FCC Part 15.247
RSS-247, ISSUE 3, August 2023
RSS-GEN, ISSUE 5, February 2021 Amendment 2
TEST REPORT

For

Fortinet, Inc.

909 Kifer Road, Sunnyvale, CA 94086, USA

FCC ID: TVE-FON780B
IC: 7280B-FON780B

Report Type:	**Product Type:**
Original Report	FortiFone 780B

Report Producer : Coco Lin

Report Number : RXZ250213056RF02

Report Date : 2025-05-26

Reviewed By: Andy Shih

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Revision History

Revision	No.	Report Number	Issue Date	Description	Author/ Revised by
0.0	RXZ250213056	RXZ250213056RF02	2025-05-26	Original Report	Coco Lin

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1. General Information

1.1. Product Description for Equipment under Test (EUT)

Applicant	Fortinet, Inc.
	909 Kifer Road, Sunnyvale, CA 94086, USA
Brand Name	FORTINET
Product (Equipment) / PMN	FortiFone 780B
Main Model Name	FON-780B
HVIN	FON-780B
Series Model Name (Only FCC)	FON-780Bxxxxxxxxxx, FortiFone 780Bxxxxxxxxxx, FORTIFONE 780Bxxxxxxxxxx (where "x" can be used as "0-9", or"A-Z",or"_", or blank for software changes or marketing purpose only)
Frequency Range	2402~2480 MHz
Modulation Technique	BR Mode: GFSK EDR Mode: π/4-DQPSK, 8DPSK
Maximum Conducted Peak Output Power	BR(GFSK) Mode: 3.82 dBm EDR(π/4-DQPSK) Mode: 7.01 dBm EDR(8DPSK) Mode: 7.04 dBm
Transmit Data Rate	BR(GFSK) Mode: 1 Mbps EDR(π/4-DQPSK) Mode: 2 Mbps EDR(8DPSK) Mode: 3 Mbps
Power Operation (Voltage Range)	12Vdc from Adapter, 48Vdc from POE
Sample Received Date	2025/03/24

*All measurement and test data in this report was gathered from production sample serial number: RXZ250213056-1 (Assigned by BACL, New Taipei Laboratory.).

1.2. Objective

This report is prepared on behalf of *Fortinet, Inc.* in accordance with Part 2, Subpart J, Part 15, Subparts A and C of the Federal Communication Commission's rules and RSS-247, Issue 3, August 2023, RSS-Gen, Issue 5, February 2021 Amendment 2 of the Innovation, Science and Economic Development Canada.

1.3. 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 15.247 Meas Guidance v05r02. And RSS-247, Issue 3, August 2023, RSS-Gen, Issue 5, February 2021 Amendment 2 of the Innovation, Science and Economic Development Canada.

1.4. Statement

Decision Rule: No, (The test results do not include MU judgment)

1. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (New Taipei Laboratory).
2. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.
3. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
4. The determination of the test results does not require consideration of the uncertainty of the measurement, unless the assessment is required by customer agreement, regulation or standard document specification.
5. Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) is not responsible for the authenticity of the information provided by the applicant that affects the test results.

1.5. Measurement Uncertainty

Parameter		Uncertainty
AC Mains		+/- 3.02 dB
RF output power, conducted		+/- 0.57 dB
Occupied Bandwidth		+/- 0.09 %
Unwanted Emissions, conducted		+/- 1.09 dB
Emissions, radiated	9 kHz~30 MHz	+/- 3.20 dB
	30 MHz~1 GHz	+/- 3.30 dB
	1 GHz~18 GHz	+/- 5.14 dB
	18 GHz~40 GHz	+/- 4.75 dB
Temperature		+/- 0.76 ℃
Humidity		+/- 0.41 %

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

1.6. Environmental Conditions

Test Site	Test Date	Temperature (℃)	Relative Humidity (%)	Test Engineer
AC Line Conducted Emissions	2025/5/5	19.2	46	Sean
Radiation Spurious Emissions	2025/4/16~2025/5/07	23.3~24.6	57~68	Nick
Conducted Spurious Emissions	2025/4/16	25.9	47	Jing
Emission Bandwidth	2025/4/16	25.9	47	Jing
Channel Separation Test	2025/4/16	25.9	47	Jing
Time of Occupancy	2025/4/16	25.9	47	Jing
Quantity of hopping channel	2025/4/16	25.9	47	Jing
Maximum Output Power	2025/4/16	25.9	47	Jing
100 kHz Bandwidth of Frequency Band Edge	2025/4/16	25.9	47	Jing

1.7. Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) to collect test data is located on

☒70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 221, Taiwan, R.O.C.

Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 3732) and the FCC designation No.TW3732 under the Mutual Recognition Agreement (MRA) in FCC Test.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: TW3732.

2. System Test Configuration

2.1. Description of Test Configuration

For BT mode, 79 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	40	2442
1	2403	--	--
2	2404	76	2478
3	2405	77	2479
--	--	78	2480
39	2441	/	/

For BT Modes were tested with channel 0, 39 and 78.

2.2. Equipment Modifications

No modification was made to the EUT.

2.3. EUT Exercise Software

The test software was used "adb v1.0.41"

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

Test Frequency		Low	Middle	High
Power Level Setting	GFSK	Default	Default	Default
	π/4-DQPSK	Default	Default	Default
	8DPSK	Default	Default	Default

2.4. Support Equipment List and Details

Description	Manufacturer	Model Number
NB	DELL	E6410
POE Adapter	Cisco	SB-PWR-INJ2
Adapter	Zhuznou Dachuan Electronic Technology Co., Ltd	DCT18W120150US-A0

2.5. External Cable List and Details

Description	Manufacturer	Model Number
USB Cable	BACL	1.5m
RJ-45 Cable	BACL	8m
RJ-45 Cable	BACL	8m
RJ-11 Cable	BACL	1m
RJ-11 Cable	Dongguan Haoyu Yong Industrial Co., Ltd.	4C2.8mP+P B019#

2.6. Test Mode

Pre-scan

AC Line Conducted Emissions and Radiated Spurious Emissions

Mode 1: FON-780B + Adapter

Mode 2: FON-780B + POE

Worst case is the Mode 1: FON-780B + Adapter

Mode 1: FON-780B + Adapter tested all measure item.

Mode 2: FON-780B + POE test Below 1GHz Radiated Spurious Emissions and AC Line Conducted Emissions.

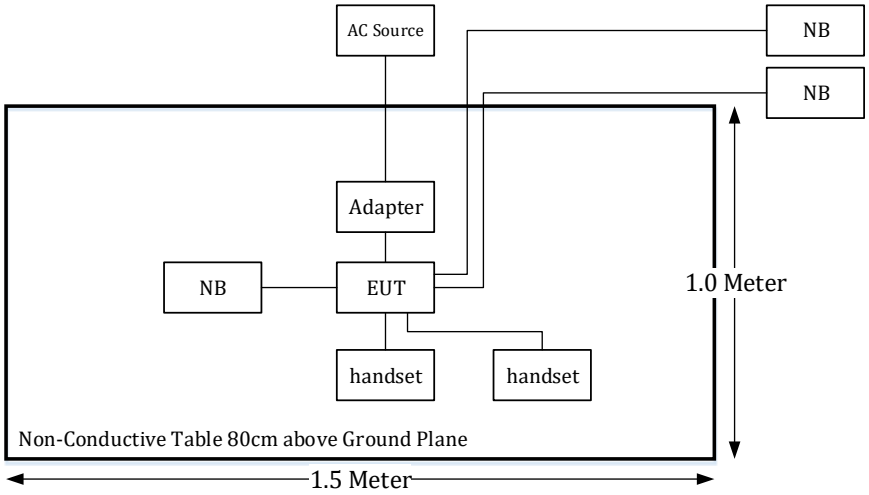
2.7. Block Diagram of Test Setup

See test photographs attached in setup photos for the actual connections between EUT and support equipment.

Radiation:

Below 1GHz:

Adapter:



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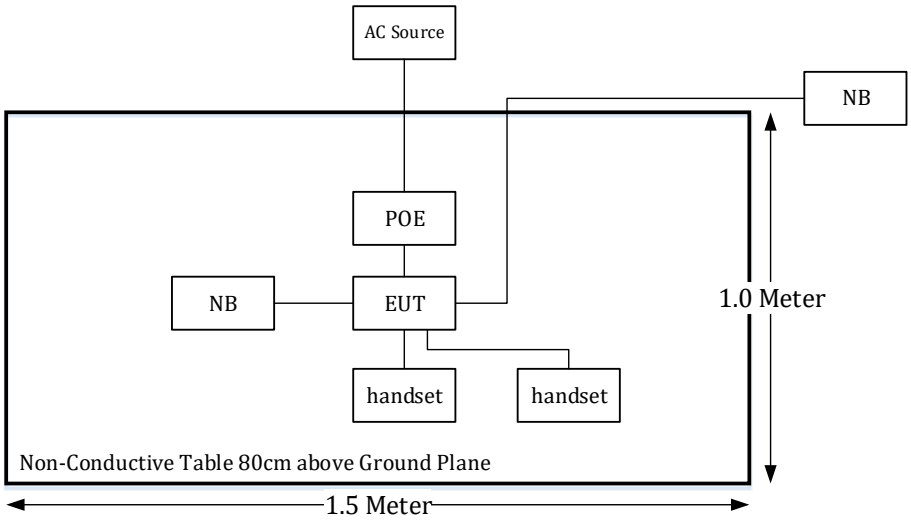
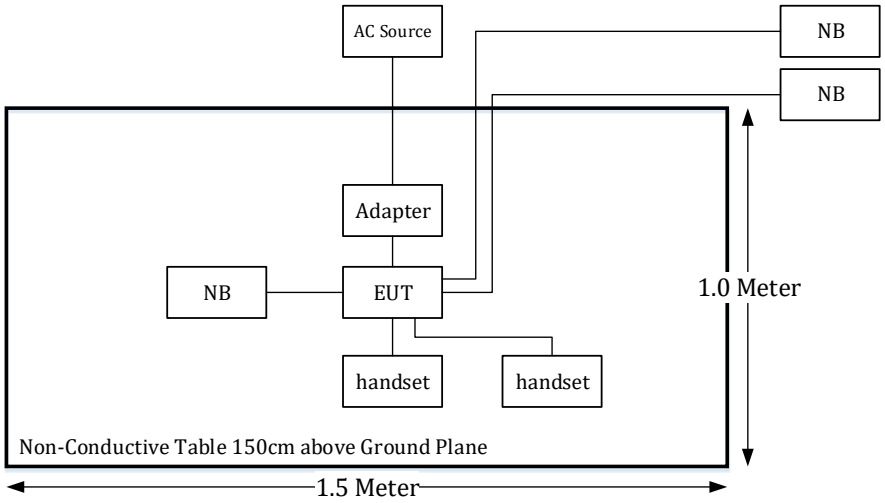
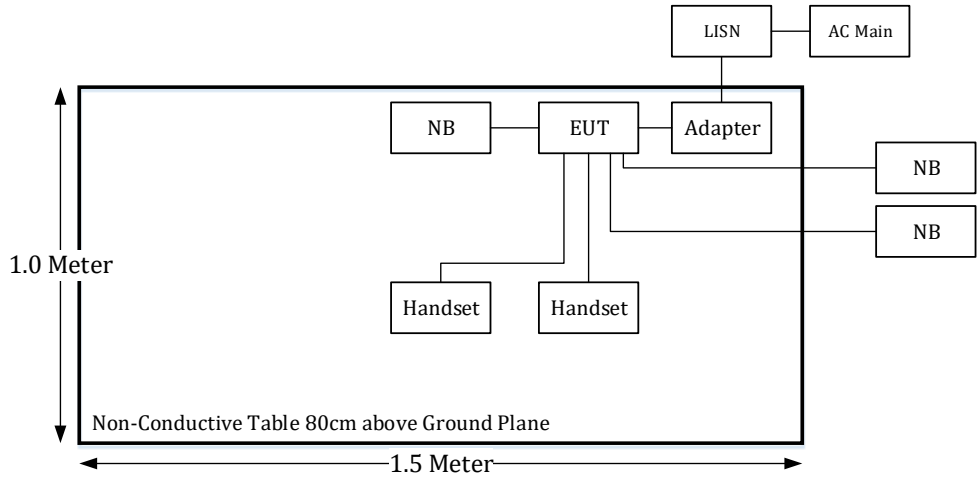


Above 1GHz:



Conduction:

Adapter:



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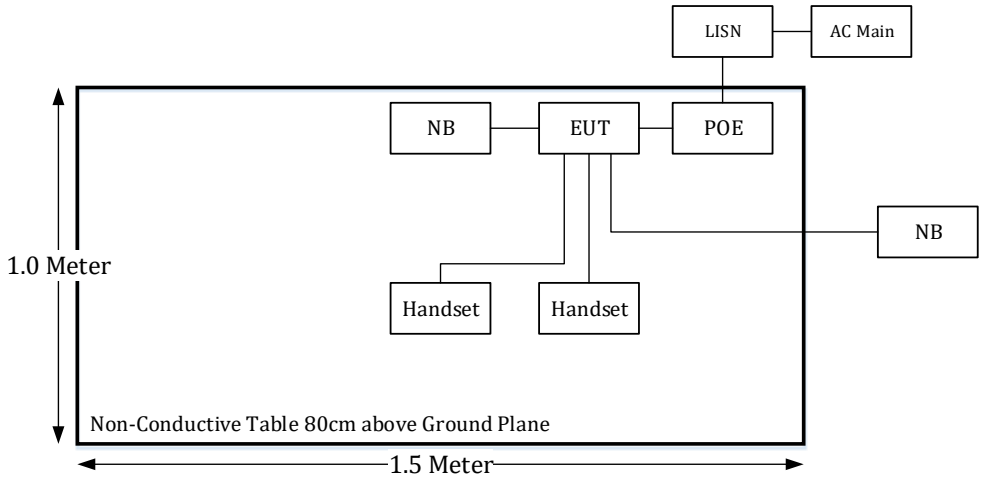
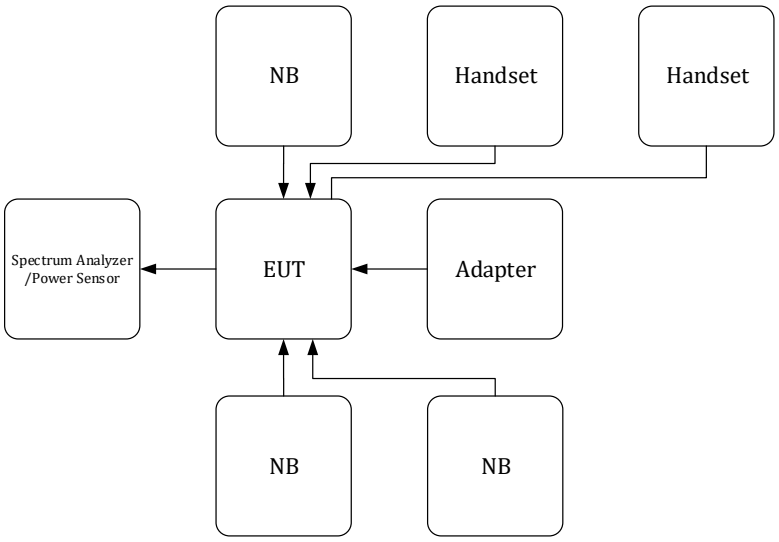


Conducted:



3. Summary of Test Results

Rules	Description of Test	Results
FCC §15.203 RSS-GEN §6.8	Antenna Requirement	Compliance
FCC §15.207(a) RSS-GEN §8.8	AC Line Conducted Emissions	Compliance
FCC §15.205, §15.209, §15.247(d) RSS-247 §5.5 RSS-GEN §8.9 RSS-GEN §8.10	Spurious Emissions	Compliance
FCC §15.247(a)(1) RSS-247 §5.1 (b) RSS-GEN §6.7	Emission Bandwidth	Compliance
FCC §15.247 (a)(1) RSS-247 §5.1 (b)	Channel Separation Test	Compliance
FCC §15.247(a)(1)(iii) RSS-247 §5.1 (d)	Time of Occupancy (Dwell Time)	Compliance
FCC §15.247(a)(1)(iii) RSS-247 §5.1 (d)	Quantity of hopping channel Test	Compliance
FCC §15.247(b)(1) RSS-247 §5.1 (b)	Maximum Peak Output Power	Compliance
FCC §15.247(d) RSS-247 §5.5	100 kHz Bandwidth of Frequency Band Edge	Compliance

4. Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
AC Line Conduction Room (CON-A)					
LISN	Rohde & Schwarz	ENV216	101612	2025/2/17	2026/2/17
EMI Test Receiver	Rohde & Schwarz	ESW8	100947	2024/5/24	2025/5/24
RF Cable	EMEC	EM-CB5D	1	2024/6/5	2025/6/5
Software	AUDIX	E3	V9.150826k	N.C.R	N.C.R
Radiation 3M Room (966-A)					
Active Loop Antenna	ETS-Lindgren	6502	35796	2025/3/27	2026/3/27
Bilog Antenna with 6 dB Attenuator	SUNOL SCIENCES & MINI-CIRCUITS	JB6/UNAT-6+	A050115/15542_01	2025/1/16	2026/1/16
Double Ridged Guide Horn Antenna	A.H. system	SAS-571	1020	2024/5/21	2025/5/21
Horn Antenna	ETS-Lindgren	3116	62638	2024/8/30	2025/8/30
Preamplifier	Sonoma	310N	130602	2024/6/18	2025/6/18
Preamplifier	Channel	ERA-100M-18G-01D1748	EC2300051	2025/4/10	2026/4/10
Preamplifier	BACL	BACL-1313-A1840	4011511	2025/2/12	2026/2/12
Spectrum Analyzer	Rohde & Schwarz	FSV40	101939	2025/3/27	2026/3/27
EMI Test Receiver	Rohde & Schwarz(R&S)	ESR3	102099	2024/6/24	2025/6/24
Microflex Cable	UTIFLEX	UFB197C-1-2362-70U-70U	225757-001	2024/12/20	2025/12/20
Coaxial Cable	UTIFLEX	UFB311A-Q-1440-300300	220490-006	2024/12/20	2025/12/20
Coaxial Cable	COMMATE	PEWC	8Dr	2024/12/20	2025/12/20
Cable	EMC	EMC105-SM-SM-10000	201003	2024/12/20	2025/12/20
Coaxial Cable	JUNFLON	J12J102248-00-B-5	AUG-07-15-044	2024/12/20	2025/12/20
Coaxial Cable	ROSNOL	K1K50-UP0264-K1K50-450CM	160309-1	2025/1/21	2026/1/21
Microflex Cable	ROSNOL	K1K50-UP0264-K1K50-80CM	160309-2	2025/1/21	2026/1/21
Band-stop filter	Woken	STI15-9831	STI15-9831-1	2024/10/19	2025/10/19
High-pass filter	XINGBOKEJI	XBLBQ-GTA54	200108-3-2	2024/10/19	2025/10/19
Software	AUDIX	E3	18621a	N.C.R	N.C.R
Conducted Room					
Spectrum Analyzer	Rohde & Schwarz(R&S)	FSV40	101204	2024/5/30	2025/5/30
Cable	UTIFLEX	UFA210A	9435	2024/10/1	2025/10/1
Power Sensor	Boonton	RTP5006	11037	2024/5/21	2025/5/21
Attenuator	MCL	BW-S10W5+	1419	2025/3/6	2026/3/6

***Statement of Traceability:** BACL Corp. attests that all of the calibrations on the equipment items listed above were traceable to the SI System of Units via the R.O.C. Center for Measurement Standards of the Electronics Testing Center, Taiwan (ETC) or to another internationally recognized National Metrology Institute (NMI), and were compliant with the current Taiwan Accreditation Foundation (TAF) requirements.

5 FCC §15.203 & RSS-Gen §6.8– Antenna Requirements

5.1 Applicable Standard

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.

According to RSS-Gen 6.8:

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

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

5.2 Antenna Information

Manufacturer	Model	Type	Antenna Gain	Impedance
Dongguan YiJia Electronics Communication Technology Co.,Ltd.	YJL01.106.071.302A	FPC Antenna	4.1 dBi	50Ω

Unit uses a unique coupling to the intentional radiator.

Result: Compliance

6. FCC §15.207(a) & RSS-Gen §8.8– AC Line Conducted Emissions

6.1. Applicable Standard

According to §15.207

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

According to RSS-GEN §8.8

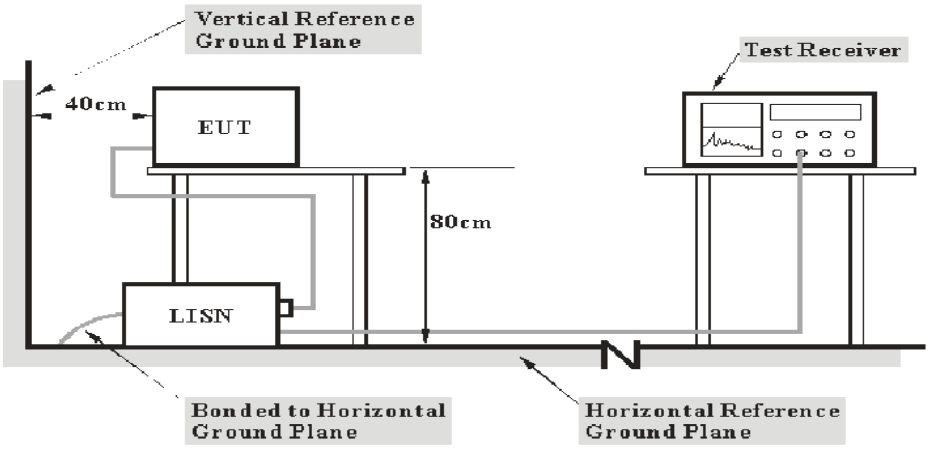
Unless stated otherwise in the applicable RSS, for radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 kHz to 30 MHz shall not exceed the limits in table 4, as measured using a 50 μH / 50 Ω line impedance stabilization network. This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.

For an EUT that connects to the AC power lines indirectly, through another device, the requirement for compliance with the limits in table 4 shall apply at the terminals of the AC power-line mains cable of a representative support device, while it provides power to the EUT. The lower limit applies at the boundary between the frequency ranges. The device used to power the EUT shall be representative of typical applications.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56 Note 1	56 to 46 Note 1
0.5-5	56	46
5-30	60	50

Note 1: Decreases with the logarithm of the frequency.

6.2. EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 and RSS-GEN limits.

6.3. EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150kHz to 30MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations

Frequency Range	IF B/W
150kHz – 30MHz	9kHz

6.4. Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

6.5. Corrected Factor & Over Limit Calculation

The factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

The “Over Limit” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit of -7 dB means the emission is 7 dB below the limit. The equation for Over Limit calculation is as follows:

Over Limit = Level – Limit Line

6.6. Test Results

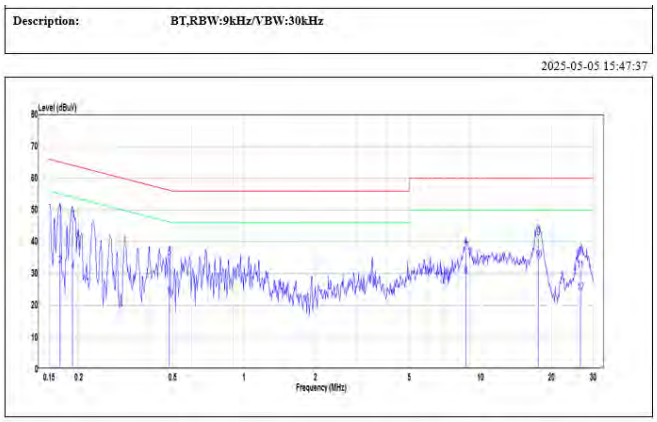
Test Mode: Transmitting

Main: AC120 V, 60 Hz

(Worst case is EDR(8DPSK) mode low channel)

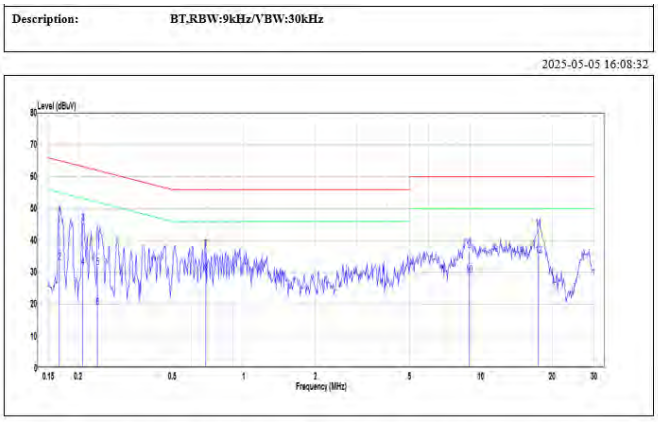
Adapter:

Line



No.	Frequency	Reading	Correct Factor	Result	Limit	Over limit	Remark	Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.167	38.63	10.09	48.72	65.12	-16.40	QP	Line
2	0.167	22.38	10.09	32.47	55.12	-22.65	Average	Line
3	0.188	36.73	10.17	46.90	64.11	-17.20	QP	Line
4	0.188	20.50	10.17	30.67	54.11	-23.44	Average	Line
5	0.484	24.73	10.42	35.15	56.27	-21.13	QP	Line
6	0.484	12.64	10.42	23.06	46.27	-23.21	Average	Line
7	8.683	26.15	10.61	36.76	60.00	-23.24	QP	Line
8	8.683	18.67	10.61	29.28	50.00	-20.72	Average	Line
9	17.568	30.57	10.77	41.34	60.00	-18.66	QP	Line
10	17.568	23.49	10.77	34.26	50.00	-15.74	Average	Line
11	26.418	20.22	10.78	31.00	60.00	-29.00	QP	Line
12	26.418	13.32	10.78	24.10	50.00	-25.90	Average	Line

Neutral



No.	Frequency	Reading	Correct Factor	Result	Limit	Over limit	Remark	Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.167	37.81	10.05	47.85	65.12	-17.27	QP	Neutral
2	0.167	23.07	10.05	33.12	55.12	-22.00	Average	Neutral
3	0.209	35.37	10.19	45.56	63.23	-17.67	QP	Neutral
4	0.209	21.22	10.19	31.41	53.23	-21.82	Average	Neutral
5	0.242	21.30	10.21	31.50	62.04	-30.54	QP	Neutral
6	0.242	8.66	10.21	18.87	52.04	-33.17	Average	Neutral
7	0.690	26.76	10.41	37.18	56.00	-18.82	QP	Neutral
8	0.690	19.10	10.41	29.51	46.00	-16.49	Average	Neutral
9	8.916	26.18	10.59	36.76	60.00	-23.24	QP	Neutral
10	8.916	18.68	10.59	29.26	50.00	-20.74	Average	Neutral
11	17.475	33.21	10.72	43.93	60.00	-16.07	QP	Neutral
12	17.475	24.55	10.72	35.26	50.00	-14.74	Average	Neutral

Note:

Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

PoE:

Line

Description: POE,RBW:9kHz/VBW:30kHz

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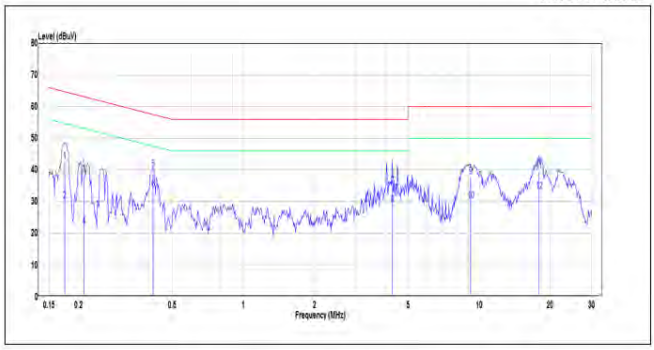

No.	Frequency	Reading	Correct Factor	Result	Limit	Over limit	Remark	Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.175	32.59	10.12	42.71	64.72	-22.01	QP	Line
2	0.175	20.02	10.12	30.14	54.72	-24.58	Average	Line
3	0.211	28.37	10.23	38.60	63.18	-24.59	QP	Line
4	0.211	12.00	10.23	22.23	53.18	-30.96	Average	Line
5	0.415	29.77	10.36	40.13	57.55	-17.42	QP	Line
6	0.415	23.45	10.36	33.81	47.55	-13.74	Average	Line
7	4.292	24.39	10.54	34.93	56.00	-21.07	QP	Line
8	4.292	18.36	10.54	28.91	46.00	-17.09	Average	Line
9	9.204	27.29	10.62	37.91	60.00	-22.09	QP	Line
10	9.204	19.50	10.62	30.12	50.00	-19.88	Average	Line
11	17.944	28.86	10.77	39.63	60.00	-20.37	QP	Line
12	17.944	22.41	10.77	33.18	50.00	-16.82	Average	Line

Neutral

Description: POE,RBW:9kHz/VBW:30kHz

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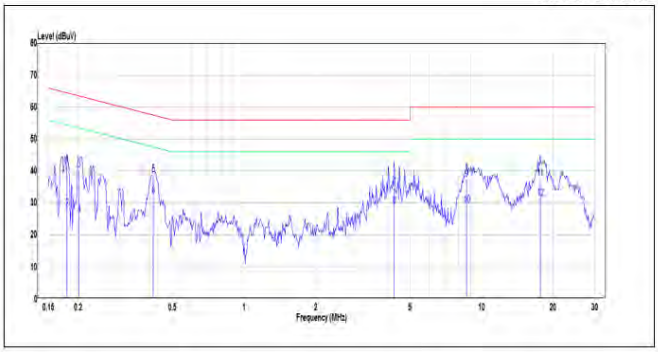


No.	Frequency	Reading	Correct Factor	Result	Limit	Over limit	Remark	Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.180	31.84	10.10	41.94	64.50	-22.56	QP	Neutral
2	0.180	18.16	10.10	28.26	54.50	-26.24	Average	Neutral
3	0.202	30.20	10.18	40.38	63.54	-23.16	QP	Neutral
4	0.202	16.25	10.18	26.43	53.54	-27.10	Average	Neutral
5	0.415	28.58	10.31	38.89	57.55	-18.66	QP	Neutral
6	0.415	22.07	10.31	32.38	47.55	-15.17	Average	Neutral
7	4.292	24.41	10.51	34.92	56.00	-21.08	QP	Neutral
8	4.292	18.55	10.51	29.07	46.00	-16.93	Average	Neutral
9	8.637	26.80	10.58	37.38	60.00	-22.62	QP	Neutral
10	8.637	18.85	10.58	29.43	50.00	-20.57	Average	Neutral
11	17.661	27.04	10.72	37.76	60.00	-22.24	QP	Neutral
12	17.661	20.72	10.72	31.44	50.00	-18.56	Average	Neutral

Note:

Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

7. FCC §15.209, §15.205 , §15.247(d) & RSS-247 §5.5, RSS-GEN §8.9, §8.10 – Spurious Emissions

7.1. Applicable Standard

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1MHz.

As per RSS-Gen 8.10,

Restricted frequency bands, identified in table 7, are designated primarily for safety-of-life services (distress calling and certain aeronautical activities), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following conditions related to the restricted frequency bands apply:

(a)The transmit frequency, including fundamental components of modulation, of licence-exempt radio apparatus shall not fall within the restricted frequency bands listed in table 7 except for apparatus compliant with RSS-287, Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD).

(b)Unwanted emissions that fall into restricted frequency bands listed in table 7 shall comply with the limits specified in table 5 and table 6.

(c)Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6.

As Per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	608 – 614	4. 5 – 5. 15
0.495 – 0.505	16.69475 – 16.69525	960 – 1240	5. 35 – 5. 46
2.1735 – 2.1905	16.80425 – 16.80475	1300 – 1427	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1435 – 1626.5	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1645.5 – 1646.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1660 – 1710	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1718.8 – 1722.2	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	2200 – 2300	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2310 – 2390	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2483.5 – 2500	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2690 – 2900	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	3260 – 3267	22.01 – 23.12
8.41425 – 8.41475	162.0125 –167.17	3.332 – 3.339	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3 3458 – 3 358	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3.600 – 4.400	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4		Above 38.6
13.36 – 13.41	399.9 – 410		

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (micro volts/meter)	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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

As per RSS-GEN §8.9: Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field strength limits shown in table 5 and table 6. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

Table 5 – General field strength limits at frequencies above 30 MHz	
Frequency (MHz)	**Field Strength (µV/m at 3 m)**
30 - 88	100
88 - 216	150
216 - 960	200
Above 960	500

Table 6 – General field strength limits at frequencies below 30 MHz		
Frequency (MHz)	**Field Strength (H-Field) (µA/m)**	**Measurement distance (m)**
9 - 490 kHz[Note 1]	6.37/F (F in kHz)	300
490 - 1705 kHz	63.7/F (F in kHz)	30
1.705 - 30 MHz	0.08	30

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

Note 2: The limit was added 51.5dB to convert the limit from dBuA/m to dBuV/m.

According to ANSI C63.10-2013, section 5.3.3

Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field, and the emissions to be measured can be detected by the measurement equipment (see 4.3.4). Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. Measurements from

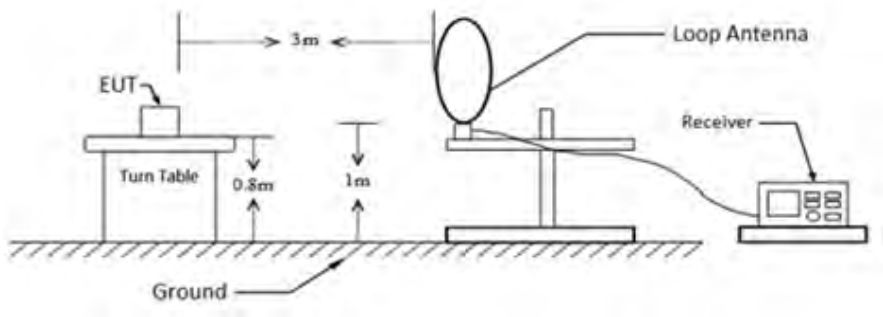
18 GHz to 40 GHz are typically made at distances significantly less than 3 m from the EUT. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade of distance (inverse of linear distance for field-strength measurements or inverse of linear distance-squared for power-density measurements).

As per FCC §15.247 (d) 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).

