TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 15.247

TEST REPORT

For

Hytera Communications Corporation Limited

Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road, Nanshan District, Shenzhen, 518057 China

FCC ID: YAMHM78XVHFS

Report Type:	**Product Name:**
Original Report	DIGITAL MOBILE RADIO

Report Number:	DG2210702-26804E-00A
Report Date:	2021-07-23
Reviewed By:	Gavin Xu RF Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	DIGITAL MOBILE RADIO
EUT Model:	HM782 VHF
Multiple Models:	HM785 VHF, HM786 VHF, HM788 VHF HDM782 VHF, HDM785 VHF, HDM786 VHF, HDM788 VHF
Model Difference:	Refer to the DOS letter
Rated Input Voltage:	DC 13.6V
Serial Number:	DG2210702-26804E-RF-S1
EUT Received Date:	2021.07.03
EUT Received Status:	Good

Technical Specification

Operation Frequency Range (MHz):	2402-2480
Max. RF Output Power (EIRP) (dBm):	4.73
Antenna Gain (dBi)▲:	0
Modulation Type:	GFSK, π/4-DQPSK, 8-DPSK

Objective

This report is prepared on behalf of ***Hytera Communications Corporation Limited*** in accordance with Part 2, Subpart J, Part 15, Subparts A and C of the Federal Communications Commission's rules.

The tests were performed in order to determine the compliance of the EUT with FCC Rules Part 15-Subpart C, section 15.203, 15.205, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

FCC Part 15C DTS submissions with FCC ID: YAMHM78XVHFS
FCC Part 22&74&80&90 TNB submissions with FCC ID: YAMHM78XVHFS

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and KDB 558074 D01 DTS Meas Guidance v05r02.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Power Spectral Density, conducted	±0.61 dB
Unwanted Emissions, radiated	30M~200MHz: 4.55 dB,200M~1GHz: 5.92 dB,1G~6GHz: 4.98 dB, 6G~18GHz: 5.89 dB,18G~26.5G:5.47 dB,26.5G~40G:5.63 dB
Unwanted Emissions, conducted	±1.5 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk "★".

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in engineering mode, which was provided by manufacturer.

EUT Exercise Software

The software: " Blue test2.5.8.exe▲" was used during test, which was provided by manufacturer.
The maximum power level was configured by the software as below table:

Mode	Channel	Test Frequency (MHz)	Power Level Setting
BDR (GFSK)	Low	2402	255
	Middle	2441	255
	High	2480	255
EDR (π/4-DQPSK)	Low	2402	255
	Middle	2441	255
	High	2480	255
EDR (8DPSK)	Low	2402	255
	Middle	2441	255
	High	2480	255

Equipment Modifications

No modification was made to the EUT.

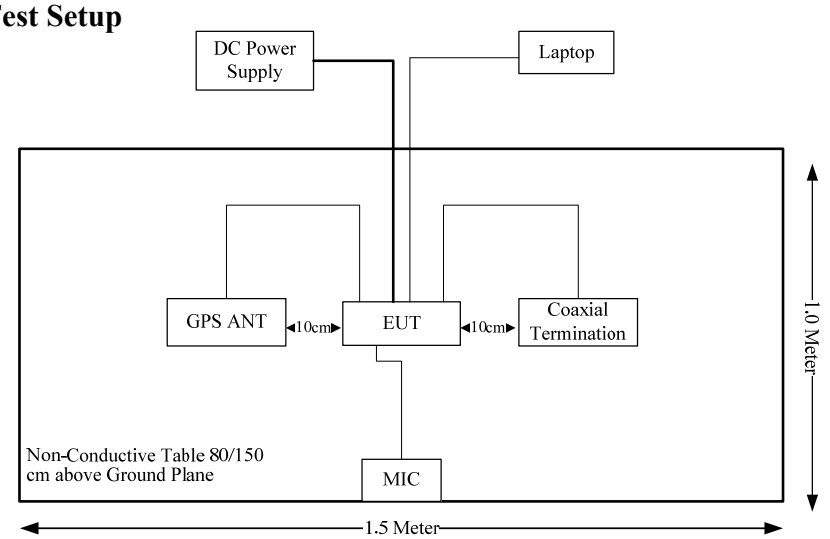
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Proinstrument	DC Power Supply	pps3300	3300012
DELL	Laptop	E6410	CB30920865
BEW	Coaxial Termination	TF300-6-B	/

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length(m)	From	To
DC Line	No	No	3	DC Power Supply	EUT
Coaxial Cable	Yes	No	0.5	EUT	Termination
GPS Antenna Cable	Yes	No	3	EUT	GPS Antenna
Network Cable	No	Yes	10	EUT	Laptop
MIC Cable	No	No	1	EUT	MIC

Block Diagram of Test Setup



Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiation Below 1GHz Test					
Sunol Sciences	Antenna	JB3	A060611-2	2020-08-25	2023-08-25
R&S	EMI Test Receiver	ESCI	100224	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2020-09-24	2021-09-24
Sonoma	Amplifier	310N	185914	2020-10-13	2021-10-13
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Radiation Above 1GHz Test					
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2020-12-05	2023-12-04
Agilent	Spectrum Analyzer	E4440A	SG43360054	2021-07-07	2022-07-07
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2020-09-05	2021-09-05
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2020-09-05	2021-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2021-06-27	2022-06-27
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
E-Microwave	Band-stop Filters	OBSF-2400-2483.5-S	OE01601525	2021-06-16	2022-06-16
Mini Circuits	High Pass Filter	VHF-6010+	31118	2021-06-16	2022-06-16
RF Conducted					
R&S	EMI Test Receiver	ESR3	102724	2021-06-22	2022-06-21
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201047	2021-05-06	2022-05-05
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	2020-09-06	2021-09-06
Agilent	USB Wideband Power Sensor	U2022XA	MY5417006	2020-09-12	2021-09-12

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Environmental Conditions

Test Items	Radiated Emissions (Below 1GHz)	Radiated Emissions (Above 1GHz)	RF Conducted
Temperature:	25.8 °C	29.4 °C	26.2 °C
Relative Humidity:	56%	29 %	47 %
ATM Pressure:	100.3kPa	100.5kPa	100.3 kPa
Tester:	Alex Hu	Jeremy Liang	Wayne Wei
Test Date:	2021.07.15	2021.07.14	2021-07-16

SUMMARY OF TEST RESULTS

S/N	FCC Rules	Description of Test	Result
2	§15.203	Antenna requirement	Compliance
3	§15.207(a)	AC line conducted emissions	Not Applicable
4	§15.205 §15.209 §15.247(d)	Spurious emissions	Compliance
5	§15.247(a)(1)	Channel separation	Compliance
6	§15.247(a)(1)	20 dB bandwidth	Compliance
7	§15.247(a)(1)(iii)	Quantity of hopping channel test	Compliance
8	§15.247(a)(1)(iii)	Time of occupancy (dwell time)	Compliance
9	§15.247(b)(1)	Peak output power measurement	Compliance
10	§15.247(d)	Band edges	Compliance

Note:
Not Applicable: EUT is used in the vehicular conditon.

2 - ANTENNA REQUIREMENT

Applicable Standard

According to § 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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.
c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

Antenna Connector Construction

The EUT has one internal FPC antennas arrangement, fulfill the requirement of this section. Please refer to the EUT photos.

Antenna Type	input impedance (Ohm)	Antenna Gain /Frequency Range
FPC	50	0 dBi/2.4~2.5GHz

Result: Compliance.

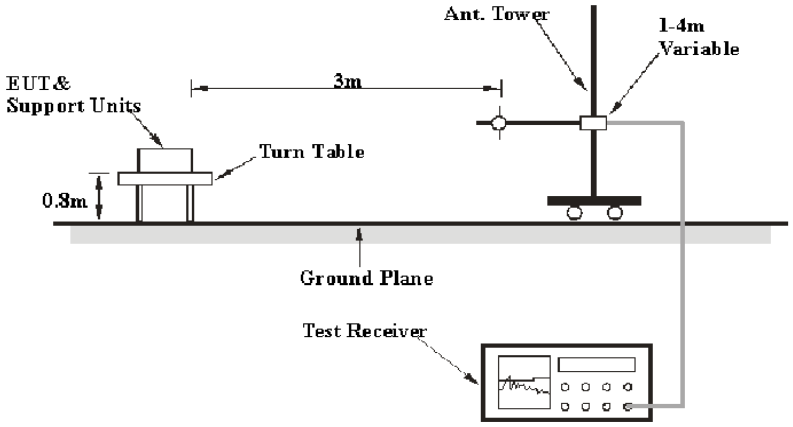
4 - SPURIOUS EMISSIONS

Applicable Standard

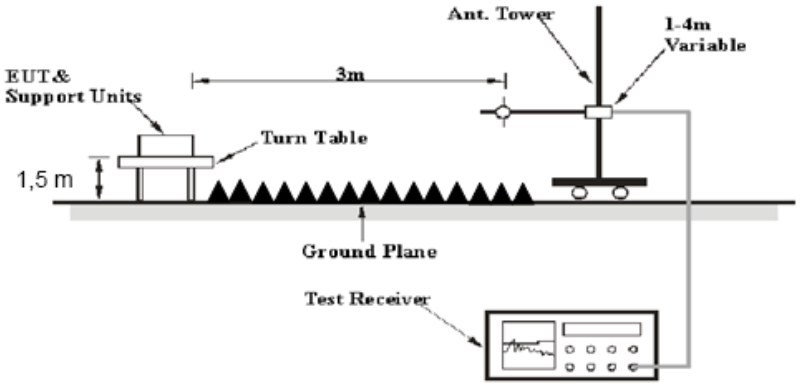
FCC §15.247 (d); §15.209; §15.205

Test System Setup

Below 1GHz:



Above 1GHz:



The radiated emission below 1GHz tests were performed in the 3meters chamber, above 1GHz tests were performed in the 3 meters chamber B, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

30MHz-1000MHz:

Measurement	RBW	Video B/W	IF B/W
QP	120 kHz	300 kHz	120kHz

1GHz- 25GHz:

Measurement	Duty cycle	RBW	Video B/W
PK	Any	1MHz	3 MHz
AV	>98%	1MHz	10 Hz
	<98%	1MHz	1/T

Note: T is minimum transmission duration

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit –Corrected Amplitude

Test Data

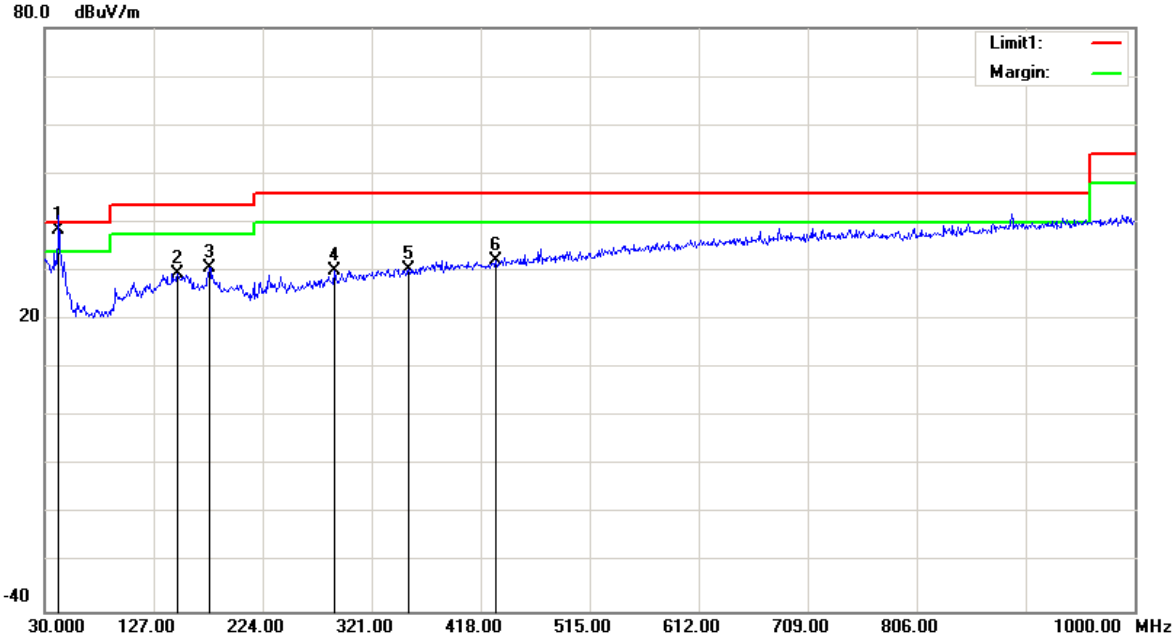
Test Mode: Transmitting

Test Result: Compliance

Please Refer to the following data.

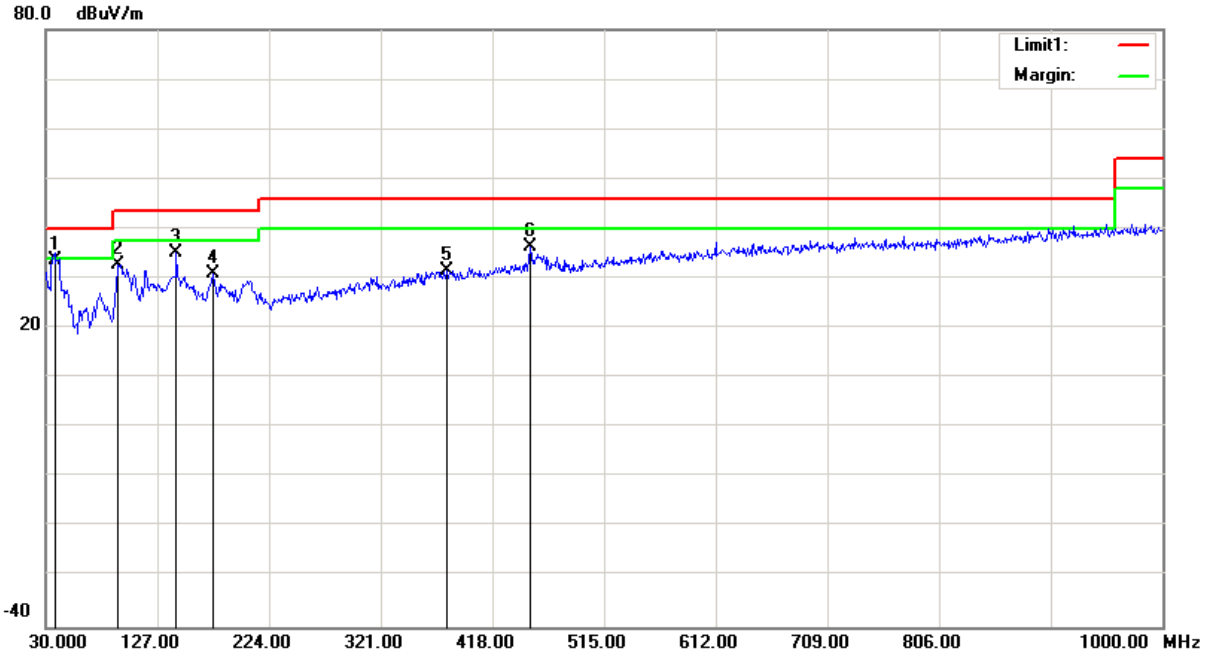
1) 30MHz-1GHz *(BDR High channel was the worst)*

