



FCC PART 15C TEST REPORT

No. I22Z00641-IOT03

for

Hytera Communications Corporation Limited

PoC Mobile Radio

Model Name: MNC360

with

Hardware Version: V1.0.01.000.01

Software Version: V1.0.06.000.01

FCC ID: YAMMNC360

IC: 8913A-MNC360

Issued Date: 2022-05-11

Note:

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The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

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1. Summary of Test Report

1.1. Test Items

Product Name	PoC Mobile Radio
Model Name	MNC360
Applicant's name	Hytera Communications Corporation Limited
Manufacturer's Name	Hytera Communications Corporation Limited

1.2. Test Standards

FCC Part15-2019; ANSI C63.10-2013; RSS-247 Issue 2; RSS-Gen Issue 5.

1.3. Test Result

Pass

Please refer to "5.2.Test Results"

1.4. Testing Location

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China100191

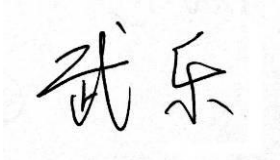
Address: No.18A, Kangding Street, Beijing Economic-Technology Development Area, Beijing,
P. R. China 100176

1.5. Project data

Testing Start Date: 2022-03-29

Testing End Date: 2022-05-11

1.6. Signature



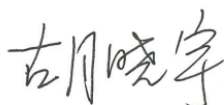
Wu Le

(Prepared this test report)



Sun Zhenyu

(Reviewed this test report)



Hu Xiaoyu

(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name: Hytera Communications Corporation Limited
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Nanshan District, Shenzhen, P.R.C., P 518057
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2.2. Manufacturer Information

Company Name: Hytera Communications Corporation Limited
Address: Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road,
Nanshan District, Shenzhen, P.R.C., P 518057
Contact Person Ruifen Huang
E-Mail Ruifen.Huang@hytera.com
Telephone: 18925250460
Fax: /

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Product Name	PoC Mobile Radio
Model Name	MNC360
Frequency Band	2400MHz~2483.5MHz
Type of Modulation	GFSK/π/4 DQPSK/8DPSK
Number of Channels	79
Antenna Type	Integrated
Antenna Gain	0.20dBi
Power Supply	13.6V DC by external power supply
FCC ID	YAMMNC360
IC	8913A-MNC360
Condition of EUT as received	No abnormality in appearance
Product Marketing Name (PMN)	Hytera
Hardware Version ID.Number (FVIN)	MNC360
Software Version ID.Number (FVIN)	N/A
Host Marketing Name (HMN)	N/A

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Shenzhen Academy of Information and Communications Technology.

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version	Receive Date
UT03aa	866346040178303	V1.0.01.000.01	V1.0.06.000.01	2022-03-28
UT11aa	866346040178394	V1.0.01.000.01	V1.0.06.000.01	2022-03-28

*EUT ID: is used to identify the test sample in the lab internally.

UT03aa is used for conduction test, UT11aa is used for radiation test.

3.3. Internal Identification of AE used during the test

AE ID*	Description	AE ID*
AE1	GPS Antenna	/
AE2	2G/3G/4G Antenna	/
AE3	DC power supply	/
AE4	Palm microphone	/

AE1

Model	DAMA1575AT41
Manufacturer	ZHANGJIAGANG FREE TRADE ZONE CAIQIN TECHNOLOGY CO.,LTD.

AE2

Model	AN1700W01
Manufacturer	/



AE3

Model ZUP60-14
Manufacturer /

AE4

Model SM16A1
Manufacturer Hytera Communications Corporation Limited

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

The Equipment under Test (EUT) is a model of PoC Mobile Radio with integrated antenna. Manual and specifications of the EUT were provided to fulfil the test. Samples undergoing test were selected by the client.



4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz	2019
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013
RSS-247	Spectrum Management and Telecommunications Radio Standards Specification Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices	Issue 2 February, 2017
RSS-Gen	Spectrum Management and Telecommunications Radio Standards Specification General Requirements for Compliance of Radio Apparatus	Issue 5 February, 2021 Amendment 2

5. Test Results

5.1. Testing Environment

Normal Temperature: 15~35°C
 Relative Humidity: 20~75%

5.2. Test Results

No	Test cases	Sub-clause of Part 15C	Sub-clause of IC	Verdict
0	Antenna Requirement	15.203	/	P
1	Maximum Peak Output Power	15.247 (b)	RSS-247 section 5.4	P
2	Band Edges Compliance	15.247 (d)	RSS-247 section 5.1	P
3	Conducted Spurious Emission	15.247 (d)	RSS-247 section 5.5/ RSS-Gen section 6.13	P
4	Radiated Spurious Emission	15.247,15.205,15.209	RSS-247 section 5.5/ RSS-Gen section 6.13	P
5	Occupied 20dB bandwidth	15.247(a)	RSS-247 section 5.1	/
6	Time of Occupancy (Dwell Time)	15.247(a)	RSS-247 section 5.1	P
7	Number of Hopping Channel	15.247(a)	RSS-247 section 5.1	P
8	Carrier Frequency Separation	15.247(a)	RSS-247 section 5.1	P
9	99% Occupied Bandwidth	/	RSS-Gen section 6.7	/

See **ANNEX A** for details.

5.3. Statements

SAICT has evaluated the test cases requested by the applicant/manufacturer as listed in section 5.2 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in section 4.2.

Disclaimer:

A. After confirmation with the customer, the sample information provided by the customer may affect the validity of the measurement results in this report, and the impact and consequences arising therefrom shall be borne by the customer.

B. The samples in this report are provided by the customer, and the test results are only applicable to the samples received.

6. Test Equipments Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Vector Signal Analyzer	FSV40	100903	Rohde & Schwarz	2022-12-29	1 year
2	Power Sensor	U2021XA	MY55430013	Keysight	2022-12-29	1 year
3	Data Acquisiton	U2531A	TW55443507	Keysight	/	/
4	RF Control Unit	JS0806-2	21C8060398	Tonscend	2023-05-08	1 year

Radiated test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Antenna	VULB9163	01176	Schwarzbeck	2022-11-15	1 year
2	Loop Antenna	HFH2-Z2	829324/007	Schwarzbeck	2022-12-22	1 year
3	Receiver	ESU26	100376	R&S	2022-09-15	1 year
4	Antenna	3117	00139065	ETS-Lindgren	2022-09-13	1 year
6	Bluetooth Tester	CMW500	101042	R&S	2022-12-23	1 year

Test software

No.	Equipment	Manufacturer	Version
1	JS1120-3	Tonscend	2.6
2	EMC32	Rohde & Schwarz	V8.53.0

EUT is engineering software provided by the customer to control the transmitting signal. The EUT was programmed to be in continuously transmitting mode.

Anechoic chamber

Fully anechoic chamber by ETS-Lindgren

7. Laboratory Environment

Semi/Full-anechoic chamber

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz > 60 dB; 1MHz-18000MHz > 90 dB
Electrical insulation	> 2M Ω
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< \pm 4 dB, 3 m distance, from 30 to 1000 MHz
Voltage Standing Wave Ratio (VSWR)	\leq 6 dB, from 1 to 18 GHz, 3 m distance

Shielded room

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz > 60 dB; 1MHz-1000MHz > 90 dB
Electrical insulation	> 2M Ω
Ground system resistance	< 4 Ω

8. Measurement Uncertainty

Test Name	Uncertainty ($k=2$)	
1. Maximum Peak Output Power	1.32dB	
2. Band Edges Compliance	1.92dB	
3. Transmitter Spurious Emission - Conducted	30MHz≤f<1GHz	1.41dB
	1GHz≤f<7GHz	1.92dB
	7GHz≤f<13GHz	2.31dB
	13GHz≤f≤26GHz	2.61dB
4.. Transmitter Spurious Emission - Radiated	9kHz≤f<30MHz	4.49dB
	30MHz≤f<1GHz	5.73dB
	1GHz≤f<18GHz	5.58dB
	18GHz≤f≤40GHz	3.37dB
5. 20dB Bandwidth	4.56kHz	
6. Time of Occupancy (Dwell Time) & Number of Hopping Channels	0.58ms	
7. Carrier Frequency Separation	4.56kHz	
8. 99% Occupied Bandwidth	4.56kHz	

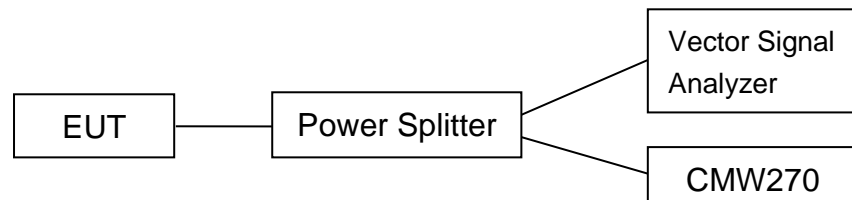
ANNEX A: Detailed Test Results

Test Configuration

The measurement is made according to ANSI C63.10.

1) Conducted Measurements

1. Connect the EUT to the test system correctly.
2. Set the EUT to the required work mode.
3. Set the EUT to the required channel.
4. Set the EUT hopping mode (hopping on or hopping off).
5. Set the spectrum analyzer to start measurement.
6. Record the values.

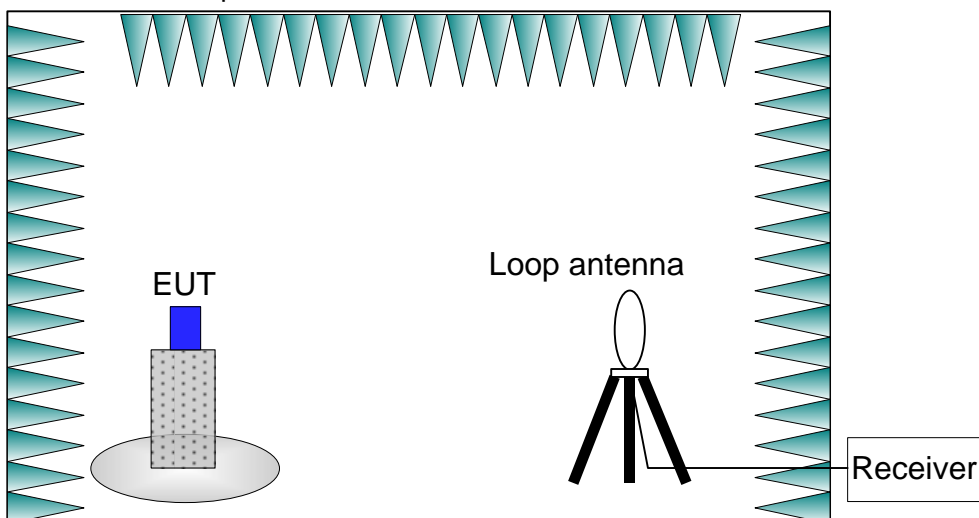


2) Radiated Measurements

Test setup:

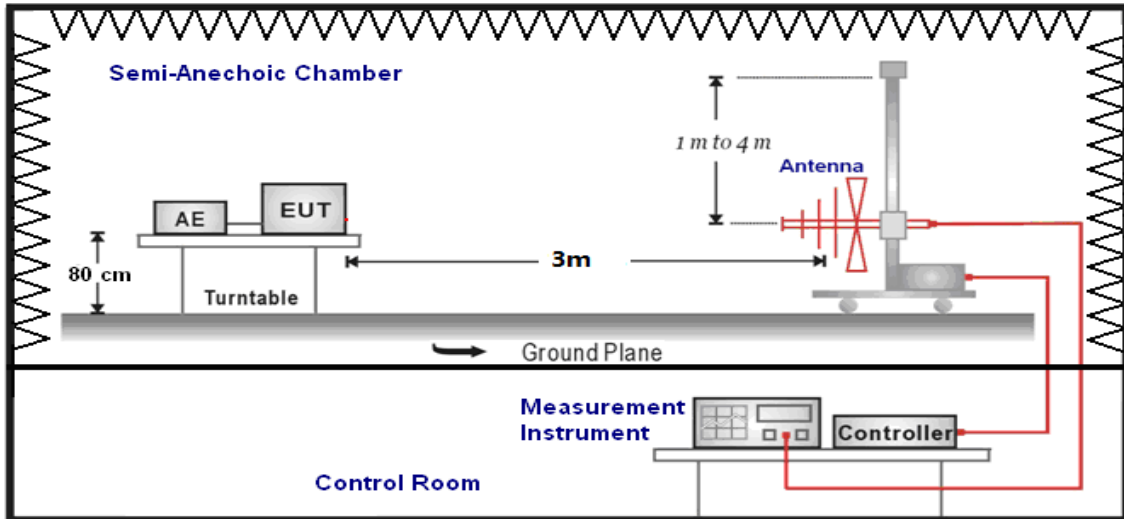
9kHz-30MHz:

The EUT are measured in a semi-anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 3m from the receiving antenna. The center of the receiving loop antenna is 1.0 meter above the ground. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the receiver antenna polarization.



30MHz-1GHz:

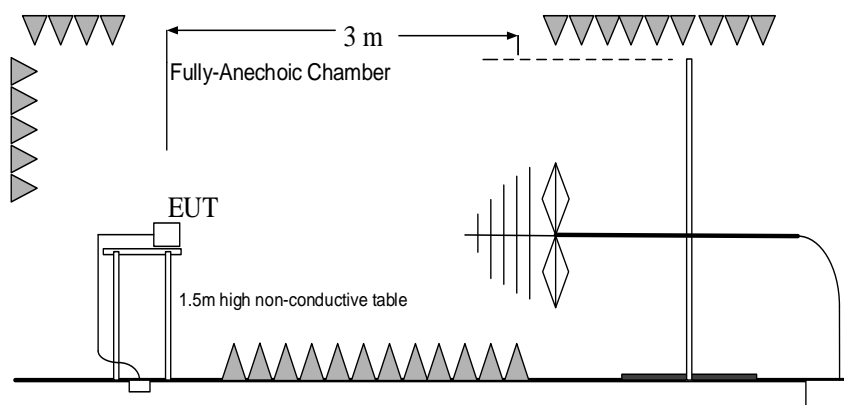
The EUT are measured in a semi-anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 3m from the receiving antenna. The center of the receiving antenna is 1.0 meter to 4.0 meter above the ground. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the receiver antenna polarization.



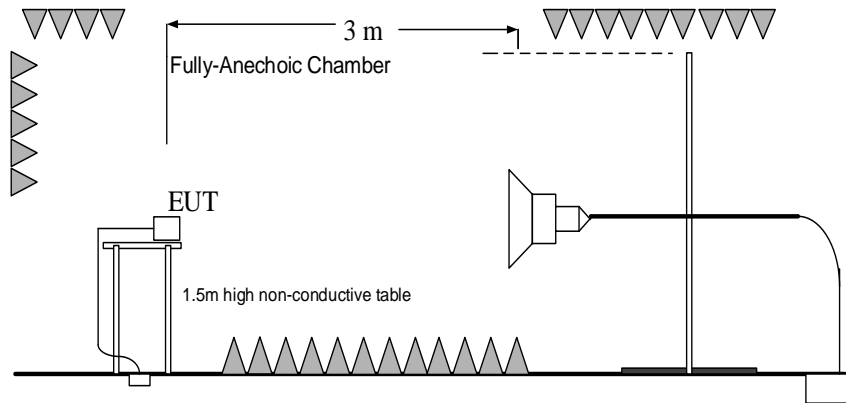
Above 1GHz:

EUT was placed on a 1.5 meter high non-conductive table at a 3 meter test distance from the receive antenna. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the receiving antenna polarization.

1GHz-3GHz:



3GHz-40GHz:



A.0 Antenna requirement

Measurement Limit:

Standard	Requirement
FCC CRF Part 15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

**Conclusion: The Directional gains of antenna used for transmitting is 0.20dBi.
The RF transmitter uses an integrate antenna without connector.**

A.1 Maximum Peak Output Power

Method of Measurement: See ANSI C63.10-clause 7.8.5.

A peak responding power meter may be used, where the power meter and sensor system video bandwidth is greater than the occupied bandwidth of the unlicensed wireless device, rather than a spectrum analyzer.

Measurement Limit:

Standard	Limit (dBm)	E.I.R.P Limit (dBm)
FCC CRF Part 15.247(b)& RSS-247 Section 5.4	< 30	< 36

Measurement Results:

Mode	Peak Conducted Output Power (dBm)		
	2402MHz (Ch0)	2441MHz (Ch39)	2480MHz (Ch78)
GFSK	6.18	7.02	6.19
$\pi/4$ DQPSK	7.50	8.29	7.41
8DPSK	8.03	8.78	7.83

The E.I.R.P Results are listed below:

Mode	E.I.R.P (dBm)		
	2402MHz (Ch0)	2441MHz (Ch39)	2480MHz (Ch78)
GFSK	6.38	7.22	6.39
$\pi/4$ DQPSK	7.70	8.49	7.61
8DPSK	8.23	8.98	8.03

Note: E.I.R.P value = Conducted values (with conducted samples) + Antenna Gain.

Conclusion: Pass

A.2 Band Edges Compliance

Measurement Limit:

Standard	Limit (dBm)
FCC 47 CFR Part 15.247 (d) & RSS-247 Section 5.1	> 20

Measurement Result:

Mode	Channel	Hopping	Test Results	Conclusion
GFSK	0	ON	Fig.1	P
	78	ON	Fig.2	P
$\pi/4$ DQPSK	0	ON	Fig.3	P
	78	ON	Fig.4	P
8DPSK	0	ON	Fig.5	P
	78	ON	Fig.6	P

Mode	Channel	Hopping	Test Results	Conclusion
GFSK	0	OFF	Fig.7	P
	78	OFF	Fig.8	P
$\pi/4$ DQPSK	0	OFF	Fig.9	P
	78	OFF	Fig.10	P
8DPSK	0	OFF	Fig.11	P
	78	OFF	Fig.12	P

See below for test graphs.