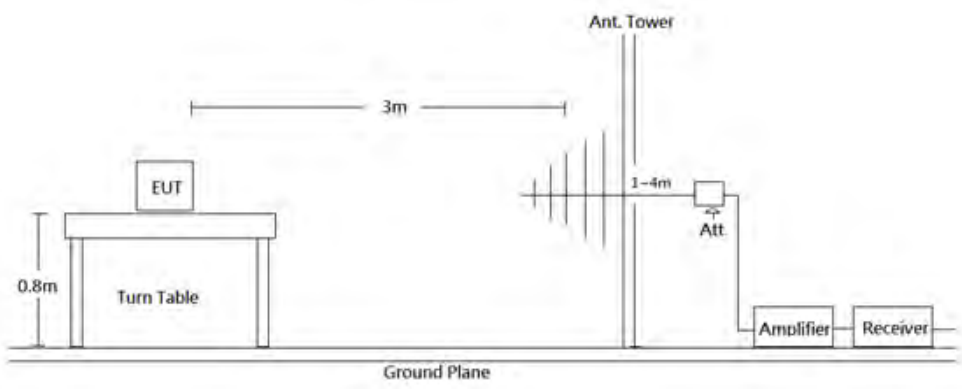
As per RSS-247 5.5,
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

7.2. EUT Setup

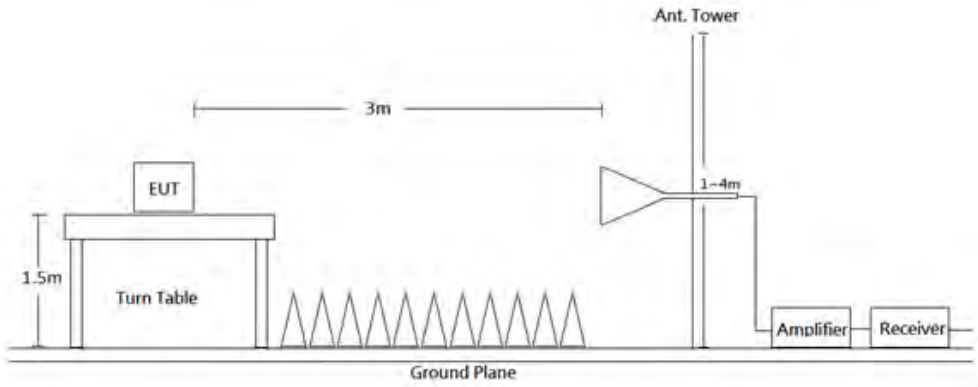
9kHz-30MHz:



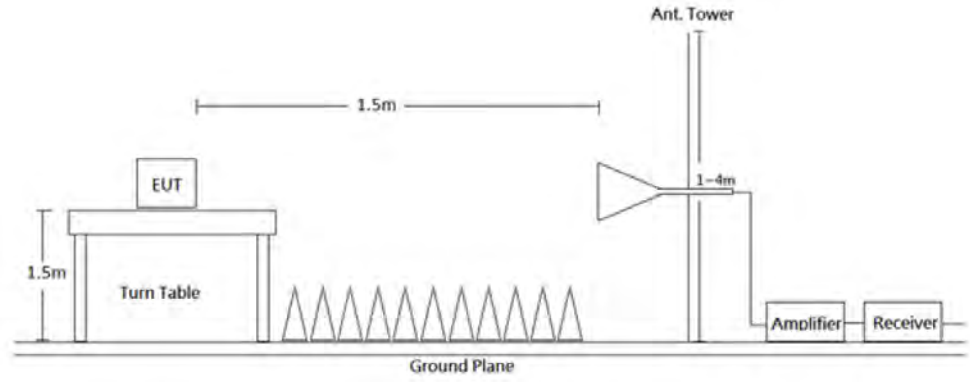
30MHz-1GHz:



1-18 GHz:



18-26.5 GHz:



Radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part 15.209 and FCC 15.247 Limits.

7.3. EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9 kHz to 26.5 GHz. During the radiated emission test, the EMI test receiver was set with the following configurations measurement method 6.3 in ANSI C63.10.

Frequency Range	RBW	VBW	Measurement method	Detector
9 kHz - 150 kHz	300 Hz	1 kHz	QP/AV	QP/AV
150 kHz - 30 MHz	10 kHz	30 kHz	QP/AV	QP/AV
30-1000 MHz	120 kHz	300 kHz	QP	QP
Above 1 GHz	Pre-scan :			
	1 MHz	3 MHz	PK	PK
	1 MHz	1 kHz	Ave	PK
	Final measurement for emission identified during pre-scan :			
	1 MHz	3 MHz	PK	PK
	1 MHz	10 Hz	Ave	PK

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.

7.4. Test Procedure

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

All data was recorded in Quasi-peak and average detector mode from 9 kHz to 30 MHz, Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

7.5. Corrected Factor & Margin Calculation

The Correct Factor 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:

Correct Factor = 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 -7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Level – Limit

7.6. Test Results

Test Mode: Transmitting

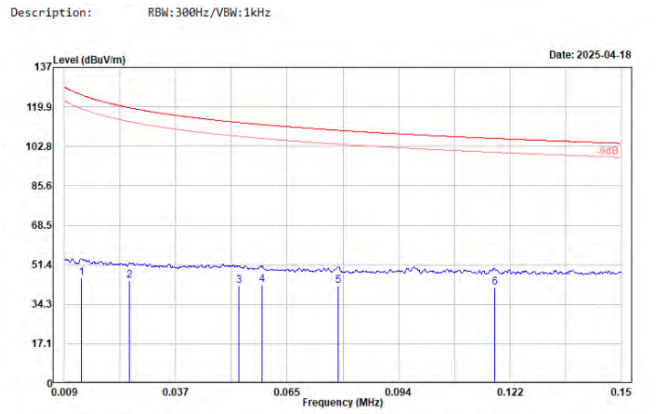
(Use Y axis test)

9kHz-30MHz:

(Worst case is EDR(8DPSK) mode low channel)

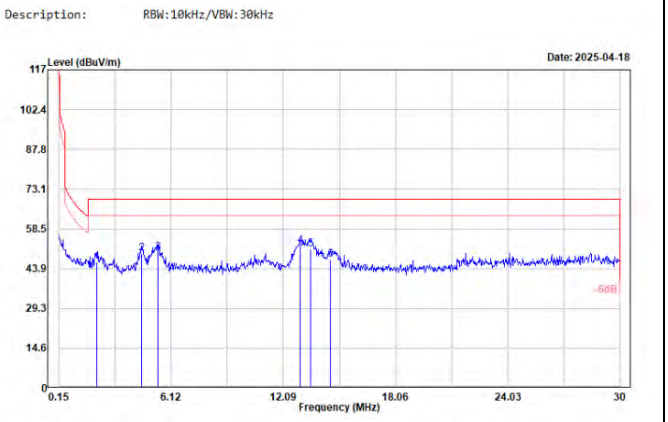
(Pre-scan using three directional polarities, worst case as parallel.)

9kHz-150kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
0.013	30.15	15.67	45.82	125.08	-79.26	100	141	Average
0.026	30.09	14.28	44.37	119.47	-75.10	100	226	Average
0.053	29.17	12.99	42.16	113.07	-70.91	100	104	Average
0.059	30.45	12.07	42.52	112.18	-69.66	100	219	Average
0.078	30.95	11.21	42.16	109.72	-67.56	100	119	Average
0.118	29.78	11.68	41.46	106.18	-64.72	100	311	Average

150kHz-30MHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2.180	35.42	10.80	46.22	69.54	-23.32	100	117	QP
4.568	38.77	10.81	49.58	69.54	-19.96	100	203	QP
5.404	38.45	11.26	49.71	69.54	-19.83	100	159	QP
12.986	40.69	11.56	52.25	69.54	-17.29	100	134	QP
13.523	39.59	11.57	51.16	69.54	-18.38	100	149	QP
14.597	35.62	11.60	47.22	69.54	-22.32	100	320	QP

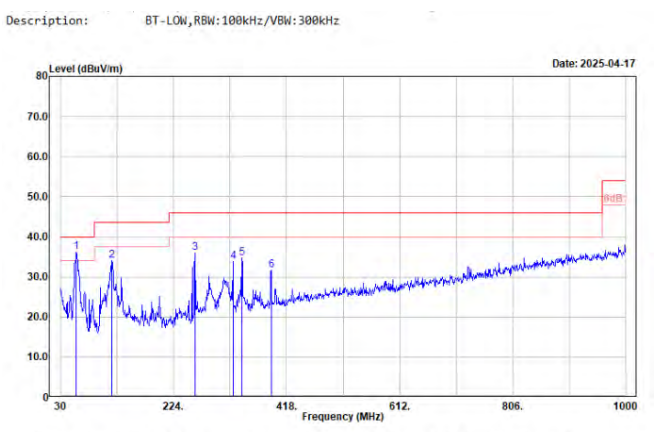
30MHz-1GHz:

(worst case is EDR(8DPSK) mode)

Adapter:

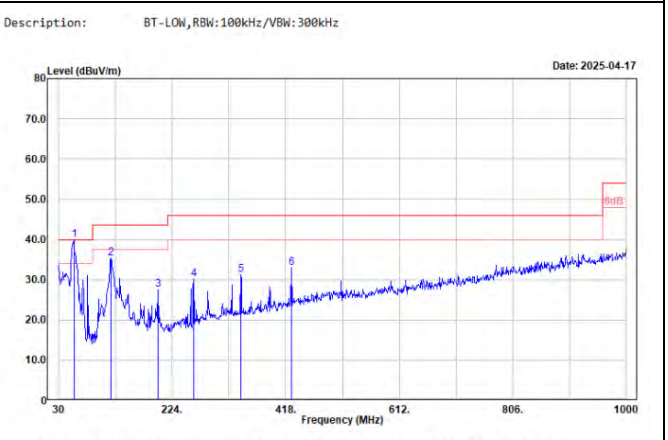
Low channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
57.160	51.85	-15.62	36.23	40.00	-3.77	100	2	QP
118.270	43.33	-9.29	34.04	43.50	-9.46	100	266	QP
260.860	45.70	-9.74	35.96	46.00	-10.04	100	346	QP
325.850	41.50	-7.61	33.89	46.00	-12.11	100	36	QP
341.370	42.02	-7.38	34.64	46.00	-11.36	100	40	QP
391.810	37.57	-5.85	31.72	46.00	-14.28	100	1	QP

Vertical

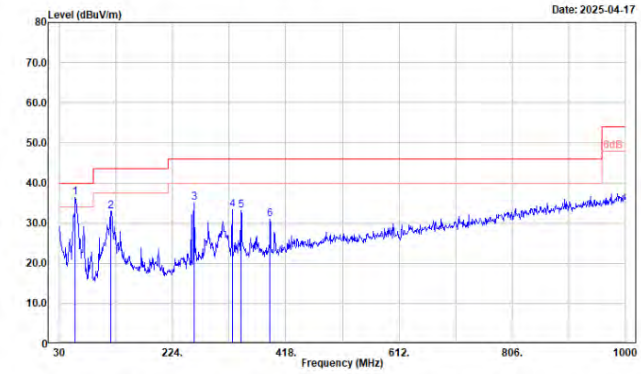


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
56.190	55.54	-15.67	39.87	40.00	-0.13	100	277	QP
119.240	44.66	-9.24	35.42	43.50	-8.08	100	25	QP
199.750	36.82	-9.38	27.44	43.50	-16.06	100	17	QP
260.860	39.79	-9.74	30.05	46.00	-15.95	100	227	QP
341.370	38.57	-7.38	31.19	46.00	-14.81	100	151	QP
427.700	37.73	-4.84	32.89	46.00	-13.11	100	185	QP

Middle channel

Horizontal

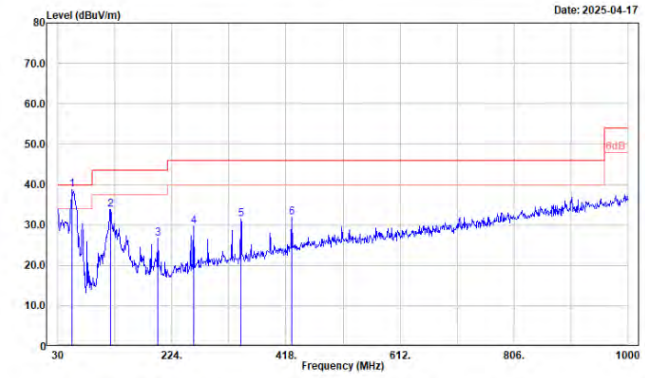
Description: BT-Middle,RBW:100kHz/VBW:300kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
57.160	52.00	-15.62	36.38	40.00	-3.62	100	196	QP
117.300	42.33	-9.30	33.03	43.50	-10.47	100	289	QP
260.860	44.76	-9.74	35.02	46.00	-10.98	100	348	QP
325.850	40.92	-7.61	33.31	46.00	-12.69	100	33	QP
341.370	40.62	-7.38	33.24	46.00	-12.76	100	45	QP
390.840	36.91	-5.89	31.02	46.00	-14.98	100	360	QP

Vertical

Description: BT-Middle,RBW:100kHz/VBW:300kHz

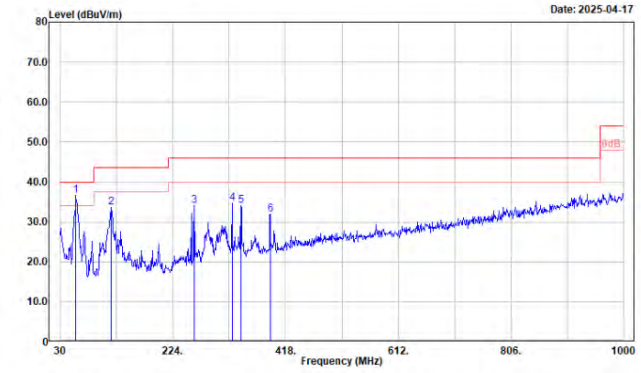


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
54.250	54.36	-15.65	38.71	40.00	-1.29	100	276	QP
119.240	43.14	-9.24	33.90	43.50	-9.60	100	235	QP
199.750	36.04	-9.38	26.66	43.50	-16.84	100	38	QP
260.860	39.49	-9.74	29.75	46.00	-16.25	100	193	QP
341.370	38.71	-7.38	31.33	46.00	-14.67	100	156	QP
427.700	36.73	-4.84	31.89	46.00	-14.11	100	107	QP

High channel

Horizontal

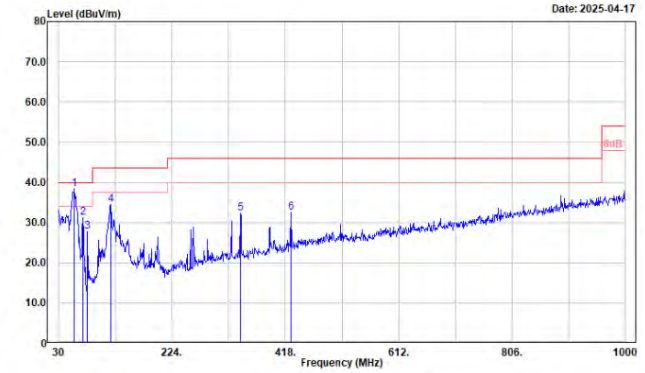
Description: BT-High,RBW:100kHz/VBW:300kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
57.160	52.35	-15.62	36.73	40.00	-3.27	100	169	QP
118.270	42.88	-9.29	33.59	43.50	-9.91	100	253	QP
260.860	43.80	-9.74	34.06	46.00	-11.94	100	162	QP
325.850	42.33	-7.61	34.72	46.00	-11.28	100	41	QP
341.370	41.36	-7.38	33.98	46.00	-12.02	100	52	QP
391.810	37.82	-5.85	31.97	46.00	-14.03	100	359	QP

Vertical

Description: BT-High,RBW:100kHz/VBW:300kHz



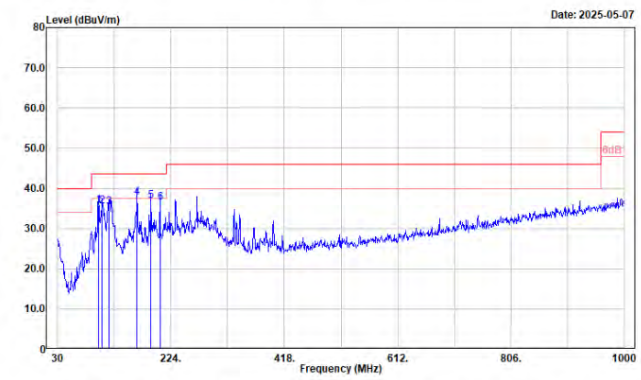
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
57.160	53.97	-15.62	38.35	40.00	-1.65	100	295	QP
71.710	46.25	-14.94	31.31	40.00	-8.69	100	310	QP
79.470	43.18	-15.35	27.83	40.00	-12.17	100	360	QP
119.240	43.72	-9.24	34.48	43.50	-9.02	100	20	QP
341.370	39.68	-7.38	32.30	46.00	-13.70	100	160	QP
427.700	37.26	-4.84	32.42	46.00	-13.58	100	86	QP

POE:

Low channel

Horizontal

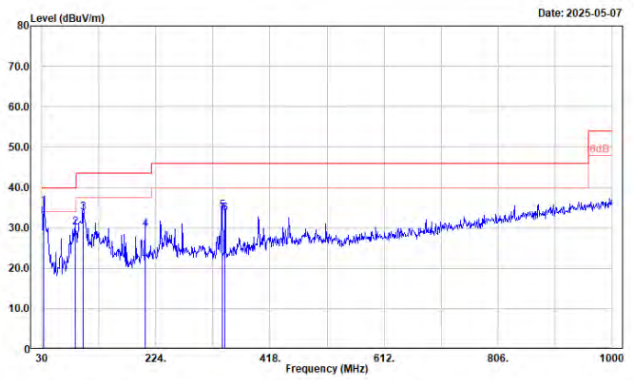
Description: BT-TX-LOW,RBW:100kHz/VBW:300kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
99.840	48.71	-12.85	35.86	43.50	-7.64	100	94	QP
106.630	46.55	-11.04	35.51	43.50	-7.99	100	75	QP
117.300	44.67	-9.30	35.37	43.50	-8.13	100	71	QP
165.800	48.17	-10.35	37.82	43.50	-5.68	100	202	QP
190.050	47.94	-11.13	36.81	43.50	-6.69	100	348	QP
205.570	47.72	-11.21	36.51	43.50	-6.99	100	352	QP

Vertical

Description: BT-TX-LOW,RBW:100kHz/VBW:300kHz

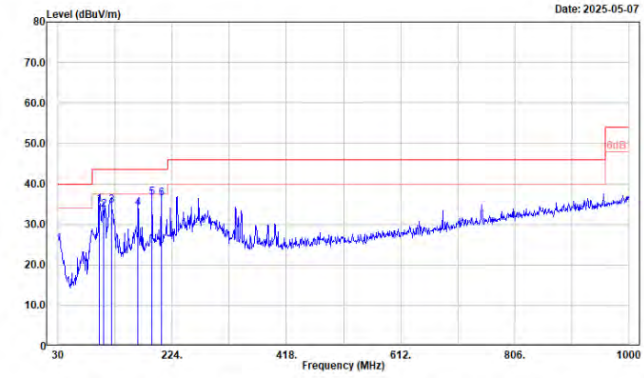


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
32.910	39.96	-4.65	35.31	40.00	-4.69	100	97	QP
86.260	45.86	-15.71	30.15	40.00	-9.85	100	258	QP
99.840	46.77	-12.85	33.92	43.50	-9.58	100	262	QP
205.570	40.81	-11.21	29.60	43.50	-13.90	100	258	QP
336.520	41.56	-7.41	34.15	46.00	-11.85	100	358	QP
341.370	41.04	-7.38	33.66	46.00	-12.34	100	321	QP

Middle channel

Horizontal

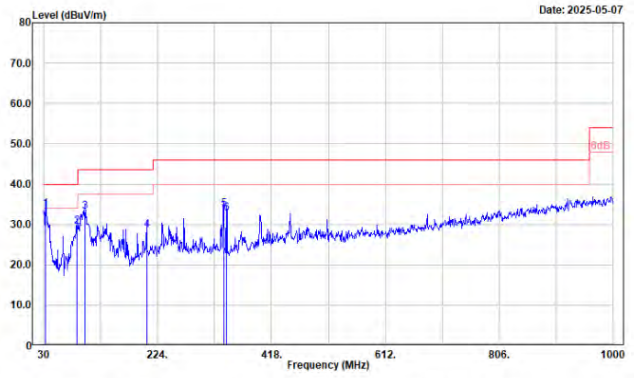
Description: BT-TX-Middle,RBW:100kHz/VBW:300kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
99.840	47.86	-12.85	35.01	43.50	-8.49	100	96	QP
107.600	44.60	-10.96	33.64	43.50	-9.86	100	88	QP
120.210	43.68	-9.10	34.58	43.50	-8.92	100	111	QP
165.800	44.34	-10.35	33.99	43.50	-9.51	100	211	QP
190.050	47.76	-11.13	36.63	43.50	-6.87	100	347	QP
205.570	47.69	-11.21	36.48	43.50	-7.02	100	357	QP

Vertical

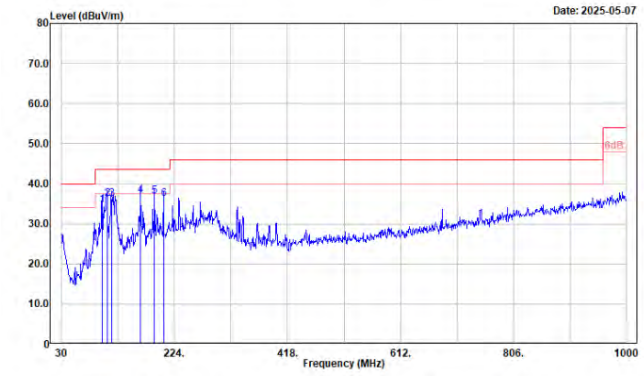
Description: BT-TX-Middle,RBW:100kHz/VBW:300kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
32.910	38.55	-4.65	33.90	40.00	-6.10	100	124	QP
86.260	45.27	-15.71	29.56	40.00	-10.44	100	243	QP
99.840	46.00	-12.85	33.15	43.50	-10.35	100	297	QP
205.570	39.86	-11.21	28.65	43.50	-14.85	100	266	QP
336.520	41.28	-7.41	33.87	46.00	-12.13	100	360	QP
341.370	40.10	-7.38	32.72	46.00	-13.28	100	342	QP

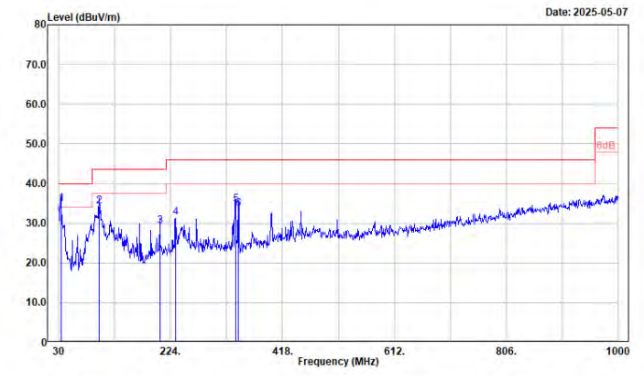
High channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
99.840	47.59	-12.85	34.74	43.50	-8.76	100	79	QP
108.570	47.01	-10.73	36.28	43.50	-7.22	100	82	QP
116.330	45.73	-9.51	36.22	43.50	-7.28	100	87	QP
165.800	47.50	-10.35	37.15	43.50	-6.35	100	220	QP
190.050	48.00	-11.13	36.87	43.50	-6.63	100	357	QP
205.570	47.46	-11.21	36.25	43.50	-7.25	100	359	QP

Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
33.880	39.90	-5.08	34.82	40.00	-5.18	100	83	QP
99.840	47.16	-12.85	34.31	43.50	-9.19	100	290	QP
205.570	40.50	-11.21	29.29	43.50	-14.21	100	274	QP
232.730	42.31	-10.79	31.52	46.00	-14.48	100	166	QP
336.520	42.03	-7.41	34.62	46.00	-11.38	100	360	QP
341.370	41.07	-7.38	33.69	46.00	-12.31	100	360	QP

Level = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

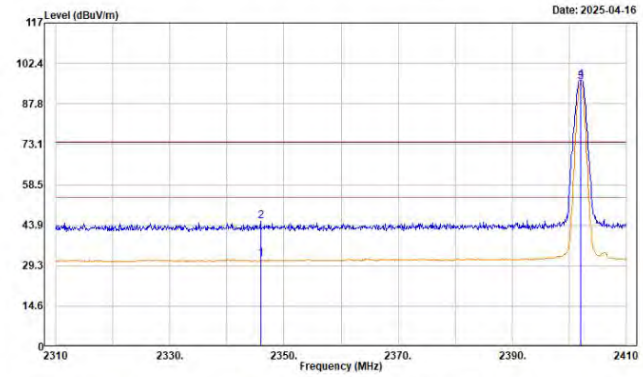
Band-Edge:

BR(GFSK) mode

Low channel

Horizontal

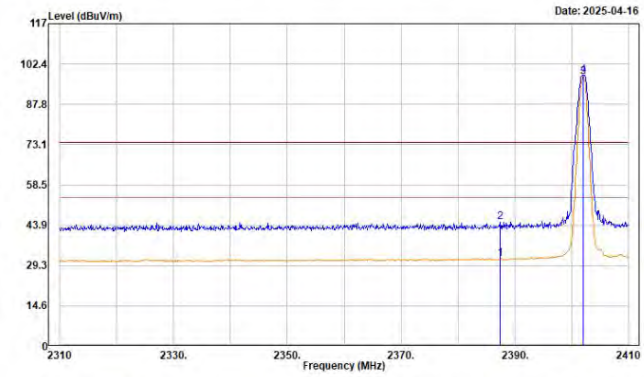
Description: BT_1DH5-TX-2402,Peak RBW:1MHz/VBW:3MHz,Avg RBW:1MHz/VBW:1kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2345.900	43.14	-11.29	31.85	54.00	-22.15	143	36	Average
2345.900	56.65	-11.29	45.36	74.00	-28.64	143	36	Peak
2402.000	106.60	-10.87	95.73			143	36	Average
2402.000	107.23	-10.87	96.36			143	36	Peak

Vertical

Description: BT_1DH5-TX-2402,Peak RBW:1MHz/VBW:3MHz,Avg RBW:1MHz/VBW:1kHz

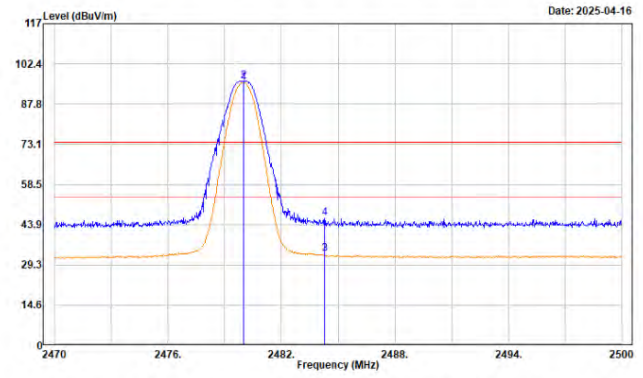


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2387.400	42.73	-10.98	31.75	54.00	-22.25	139	88	Average
2387.400	56.12	-10.98	45.14	74.00	-28.86	139	88	Peak
2402.000	108.61	-10.87	97.74			139	88	Average
2402.000	109.26	-10.87	98.39			139	88	Peak

High channel

Horizontal

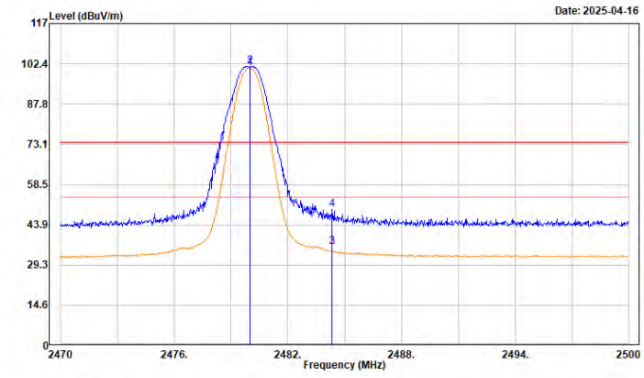
Description: BT_1DH5-TX-2480,Peak RBW:1MHz/VBW:3MHz,Avg RBW:1MHz/VBW:1kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2480.000	106.09	-10.51	95.58			150	19	Average
2480.000	106.53	-10.51	96.02			150	19	Peak
2484.280	43.87	-10.45	33.42	54.00	-20.58	150	19	Average
2484.280	56.84	-10.45	46.39	74.00	-27.61	150	19	Peak

Vertical

Description: BT_1DH5-TX-2480,Peak RBW:1MHz/VBW:3MHz,Avg RBW:1MHz/VBW:1kHz

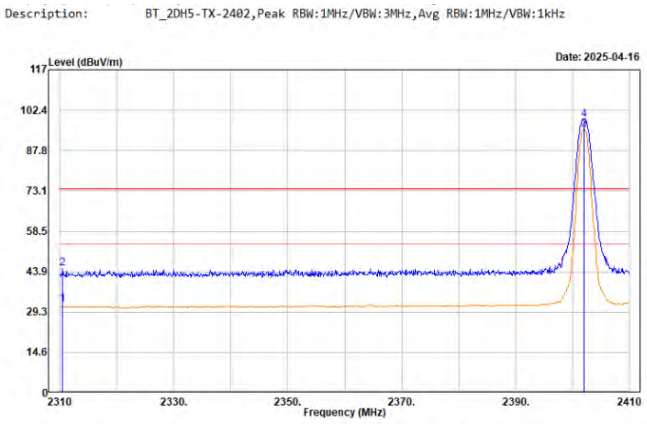


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2480.000	111.41	-10.51	100.90			181	68	Average
2480.000	111.86	-10.51	101.35			181	68	Peak
2484.340	46.18	-10.45	35.73	54.00	-18.27	181	68	Average
2484.340	59.82	-10.45	49.37	74.00	-24.63	181	68	Peak

EDR (π/4-DQPSK) mode

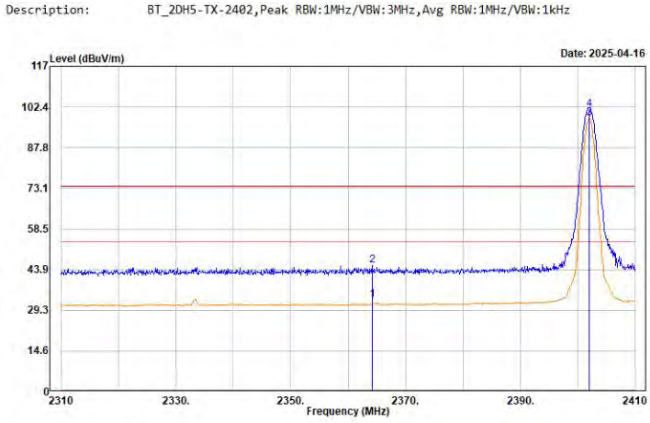
Low channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2310.500	43.50	-11.58	31.92	54.00	-22.08	143	36	Average
2310.500	56.67	-11.58	45.09	74.00	-28.91	143	36	Peak
2402.000	106.45	-10.87	95.58			143	36	Average
2402.000	109.82	-10.87	98.95			143	36	Peak

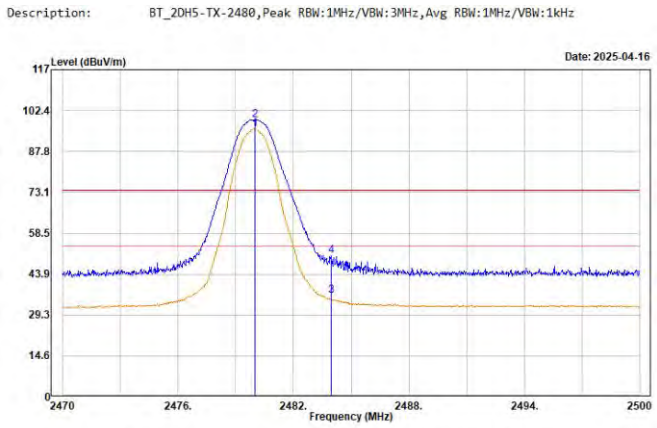
Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2364.200	44.21	-11.15	33.06	54.00	-20.94	139	88	Average
2364.200	56.49	-11.15	45.34	74.00	-28.66	139	88	Peak
2402.000	109.16	-10.87	98.29			139	88	Average
2402.000	112.24	-10.87	101.37			139	88	Peak

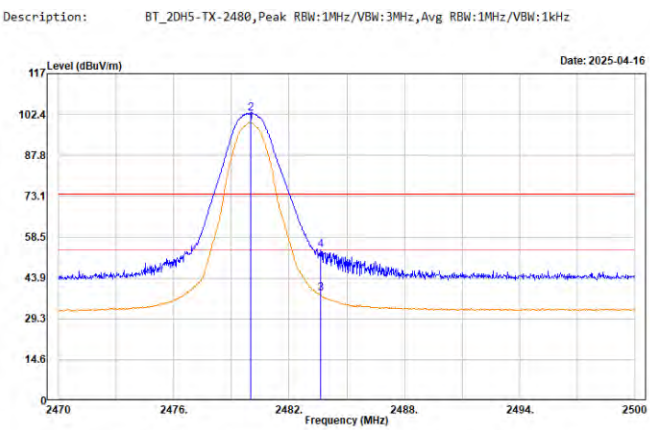
High channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2480.000	106.28	-10.51	95.77			128	242	Average
2480.000	109.47	-10.51	98.96			128	242	Peak
2483.950	46.51	-10.45	36.06	54.00	-17.94	128	242	Average
2483.950	60.89	-10.45	50.44	74.00	-23.56	128	242	Peak

