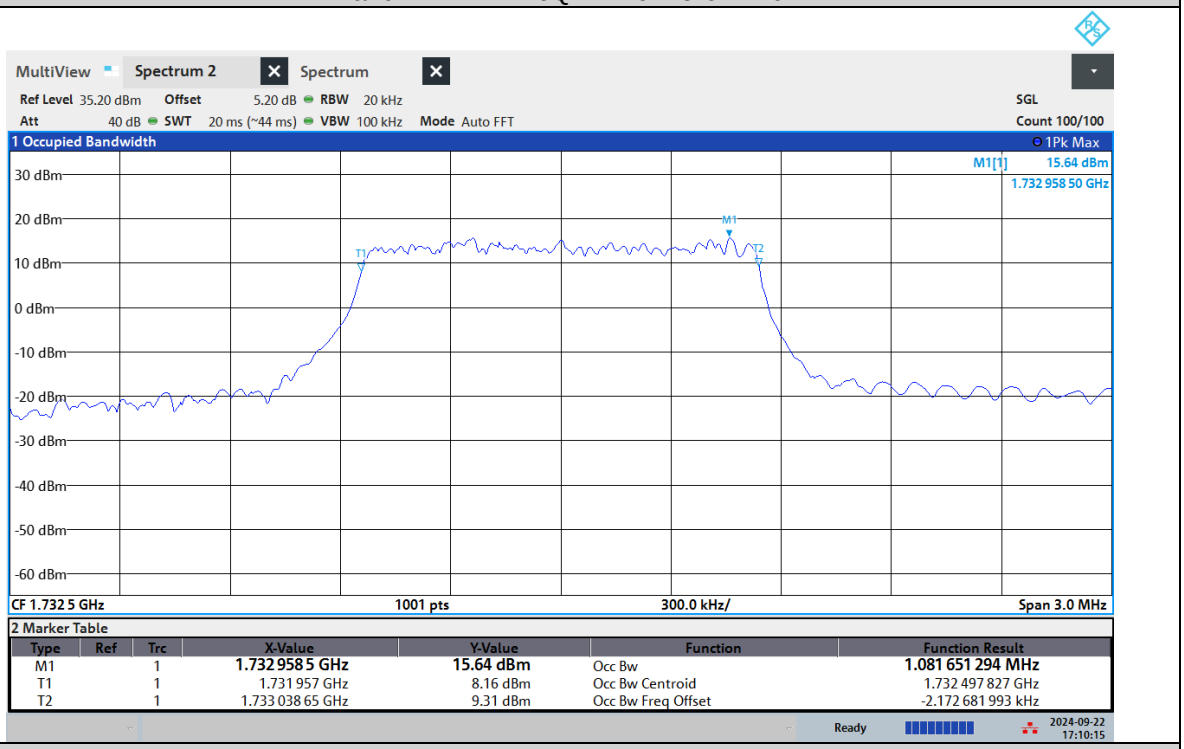
Band4-1.4MHz-QPSK-20393-6RB#0



Band4-1.4MHz-16QAM-19957-6RB#0



Band4-1.4MHz-16QAM-20175-6RB#0



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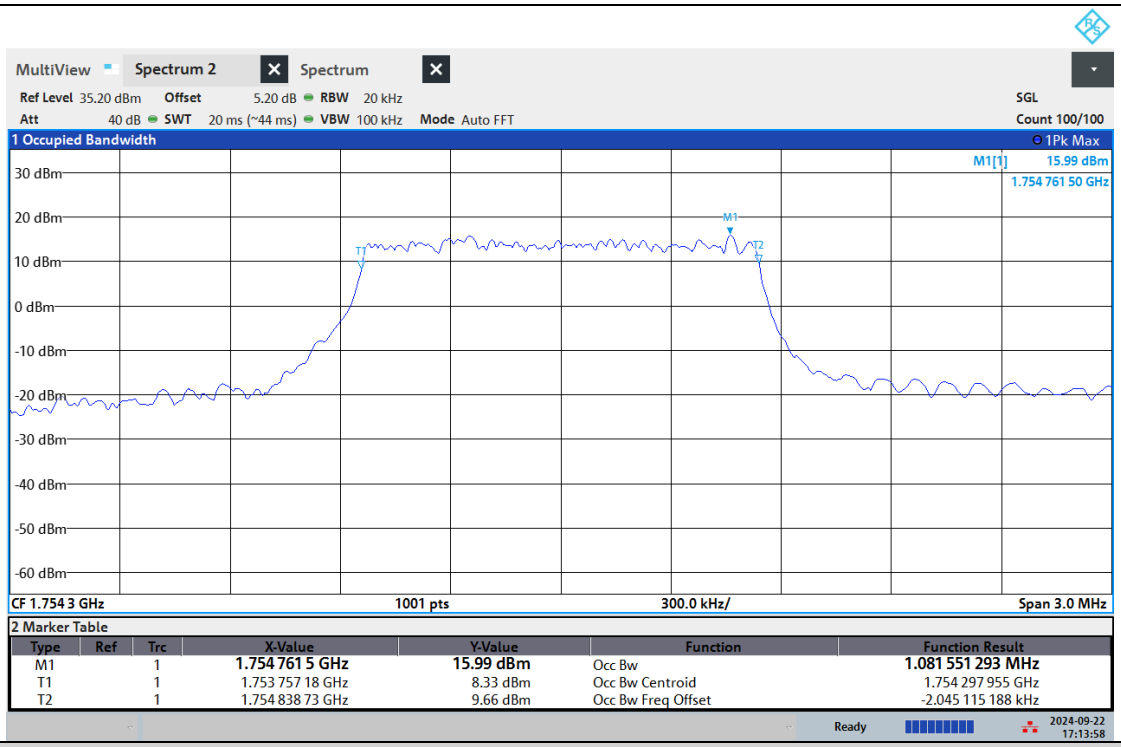
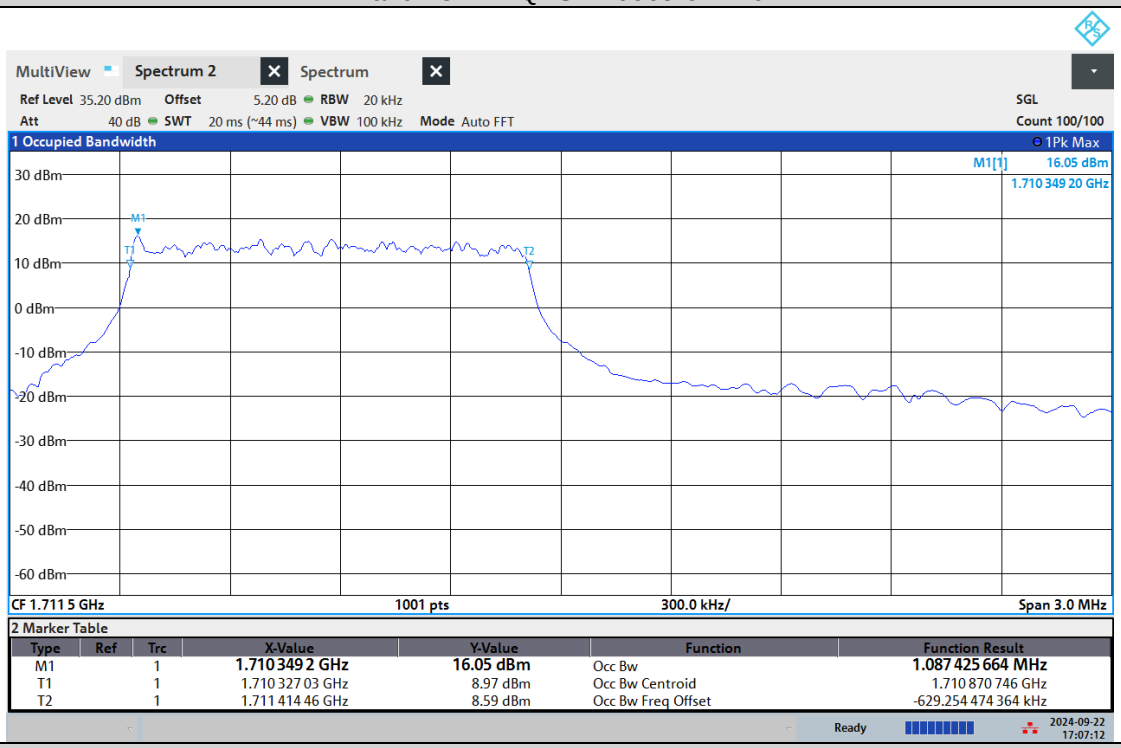
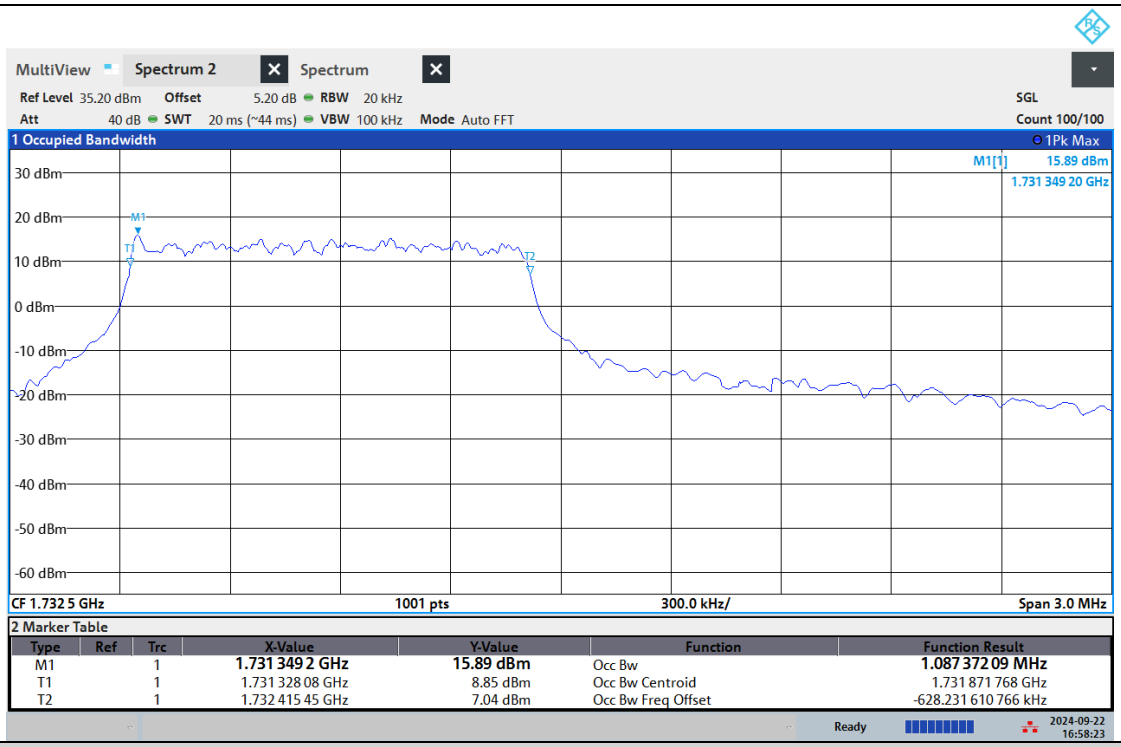


