TEST REPORT

Applicant Name :	TECNO MOBILE LIMITED
Address :	FLAT 39 8/F BLOCK D WAH LOK INDUSTRIAL CENTRE 31-35 SHAN MEI STREET FOTAN NT Hong Kong
Report Number :	SZNS220126-03832E-RF-00A
FCC ID:	2ADYY-CI6N

Test Standard (s)

FCC PART 15.247

Sample Description

Product Type:	Mobile Phone
Model No.:	CI6n
Multiple Model(s) No.:	N/A
Trade Mark:	TECNO
Date Received:	2022/01/26
Date of Test:	2022/02/22~2022/03/29
Report Date:	2022/03/29

Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By: **Approved By:**

Black Ding   *Robert Li*

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Black Ding   Robert Li
EMC Engineer   EMC Engineer

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Frequency Range	Bluetooth: 2402~2480MHz
Maximum conducted Peak output power	Bluetooth: 6.22dBm
Modulation Technique	Bluetooth: GFSK, π/4-DQPSK, 8DPSK
Antenna Specification*	1.2dBi (provided by the applicant)
Voltage Range	DC 3.87V from battery or DC 5V or 7.5Vfrom adapter
Sample serial number	SZNS220126-03832E-RF-S1 for RF Conducted Test SZNS220126-03832E-RF-S2 for Conducted and Radiated Emissions (Assigned by ATC)
Sample/EUT Status	Good condition
Adapter information	Model: U180TSA Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 5.0V, 2.4A or DC7.5V,2.4A 18W Max

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

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.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
AC Line Conducted emission		2.72dB
Emissions, Radiated	30MHz - 1GHz	4.28dB
	1GHz - 18GHz	4.98dB
	18GHz - 26.5GHz	5.06dB
Temperature		1℃
Humidity		6%
Supply voltages		0.4%

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.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

Listed by Innovation, Science and Economic Development Canada (ISEDC), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode.

EUT Exercise Software

EUT was test in engineering mode and the power level is default*, which provided by the applicant.

EUT have two antennas, the two antennas have same power level setting, and the two antennas cannot transmit at same time.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

Cable Description	Length (m)	From Port	To
Un-shielding Detachable USB Cable	1.0	EUT	Adapter

Block Diagram of Test Setup

For conducted emission:

Adapter

LISN

EUT

10cm

Receptacle

1.0 Meter

Earphone

Non-Conductive Table
80 cm above Ground Plane

1.5 Meters

For radiated emission:

AC Mains

Adapter

EUT

10cm

Receptacle

1.0 Meter

Earphone

Non-Conductive Table
80/150 cm above Ground Plane

1.5 Meters
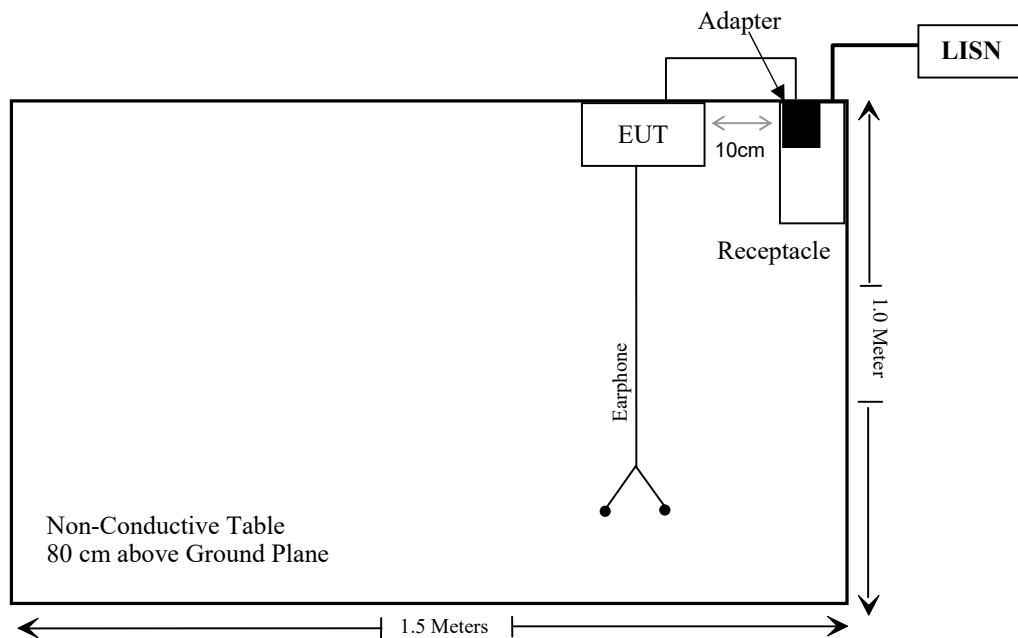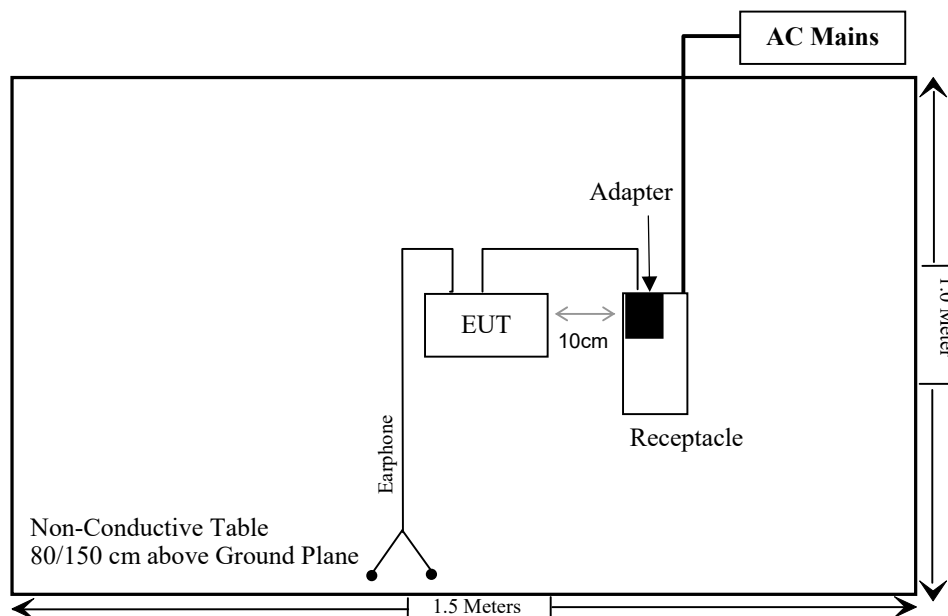
SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b) (1) & §2.1093	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.207(a)	AC Line Conducted Emissions	Compliant
§15.205, §15.209 & §15.247(d)	Radiated Emissions	Compliant
§15.247(a)(1)	20 dB Emission Bandwidth & 99% Occupied Bandwidth	Compliant
§15.247(a)(1)	Channel Separation Test	Compliant
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliant
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant
§15.247(b)(1)	Peak Output Power Measurement	Compliant
§15.247(d)	Band edges	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emission test					
Rohde& Schwarz	EMI Test Receiver	ESCI	100784	2021/12/13	2022/12/12
Rohde & Schwarz	L.I.S.N.	ENV216	101314	2021/12/13	2022/12/12
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2021/12/13	2022/12/12
Unknown	RF Coaxial Cable	No.17	N0350	2021/12/14	2022/12/13
Conducted Emission Test Software: e3 19821b (V9)					
Radiated emission test					
Rohde& Schwarz	Test Receiver	ESR	102725	2021/12/13	2022/12/12
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2021/12/13	2022/12/12
SONOMA INSTRUMENT	Amplifier	310 N	186131	2021/11/09	2022/11/08
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2021/11/09	2022/11/08
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2021/11/11	2022/11/10
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2020/01/05	2023/01/04
Radiated Emission Test Software: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.10	N050	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.11	N1000	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.12	N040	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.13	N300	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.14	N800	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.15	N600	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.16	N650	2021/12/14	2022/12/13
Wainwright	High Pass Filter	WHKX3.6/18 G-10SS	5	2021/12/14	2022/12/13
RF conducted test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2021/12/13	2022/12/12
WEINSCHEL	10dB Attenuator	5324	AU 3842	2021/12/14	2022/12/13
Unknown	RF Cable	Unknown	Unknown	Each time	Each time