Vertical

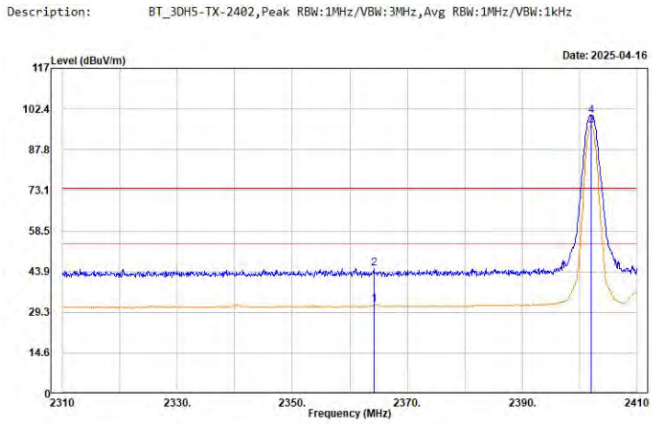


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2480.000	109.96	-10.51	99.45			142	56	Average
2480.000	113.13	-10.51	102.62			142	56	Peak
2483.650	48.94	-10.46	38.48	54.00	-15.52	142	56	Average
2483.650	64.31	-10.46	53.85	74.00	-20.15	142	56	Peak

EDR (8DPSK) mode

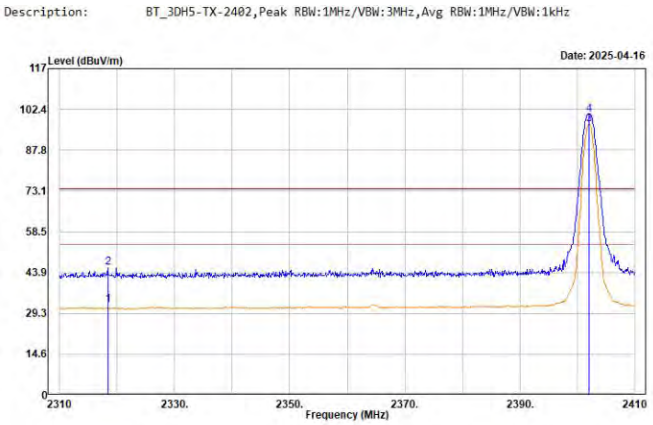
Low channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2364.200	43.22	-11.15	32.07	54.00	-21.93	121	234	Average
2364.200	56.25	-11.15	45.10	74.00	-28.90	121	234	Peak
2402.000	107.30	-10.87	96.43			121	234	Average
2402.000	110.84	-10.87	99.97			121	234	Peak

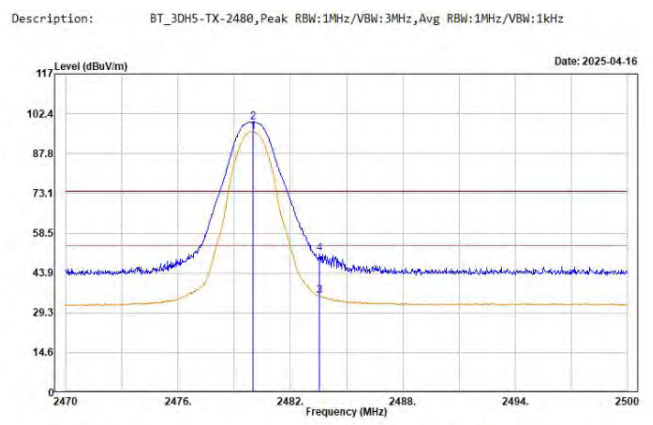
Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2318.400	43.84	-11.51	32.33	54.00	-21.67	244	14	Average
2318.400	57.04	-11.51	45.53	74.00	-28.47	244	14	Peak
2402.000	107.99	-10.87	97.12			244	14	Average
2402.000	111.50	-10.87	100.63			244	14	Peak

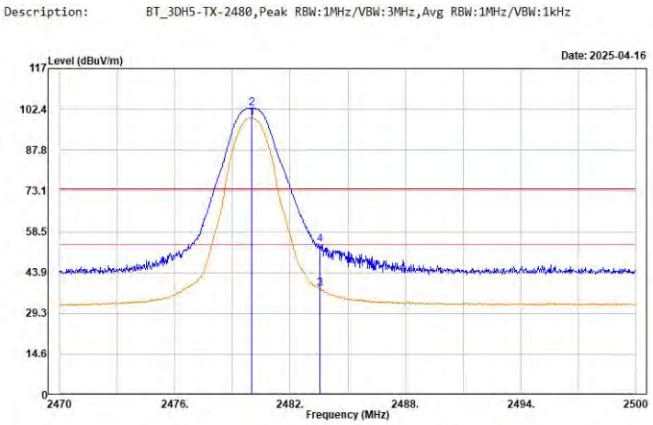
High channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2480.000	106.28	-10.51	95.77			267	244	Average
2480.000	109.76	-10.51	99.25			267	244	Peak
2483.560	46.07	-10.46	35.61	54.00	-18.39	267	244	Average
2483.560	61.40	-10.46	50.94	74.00	-23.06	267	244	Peak

Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2480.000	109.81	-10.51	99.30			141	56	Average
2480.000	113.27	-10.51	102.76			141	56	Peak
2483.530	48.44	-10.46	37.98	54.00	-16.02	141	56	Average
2483.530	64.47	-10.46	54.01	74.00	-19.99	141	56	Peak

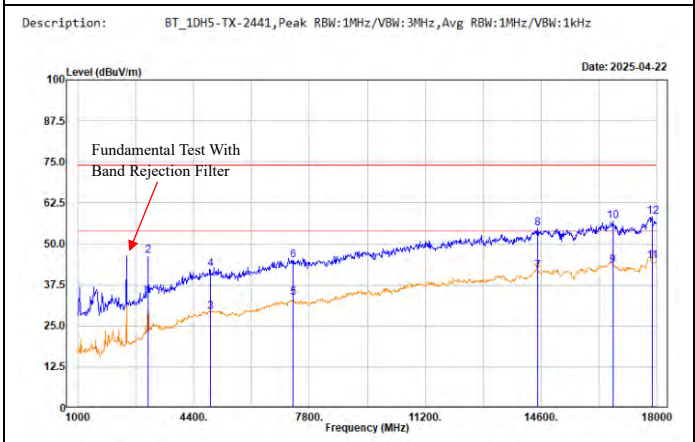
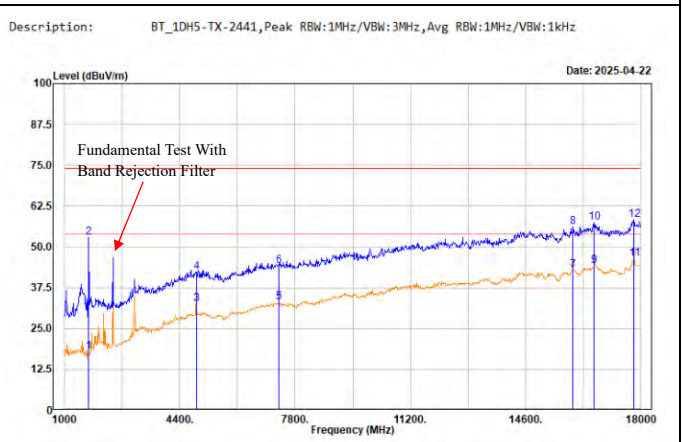
Level = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

1GHz-18GHz:

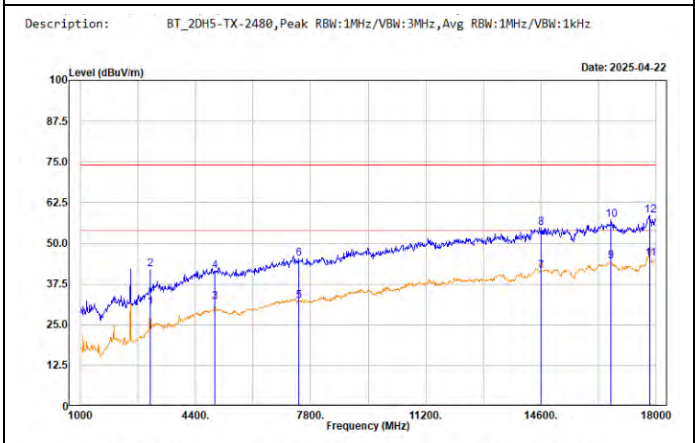
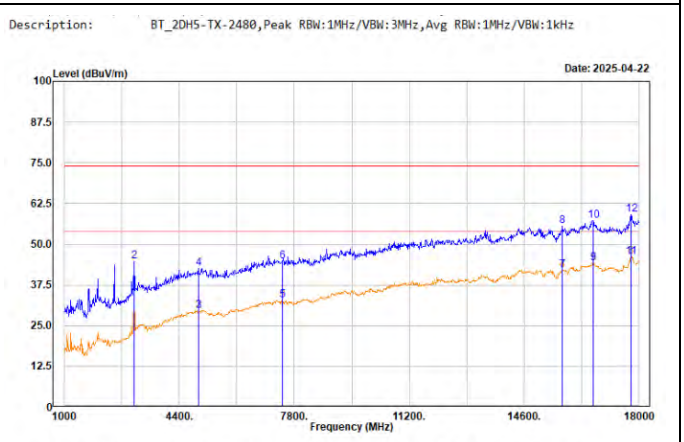
BR(GFSK) mode worst case is Middle channel

Horizontal	Vertical
	

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3074.000	42.07	-7.96	34.11	54.00	-19.89	150	65	Average
3074.000	54.37	-7.96	46.41	74.00	-27.59	150	65	Peak
4882.000	31.92	-2.70	29.22	54.00	-24.78	236	163	Average
4882.000	45.03	-2.70	42.33	74.00	-31.67	236	163	Peak
7323.000	31.93	1.54	33.47	54.00	-20.53	154	227	Average
7323.000	43.35	1.54	44.89	74.00	-29.11	154	227	Peak
14498.000	29.73	11.89	41.62	54.00	-12.38	150	314	Average
14498.000	42.79	11.89	54.68	74.00	-19.32	150	314	Peak
16708.000	30.97	12.29	43.26	54.00	-10.74	150	119	Average
16708.000	44.57	12.29	56.86	74.00	-17.14	150	119	Peak
17864.000	30.93	13.80	44.73	54.00	-9.27	150	3	Average
17864.000	44.58	13.80	58.38	74.00	-15.62	150	3	Peak

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1714.000	32.41	-14.51	17.90	54.00	-36.10	150	102	Average
1714.000	67.29	-14.51	52.78	74.00	-21.22	150	102	Peak
4882.000	35.31	-2.70	32.61	54.00	-21.39	233	165	Average
4882.000	44.95	-2.70	42.25	74.00	-31.75	233	165	Peak
7323.000	31.49	1.54	33.03	54.00	-20.97	148	58	Average
7323.000	42.60	1.54	44.14	74.00	-29.86	148	58	Peak
15994.000	32.04	10.86	42.90	54.00	-11.10	150	234	Average
15994.000	45.19	10.86	56.05	74.00	-17.95	150	234	Peak
16623.000	31.82	12.47	44.29	54.00	-9.71	150	330	Average
16623.000	44.96	12.47	57.43	74.00	-16.57	150	330	Peak
17796.000	32.91	13.44	46.35	54.00	-7.65	150	5	Average
17796.000	44.87	13.44	58.31	74.00	-15.69	150	5	Peak

EDR (π/4-DQPSK) mode worst case is High channel

Horizontal	Vertical
	

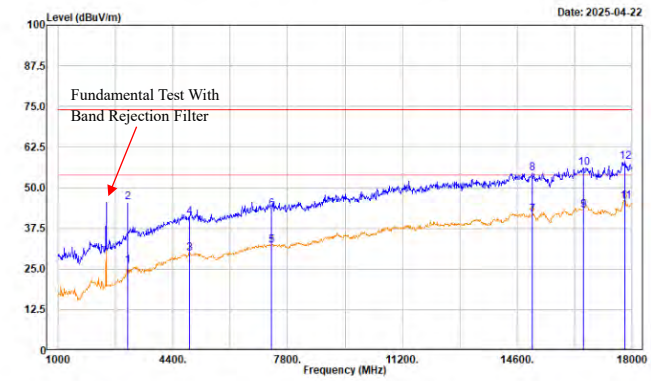
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3074.000	38.38	-7.96	30.42	54.00	-23.58	150	182	Average
3074.000	50.09	-7.96	42.13	74.00	-31.87	150	182	Peak
4960.000	34.74	-2.85	31.89	54.00	-22.11	127	204	Average
4960.000	44.40	-2.85	41.55	74.00	-32.45	127	204	Peak
7440.000	30.97	1.27	32.24	54.00	-21.76	155	61	Average
7440.000	44.06	1.27	45.33	74.00	-28.67	155	61	Peak
14617.000	29.53	11.94	41.47	54.00	-12.53	150	321	Average
14617.000	42.91	11.94	54.85	74.00	-19.15	150	321	Peak
16674.000	31.94	12.37	44.31	54.00	-9.69	150	133	Average
16674.000	44.90	12.37	57.27	74.00	-16.73	150	133	Peak
17830.000	31.57	13.61	45.18	54.00	-8.82	150	19	Average
17830.000	44.87	13.61	58.48	74.00	-15.52	150	19	Peak

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3074.000	42.65	-7.96	34.69	54.00	-19.31	150	198	Average
3074.000	52.78	-7.96	44.82	74.00	-29.18	150	198	Peak
4960.000	32.46	-2.85	29.61	54.00	-24.39	206	80	Average
4960.000	45.34	-2.85	42.49	74.00	-31.51	206	80	Peak
7440.000	31.52	1.27	32.79	54.00	-21.21	148	270	Average
7440.000	43.34	1.27	44.61	74.00	-29.39	148	270	Peak
15739.000	32.39	9.55	41.94	54.00	-12.06	150	111	Average
15739.000	45.92	9.55	55.47	74.00	-18.53	150	111	Peak
16640.000	31.73	12.44	44.17	54.00	-9.83	150	22	Average
16640.000	44.64	12.44	57.08	74.00	-16.92	150	22	Peak
17762.000	32.74	13.39	46.13	54.00	-7.87	150	315	Average
17762.000	45.56	13.39	58.95	74.00	-15.05	150	315	Peak

EDR (8DPSK) mode worst case is Middle channel

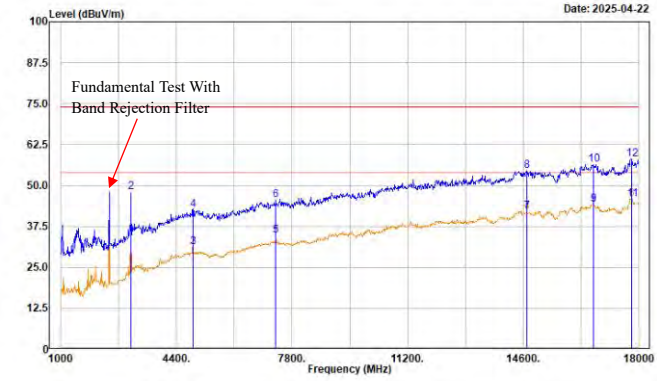
Horizontal	Vertical

Description: BT_3DH5-TX-2441,Peak RBW:1MHz/VBW:3MHz,Avg RBW:1MHz/VBW:1kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3074.000	34.11	-7.96	26.15	54.00	-27.85	150	129	Average
3074.000	53.46	-7.96	45.50	74.00	-28.50	150	129	Peak
4882.000	32.42	-2.70	29.72	54.00	-24.28	150	240	Average
4882.000	43.68	-2.70	40.98	74.00	-33.02	150	240	Peak
7323.000	30.72	1.54	32.26	54.00	-21.74	159	355	Average
7323.000	41.80	1.54	43.34	74.00	-30.66	159	355	Peak
15059.000	30.62	11.24	41.86	54.00	-12.14	150	179	Average
15059.000	43.32	11.24	54.56	74.00	-19.44	150	179	Peak
16555.000	30.57	12.45	43.02	54.00	-10.98	150	82	Average
16555.000	43.60	12.45	56.05	74.00	-17.95	150	82	Peak
17796.000	32.32	13.44	45.76	54.00	-8.24	150	49	Average
17796.000	44.69	13.44	58.13	74.00	-15.87	150	49	Peak

Description: BT_3DH5-TX-2441,Peak RBW:1MHz/VBW:3MHz,Avg RBW:1MHz/VBW:1kHz



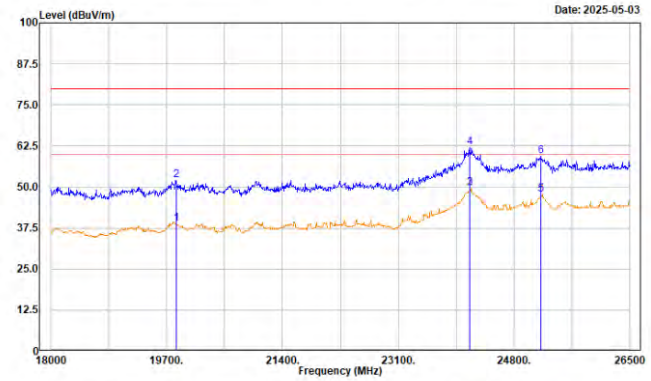
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3074.000	43.03	-7.96	35.07	54.00	-18.93	150	35	Average
3074.000	55.95	-7.96	47.99	74.00	-26.01	150	35	Peak
4882.000	33.88	-2.70	31.18	54.00	-22.82	208	164	Average
4882.000	45.28	-2.70	42.58	74.00	-31.42	208	164	Peak
7323.000	33.09	1.54	34.63	54.00	-19.37	147	138	Average
7323.000	43.90	1.54	45.44	74.00	-28.56	147	138	Peak
14719.000	30.06	11.86	41.92	54.00	-12.08	150	266	Average
14719.000	42.52	11.86	54.38	74.00	-19.62	150	266	Peak
16674.000	31.81	12.37	44.18	54.00	-9.82	150	333	Average
16674.000	44.06	12.37	56.43	74.00	-17.57	150	333	Peak
17796.000	32.44	13.44	45.88	54.00	-8.12	150	93	Average
17796.000	44.69	13.44	58.13	74.00	-15.87	150	93	Peak

18GHz-26.5GHz:

(worst case is BR(GFSK) mode High channel)

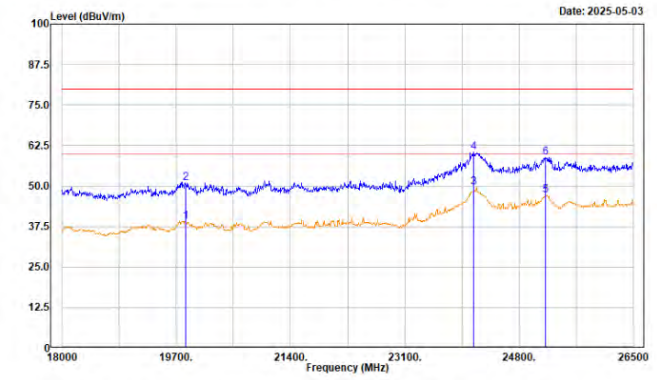
Horizontal	Vertical

Description: BT_1DH5-TX-2480,Peak RBW:1MHz/VBW:3MHz,Avg RBW:1MHz/VBW:1kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
19840.000	39.26	-0.54	38.72	60.00	-21.28	159	148	Average
19840.000	52.59	-0.54	52.05	80.00	-27.95	159	148	Peak
24145.500	36.82	12.74	49.56	60.00	-10.44	154	239	Average
24145.500	49.41	12.74	62.15	80.00	-17.85	154	239	Peak
25191.000	37.34	10.34	47.68	60.00	-12.32	148	202	Average
25191.000	49.06	10.34	59.40	80.00	-20.60	148	202	Peak

Description: BT_1DH5-TX-2480,Peak RBW:1MHz/VBW:3MHz,Avg RBW:1MHz/VBW:1kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
19840.000	39.49	-0.54	38.95	60.00	-21.05	143	162	Average
19840.000	51.41	-0.54	50.87	80.00	-29.13	143	162	Peak
24120.000	36.42	13.19	49.61	60.00	-10.39	159	205	Average
24120.000	47.27	13.19	60.46	80.00	-19.54	159	205	Peak
25191.000	36.75	10.34	47.09	60.00	-12.91	155	318	Average
25191.000	48.59	10.34	58.93	80.00	-21.07	155	318	Peak

Level = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

For 18-26.5GHz Convert the test distance limit of 3 meters to a limit of 1.5 meter:

Conversion factor = 20 log (1.5m/3m) = 6 dB,

Average Limit = 54+6 = 60 dBuV/m@1.5m , Peak Limit = 60+20 = 80 dBuV/m@1.5m

Above 1GHz

BR (GFSK)

Low channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3839.000	39.78	-6.87	32.91	54.00	-21.09	150	33	Average
3839.000	51.91	-6.87	45.04	74.00	-28.96	150	33	Peak
4804.000	33.90	-3.28	30.62	54.00	-23.38	221	203	Average
4804.000	44.53	-3.28	41.25	74.00	-32.75	221	203	Peak
7206.000	31.89	1.47	33.36	54.00	-20.64	143	105	Average
7206.000	43.79	1.47	45.26	74.00	-28.74	143	105	Peak
15280.000	31.22	10.36	41.58	54.00	-12.42	150	327	Average
15280.000	44.67	10.36	55.03	74.00	-18.97	150	327	Peak
16555.000	30.60	12.45	43.05	54.00	-10.95	150	174	Average
16555.000	45.10	12.45	57.55	74.00	-16.45	150	174	Peak
17745.000	32.18	13.36	45.54	54.00	-8.46	150	98	Average
17745.000	44.33	13.36	57.69	74.00	-16.31	150	98	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1935.000	32.19	-12.28	19.91	54.00	-34.09	150	87	Average
1935.000	56.35	-12.28	44.07	74.00	-29.93	150	87	Peak
4804.000	36.43	-3.28	33.15	54.00	-20.85	187	358	Average
4804.000	44.18	-3.28	40.90	74.00	-33.10	187	358	Peak
7206.000	31.78	1.47	33.25	54.00	-20.75	158	162	Average
7206.000	42.44	1.47	43.91	74.00	-30.09	158	162	Peak
15297.000	31.06	10.27	41.33	54.00	-12.67	150	207	Average
15297.000	44.71	10.27	54.98	74.00	-19.02	150	207	Peak
16640.000	31.71	12.44	44.15	54.00	-9.85	150	1	Average
16640.000	44.40	12.44	56.84	74.00	-17.16	150	1	Peak
17779.000	32.32	13.41	45.73	54.00	-8.27	150	124	Average
17779.000	44.93	13.41	58.34	74.00	-15.66	150	124	Peak

Middle channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3074.000	42.07	-7.96	34.11	54.00	-19.89	150	65	Average
3074.000	54.37	-7.96	46.41	74.00	-27.59	150	65	Peak
4882.000	31.92	-2.70	29.22	54.00	-24.78	236	163	Average
4882.000	45.03	-2.70	42.33	74.00	-31.67	236	163	Peak
7323.000	31.93	1.54	33.47	54.00	-20.53	154	227	Average
7323.000	43.35	1.54	44.89	74.00	-29.11	154	227	Peak
14498.000	29.73	11.89	41.62	54.00	-12.38	150	314	Average
14498.000	42.79	11.89	54.68	74.00	-19.32	150	314	Peak
16708.000	30.97	12.29	43.26	54.00	-10.74	150	119	Average
16708.000	44.57	12.29	56.86	74.00	-17.14	150	119	Peak
17864.000	30.93	13.80	44.73	54.00	-9.27	150	3	Average
17864.000	44.58	13.80	58.38	74.00	-15.62	150	3	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1714.000	32.41	-14.51	17.90	54.00	-36.10	150	102	Average
1714.000	67.29	-14.51	52.78	74.00	-21.22	150	102	Peak
4882.000	35.31	-2.70	32.61	54.00	-21.39	233	165	Average
4882.000	44.95	-2.70	42.25	74.00	-31.75	233	165	Peak
7323.000	31.49	1.54	33.03	54.00	-20.97	148	58	Average
7323.000	42.60	1.54	44.14	74.00	-29.86	148	58	Peak
15994.000	32.04	10.86	42.90	54.00	-11.10	150	234	Average
15994.000	45.19	10.86	56.05	74.00	-17.95	150	234	Peak
16623.000	31.82	12.47	44.29	54.00	-9.71	150	330	Average
16623.000	44.96	12.47	57.43	74.00	-16.57	150	330	Peak
17796.000	32.91	13.44	46.35	54.00	-7.65	150	5	Average
17796.000	44.87	13.44	58.31	74.00	-15.69	150	5	Peak

High channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3924.000	33.51	-5.99	27.52	54.00	-26.48	150	139	Average
3924.000	46.50	-5.99	40.51	74.00	-33.49	150	139	Peak
4960.000	32.94	-2.85	30.09	54.00	-23.91	157	205	Average
4960.000	45.31	-2.85	42.46	74.00	-31.54	157	205	Peak
7440.000	31.15	1.27	32.42	54.00	-21.58	144	42	Average
7440.000	43.97	1.27	45.24	74.00	-28.76	144	42	Peak
15739.000	32.11	9.55	41.66	54.00	-12.34	150	182	Average
15739.000	45.39	9.55	54.94	74.00	-19.06	150	182	Peak
16691.000	31.44	12.33	43.77	54.00	-10.23	150	338	Average
16691.000	44.43	12.33	56.76	74.00	-17.24	150	338	Peak
17745.000	32.14	13.36	45.50	54.00	-8.50	150	7	Average
17745.000	46.06	13.36	59.42	74.00	-14.58	150	7	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1714.000	31.88	-14.51	17.37	54.00	-36.63	150	208	Average
1714.000	63.98	-14.51	49.47	74.00	-24.53	150	208	Peak
4960.000	39.28	-2.85	36.43	54.00	-17.57	289	164	Average
4960.000	45.91	-2.85	43.06	74.00	-30.94	289	164	Peak
7440.000	31.85	1.27	33.12	54.00	-20.88	159	75	Average
7440.000	42.65	1.27	43.92	74.00	-30.08	159	75	Peak
15790.000	32.01	9.86	41.87	54.00	-12.13	150	313	Average
15790.000	45.60	9.86	55.46	74.00	-18.54	150	313	Peak
16623.000	31.73	12.47	44.20	54.00	-9.80	150	127	Average
16623.000	44.12	12.47	56.59	74.00	-17.41	150	127	Peak
17779.000	32.17	13.41	45.58	54.00	-8.42	150	9	Average
17779.000	45.48	13.41	58.89	74.00	-15.11	150	9	Peak

Level = Reading + Factor.

Margin = Level – Limit.

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain.

EDR (π/4-DQPSK)

Low channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3839.000	37.69	-6.87	30.82	54.00	-23.18	150	140	Average
3839.000	53.46	-6.87	46.59	74.00	-27.41	150	140	Peak
4804.000	33.70	-3.28	30.42	54.00	-23.58	188	197	Average
4804.000	44.25	-3.28	40.97	74.00	-33.03	188	197	Peak
7206.000	36.32	1.47	37.79	54.00	-16.21	156	33	Average
7206.000	45.54	1.47	47.01	74.00	-26.99	156	33	Peak
14736.000	29.78	11.86	41.64	54.00	-12.36	150	236	Average
14736.000	43.48	11.86	55.34	74.00	-18.66	150	236	Peak
16334.000	31.73	11.44	43.17	54.00	-10.83	150	346	Average
16334.000	45.31	11.44	56.75	74.00	-17.25	150	346	Peak
17762.000	32.52	13.39	45.91	54.00	-8.09	150	88	Average
17762.000	44.41	13.39	57.80	74.00	-16.20	150	88	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3074.000	43.81	-7.96	35.85	54.00	-18.15	150	126	Average
3074.000	55.01	-7.96	47.05	74.00	-26.95	150	126	Peak
4804.000	32.69	-3.28	29.41	54.00	-24.59	235	167	Average
4808.000	45.35	-3.24	42.11	74.00	-31.89	235	167	Peak
7206.000	33.74	1.47	35.21	54.00	-18.79	141	221	Average
7206.000	43.19	1.47	44.66	74.00	-29.34	141	221	Peak
16028.000	31.95	10.93	42.88	54.00	-11.12	150	0	Average
16028.000	44.66	10.93	55.59	74.00	-18.41	150	0	Peak
16691.000	31.29	12.33	43.62	54.00	-10.38	150	300	Average
16691.000	45.05	12.33	57.38	74.00	-16.62	150	300	Peak
17762.000	32.49	13.39	45.88	54.00	-8.12	150	16	Average
17762.000	44.76	13.39	58.15	74.00	-15.85	150	16	Peak

Middle channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3074.000	42.90	-7.96	34.94	54.00	-19.06	150	55	Average
3074.000	56.16	-7.96	48.20	74.00	-25.80	150	55	Peak
4882.000	34.80	-2.70	32.10	54.00	-21.90	233	163	Average
4882.000	44.90	-2.70	42.20	74.00	-31.80	233	163	Peak
7323.000	32.65	1.54	34.19	54.00	-19.81	144	258	Average
7323.000	45.74	1.54	47.28	74.00	-26.72	144	258	Peak
15671.000	31.76	9.41	41.17	54.00	-12.83	150	107	Average
15671.000	46.07	9.41	55.48	74.00	-18.52	150	107	Peak
16640.000	32.21	12.44	44.65	54.00	-9.35	150	322	Average
16640.000	44.34	12.44	56.78	74.00	-17.22	150	322	Peak
17779.000	32.47	13.41	45.88	54.00	-8.12	150	12	Average
17779.000	45.21	13.41	58.62	74.00	-15.38	150	12	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3907.000	34.43	-6.25	28.18	54.00	-25.82	150	77	Average
3907.000	52.83	-6.25	46.58	74.00	-27.42	150	77	Peak
4882.000	33.96	-2.70	31.26	54.00	-22.74	207	199	Average
4882.000	45.46	-2.70	42.76	74.00	-31.24	207	199	Peak
7323.000	33.63	1.54	35.17	54.00	-18.83	153	272	Average
7323.000	43.65	1.54	45.19	74.00	-28.81	153	272	Peak
14770.000	29.38	11.87	41.25	54.00	-12.75	150	306	Average
14770.000	43.32	11.87	55.19	74.00	-18.81	150	306	Peak
16436.000	31.17	11.89	43.06	54.00	-10.94	150	145	Average
16436.000	45.31	11.89	57.20	74.00	-16.80	150	145	Peak
17762.000	32.67	13.39	46.06	54.00	-7.94	150	39	Average
17762.000	44.48	13.39	57.87	74.00	-16.13	150	39	Peak

High channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3074.000	38.38	-7.96	30.42	54.00	-23.58	150	182	Average
3074.000	50.09	-7.96	42.13	74.00	-31.87	150	182	Peak
4960.000	34.74	-2.85	31.89	54.00	-22.11	127	204	Average
4960.000	44.40	-2.85	41.55	74.00	-32.45	127	204	Peak
7440.000	30.97	1.27	32.24	54.00	-21.76	155	61	Average
7440.000	44.06	1.27	45.33	74.00	-28.67	155	61	Peak
14617.000	29.53	11.94	41.47	54.00	-12.53	150	321	Average
14617.000	42.91	11.94	54.85	74.00	-19.15	150	321	Peak
16674.000	31.94	12.37	44.31	54.00	-9.69	150	133	Average
16674.000	44.90	12.37	57.27	74.00	-16.73	150	133	Peak
17830.000	31.57	13.61	45.18	54.00	-8.82	150	19	Average
17830.000	44.87	13.61	58.48	74.00	-15.52	150	19	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3074.000	42.65	-7.96	34.69	54.00	-19.31	150	198	Average
3074.000	52.78	-7.96	44.82	74.00	-29.18	150	198	Peak
4960.000	32.46	-2.85	29.61	54.00	-24.39	206	80	Average
4960.000	45.34	-2.85	42.49	74.00	-31.51	206	80	Peak
7440.000	31.52	1.27	32.79	54.00	-21.21	148	270	Average
7440.000	43.34	1.27	44.61	74.00	-29.39	148	270	Peak
15739.000	32.39	9.55	41.94	54.00	-12.06	150	111	Average
15739.000	45.92	9.55	55.47	74.00	-18.53	150	111	Peak
16640.000	31.73	12.44	44.17	54.00	-9.83	150	22	Average
16640.000	44.64	12.44	57.08	74.00	-16.92	150	22	Peak
17762.000	32.74	13.39	46.13	54.00	-7.87	150	315	Average
17762.000	45.56	13.39	58.95	74.00	-15.05	150	315	Peak

Level = Reading + Factor.

Margin = Level – Limit.

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain.