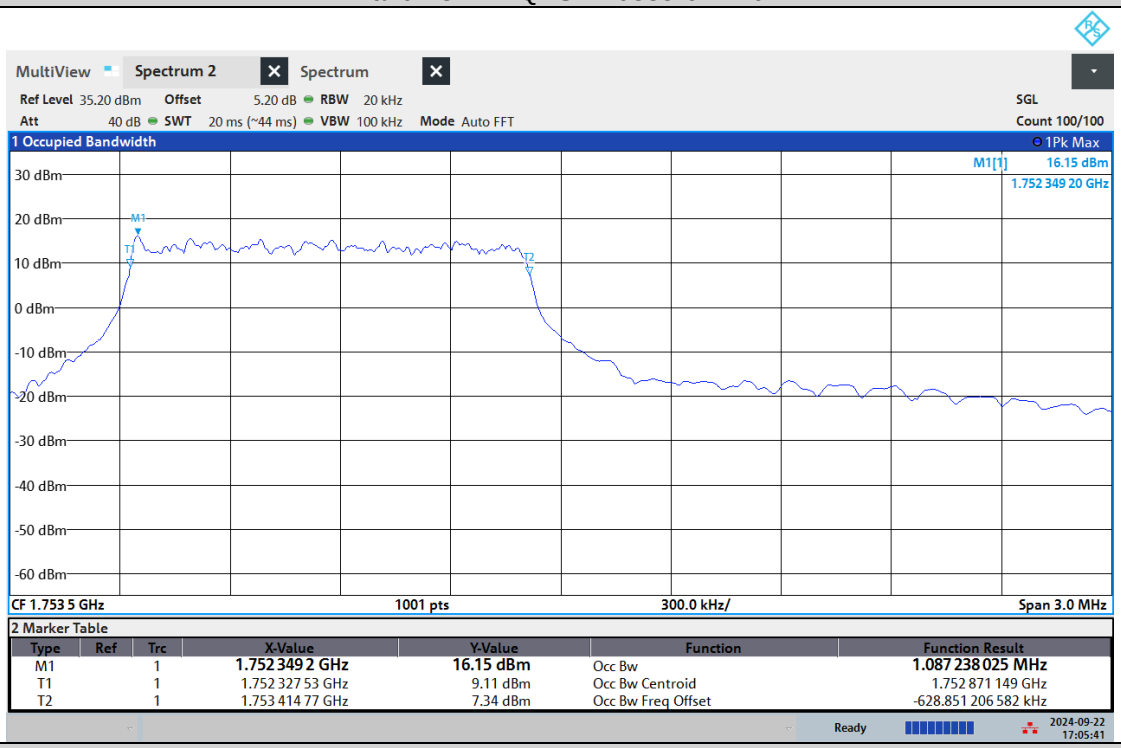
Band4-3MHz-QPSK-19965-6RB#0



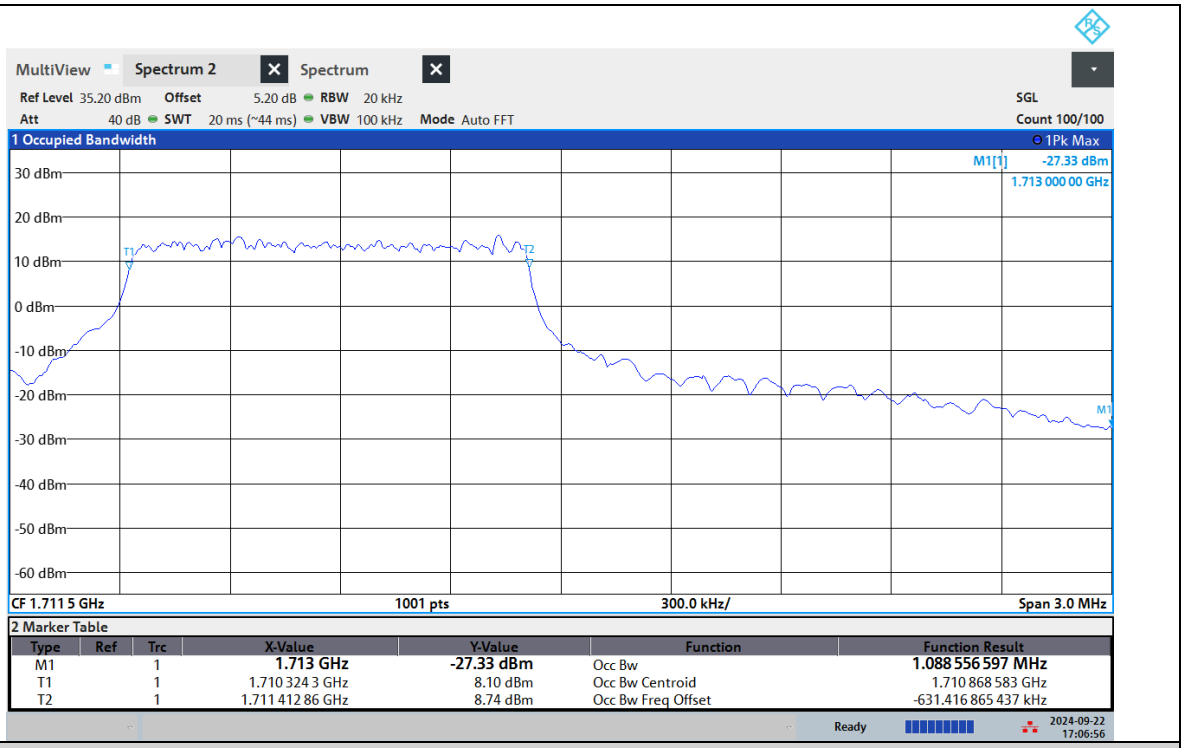
Band4-3MHz-QPSK-20175-6RB#0



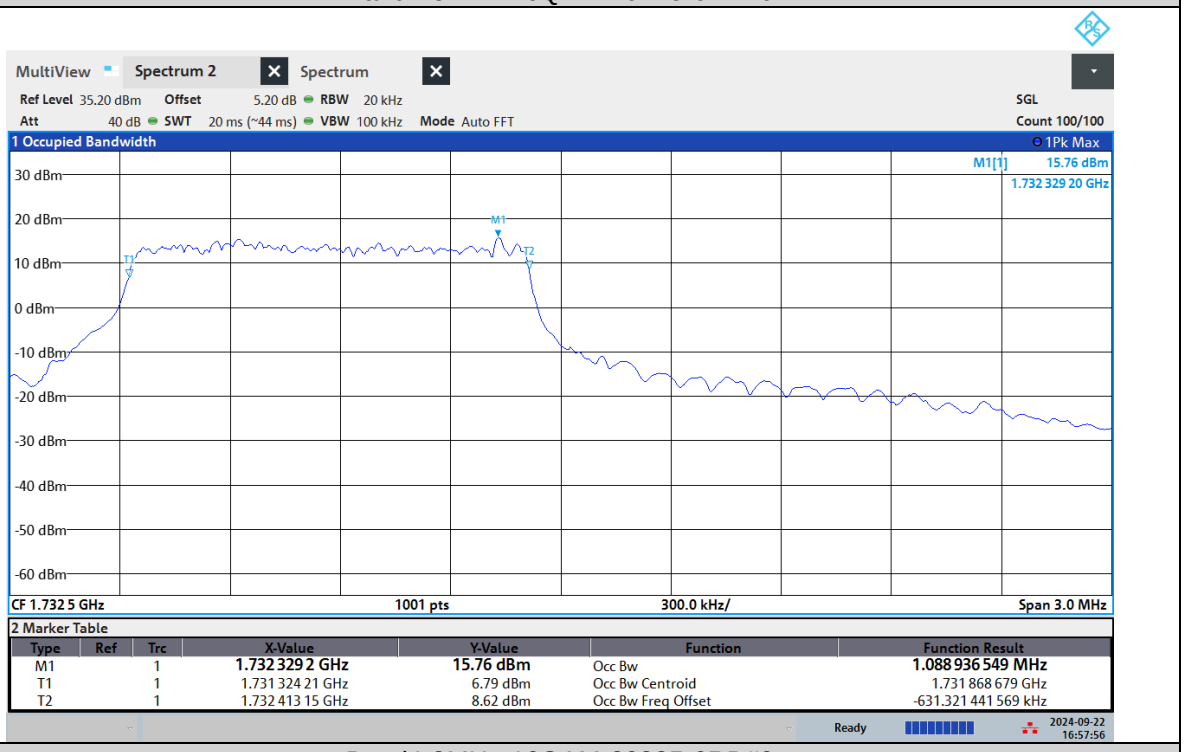
Band4-3MHz-QPSK-20385-6RB#0



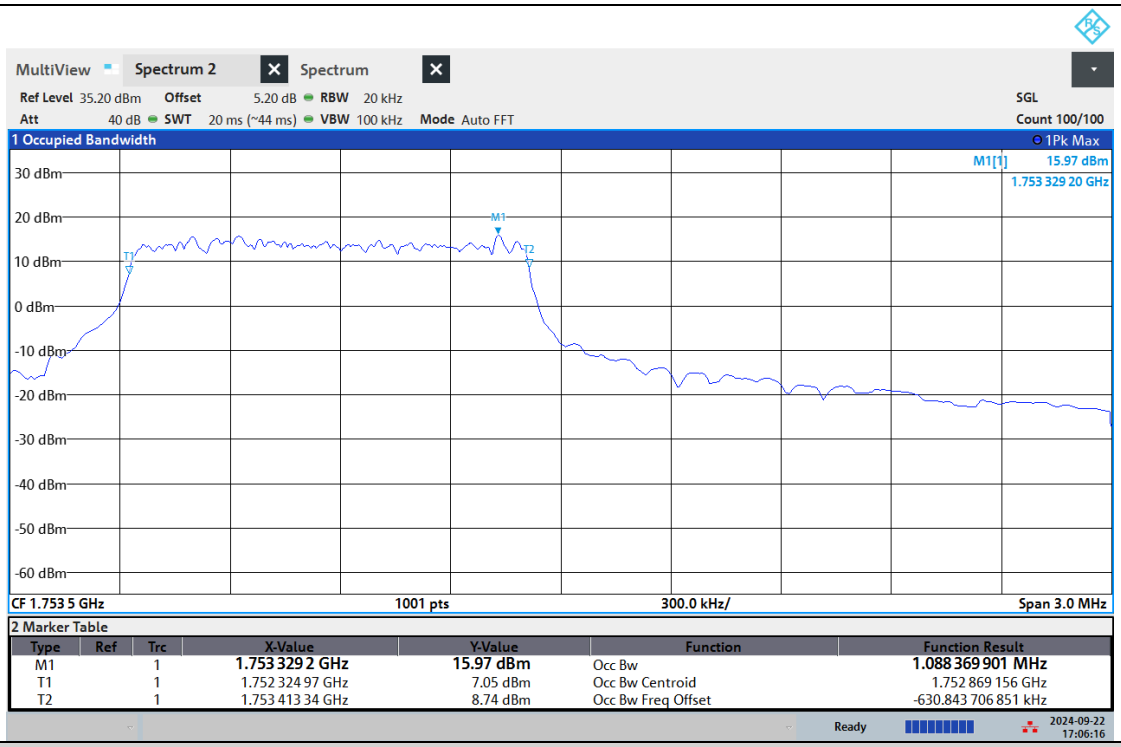
Band4-3MHz-16QAM-19965-6RB#0



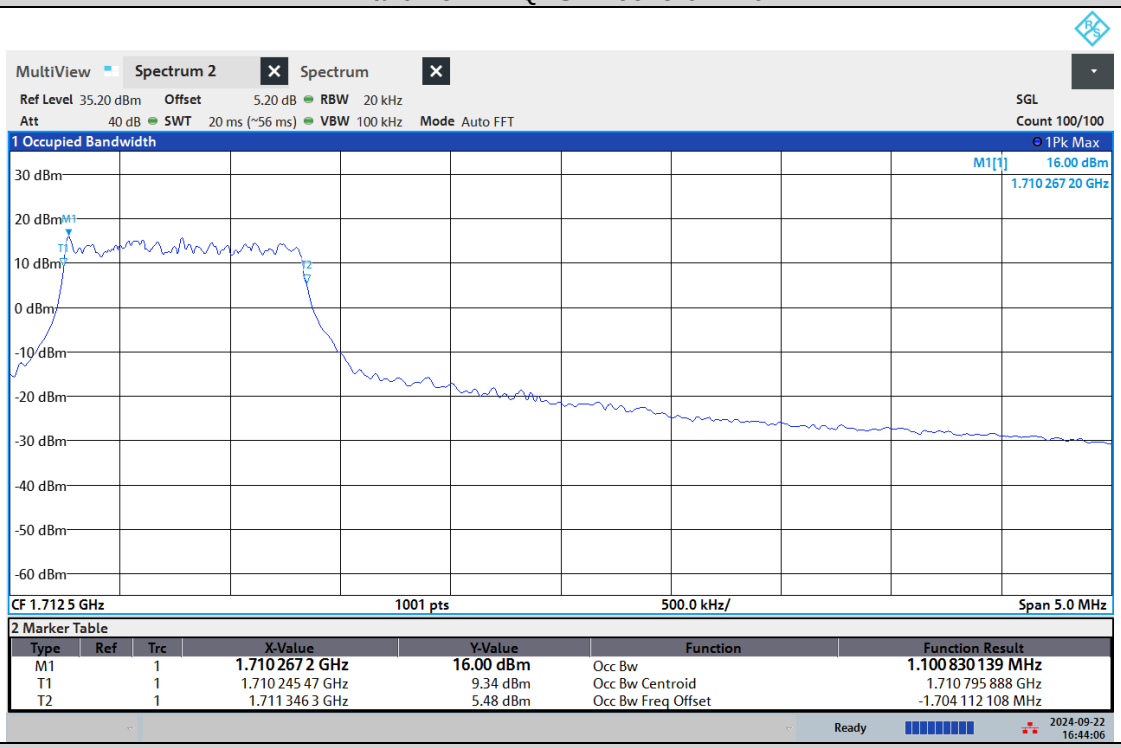
Band4-3MHz-16QAM-20175-6RB#0



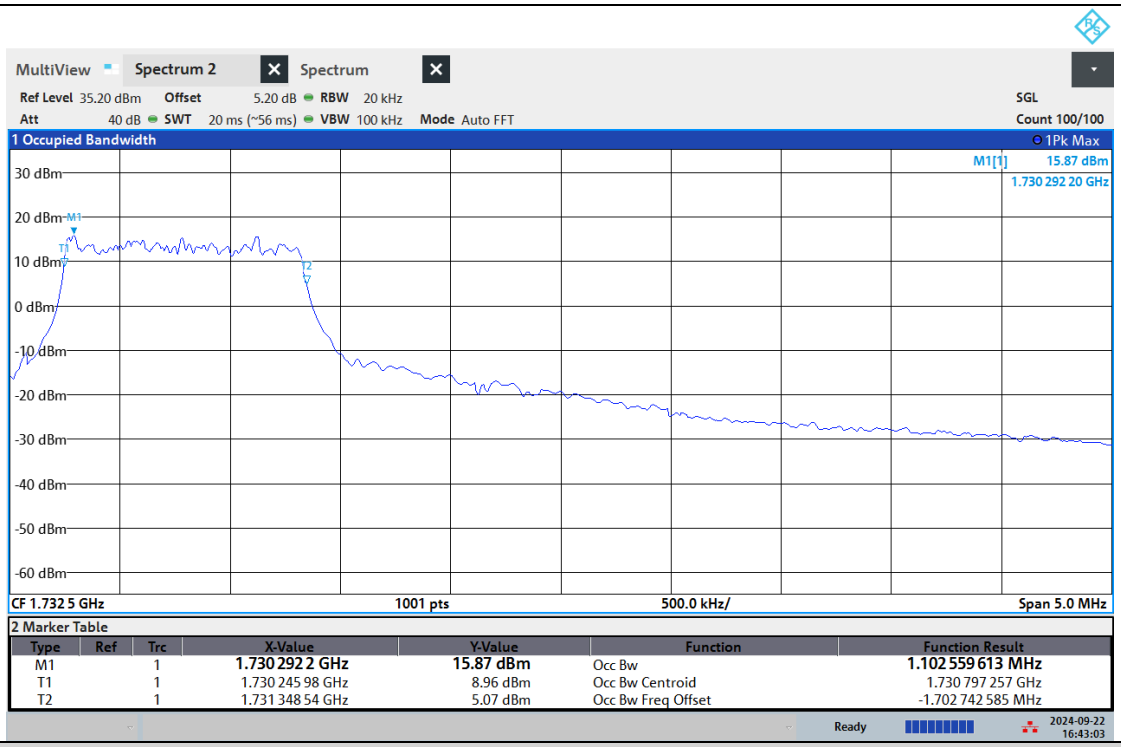
Band4-3MHz-16QAM-20385-6RB#0



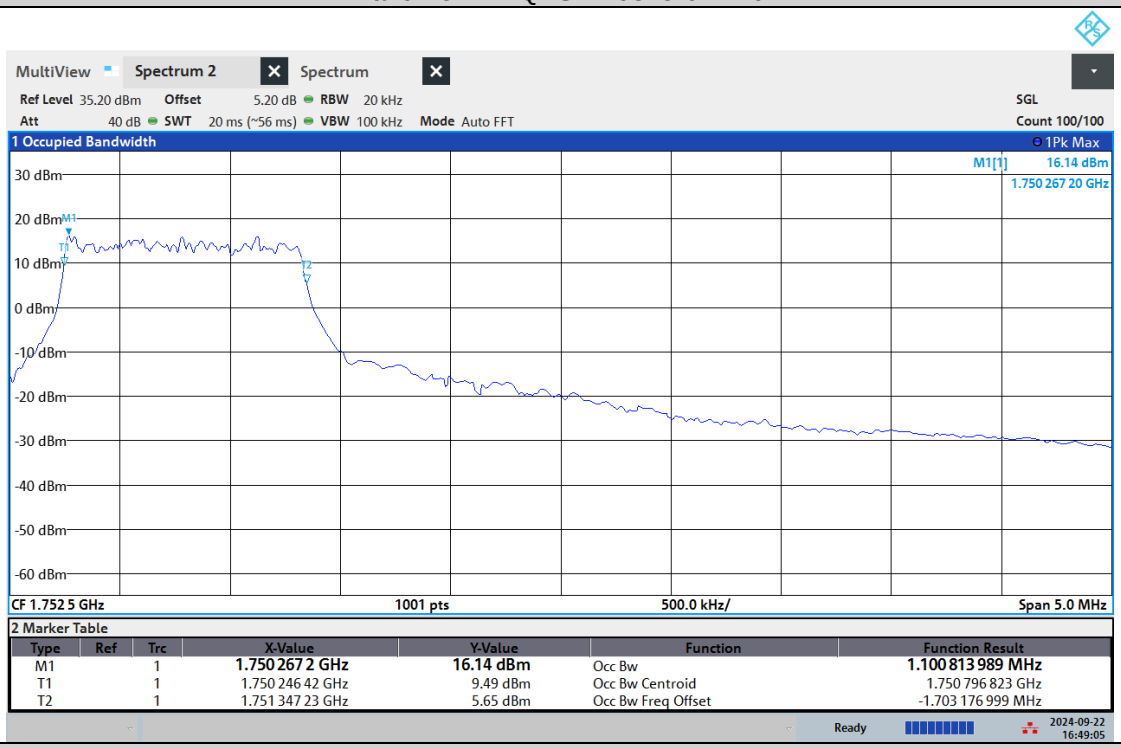
Band4-5MHz-QPSK-19975-6RB#0



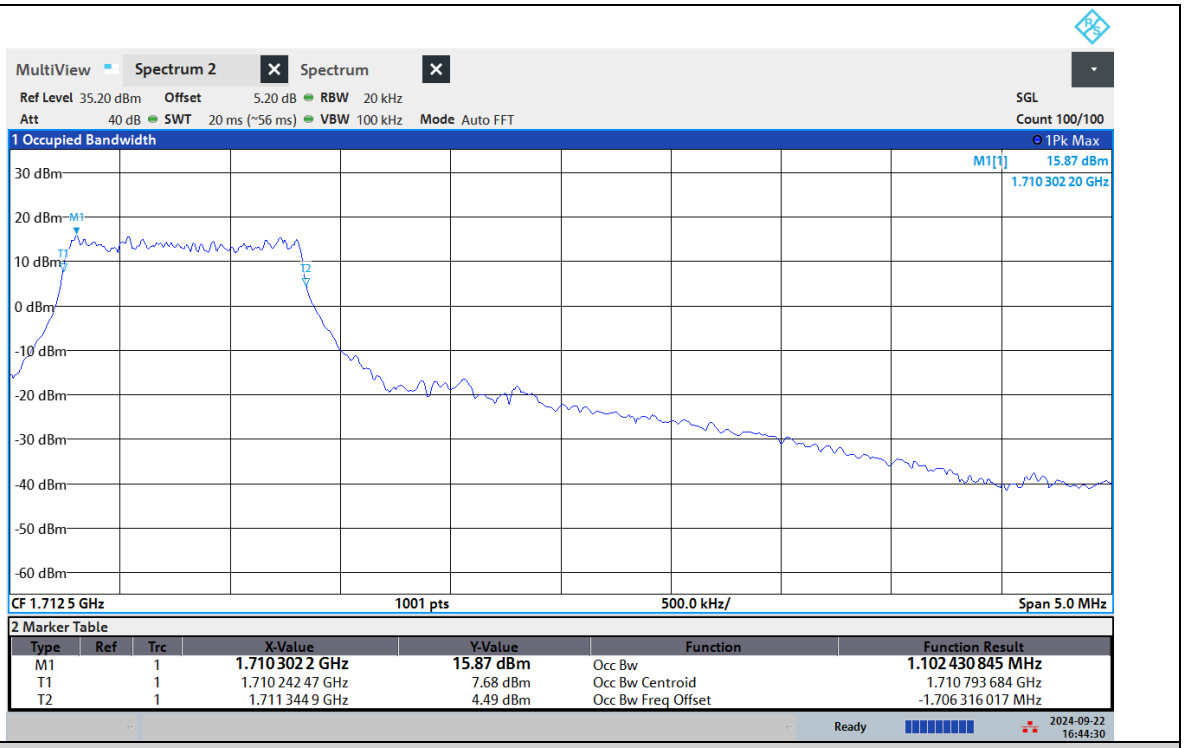
Band4-5MHz-QPSK-20175-6RB#0



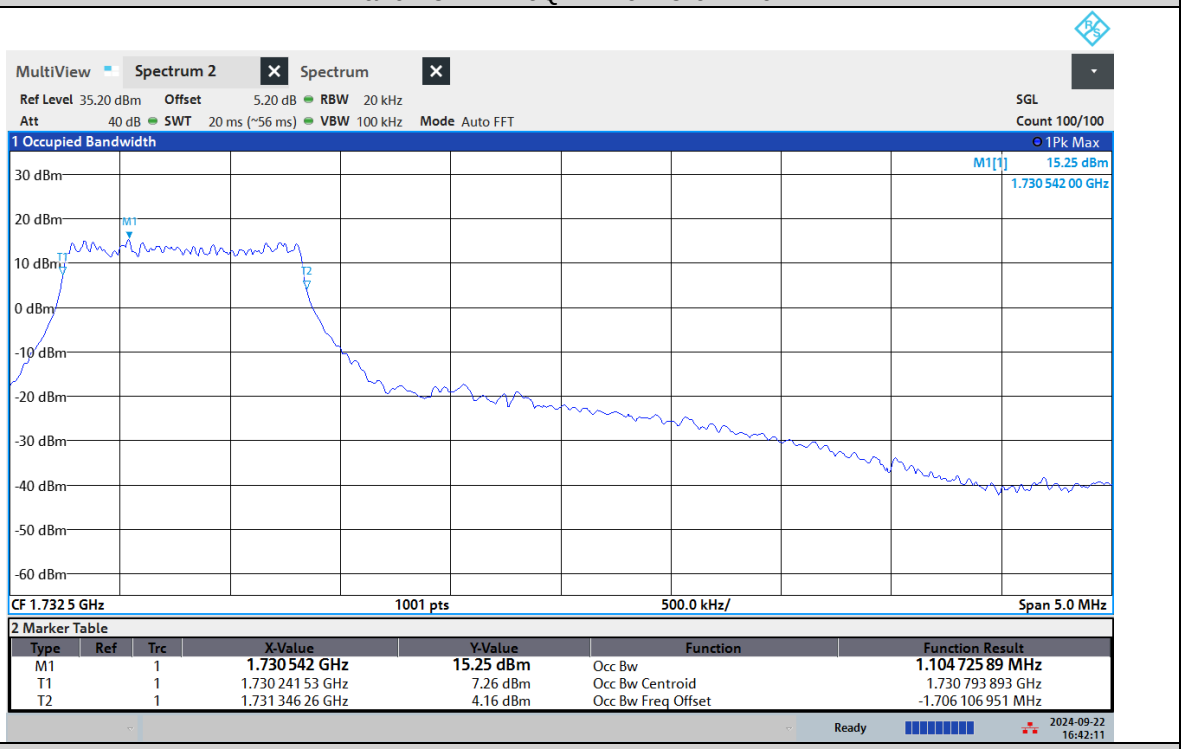
Band4-5MHz-QPSK-20375-6RB#0