Horizontal:



Frequency (MHz)	Receiver Reading (dBµV)	Remark	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
42.6100	18.66	QP	19.94	38.60	40.00	1.40
148.3400	7.80	peak	21.55	29.35	43.50	14.15
176.4700	9.73	peak	20.89	30.62	43.50	12.88
288.0200	7.50	peak	22.54	30.04	46.00	15.96
353.9800	6.02	peak	24.29	30.31	46.00	15.69
431.5800	6.20	peak	26.03	32.23	46.00	13.77

Vertical:



Frequency (MHz)	Receiver Reading (dBµV)	Remark	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
37.7600	10.92	QP	22.88	33.80	40.00	6.20
93.0500	16.71	peak	16.10	32.81	43.50	10.69
143.4900	13.54	peak	21.63	35.17	43.50	8.33
175.5000	10.03	peak	20.92	30.95	43.50	12.55
378.2300	6.80	peak	24.87	31.67	46.00	14.33
450.9800	9.99	peak	26.32	36.31	46.00	9.69

2)1GHz-25GHz:

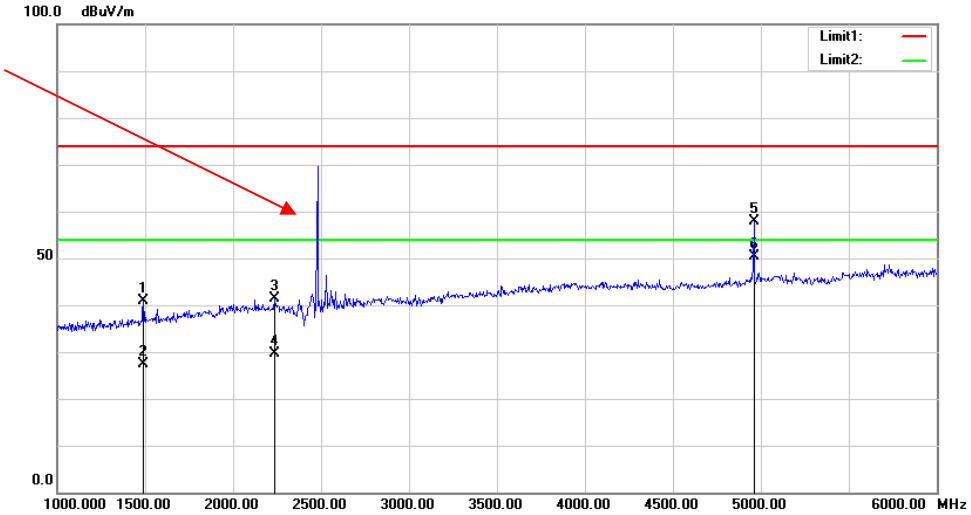
BDR Mode(GFSK) was the worst case:

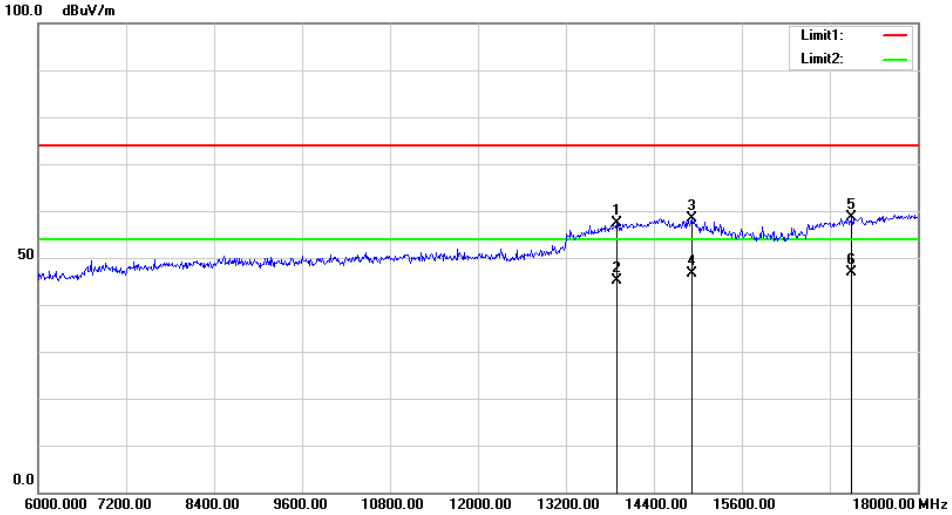
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Remark	Polar (H/V)	Factor (dB/m)					
Low Channel: 2402 MHz									
2402.00	69.67	PK	H	28.10	1.80	0.00	99.57	N/A	N/A
2402.00	59.74	AV	H	28.10	1.80	0.00	89.64	N/A	N/A
2402.00	69.04	PK	V	28.10	1.80	0.00	98.94	N/A	N/A
2402.00	58.69	AV	V	28.10	1.80	0.00	88.59	N/A	N/A
2390.00	25.67	PK	H	28.08	1.80	0.00	55.55	74.00	18.45
2390.00	13.31	AV	H	28.08	1.80	0.00	43.19	54.00	10.81
4804.00	47.07	PK	H	32.91	3.17	25.60	57.55	74.00	16.45
4804.00	36.29	AV	H	32.91	3.17	25.60	46.77	54.00	7.23
7206.00	35.65	PK	H	35.74	4.82	25.60	50.61	74.00	23.39
7206.00	23.74	AV	H	35.74	4.82	25.60	38.70	54.00	15.30
Middle Channel: 2441 MHz									
2441.00	70.56	PK	H	28.18	1.82	0.00	100.56	N/A	N/A
2441.00	60.35	AV	H	28.18	1.82	0.00	90.35	N/A	N/A
2441.00	70.75	PK	V	28.18	1.82	0.00	100.75	N/A	N/A
2441.00	60.28	AV	V	28.18	1.82	0.00	90.28	N/A	N/A
4882.00	47.79	PK	V	33.06	3.27	25.66	58.46	74.00	15.54
4882.00	36.39	AV	V	33.06	3.27	25.66	47.06	54.00	6.94
7323.00	35.16	PK	V	36.04	4.62	25.73	50.09	74.00	23.91
7323.00	23.14	AV	V	36.04	4.62	25.73	38.07	54.00	15.93
High Channel: 2480 MHz									
2480.00	69.86	PK	H	28.26	1.84	0.00	99.96	N/A	N/A
2480.00	59.69	AV	H	28.26	1.84	0.00	89.79	N/A	N/A
2480.00	69.73	PK	V	28.26	1.84	0.00	99.83	N/A	N/A
2480.00	59.64	AV	V	28.26	1.84	0.00	89.74	N/A	N/A
2483.50	27.37	PK	H	28.27	1.84	0.00	57.48	74.00	16.52
2483.50	14.03	AV	H	28.27	1.84	0.00	44.14	54.00	9.86
4960.00	50.73	PK	H	33.22	3.23	25.63	61.55	74.00	12.45
4960.00	39.57	AV	H	33.22	3.23	25.63	50.39	54.00	3.61
7440.00	35.64	PK	H	36.34	4.41	25.85	50.54	74.00	23.46
7440.00	23.57	AV	H	36.34	4.41	25.85	38.47	54.00	15.53

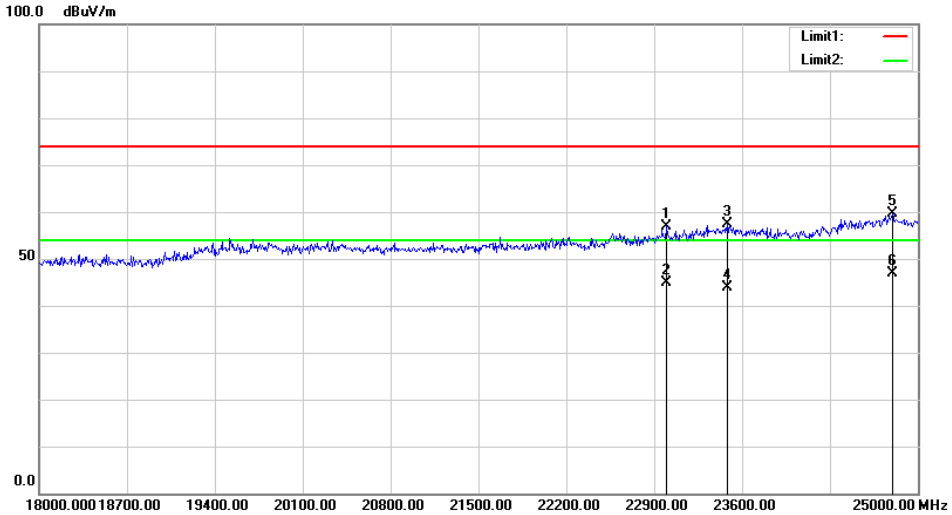
3) Worst plots *(GFSK high channel was the worst)*

Horizontal

Fundamental Test with Band Rejection Filter

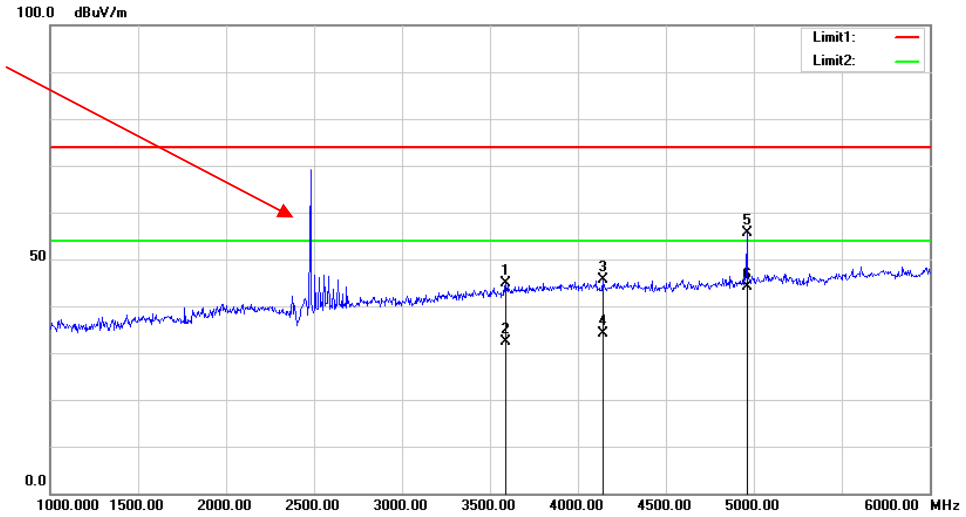


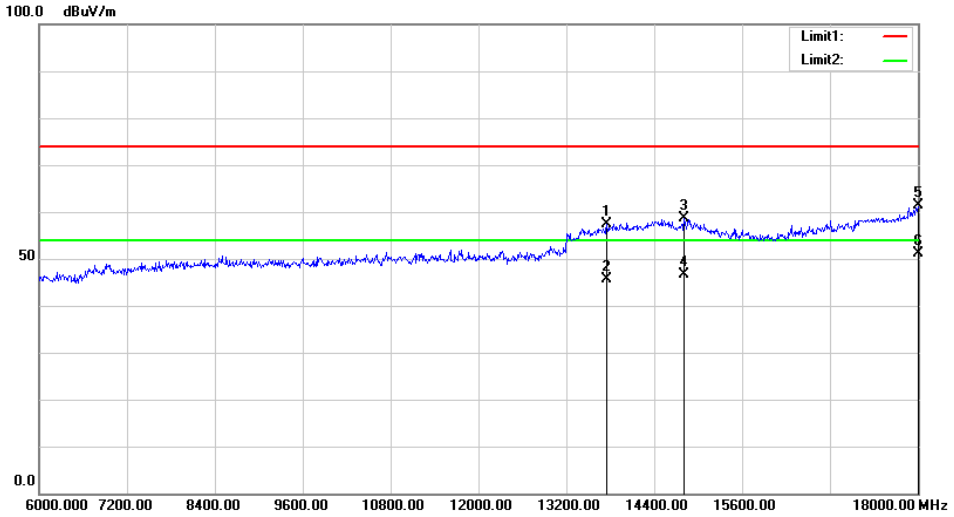


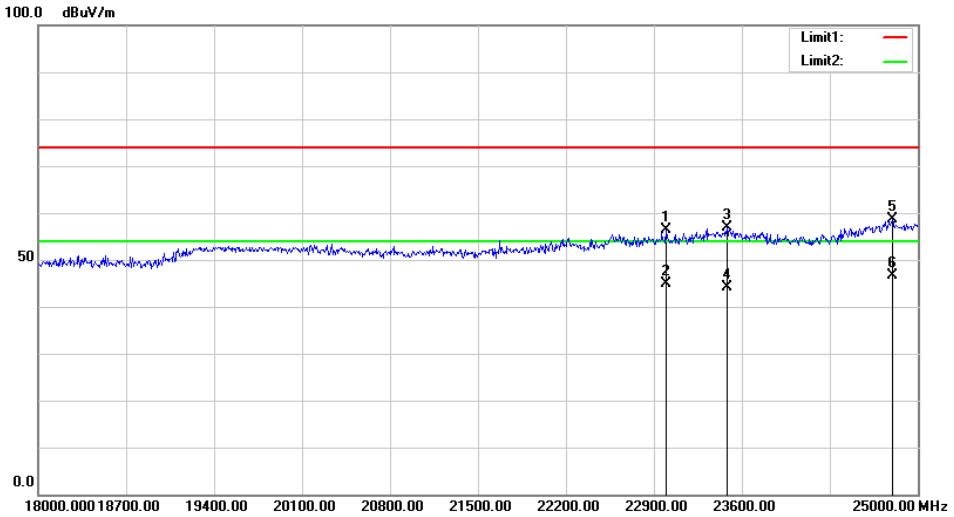


Vertical

Fundamental Test with Band Rejection Filter







5 - CHANNEL SEPARATION TEST

Applicable Standard

Frequency hopping systems shall have hoping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.50 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW.

Test Procedure

1. Set the EUT in transmitting mode, spectrum Bandwidth was set at 30 kHz, maxhold the channel.
2. Set the adjacent channel of the EUT maxhold another trace.
3. Measure the channel separation.