EDR (8DPSK)

Low channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3839.000	36.23	-6.87	29.36	54.00	-24.64	150	109	Average
3839.000	53.59	-6.87	46.72	74.00	-27.28	150	109	Peak
4804.000	32.22	-3.28	28.94	54.00	-25.06	112	242	Average
4804.000	43.40	-3.28	40.12	74.00	-33.88	112	242	Peak
7206.000	31.49	1.47	32.96	54.00	-21.04	156	67	Average
7206.000	42.32	1.47	43.79	74.00	-30.21	156	67	Peak
15365.000	31.48	10.05	41.53	54.00	-12.47	150	188	Average
15365.000	45.21	10.05	55.26	74.00	-18.74	150	188	Peak
16521.000	30.63	12.40	43.03	54.00	-10.97	150	343	Average
16521.000	45.21	12.40	57.61	74.00	-16.39	150	343	Peak
17796.000	32.42	13.44	45.86	54.00	-8.14	150	23	Average
17796.000	44.67	13.44	58.11	74.00	-15.89	150	23	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3074.000	43.04	-7.96	35.08	54.00	-18.92	150	229	Average
3074.000	55.32	-7.96	47.36	74.00	-26.64	150	229	Peak
4804.000	33.53	-3.28	30.25	54.00	-23.75	236	163	Average
4804.000	43.57	-3.28	40.29	74.00	-33.71	236	163	Peak
7206.000	34.35	1.47	35.82	54.00	-18.18	140	71	Average
7206.000	44.02	1.47	45.49	74.00	-28.51	140	71	Peak
14464.000	29.82	11.78	41.60	54.00	-12.40	150	306	Average
14464.000	43.57	11.78	55.35	74.00	-18.65	150	306	Peak
16436.000	31.57	11.89	43.46	54.00	-10.54	150	105	Average
16436.000	44.04	11.89	55.93	74.00	-18.07	150	105	Peak
17762.000	32.13	13.39	45.52	54.00	-8.48	150	51	Average
17762.000	45.10	13.39	58.49	74.00	-15.51	150	51	Peak

Middle channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3074.000	34.11	-7.96	26.15	54.00	-27.85	150	129	Average
3074.000	53.46	-7.96	45.50	74.00	-28.50	150	129	Peak
4882.000	32.42	-2.70	29.72	54.00	-24.28	150	240	Average
4882.000	43.68	-2.70	40.98	74.00	-33.02	150	240	Peak
7323.000	30.72	1.54	32.26	54.00	-21.74	159	355	Average
7323.000	41.80	1.54	43.34	74.00	-30.66	159	355	Peak
15059.000	30.62	11.24	41.86	54.00	-12.14	150	179	Average
15059.000	43.32	11.24	54.56	74.00	-19.44	150	179	Peak
16555.000	30.57	12.45	43.02	54.00	-10.98	150	82	Average
16555.000	43.60	12.45	56.05	74.00	-17.95	150	82	Peak
17796.000	32.32	13.44	45.76	54.00	-8.24	150	49	Average
17796.000	44.69	13.44	58.13	74.00	-15.87	150	49	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3074.000	43.03	-7.96	35.07	54.00	-18.93	150	35	Average
3074.000	55.95	-7.96	47.99	74.00	-26.01	150	35	Peak
4882.000	33.88	-2.70	31.18	54.00	-22.82	208	164	Average
4882.000	45.28	-2.70	42.58	74.00	-31.42	208	164	Peak
7323.000	33.09	1.54	34.63	54.00	-19.37	147	138	Average
7323.000	43.90	1.54	45.44	74.00	-28.56	147	138	Peak
14719.000	30.06	11.86	41.92	54.00	-12.08	150	266	Average
14719.000	42.52	11.86	54.38	74.00	-19.62	150	266	Peak
16674.000	31.81	12.37	44.18	54.00	-9.82	150	333	Average
16674.000	44.06	12.37	56.43	74.00	-17.57	150	333	Peak
17796.000	32.44	13.44	45.88	54.00	-8.12	150	93	Average
17796.000	44.69	13.44	58.13	74.00	-15.87	150	93	Peak

High channel

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3992.000	32.23	-5.56	26.67	54.00	-27.33	150	132	Average
3992.000	46.63	-5.56	41.07	74.00	-32.93	150	132	Peak
4960.000	34.46	-2.85	31.61	54.00	-22.39	202	204	Average
4960.000	44.15	-2.85	41.30	74.00	-32.70	202	204	Peak
7440.000	32.10	1.27	33.37	54.00	-20.63	157	60	Average
7440.000	42.91	1.27	44.18	74.00	-29.82	157	60	Peak
14430.000	30.00	11.69	41.69	54.00	-12.31	150	183	Average
14430.000	43.05	11.69	54.74	74.00	-19.26	150	183	Peak
16640.000	31.81	12.44	44.25	54.00	-9.75	150	323	Average
16640.000	43.72	12.44	56.16	74.00	-17.84	150	323	Peak
17762.000	32.46	13.39	45.85	54.00	-8.15	150	22	Average
17762.000	44.61	13.39	58.00	74.00	-16.00	150	22	Peak

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
3074.000	44.06	-7.96	36.10	54.00	-17.90	150	137	Average
3074.000	55.50	-7.96	47.54	74.00	-26.46	150	137	Peak
4960.000	34.97	-2.85	32.12	54.00	-21.88	199	79	Average
4960.000	45.47	-2.85	42.62	74.00	-31.38	199	79	Peak
7440.000	31.16	1.27	32.43	54.00	-21.57	142	199	Average
7440.000	44.66	1.27	45.93	74.00	-28.07	142	199	Peak
15756.000	32.38	9.66	42.04	54.00	-11.96	150	201	Average
15756.000	46.02	9.66	55.68	74.00	-18.32	150	201	Peak
16691.000	31.66	12.33	43.99	54.00	-10.01	150	317	Average
16691.000	45.39	12.33	57.72	74.00	-16.28	150	317	Peak
17762.000	32.46	13.39	45.85	54.00	-8.15	150	57	Average
17762.000	45.05	13.39	58.44	74.00	-15.56	150	57	Peak

Level = Reading + Factor.

Margin = Level – Limit.

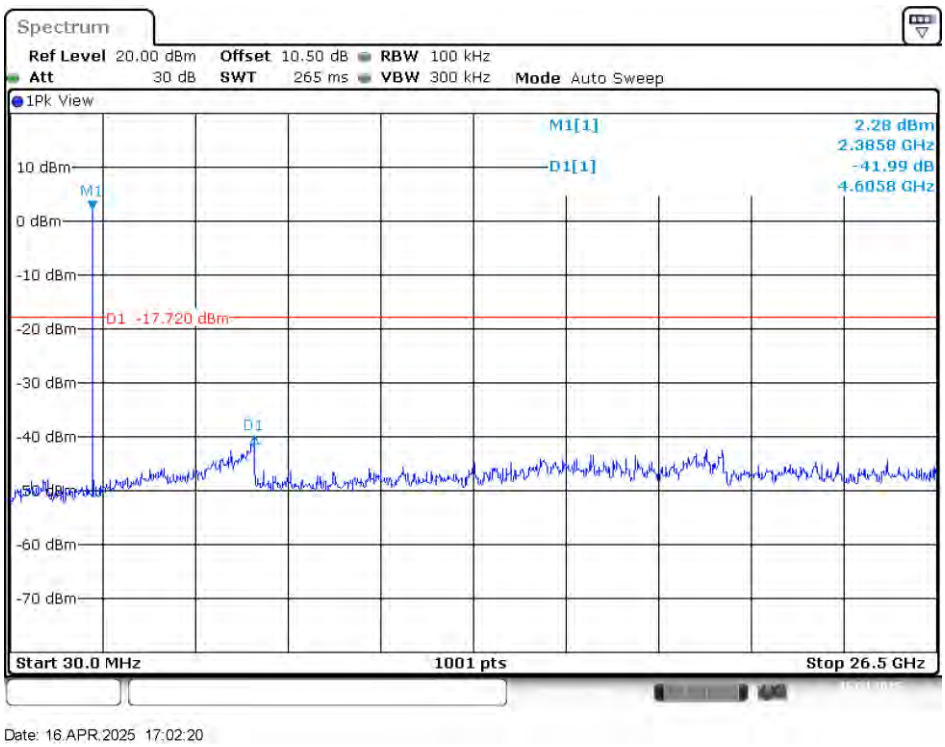
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Conducted Spurious Emissions:

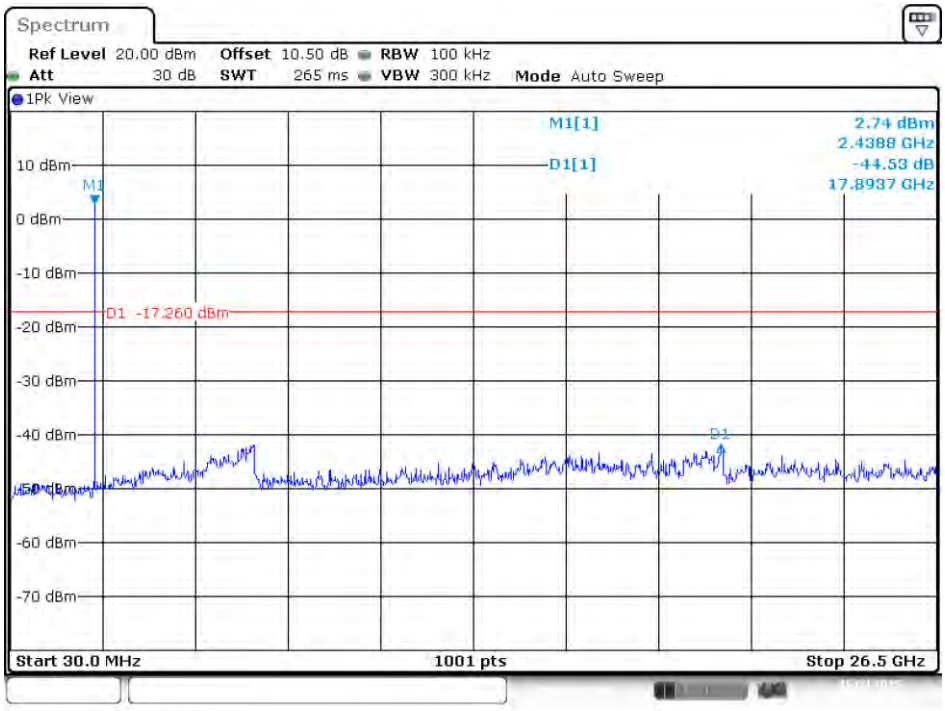
Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
BR Mode (GFSK)				
Low	2402	41.99	≥ 20	PASS
Mid	2441	44.53	≥ 20	PASS
High	2480	42.96	≥ 20	PASS
EDR Mode (π/4-DQPSK)				
Low	2402	42.06	≥ 20	PASS
Mid	2441	41.70	≥ 20	PASS
High	2480	41.03	≥ 20	PASS
EDR Mode (8DPSK)				
Low	2402	42.78	≥ 20	PASS
Mid	2441	44.96	≥ 20	PASS
High	2480	40.96	≥ 20	PASS

BR Mode (GFSK)

Low Channel

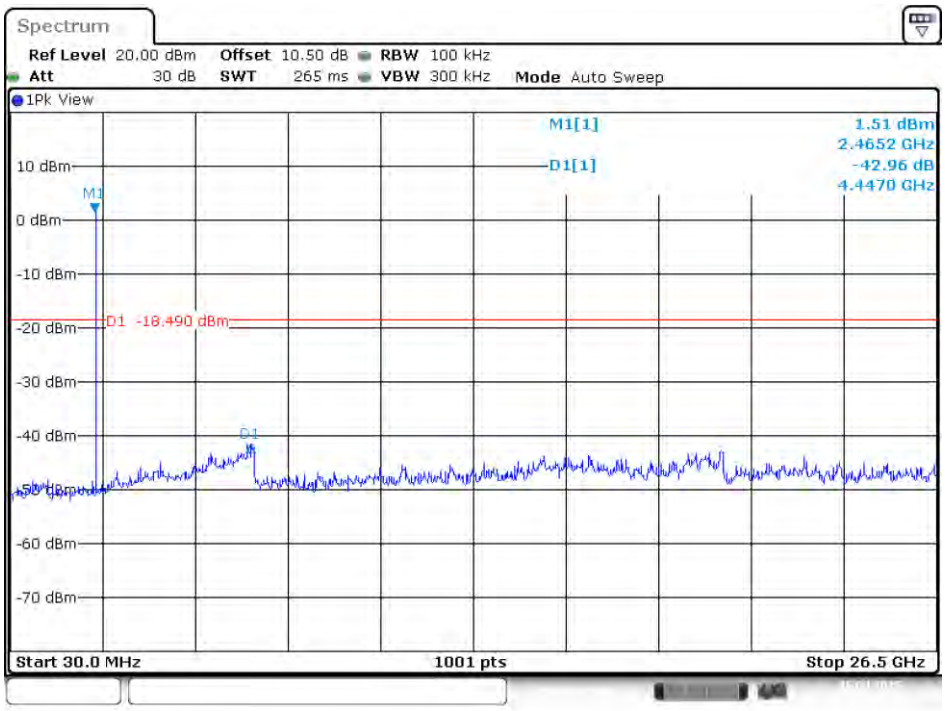


Middle Channel



Date: 16.APR.2025 17:05:10

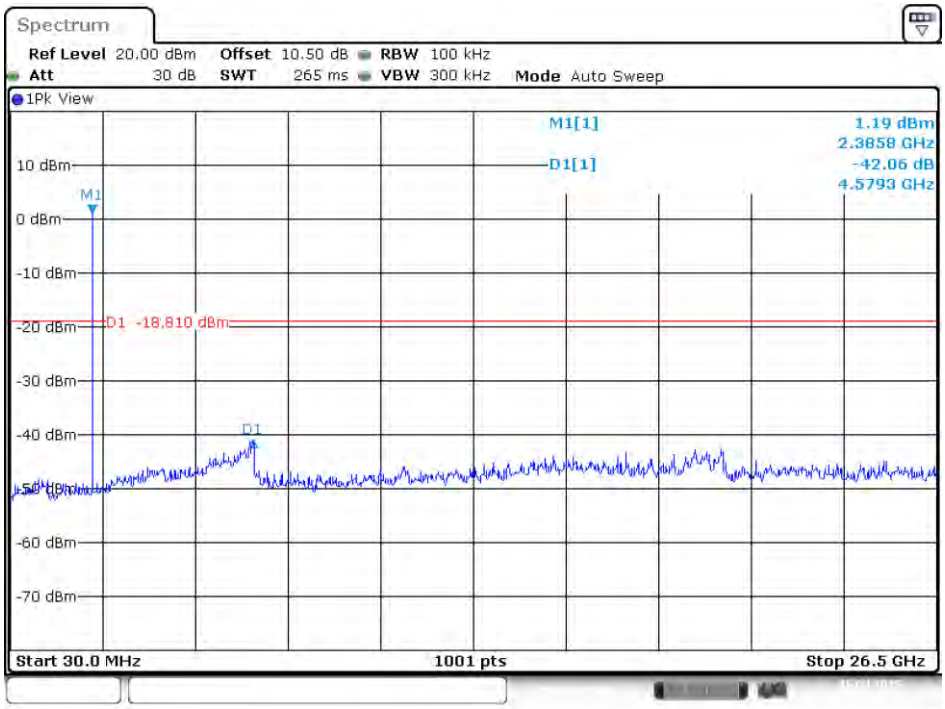
High Channel



Date: 16.APR.2025 17:07:28

EDR Mode (π/4-DQPSK)

Low Channel



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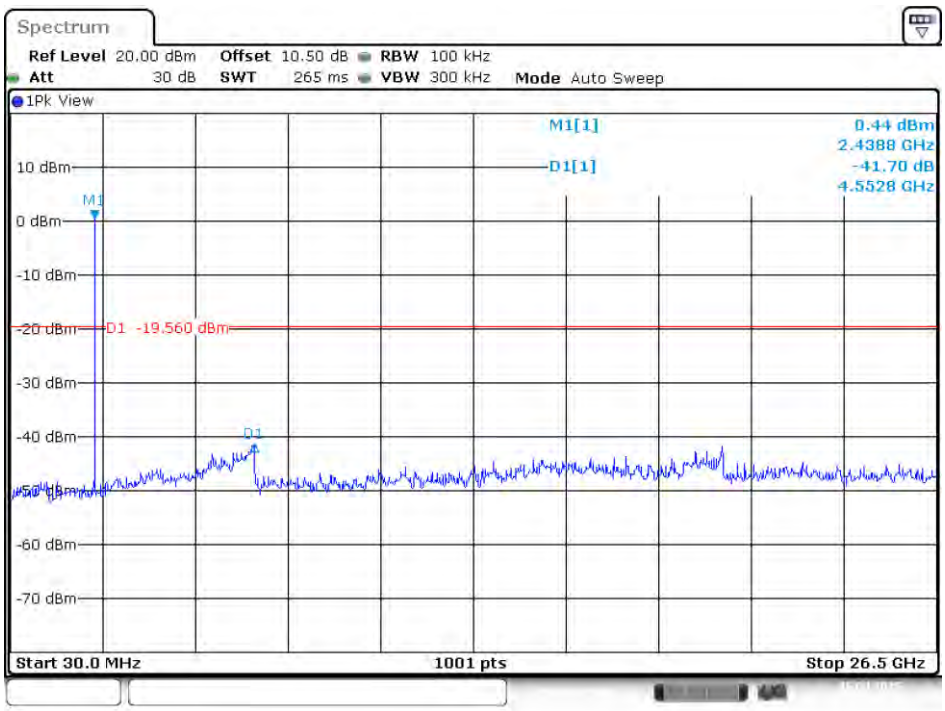
Middle Channel



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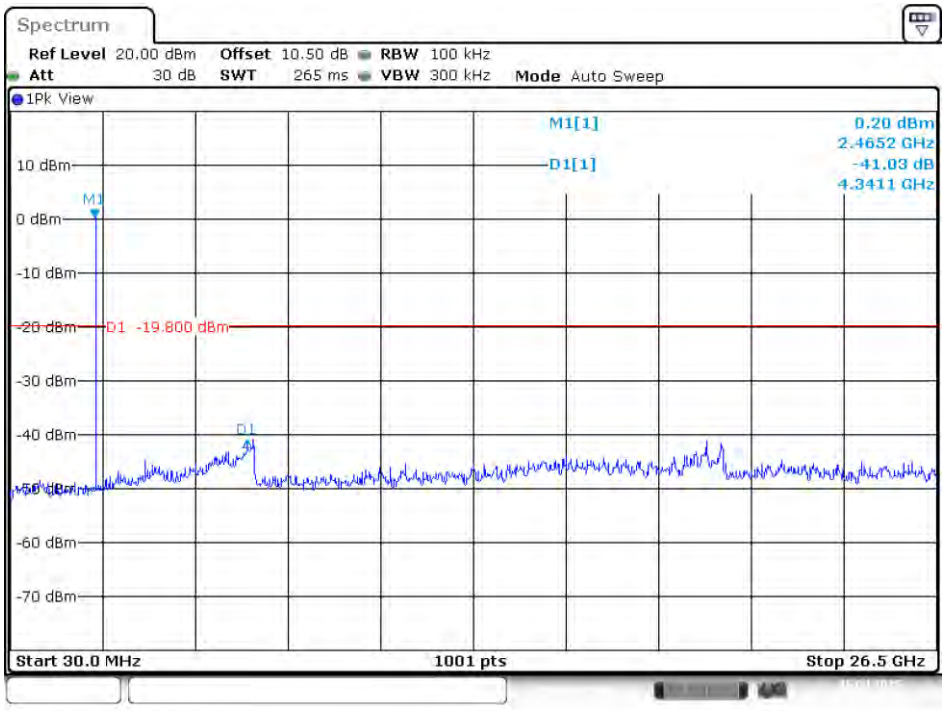
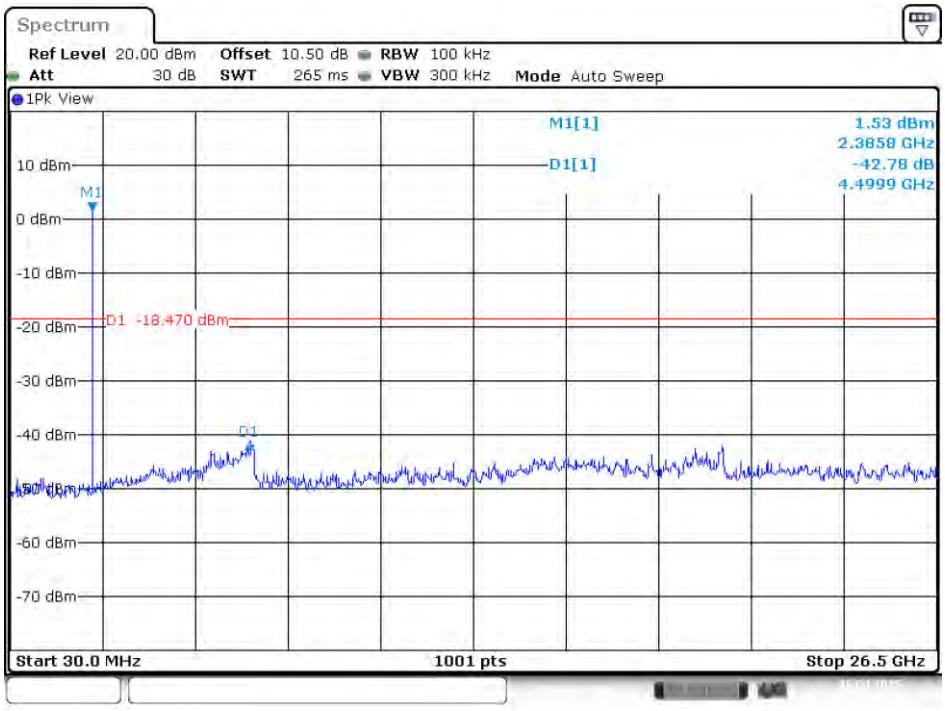
High Channel



Date: 16.APR.2025 17:15:40

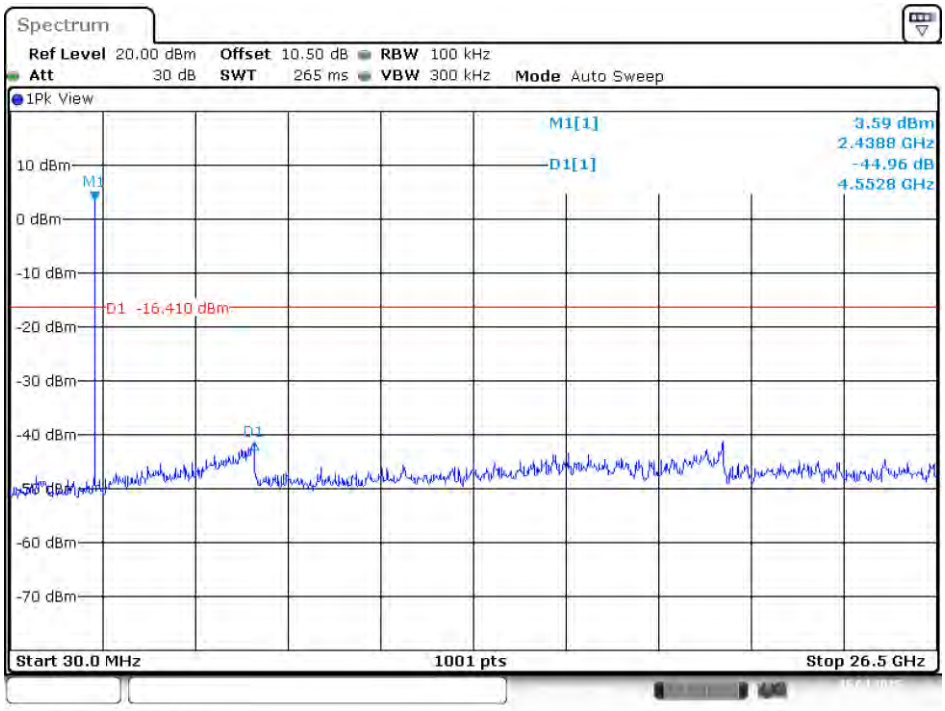
EDR Mode (8DPSK)

Low Channel



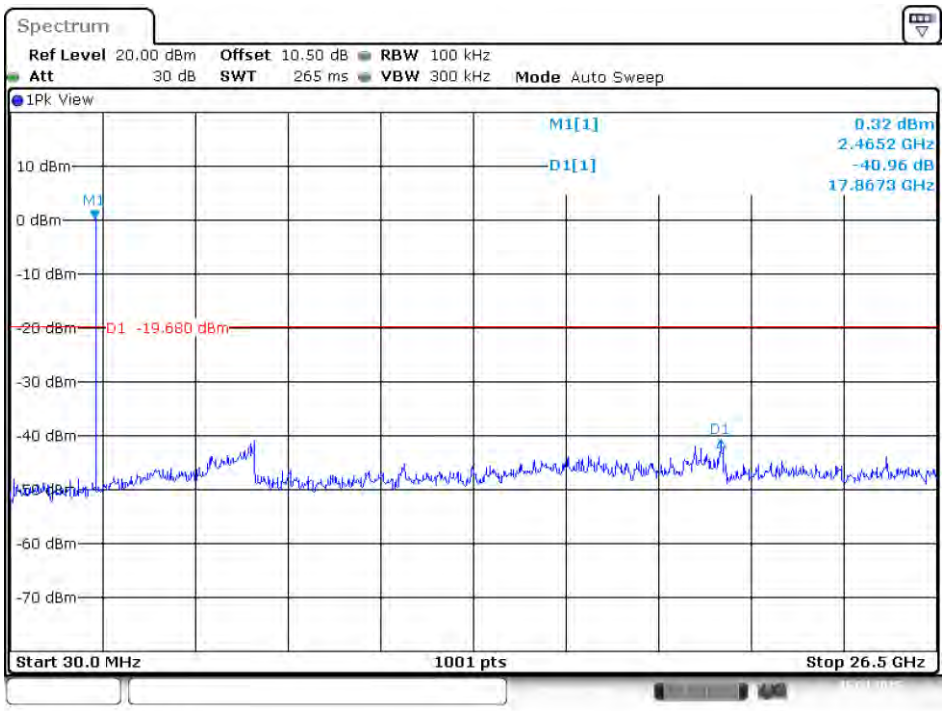
Date: 16.APR.2025 17:19:22

Middle Channel



Date: 16.APR.2025 17:21:32

High Channel



Date: 16.APR.2025 17:23:30

8. FCC §15.247(a)(1) & RSS-247 §5.1(b), RSS-GEN §6.7– Emission Bandwidth

8.1. Applicable Standard

According to FCC §15.247(a) (1) the maximum 20 dB bandwidth of the hopping channel shall be presented.

According to RSS-247 §5.1(b)

FHSs shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, FHSs operating in the band 2400-2483.5 MHz 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 that the systems operate with an output power no greater than 0.125 W.

According to RSS-GEN §6.7

The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

8.2. Test Procedure

According to ANSI C63.10-2013, section 6.9.2

20 dB Emission Bandwidth

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 without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. 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.

According to ANSI C63.10-2013 Section 6.9.3

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

8.3. Test Results

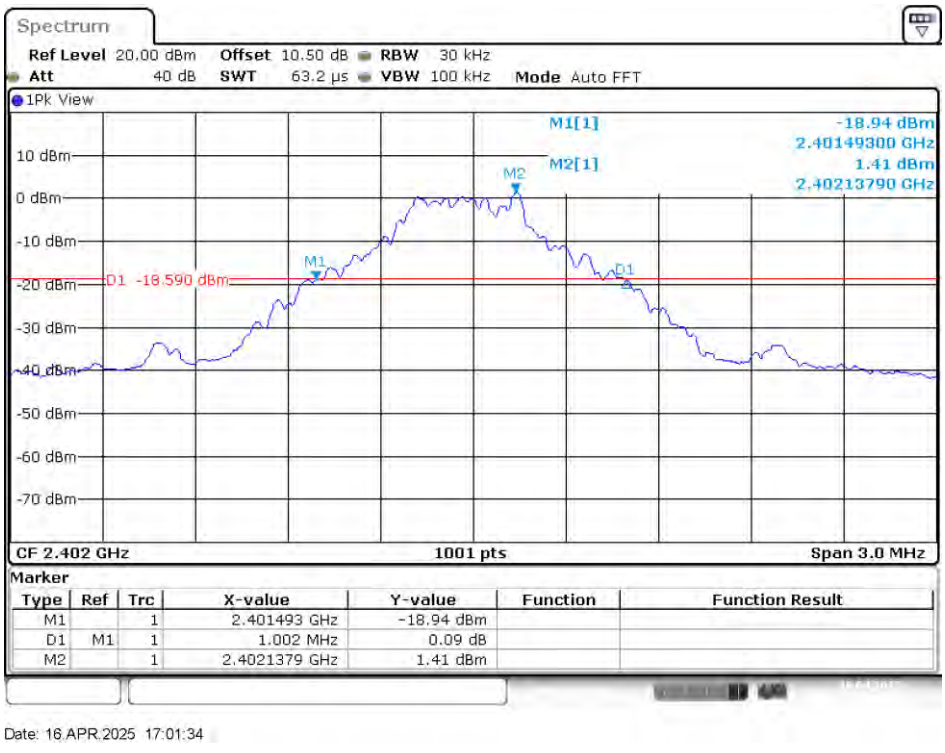
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
BR Mode (GFSK)			
Low	2402	1.00	0.90
Middle	2441	1.01	0.91
High	2480	1.04	0.90
EDR Mode (π/4-DQPSK)			
Low	2402	1.36	1.23
Middle	2441	1.36	1.25
High	2480	1.37	1.27
EDR Mode (8DPSK)			
Low	2402	1.34	1.22
Middle	2441	1.34	1.25
High	2480	1.34	1.26

Please refer to the following plots

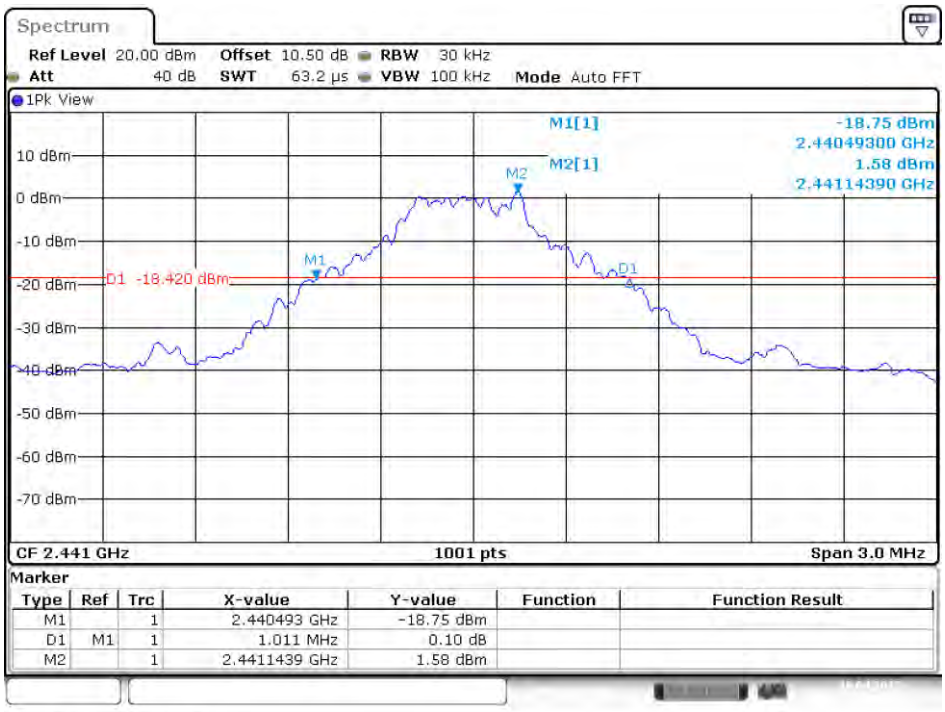
20 dB Emission Bandwidth

BR Mode (GFSK)

Low Channel

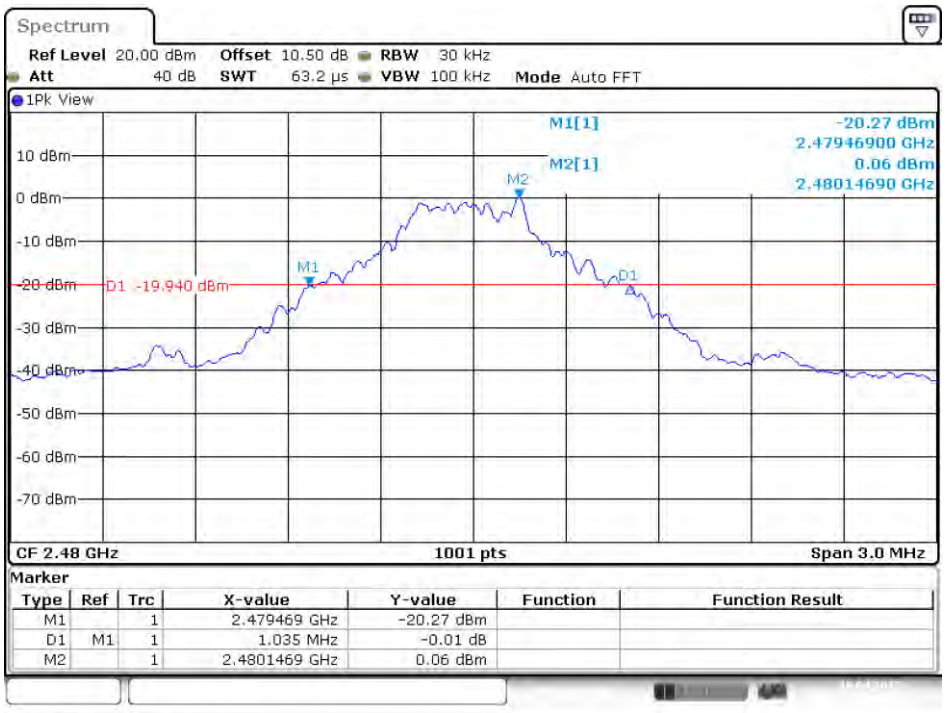


Middle Channel



Date: 16.APR.2025 17:04:39

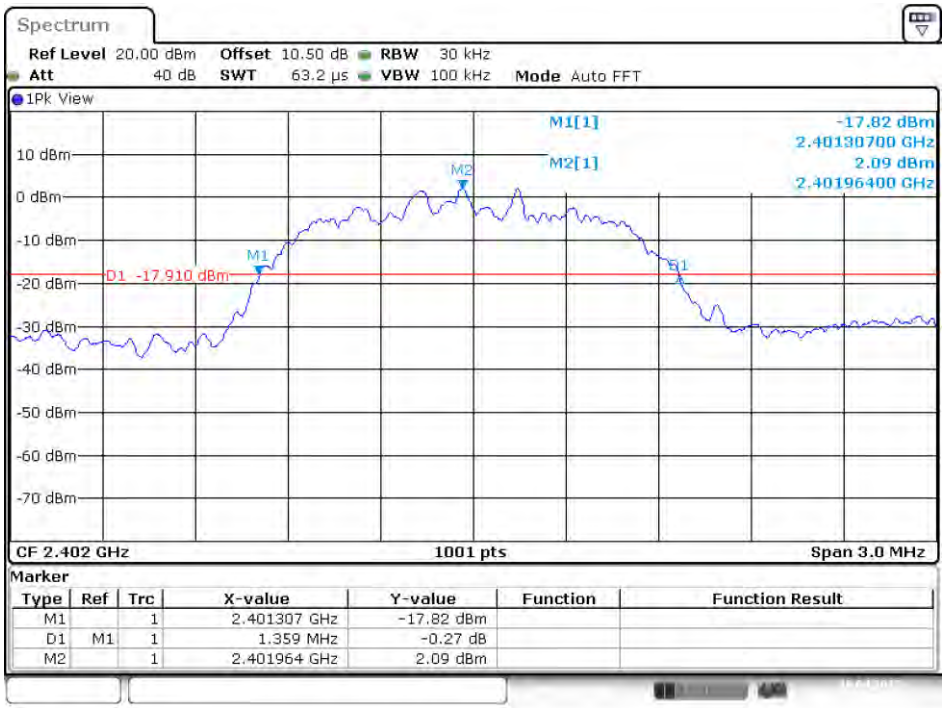
High Channel



Date: 16.APR.2025 17:06:42

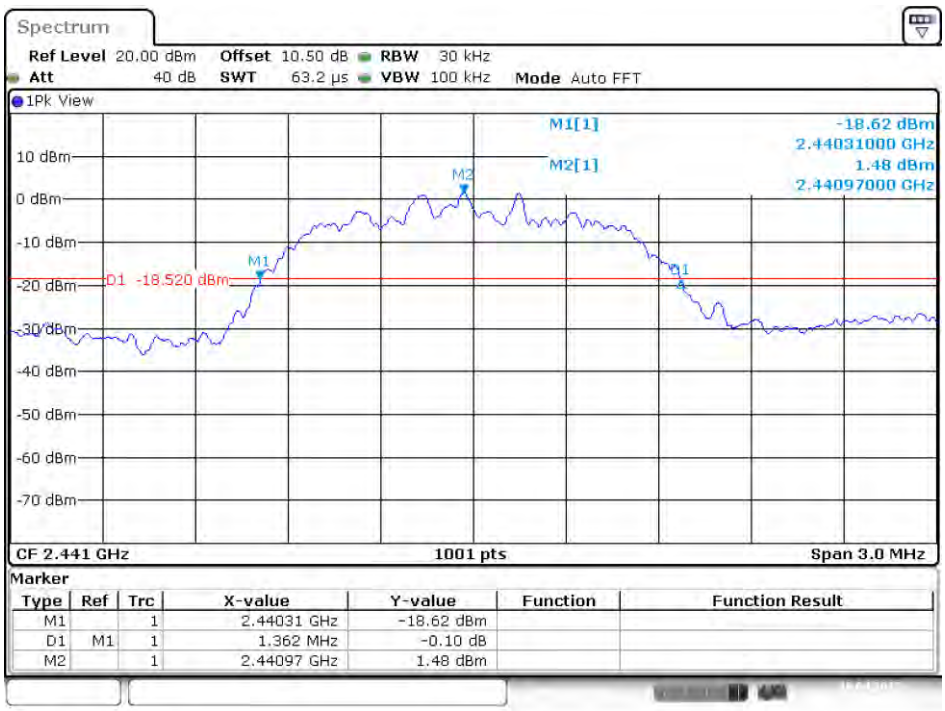
EDR Mode (π/4-DQPSK)