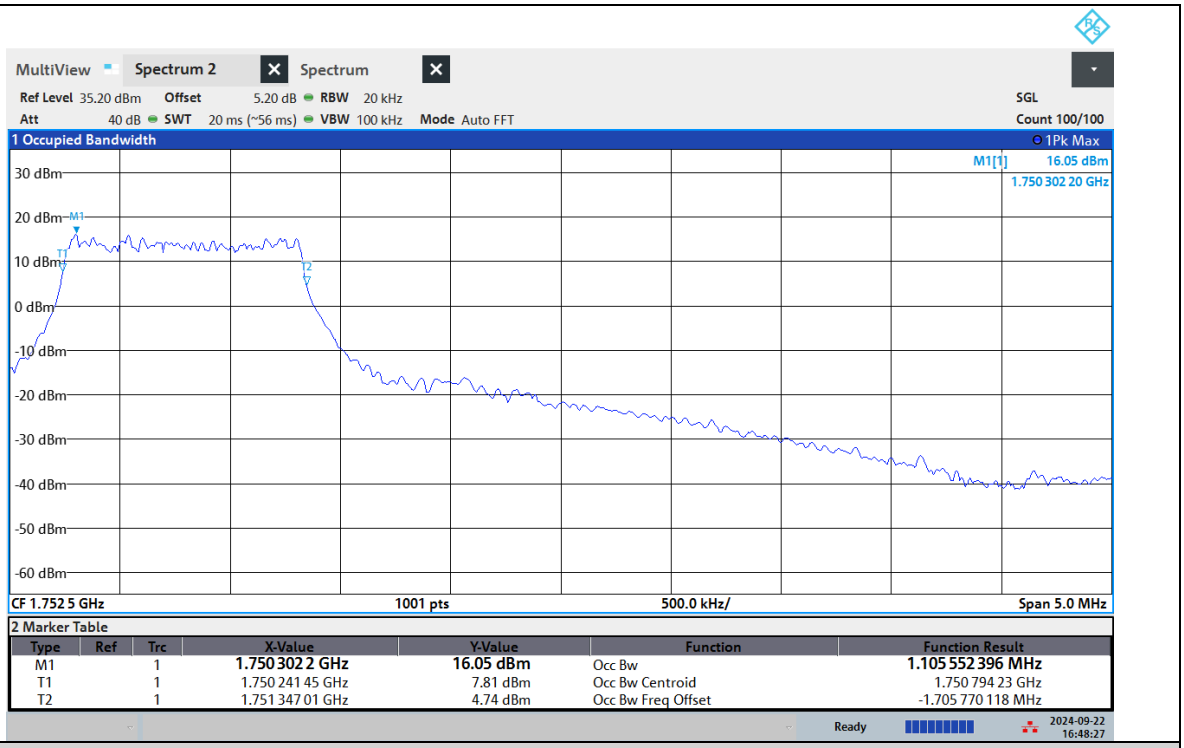
Band4-5MHz-16QAM-19975-6RB#0



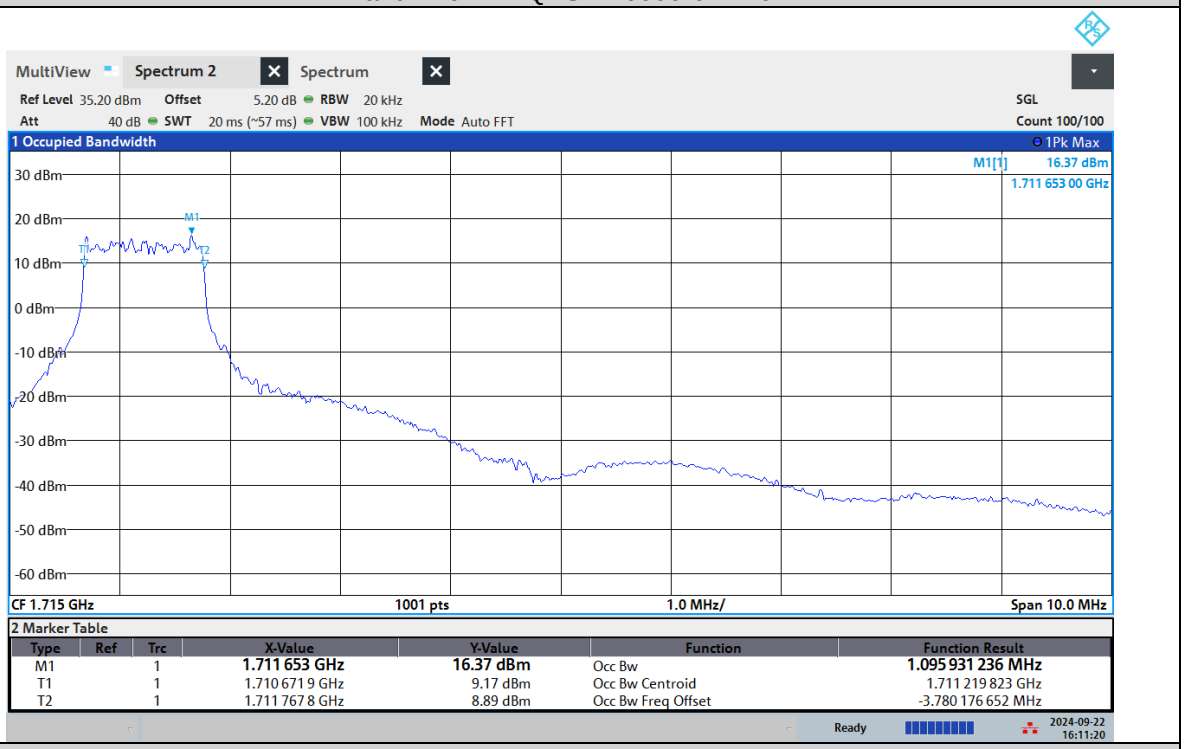
Band4-5MHz-16QAM-20175-6RB#0



Band4-5MHz-16QAM-20375-6RB#0



Band4-10MHz-QPSK-20000-6RB#0



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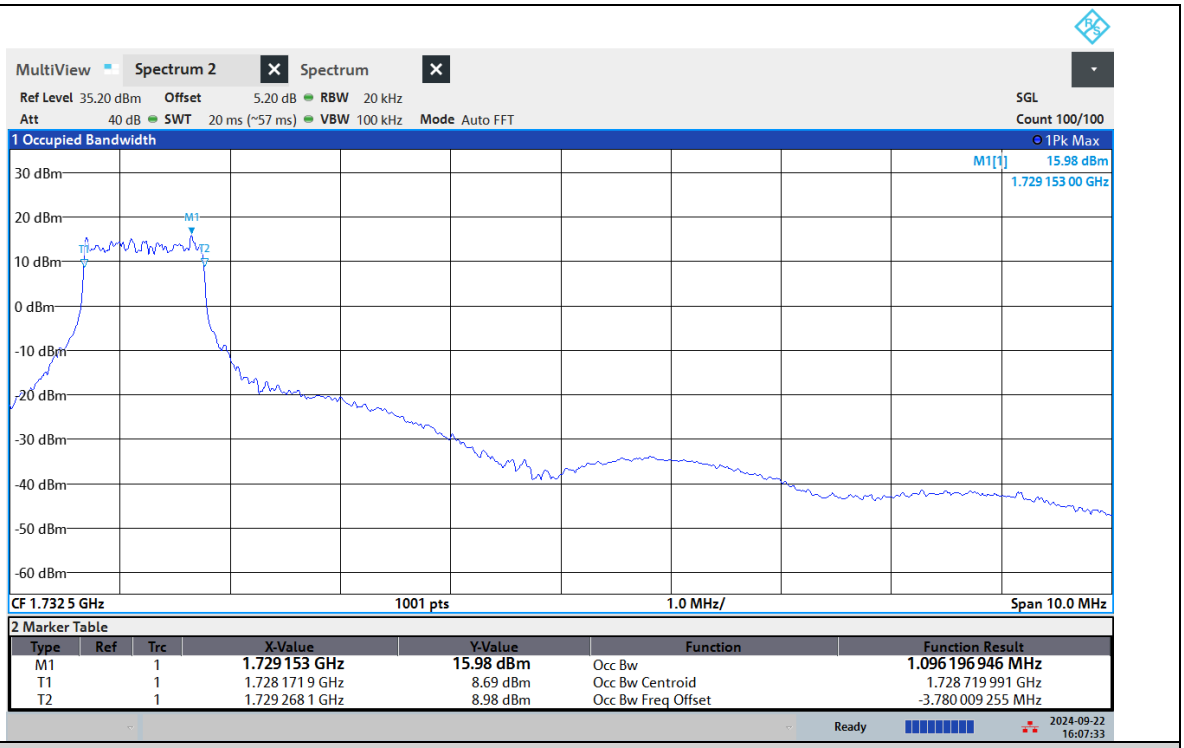

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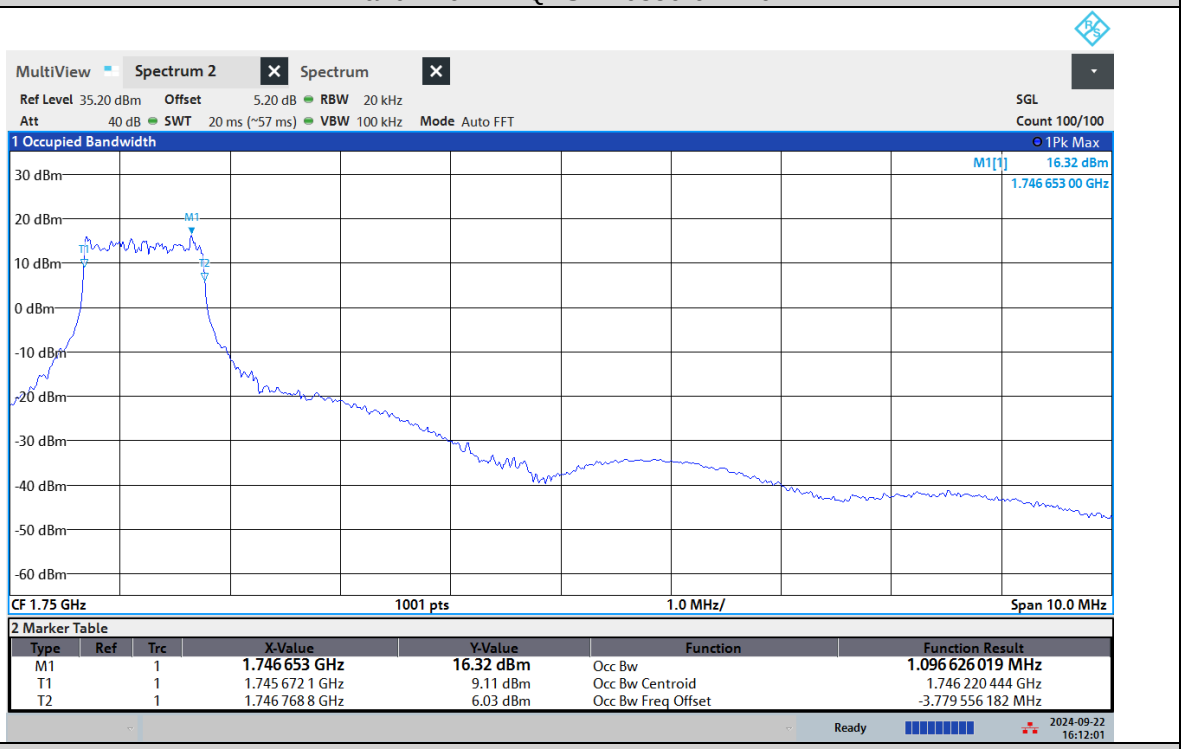

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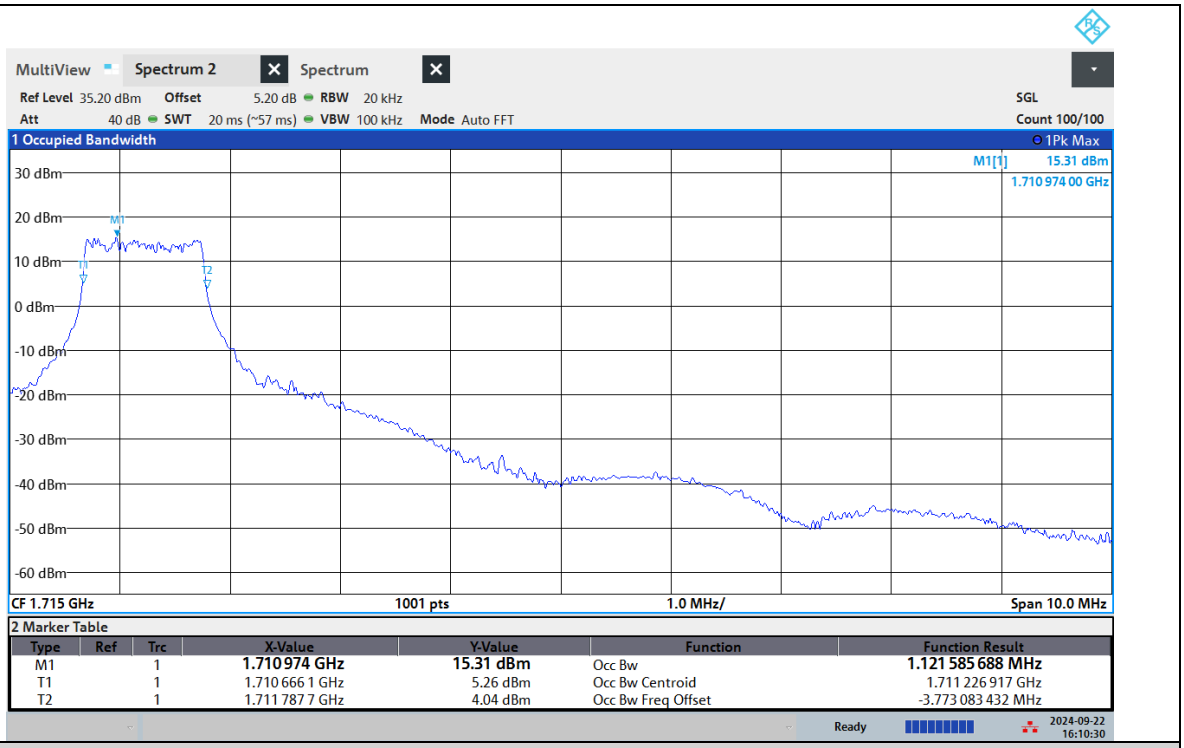

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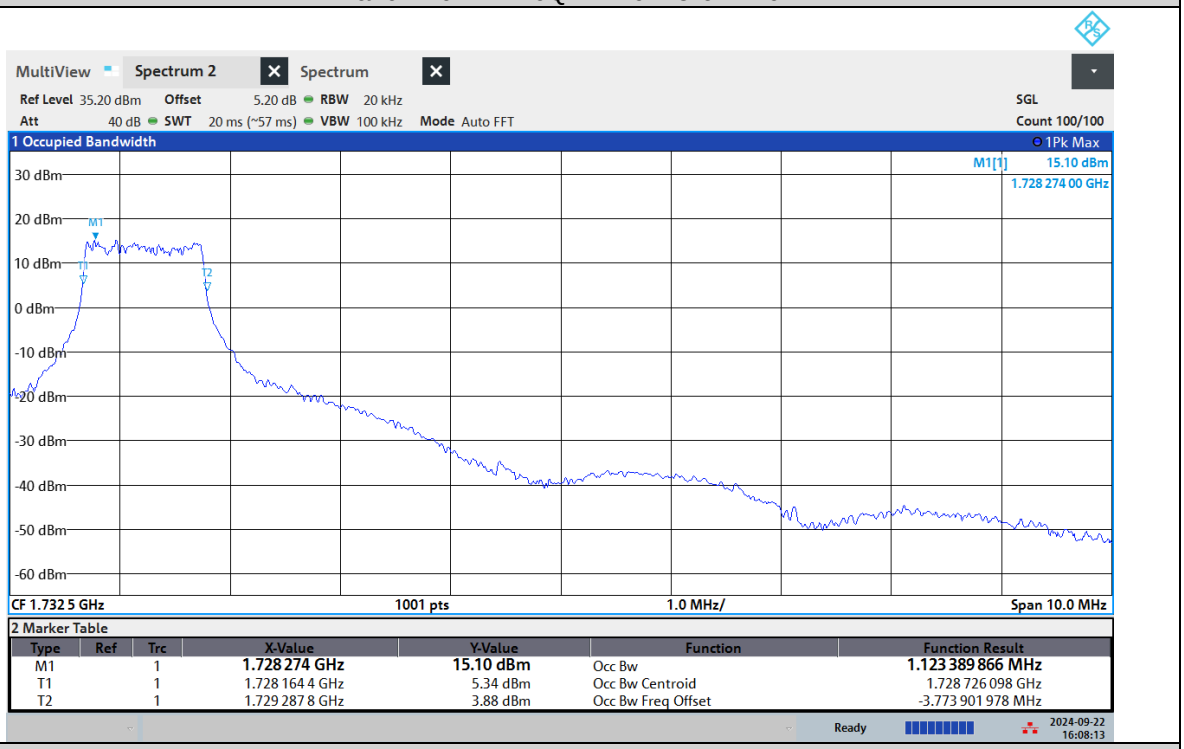

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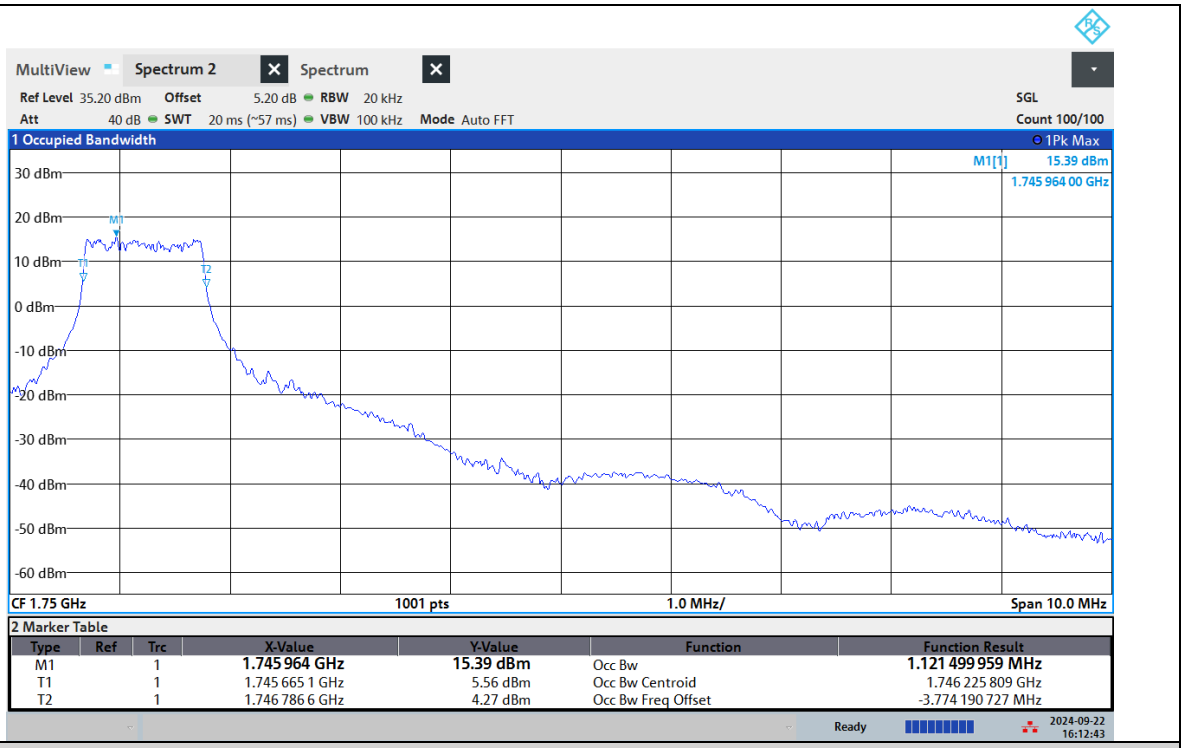