Test Data

Test Mode: Transmitting

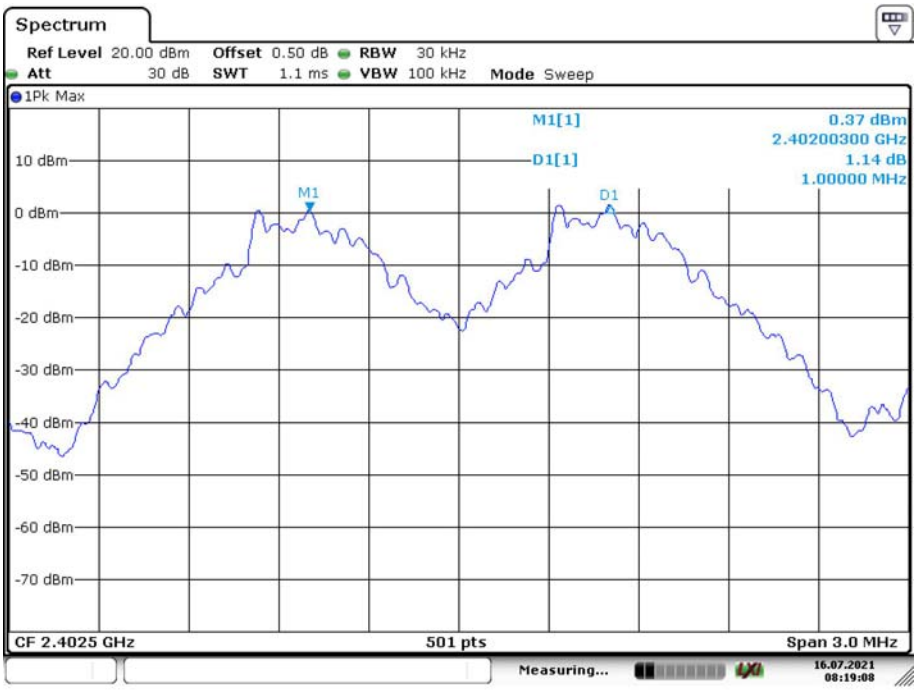
Test Result: Compliance. Please refer to following tables and plots.

Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)
BDR (GFSK)	Low	2402	1.000	0.62
	Middle	2441	1.000	0.59
	High	2480	1.000	0.60
EDR (π/4-DQPSK)	Low	2402	1.000	0.82
	Middle	2441	1.000	0.82
	High	2480	1.000	0.82
EDR (8DPSK)	Low	2402	1.000	0.81
	Middle	2441	1.000	0.81
	High	2480	1.000	0.81

Note: Limit= (2/3) × 20dB bandwidth

BDR Mode (GFSK):

Low Channel



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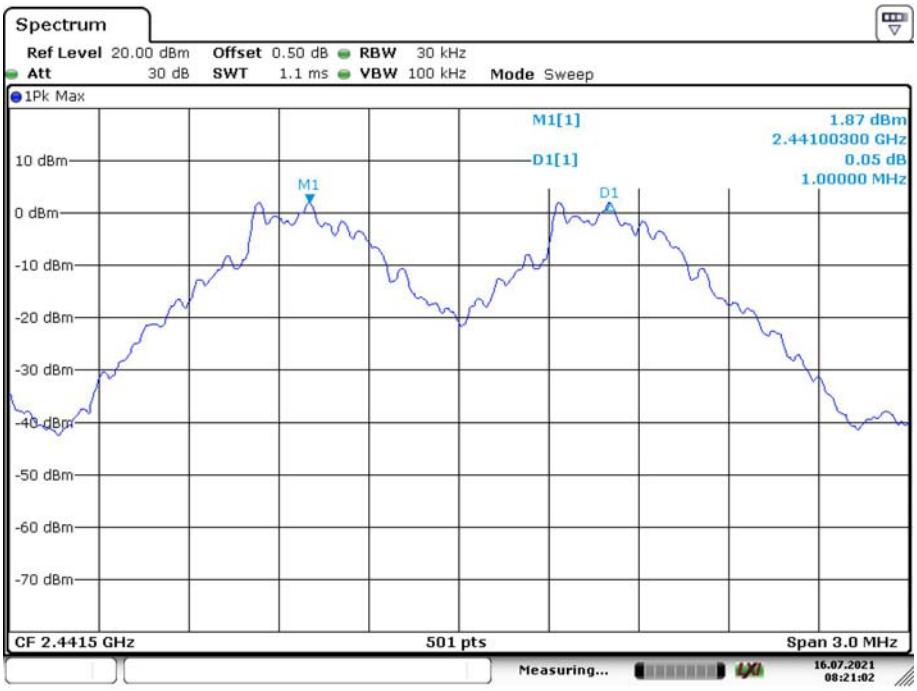
Middle Channel



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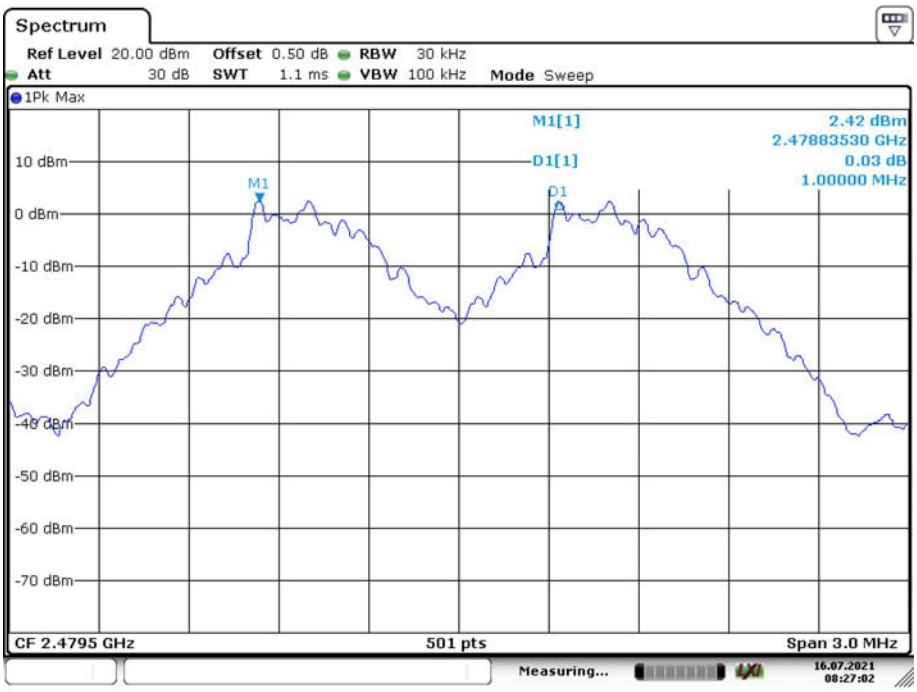
High Channel



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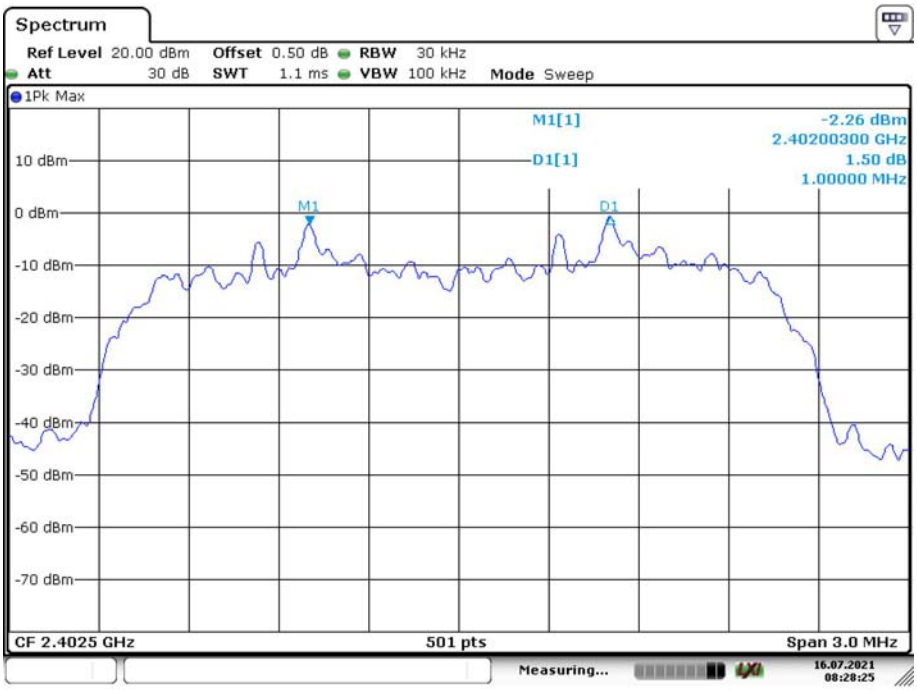
EDR Mode (π/4-DQPSK):

Low Channel



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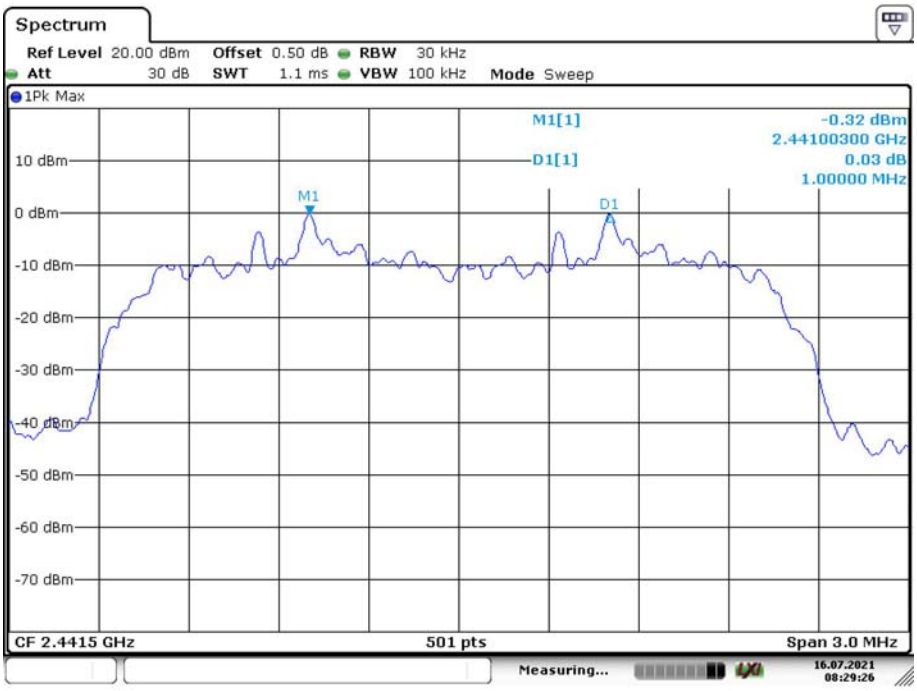
Middle Channel



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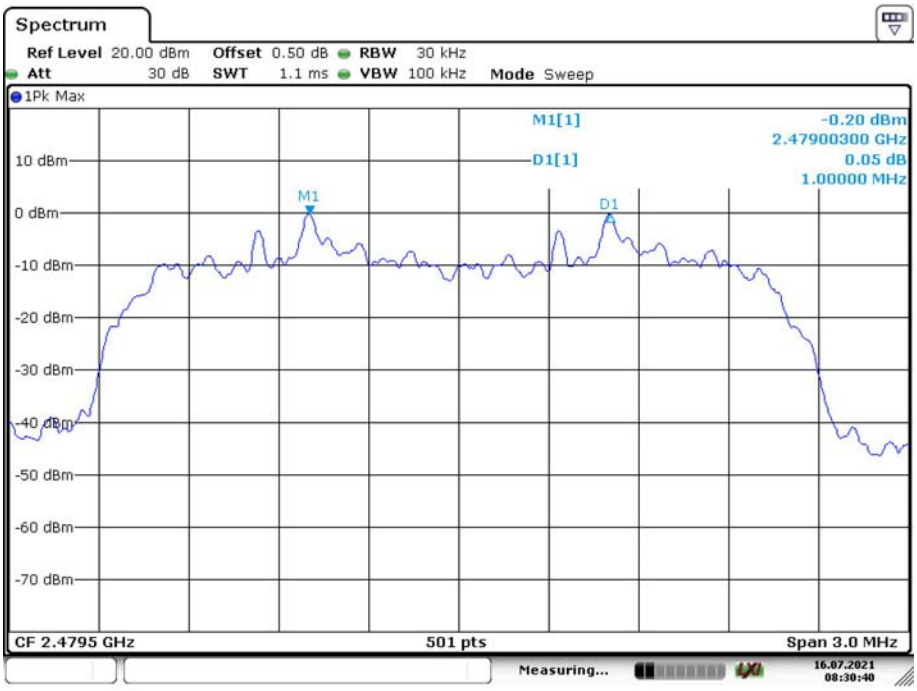
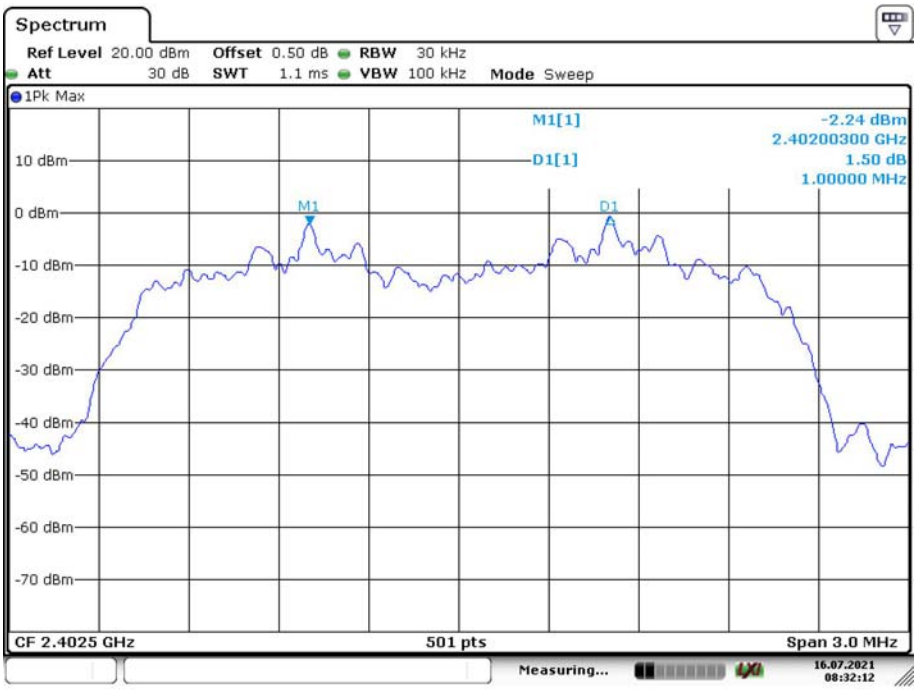
High Channel