Low Channel



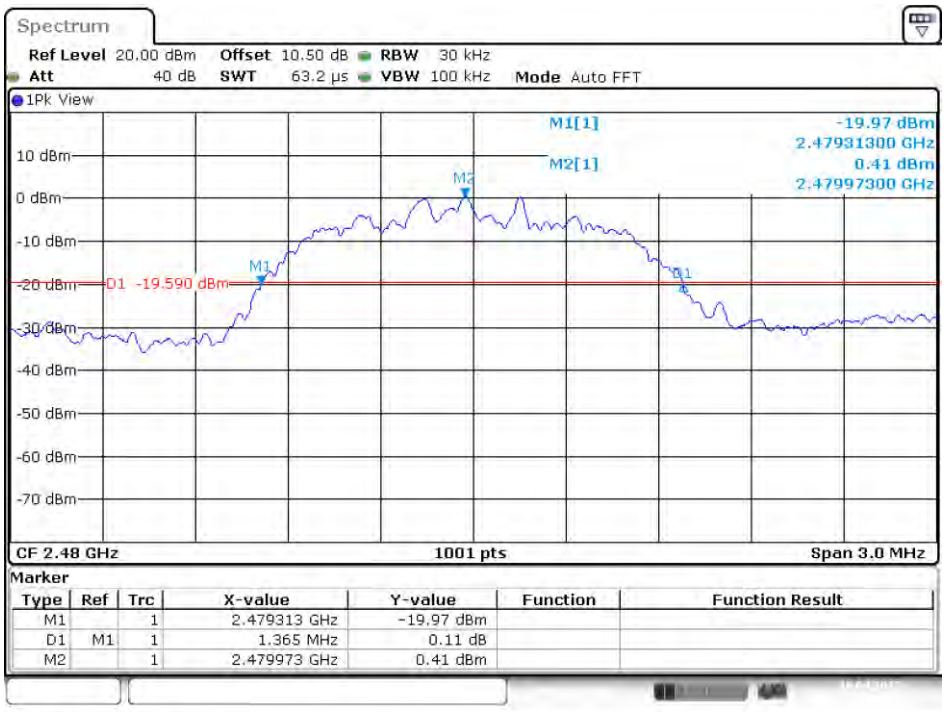
Date: 16.APR.2025 17:09:41

Middle Channel



Date: 16.APR.2025 17:11:40

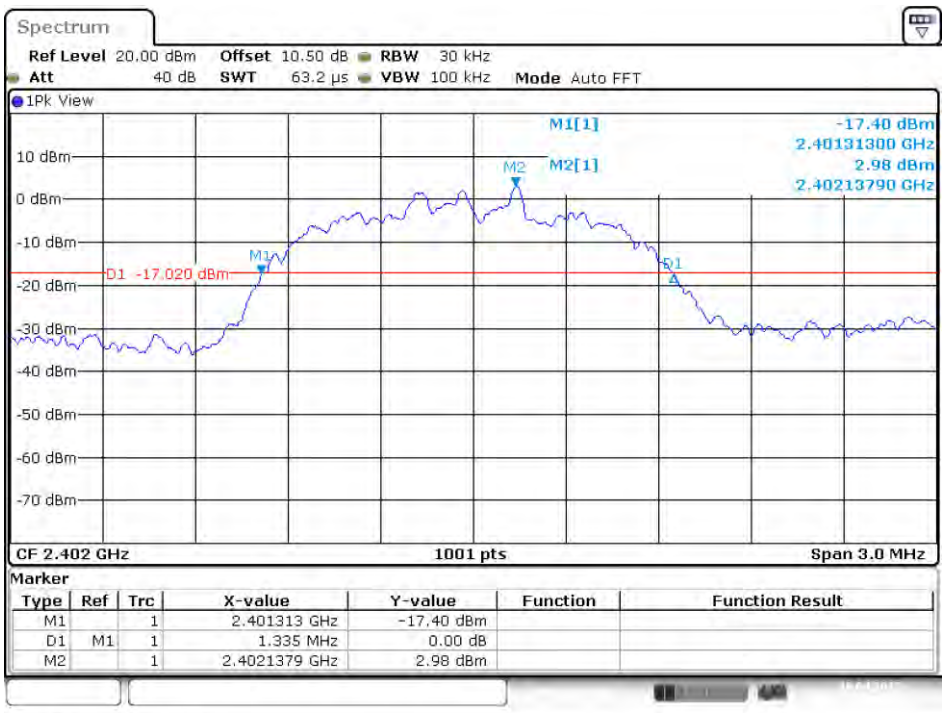
High Channel



Date: 16.APR.2025 17:14:54

EDR Mode (8DPSK)

Low Channel



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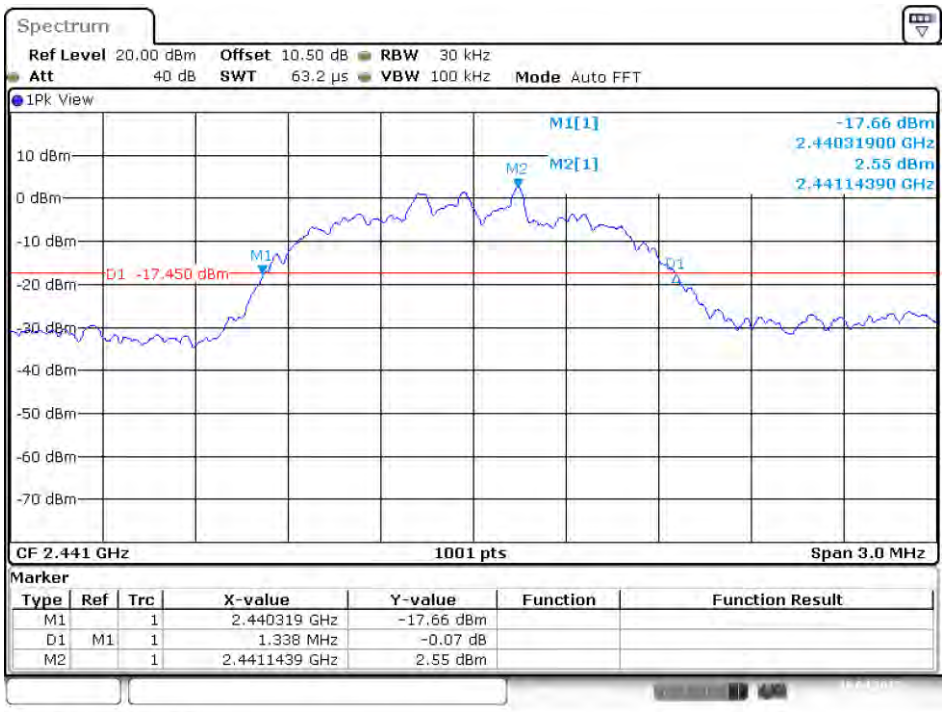
Middle Channel



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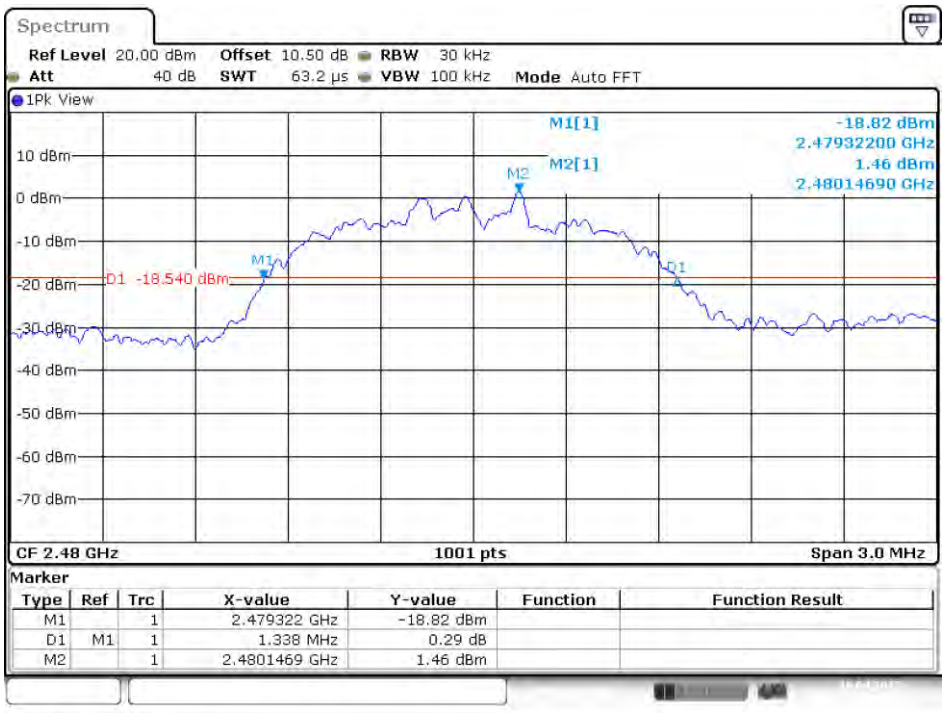
High Channel

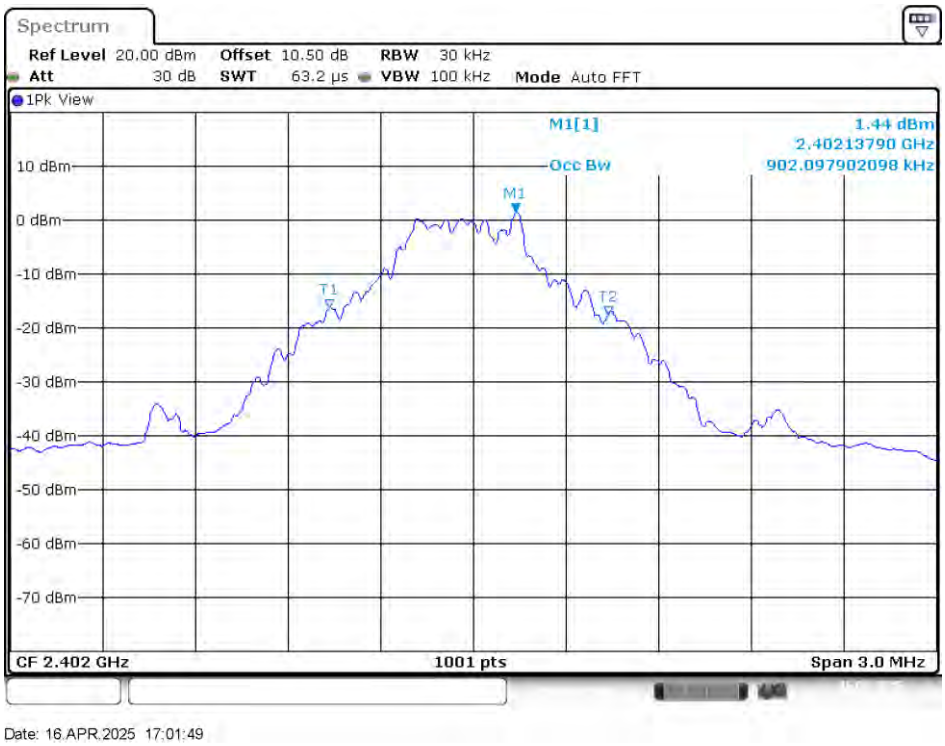


Date: 16.APR.2025 17:22:44

99% Bandwidth

BR Mode (GFSK)

Low Channel



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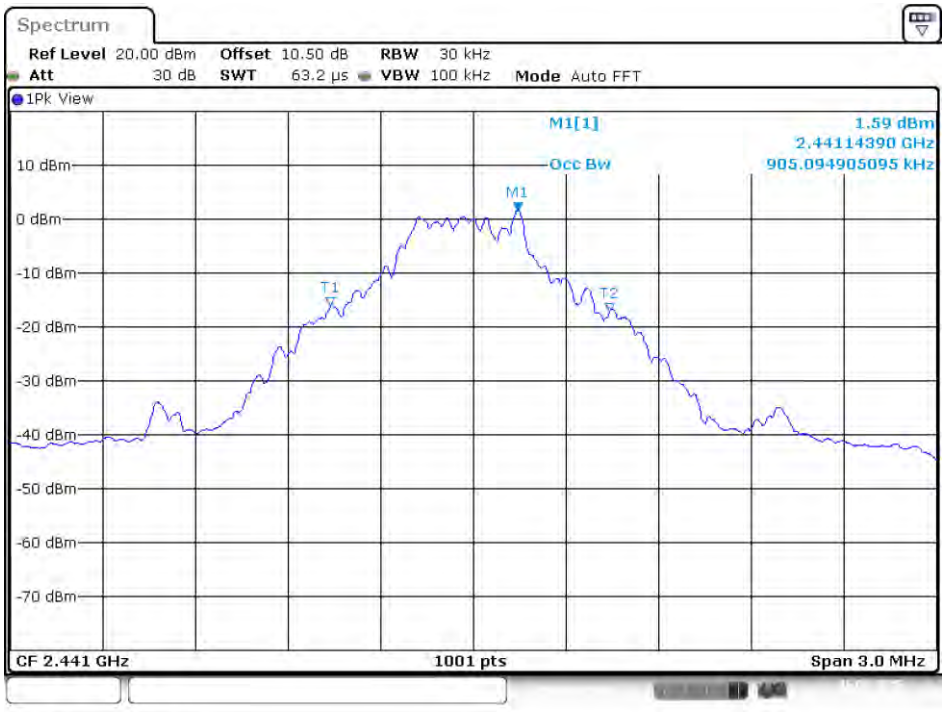
Middle Channel



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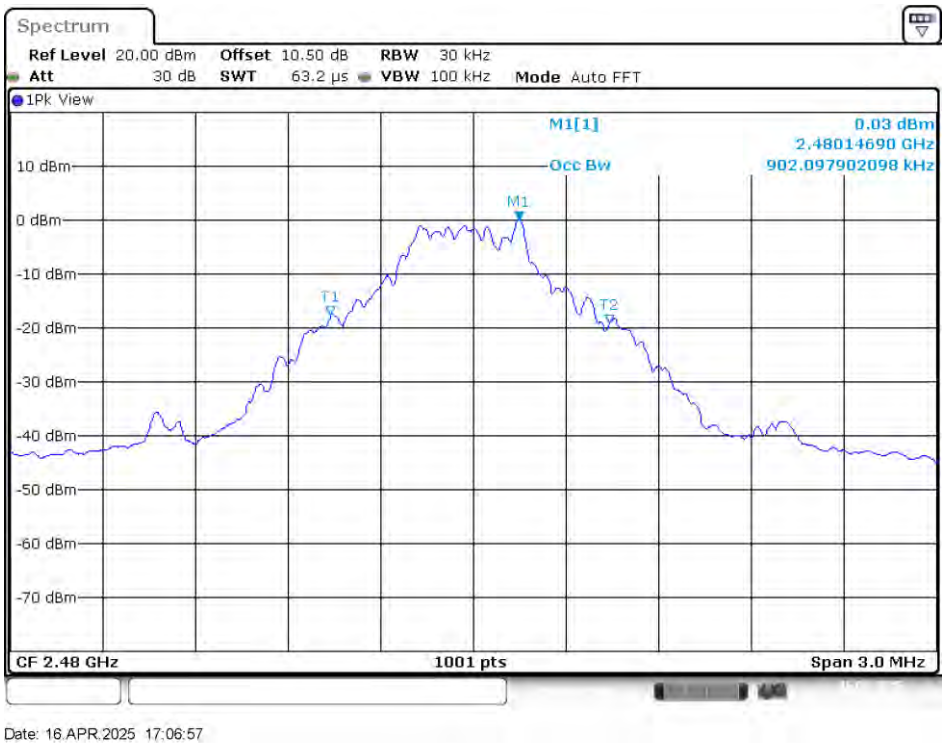
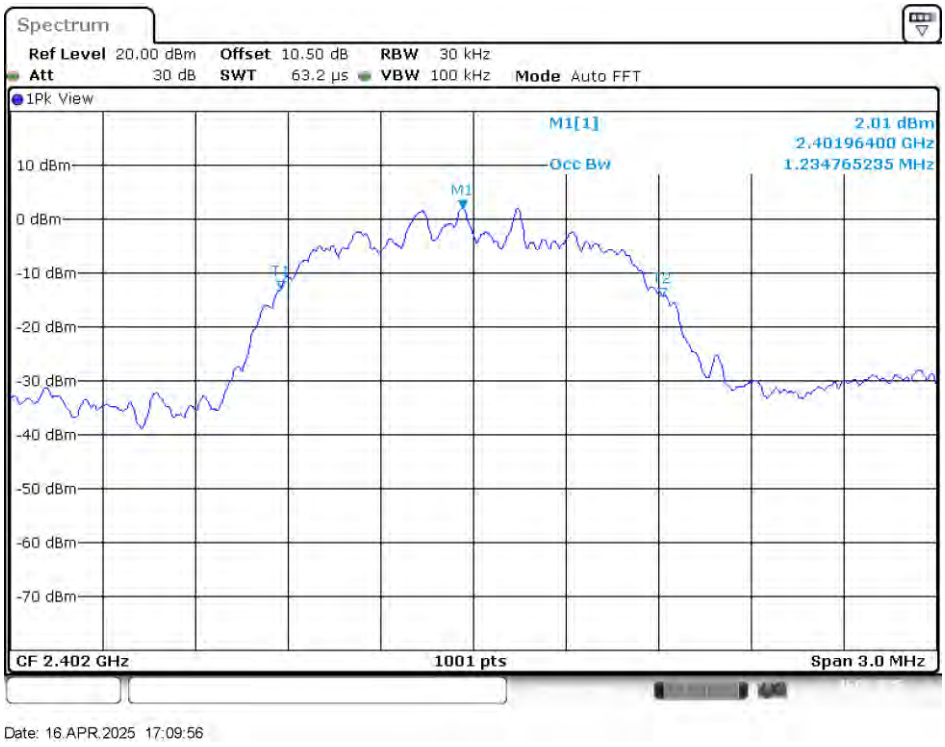
High Channel



Date: 16.APR.2025 17:06:57

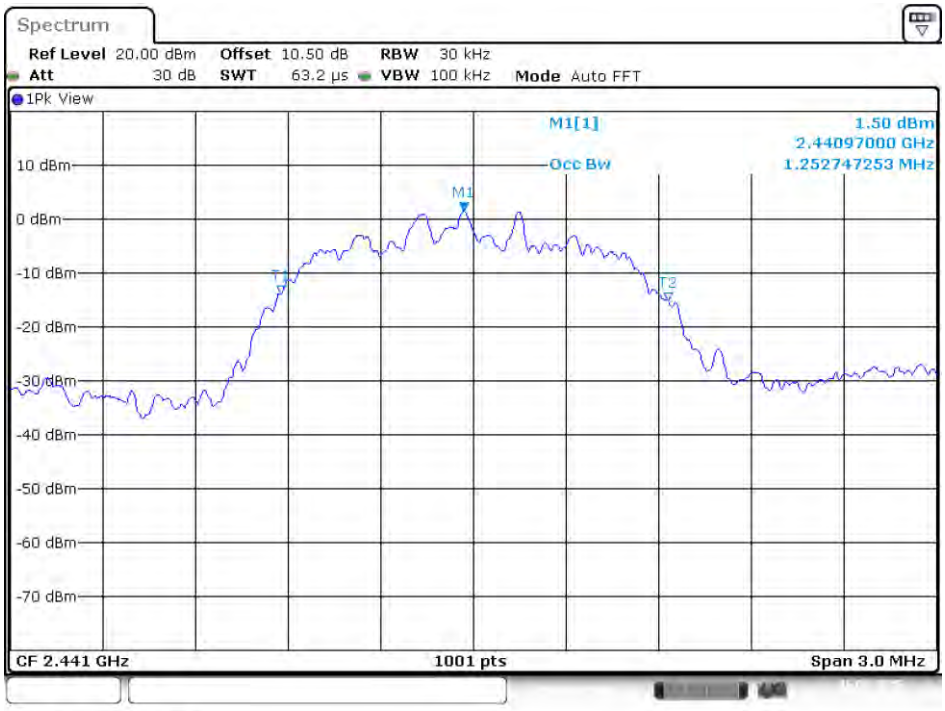
EDR Mode (π/4-DQPSK)

Low Channel



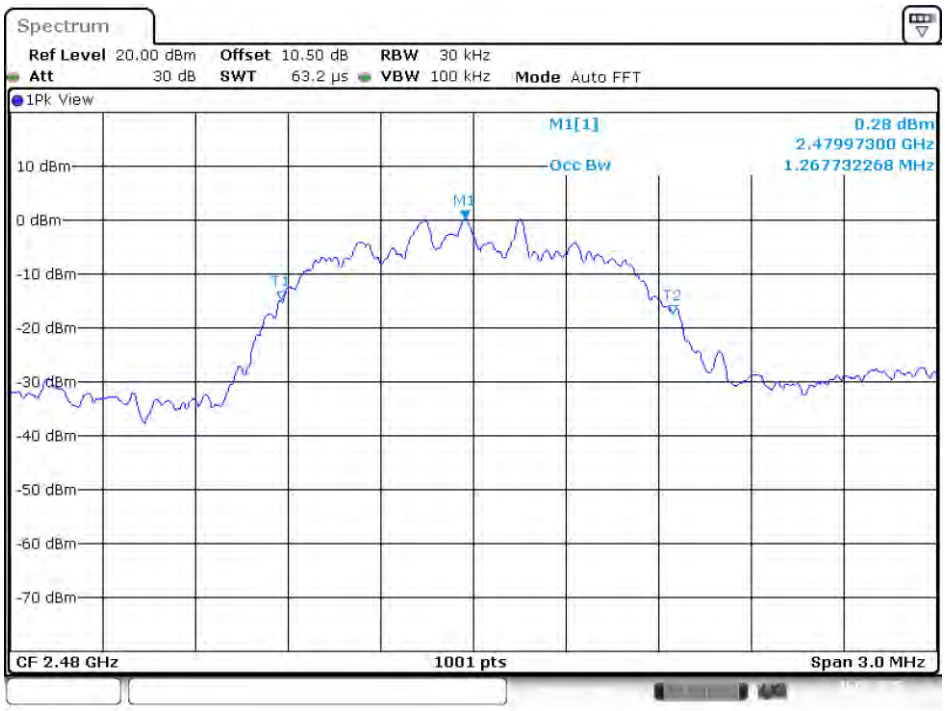
Date: 16.APR.2025 17:09:56

Middle Channel



Date: 16.APR.2025 17:11:55

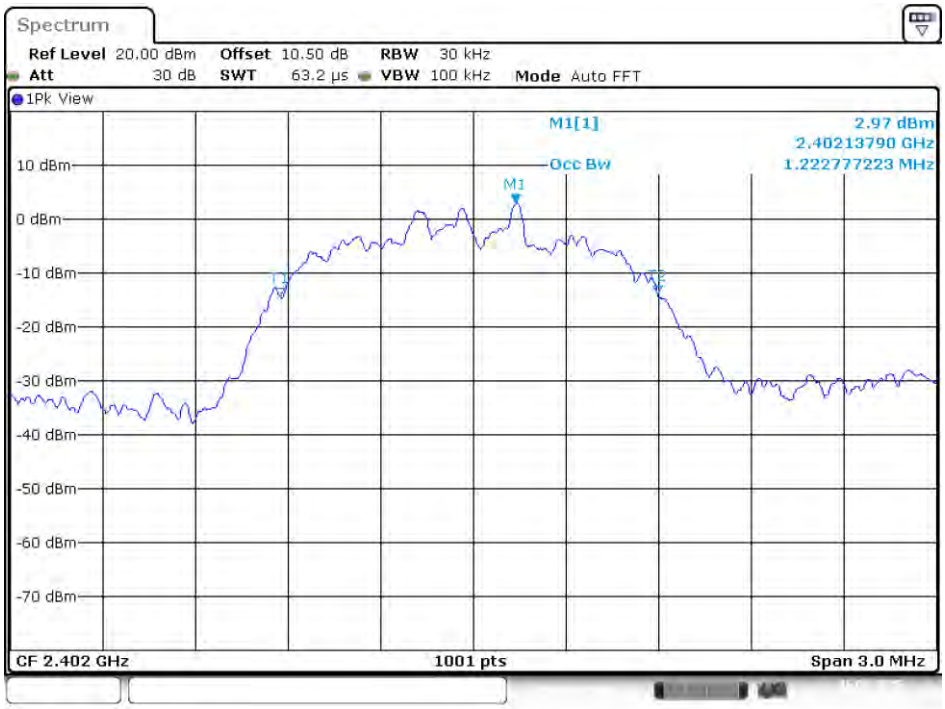
High Channel



Date: 16.APR.2025 17:15:09

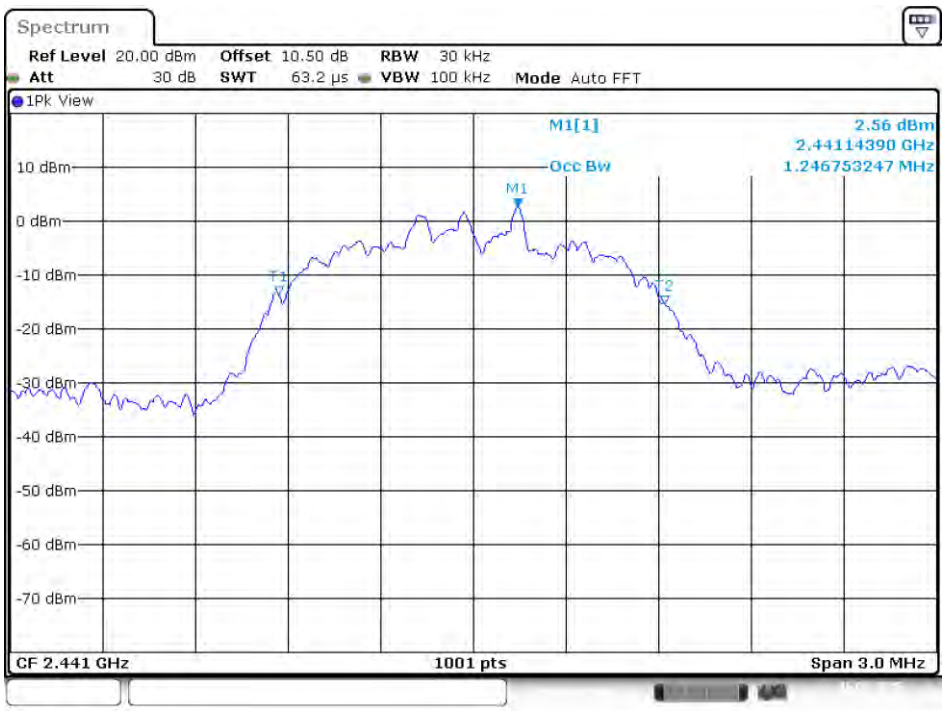
EDR Mode (8DPSK)

Low Channel



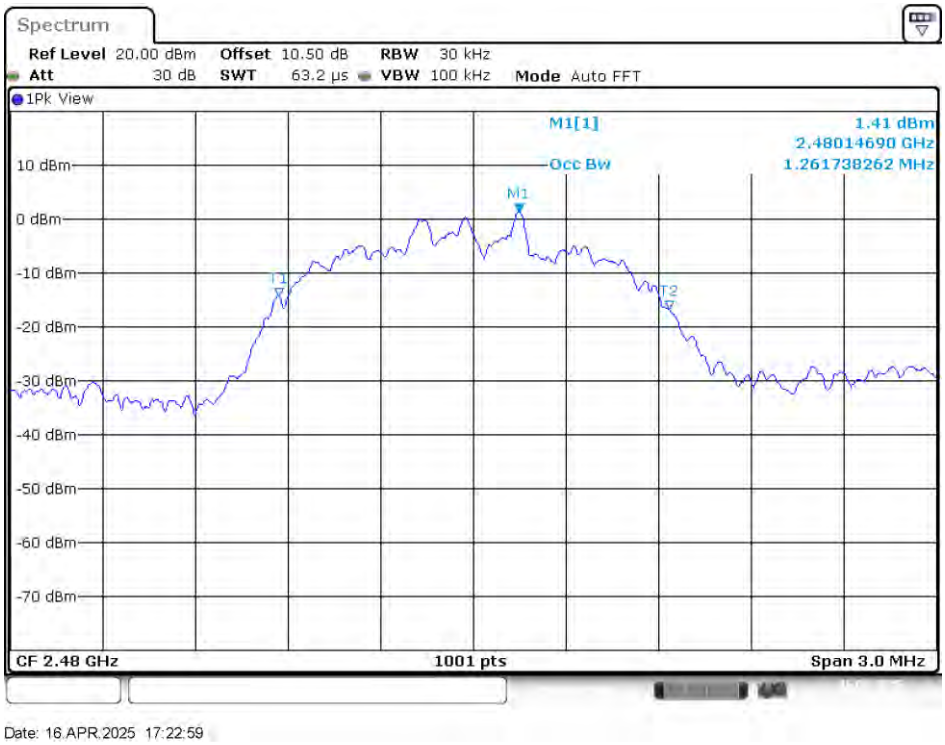
Date: 16.APR.2025 17:18:51

Middle Channel



Date: 16.APR.2025 17:21:16

High Channel



9. FCC §15.247(a)(1) & RSS-247 §5.1(b)– Channel Separation Test

9.1. Applicable Standard

According to FCC §15.247(a) (1)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. 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. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

According to RSS-247 §5.1(b)

FHSs shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, FHSs operating in the band 2400-2483.5 MHz 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 that the systems operate with an output power no greater than 0.125 W.

9.2. Test Procedure

According to ANSI C63.10-2013, section 7.8.2

1. Set the EUT in transmitting mode, max hold the channel.
2. Set the adjacent channel of the EUT and max hold another trace.
3. Measure the channel separation.

9.3. Test Results

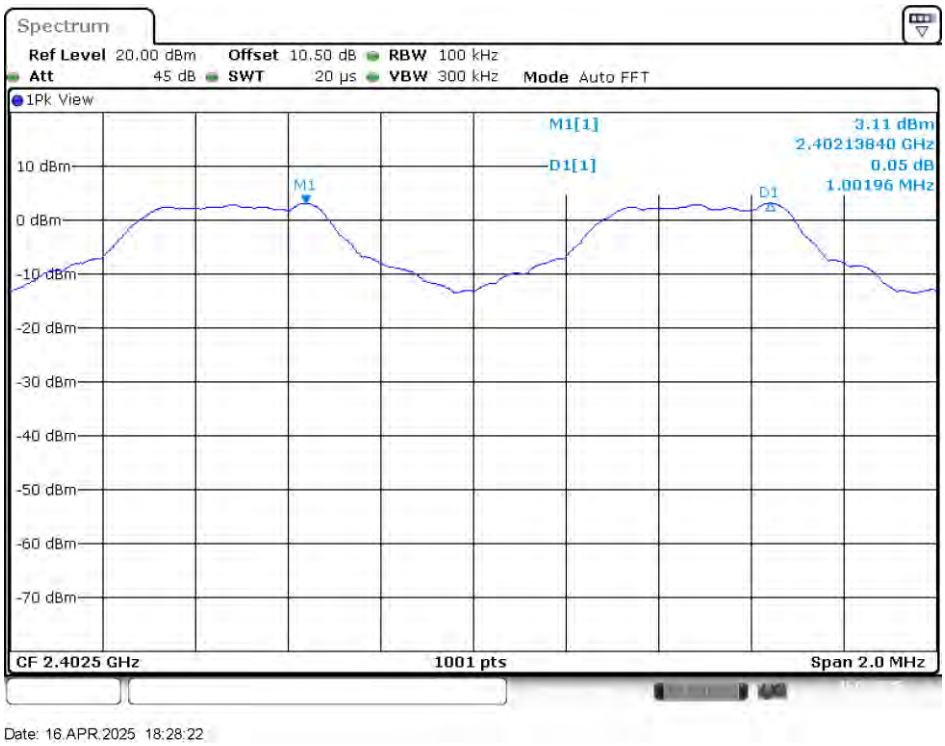
Channel	Channel Separation (MHz)	20 dBc BW (MHz)	Two-thirds of the 20 dB bandwidth (MHz)	Channel Separation Limit	Result
BR Mode (GFSK)					
Low	1.00	1.00	0.66	>two-thirds of the 20 dB bandwidth	Compliance
Middle	1.00	1.01	0.67	>two-thirds of the 20 dB bandwidth	Compliance
High	1.00	1.04	0.69	>two-thirds of the 20 dB bandwidth	Compliance

Note: Only the BDR (GFSK) mode result is reported since EDR (π/4-DQPSK) and EDR (8DPSK) modes have the exact same channel plan, and the limit is the maximum 20dB bandwidth *2/3.