* Statement of Traceability: Shenzhen Accurate Technology Co., Ltd. attests that all calibrations hAve.e been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC§15.247 (i), §1.1307 (b) (1) & §2.1093 – RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 General RF Exposure Guidance

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] ·
[$\sqrt{f(GHz)}$] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where
1. f(GHz) is the RF channel transmit frequency in GHz.
2. Power and distance are rounded to the nearest mW and mm before calculation.
3. The result is rounded to one decimal place for comparison.
4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.

Measurement Result

For worst case:

Mode	Frequency (MHz)	Max tune-up conducted power (dBm)	Max tune-up conducted power (mW)	Distance (mm)	Calculated value	Threshold (1-g SAR)	SAR Test Exclusion
BT	2402-2480	6.5	4.47	5	1.4	3.0	Yes

Result: Compliant.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has two internal antennas, which was permanently attached, and the maximum antenna gain is 1.2dBi, fulfill the requirement of this section. Please refer to the EUT photos.
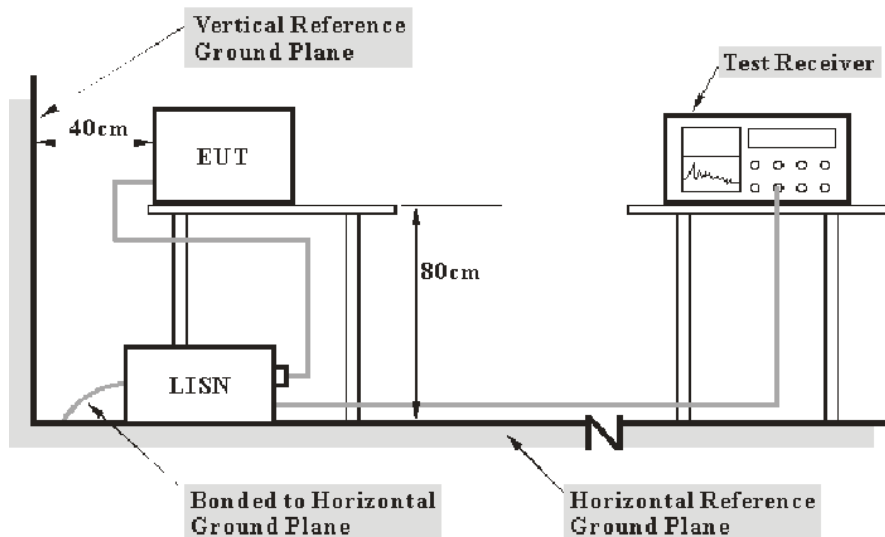
Result: Compliant.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

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 measurement procedure of EUT setup is according with ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

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

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

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

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 final data was recorded in the Quasi-peak and Ave.erage detection mode.

Transd Factor & Margin Calculation

The Transd factor is calculated by adding LISN VDF (Voltage Division Factor) and Cable Loss. The basic equation is as follows:

> Factor = LISN VDF + Cable Loss

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 calculation is as follows:

> Over Limit = Level – Limit
> Level = Read Level + Factor

Test Data

    Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	53 %
ATM Pressure:	101.0 kPa

*The testing was performed by Bin Duan on 2022-02-22.*

EUT operation mode: Transmitting (the worst case is 8DPSK Mode, Middle channel, ANT 1)

AC 120V/60 Hz, Line
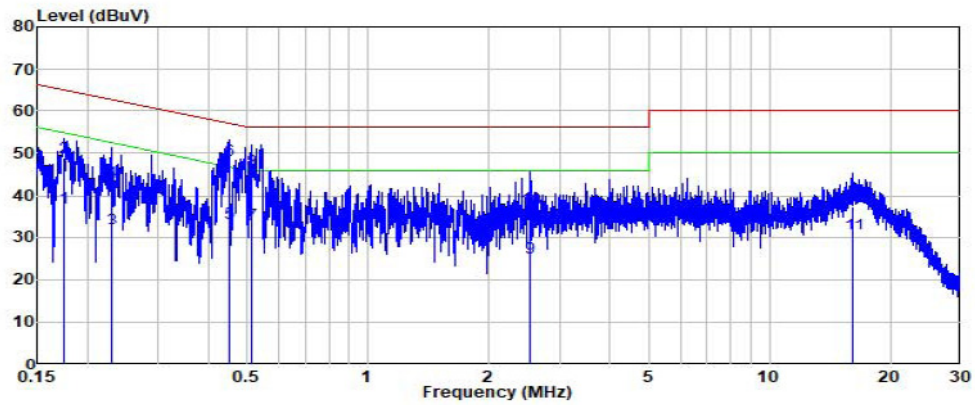
No.	Frequency	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.176	9.84	27.19	37.03	54.69	-17.66	Average
2	0.176	9.84	38.92	48.76	64.69	-15.93	QP
3	0.231	9.80	22.05	31.85	52.42	-20.57	Average
4	0.231	9.80	33.46	43.26	62.42	-19.16	QP
5	0.450	9.80	23.61	33.41	46.87	-13.46	Average
6	0.450	9.80	38.39	48.19	56.87	-8.68	QP
7	0.513	9.81	23.47	33.28	46.00	-12.72	Average
8	0.513	9.81	36.17	45.98	56.00	-10.02	QP
9	2.525	9.93	15.20	25.13	46.00	-20.87	Average
10	2.525	9.93	26.99	36.92	56.00	-19.08	QP
11	16.161	10.09	20.56	30.65	50.00	-19.35	Average
12	16.161	10.09	27.27	37.36	60.00	-22.64	QP