Conclusion: Pass

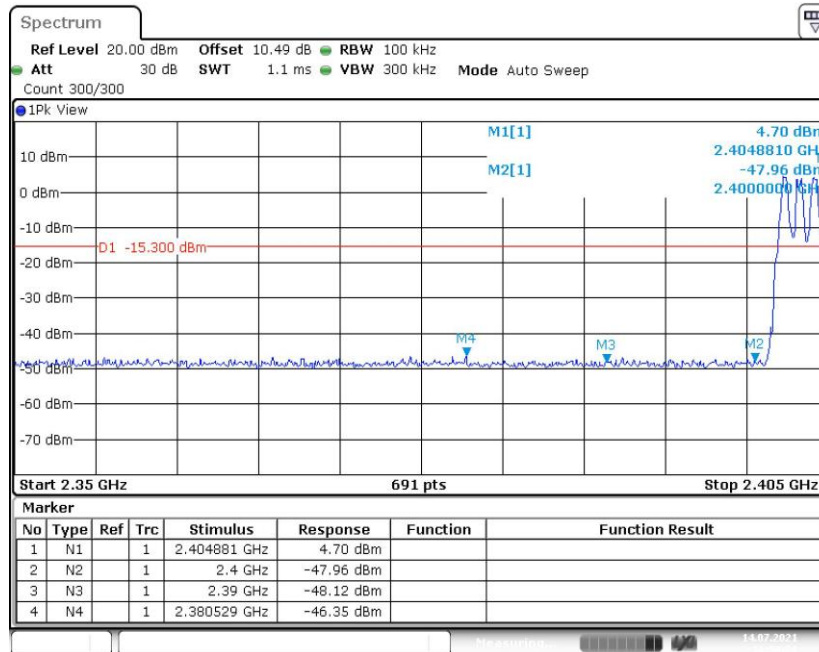


Fig. 1 Band Edges (GFSK, CH0, Hopping ON)

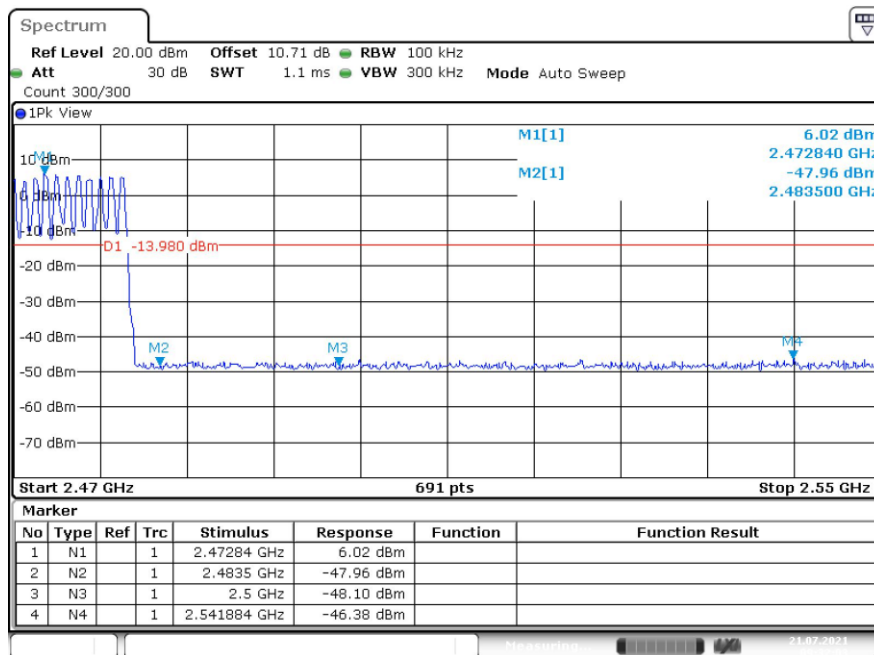


Fig. 2 Band Edges (GFSK, CH78, Hopping ON)

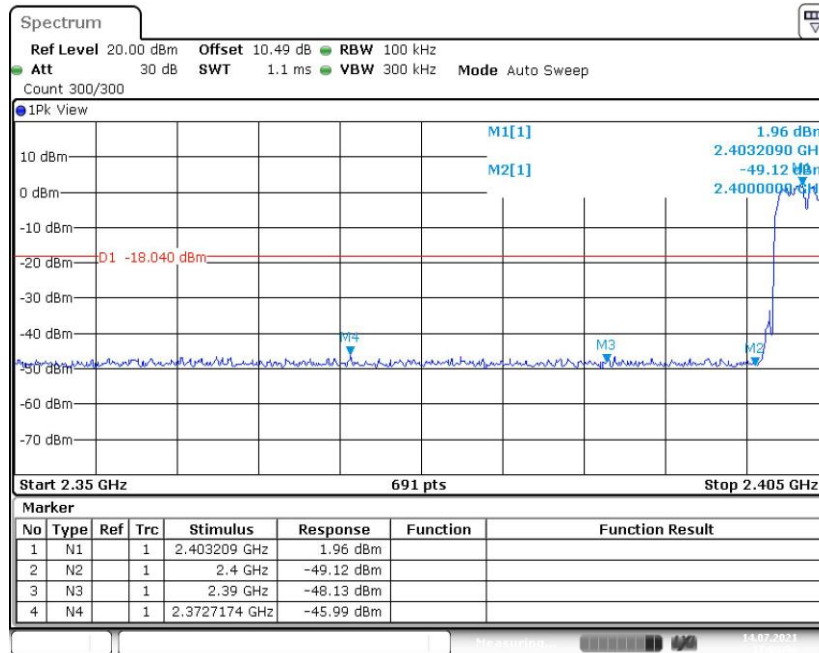


Fig. 3 Band Edges ($\pi/4$ DQPSK, CH0, Hopping ON)

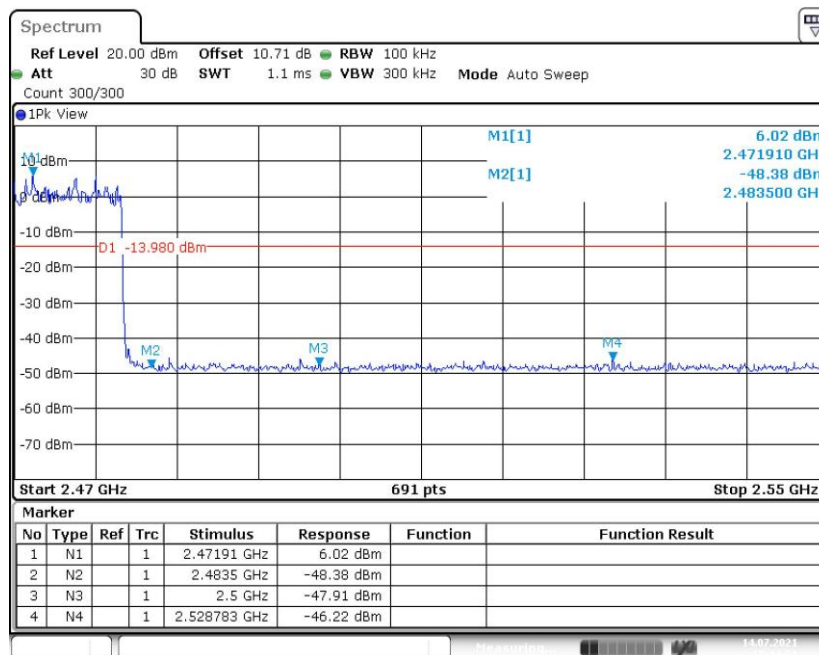


Fig. 4 Band Edges ($\pi/4$ DQPSK, CH78, Hopping ON)

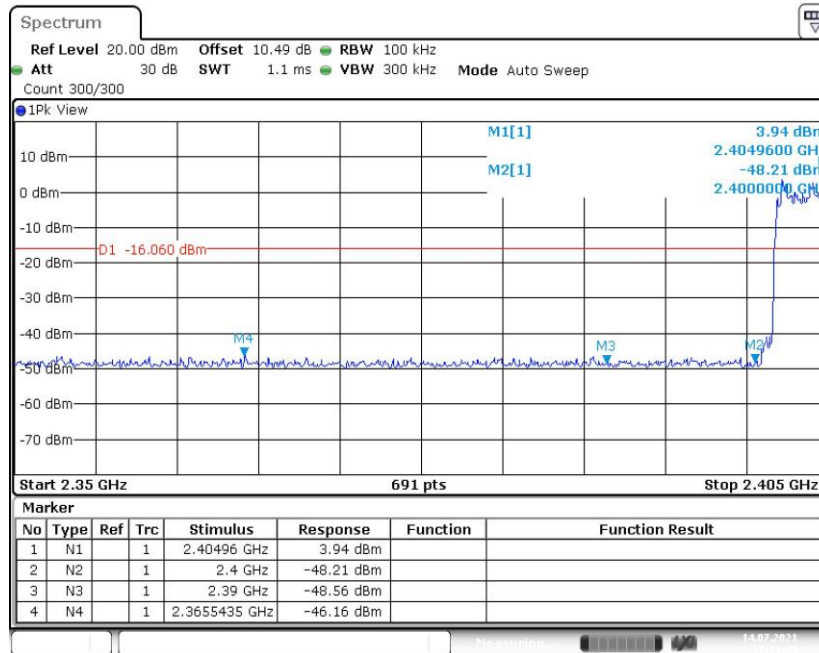


Fig. 5 Band Edges (8DPSK, CH0, Hopping ON)

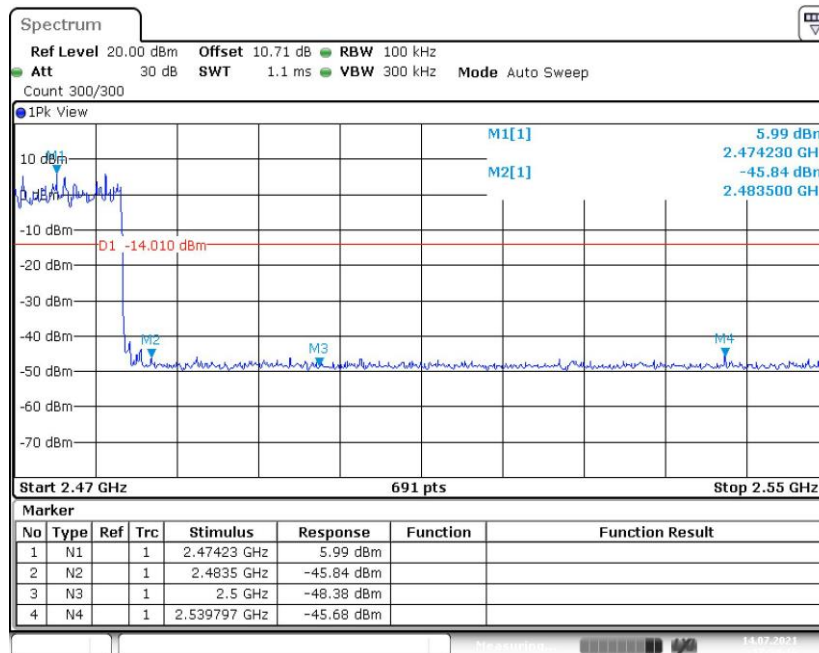


Fig. 6 Band Edges (8DPSK, CH78, Hopping ON)

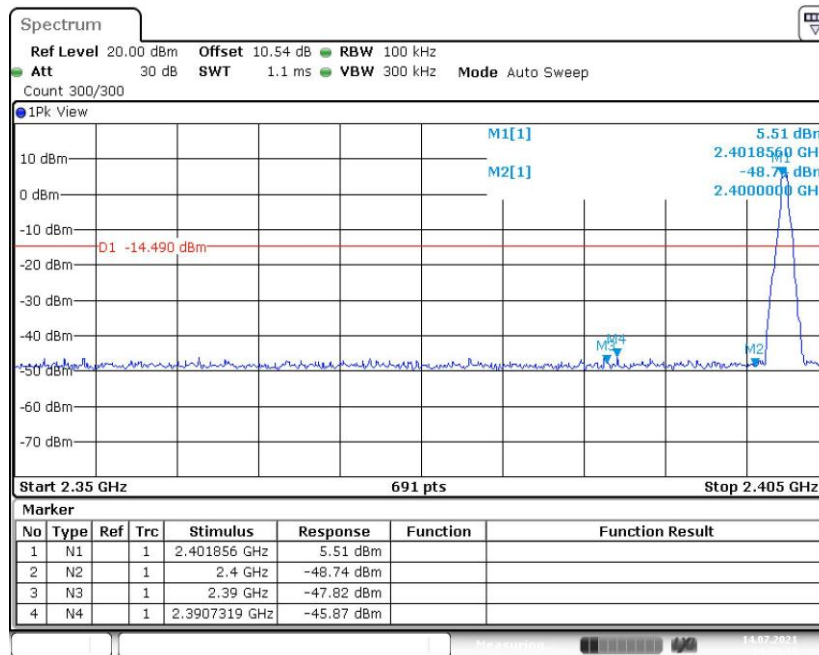


Fig. 7 Band Edges (GFSK, CH0, Hopping OFF)

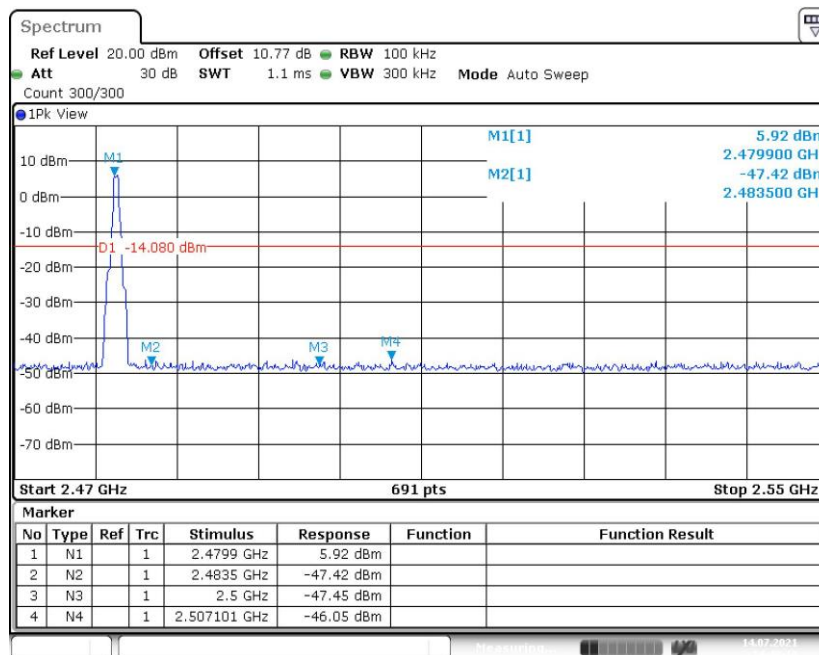


Fig. 8 Band Edges (GFSK, CH78, Hopping OFF)

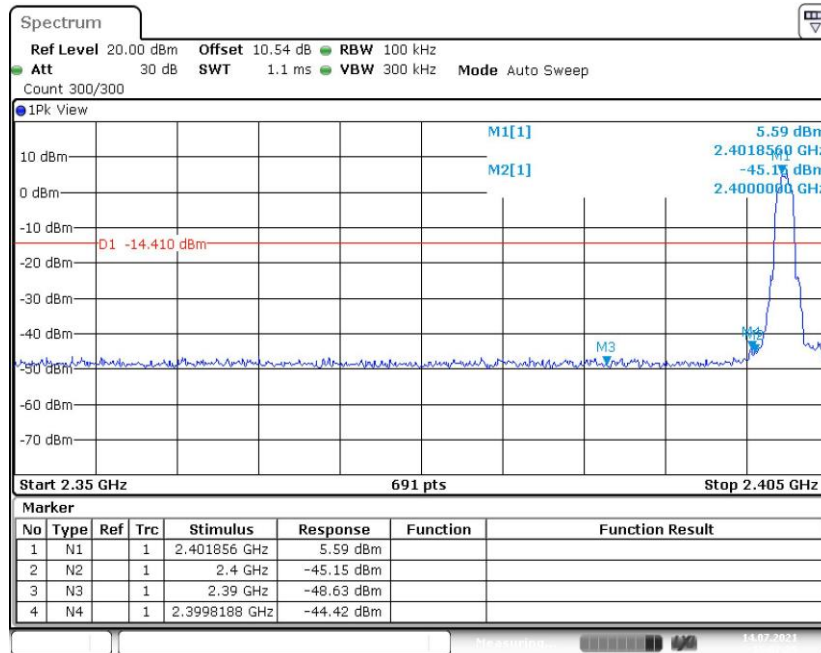


Fig. 9 Band Edges ($\pi/4$ DQPSK, CH0, Hopping OFF)

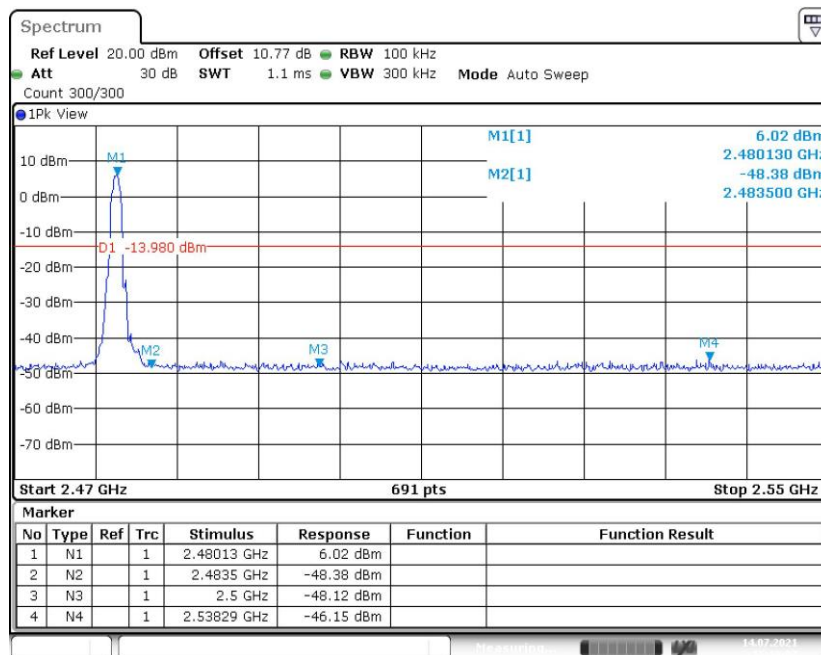


Fig. 10 Band Edges ($\pi/4$ DQPSK, CH78, Hopping OFF)

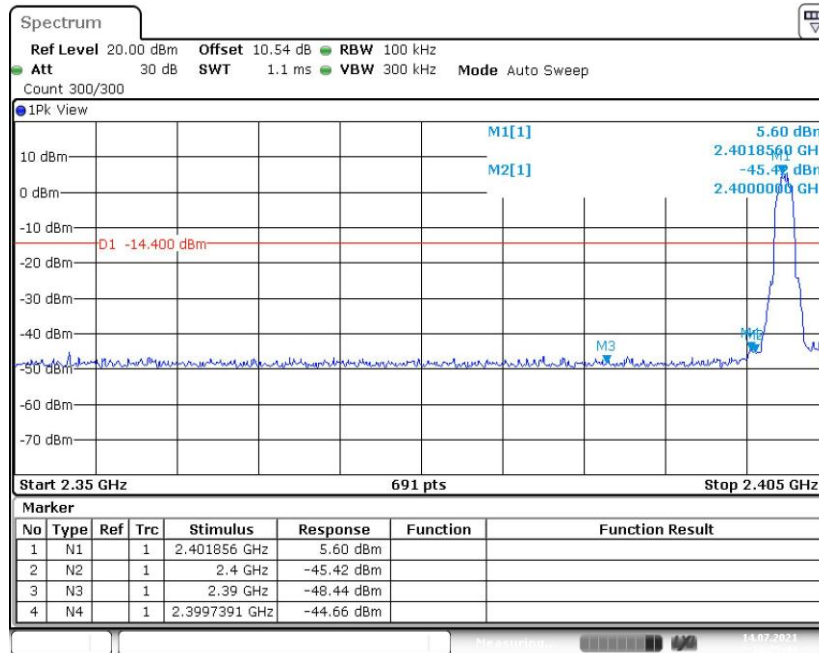


Fig. 11 Band Edges (8DPSK, CH0, Hopping OFF)