Date: 16.JUL.2021 08:30:41

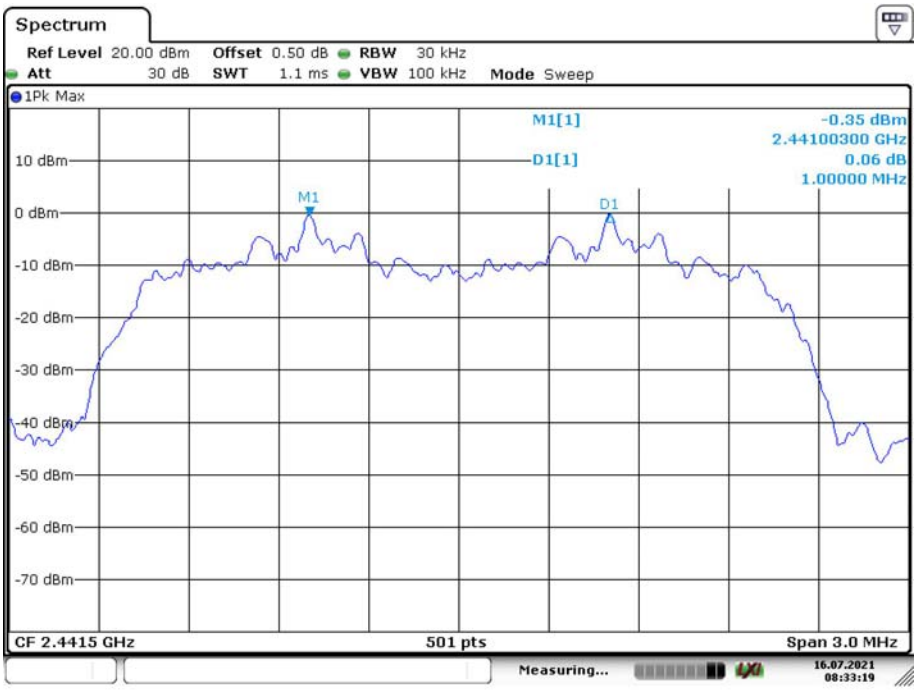
EDR Mode (8DPSK):

Low Channel



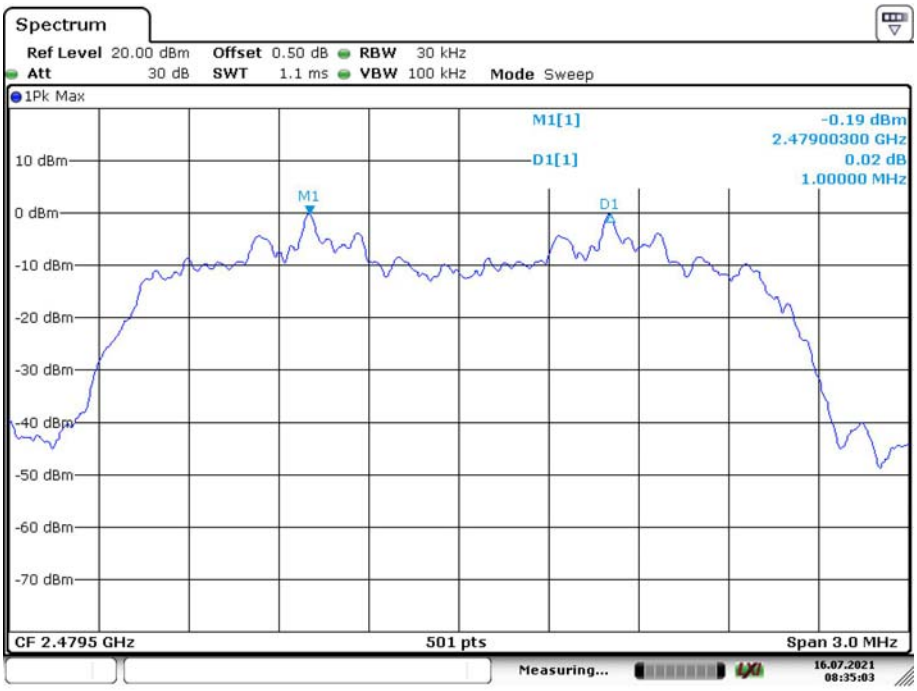
Date: 16.JUL.2021 08:32:13

Middle Channel



Date: 16.JUL.2021 08:33:20

High Channel



Date: 16.JUL.2021 08:35:04

6 – 20 dB BANDWIDTH TESTING

Applicable Standard

Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Data

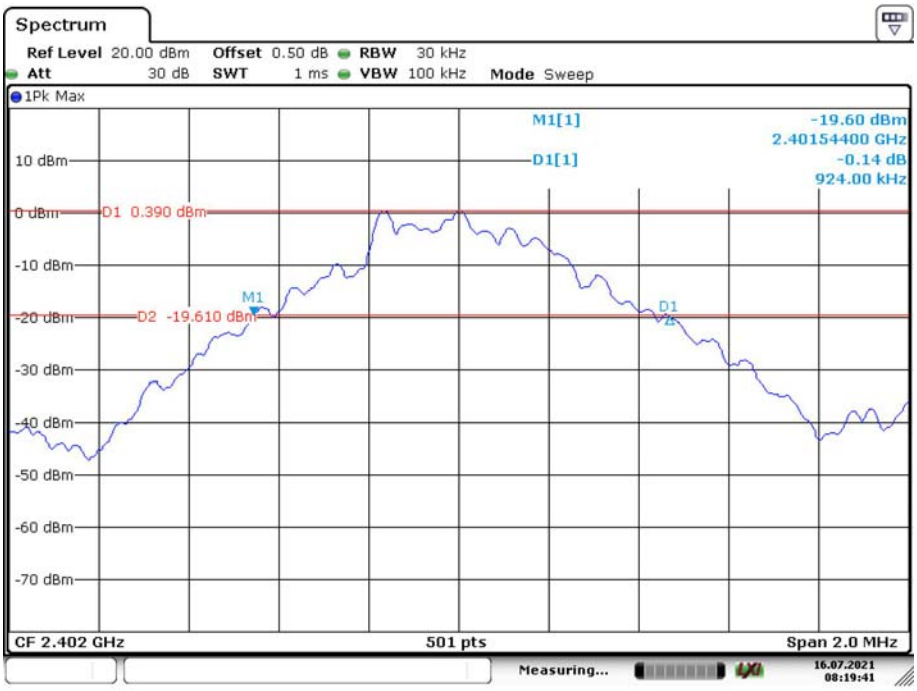
Test Mode: Transmitting

Test Result: Compliance. Please refer to following tables and plots.

Mode	Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
BDR Mode (GFSK)	Low	2402	0.924
	Middle	2441	0.892
	High	2480	0.896
EDR Mode (π/4-DQPSK)	Low	2402	1.224
	Middle	2441	1.224
	High	2480	1.224
EDR Mode (8DPSK)	Low	2402	1.212
	Middle	2441	1.212
	High	2480	1.212

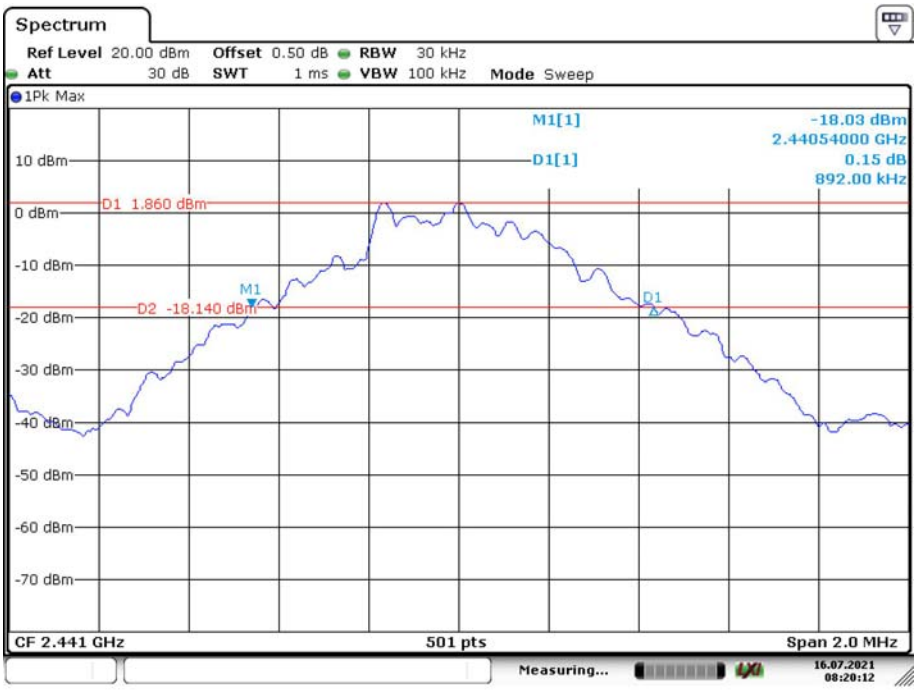
BDR Mode (GFSK):

Low Channel



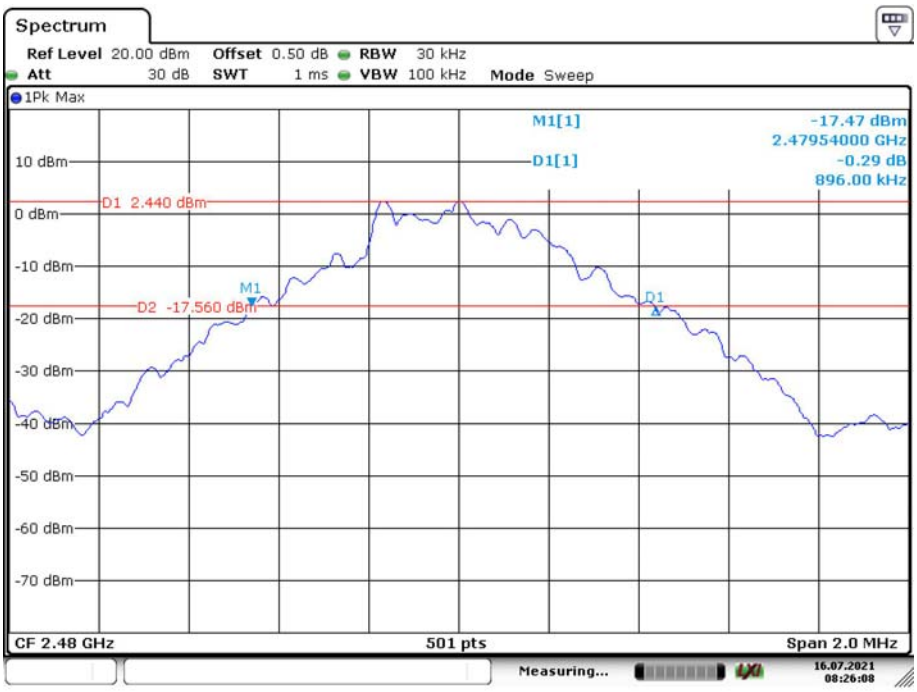
Date: 16.JUL.2021 08:19:41

Middle Channel



Date: 16.JUL.2021 08:20:13

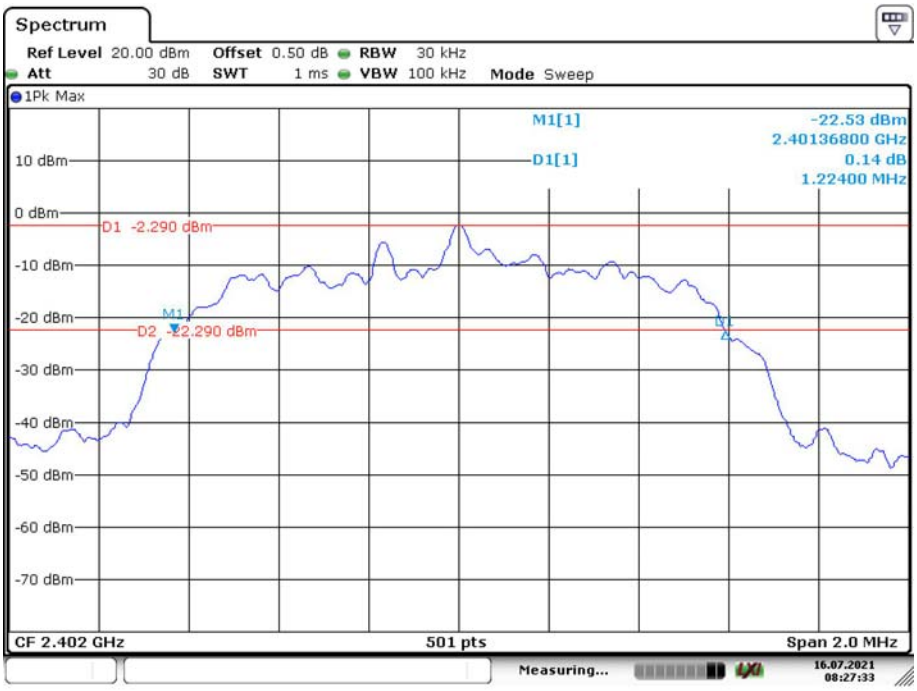
High Channel



Date: 16.JUL.2021 08:26:09

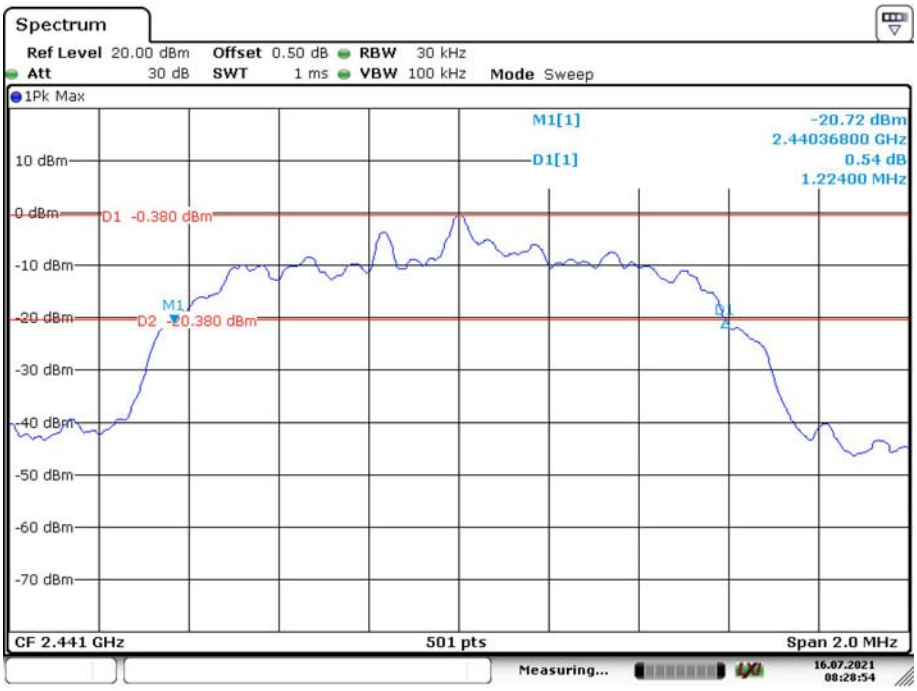
EDR Mode (π/4-DQPSK):