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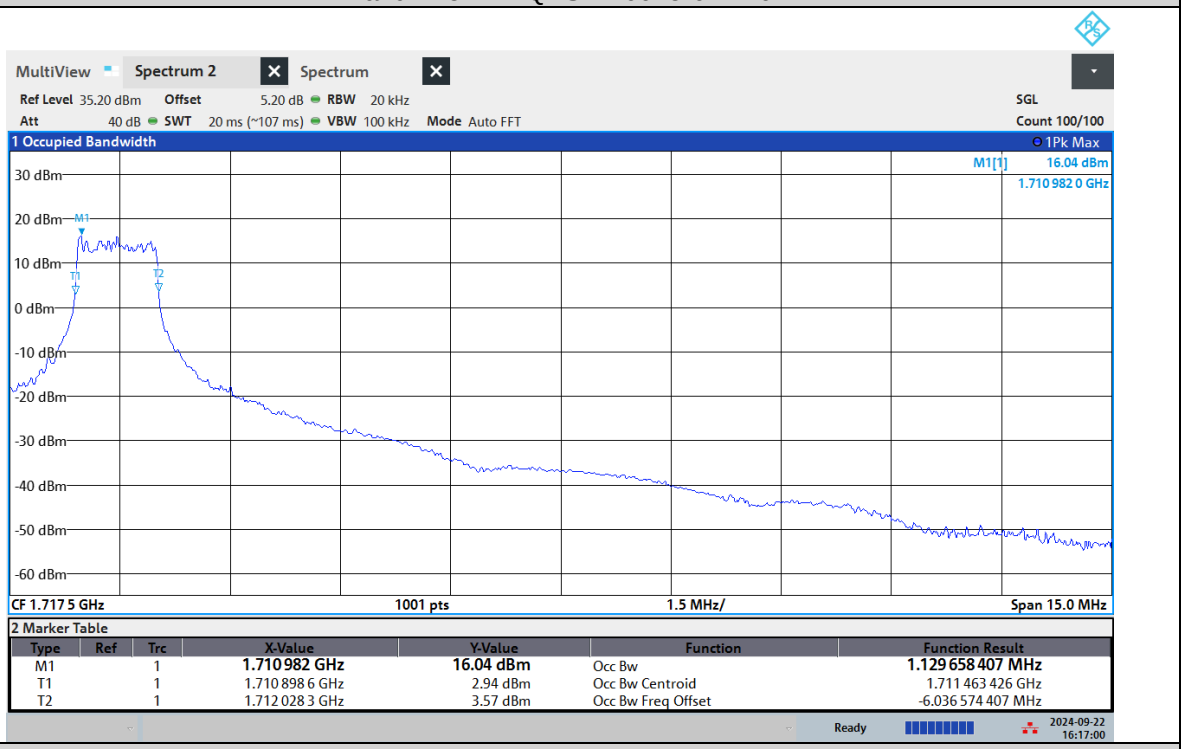

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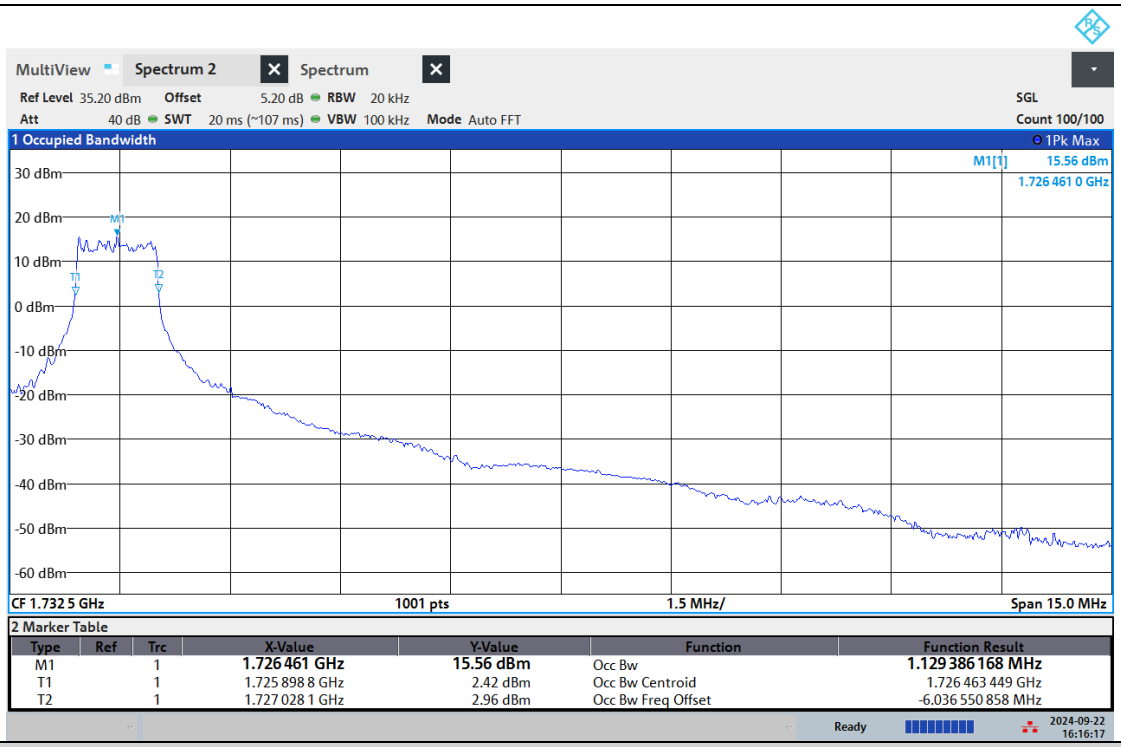

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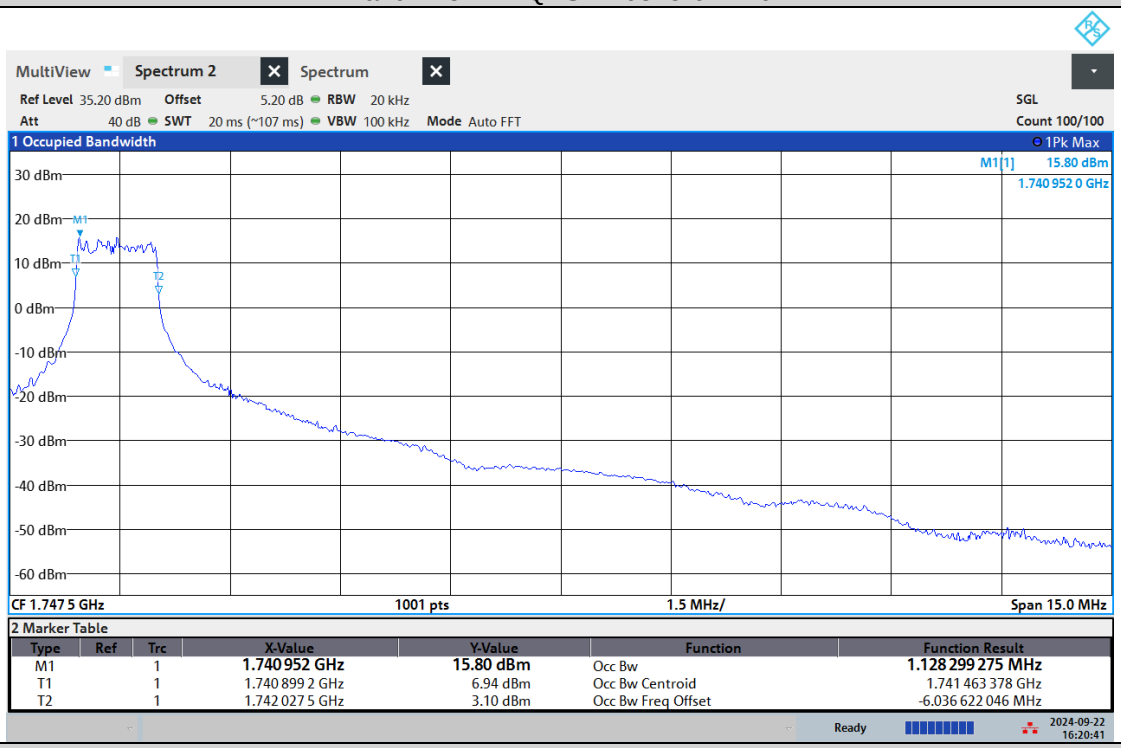

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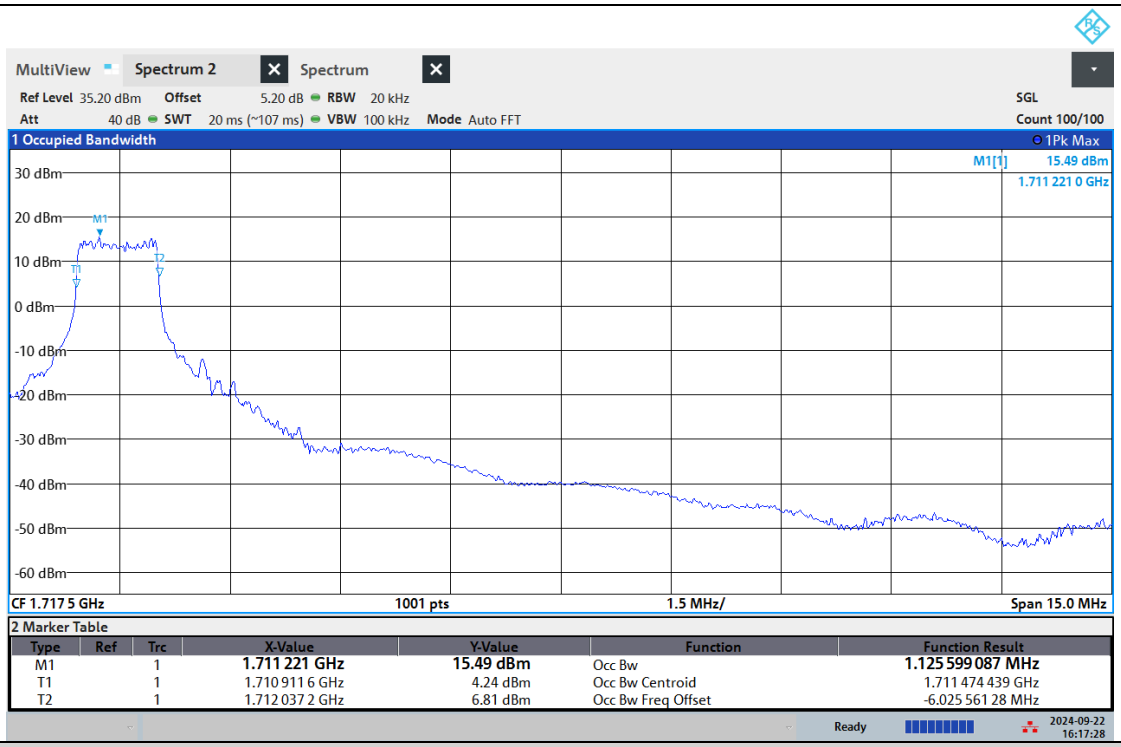

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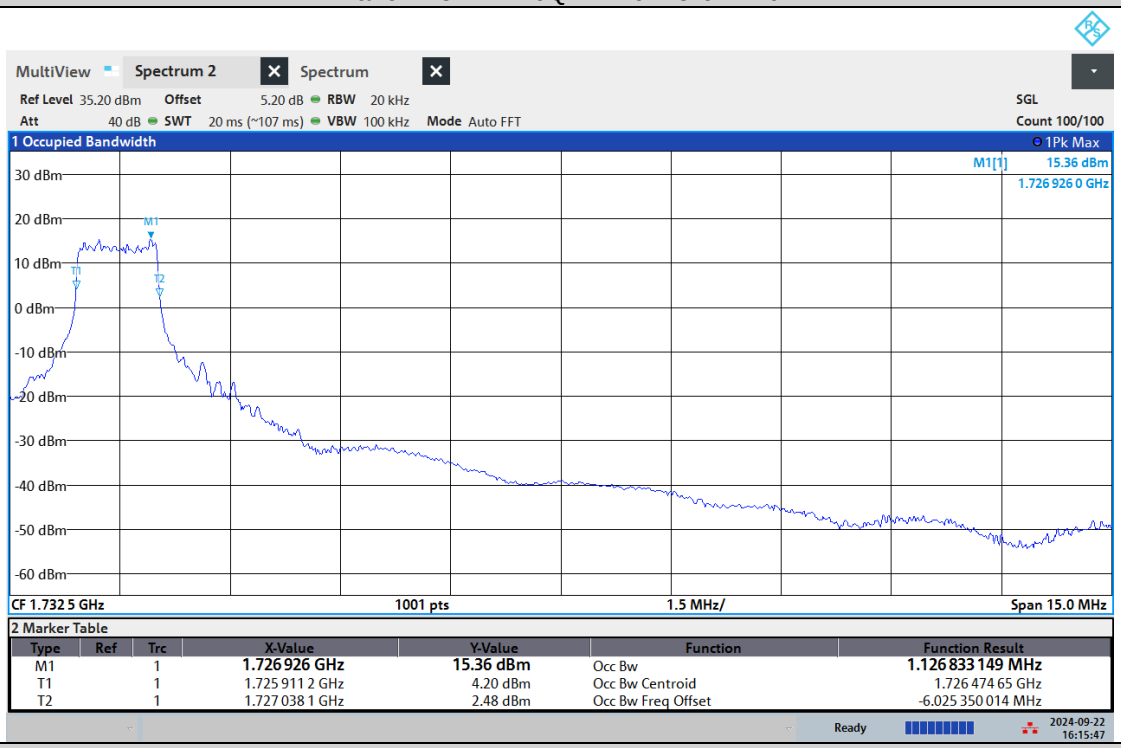

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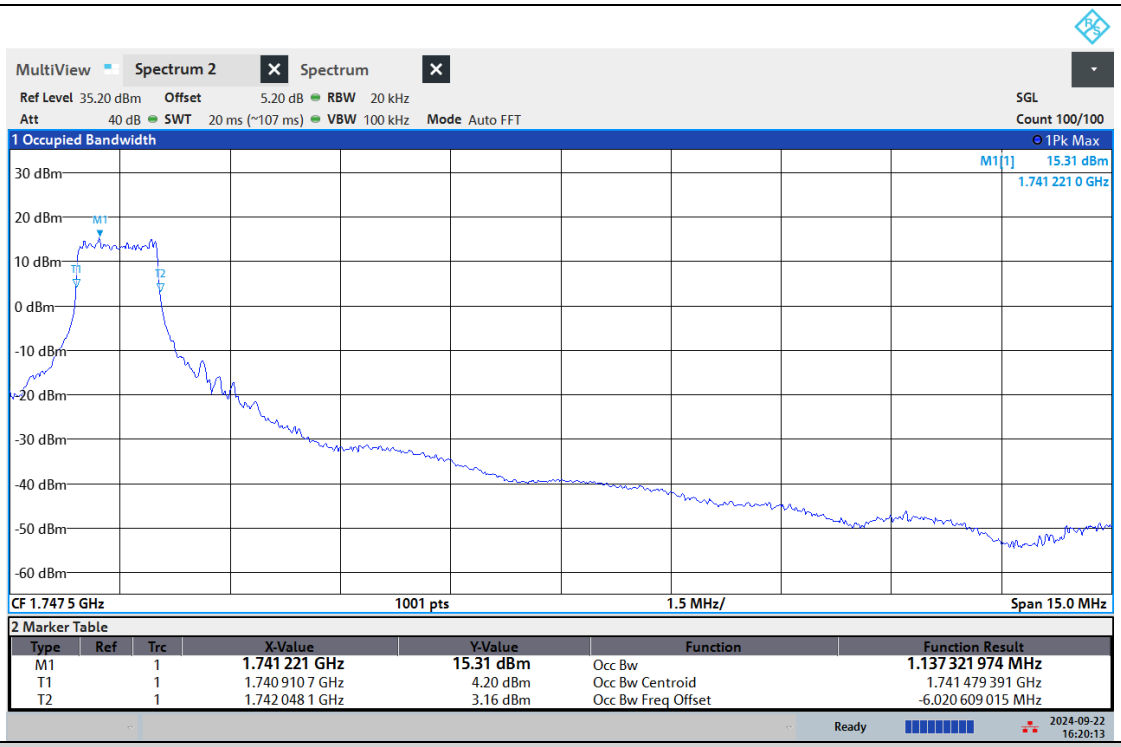