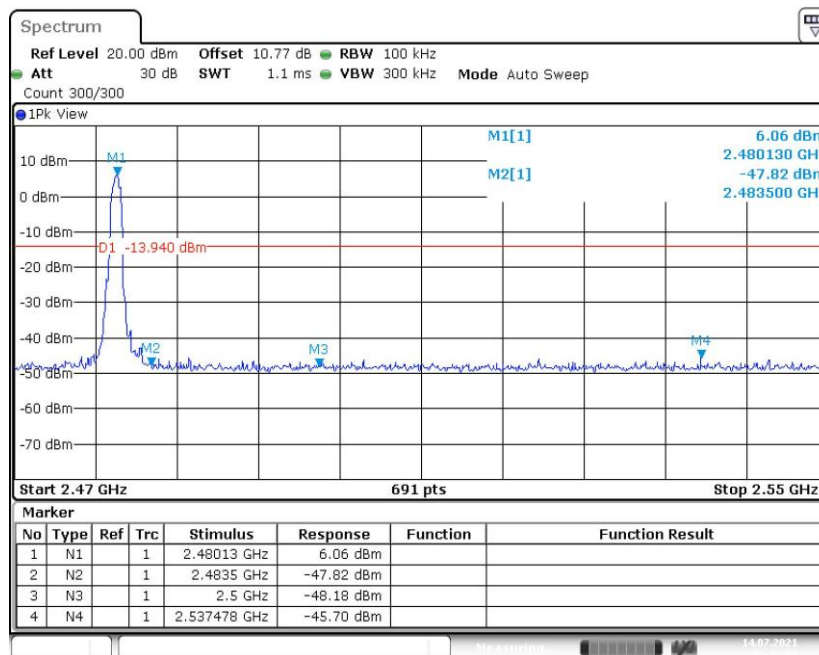


Fig. 12 Band Edges (8DPSK, CH78, Hopping OFF)

A.3 Conducted Emission

Measurement Limit:

Standard	Limit (dBm)
FCC 47 CFR Part 15.247 (d) & RSS-247 section 5.5/RSS-Gen section 6.13	20dBm below peak output power in 100 kHz bandwidth

Measurement Results:

MODE	Channel	Frequency Range	Test Results	Conclusion
GFSK	0	2.402 GHz	Fig.13	P
		30MHz -1GHz	Fig.14	P
		1GHz-26.5GHz	Fig.15	P
	39	2.441 GHz	Fig.16	P
		30MHz -1GHz	Fig.17	P
		1GHz-26.5GHz	Fig.18	P
	78	2.480 GHz	Fig.19	P
		30MHz -1GHz	Fig.20	P
		1GHz-26.5GHz	Fig.21	P
$\pi/4$ DQPSK	0	2.402 GHz	Fig.22	P
		30MHz -1GHz	Fig.23	P
		1GHz-26.5GHz	Fig.24	P
	39	2.441 GHz	Fig.25	P
		30MHz -1GHz	Fig.26	P
		1GHz-26.5GHz	Fig.27	P
	78	2.480 GHz	Fig.28	P
		30MHz -1GHz	Fig.29	P
		1GHz-26.5GHz	Fig.30	P
8DPSK	0	2.402 GHz	Fig.31	P
		30MHz -1GHz	Fig.32	P
		1GHz-26.5GHz	Fig.33	P
	39	2.441 GHz	Fig.34	P
		30MHz -1GHz	Fig.35	P
		1GHz-26.5GHz	Fig.36	P
	78	2.480 GHz	Fig.37	P
		30MHz -1GHz	Fig.38	P
		1GHz-26.5GHz	Fig.39	P

See below for test graphs.

Conclusion: Pass

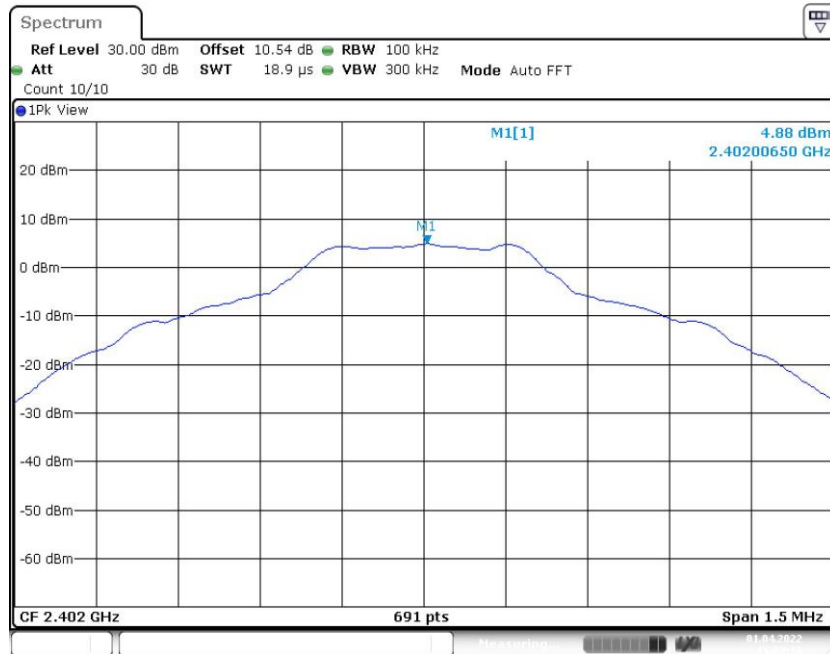


Fig. 13 Conducted Spurious Emission (GFSK, CH0, 2.402GHz)

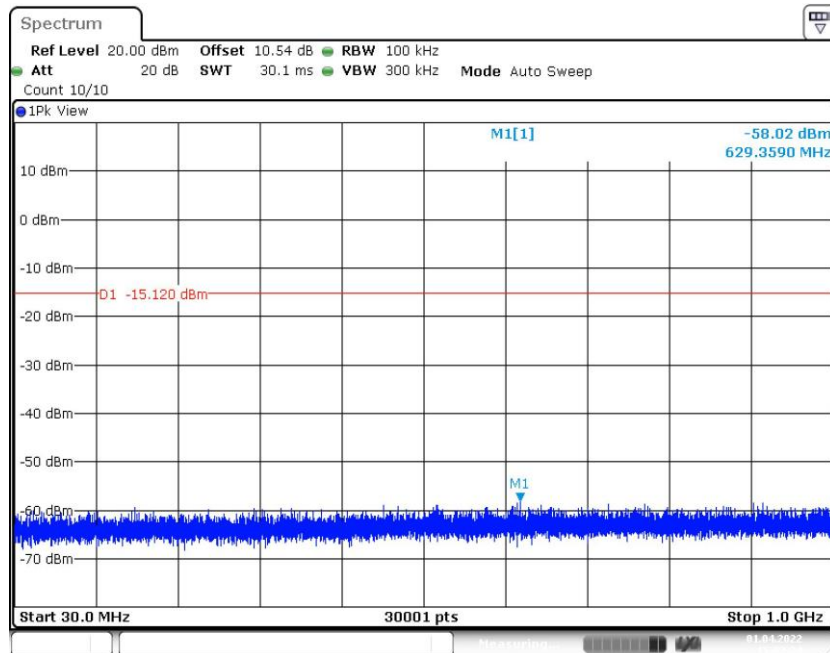


Fig. 14 Conducted Spurious Emission (GFSK, CH0, 30MHz -1GHz)

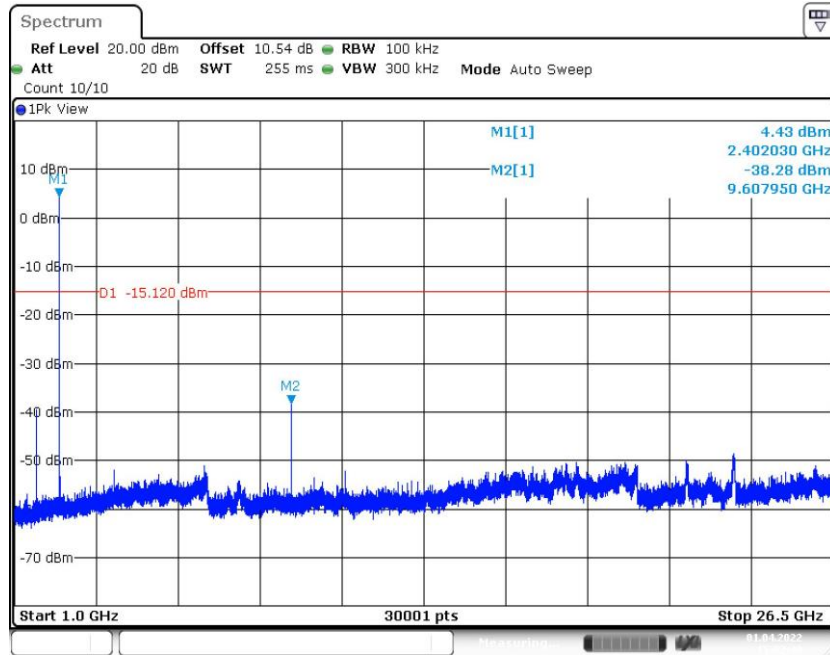


Fig. 15 Conducted Spurious Emission (GFSK, CH0, 1GHz-26.5GHz)

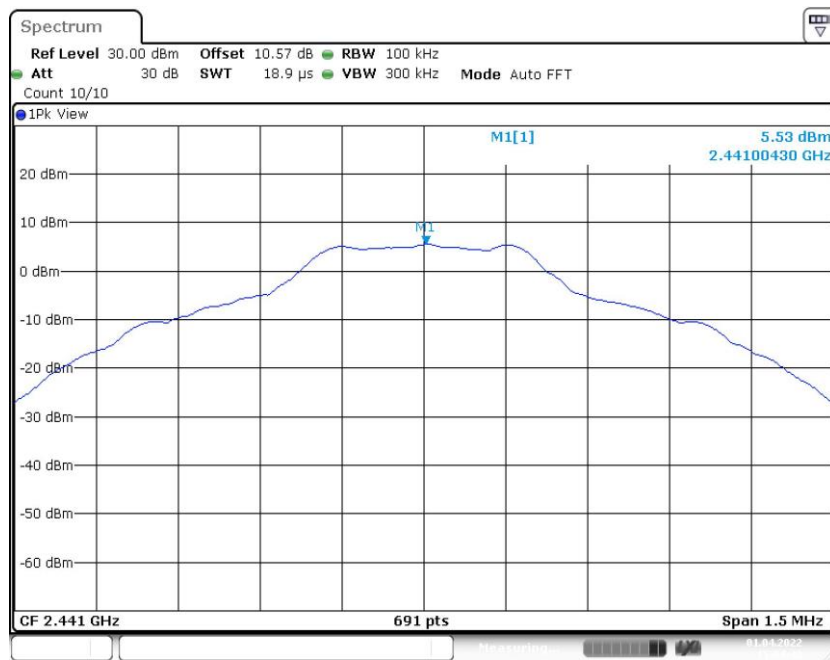


Fig. 16 Conducted Spurious Emission (GFSK, CH39, 2.441GHz)

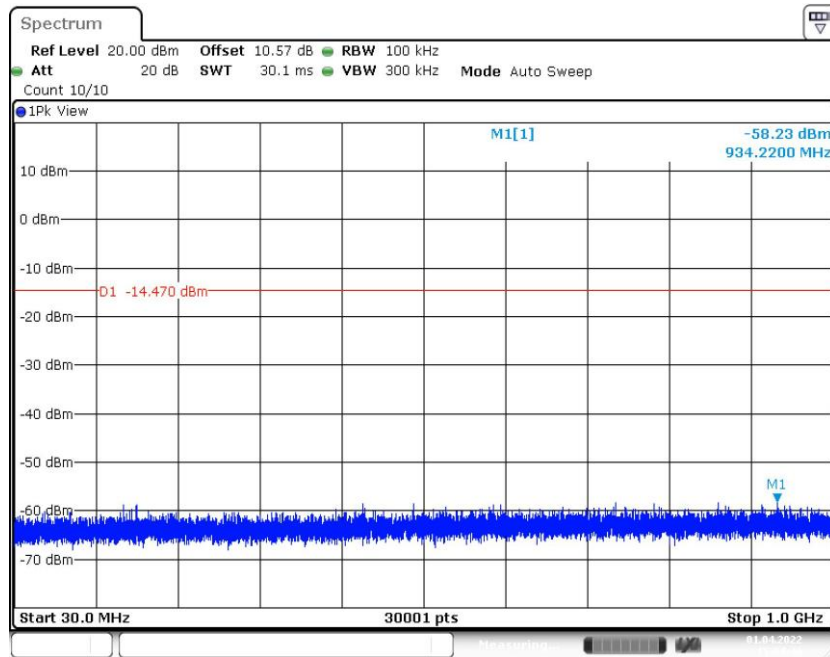


Fig. 17 Conducted Spurious Emission (GFSK, CH39, 30MHz -1GHz)

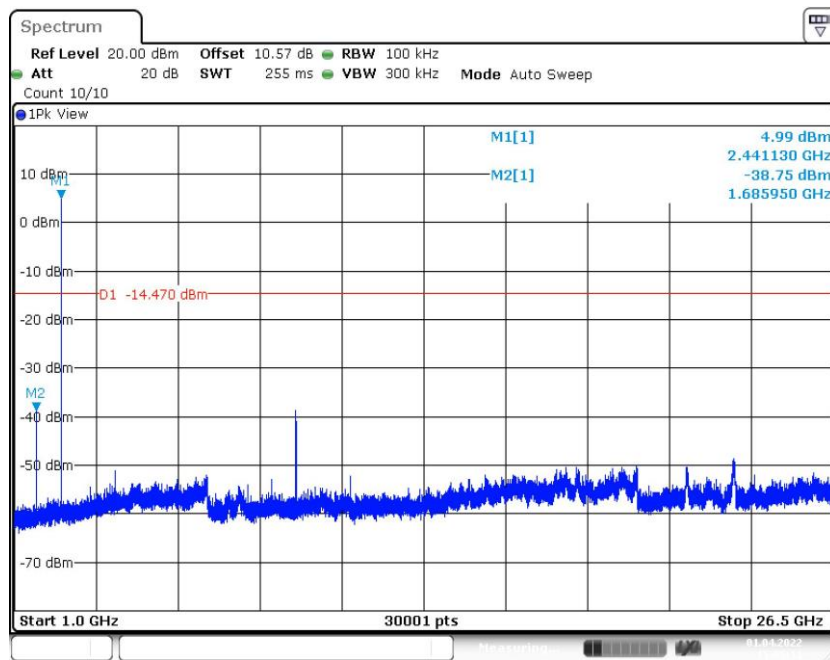


Fig. 18 Conducted Spurious Emission (GFSK, CH39, 1GHz-26.5GHz)

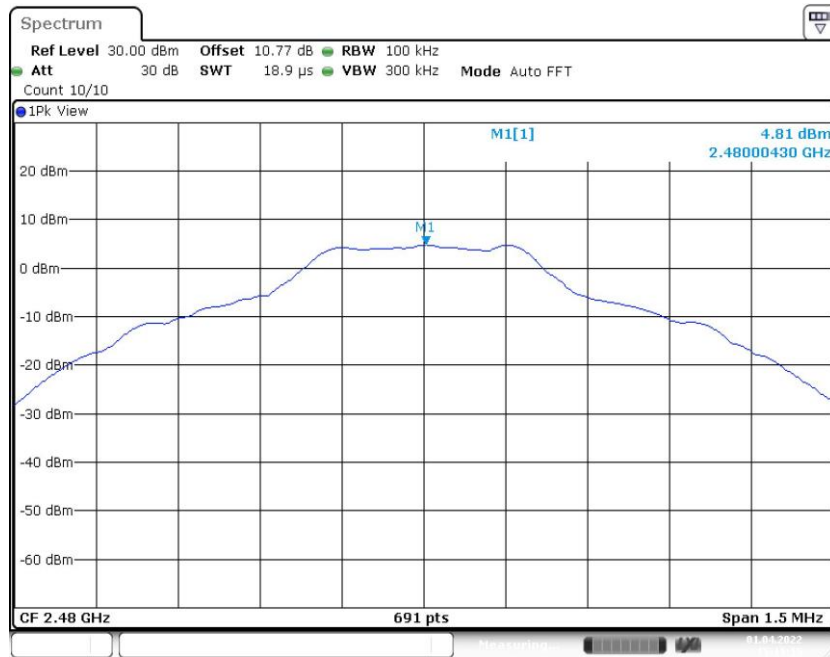


Fig. 19 Conducted Spurious Emission (GFSK, CH78, 2.480GHz)

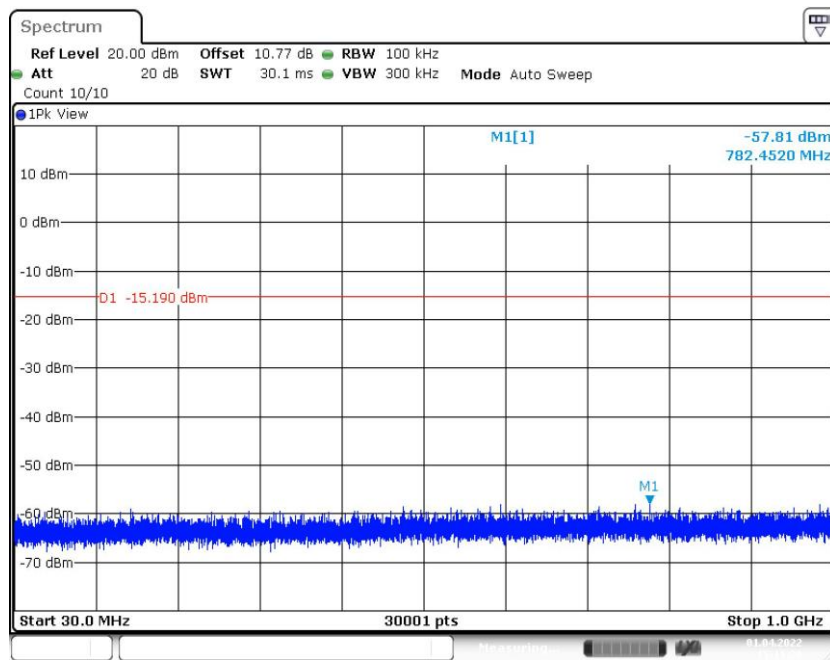


Fig. 20 Conducted Spurious Emission (GFSK, CH78, 30MHz -1GHz)