AC 120V/60 Hz, Neutral
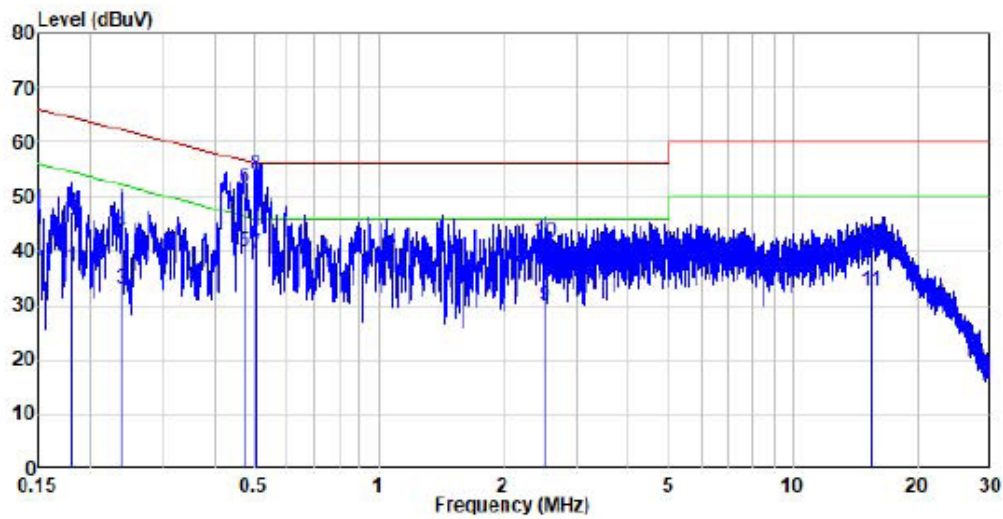
No.	Frequency	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.182	9.80	27.35	37.15	54.41	-17.26	Average
2	0.182	9.80	37.41	47.21	64.41	-17.20	QP
3	0.240	9.80	23.23	33.03	52.11	-19.08	Average
4	0.240	9.80	33.76	43.56	62.11	-18.55	QP
5	0.471	9.80	30.07	39.87	46.49	-6.62	Average
6	0.471	9.80	41.87	51.67	56.49	-4.82	QP
7	0.504	9.80	29.67	39.47	46.00	-6.53	Average
8	0.504	9.80	44.25	54.05	56.00	-1.95	QP
9	2.515	9.83	20.17	30.00	46.00	-16.00	Average
10	2.515	9.83	31.86	41.69	56.00	-14.31	QP
11	15.409	10.05	22.42	32.47	50.00	-17.53	Average
12	15.409	10.05	29.49	39.54	60.00	-20.46	QP

FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS
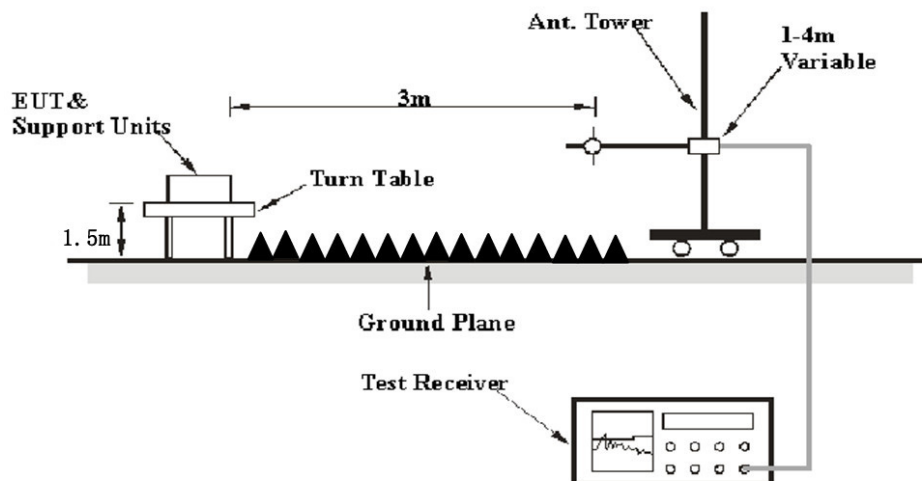
Applicable Standard

FCC §15.205; §15.209; §15.247(d)

EUT Setup

Below 1 GHz:
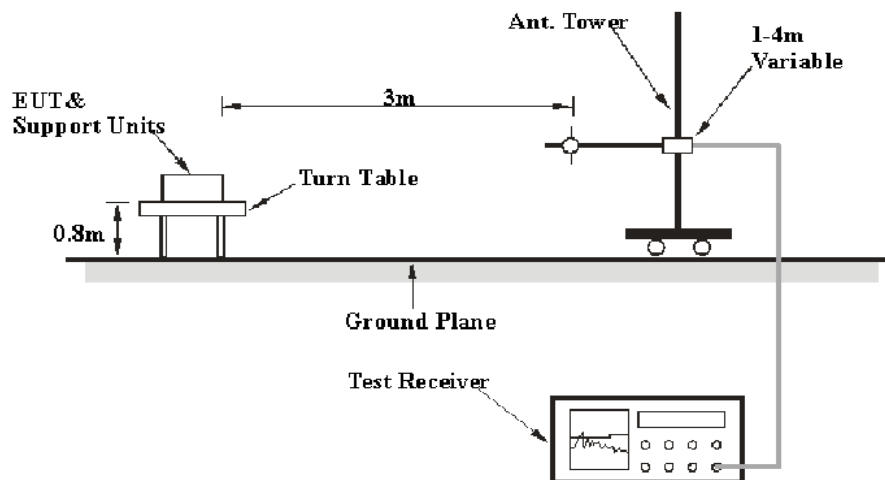
Above 1GHz:

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

EMI Test Receiver & Spectrum Analyzer Setup

The EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	/	Ave.erage

Test Procedure

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

All final data was recorded in Quasi-peak detection mode for frequency range of 30 MHz -1 GHz and peak and Ave.erage detection modes for frequencies above 1 GHz.

Factor & Margin Calculation

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

Factor = Antenna Factor + Cable Loss - Amplifier Gain

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

Over Limit/Margin = Level / Corrected Amplitude – Limit
Level / Corrected Amplitude = Read Level + Factor

Test Data

Environmental Conditions

|	
Temperature:	19~20 ℃
Relative Humidity:	56 ~58%
ATM Pressure:	101.0 kPa

The testing was performed by Chao Mo on 2022-02-23 for below 1GHz and 2022-02-25 forabove 1GHz.