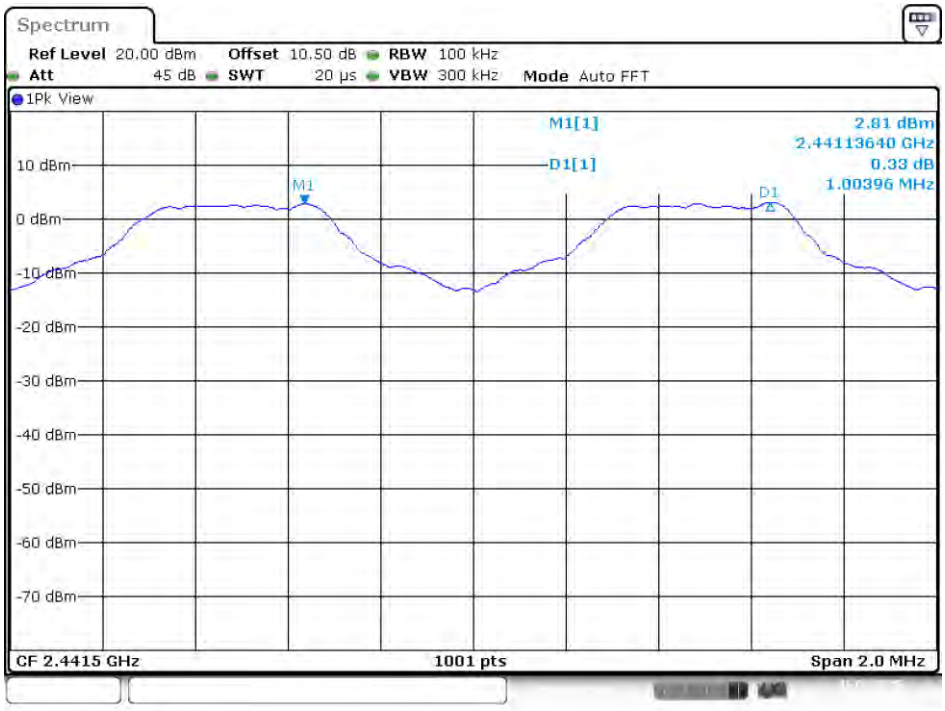
Please refer to the following plots.

BR Mode (GFSK)

Low Channel

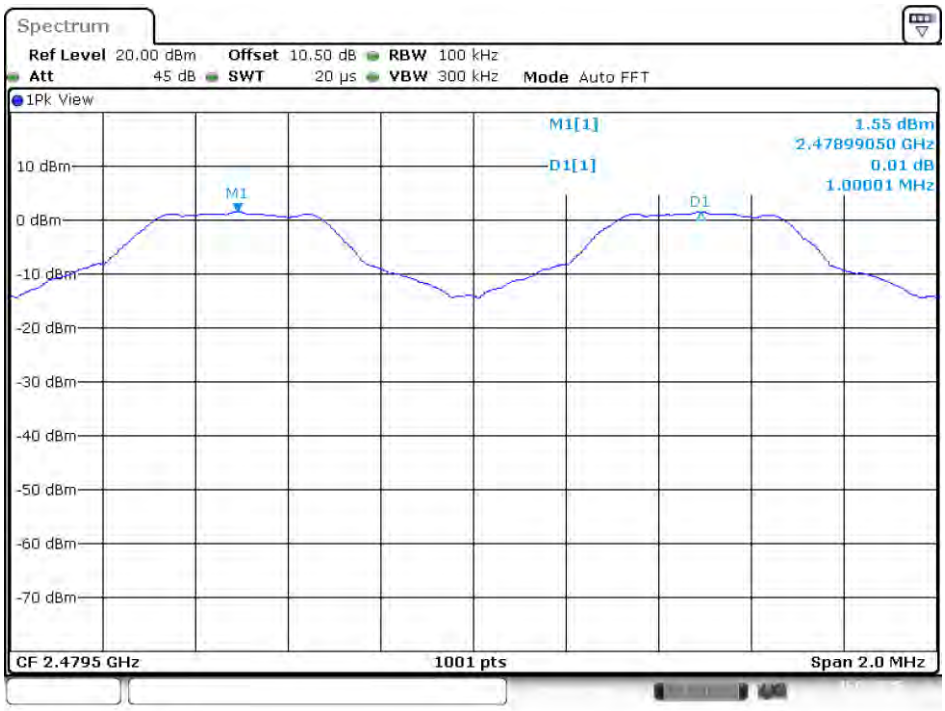


Middle Channel



Date: 16.APR.2025 18:28:06

High Channel



Date: 16.APR.2025 18:27:48

10. FCC §15.247(a)(1)(iii) & RSS-247 §5.1 (d) – Time of Occupancy (Dwell Time)

10.1. Applicable Standard

According to FCC §15.247(a) (1) (iii).

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.

According to RSS-247 §5.1 (d).

FHSs operating in the band 2400-2483.5 MHz shall use at least 15 hopping 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. Transmissions on particular hopping frequencies may be avoided or suppressed provided that at least 15 hopping channels are used.

10.2. Test Procedure

According to ANSI C63.10-2013, section 7.8.4

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel RBW ≤ channel spacing and where possible RBW should be set >> 1/T, where T is the expected dwell time per channel Sweep = as necessary to capture the entire dwell time per hopping channel Detector function = peak Trace = max hold

Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time.

Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements.

Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation:

(Number of hops in the period specified in the requirements) = (number of hops on spectrum analyzer) x (period specified in the requirements / analyzer sweep time)

The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified. If the number of hops in a specific time varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation.

10.3. Test Results

BR mode (GFSK)						
Mode	Pulse Time (ms)	Hopping Number	Period Time (s)	Total of Dwell (ms)	Limit (ms)	Result
DH1	0.381	320	31.6	121.92	<400	PASS
DH3	1.634	190	31.6	310.46	<400	PASS
DH5	2.875	130	31.6	373.75	<400	PASS
EDR mode (π/4-DQPSK)						
Mode	Pulse Time (ms)	Hopping Number	Period Time (s)	Total of Dwell (ms)	Limit (ms)	Result
2DH1	0.386	310	31.6	119.66	<400	PASS
2DH3	1.638	160	31.6	262.08	<400	PASS
2DH5	2.88	100	31.6	288.00	<400	PASS
EDR mode (8DPSK)						
Mode	Pulse Time (ms)	Hopping Number	Period Time (s)	Total of Dwell (ms)	Limit (ms)	Result
3DH1	0.387	310	31.6	119.97	<400	PASS
3DH3	1.638	120	31.6	196.56	<400	PASS
3DH5	2.88	110	31.6	316.80	<400	PASS

Note 1: Period time = 0.4*79 = 31.6 (s), Total of Dwell=Pulse Time * Hopping Number

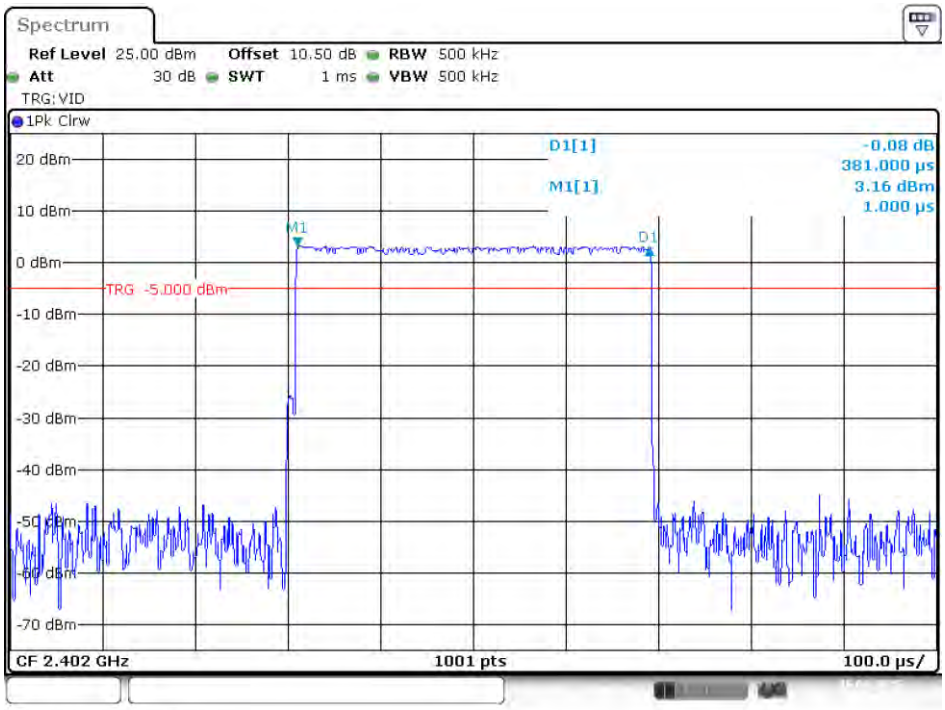
Note 2: Hopping Number = Hopping Number/10 * 10

Note 3: Hopping Number/10 = Total of highest signals in 3.16s. (Second high signals were other channel)

Please refer to the following plots

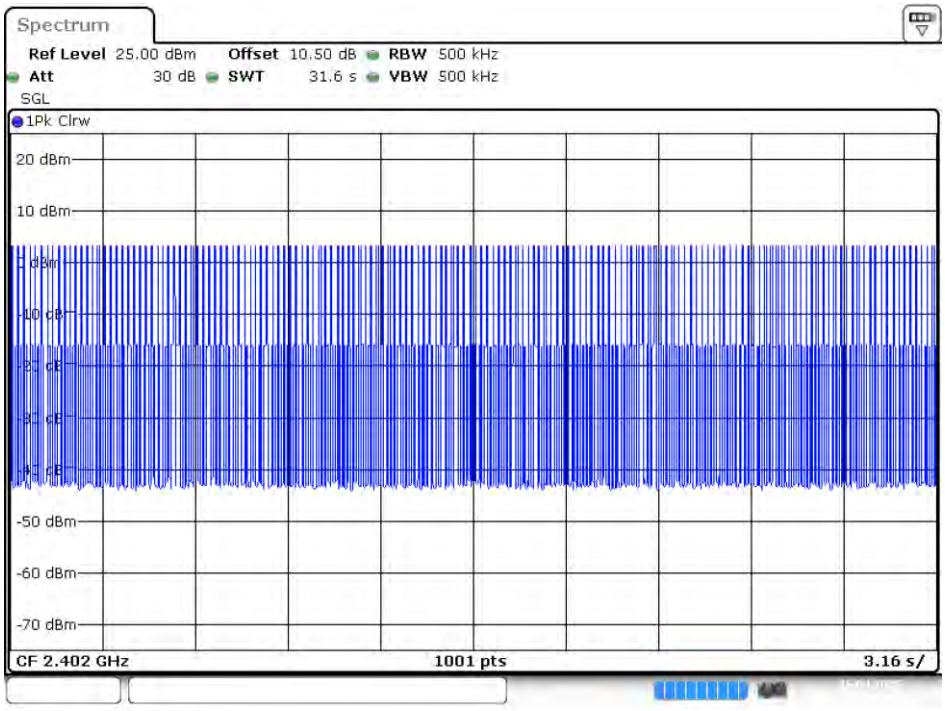
BR Mode (GFSK)

DH1: Pulse Width



Date: 16.APR.2025 18:41:31

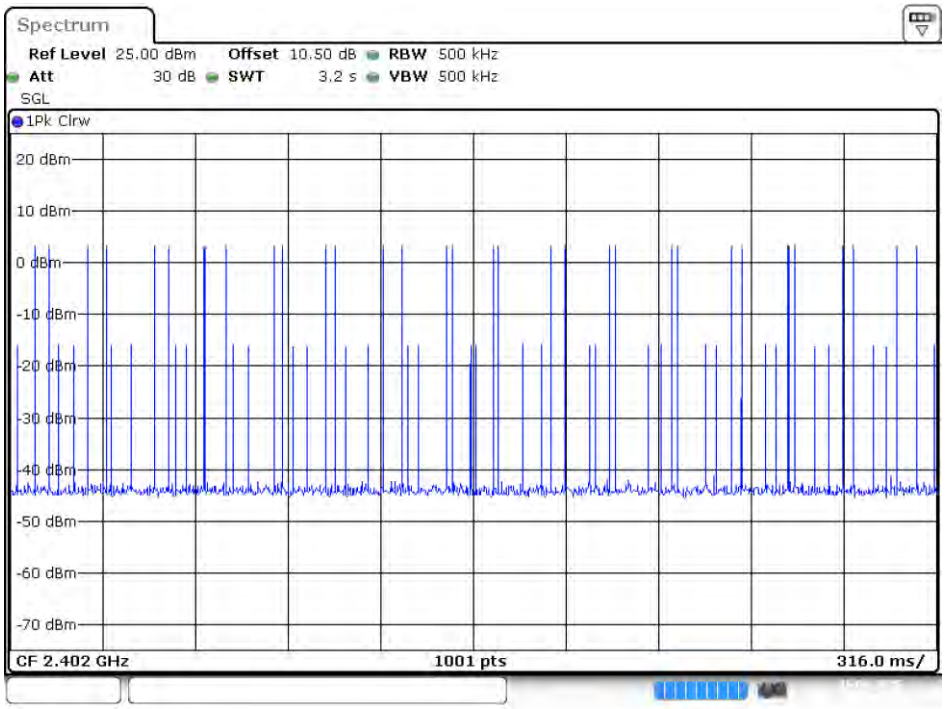
DH1: Hopping Number



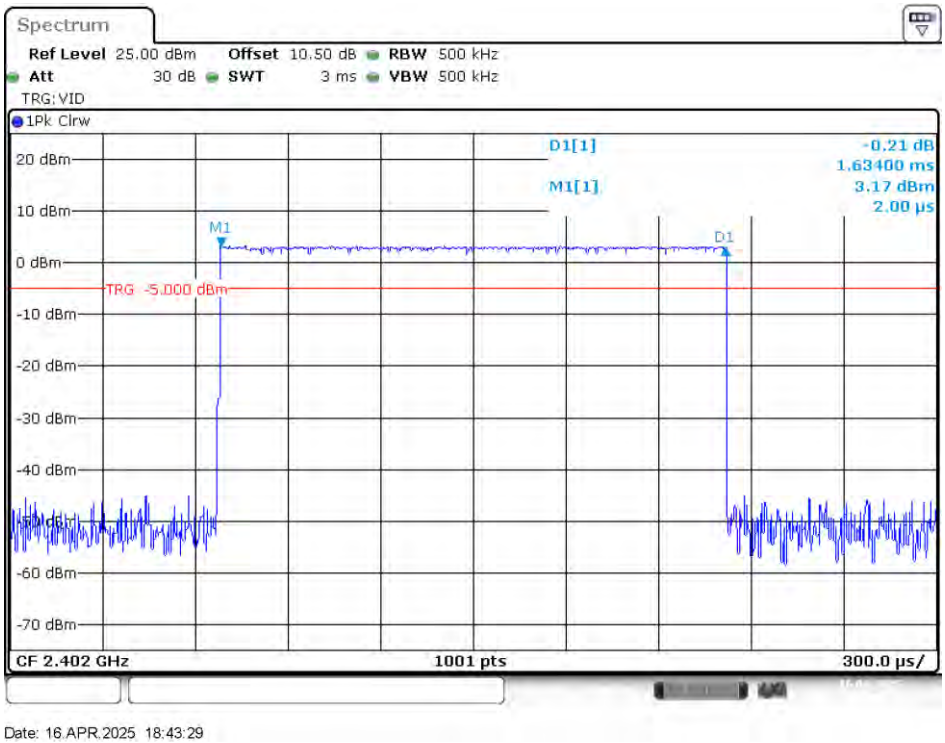
Date: 16.APR.2025 18:42:03

DH1: Hopping Number /10

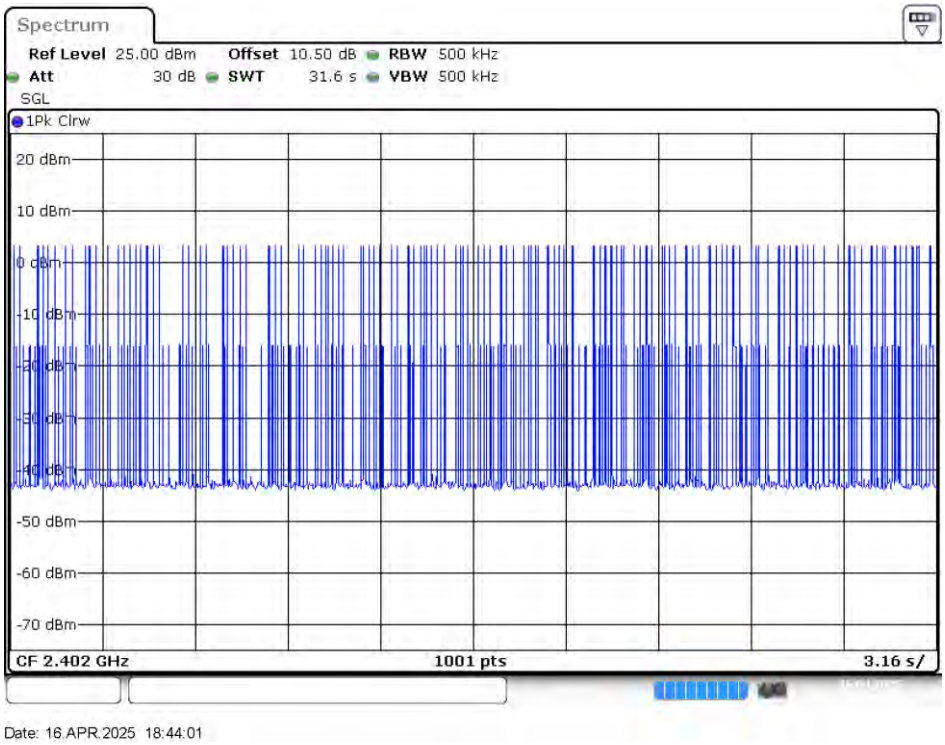
(Hopping Number = 32 in 1/10 period of highest signals, Second High signals were other channel)



DH3: Pulse Width



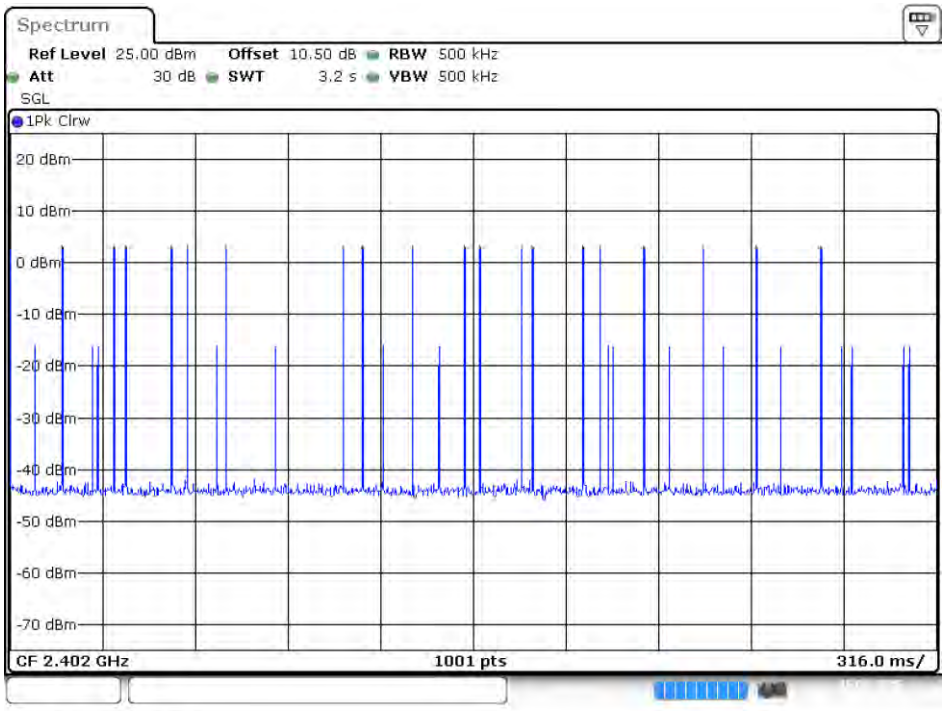
DH3: Hopping Number



Date: 16.APR.2025 18:44:01

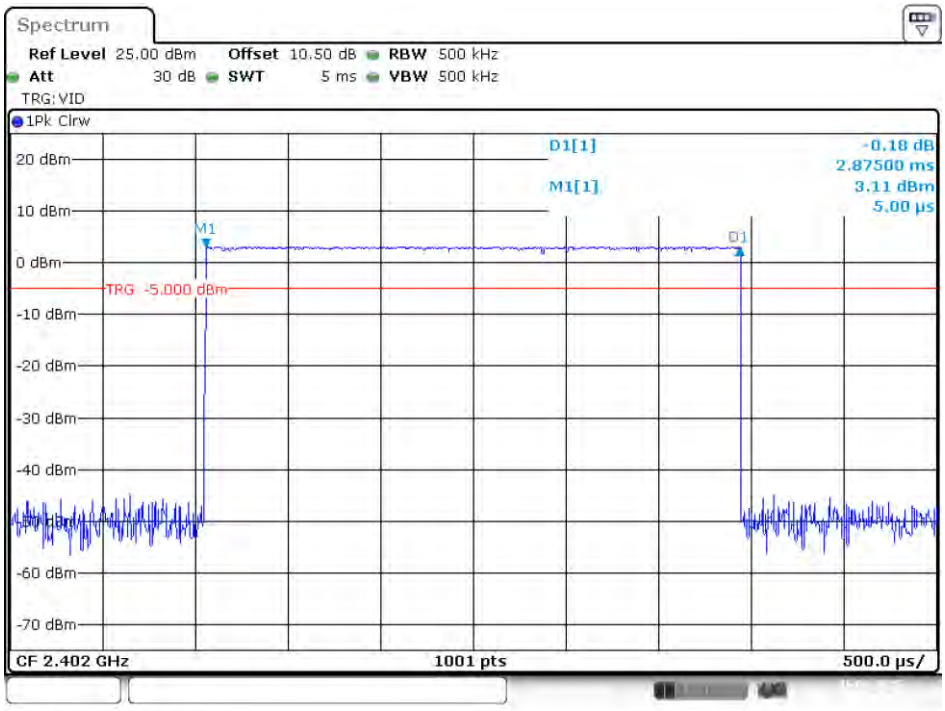
DH3: Hopping Number /10

(Hopping Number = 19 in 1/10 period of highest signals, Second High signals were other channel)



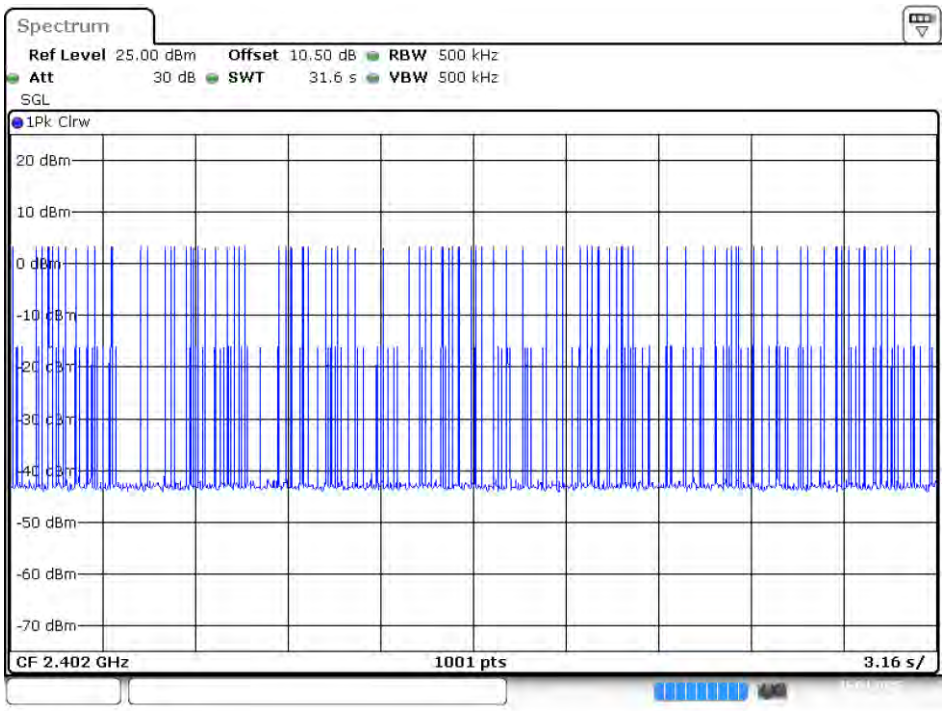
Date: 16.APR.2025 18:44:09

DH5: Pulse Width



Date: 16.APR.2025 18:45:09

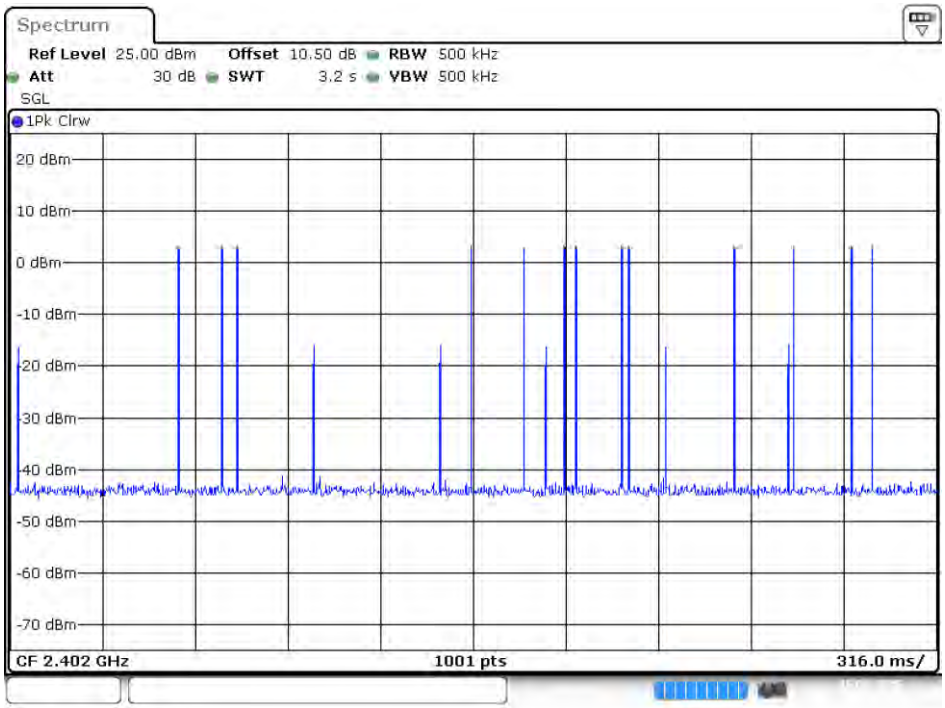
DH5: Hopping Number



Date: 16.APR.2025 18:45:41

DH5: Hopping Number /10

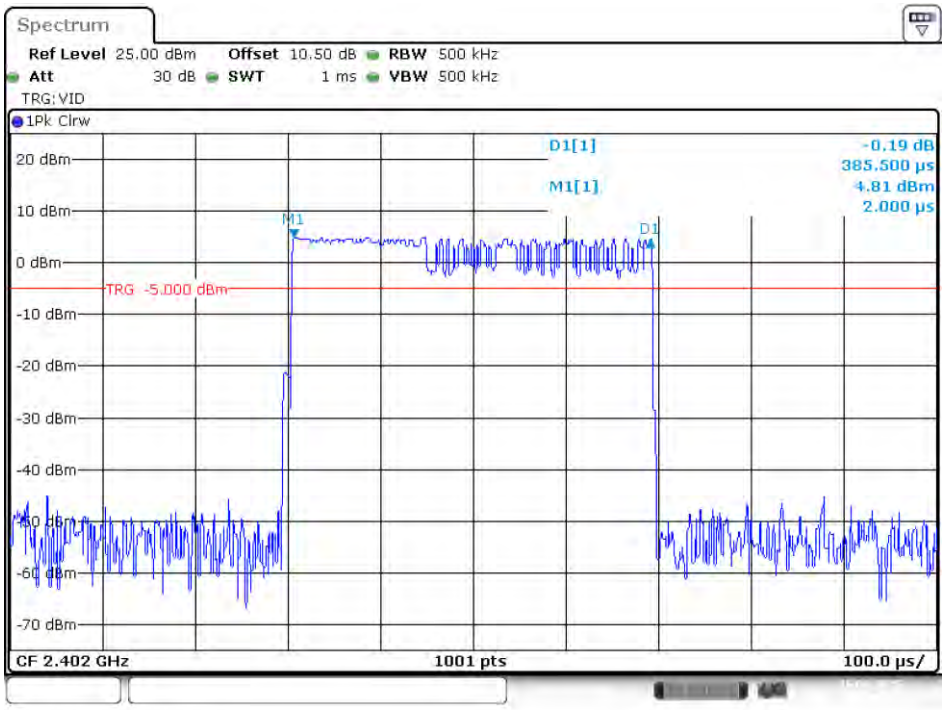
(Hopping Number = 13 in 1/10 period of highest signals, Second High signals were other channel)



Date: 16.APR.2025 18:45:57

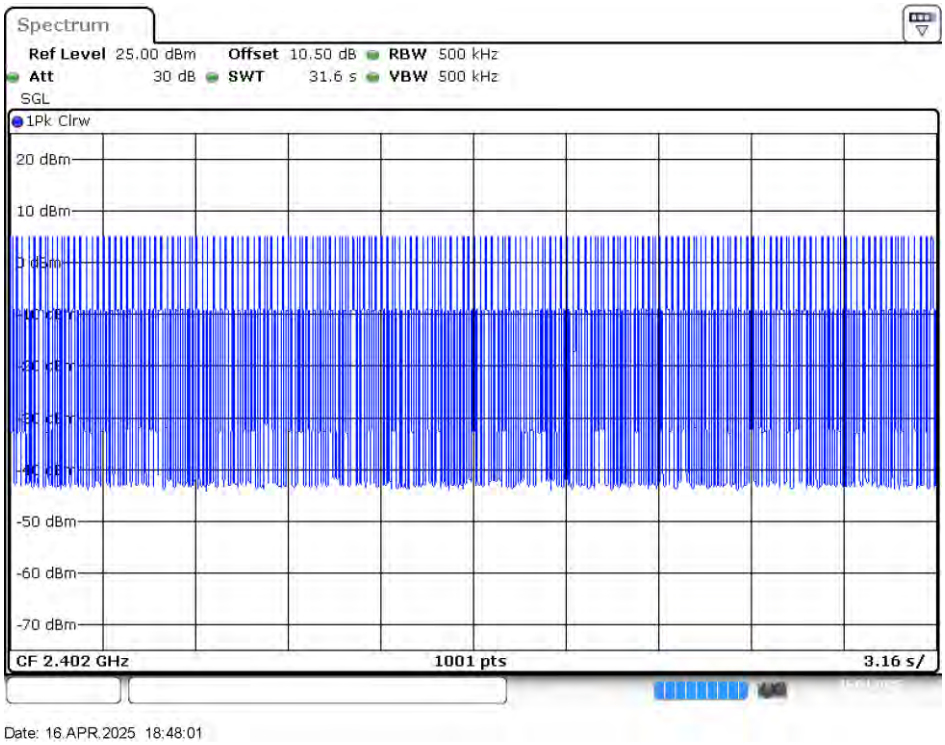
EDR Mode (π/4-DQPSK)

2DH1: Pulse Width



Date: 16.APR.2025 18:47:28

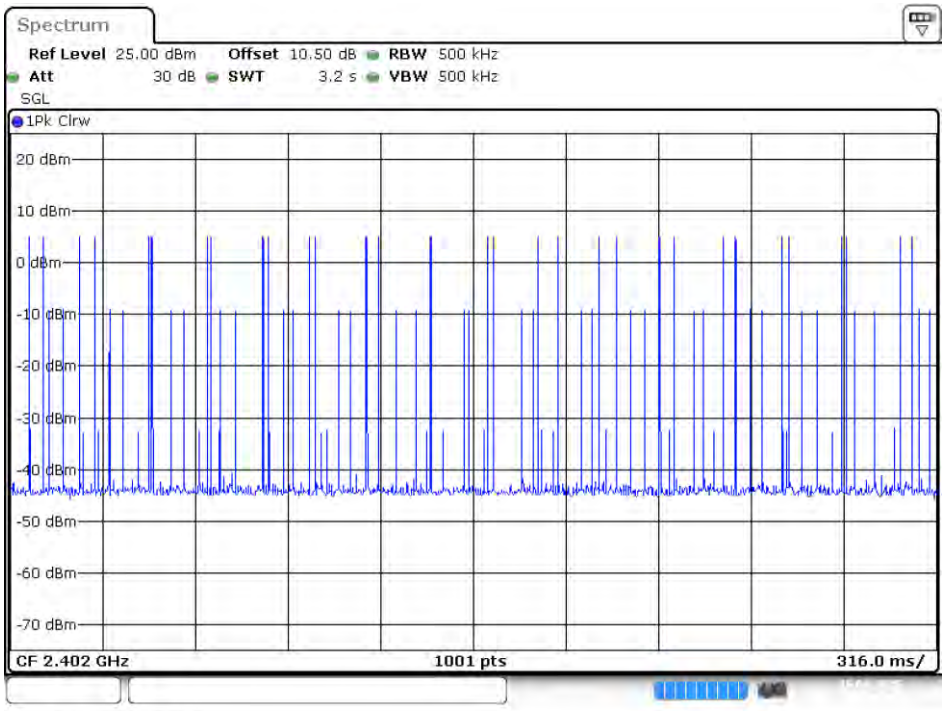
2DH1: Hopping Number



Date: 16.APR.2025 18:48:01

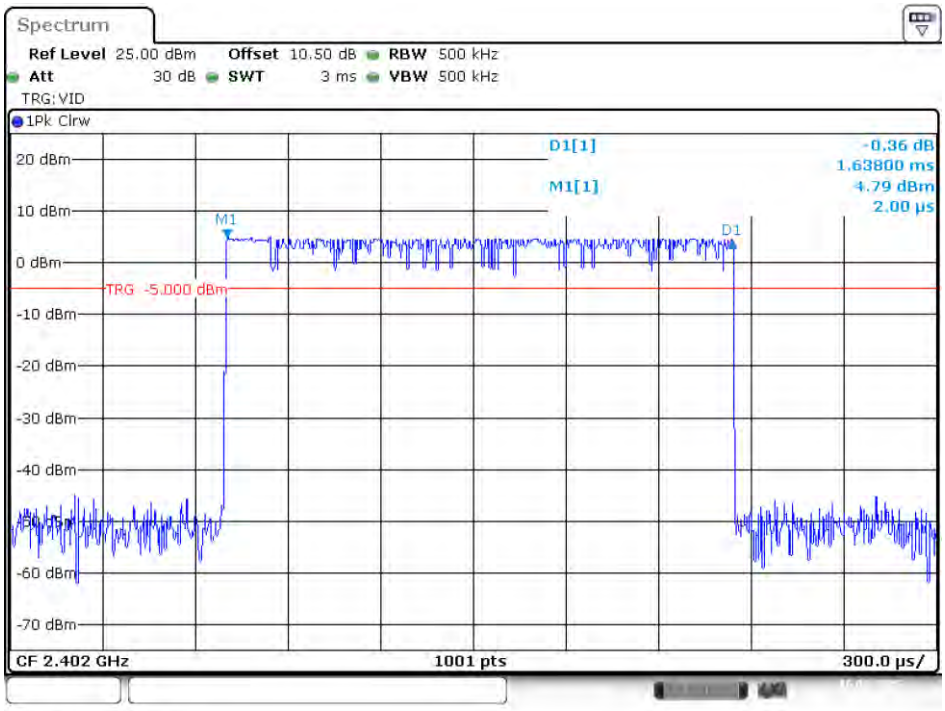
2DH1: Hopping Number /10

(Hopping Number = 31 in 1/10 period of highest signals, Second High signals were other channel)