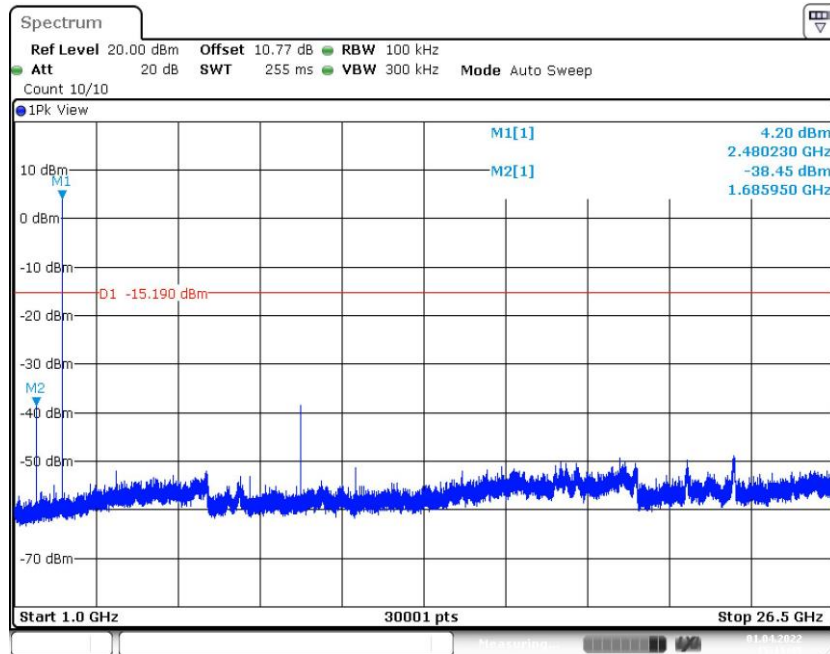


Fig. 21 Conducted Spurious Emission (GFSK, CH78, 1GHz-26.5GHz)

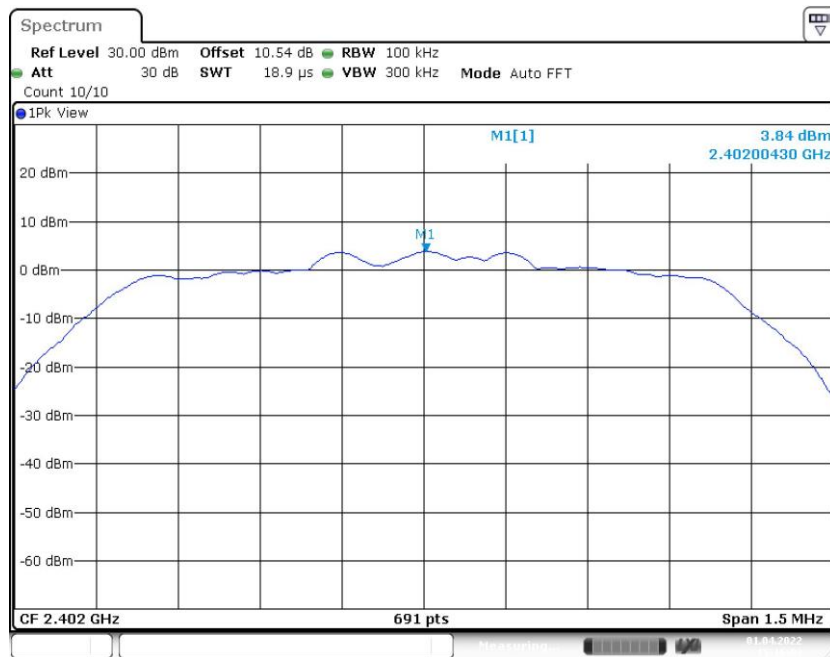


Fig. 22 Conducted Spurious Emission ($\pi/4$ DQPSK, CH0, 2.402GHz)

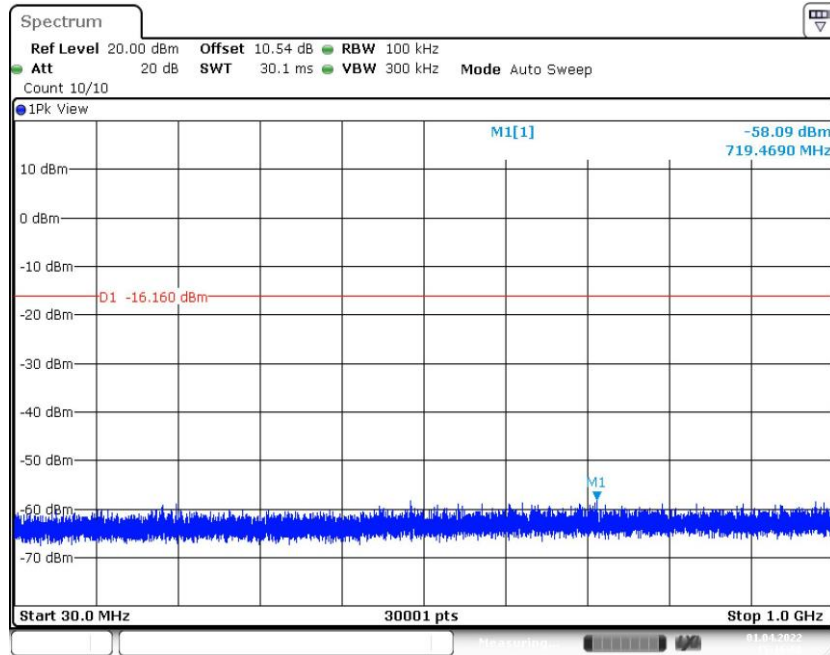


Fig. 23 Conducted Spurious Emission ($\pi/4$ DQPSK, CH0, 30MHz -1GHz)

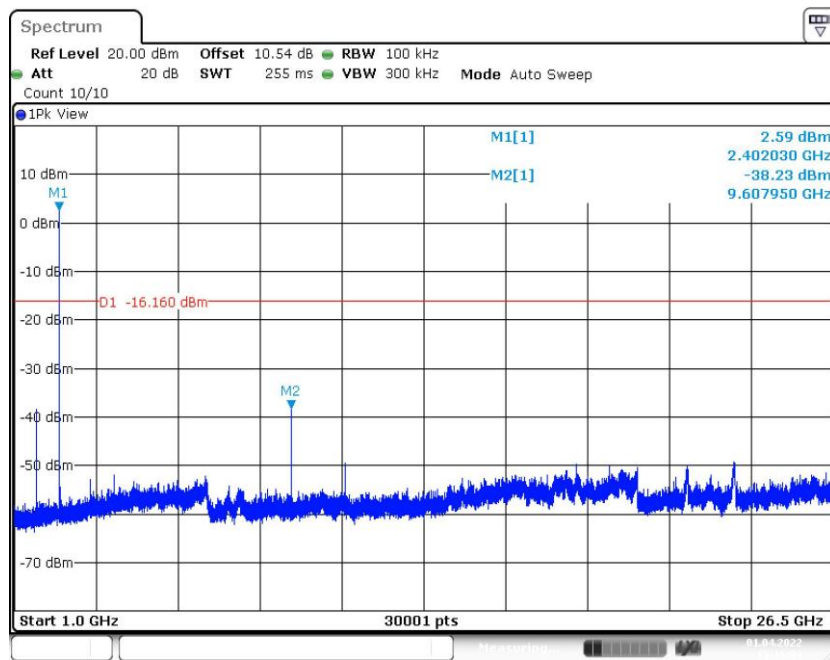


Fig. 24 Conducted Spurious Emission ($\pi/4$ DQPSK, CH0, 1GHz-26.5GHz)

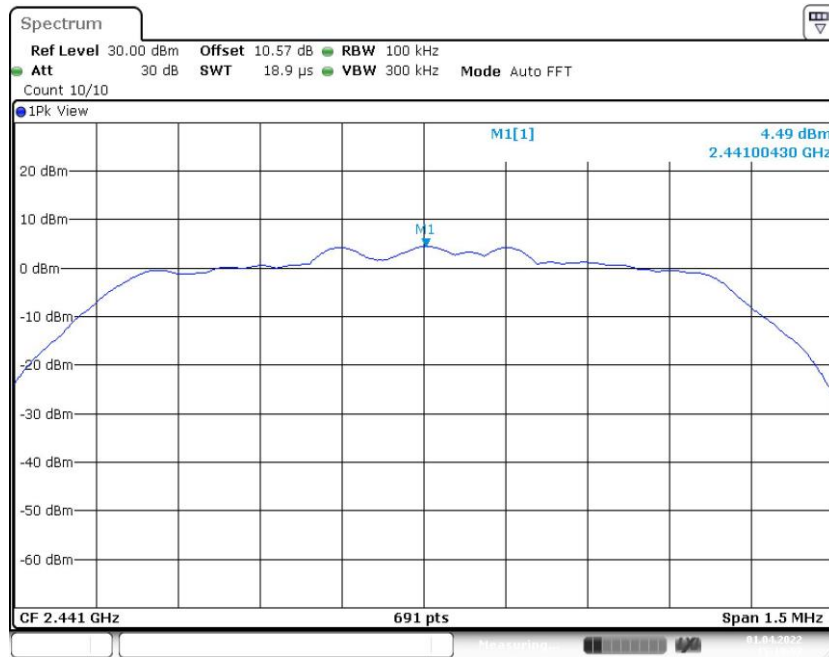


Fig. 25 Conducted Spurious Emission ($\pi/4$ DQPSK, CH39, 2.441GHz)

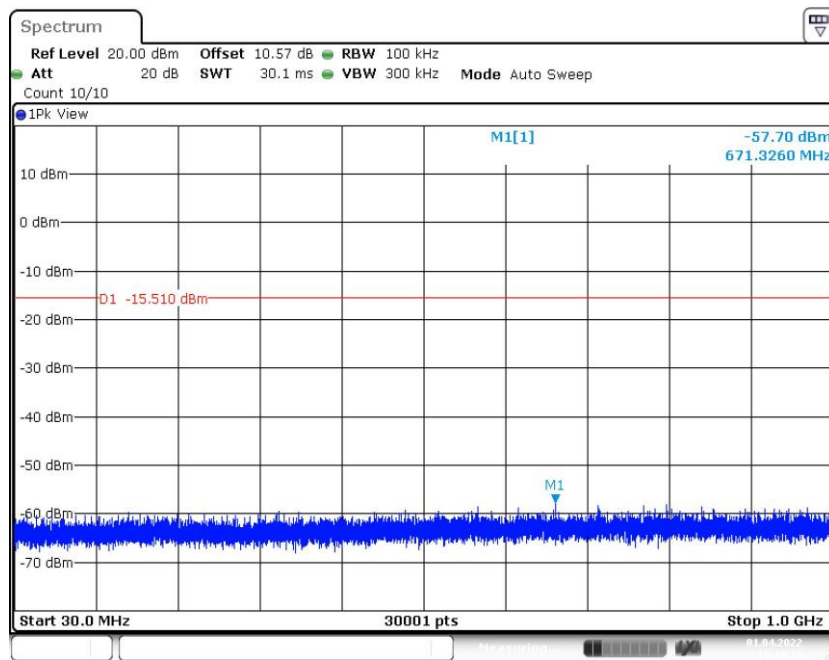


Fig. 26 Conducted Spurious Emission ($\pi/4$ DQPSK, CH39, 30MHz -1GHz)

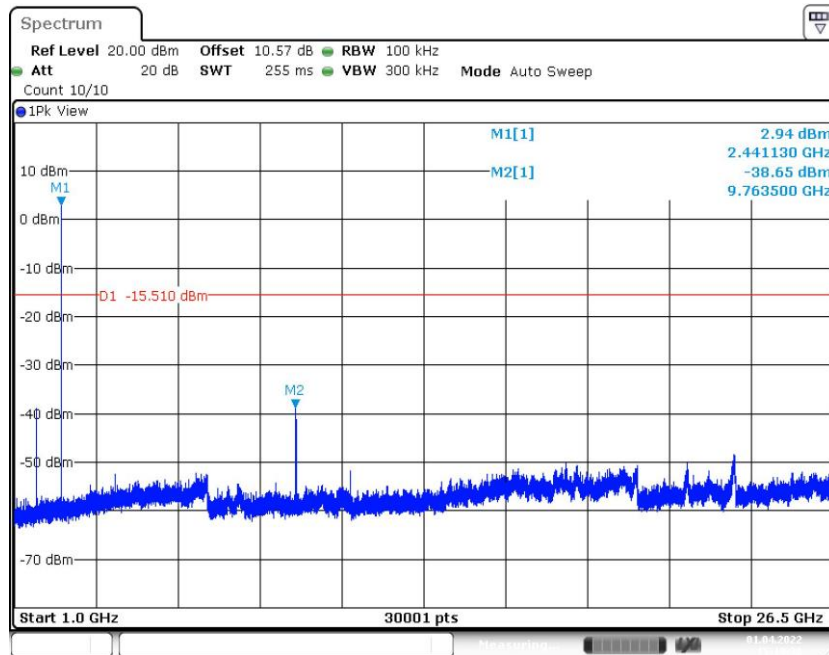


Fig. 27 Conducted Spurious Emission ($\pi/4$ DQPSK, CH39, 1GHz-26.5GHz)

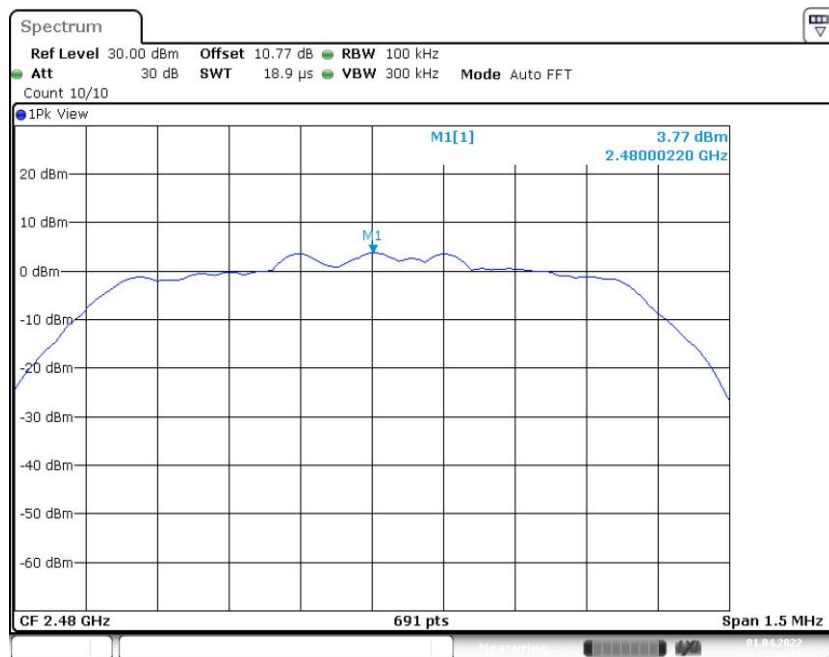


Fig. 28 Conducted Spurious Emission ($\pi/4$ DQPSK, CH78, 2.480GHz)

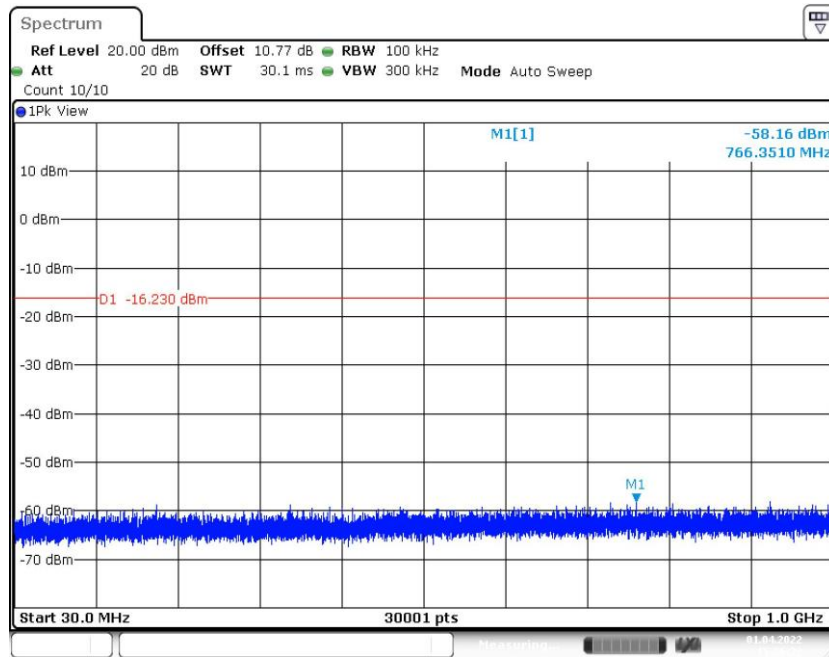


Fig. 29 Conducted Spurious Emission ($\pi/4$ DQPSK, CH78, 30MHz -1GHz)

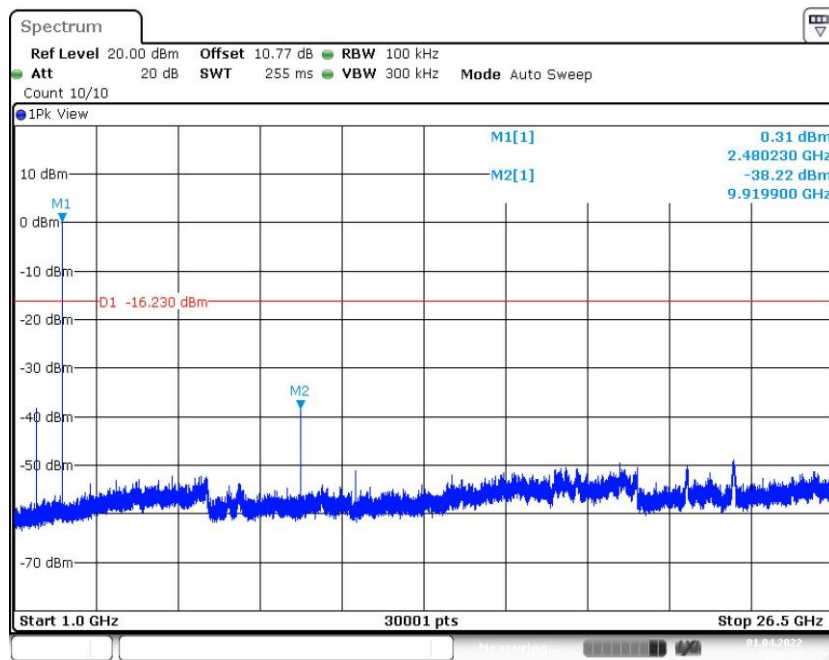


Fig. 30 Conducted Spurious Emission ($\pi/4$ DQPSK, CH78, 1GHz-26.5GHz)

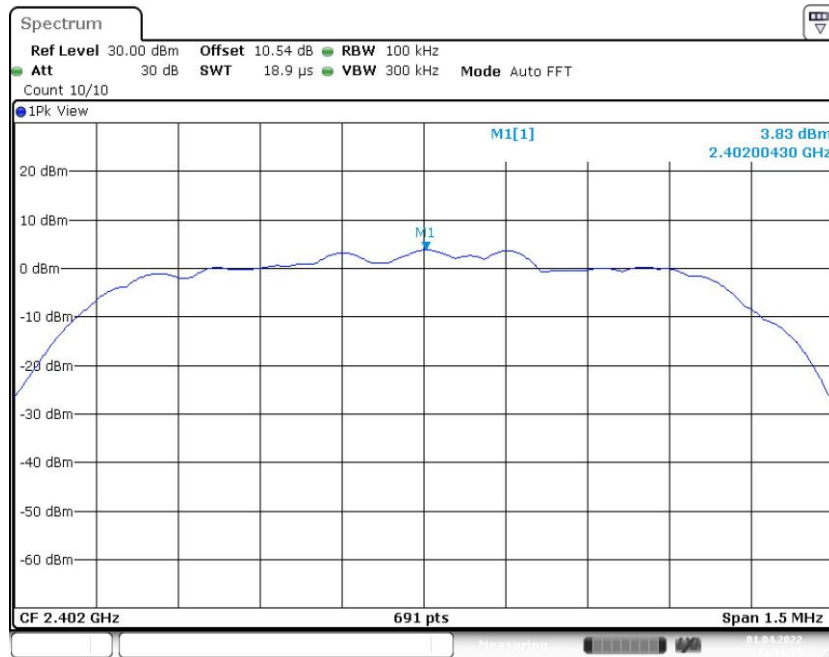


Fig. 31 Conducted Spurious Emission (8DPSK, CH0, 2.402GHz)