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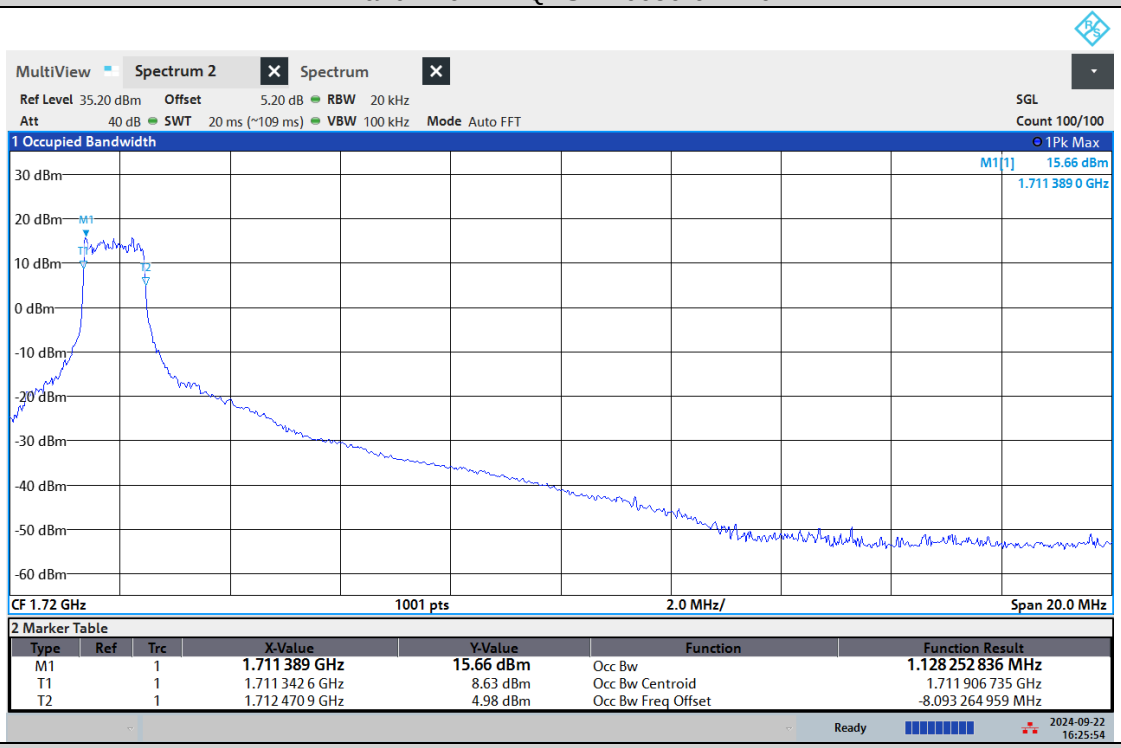

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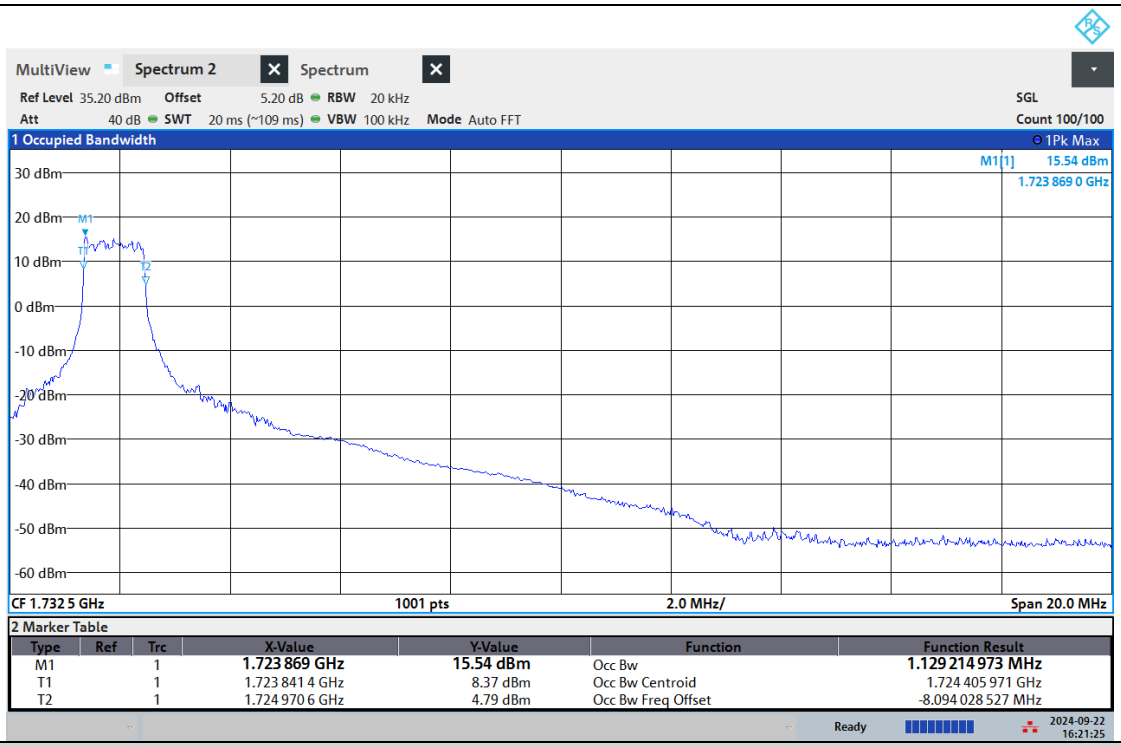

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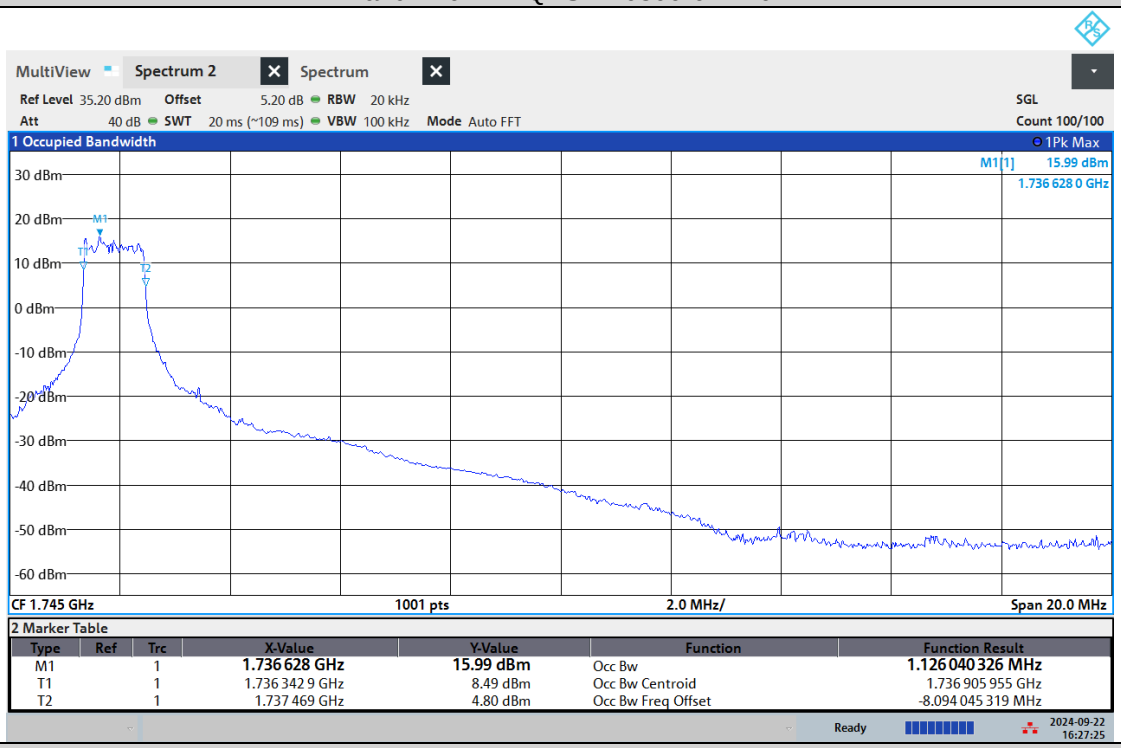

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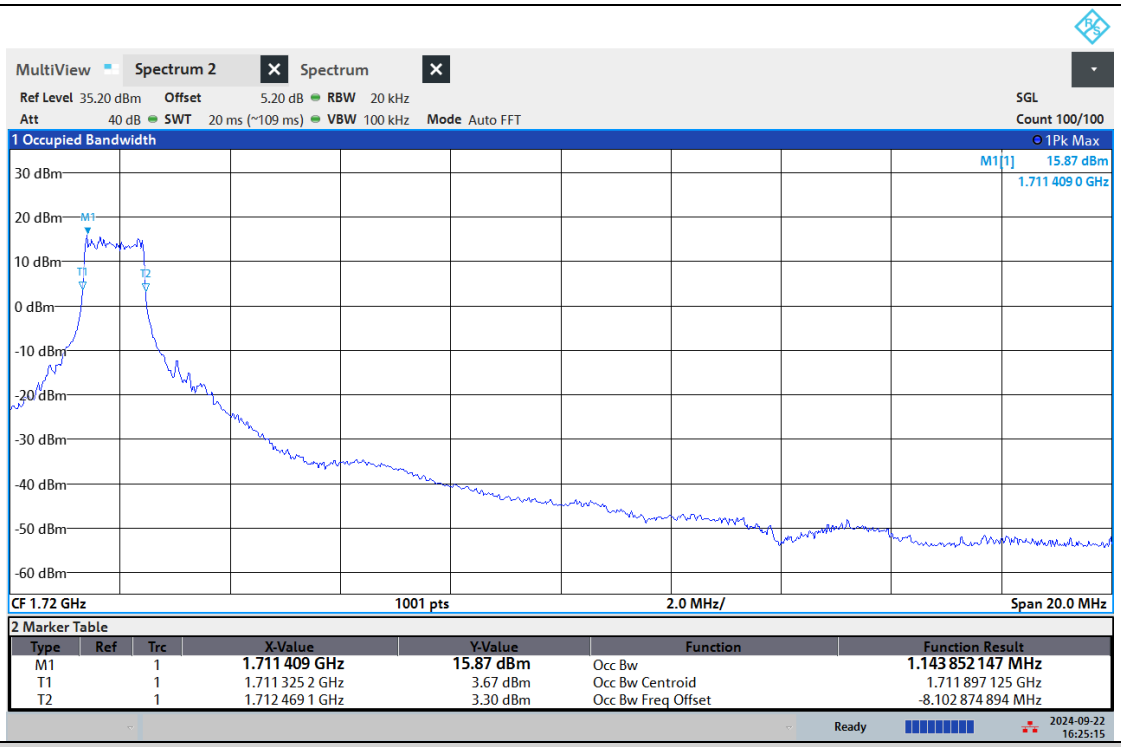

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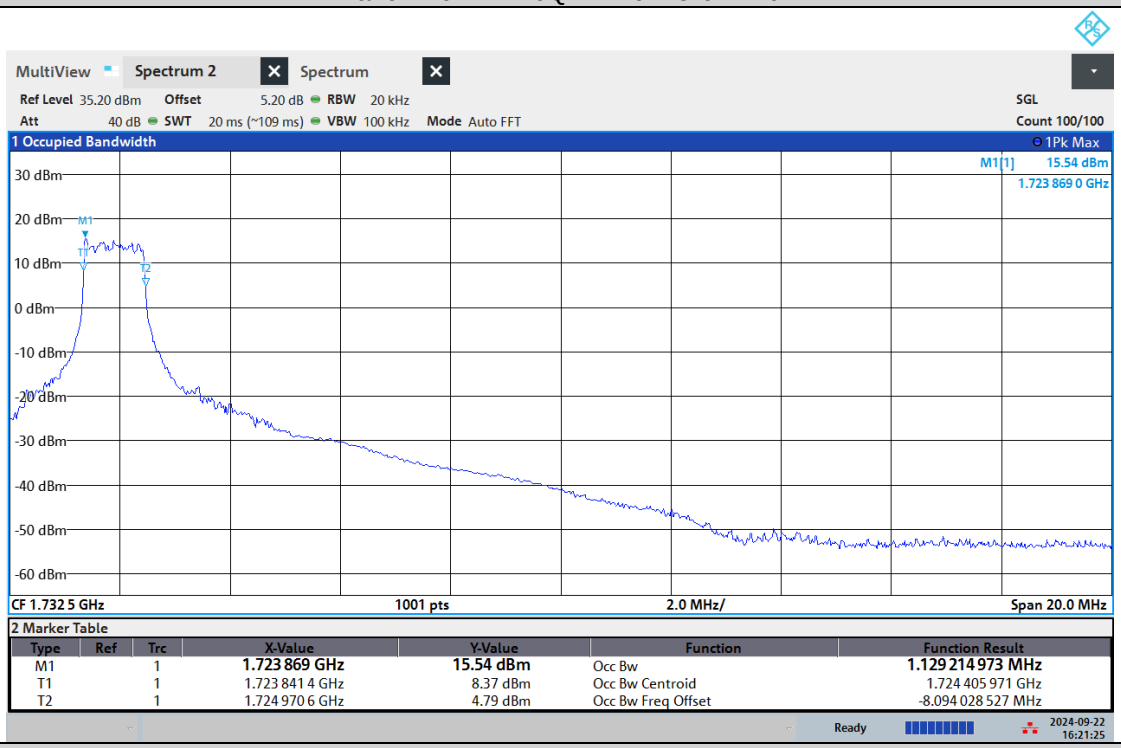

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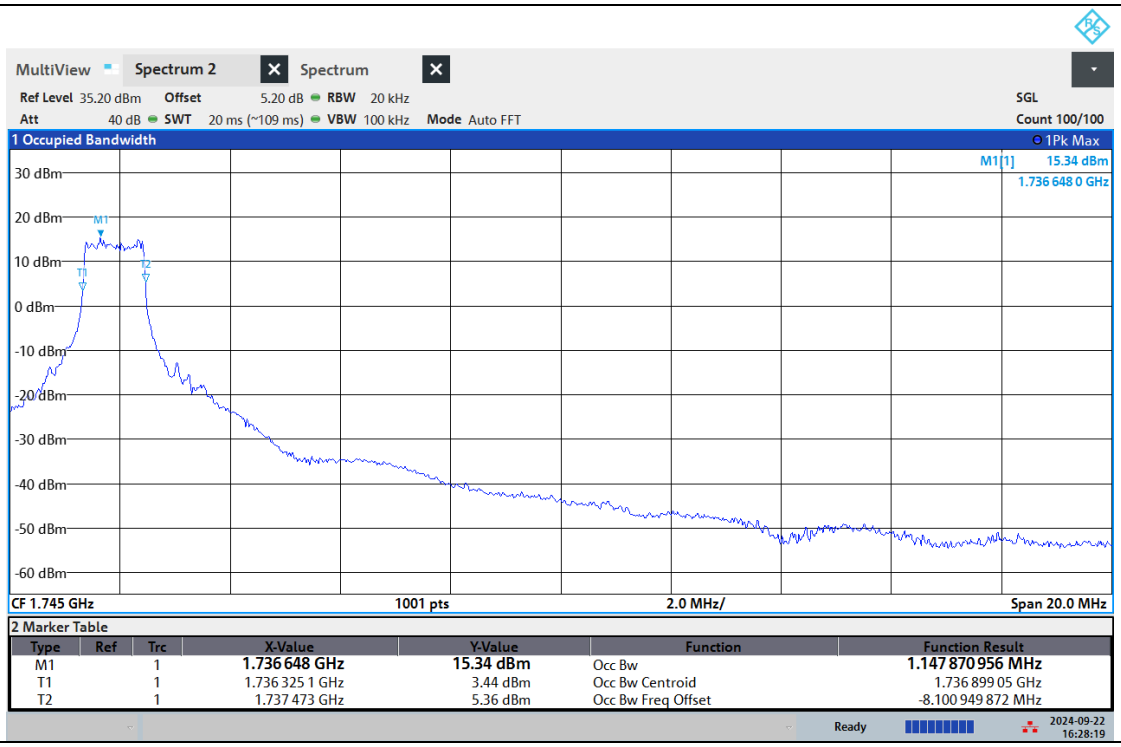
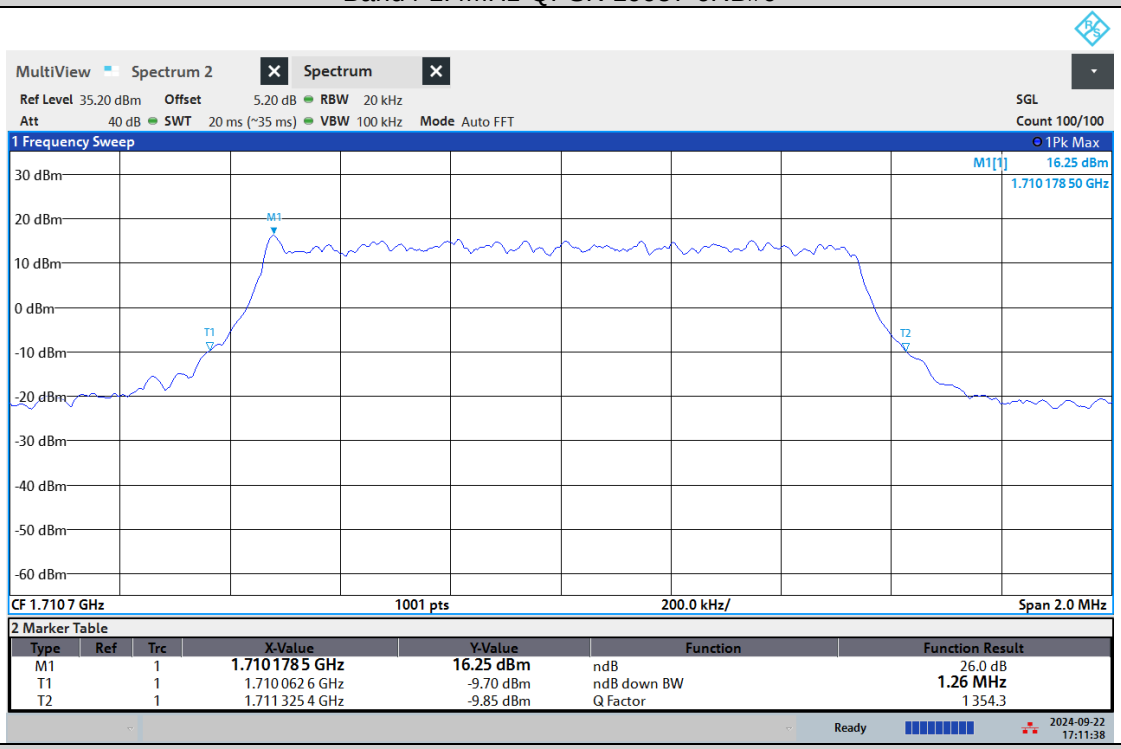