EUT operation mode: Transmitting (Pre-scan in the X,Y and Z axes of orientation, the worst case X-axes of orientation was recorded)

30MHz-1GHz: *(worst case is 8DPSK Mode, Middle channel, ANT 1)*

Note: When the test result of peak was less than the limit of QP more than 6dB, just peak value were recorded.
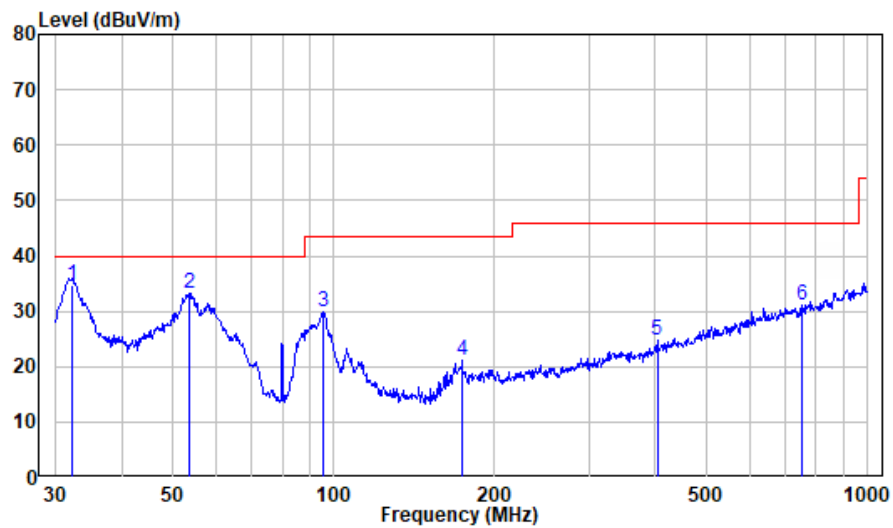
Horizontal:
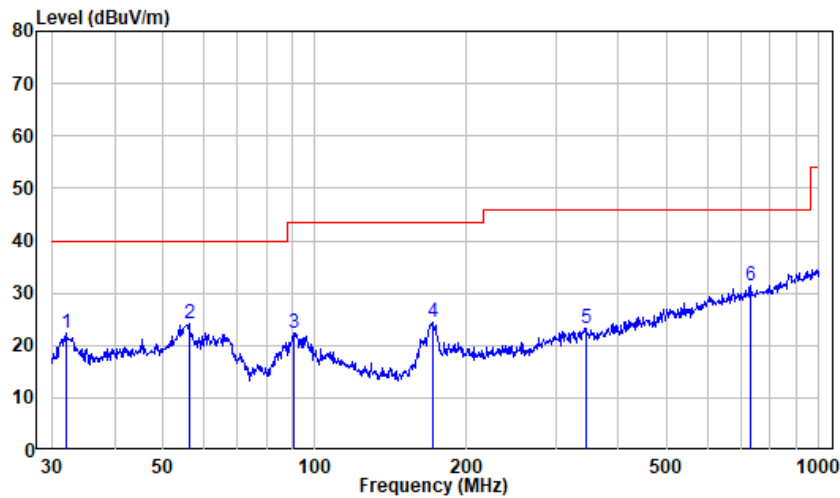

```
Site     : chamber
Condition: 3m HORIZONTAL
Model    : CI6n
Test Mode: BT Transmitting
```

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	32.179	-12.14	34.55	22.41	40.00	-17.59	Peak
2	56.197	-10.16	34.27	24.11	40.00	-15.89	Peak
3	90.537	-13.82	36.16	22.34	43.50	-21.16	Peak
4	170.793	-13.50	37.81	24.31	43.50	-19.19	Peak
5	344.386	-7.24	30.59	23.35	46.00	-22.65	Peak
6	729.358	-0.96	32.26	31.30	46.00	-14.70	Peak

Vertical


```
Site      : chamber
Condition : 3m VERTICAL
Model     : CI6n
Test Mode : BT Transmitting
```

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	32.293	-12.13	46.70	34.57	40.00	-5.43	QP
2	53.693	-10.29	43.54	33.25	40.00	-6.75	Peak
3	95.427	-12.40	42.38	29.98	43.50	-13.52	Peak
4	173.814	-13.20	34.27	21.07	43.50	-22.43	Peak
5	403.250	-6.73	31.35	24.62	46.00	-21.38	Peak
6	755.387	-0.74	31.88	31.14	46.00	-14.86	Peak

Above 1GHz: *(worst case is 8DPSK Mode)*

Ant 1

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
Low Channel (2402 MHz)									
2310	68.12	PK	85	1.0	H	-7.24	60.88	74	-13.12
2310	53.56	Ave.	85	1.0	H	-7.24	46.32	54	-7.68
2310	68.24	PK	164	2.1	V	-7.24	61.00	74	-13.00
2310	53.63	Ave.	164	2.1	V	-7.24	46.39	54	-7.61
2390	68.96	PK	354	1.3	H	-7.22	61.74	74	-12.26
2390	54.18	Ave.	354	1.3	H	-7.22	46.96	54	-7.04
2390	69.12	PK	147	1.6	V	-7.22	61.90	74	-12.10
2390	54.23	Ave.	147	1.6	V	-7.22	47.01	54	-6.99
4804	54.74	PK	234	2.2	H	-3.52	51.22	74	-22.78
4804	55.06	PK	117	1.1	V	-3.52	51.54	74	-22.46
Middle Channel (2441 MHz)									
4882	55.02	PK	325	2.2	H	-3.37	51.65	74	-22.35
4882	55.20	PK	324	2.4	V	-3.37	51.83	74	-22.17
High Channel (2480 MHz)									
2483.5	69.81	PK	340	1.1	H	-7.20	62.61	74	-11.39
2483.5	54.89	Ave.	340	1.1	H	-7.20	47.69	54	-6.31
2483.5	69.96	PK	263	2.3	V	-7.20	62.76	74	-11.24
2483.5	55.00	Ave.	263	2.3	V	-7.20	47.80	54	-6.20
2500	68.76	PK	238	2.1	H	-7.18	61.58	74	-12.42
2500	54.75	Ave.	238	2.1	H	-7.18	47.57	54	-6.43
2500	68.90	PK	15	2.5	V	-7.18	61.72	74	-12.28
2500	54.79	Ave.	15	2.5	V	-7.18	47.61	54	-6.39
4960	54.29	PK	218	1.2	H	-3.01	51.28	74	-22.72
4960	54.77	PK	240	1.5	V	-3.01	51.76	74	-22.24