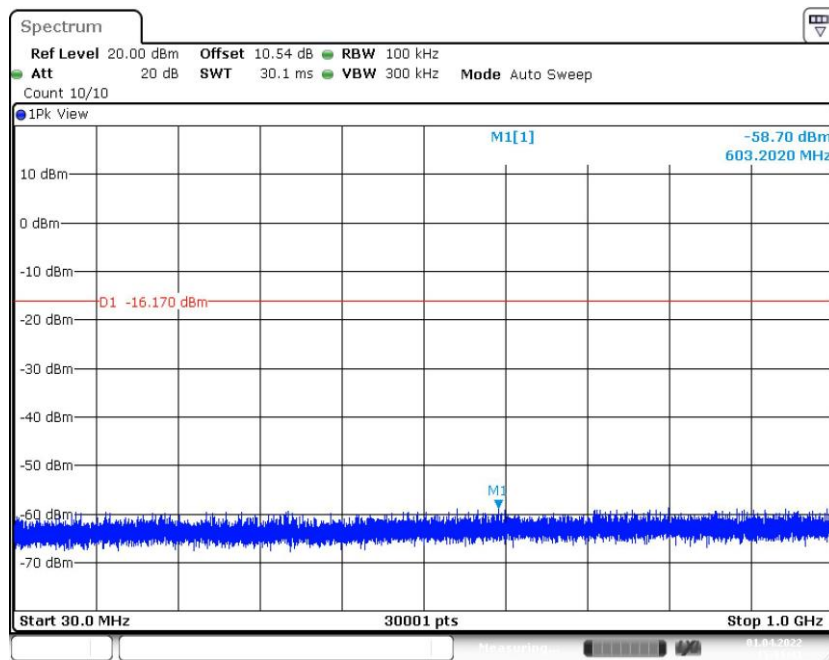


Fig. 32 Conducted Spurious Emission (8DPSK, CH0, 30MHz -1GHz)

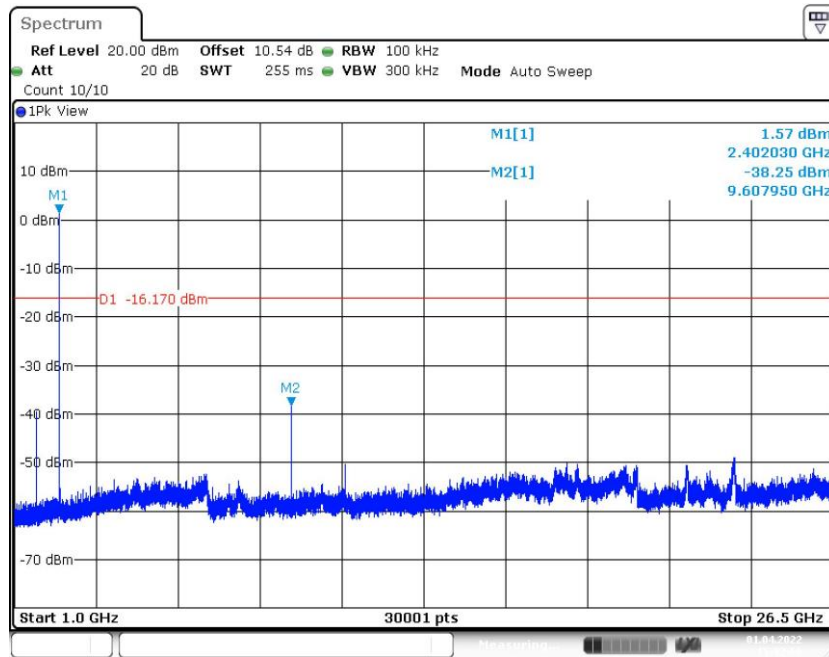


Fig. 33 Conducted Spurious Emission (8DPSK, CH0, 1GHz-26.5GHz)

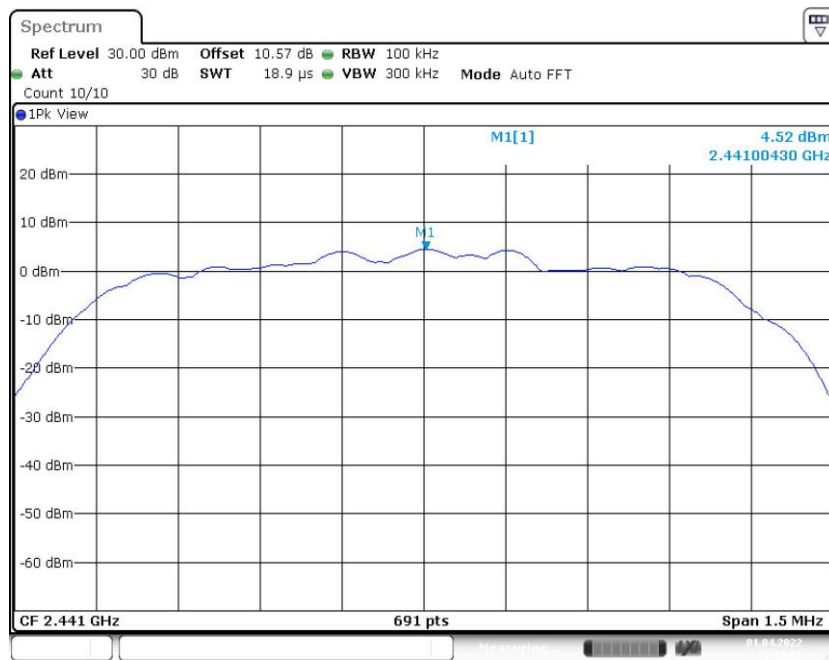


Fig. 34 Conducted Spurious Emission (8DPSK, CH39, 2.441GHz)

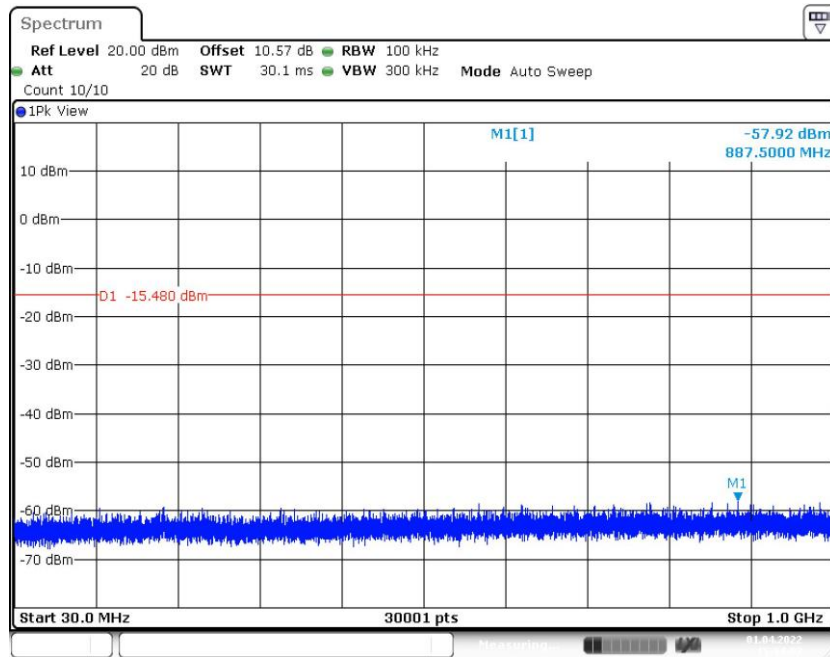


Fig. 35 Conducted Spurious Emission (8DPSK, CH39, 30MHz -1GHz)

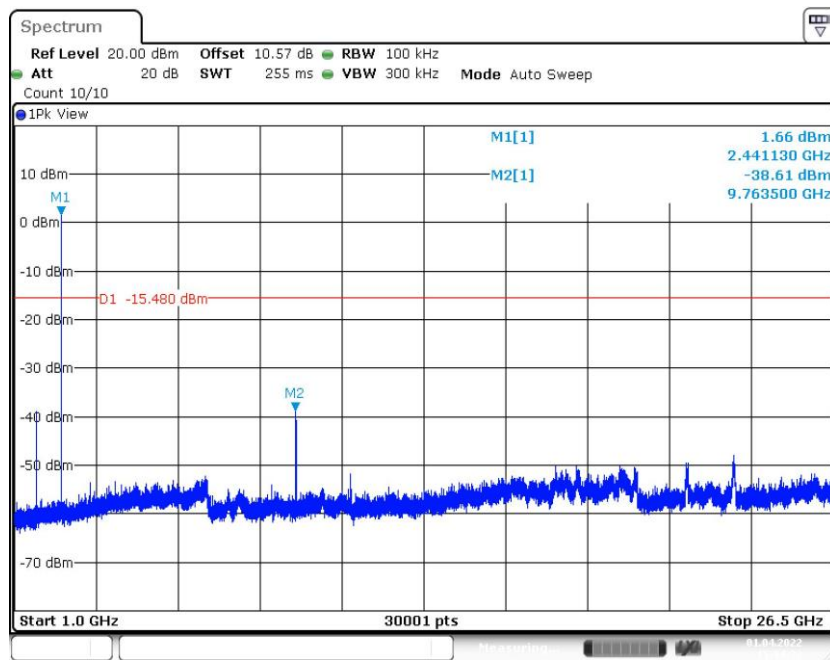


Fig. 36 Conducted Spurious Emission (8DPSK, CH39, 1GHz-26.5GHz)

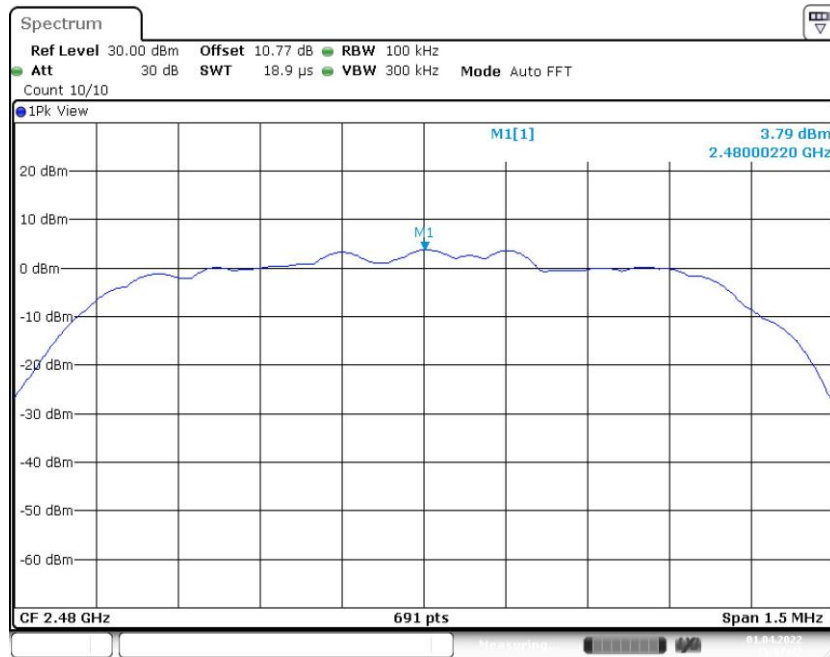


Fig. 37 Conducted Spurious Emission (8DPSK, CH78, 2.480GHz)

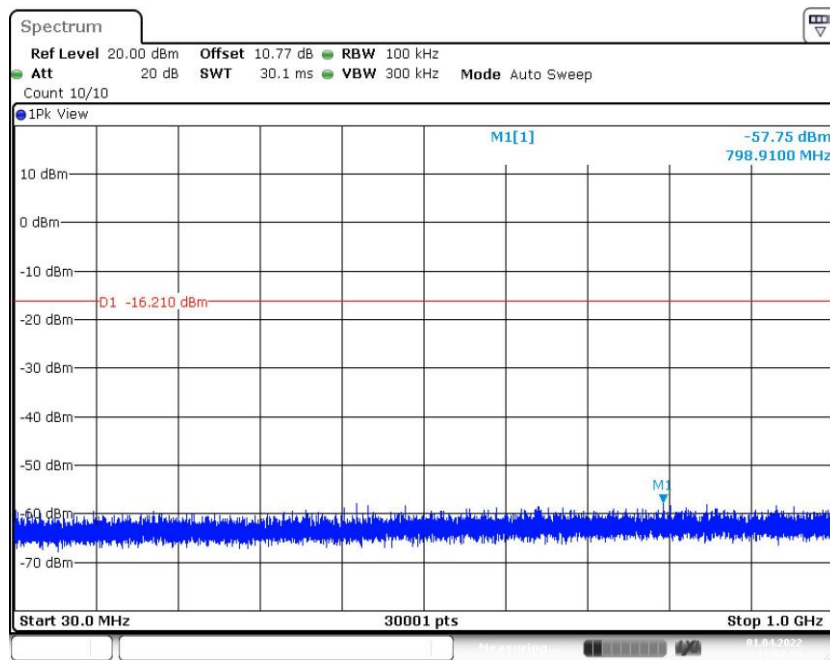


Fig. 38 Conducted Spurious Emission (8DPSK, CH78, 30MHz -1GHz)

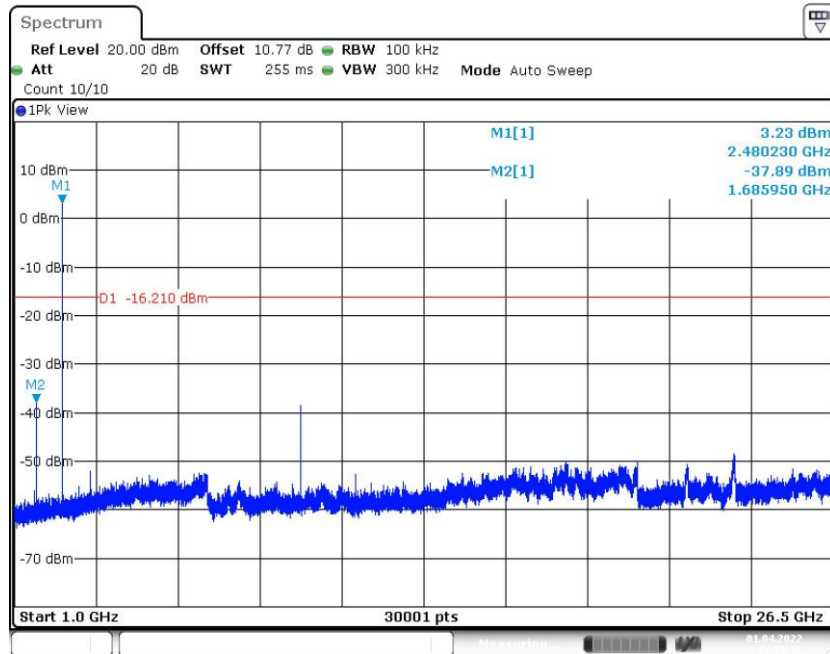


Fig. 39 Conducted Spurious Emission (8DPSK, CH78, 1GHz-26.5GHz)

A.4 Radiated Emission

Measurement Limit:

Standard	Limit (dBm)
FCC 47 CFR Part 15.247, 15.205, 15.209 & RSS-247 section 5.5/RSS-Gen section 6.13	20dBm below peak output power

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Limit in restricted band:

Frequency of emission (MHz)	Field strength(μ V/m)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Condition:

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz/300kHz	5
1000-4000	1MHz/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

Note: According to the performance evaluation, the radiated emission margin of EUT is over 20dB in the band from 9kHz to 30MHz. Therefore, the measurement starts from 30MHz to tenth harmonic.

The measurement results include the horizontal polarization and vertical polarization measurements.

Measurement Results:

Mode	Channel	Frequency Range	Test Results	Conclusion
GFSK	0	1 GHz ~18 GHz	Fig.40	P
	39	1 GHz ~18 GHz	Fig.41	P
	78	1 GHz ~18 GHz	Fig.42	P
	Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.43	P
	Restricted Band (CH78)	2.45 GHz ~ 2.5 GHz	Fig.44	P
$\pi/4$ DQPSK	0	1 GHz ~18 GHz	Fig.45	P
	39	1 GHz ~18 GHz	Fig.46	P
	78	1 GHz ~18 GHz	Fig.47	P
	Restricted Band (CH0)	2.38 GHz ~ 2.45 GHz	Fig.48	P
	Restricted Band (CH78)	2.45 GHz ~ 2.5 GHz	Fig.49	P
8DPSK	0	1 GHz ~18 GHz	Fig.50	P
	39	1 GHz ~18 GHz	Fig.51	P
	78	1 GHz ~18 GHz	Fig.52	P
	Restricted Band (CH0)	2.38 GHz ~ 2.45 GHz	Fig.53	P
	Restricted Band (CH78)	2.45 GHz ~ 2.5 GHz	Fig.54	P
/	All channels	9 kHz ~30 MHz	Fig.55	P
		30 MHz ~1 GHz	Fig.56	P
		18 GHz ~26.5 GHz	Fig.57	P

Worst Case Result
GFSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
3373.200000	46.16	74.00	27.84	H	-0.4
9763.714286	53.44	74.00	20.56	H	7.5
11451.857143	49.29	74.00	24.71	V	10.1
13411.285714	48.22	74.00	25.78	V	11.5
16866.428571	53.64	74.00	20.36	H	18.0
17905.714286	52.76	74.00	21.24	H	18.8

Frequency (MHz)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
3373.200000	38.30	54.00	15.70	H	-0.4
9763.714286	49.75	54.00	4.25	H	7.5
11451.857143	42.08	54.00	11.92	V	10.1
13411.285714	37.11	54.00	16.89	V	11.5
16866.428571	43.83	54.00	10.17	H	18.0
17905.714286	44.23	54.00	9.77	H	18.8

π/4 DQPSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3372.600000	48.70	74.00	25.30	V	-0.4
4129.500000	48.16	74.00	25.84	H	2.4
9763.714286	59.48	74.00	14.52	H	7.5
11452.285714	50.57	74.00	23.43	V	10.1
16563.000000	54.11	74.00	19.89	V	16.6
17986.714286	55.11	74.00	18.89	V	19.2

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3372.600000	40.19	54.00	13.81	V	-0.4
4129.500000	40.54	54.00	13.46	H	2.4
9763.714286	51.82	54.00	2.18	H	7.5
11452.285714	48.32	54.00	5.68	V	10.1
16563.000000	43.54	54.00	10.46	V	16.6
17986.714286	44.48	54.00	9.52	V	19.2

8DPSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3373.200000	49.11	74.00	24.89	H	-0.4
7632.428572	45.89	74.00	28.11	V	5.7
9764.142857	58.71	74.00	15.29	H	7.5
11451.000000	50.90	74.00	23.10	V	10.1
15939.428571	52.36	74.00	21.64	V	14.1
17901.000000	53.74	74.00	20.26	H	18.8

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
3373.200000	40.35	54.00	13.65	H	-0.4
7632.428572	35.50	54.00	18.50	V	5.7
9764.142857	51.27	54.00	2.73	H	7.5
11451.000000	45.07	54.00	8.93	V	10.1
15939.428571	41.74	54.00	12.26	V	14.1
17901.000000	44.19	54.00	9.81	H	18.8

Note:

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss", and Antenna Factor, the gain of the preamplifier, the cable loss. P_{Mea} is the field strength recorded from the instrument. The measurement results are obtained as described below:

Result= P_{Mea} +Cable Loss +Antenna Factor-Gain of the preamplifier.