Low Channel



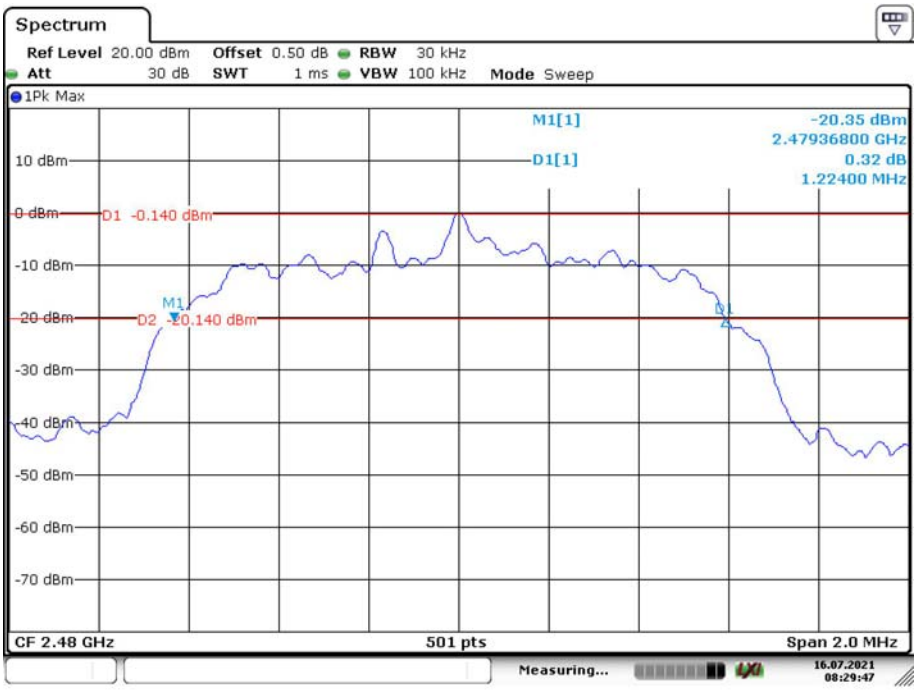
Date: 16.JUL.2021 08:27:33

Middle Channel



Date: 16.JUL.2021 08:28:54

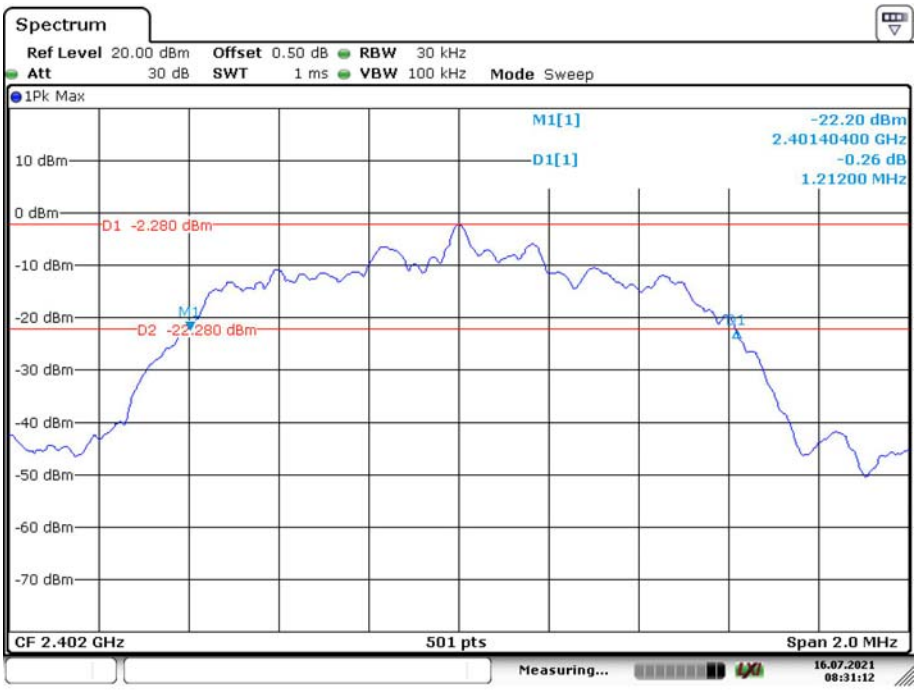
High Channel



Date: 16.JUL.2021 08:29:48

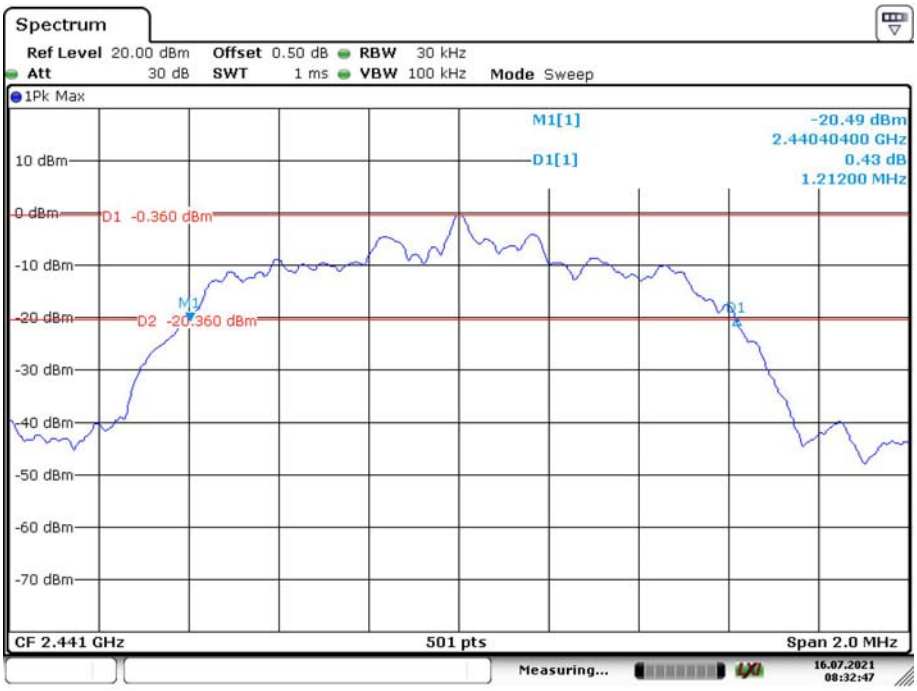
EDR Mode (8DPSK):

Low Channel



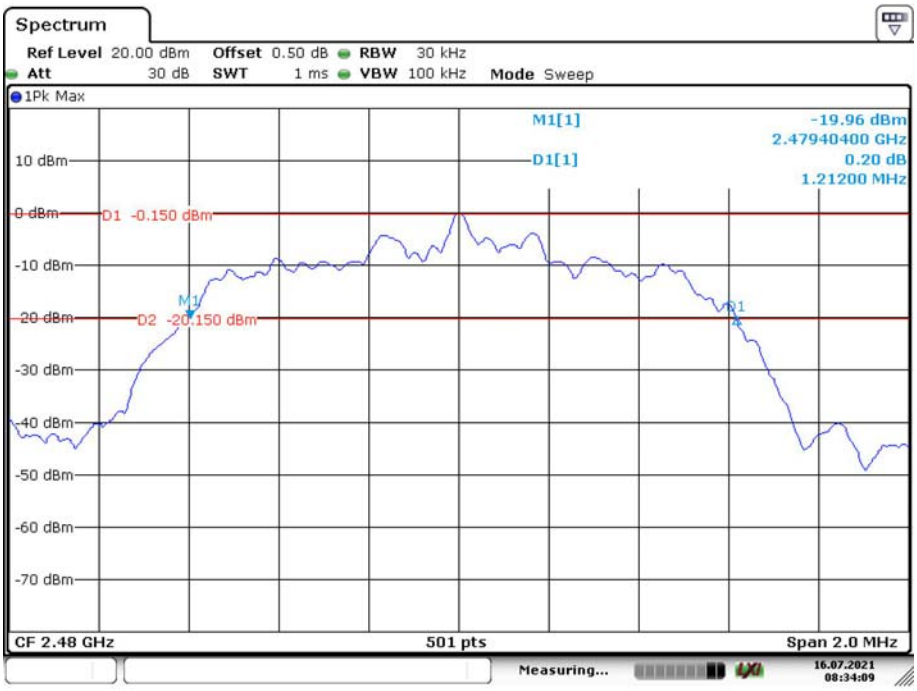
Date: 16.JUL.2021 08:31:13

Middle Channel



Date: 16.JUL.2021 08:32:47

High Channel



Date: 16.JUL.2021 08:34:10

7 - QUANTITY OF HOPPING CHANNEL TEST

Applicable Standard

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.

2. Set the EUT in hopping mode from first channel to last.

3. By using the Max-Hold function record the Quantity of the channel.

Test Data

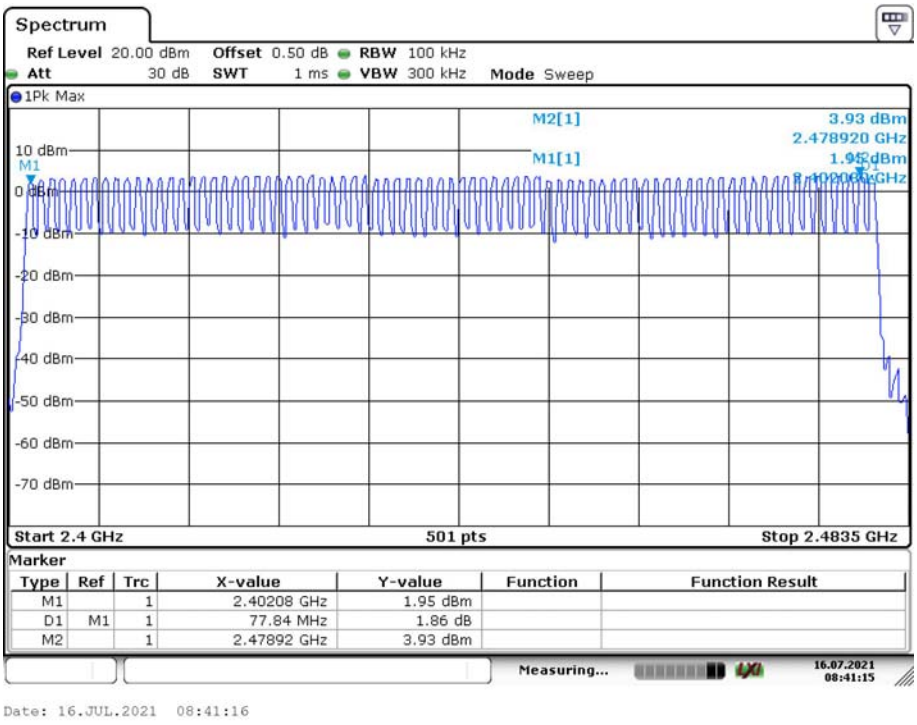
Test Mode: Transmitting

Test Result: Compliance. Please refer to following tables and plots.

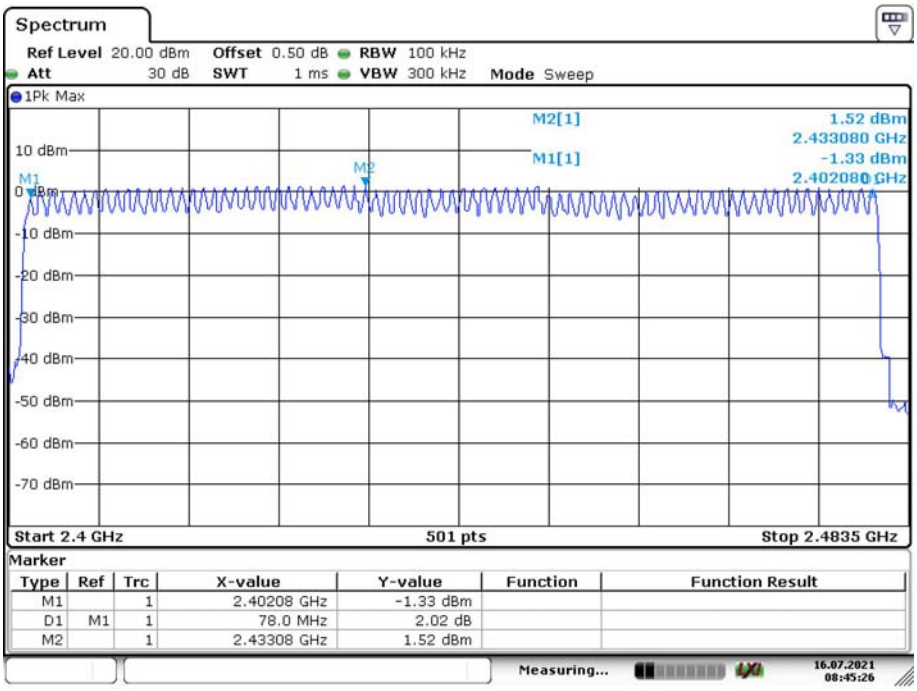
Test mode	Frequency Range (MHz)	Number of Hopping Channel	Limit
GFSK	2400-2483.5	79	≥15
π/4-DQPSK	2400-2483.5	79	≥15
8DPSK	2400-2483.5	79	≥15

Test Result: Compliance. Please refer to following tables and plots

BDR Mode (GFSK)

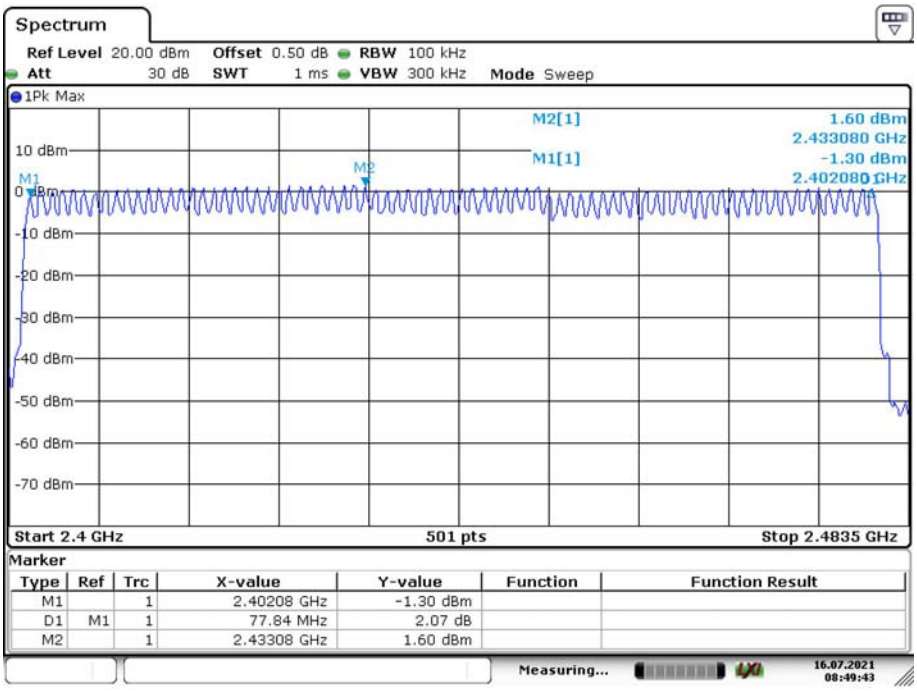


EDR Mode (π/4-DQPSK)



Date: 16.JUL.2021 08:45:27

EDR Mode (8DPSK)



Date: 16.JUL.2021 08:49:44

8 - TIME OF OCCUPANCY (DWELL TIME)

Applicable Standard

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

The EUT was worked in channel hopping; the time of single pulses was tested.