26dB Bandwidth

Band4-1.4MHz-QPSK-19957-6RB#0



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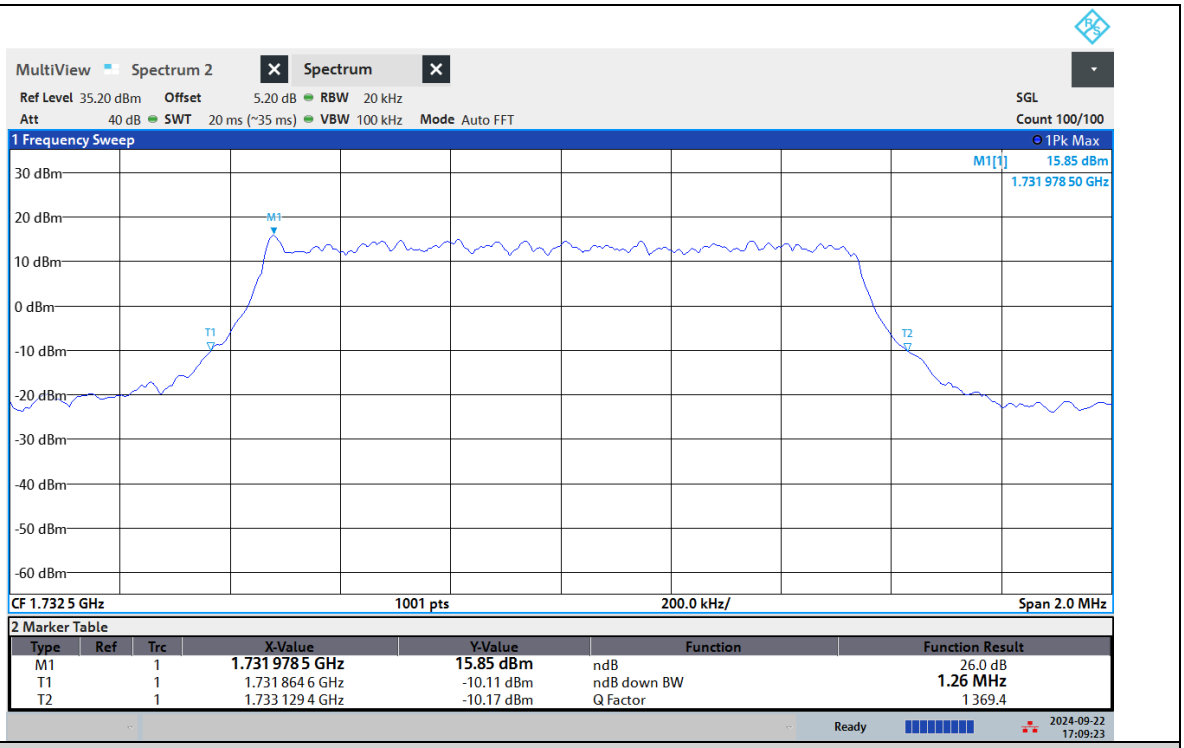

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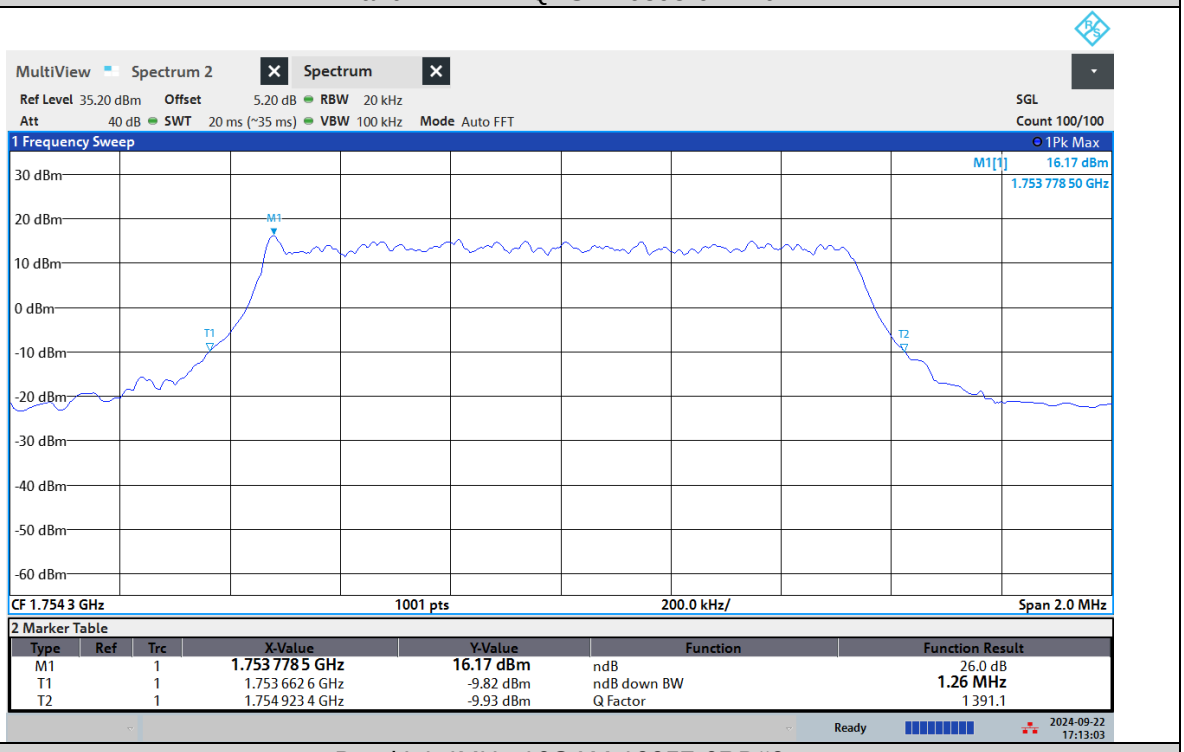

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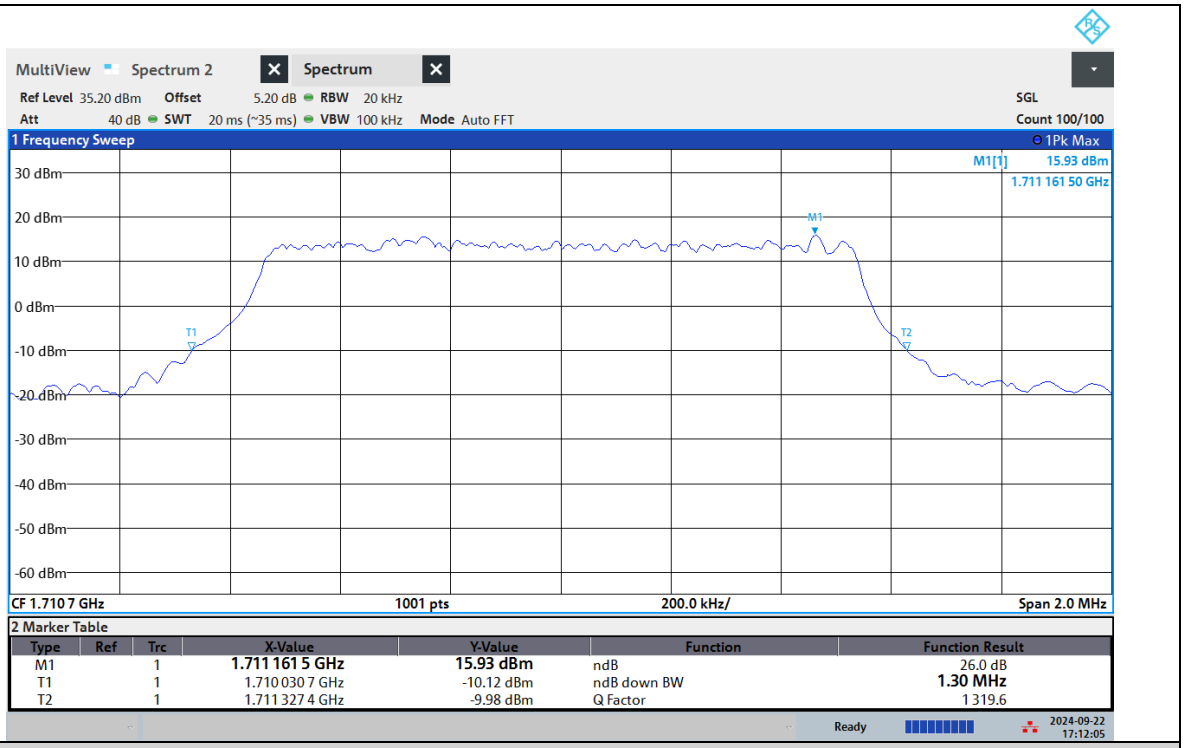

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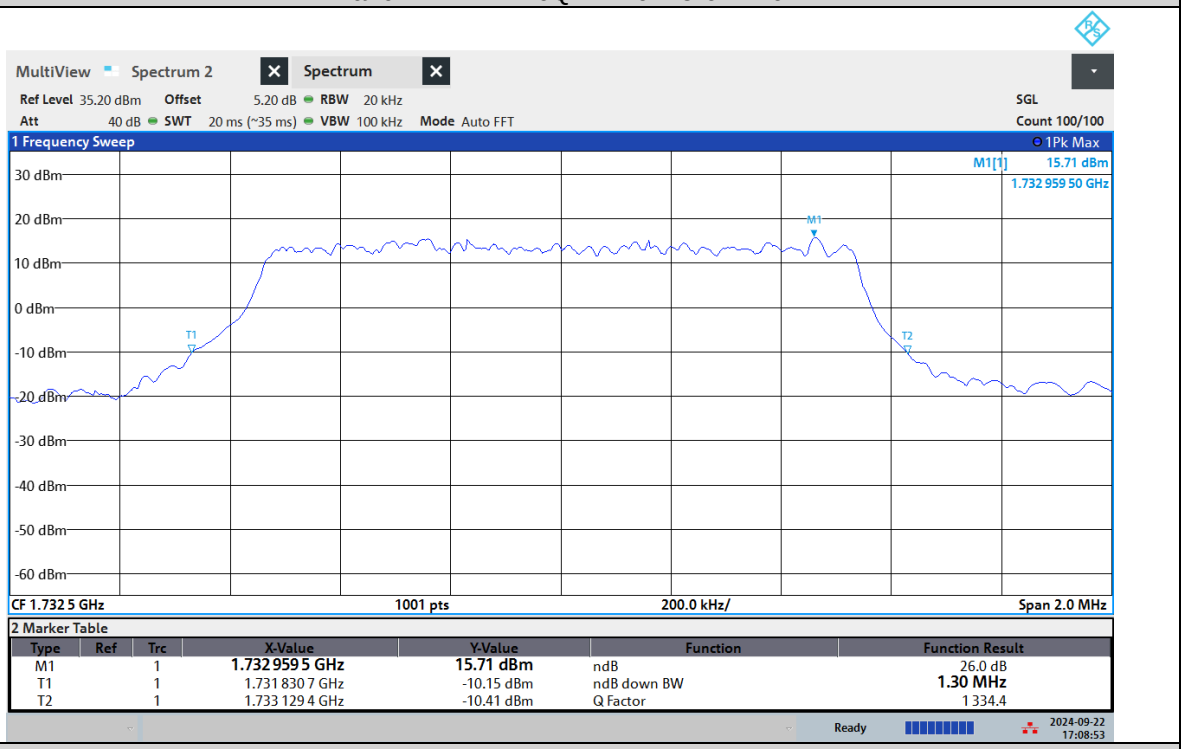

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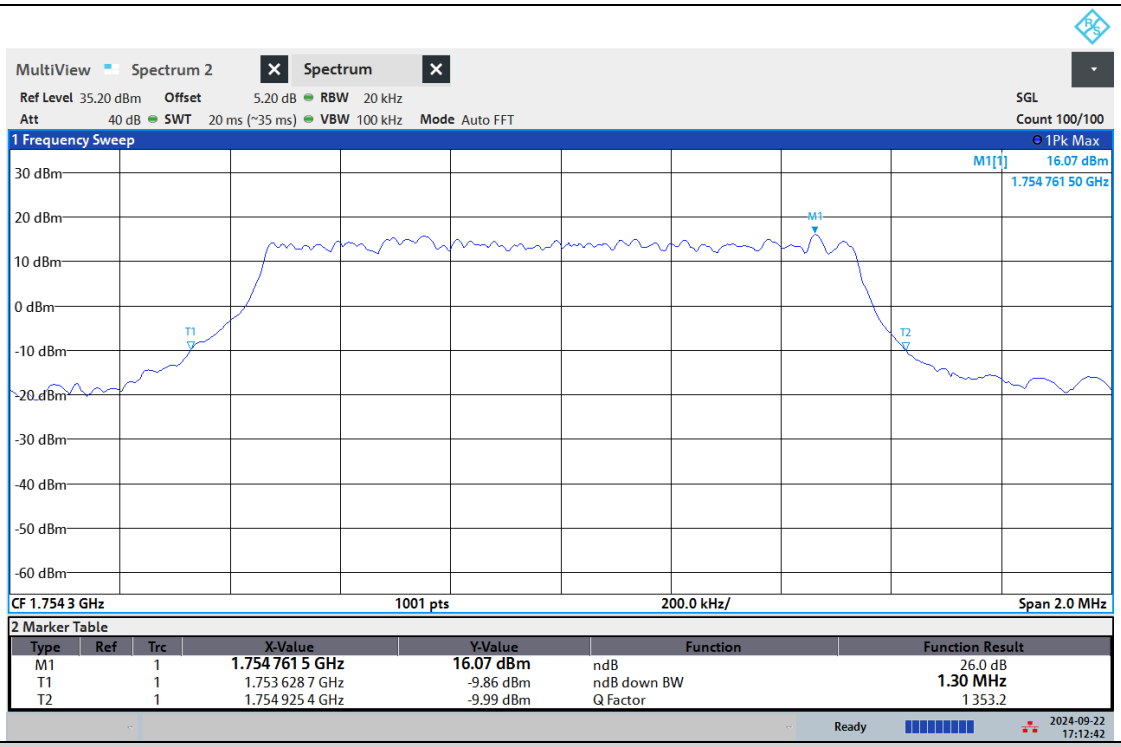

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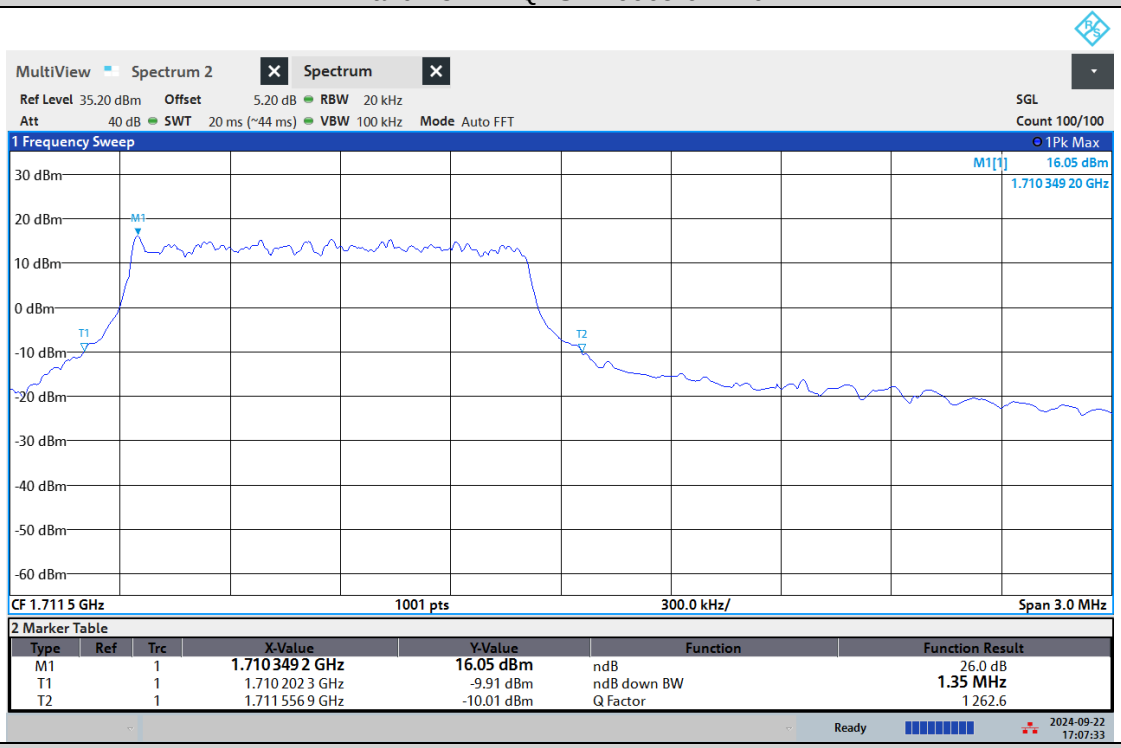

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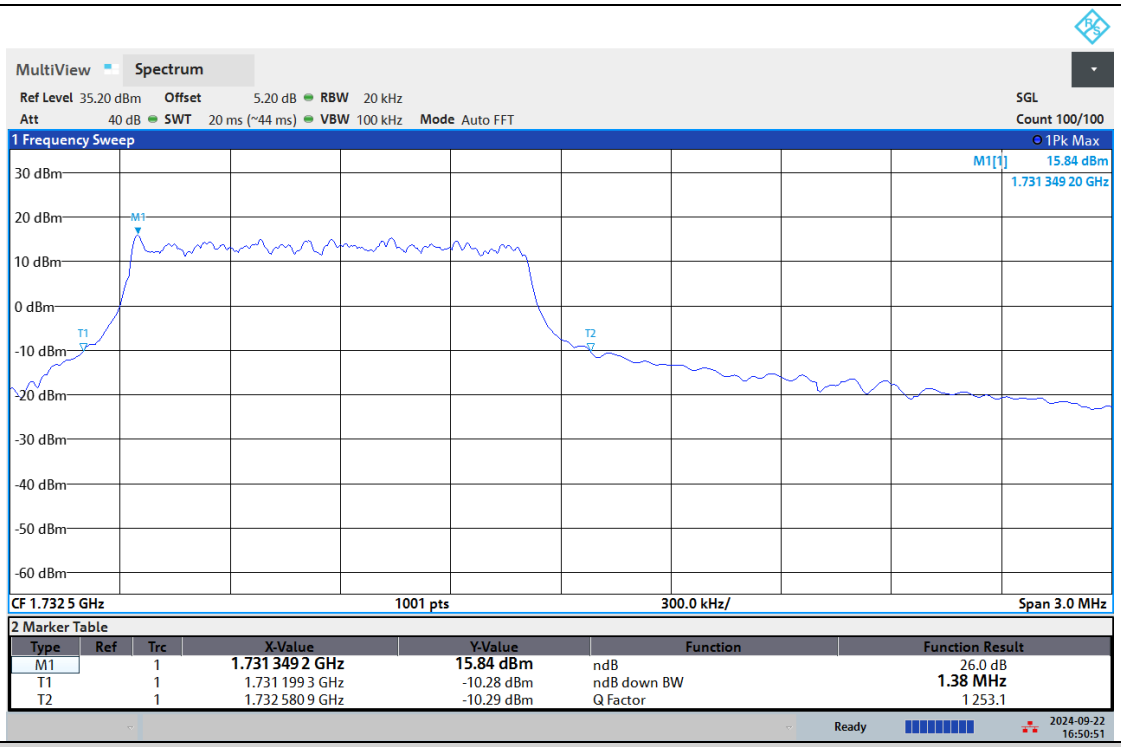