See below for test graphs.

Conclusion: Pass

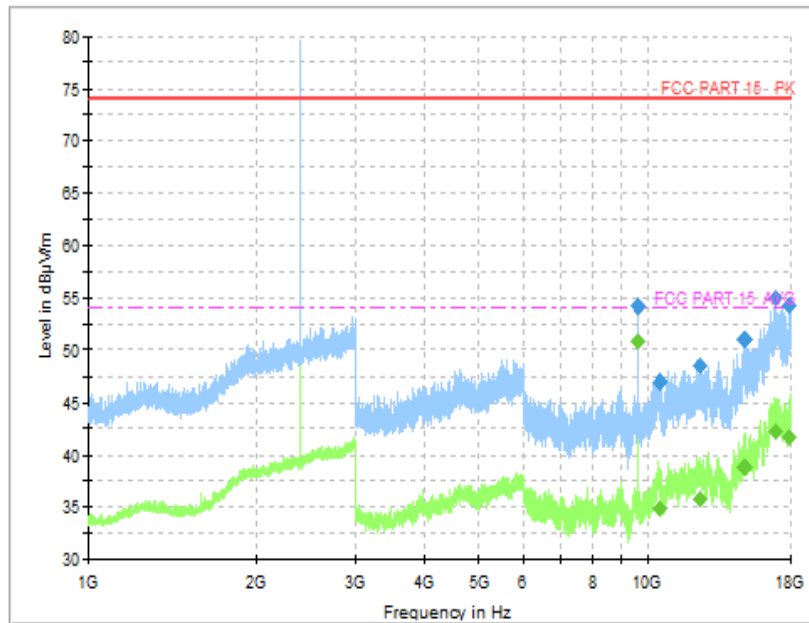


Fig. 40 Radiated Spurious Emission (GFSK, CH0, 1 GHz ~18 GHz)

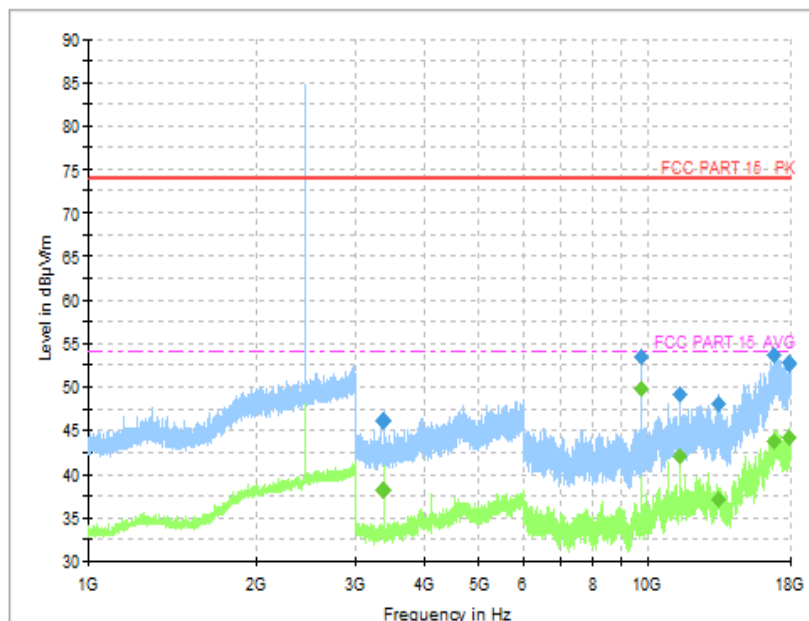


Fig. 41 Radiated Spurious Emission (GFSK, CH39, 1 GHz ~18 GHz)

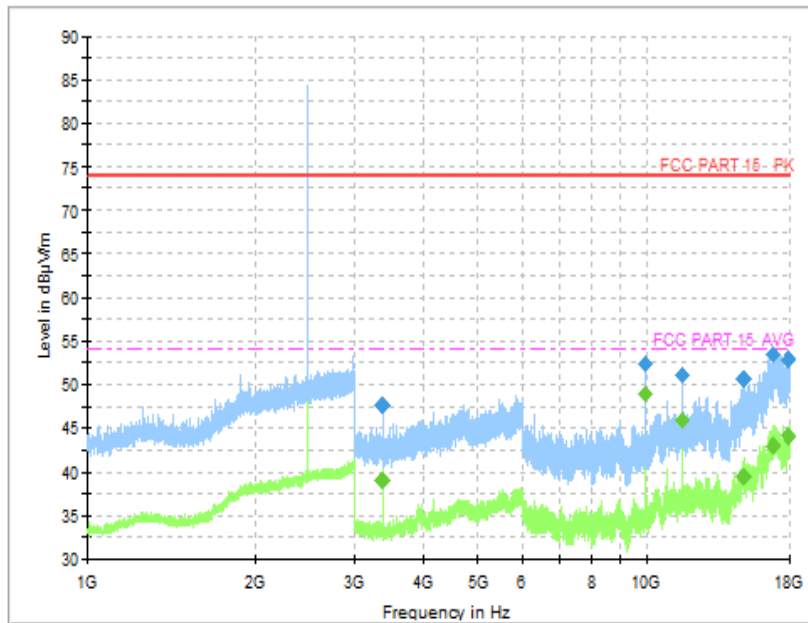


Fig. 42 Radiated Spurious Emission (GFSK, CH78, 1 GHz ~18 GHz)

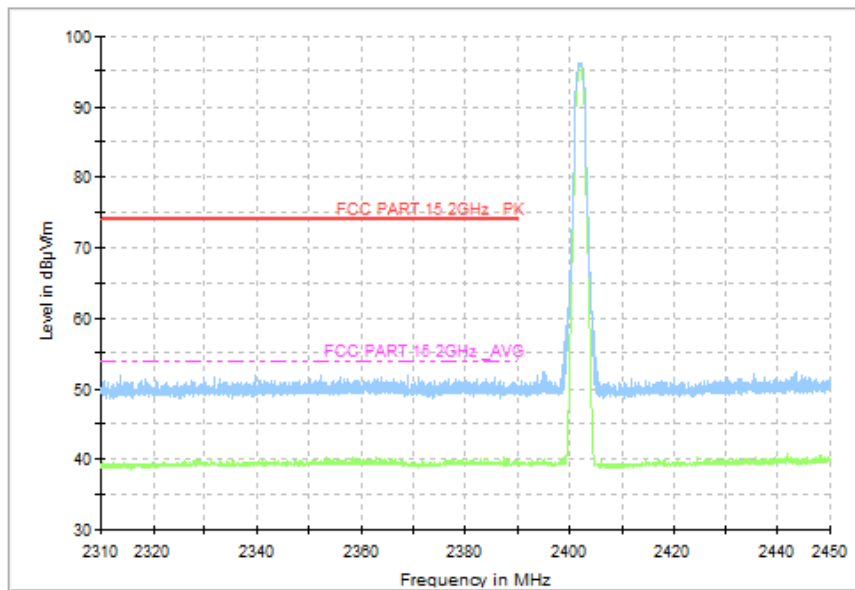


Fig. 43 Radiated Band Edges (GFSK, CH0, 2380GHz~2450GHz)

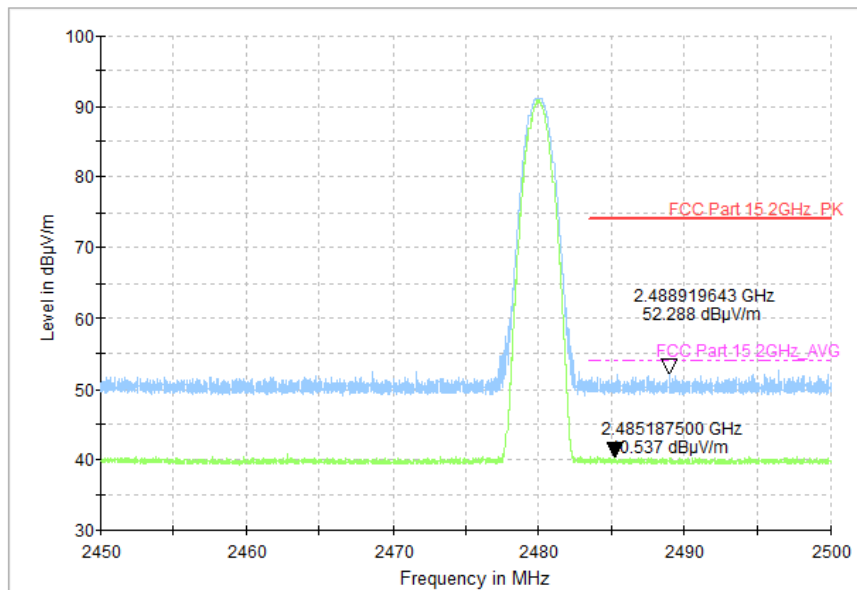


Fig. 44 Radiated Band Edges (GFSK, CH78, 2450GHz~2500GHz)

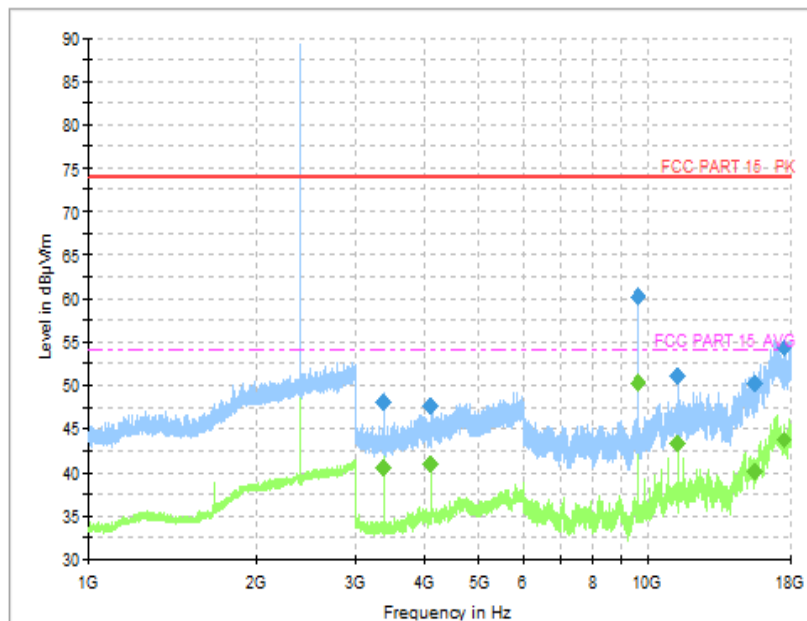


Fig. 45 Radiated Spurious Emission ($\pi/4$ DQPSK, CH0, 1 GHz ~18 GHz)

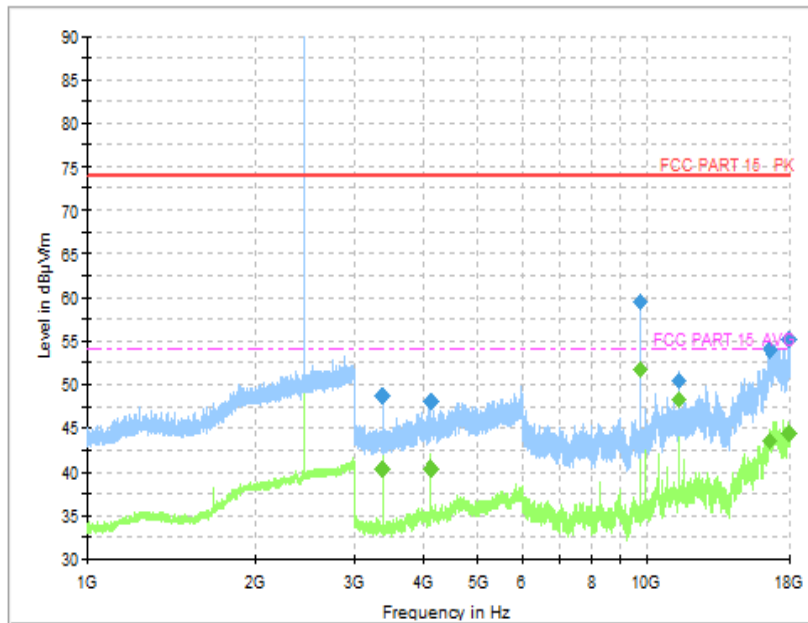


Fig. 46 Radiated Spurious Emission ($\pi/4$ DQPSK, CH39, 1 GHz ~18 GHz)

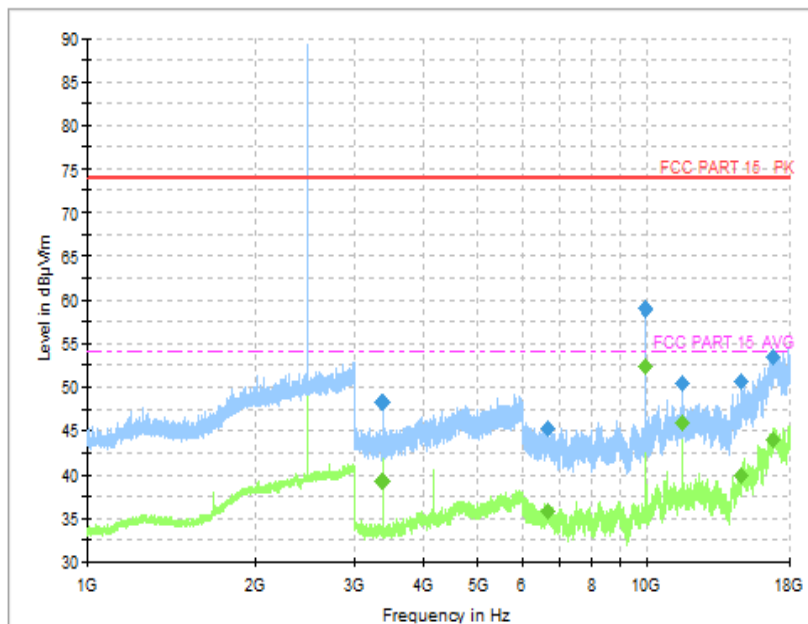


Fig. 47 Radiated Spurious Emission ($\pi/4$ DQPSK, CH78, 1 GHz ~18 GHz)

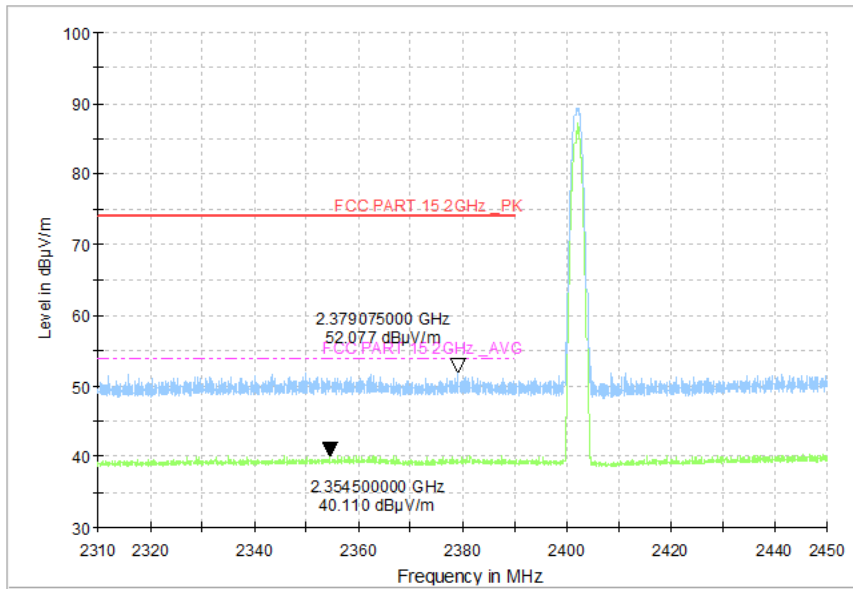


Fig. 48 Radiated Band Edges ($\pi/4$ DQPSK, CH0, 2380GHz~2450GHz)

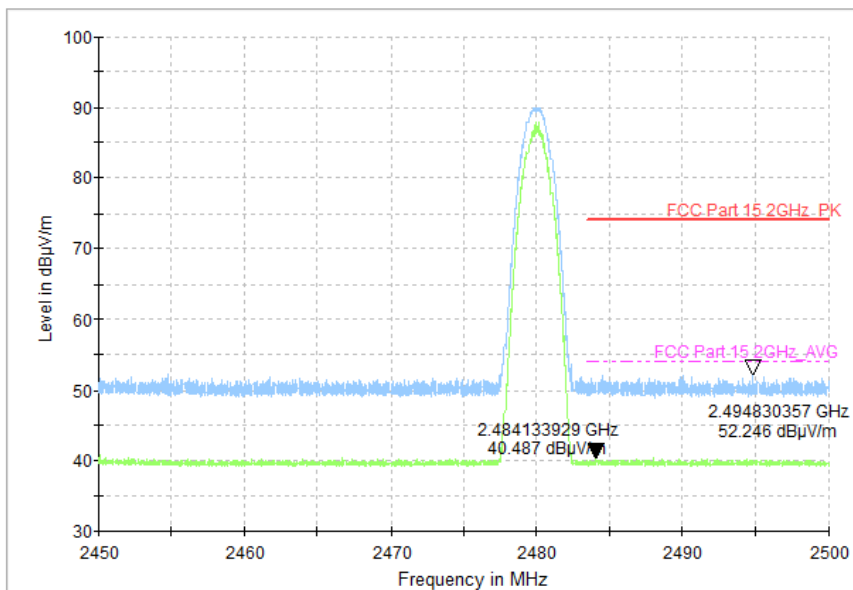


Fig. 49 Radiated Band Edges ($\pi/4$ DQPSK, CH78, 2450GHz~2500GHz)