Test Data

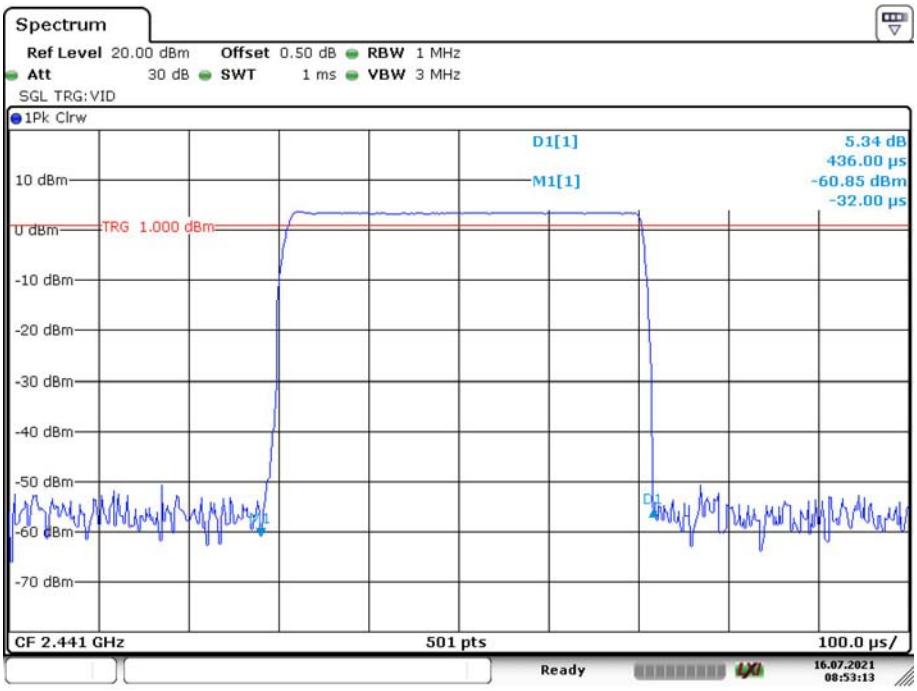
Test Mode: Transmitting

Test Result: Compliance. Please refer to following tables and plots.

Mode	Packet type	Channel	Frequency (MHz)	Puse width (ms)	Result (s)	Limit (s)
GFSK	DH1	Middle	2441	0.436	0.140	0.4
	DH3	Middle	2441	1.696	0.271	
	DH5	Middle	2441	2.960	0.316	
π/4-DQPSK	2DH1	Middle	2441	0.449	0.144	
	2DH3	Middle	2441	1.721	0.275	
	2DH5	Middle	2441	2.961	0.316	
8DPSK	3DH1	Middle	2441	0.448	0.143	
	3DH3	Middle	2441	1.714	0.274	
	3DH5	Middle	2441	2.970	0.317	
Note: DH1:Dwell time=Pulse time (ms) × (1600/2/79) ×31.6 s DH3:Dwell time=Pulse time (ms) × (1600/4/79) ×31.6 s DH5:Dwell time=Pulse time (ms) × (1600/6/79) ×31.6 s						

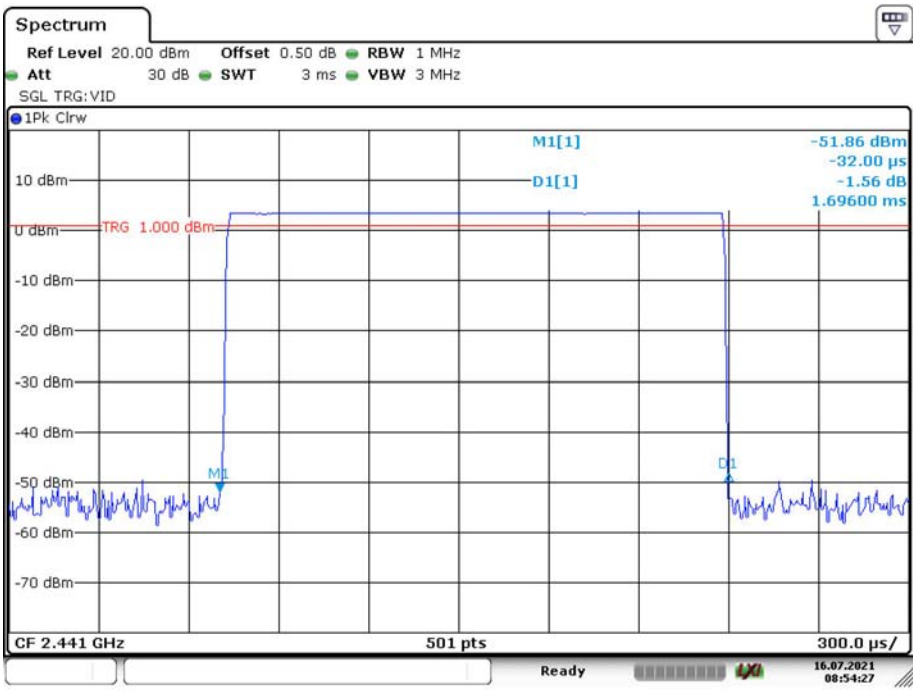
BDR Mode (GFSK):

DH1: Middle Channel



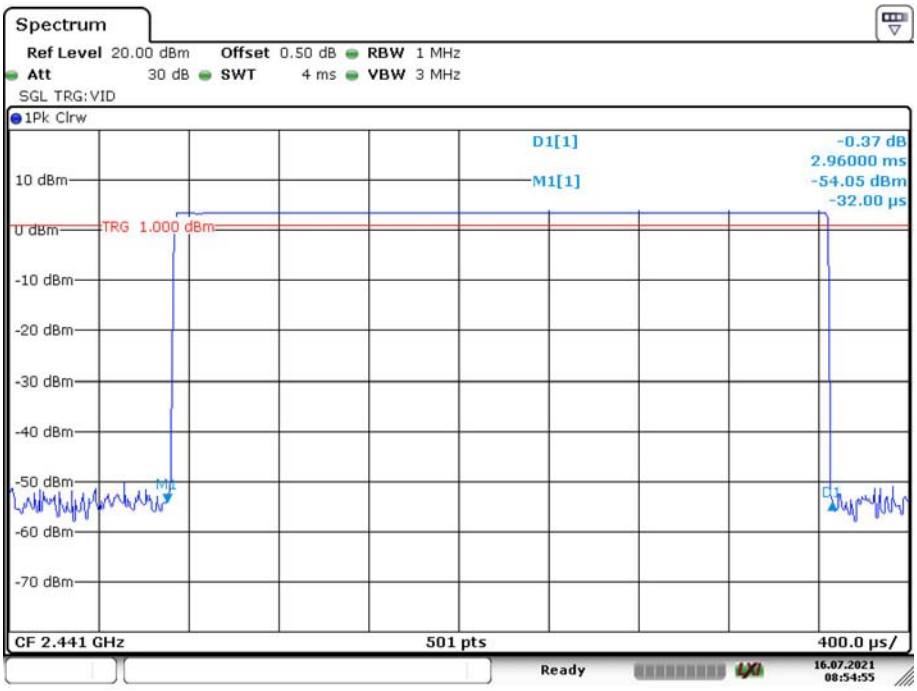
Date: 16.JUL.2021 08:53:14

DH3: Middle Channel



Date: 16.JUL.2021 08:54:27

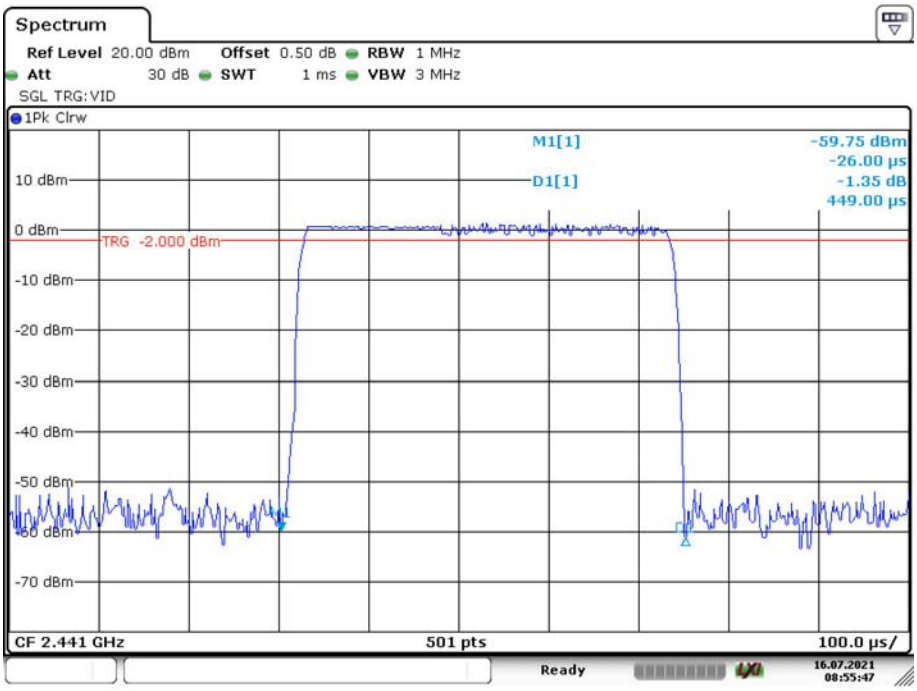
DH5: Middle Channel



Date: 16.JUL.2021 08:54:56

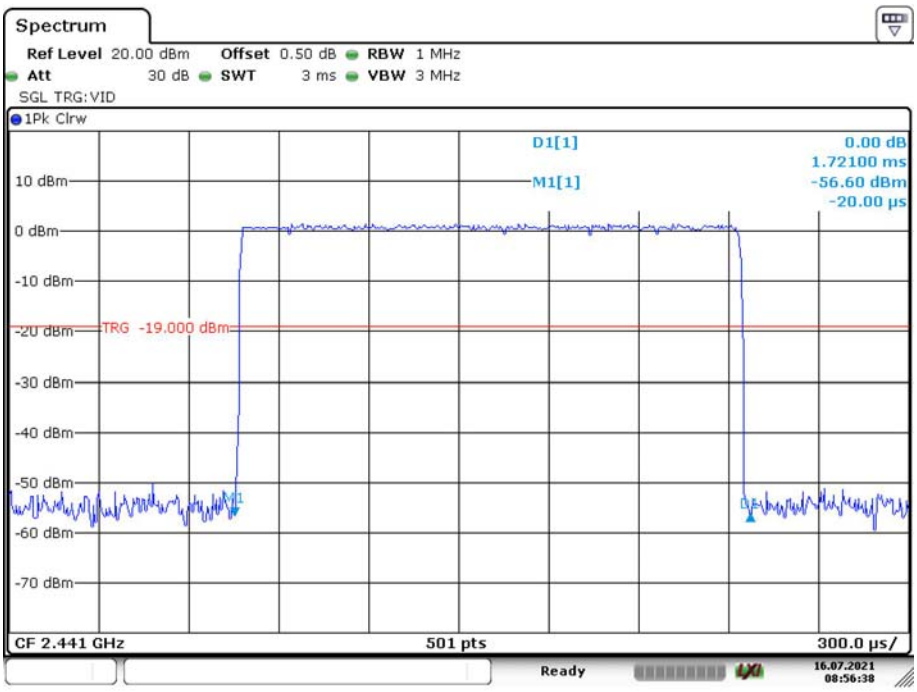
EDR Mode (π/4-DQPSK):