Note:
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Corrected. Amplitude - Limit
The other spurious emission which is in the noise floor level was not recorded.
When the test result of peak was less than the limit of average, just peak value were recorded.
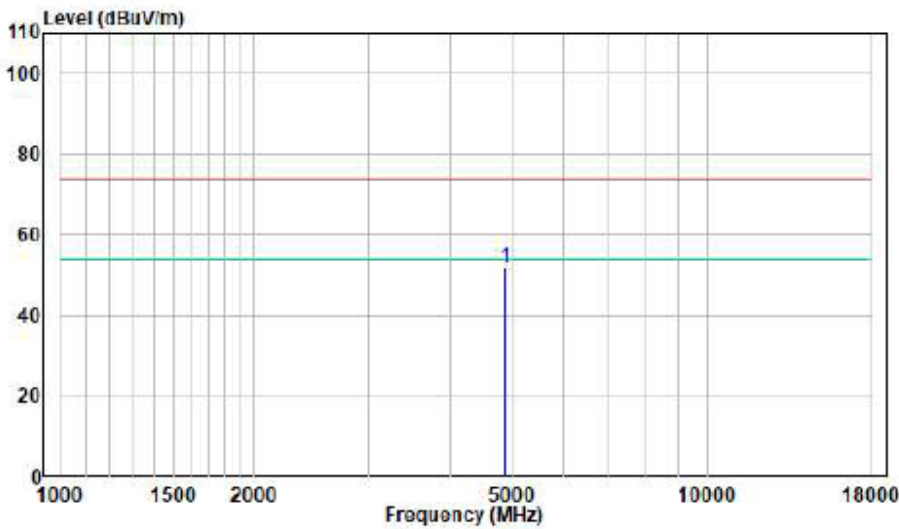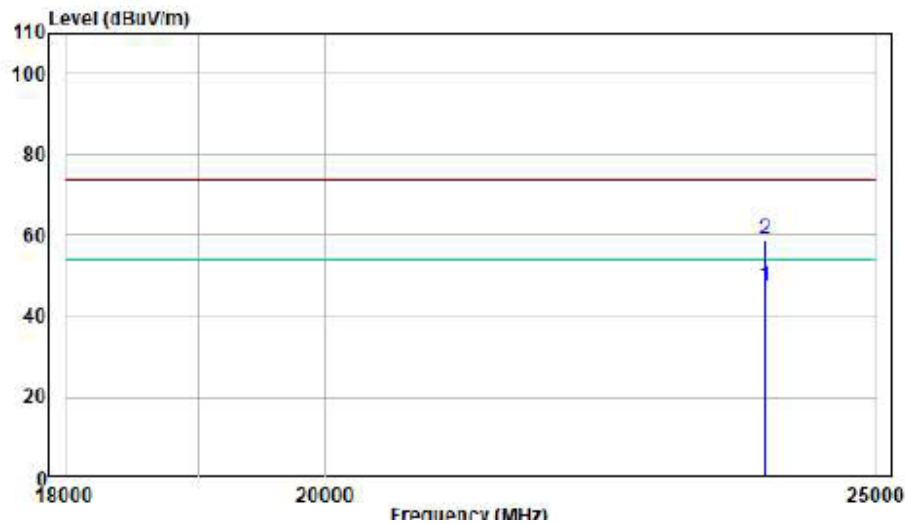
1-18GHz

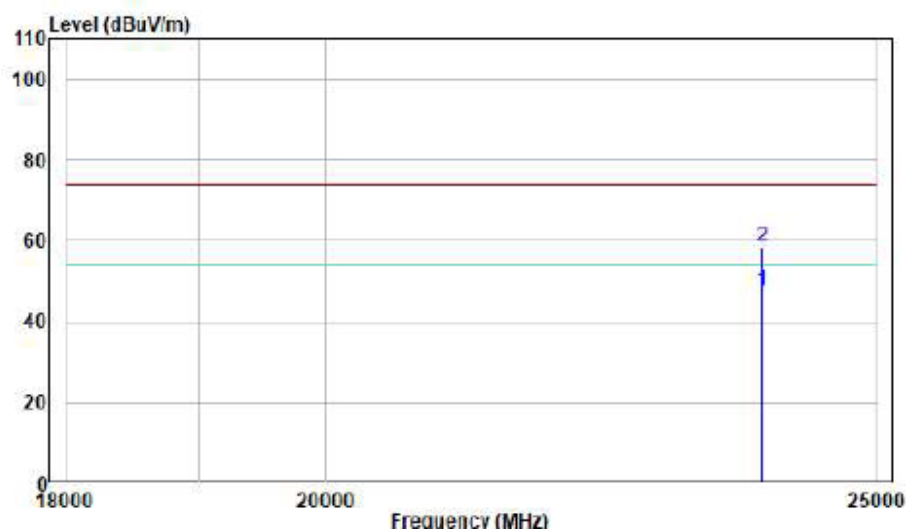**Pre-scan for Middle channel**
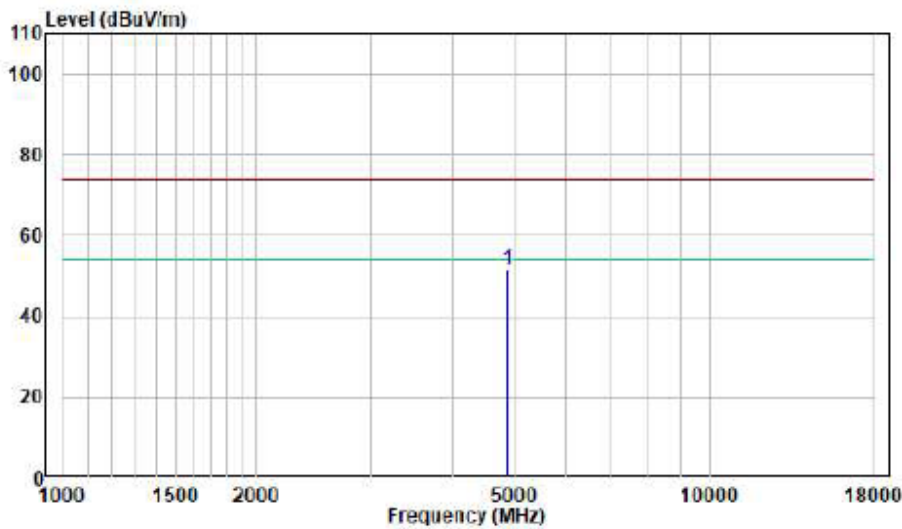
Horizontal:

Vertical:

18-25GHz

Pre-scan for Middle channel

Horizontal:

Vertical:

Ant 2

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
Low Channel (2402 MHz)									
2310	68.04	PK	161	2.1	H	-7.24	60.8	74	-13.2
2310	53.53	Ave.	161	2.1	H	-7.24	46.29	54	-7.71
2310	68.04	PK	164	1.2	V	-7.24	60.8	74	-13.2
2310	53.53	Ave.	164	1.2	V	-7.24	46.29	54	-7.71
2390	69.78	PK	119	2.2	H	-7.22	62.56	74	-11.44
2390	54.16	Ave.	119	2.2	H	-7.22	46.94	54	-7.06
2390	69.89	PK	219	1.4	V	-7.22	62.67	74	-11.33
2390	54.38	Ave.	219	1.4	V	-7.22	47.16	54	-6.84
4804	55.88	PK	347	1.7	H	-3.52	52.36	74	-21.64
4804	56.34	PK	110	1.8	V	-3.52	52.82	74	-21.18
Middle Channel (2441 MHz)									
4882	54.95	PK	260	2.2	H	-3.37	51.58	74	-22.42
4882	54.89	PK	45	1.6	V	-3.37	51.52	74	-22.48
High Channel (2480 MHz)									
2483.5	69.51	PK	272	1.6	H	-7.2	62.31	74	-11.69
2483.5	54.86	Ave.	272	1.6	H	-7.2	47.66	54	-6.34
2483.5	69.53	PK	237	1.3	V	-7.2	62.33	74	-11.67
2483.5	54.97	Ave.	237	1.3	V	-7.2	47.77	54	-6.23
2500	69	PK	354	2.4	H	-7.18	61.82	74	-12.18
2500	55.56	Ave.	354	2.4	H	-7.18	48.38	54	-5.62
2500	69.31	PK	348	1.9	V	-7.18	62.13	74	-11.87
2500	55.38	Ave.	348	1.9	V	-7.18	48.2	54	-5.8
4960	54.43	PK	165	1.5	H	-3.01	51.42	74	-22.58
4960	54.4	PK	4	2.2	V	-3.01	51.39	74	-22.61

Note:
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Corrected. Amplitude - Limit
The other spurious emission which is in the noise floor level was not recorded.
When the test result of peak was less than the limit of average, just peak value were recorded.