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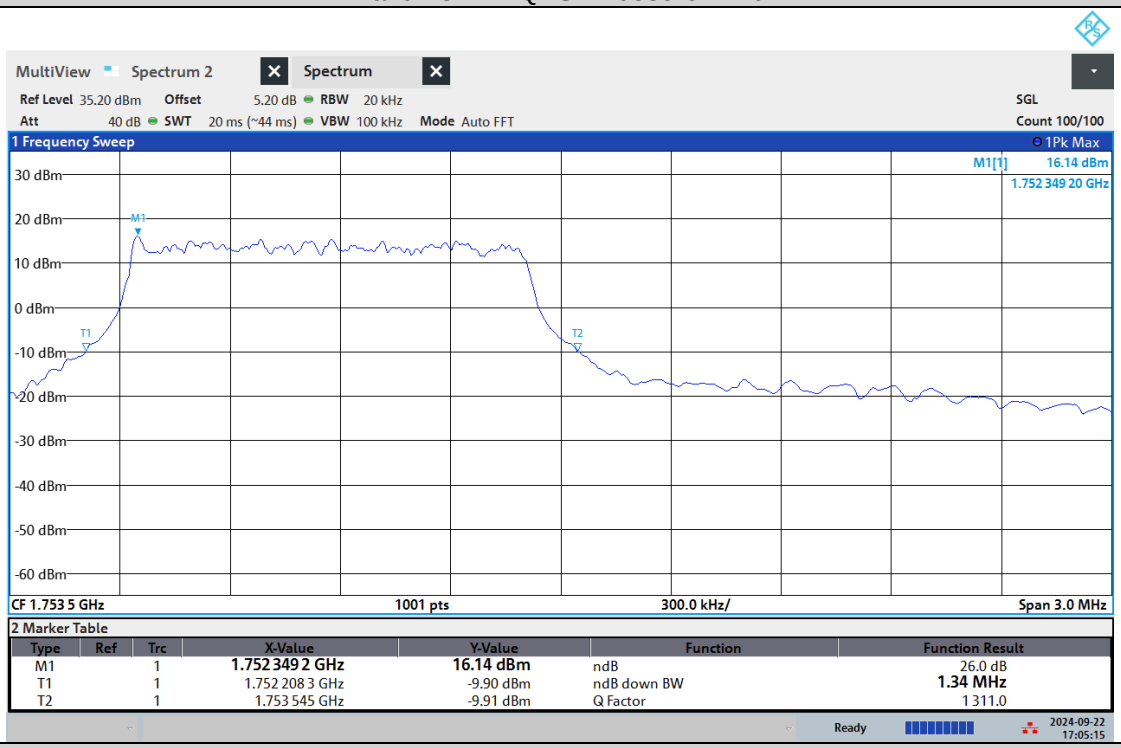

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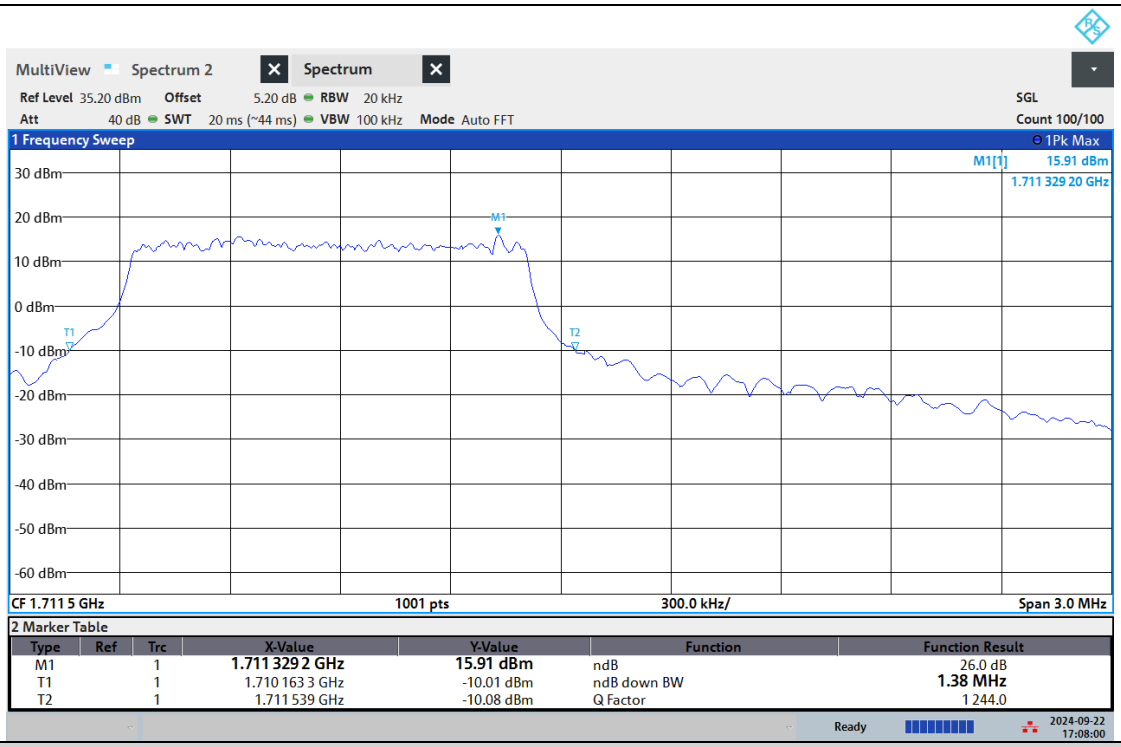

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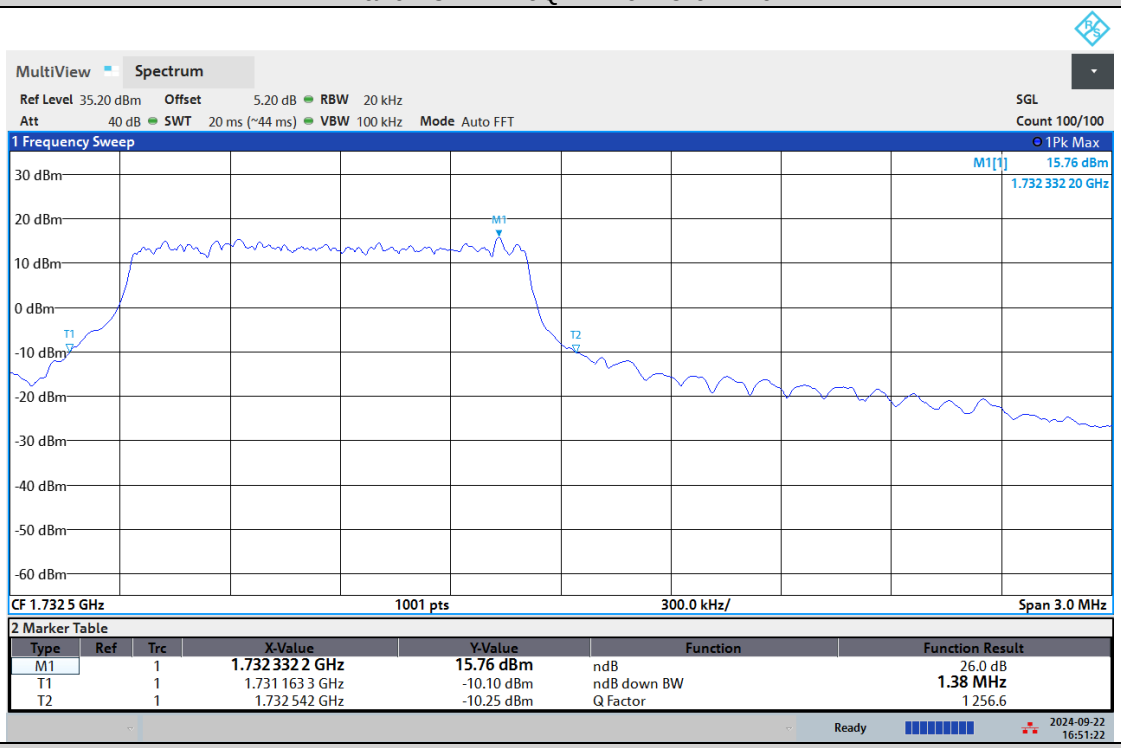

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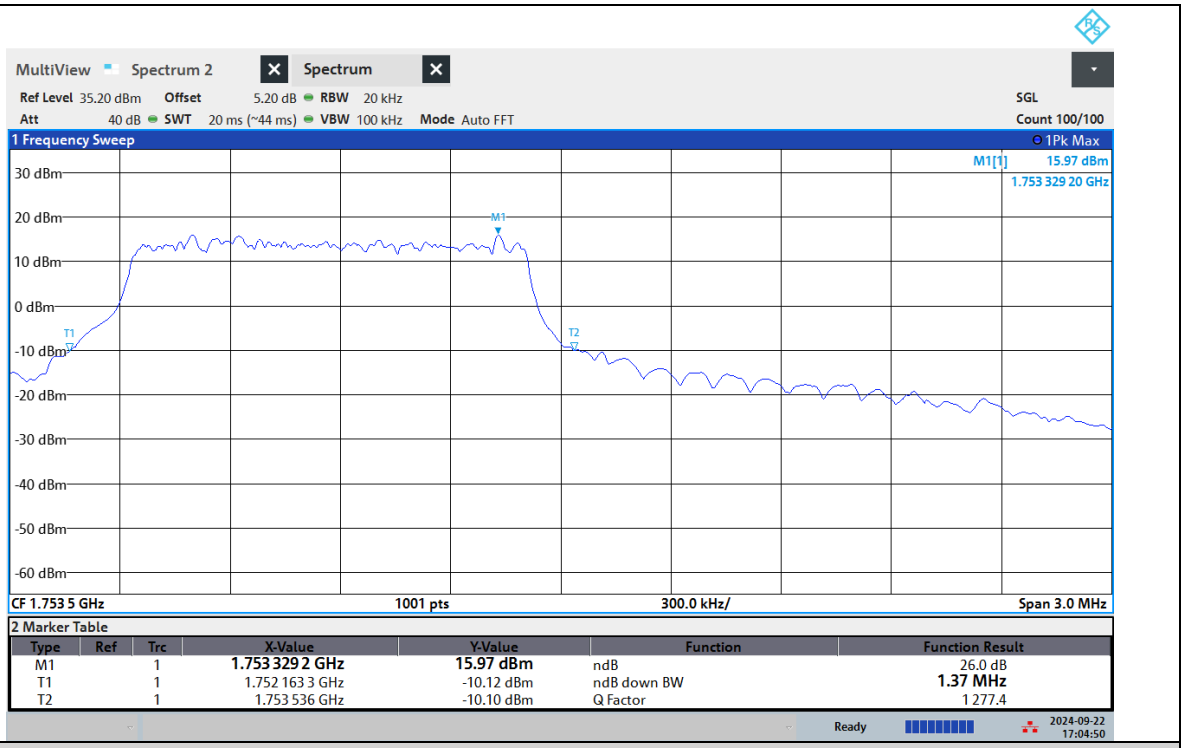

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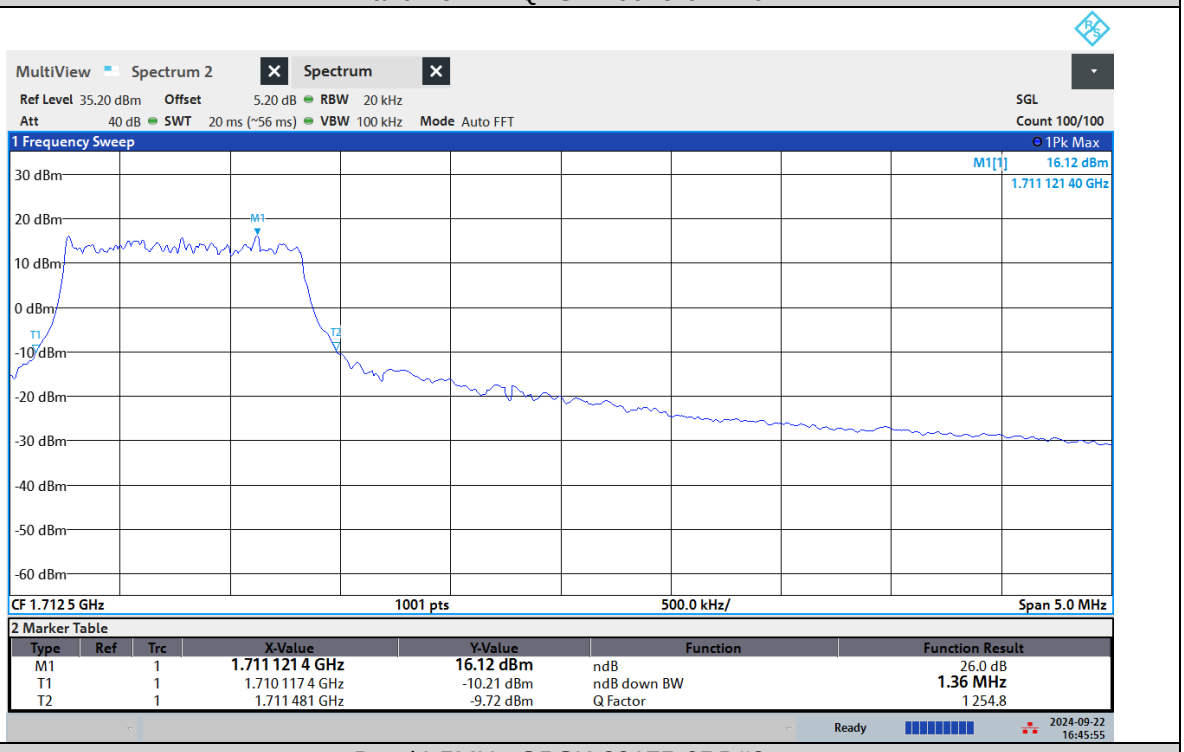

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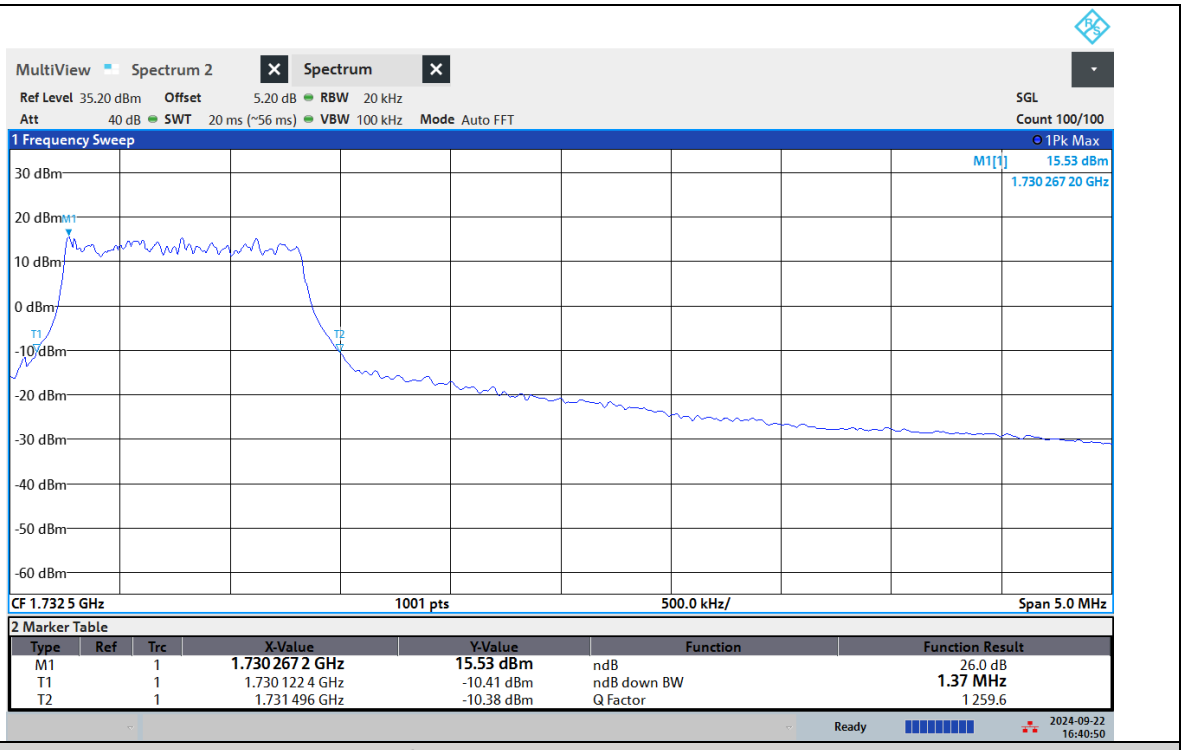

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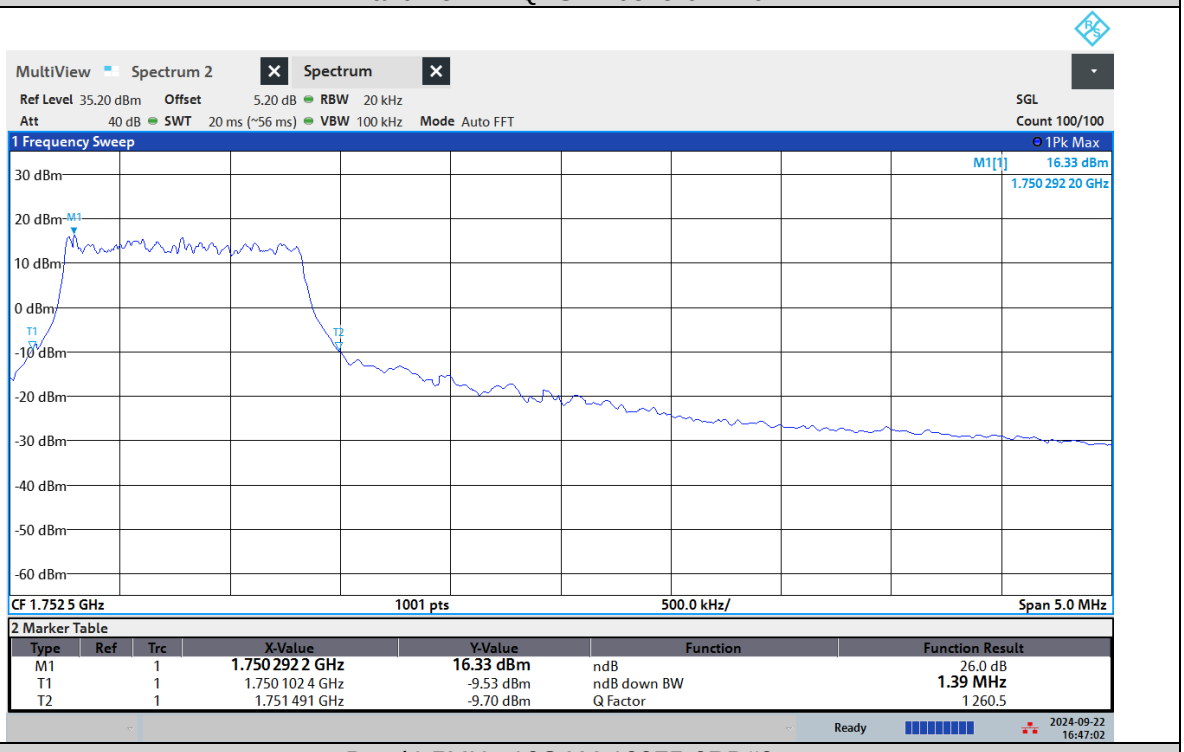