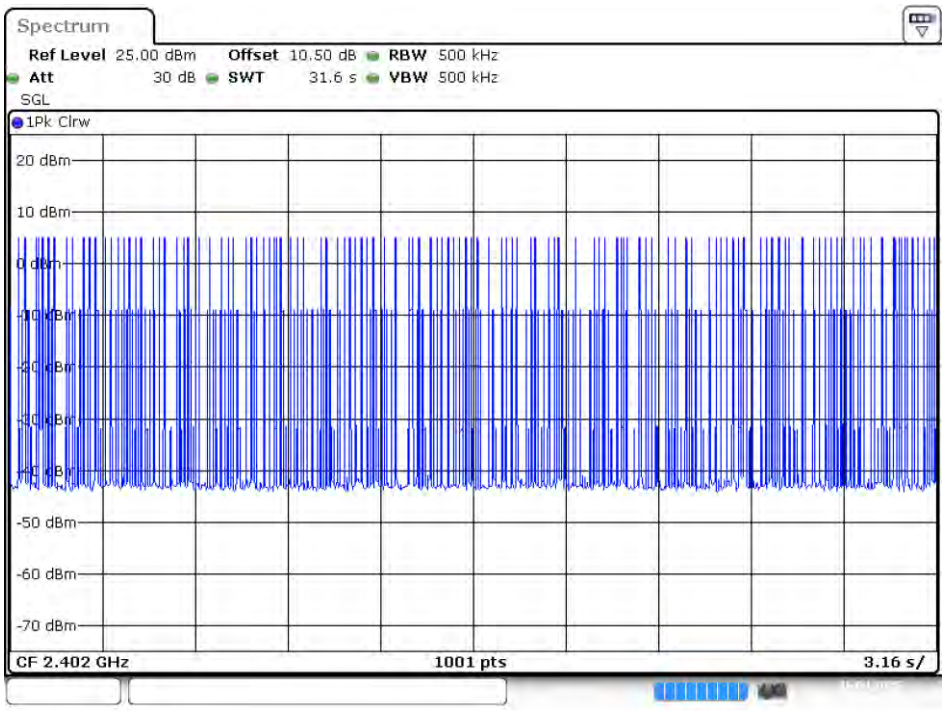
Date: 16.APR.2025 18:48:09

2DH3: Pulse Width



Date: 16.APR.2025 18:49:14

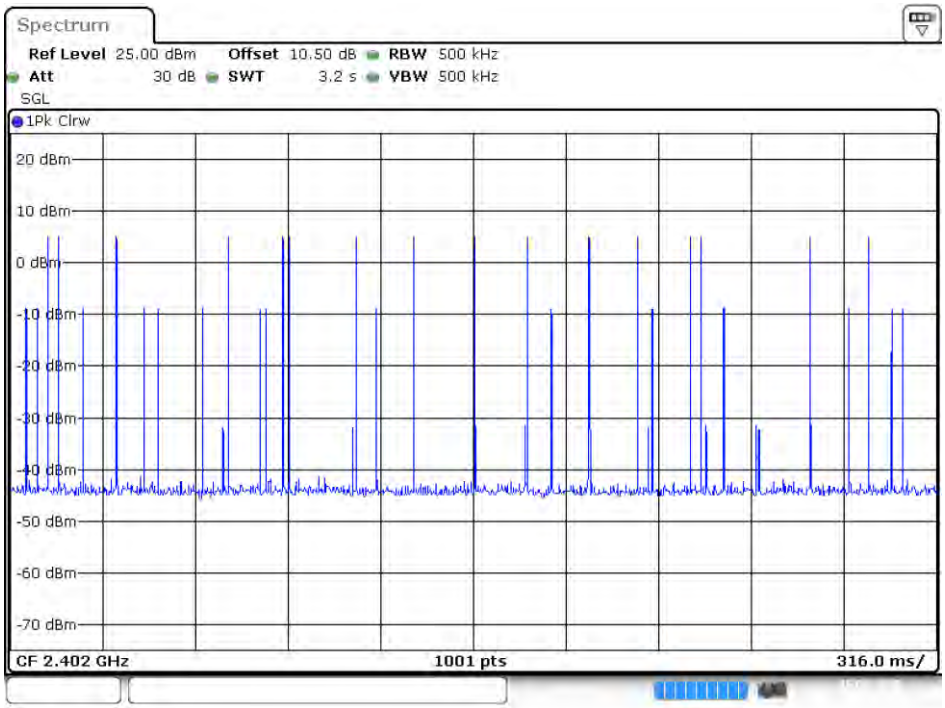
2DH3: Hopping Number



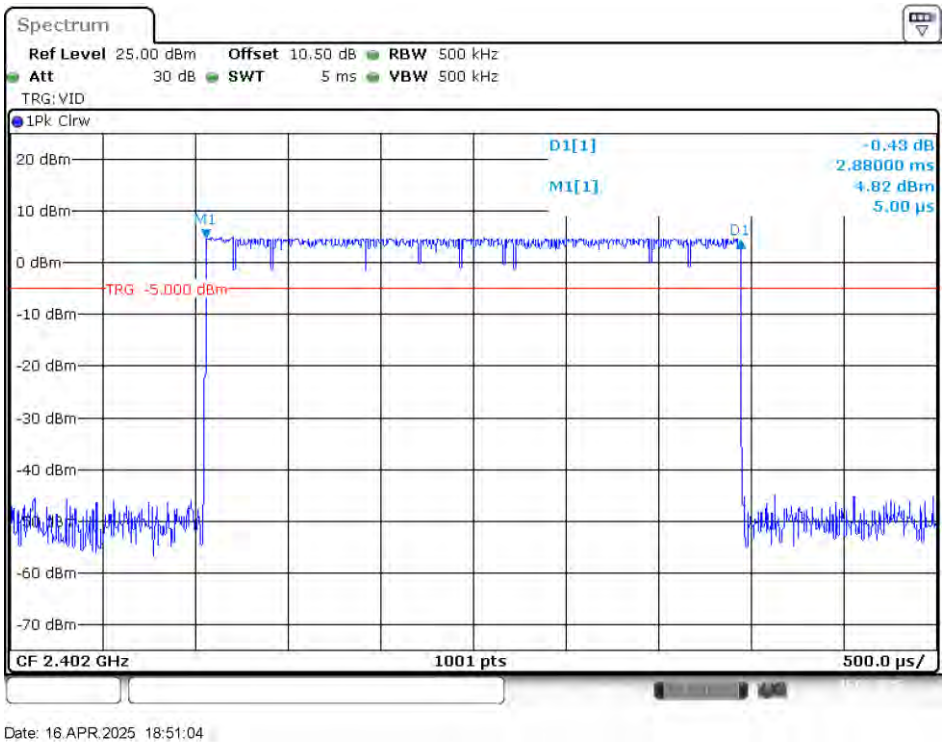
Date: 16.APR.2025 18:49:47

2DH3: Hopping Number /10

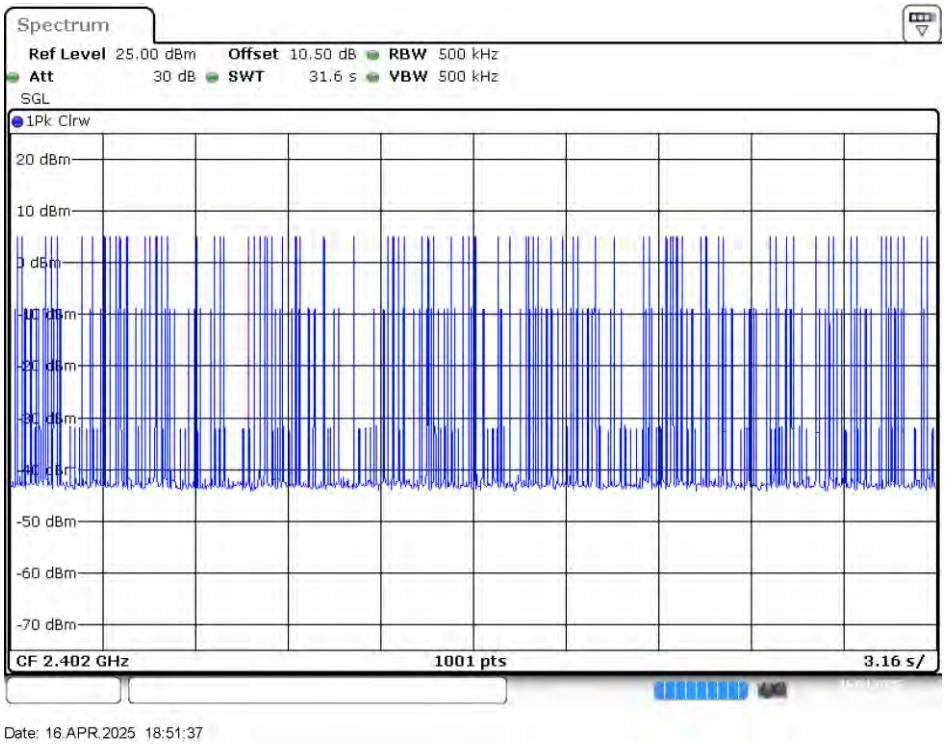
(Hopping Number = 16 in 1/10 period of highest signals, Second High signals were other channel)



2DH5: Pulse Width



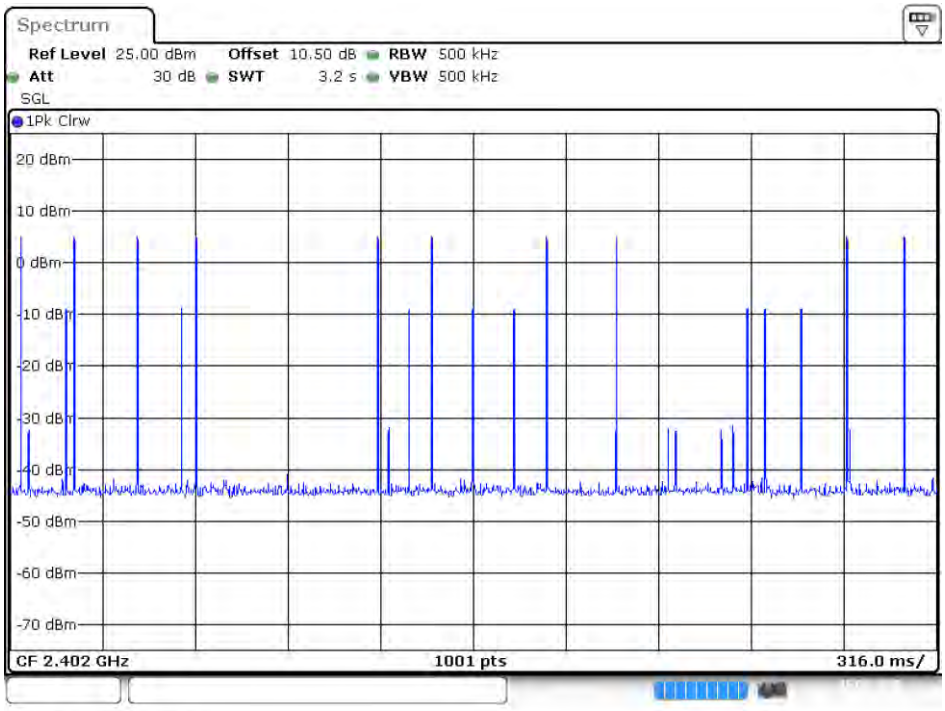
2DH5: Hopping Number



Date: 16.APR.2025 18:51:37

2DH5: Hopping Number /10

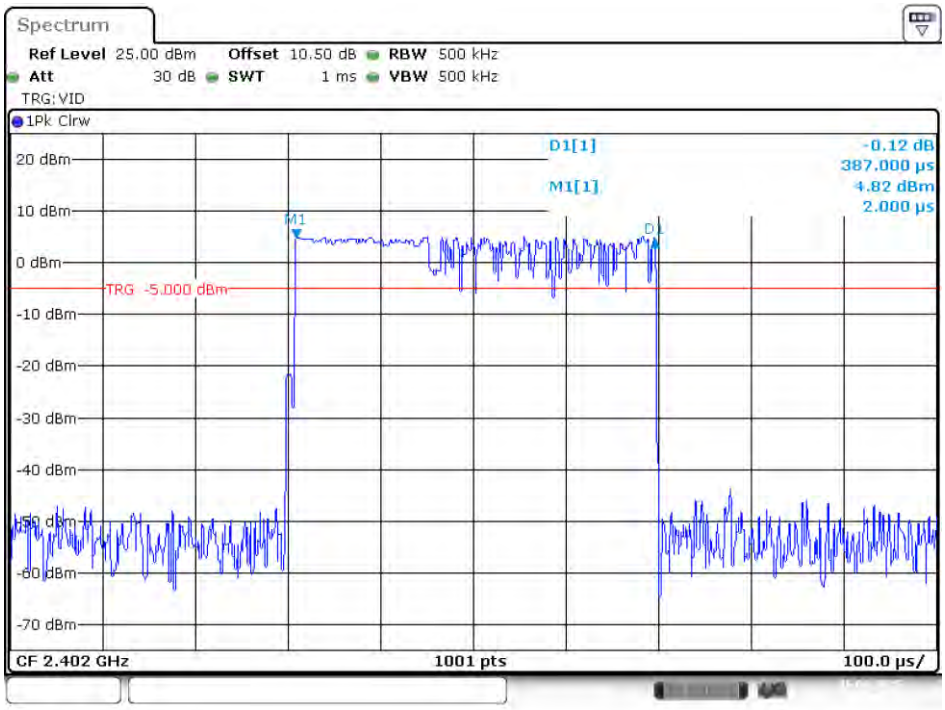
(Hopping Number = 10 in 1/10 period of highest signals, Second High signals were other channel)



Date: 16.APR.2025 18:51:52

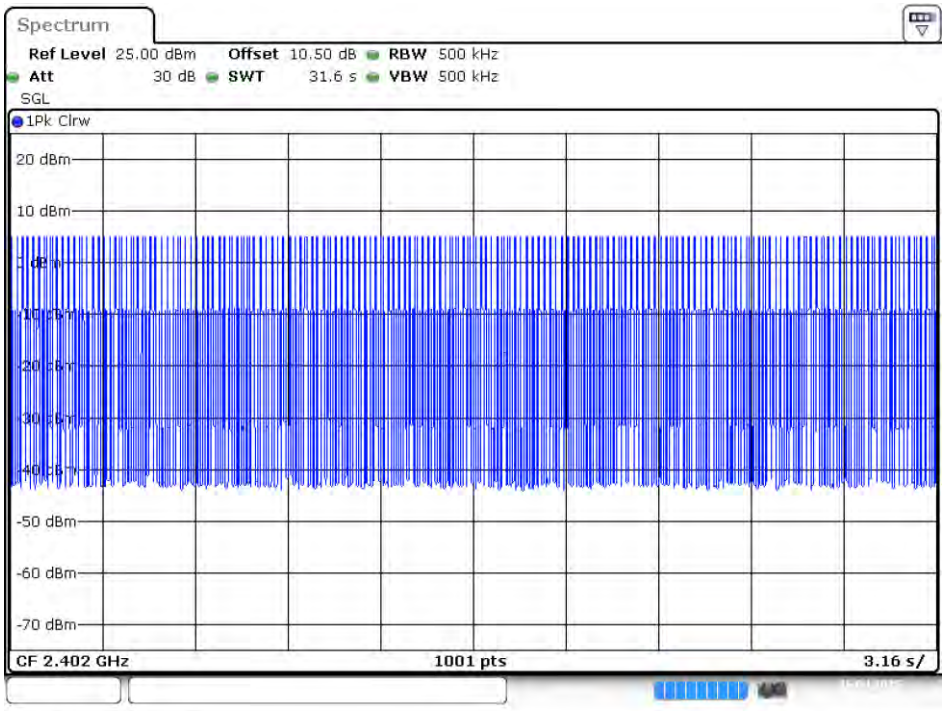
EDR Mode (8DPSK)

3DH1: Pulse Width



Date: 16.APR.2025 18:53:20

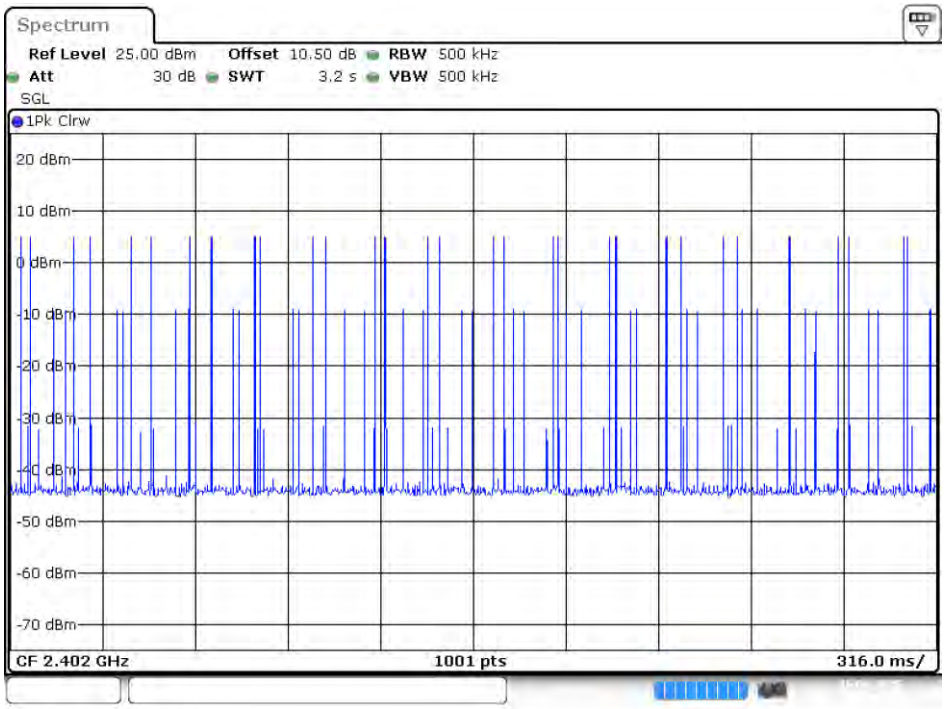
3DH1: Hopping Number



Date: 16.APR.2025 18:53:53

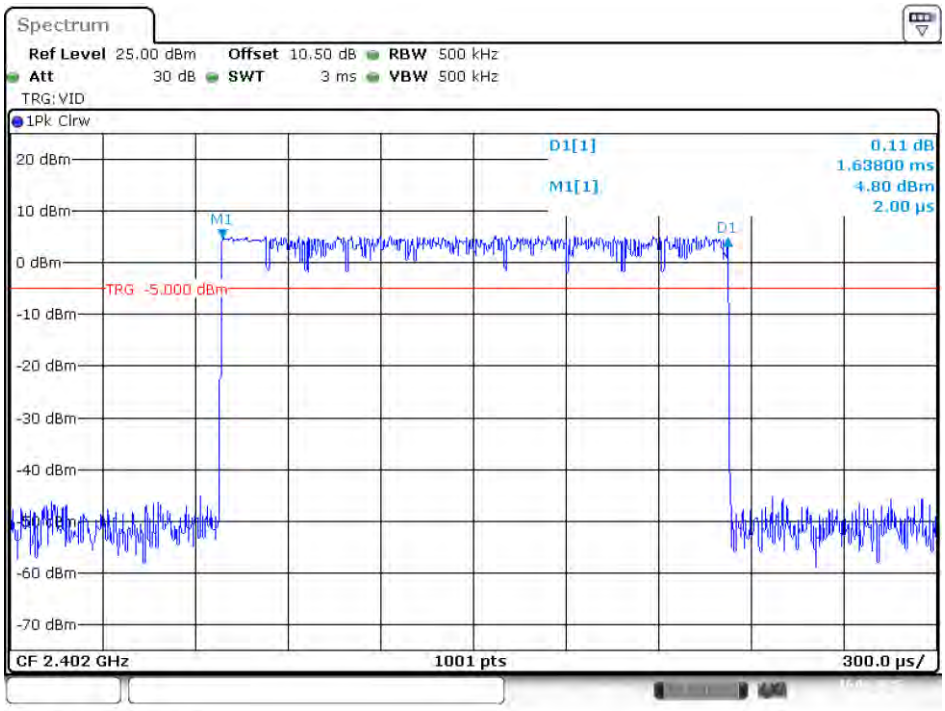
3DH1: Hopping Number /10

(Hopping Number = 31 in 1/10 period of highest signals, Second High signals were other channel)



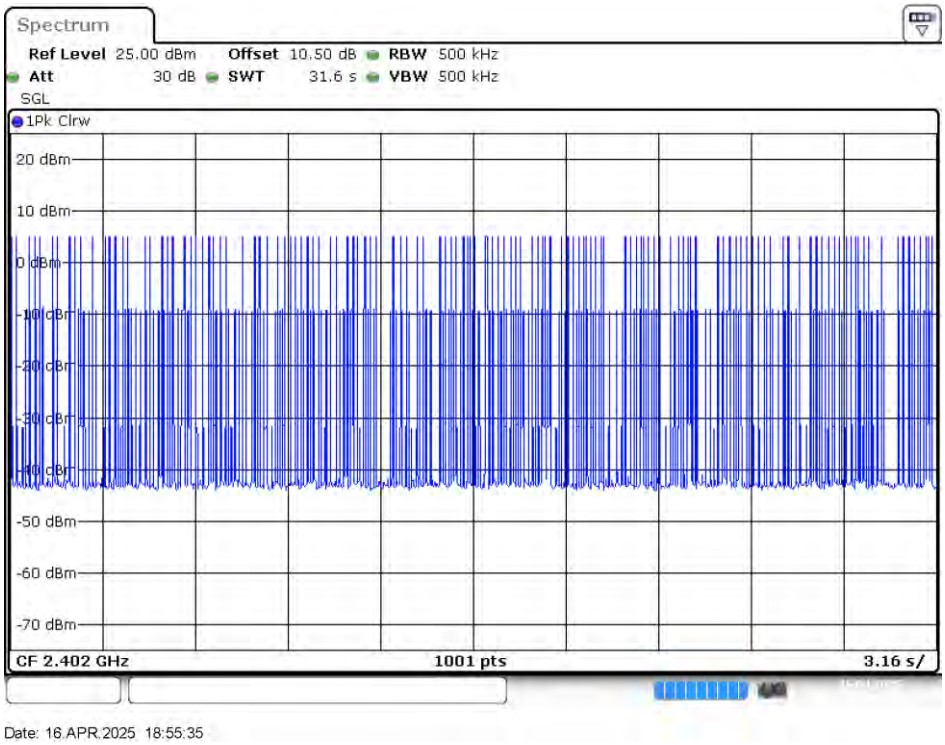
Date: 16.APR.2025 18:54:00

3DH3: Pulse Width



Date: 16.APR.2025 18:55:03

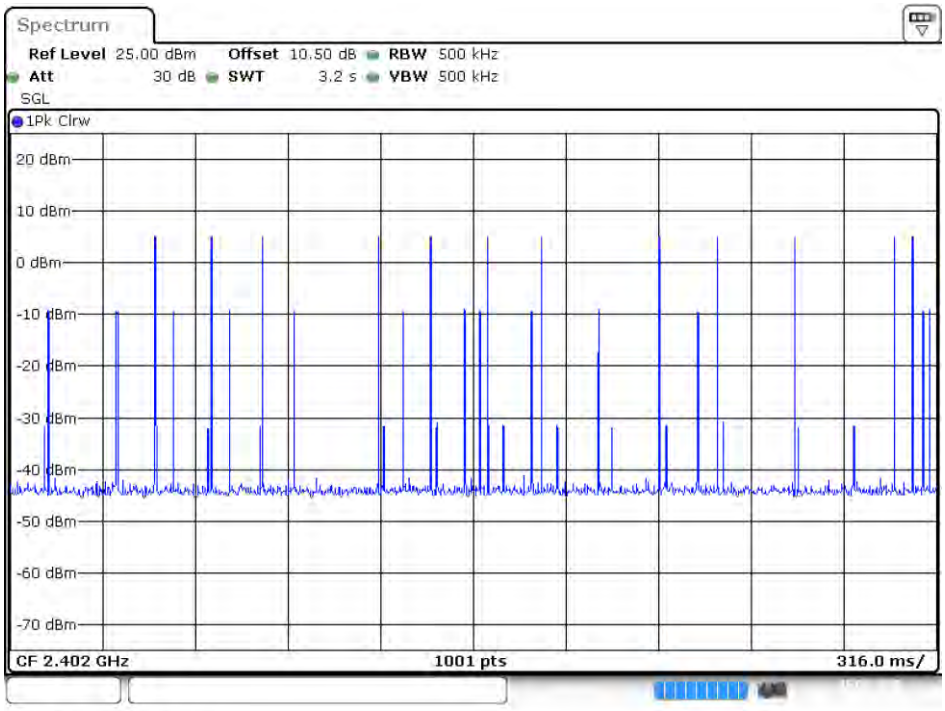
3DH3: Hopping Number



Date: 16.APR.2025 18:55:35

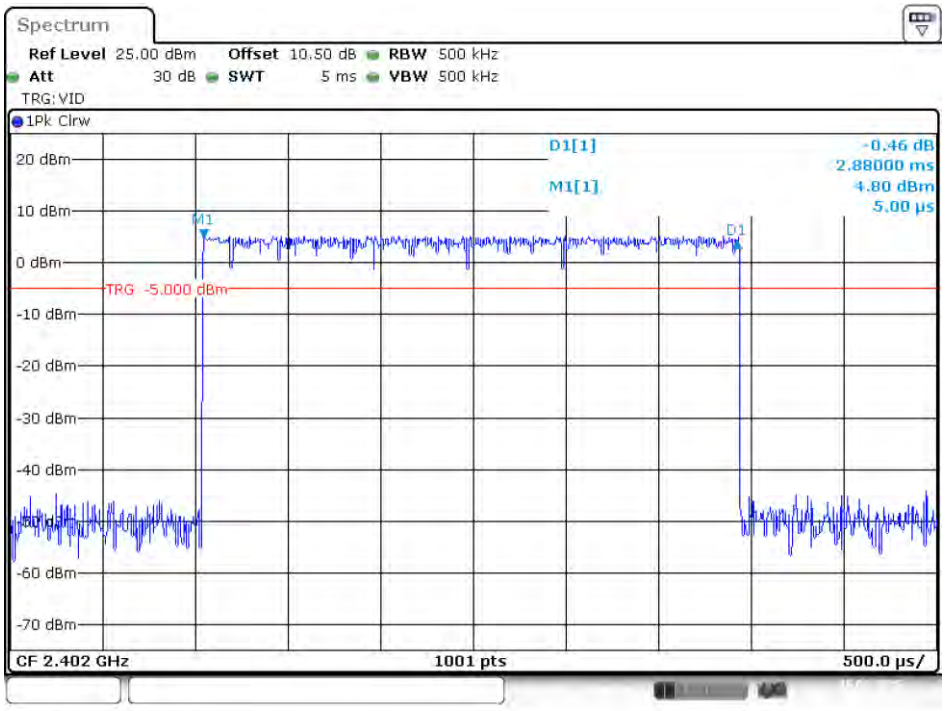
3DH3: Hopping Number /10

(Hopping Number = 12 in 1/10 period of highest signals, Second High signals were other channel)



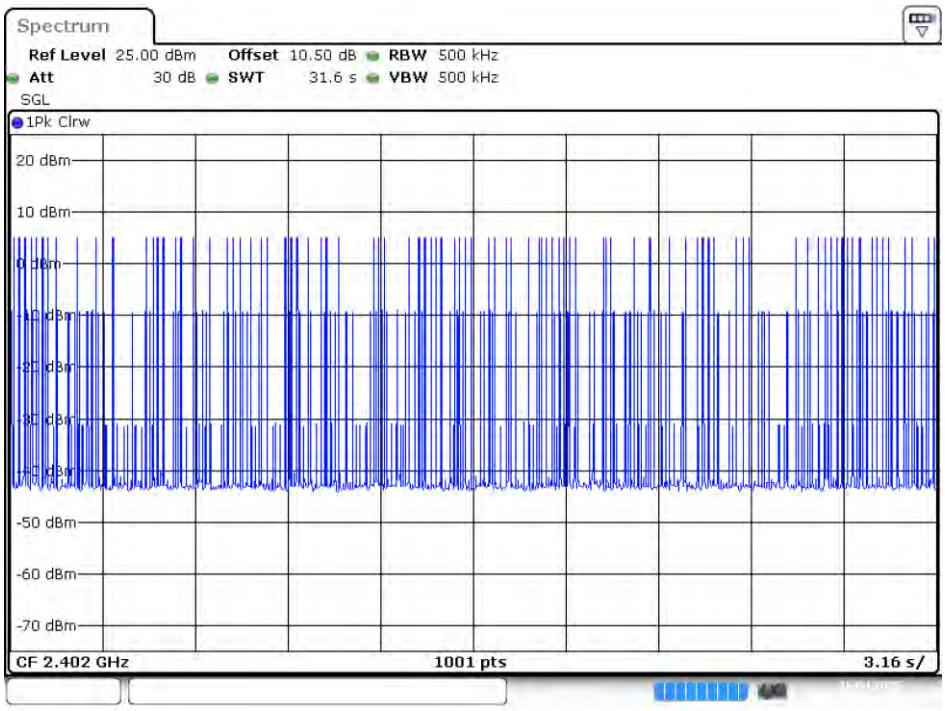
Date: 16.APR.2025 18:55:44

3DH5: Pulse Width



Date: 16.APR.2025 18:56:41

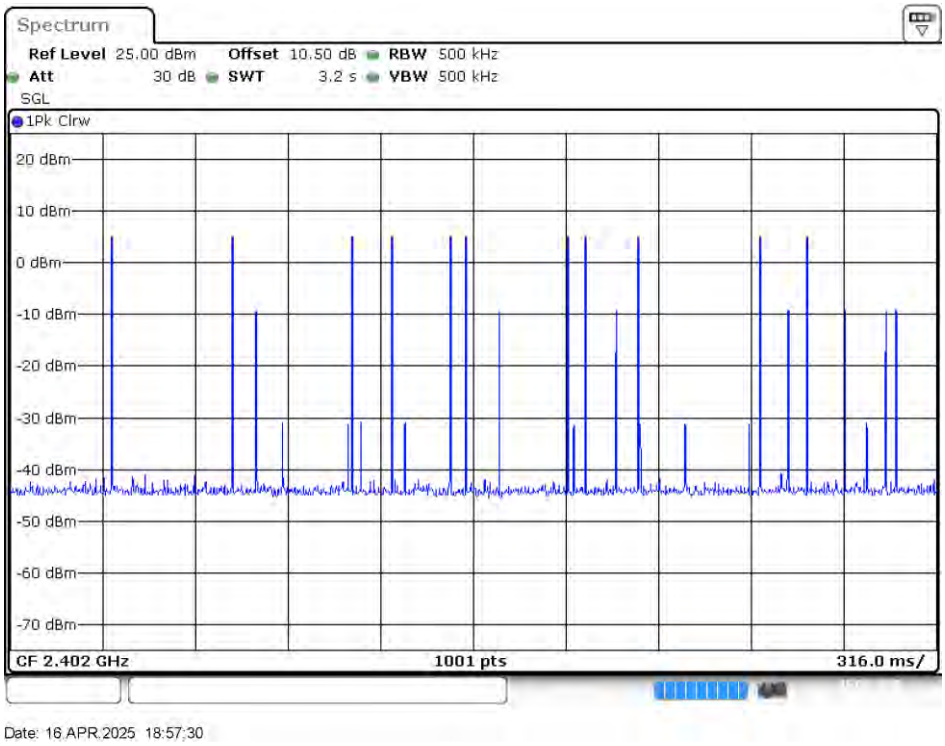
3DH5: Hopping Number



Date: 16.APR.2025 18:57:14

3DH5: Hopping Number /10

(Hopping Number = 11 in 1/10 period of highest signals, Second High signals were other channel)



11. FCC §15.247(a)(1)(iii) & RSS-247 §5.1(d) – Quantity of hopping channel Test

11.1. Applicable Standard

According to FCC §15.247(a) (1) (iii).

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.

According to RSS-247 §5.1(d).

FHSs operating in the band 2400-2483.5 MHz shall use at least 15 hopping 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. Transmissions on particular hopping frequencies may be avoided or suppressed provided that at least 15 hopping channels are used.