2DH1: Middle Channel



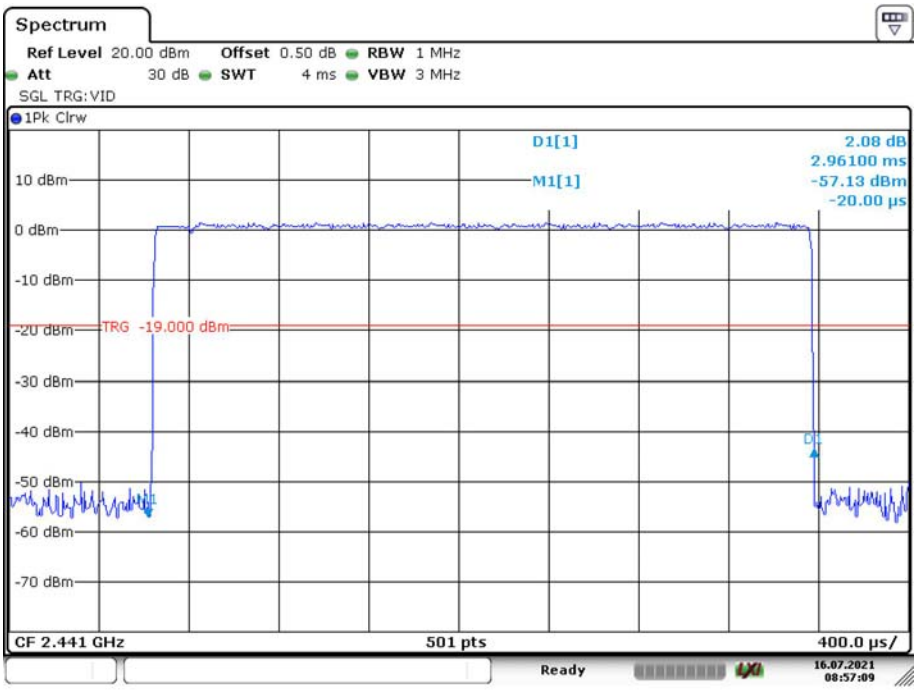
Date: 16.JUL.2021 08:55:47

2DH3: Middle Channel



Date: 16.JUL.2021 08:56:39

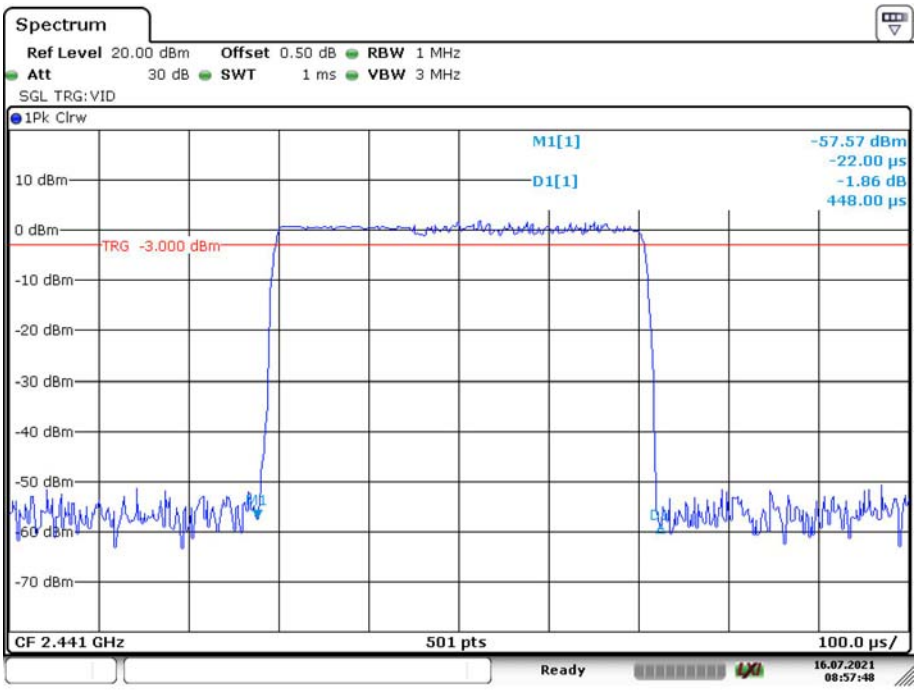
2DH5: Middle Channel



Date: 16.JUL.2021 08:57:10

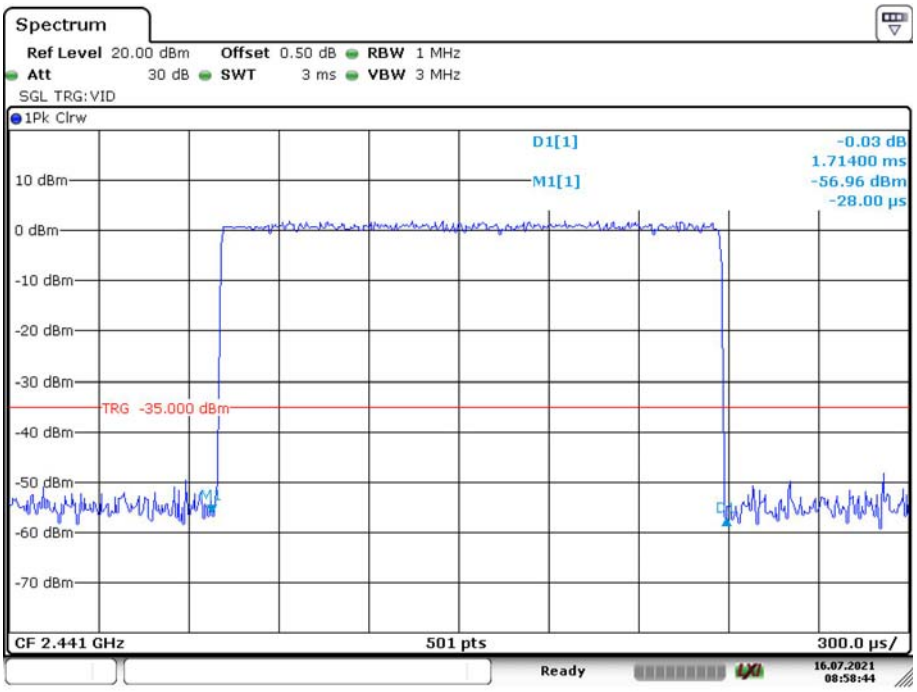
EDR Mode (8DPSK):

3DH1: Middle Channel



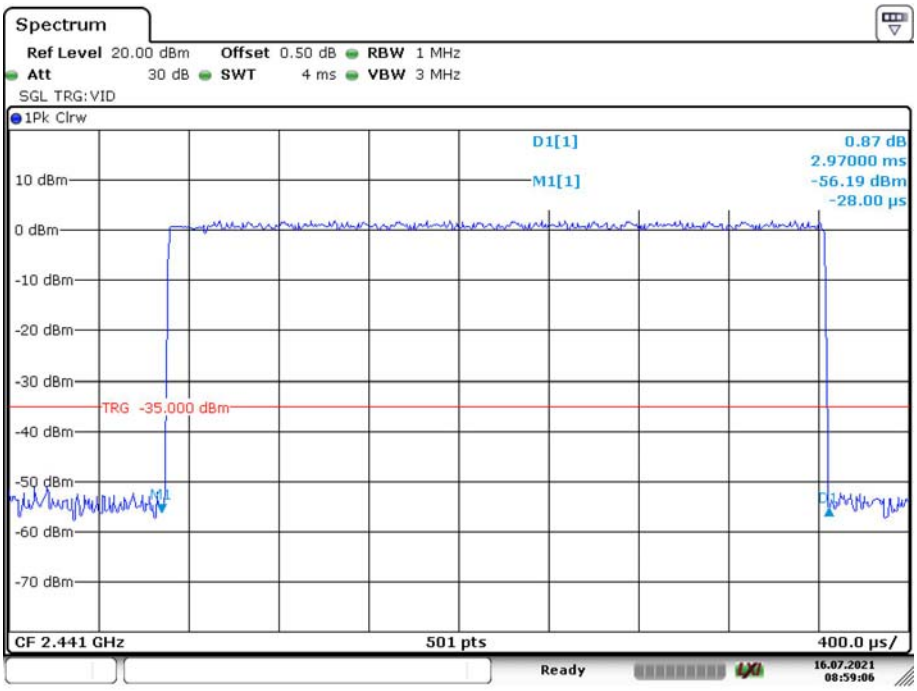
Date: 16.JUL.2021 08:57:48

3DH3: Middle Channel



Date: 16.JUL.2021 08:58:44

3DH5: Middle Channel



Date: 16.JUL.2021 08:59:06

9 - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

According to §15.247(b) (1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts

Test Procedure

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.

Test Data

Test Mode: Transmitting

Test Result: Compliance. Please refer to following tables and plots.

Mode	Frequency (MHz)	Peak Conducted Output power (dBm)	Limit (dBm)
BDR Mode (GFSK)	2402	4.03	21
	2441	4.58	21
	2480	**4.73**	21
EDR Mode (π/4-DQPSK)	2402	1.18	21
	2441	1.94	21
	2480	1.91	21
EDR Mode (8DPSK)	2402	1.19	21
	2441	1.95	21
	2480	1.91	21

Note: The data above was tested in conducted mode, the antenna gain is 0 dBi.

10 - BAND EDGES TESTING

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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)).

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW/ VBW of spectrum analyzer to 100/300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Data

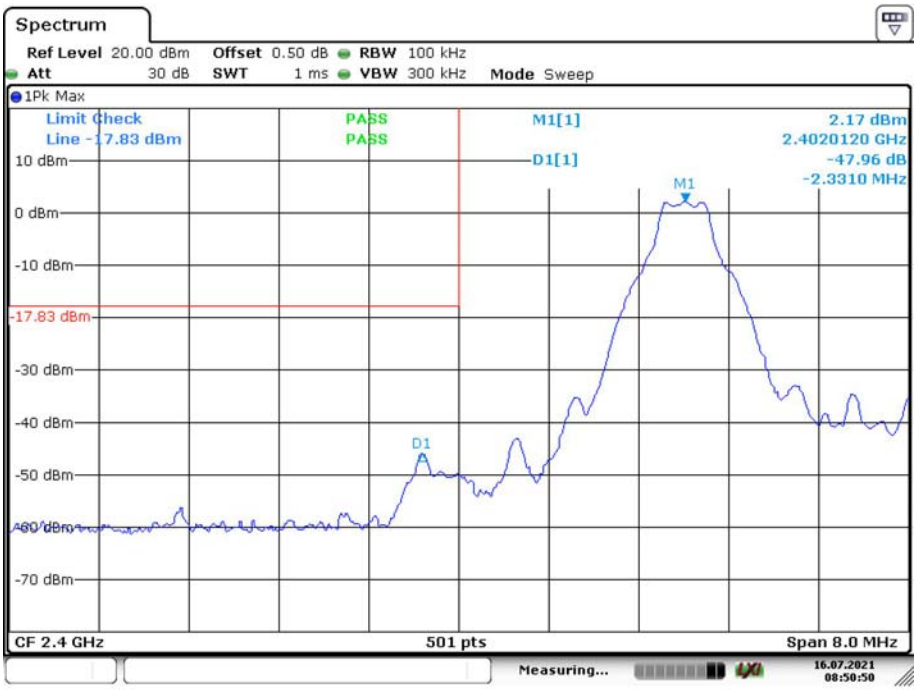
Test Mode: Transmitting

Test Result: Compliance. Please refer to following tables and plots.

Single mode:

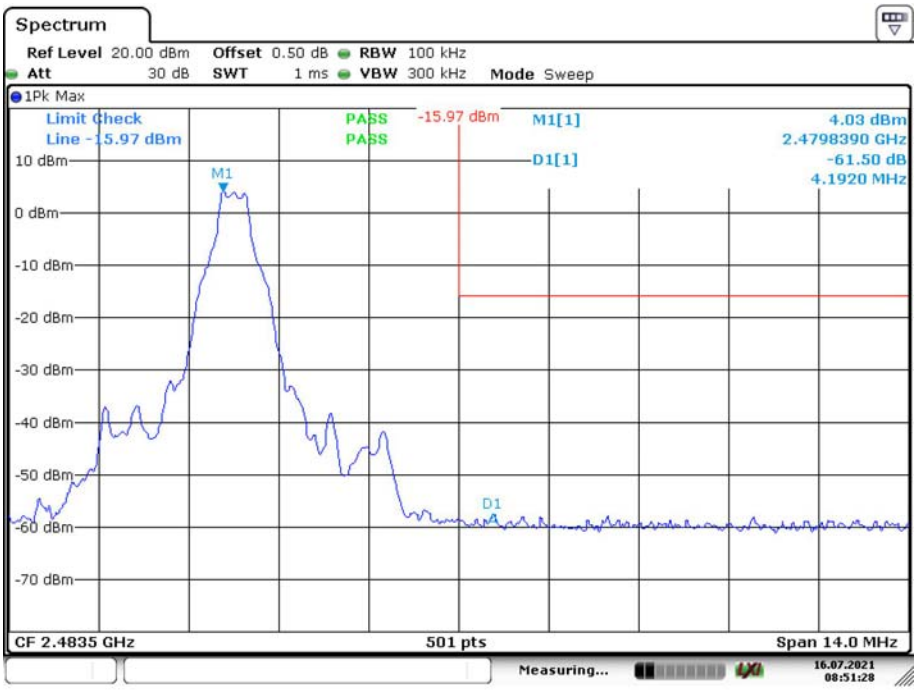
BDR Mode (GFSK):

Band Edge, Left Side



Date: 16.JUL.2021 08:50:50

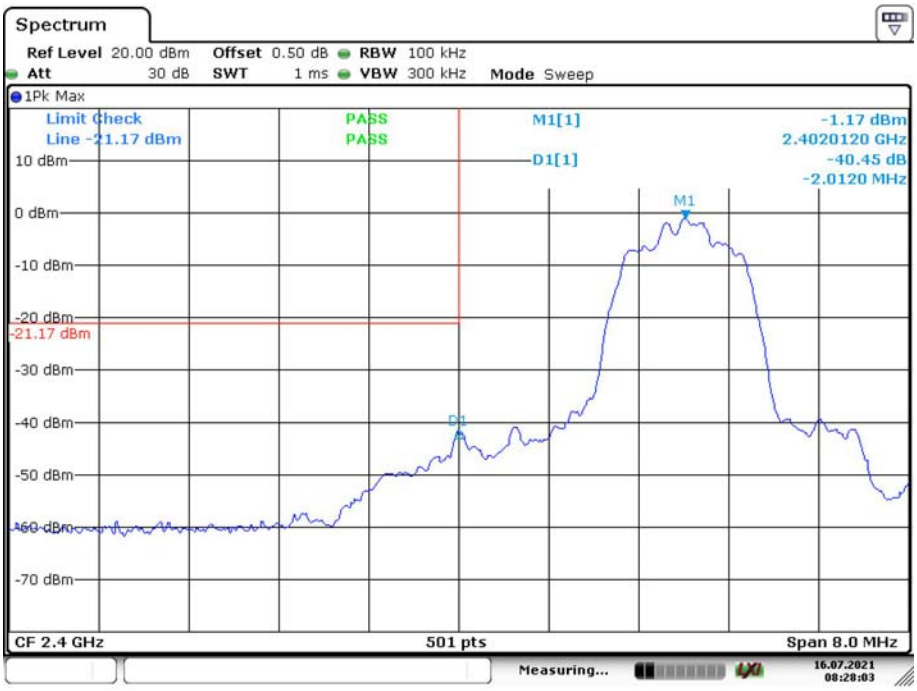
Band Edge, Right Side



Date: 16.JUL.2021 08:51:28

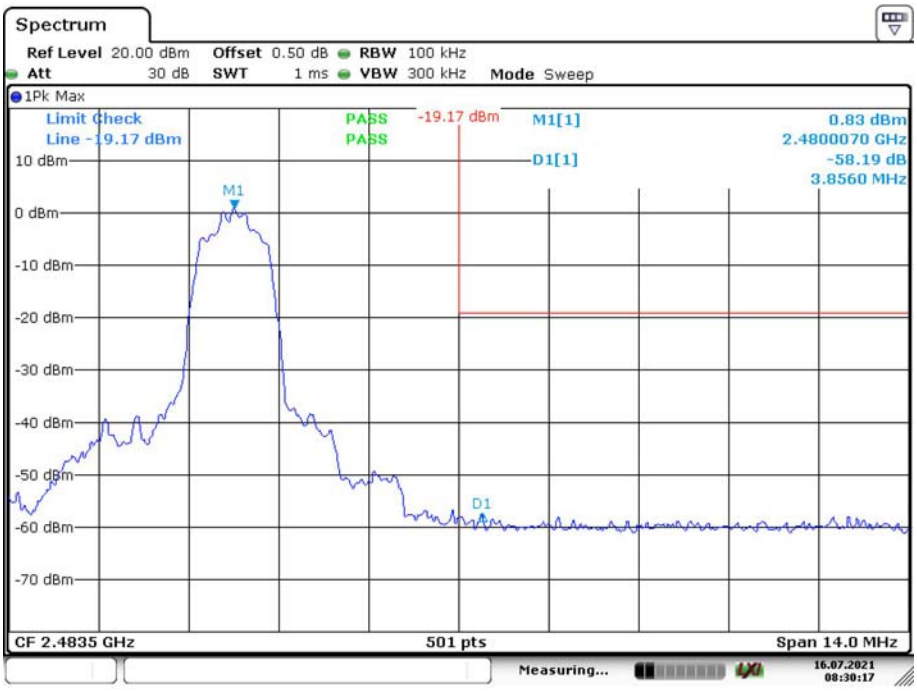
EDR Mode (π/4-DQPSK):