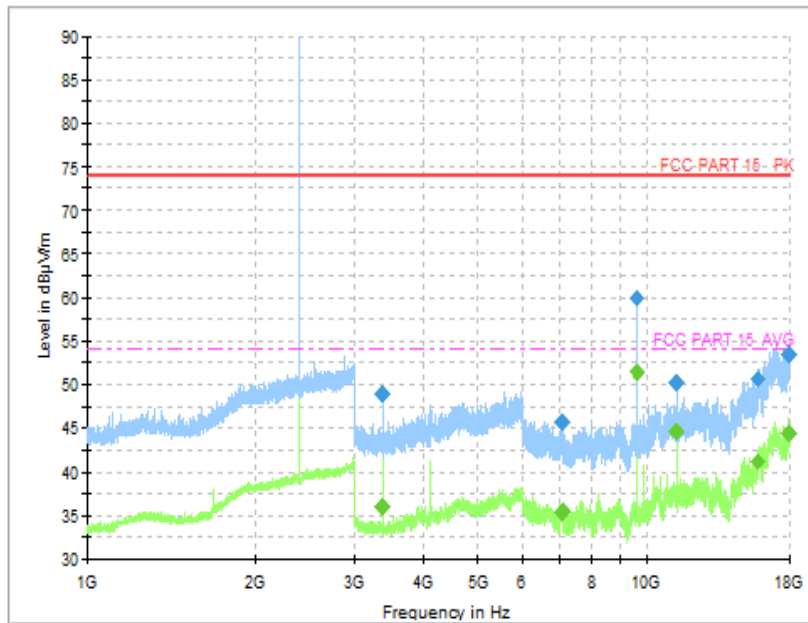


Fig. 50 Radiated Spurious Emission (8DPSK, CH0, 1 GHz ~18 GHz)

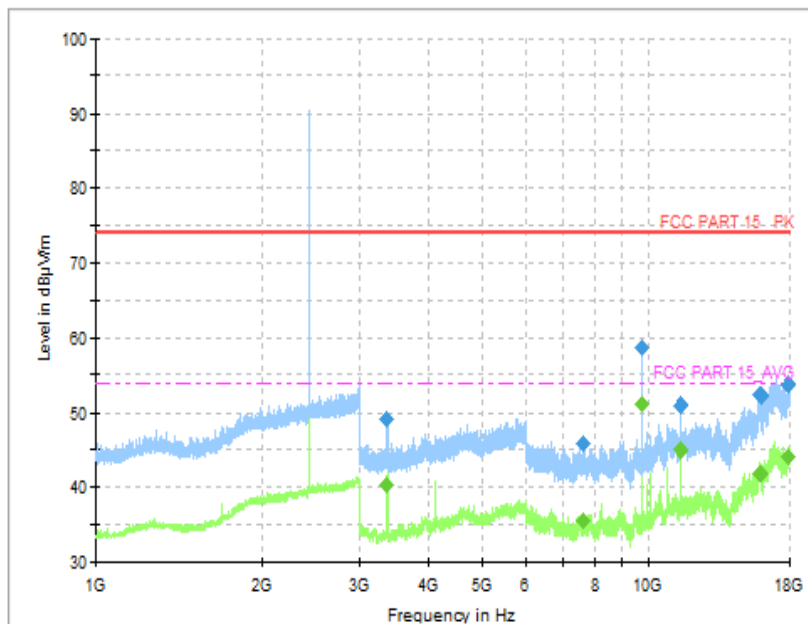


Fig. 51 Radiated Spurious Emission (8DPSK, CH39, 1 GHz ~18 GHz)

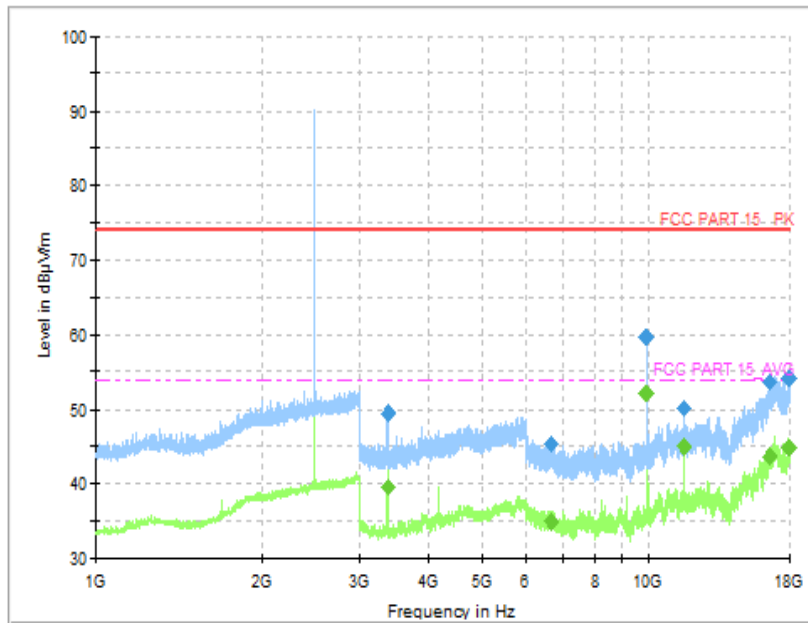


Fig. 52 Radiated Spurious Emission (8DPSK, CH78, 1 GHz ~18 GHz)

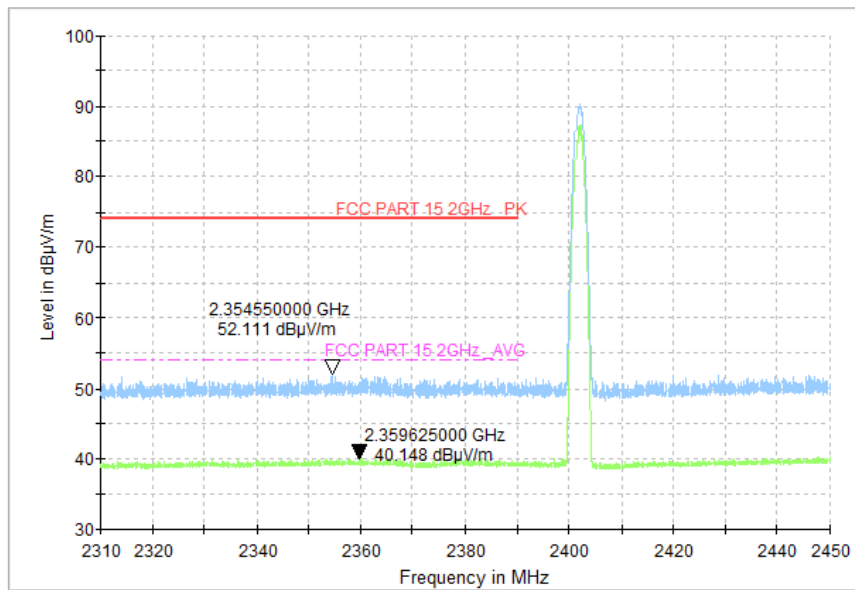


Fig. 53 Radiated Band Edges (8DPSK, CH0, 2380GHz~2450GHz)

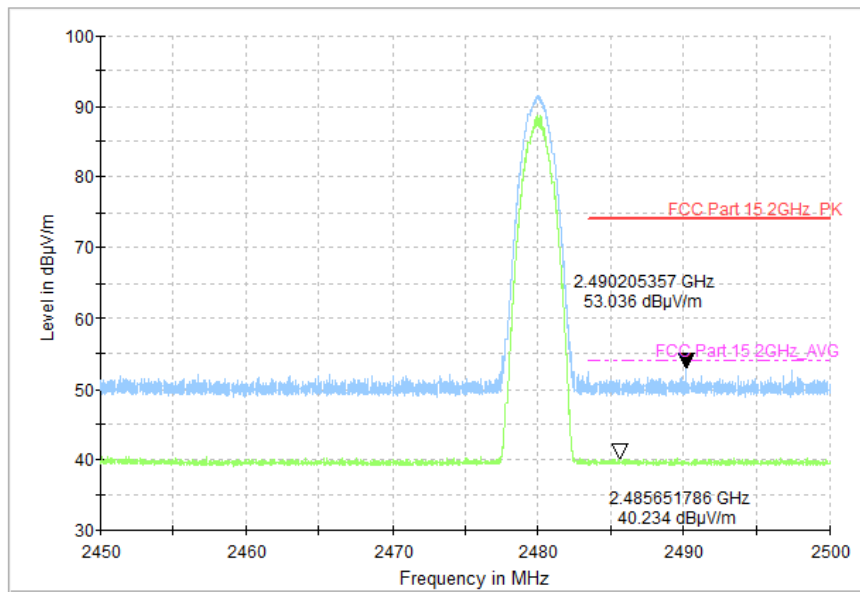


Fig. 54 Radiated Band Edges (8DPSK, CH78, 2450GHz~2500GHz)

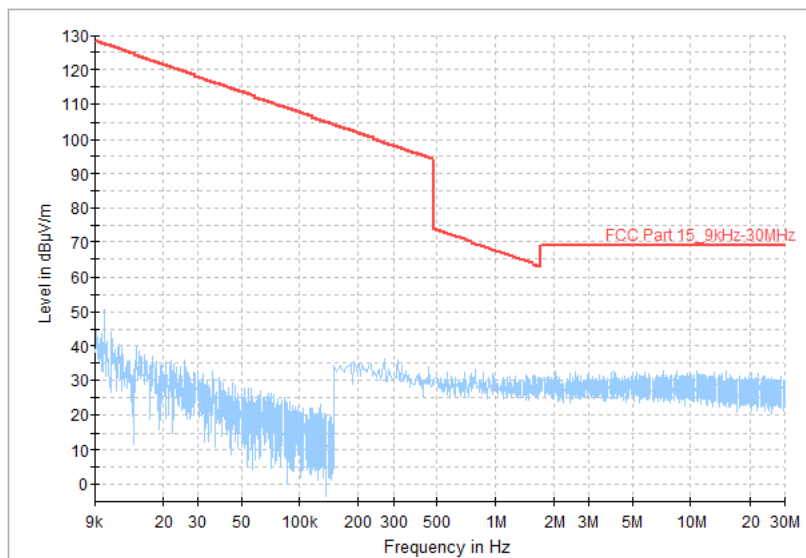


Fig. 55 Radiated Spurious Emission (All Channels, 9 kHz ~30 MHz)

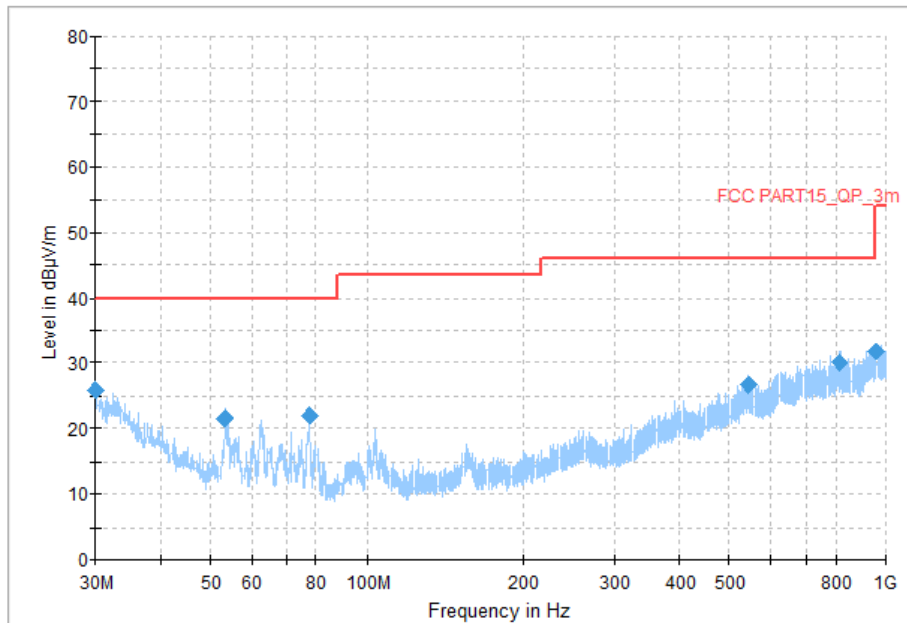


Fig. 56 Radiated Spurious Emission (All Channels, 30 MHz ~1 GHz)

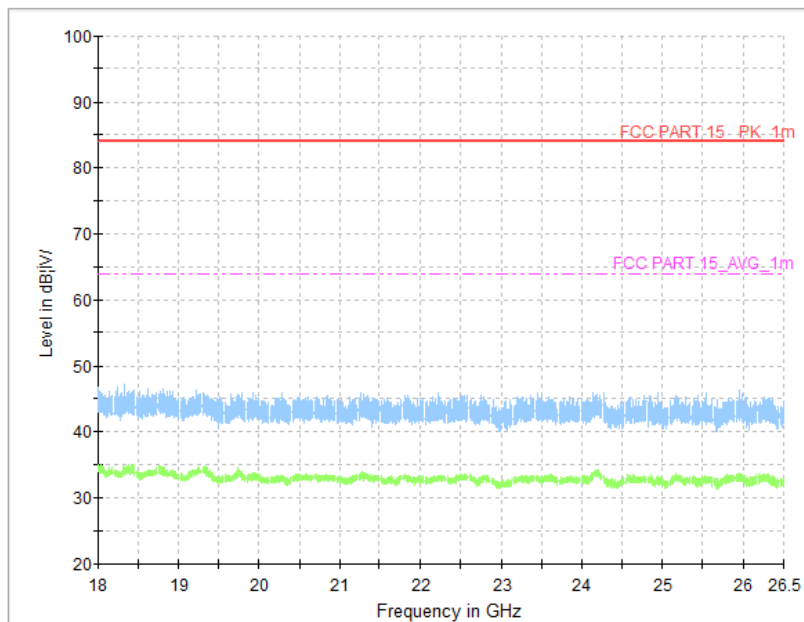


Fig. 57 Radiated Spurious Emission (All Channels, 18 GHz ~26.5 GHz)

A.5 20dB Bandwidth

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a) & RSS-247 Section 5.1	/

Measurement Result:

Mode	Channel	20dB Bandwidth (kHz)		Conclusion
		Fig.	Value	
GFSK	0	Fig.58	940.00	/
	39	Fig.59	940.00	
	78	Fig.60	940.00	
$\pi/4$ DQPSK	0	Fig.61	1260.00	/
	39	Fig.62	1260.00	
	78	Fig.63	1260.00	
8DPSK	0	Fig.64	1260.00	/
	39	Fig.65	1260.00	
	78	Fig.66	1260.00	

See below for test graphs.

Conclusion: PASS

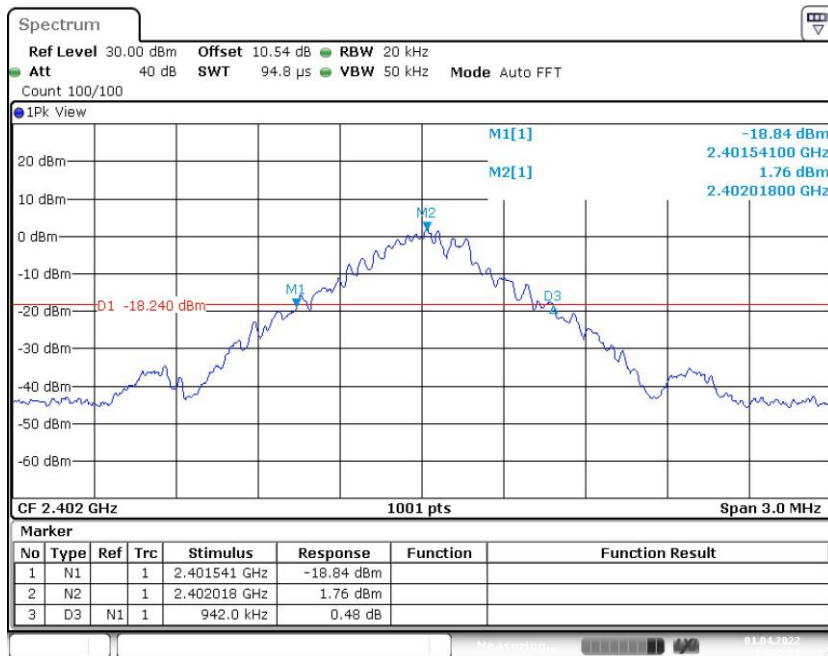


Fig. 58 20dB Bandwidth (GFSK, CH0)

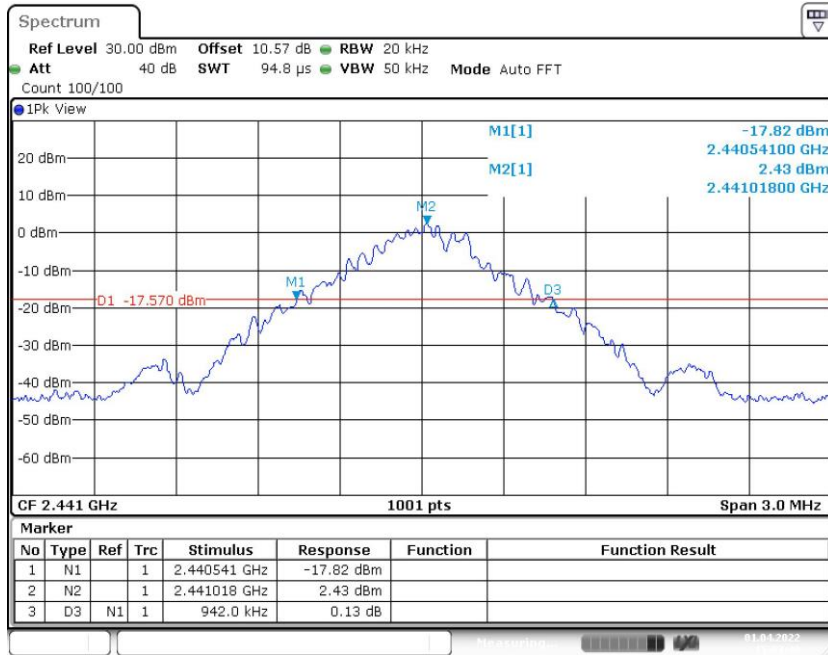


Fig. 59 20dB Bandwidth (GFSK, CH39)

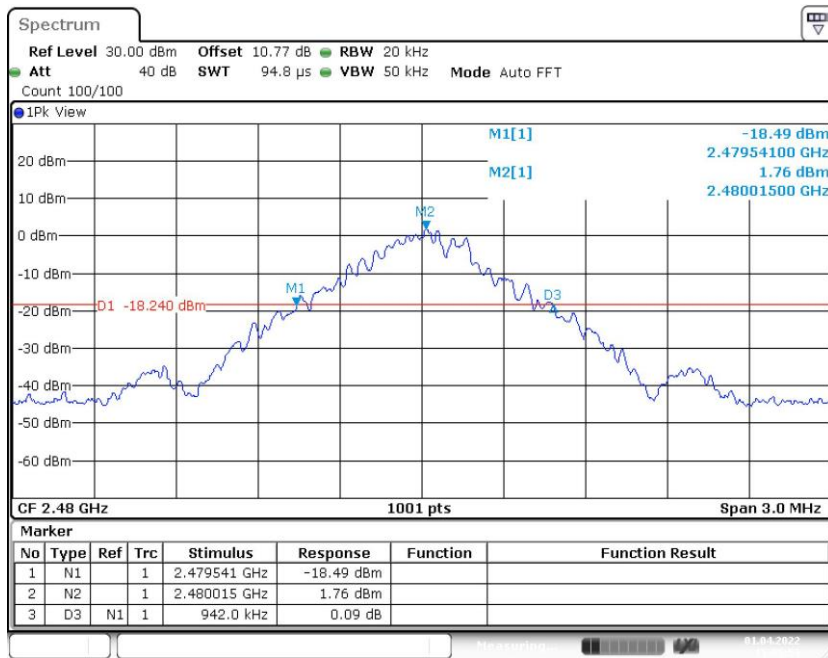


Fig. 60 20dB Bandwidth (GFSK, CH78)