11.2. Test Procedure

According to ANSI C63.10-2013, section 7.8.3

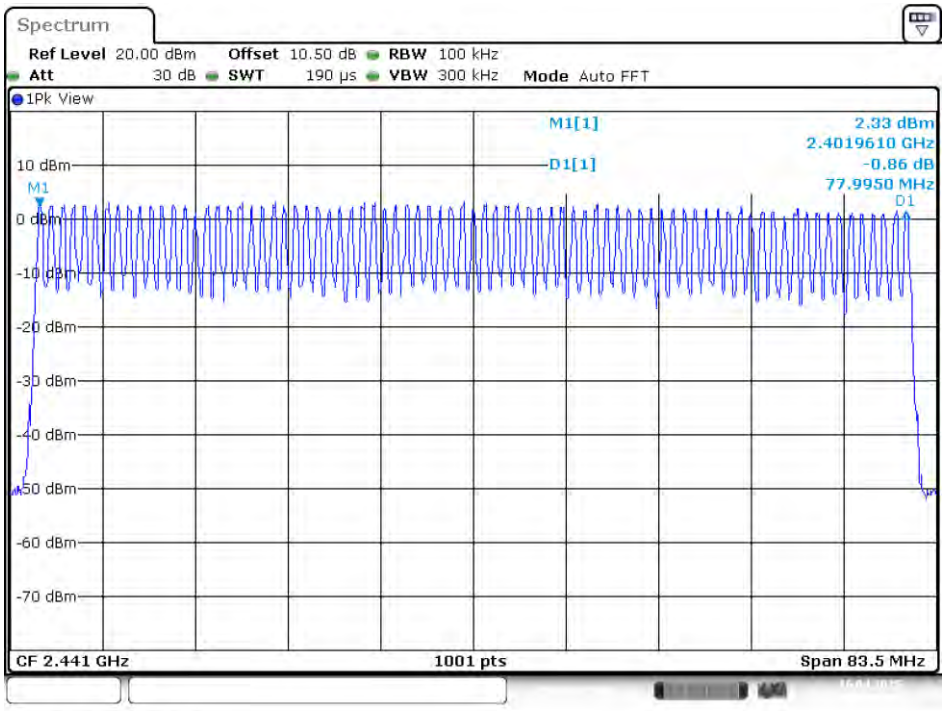
1. The EUT shall have its hopping function enabled.
2. Set the EUT in hopping mode from first channel to last.
3. By using the Max-Hold function record the Quantity of the channel.

11.3. Test Results

Mode	Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)	Result
GFSK	2402-2480	79	>15	Compliance
π/4-DQPSK	2402-2480	79	>15	Compliance
8DPSK	2402-2480	79	>15	Compliance

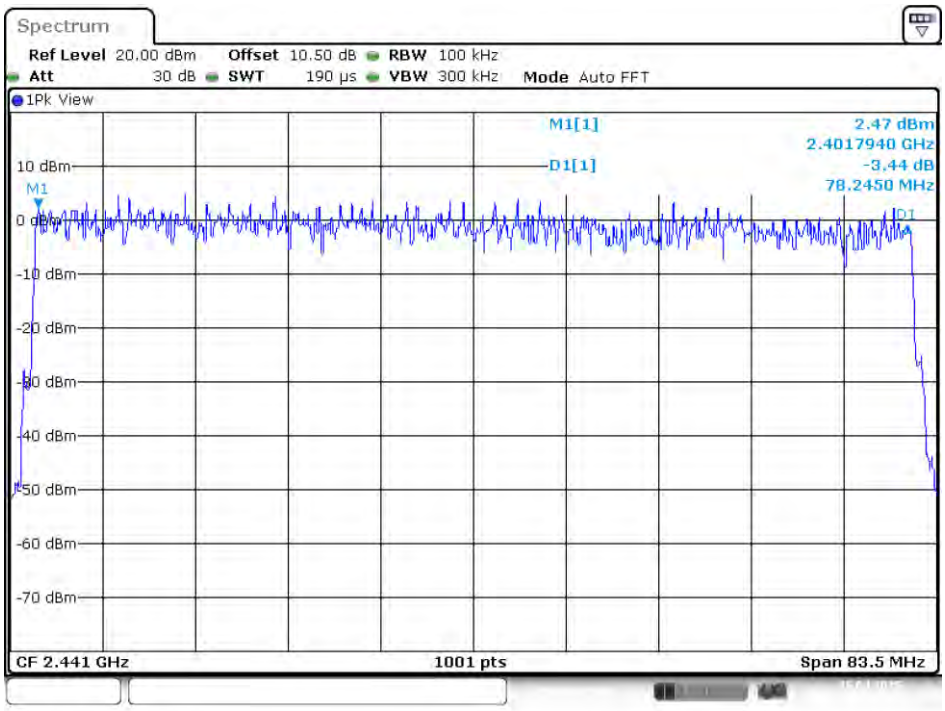
Please refer to the following plots

BR Mode (GFSK)



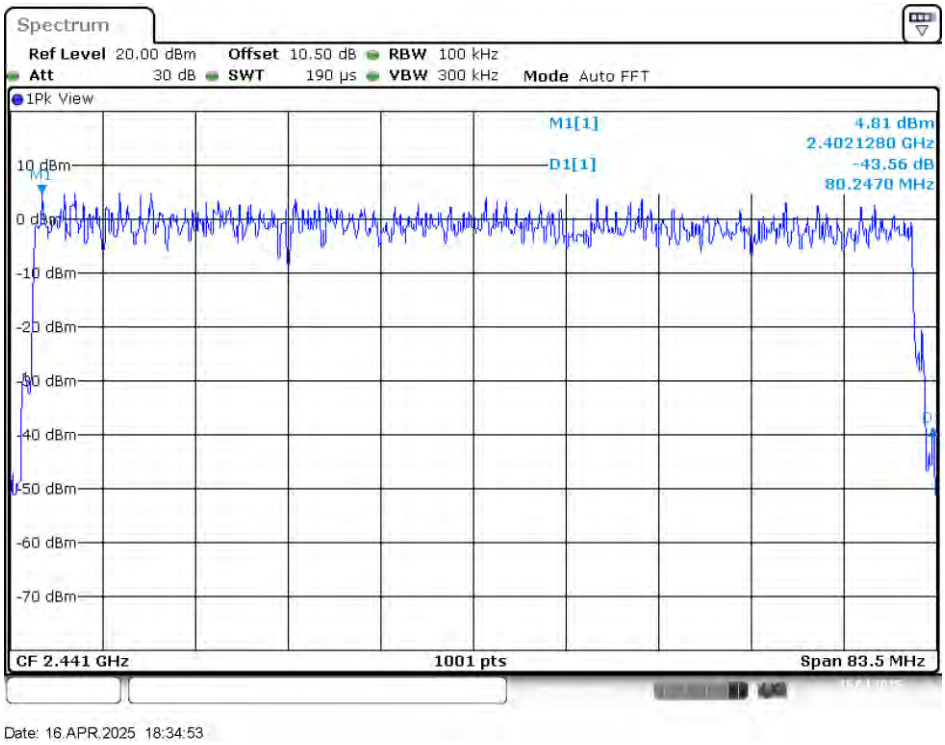
Date: 16.APR.2025 18:29:00

EDR Mode (π/4-DQPSK)



Date: 16.APR.2025 18:32:08

EDR Mode (8DPSK)



12. FCC §15.247(b)(1) & RSS-247 §5.4 (b)– Maximum Output Power

12.1. Applicable Standard

According to FCC §15.247(b) (1).

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.

According to RSS-247 §5.4(b).

For FHSs operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W if the hopset uses less than 75 hopping channels. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).

12.2. Test Procedure

According to ANSI C63.10-2013, section 7.8.5

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to measuring equipment.

12.3. Test Results

Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)	Limit (dBm)	Antenna Gain (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)
BR Mode (GFSK)						
Low	2402	3.82	21	4.1	7.92	36
Middle	2441	3.76	21	4.1	7.86	36
High	2480	2.32	21	4.1	6.42	36
EDR Mode (π/4-DQPSK)						
Low	2402	7.01	21	4.1	11.11	36
Middle	2441	6.17	21	4.1	10.27	36
High	2480	4.93	21	4.1	9.03	36
EDR Mode (8DPSK)						
Low	2402	7.04	21	4.1	11.14	36
Middle	2441	6.23	21	4.1	10.33	36
High	2480	4.99	21	4.1	9.09	36

13. FCC §15.247(d) & RSS-247 §5.5– 100 kHz Bandwidth of Frequency Band Edge

13.1. Applicable Standard

According to FCC §15.247(d)

For FCC §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum 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. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emissions limits specified in §15.209(a) see §15.205(c).

According to RSS-247 §5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

13.2. Test Procedure

According to ANSI C63.10-2013, section 7.8.6

Band-edge measurements shall be tested both on single channels, and with the EUT hopping.

a) Set the center frequency and span to encompass frequency range to be measured.

b) Set the RBW = 100 kHz.

c) Set the VBW ≥ [3 × RBW].

d) Detector = peak.

e) Sweep time = auto couple.

f) Trace mode = max hold.

g) Allow trace to fully stabilize.

h) Use the peak marker function to determine the maximum amplitude level.

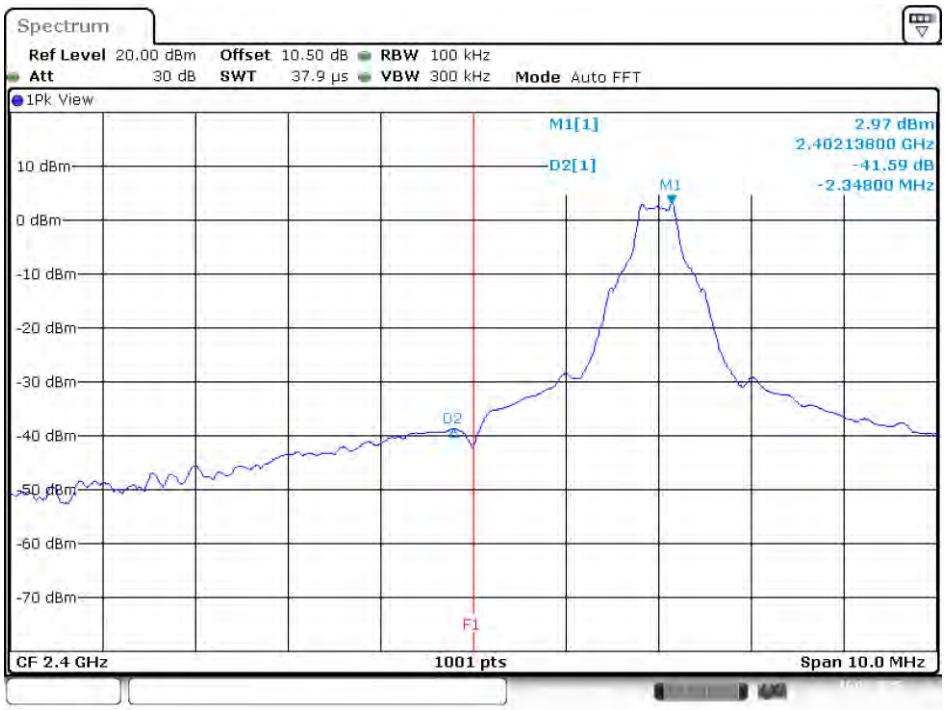
13.3. Test Results

Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
BR Mode (GFSK)				
Low	2402	41.59	≥ 20	PASS
High	2480	44.25	≥ 20	PASS
BR Hopping Mode (GFSK)				
Low	2402-2480	52.05	≥ 20	PASS
High	2402-2480	49.14	≥ 20	PASS
EDR Mode (π/4-DQPSK)				
Low	2402	41.24	≥ 20	PASS
High	2480	46.16	≥ 20	PASS
EDR Hopping Mode (π/4-DQPSK)				
Low	2402-2480	51.08	≥ 20	PASS
High	2402-2480	48.84	≥ 20	PASS
EDR Mode (8DPSK)				
Low	2402	39.84	≥ 20	PASS
High	2480	43.64	≥ 20	PASS
EDR Hopping Mode (8DPSK)				
Low	2402-2480	50.51	≥ 20	PASS
High	2402-2480	51.19	≥ 20	PASS

Please refer to the following plots.

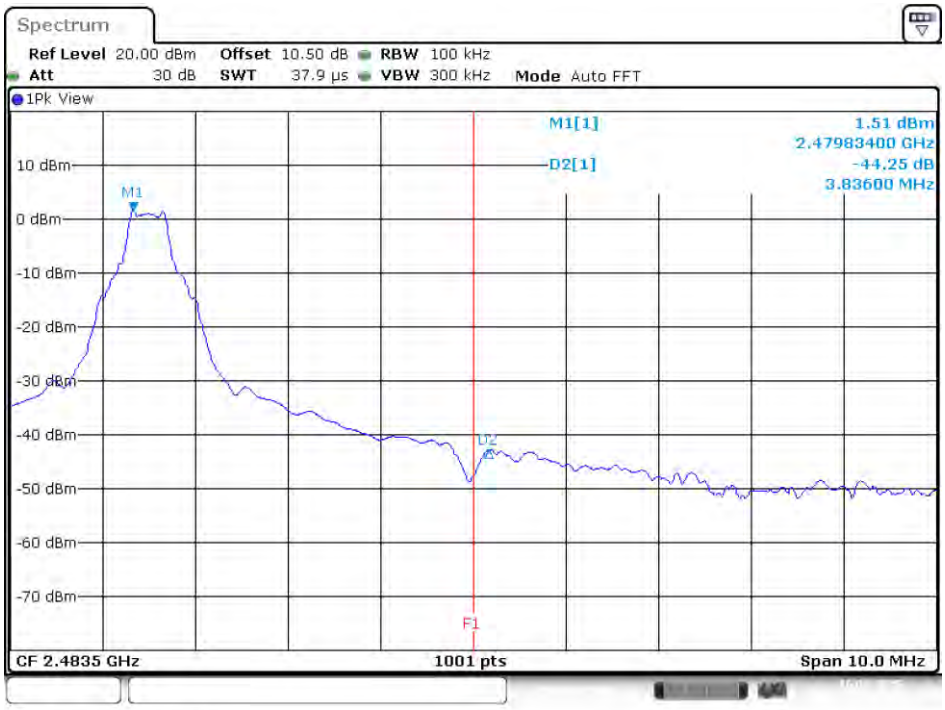
BR Mode (GFSK)

Band Edge, CH Low



Date: 16.APR.2025 17:02:05

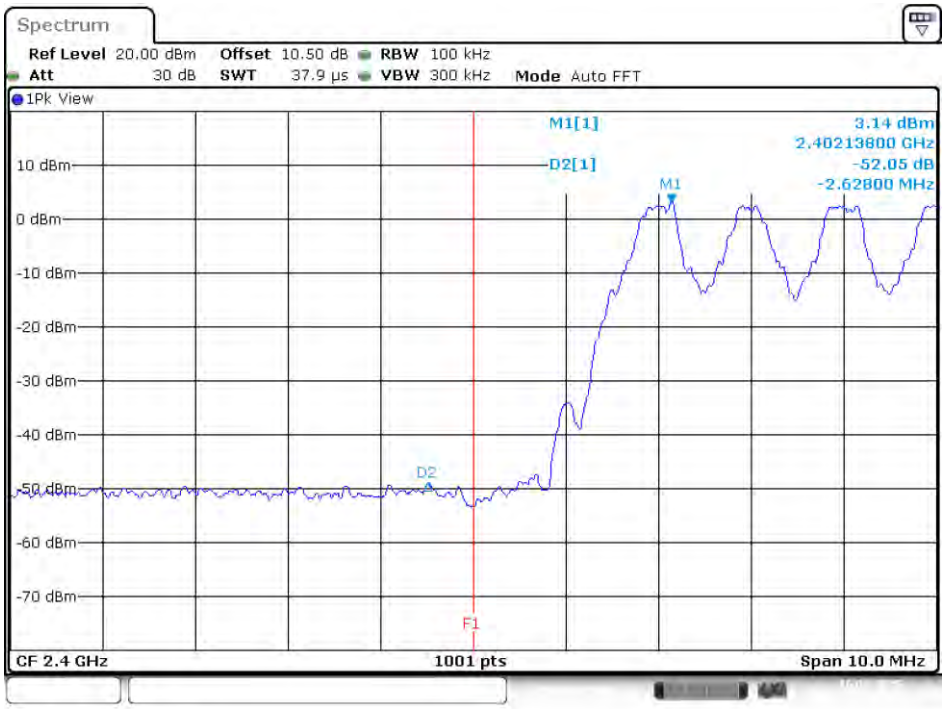
Band Edge, CH High



Date: 16.APR.2025 17:07:12

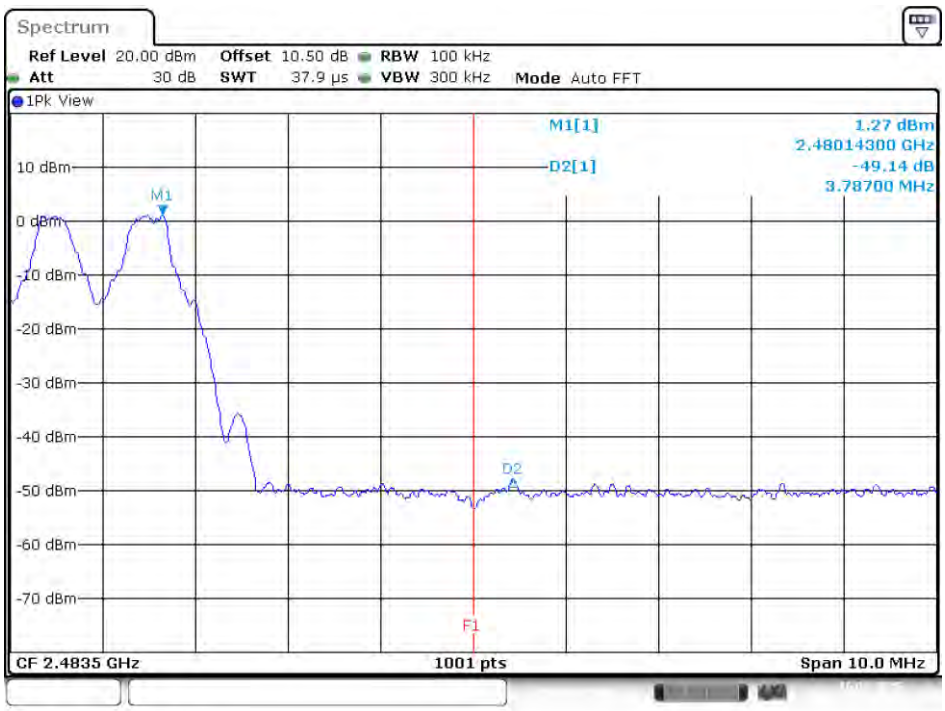
BR Hopping Mode (GFSK)

Band Edge, CH Low



Date: 16.APR.2025 18:26:51

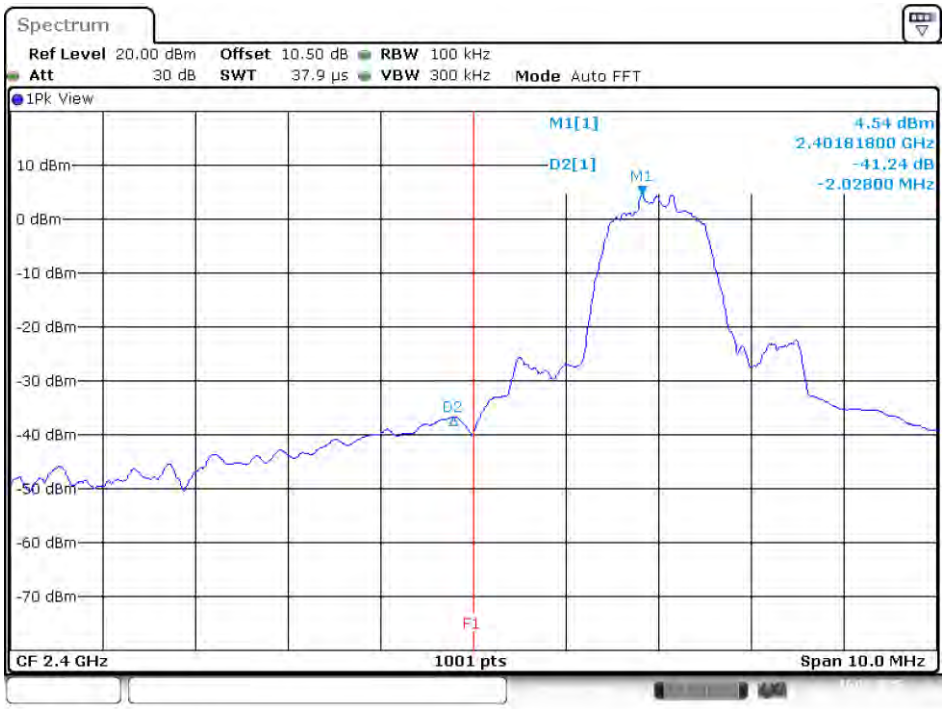
Band Edge, CH High



Date: 16.APR.2025 18:27:16

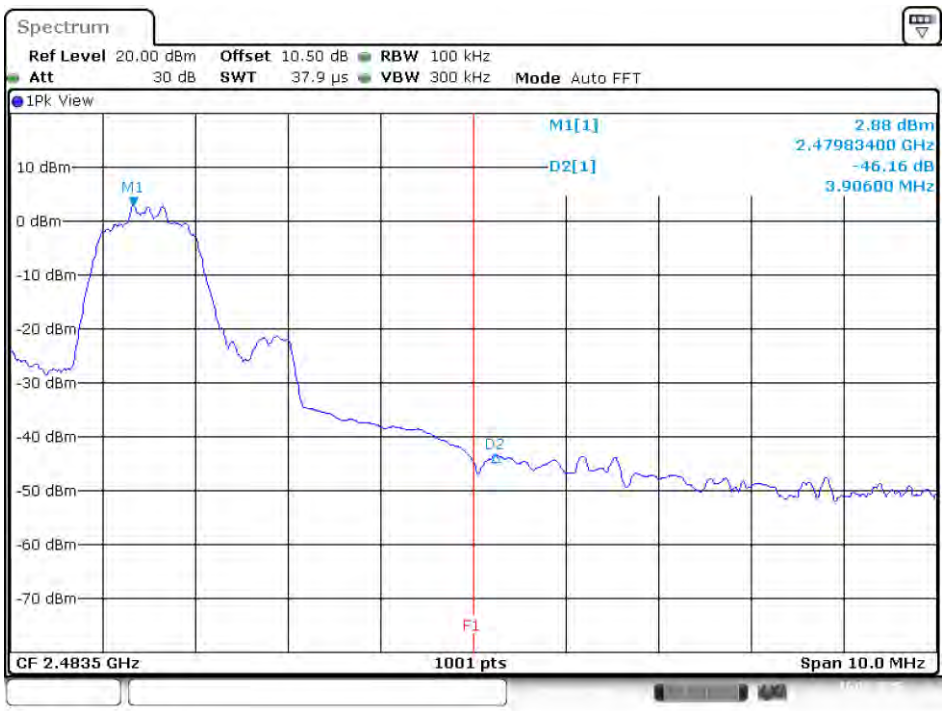
EDR Mode (π/4-DQPSK)

Band Edge, CH Low



Date: 16.APR.2025 17:10:12

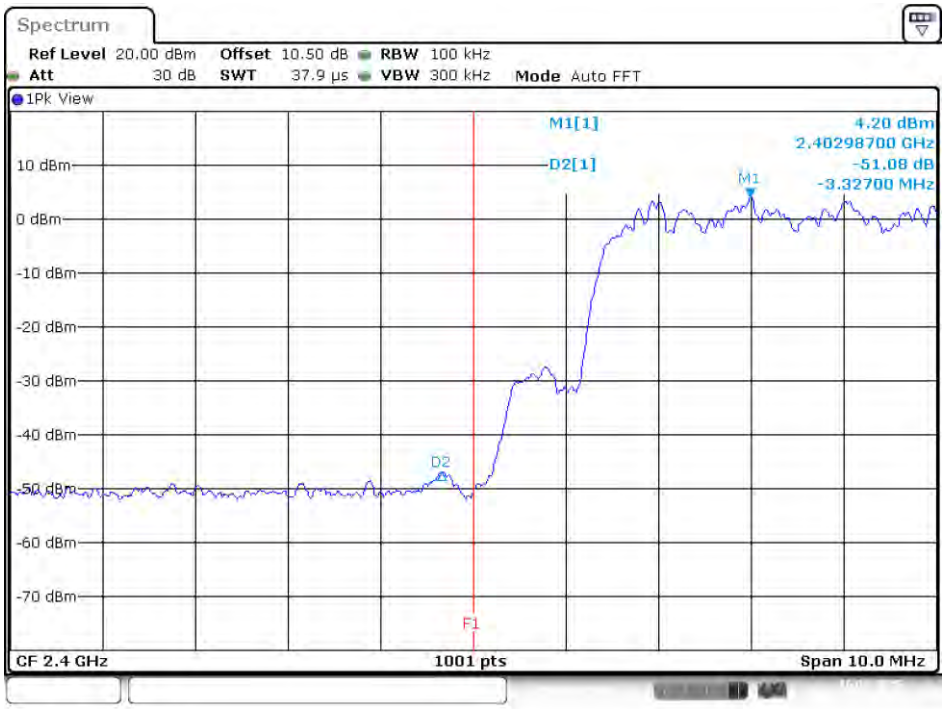
Band Edge, CH High



Date: 16.APR.2025 17:15:24

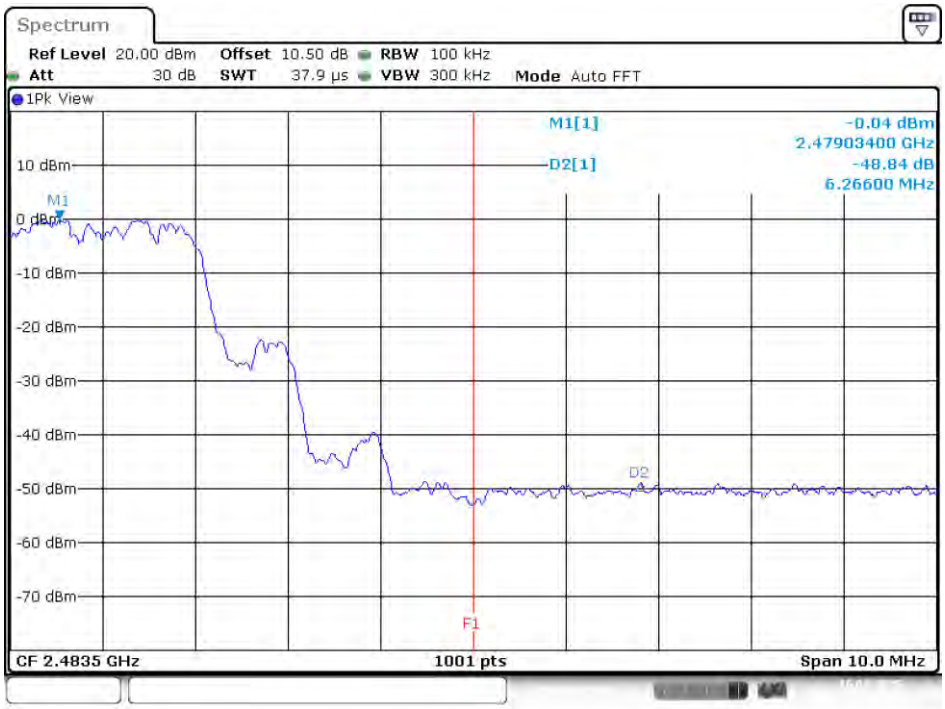
EDR Hopping Mode (π/4-DQPSK)

Band Edge, CH Low



Date: 16.APR.2025 18:30:28

Band Edge, CH High



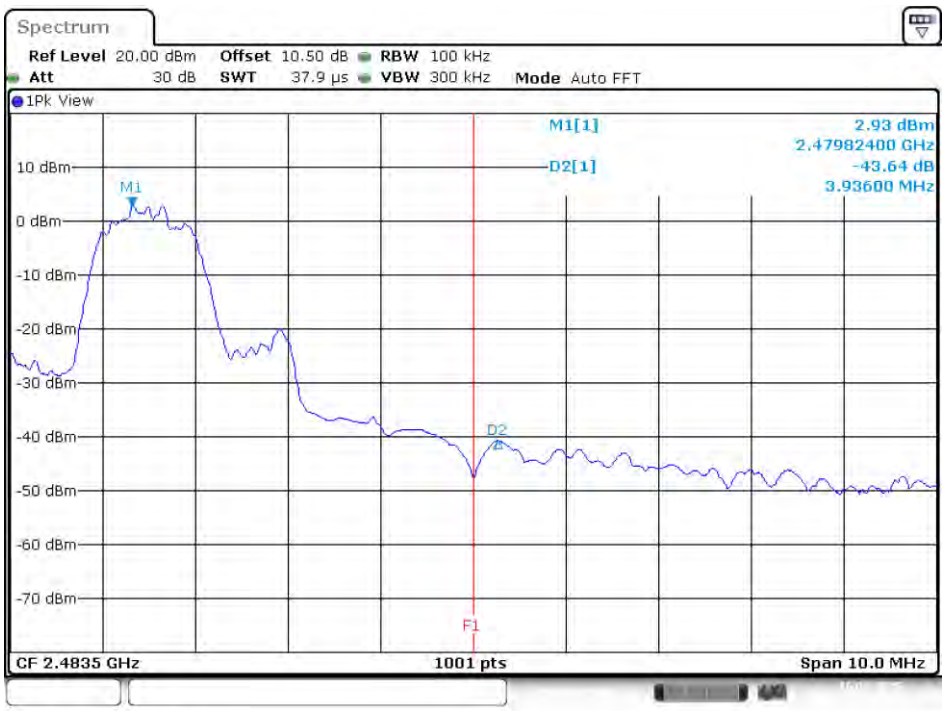
Date: 16.APR.2025 18:30:48

EDR Mode (8DPSK)

Band Edge, CH Low

Date: 16.APR.2025 17:19:06

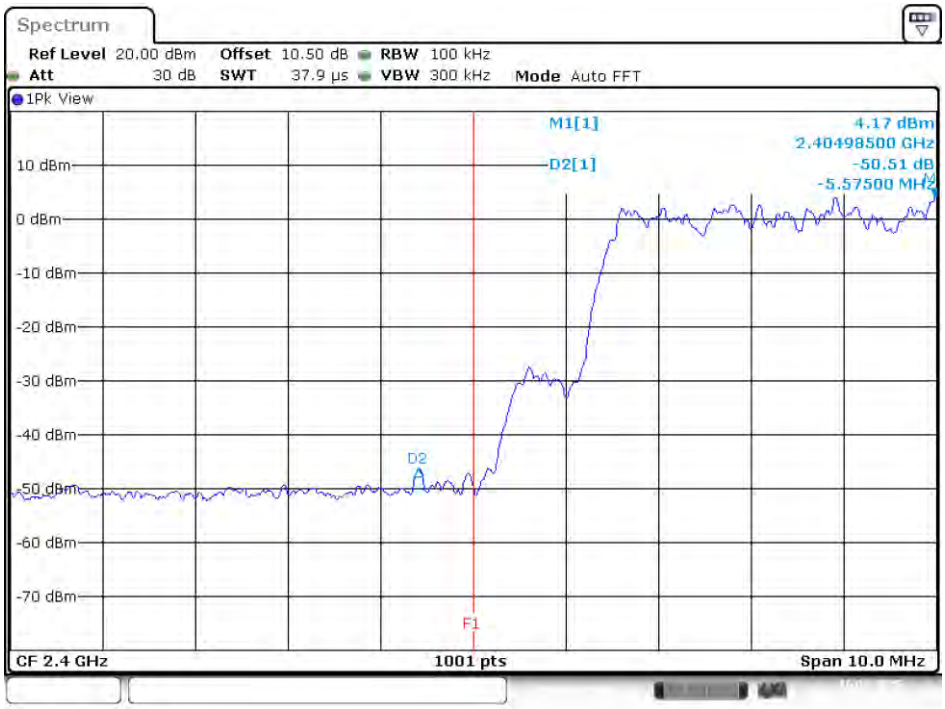
Band Edge, CH High



Date: 16.APR.2025 17:23:14

EDR Hopping Mode (8DPSK)

Band Edge, CH Low



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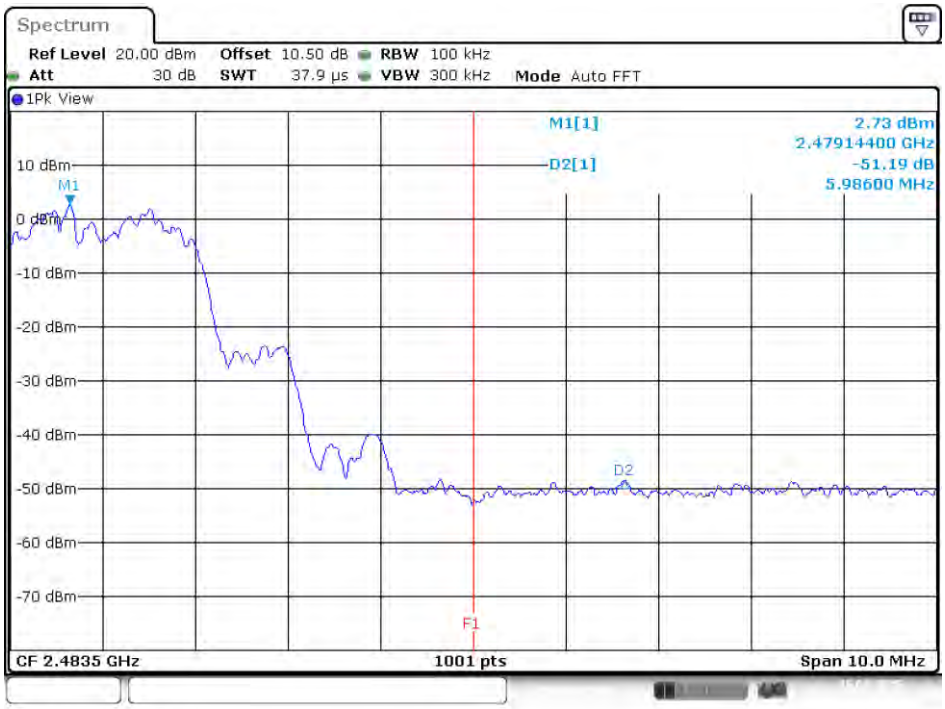
Band Edge, CH High



Date: 16.APR.2025 18:33:27

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