Band Edge, Left Side



Date: 16.JUL.2021 08:28:03

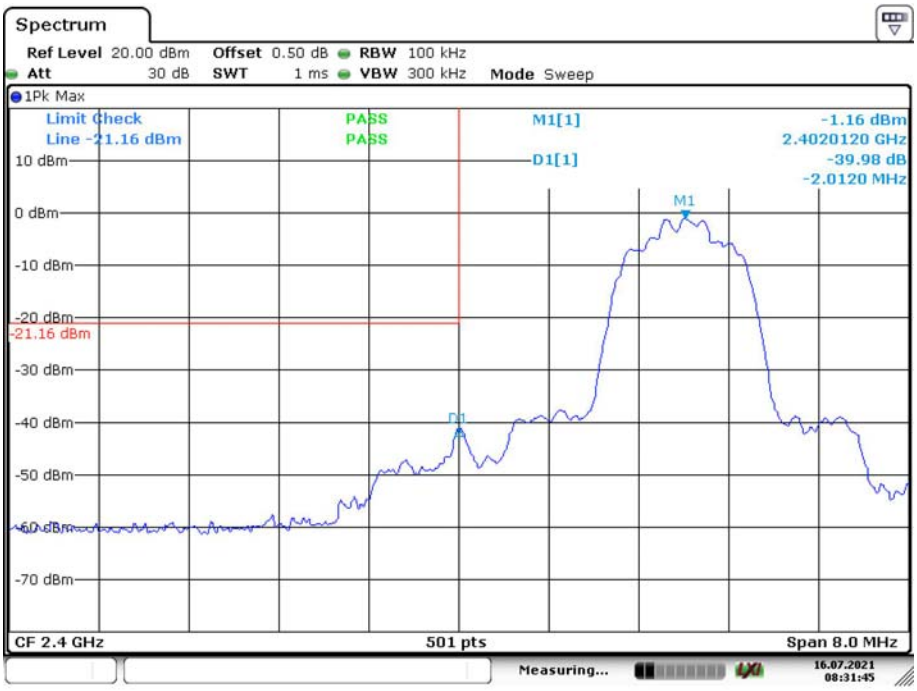
Band Edge, Right Side



Date: 16.JUL.2021 08:30:17

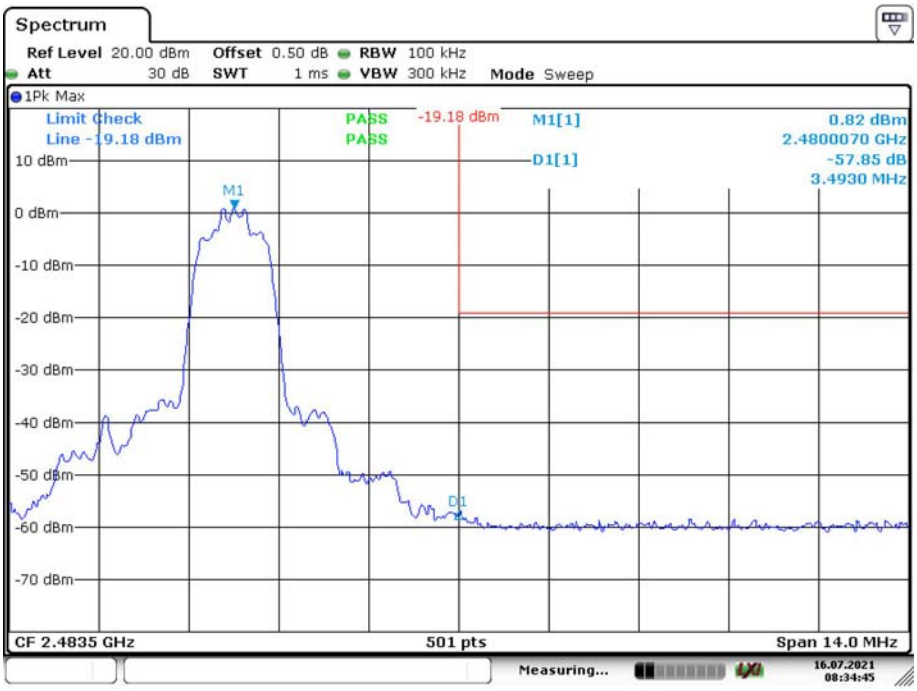
EDR Mode (8DPSK):

Band Edge, Left Side



Date: 16.JUL.2021 08:31:46

Band Edge, Right Side



Date: 16.JUL.2021 08:34:46

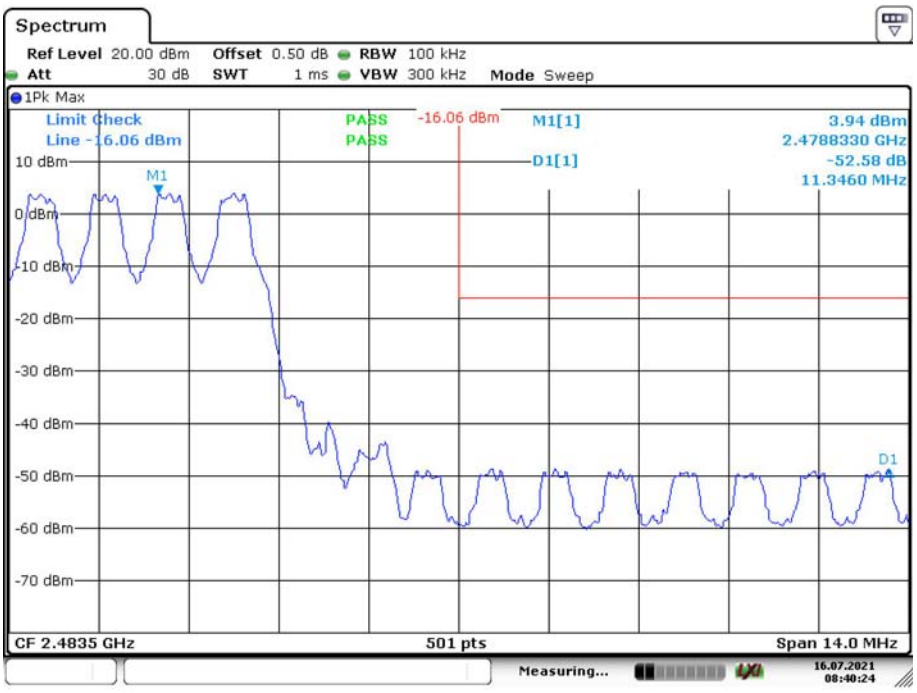
Hopping Mode,

BDR Mode (GFSK):

Band Edge, Left Side

Date: 16.JUL.2021 08:38:50

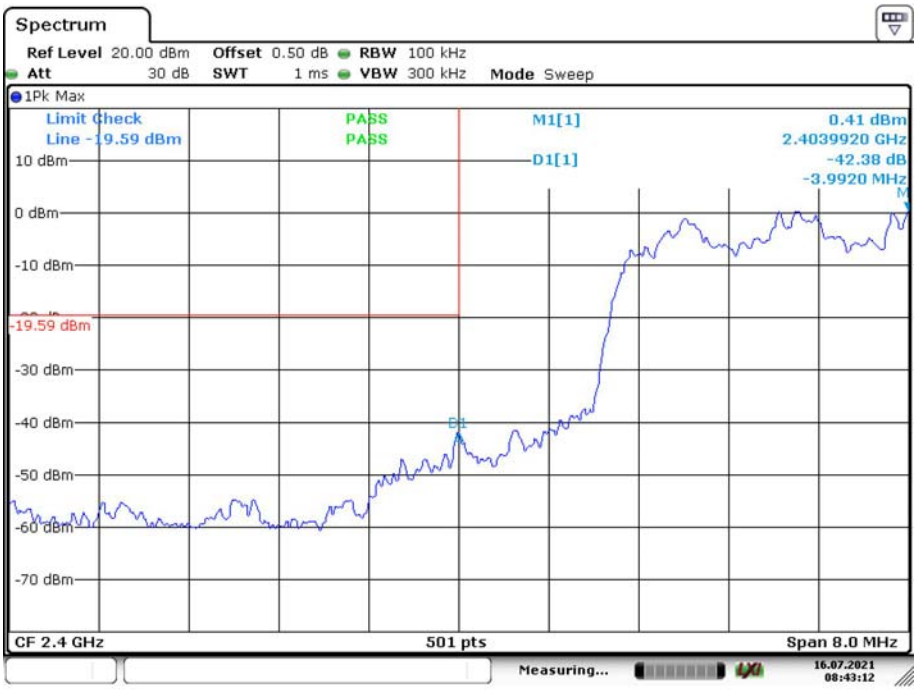
Band Edge, Right Side



Date: 16.JUL.2021 08:40:24

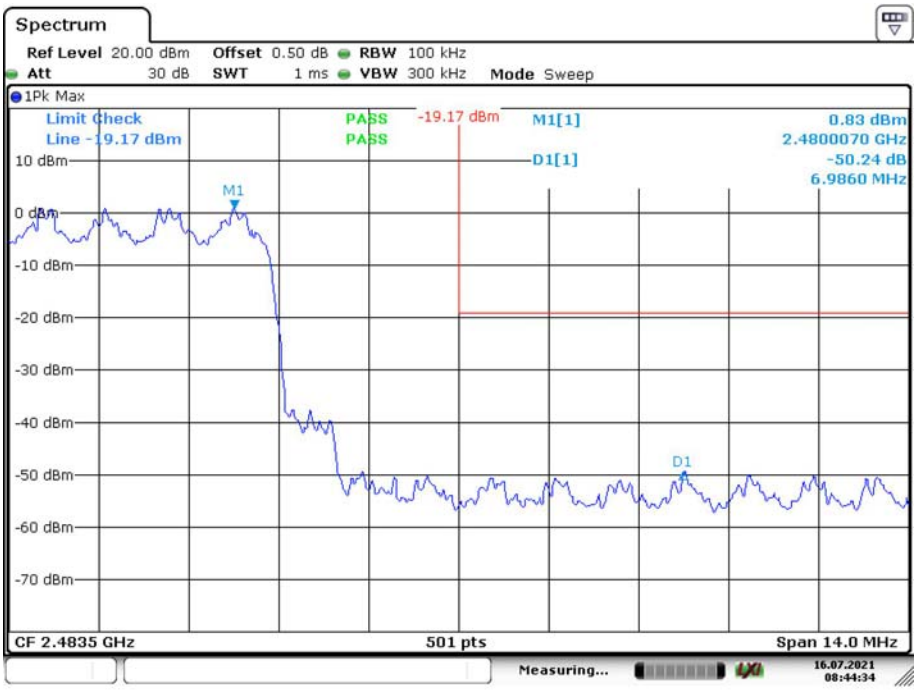
EDR Mode (π/4-DQPSK):

Band Edge, Left Side



Date: 16.JUL.2021 08:43:12

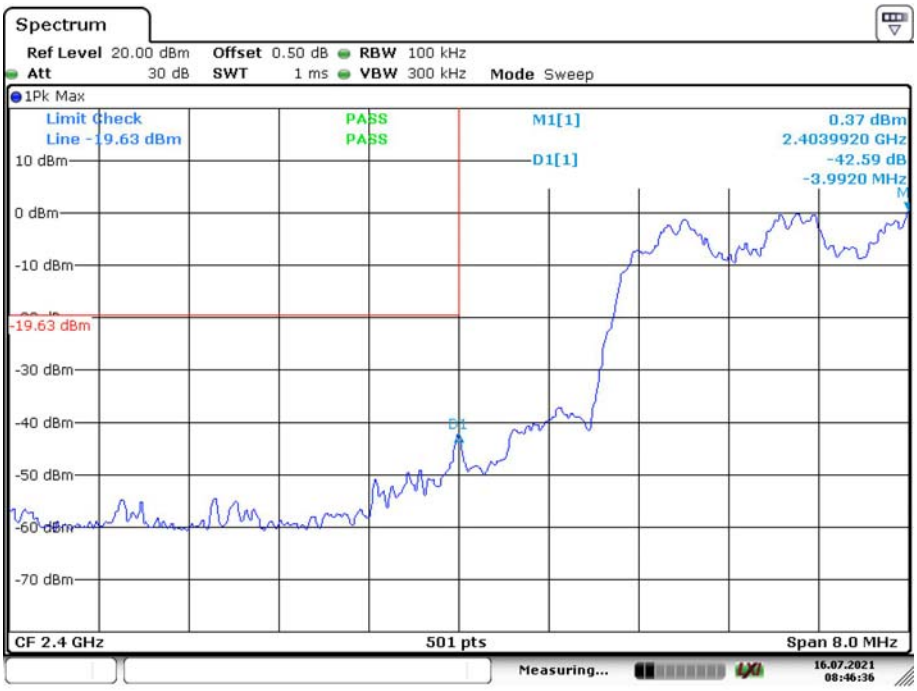
Band Edge, Right Side



Date: 16.JUL.2021 08:44:35

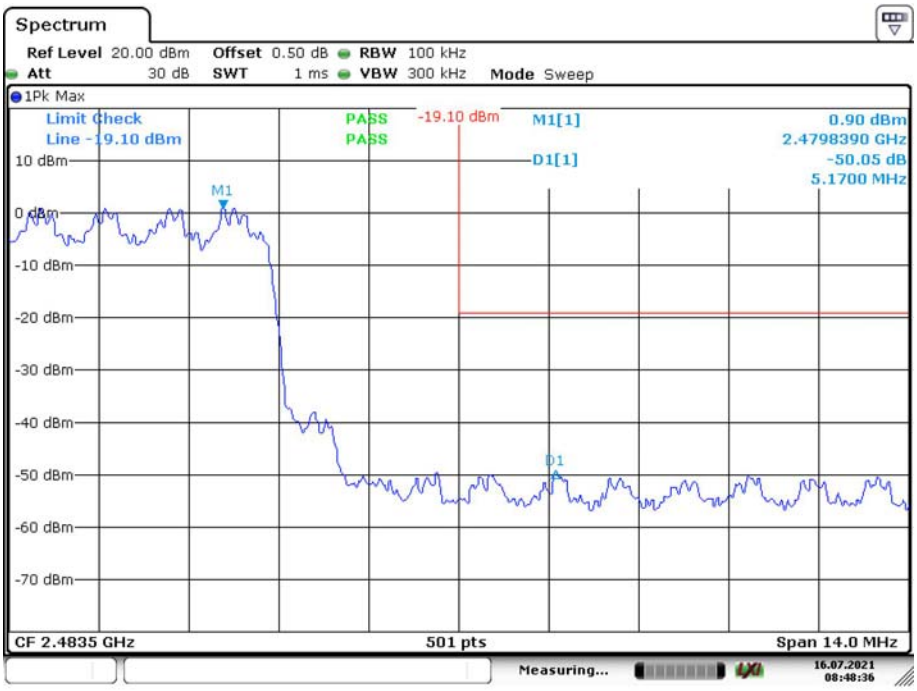
EDR Mode (8DPSK):

Band Edge, Left Side



Date: 16.JUL.2021 08:46:36

Band Edge, Right Side



Date: 16.JUL.2021 08:48:36

******* END OF REPORT *******