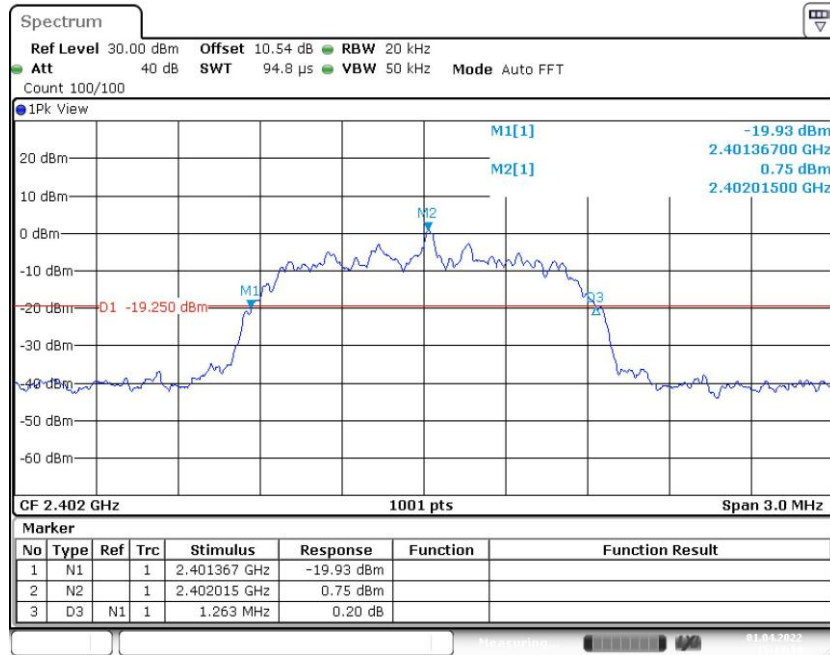


Fig. 61 20dB Bandwidth ($\pi/4$ DQPSK, CH0)

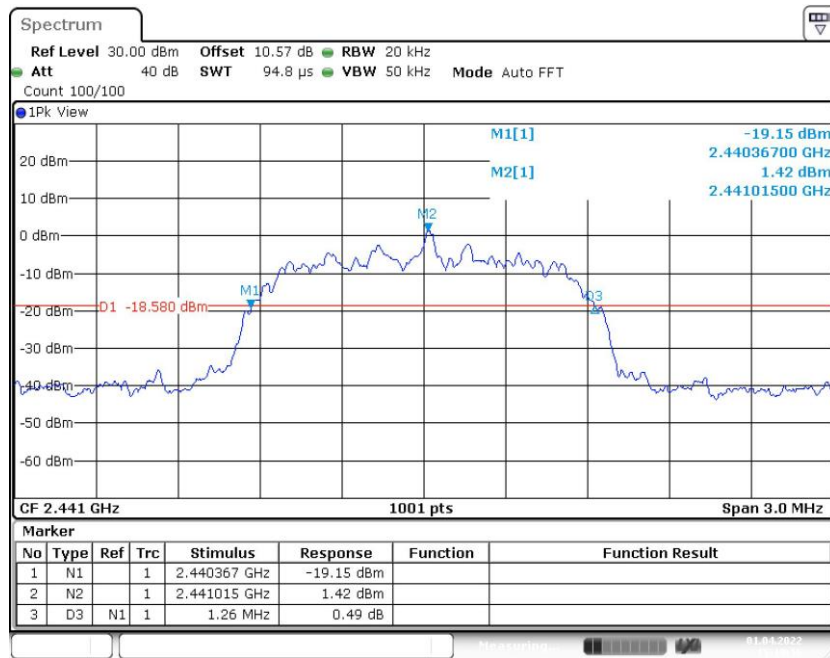


Fig. 62 20dB Bandwidth ($\pi/4$ DQPSK, CH39)

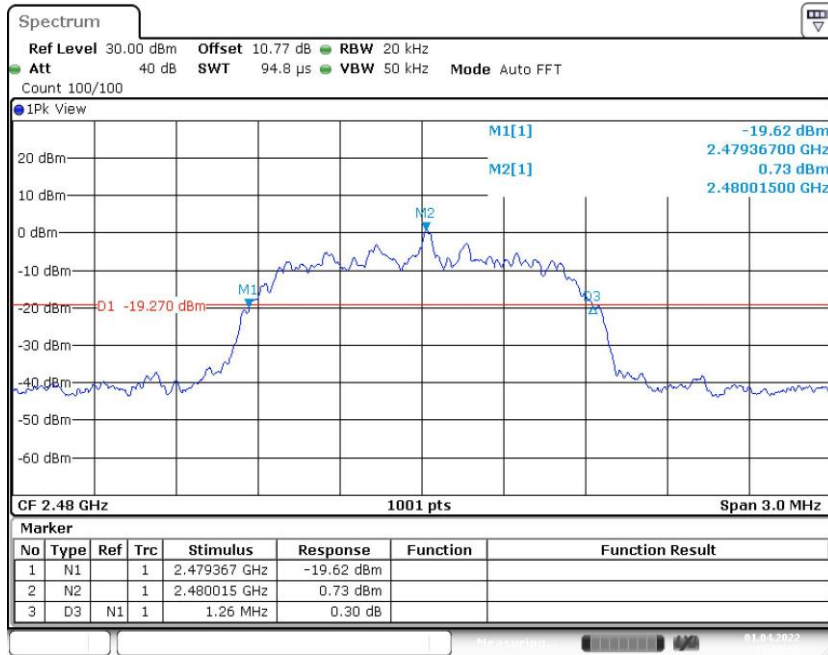


Fig. 63 20dB Bandwidth ($\pi/4$ DQPSK, CH78)

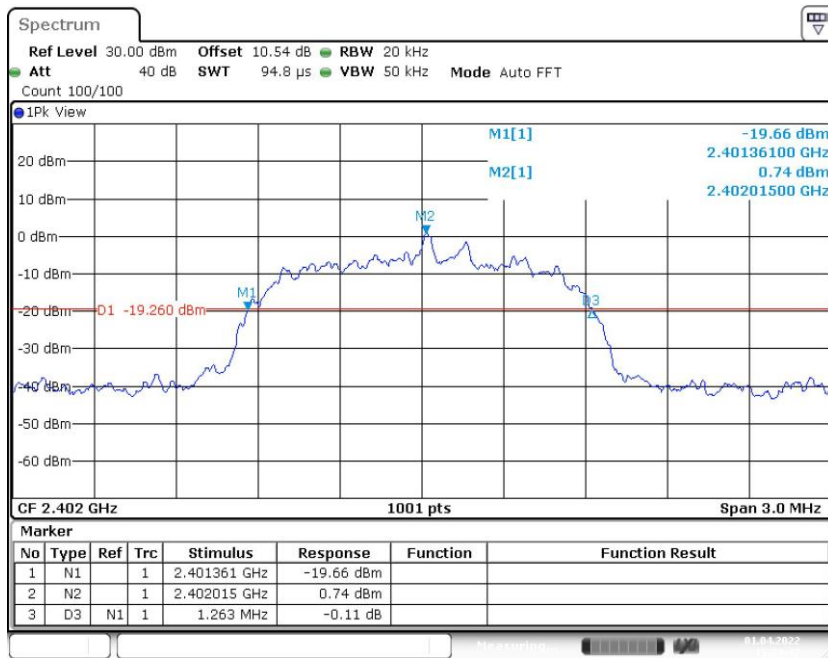


Fig. 64 20dB Bandwidth (8DPSK, CH0)

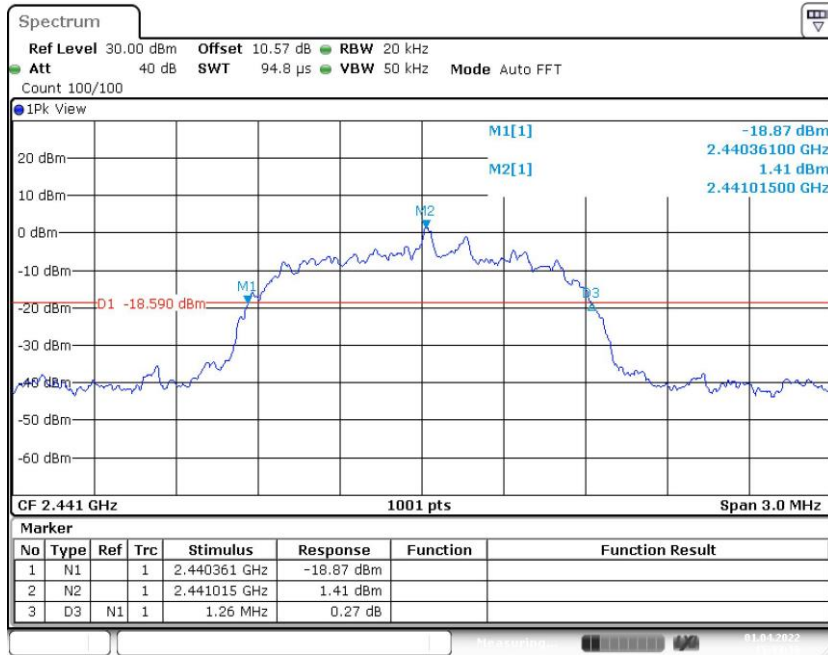


Fig. 65 20dB Bandwidth (8DPSK, CH39)

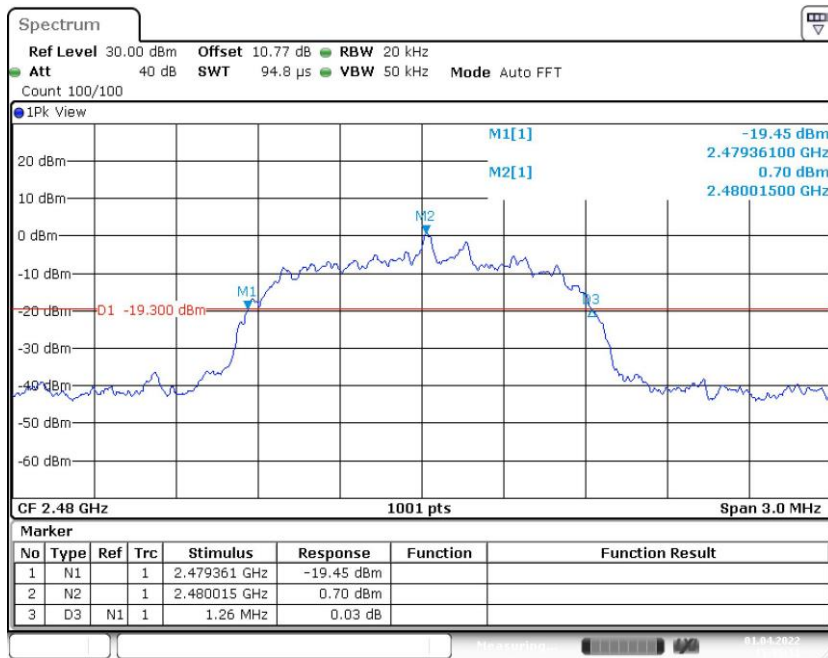


Fig. 66 20dB Bandwidth (8DPSK, CH78)



A.6 Time of Occupancy (Dwell Time)

Measurement Limit:

Standard	Limit (ms)
FCC 47 CFR Part 15.247(a) & RSS-247 Section 5.1	< 400

Measurement Results:

Mode	Channel	Packet	BurstWidth (ms)		TotalHops (Num)		Result (ms)	Conclusion
GFSK	39	DH5	Fig.67	2.87	Fig.68	130	372.00	P
$\pi/4$ DQPSK	39	2-DH5	Fig.69	2.87	Fig.70	110	316.00	P
8DPSK	39	3-DH5	Fig.71	2.87	Fig.72	130	373.00	P

See below for test graphs.

Conclusion: Pass

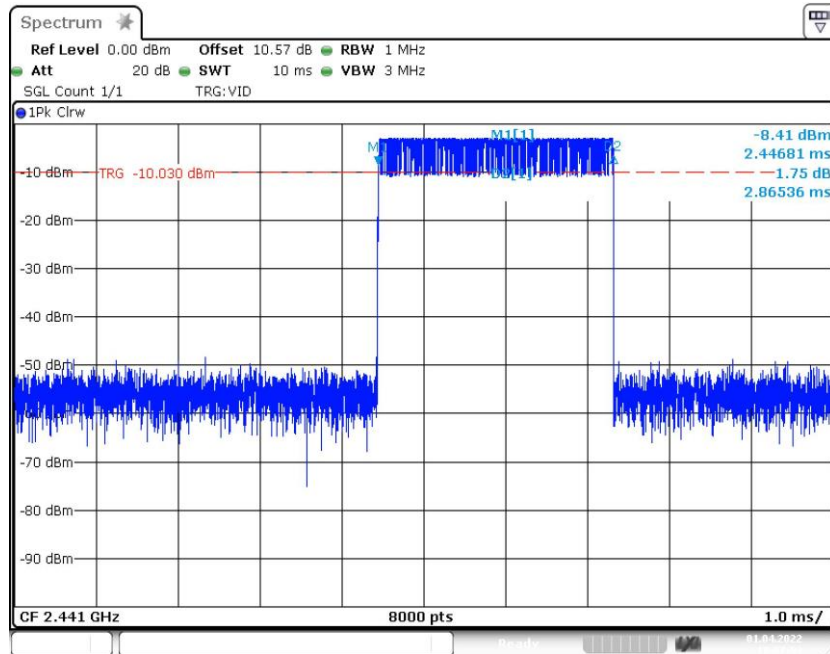


Fig. 67 BurstWidth (Dwell Time) (GFSK, CH39)

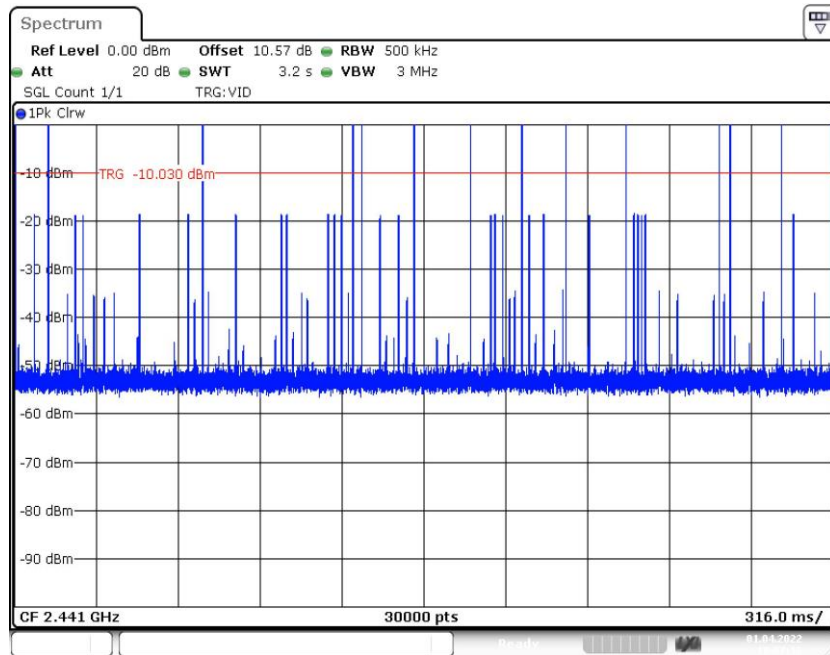


Fig. 68 Number of Burst in Observation Period (Dwell Time) (GFSK, CH39)

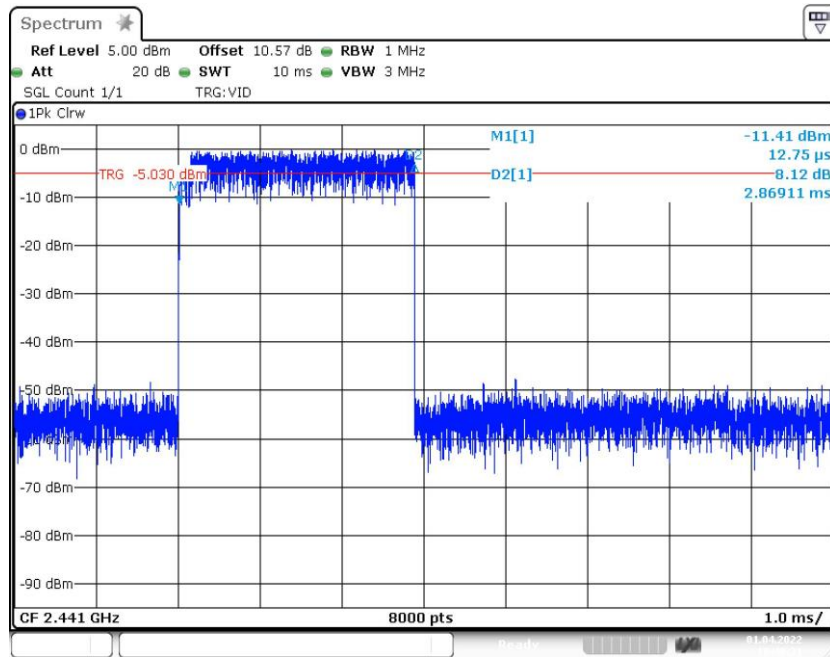


Fig. 69 BurstWidth (Dwell Time) ($\pi/4$ DQPSK, CH39)

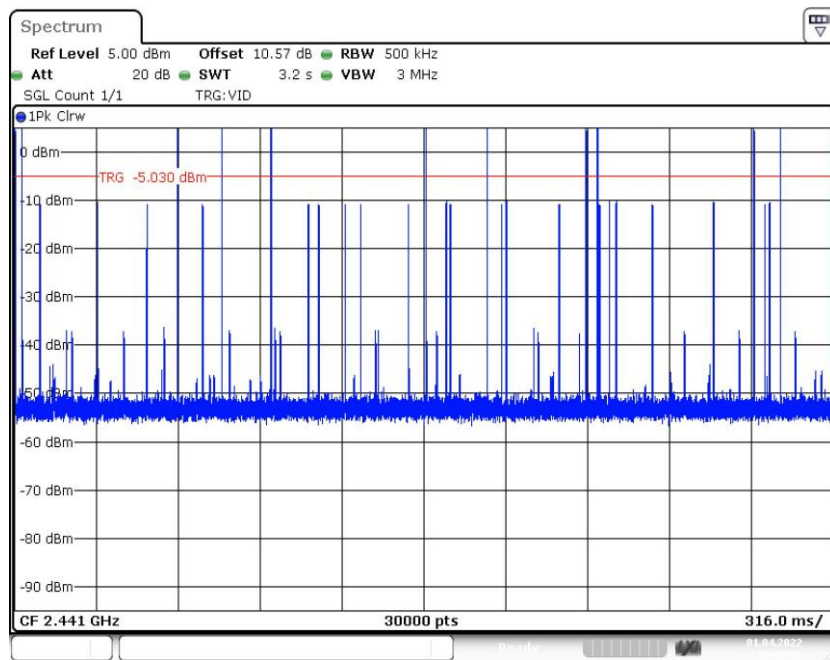


Fig. 70 Number of Burst in Observation Period (Dwell Time) ($\pi/4$ DQPSK, CH39)