1-18GHz

Pre-scan for Low channel
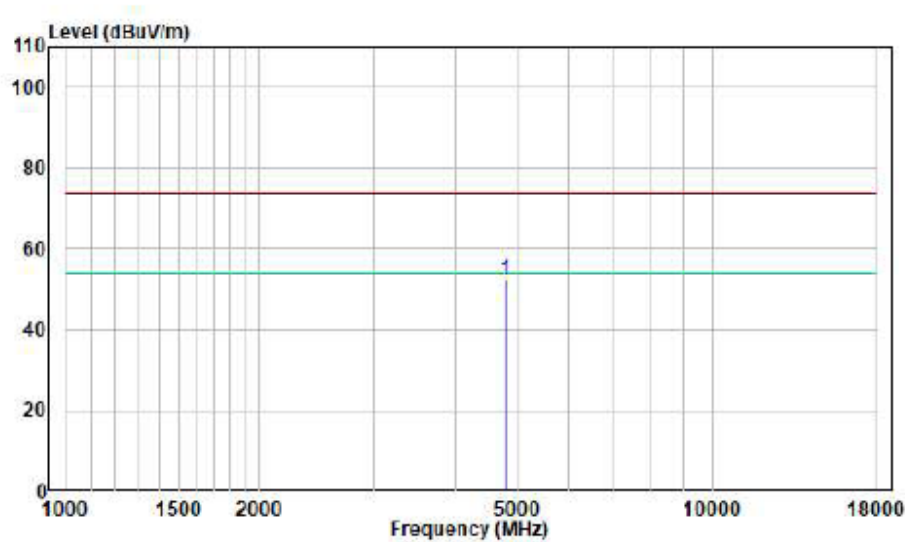
Horizontal:
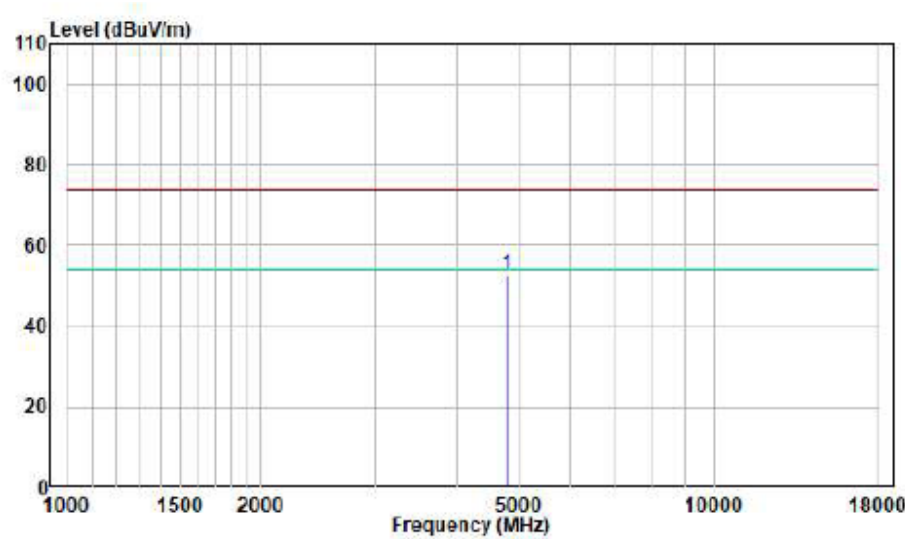
Vertical:

18-25GHz

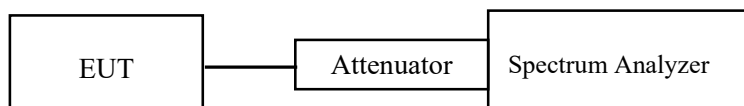**Pre-scan for Low channel**

Horizontal:
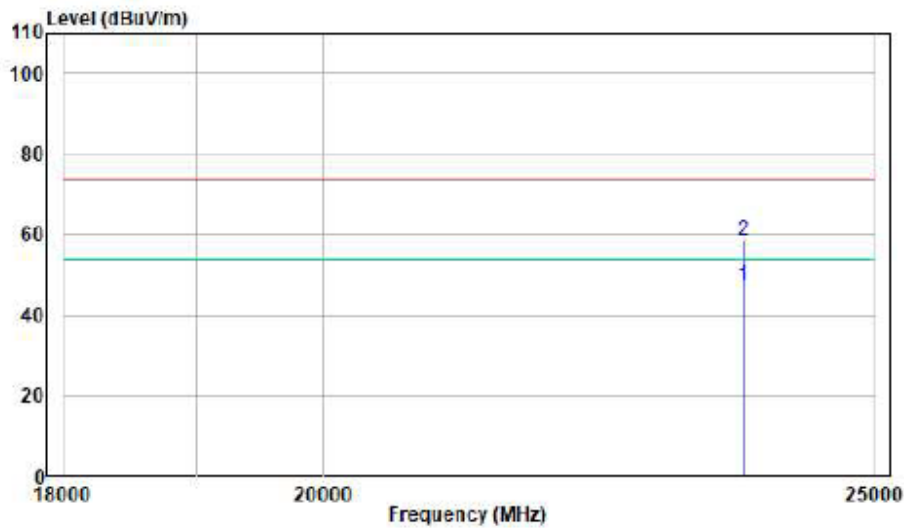
Vertical:
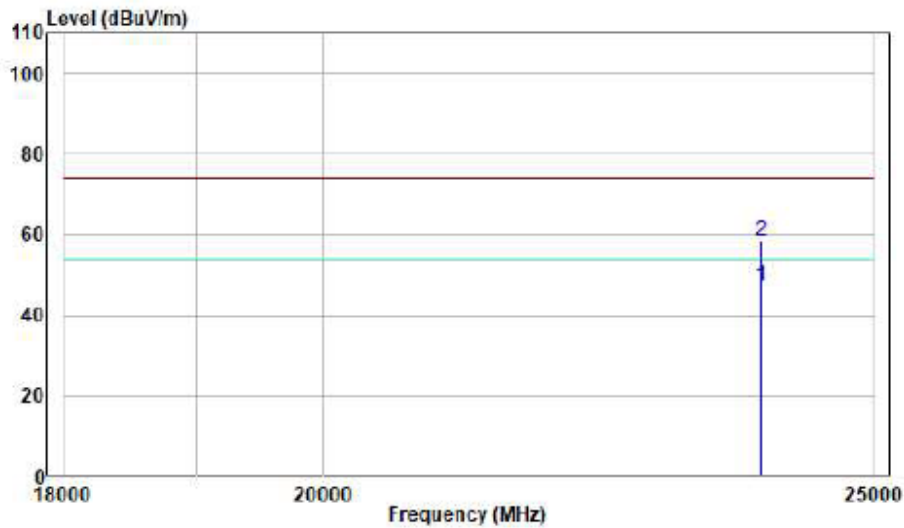
FCC §15.247(a) (1)-CHANNEL SEPARATION TEST

Applicable Standard

Frequency hopping systems shall hAve.e hoping 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.e 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 Ave.erage by each transmitter. The system receivers shall hAve.e input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

Test Procedure

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

```
┌──────────┐       ┌────────────┐ ┌──────────────────┐
│   EUT    │───────│ Attenuator │ │ Spectrum Analyzer │
└──────────┘       └────────────┘ └──────────────────┘
```

Test Data

Environmental Conditions

Temperature:	26℃
Relative Humidity:	57.3 %
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding from 2022-03-21 to 2022-03-22.