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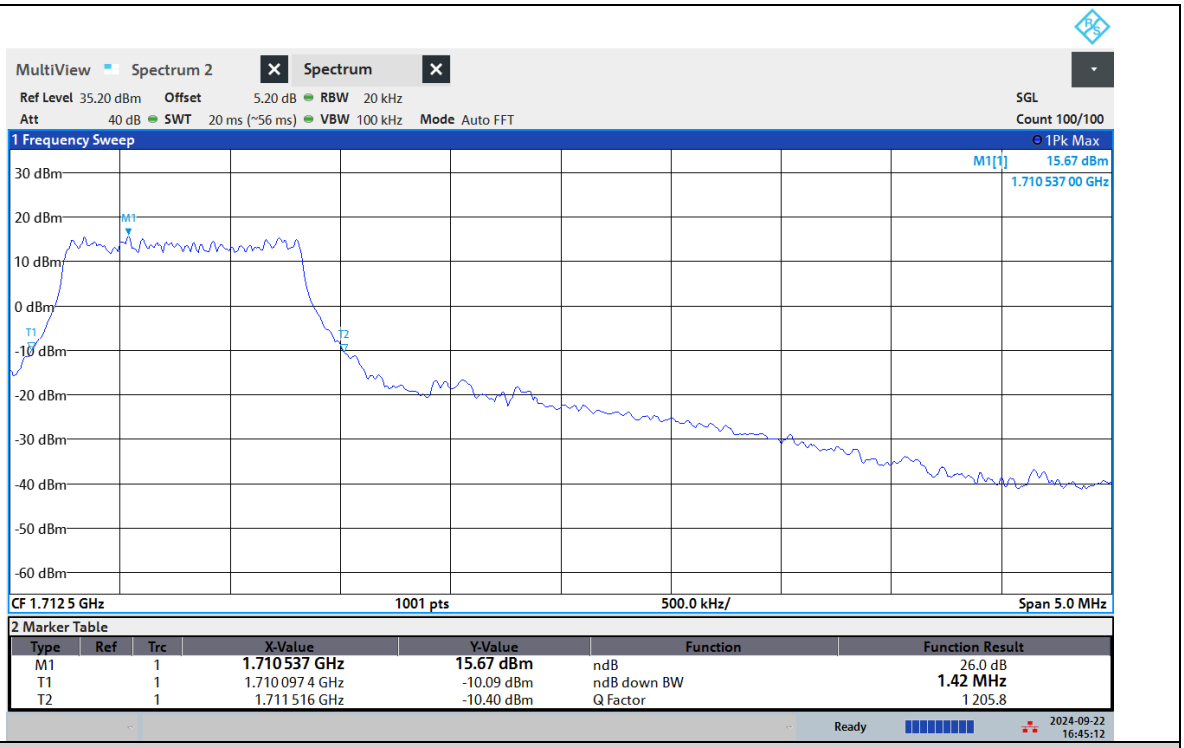

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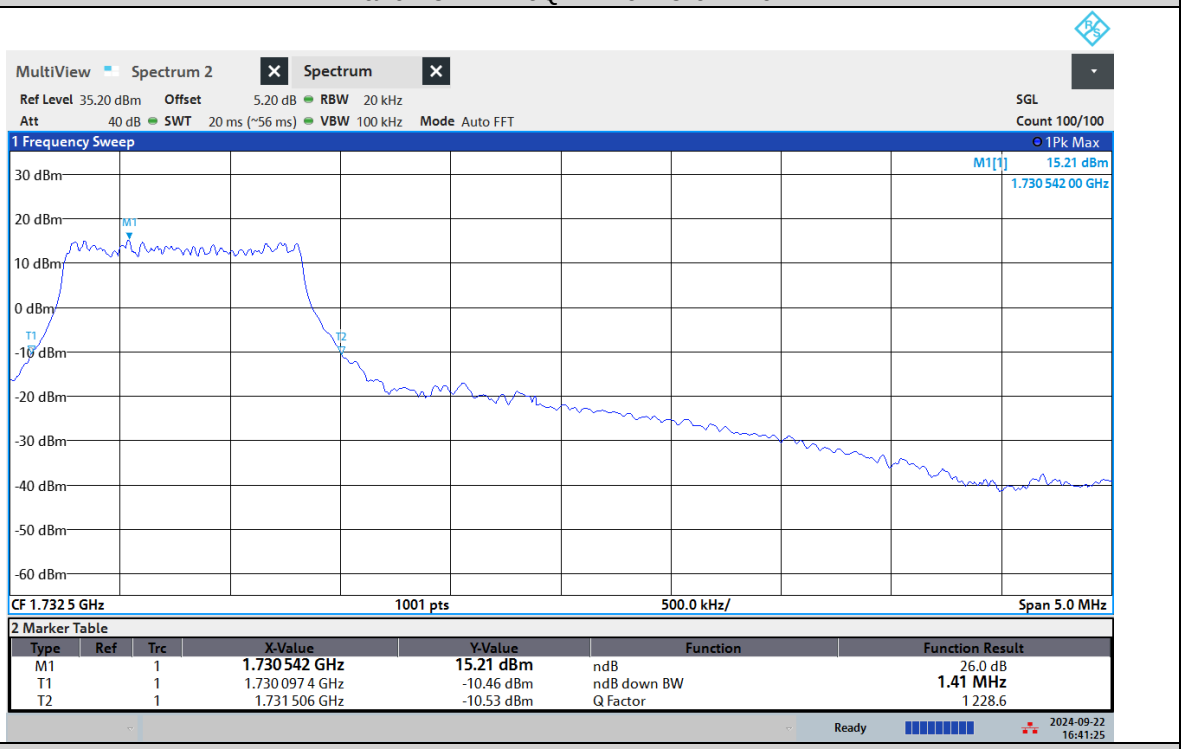

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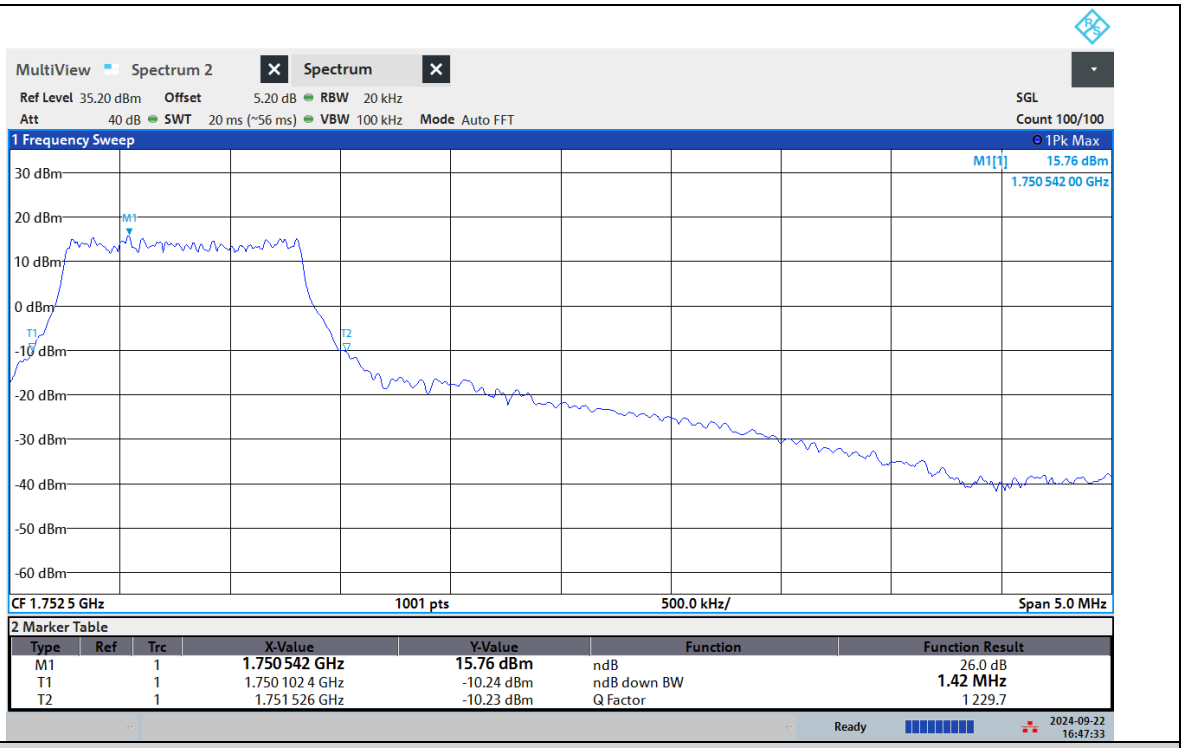

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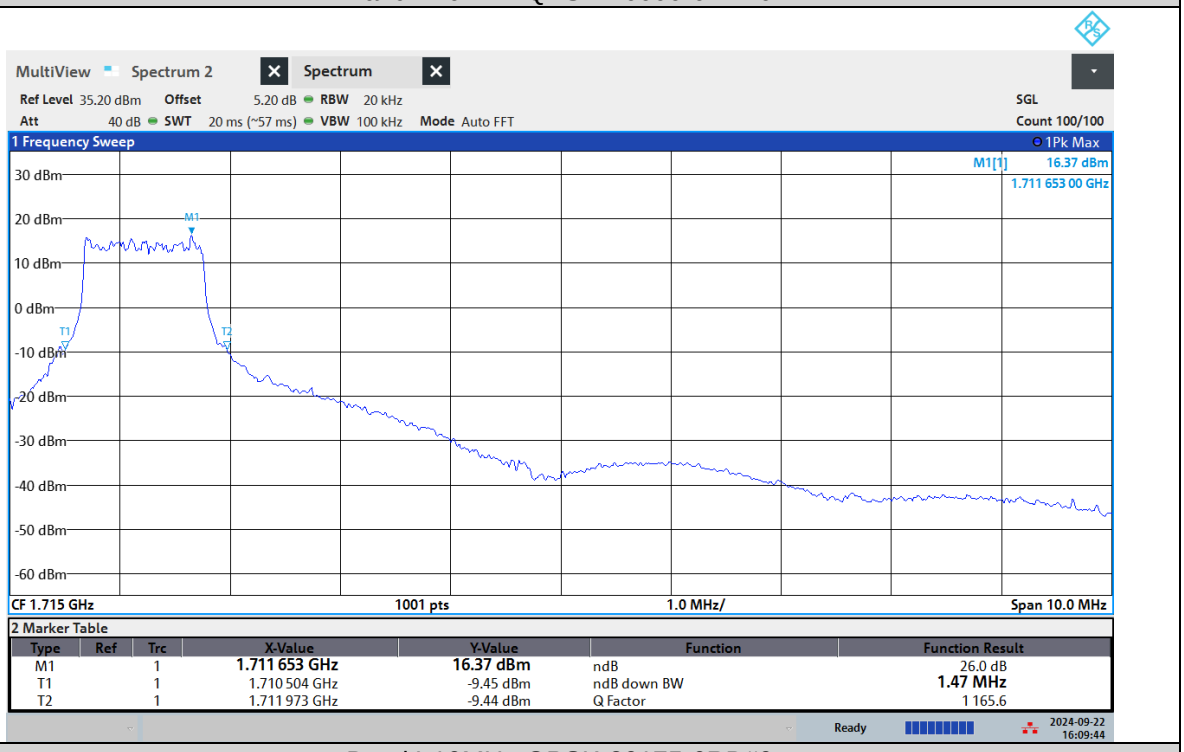

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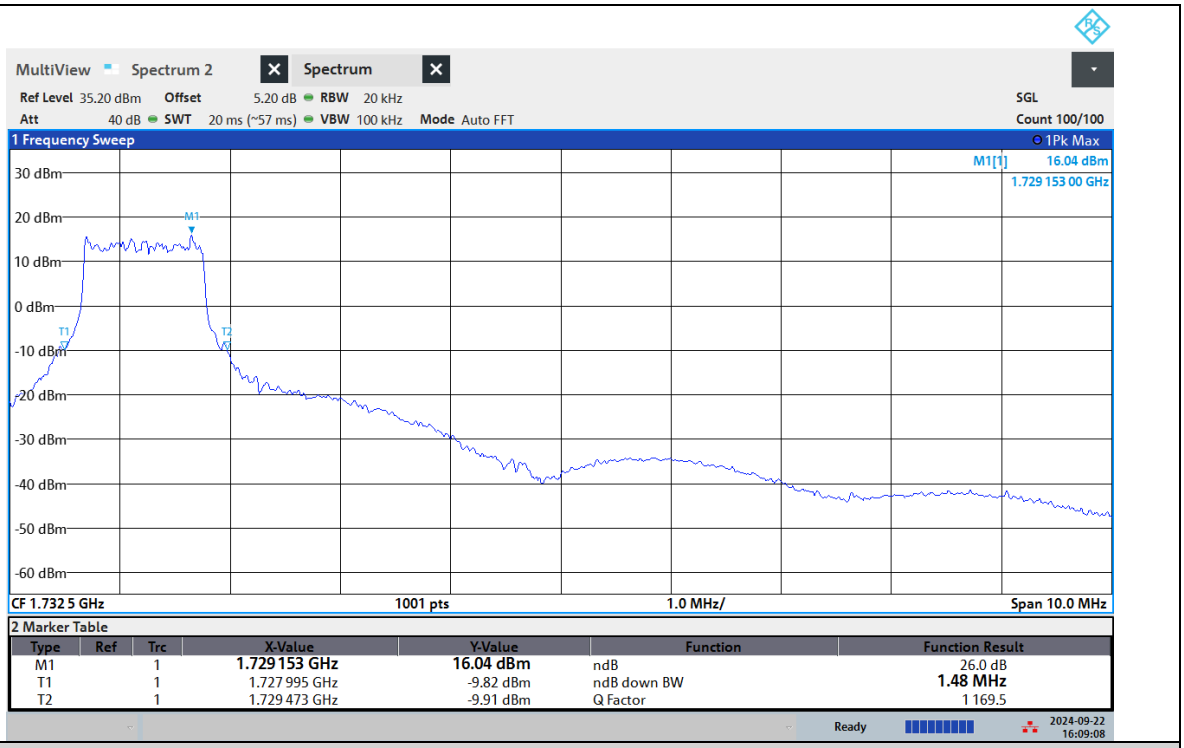

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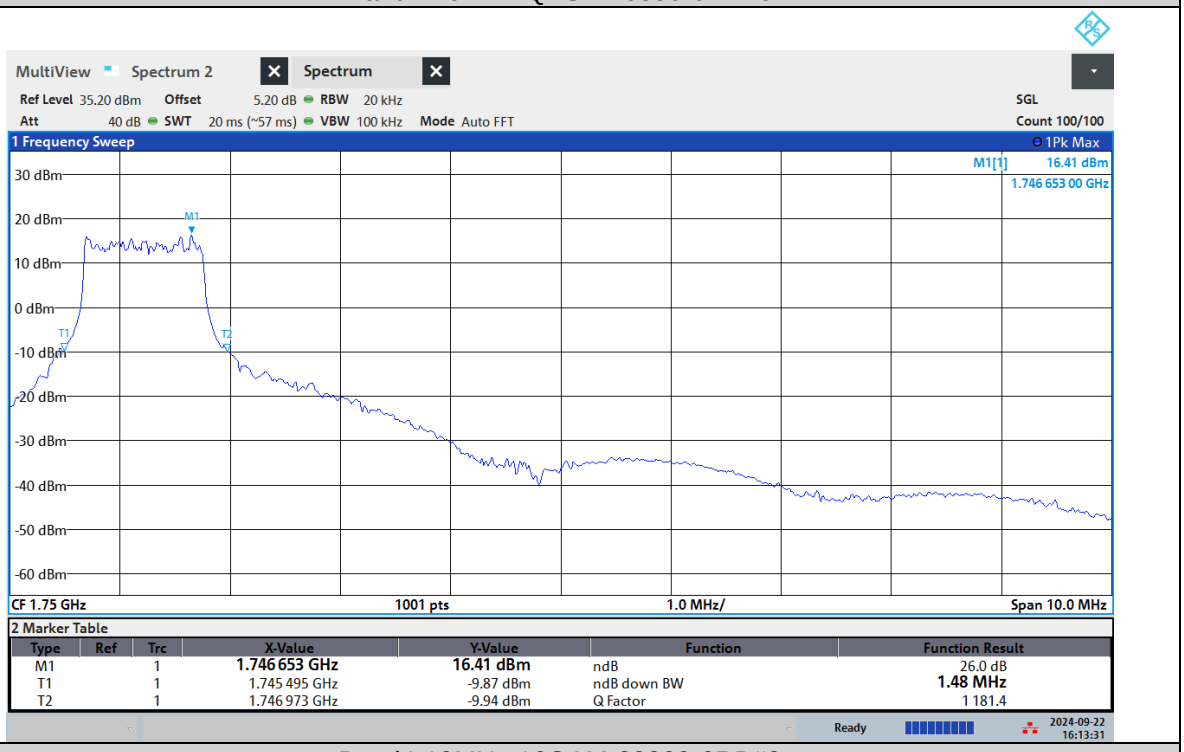

Band4-10MHz-16QAM-20000-6RB#0