EUT operation mode: Transmitting
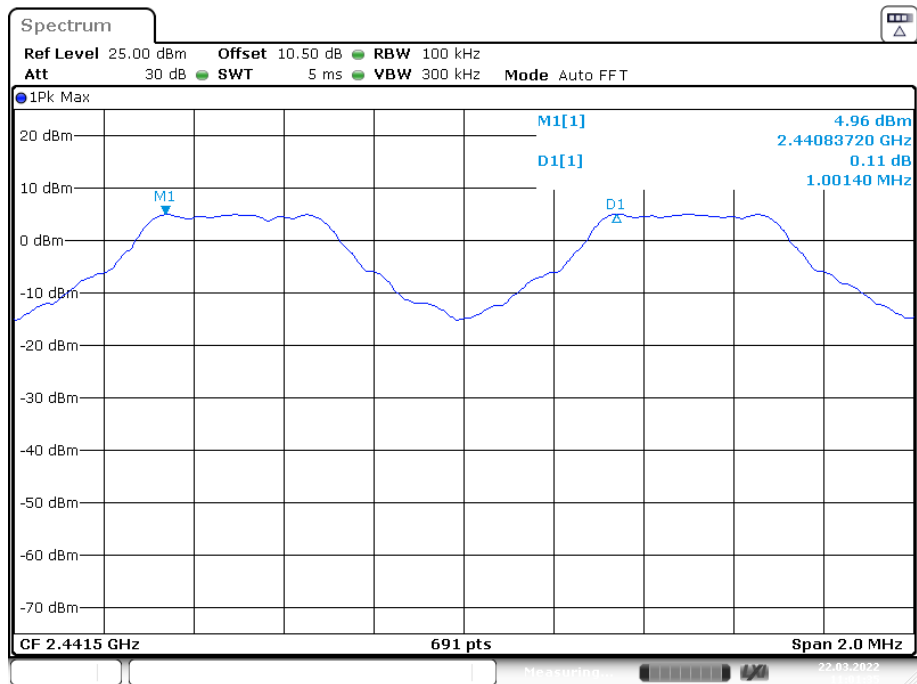Test Result: Compliance. Please refer to following table and plots.

Ant 1

Test Mode	Channel Separation (MHz)	20 dBc BW (MHz)	Two-thirds of the 20 dB bandwidth (MHz)	Channel Separation Limit	Result
BDR(GFSK)					
Hopping	0.999	0.822	0.548	> two-thirds of the 20 dB bandwidth	Compliance
EDR(π/4-DQPSK)					
Hopping	0.999	1.216	0.811	> two-thirds of the 20 dB bandwidth	Compliance
EDR(8DPSK)					
Hopping	0.999	1.219	0.813	> two-thirds of the 20 dB bandwidth	Compliance
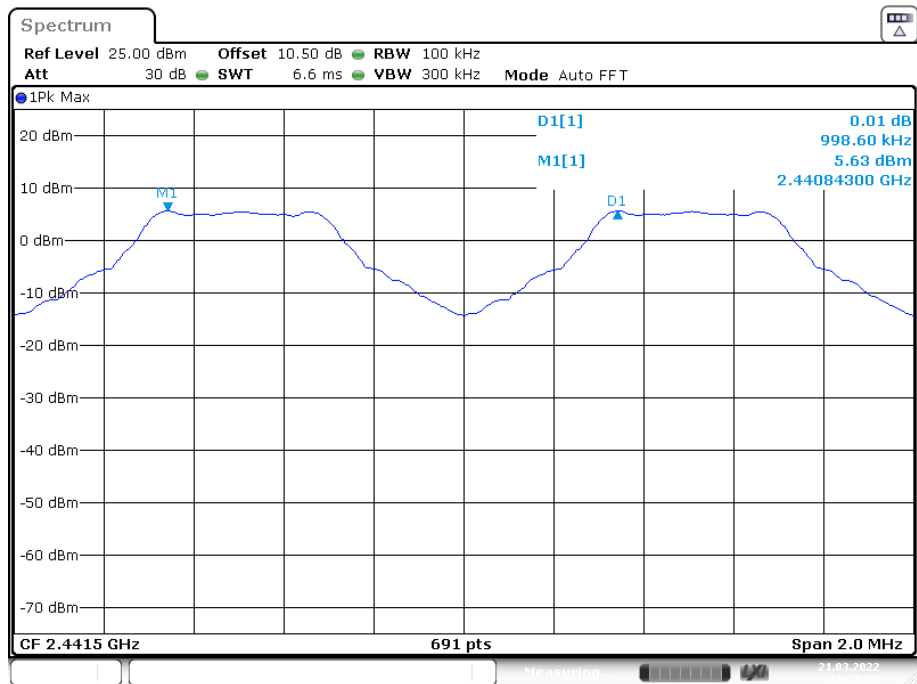
DH1_Hop

Date: 21.MAR.2022 18:28:03
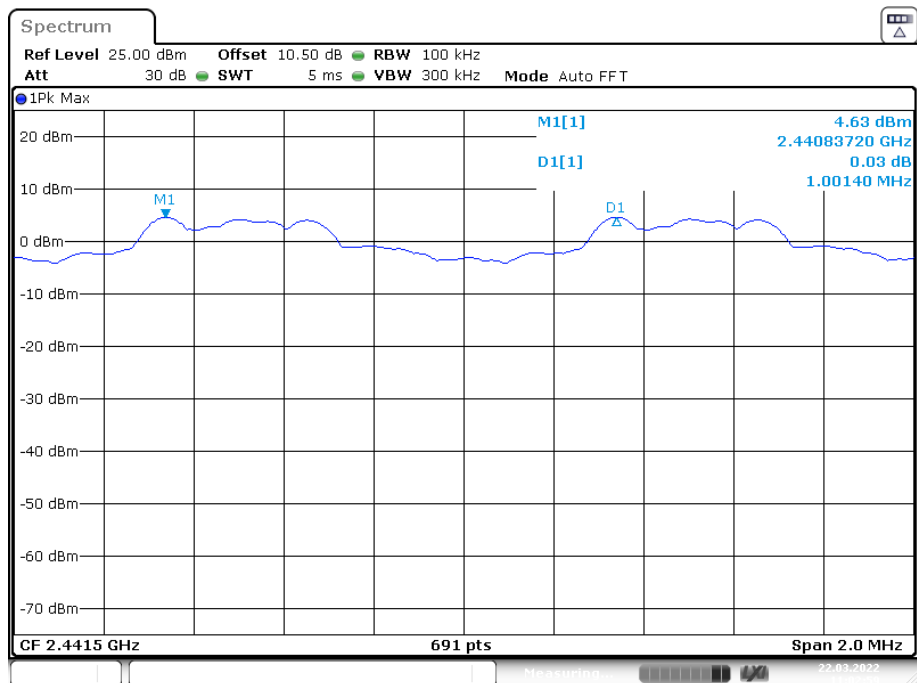
2DH1_Hop

Date: 21.MAR.2022 18:27:06
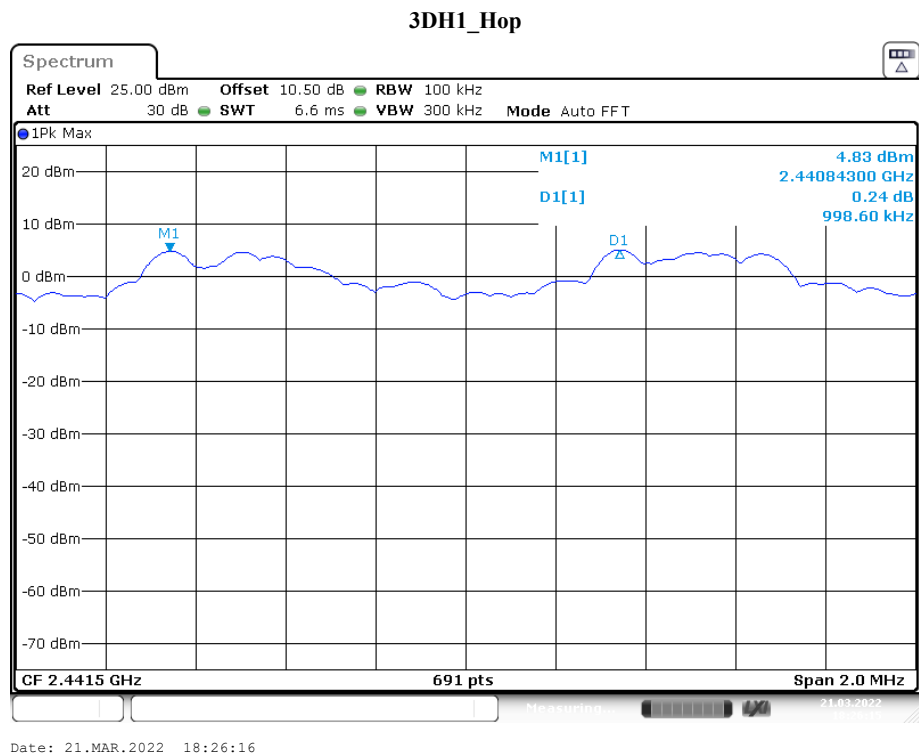
3DH1_Hop

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB ● RBW 100 kHz
Att   30 dB ● SWT   6.6 ms ● VBW 300 kHz   Mode Auto FFT

● 1Pk Max

	M1[1]	4.83 dBm
		2.44084300 GHz
	D1[1]	0.24 dB
		998.60 kHz

CF 2.4415 GHz   691 pts   Span 2.0 MHz

Date: 21.MAR.2022 18:26:16

Ant 2

Test Mode	Channel Separation (MHz)	20 dBc BW (MHz)	Two-thirds of the 20 dB bandwidth (MHz)	Channel Separation Limit	Result
BDR(GFSK)					
Hopping	1.001	0.813	0.542	> two-thirds of the 20 dB bandwidth	Compliance
EDR(π/4-DQPSK)					
Hopping	1.001	1.213	0.809	> two-thirds of the 20 dB bandwidth	Compliance
EDR(8DPSK)					
Hopping	1.001	1.216	0.811	> two-thirds of the 20 dB bandwidth	Compliance

DH1_Hop

Date: 22.MAR.2022 11:01:35

2DH1_Hop

Date: 22.MAR.2022 11:02:59

3DH1_Hop

Spectrum					
Ref Level 25.00 dBm	**Offset** 10.50 dB ● **RBW** 100 kHz				
Att 30 dB ● **SWT**	5 ms ● **VBW** 300 kHz	**Mode** Auto FFT			

● 1Pk Max

```
                                              D1[1]                    0.03 dB
20 dBm                                                             1.00140 MHz
                                              M1[1]                   4.58 dBm
10 dBm                                                           2.44083720 GHz
           M1                               D1
 0 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm
CF 2.4415 GHz              691 pts                        Span 2.0 MHz
```

Date: 22.MAR.2022 11:03:40
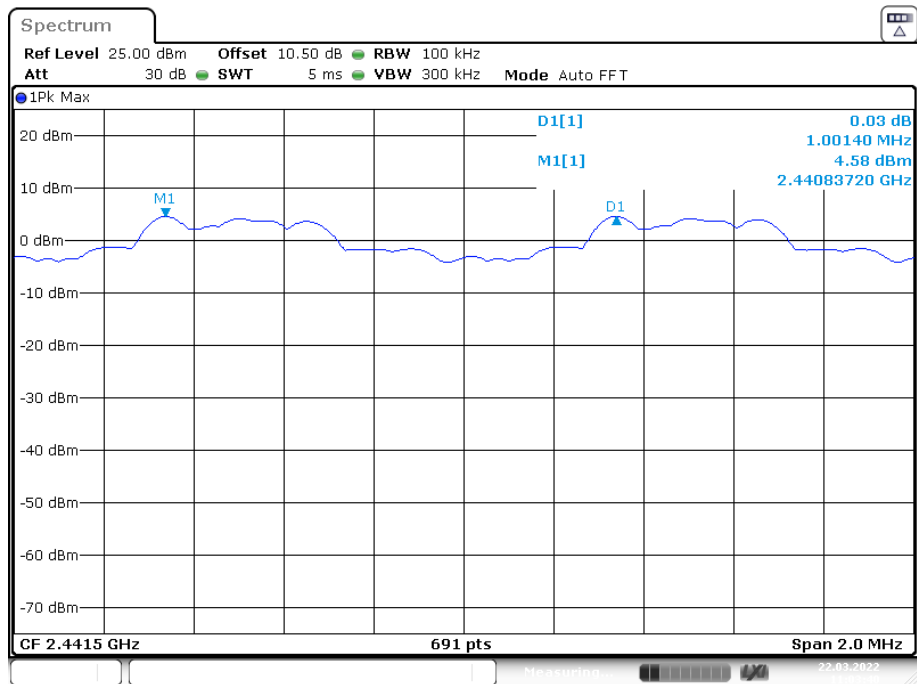
FCC §15.247(a) (1) – 20 dB EMISSION BANDWIDTH & 99% OCCUPIED BANDWIDTH

Applicable Standard

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

Test Procedure

The following conditions shall be observed for measuring the occupied bandwidth and 20 dB bandwidth:
• The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

• The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to Ave.oid hAve.ing other emissions (e.g. on adjacent channels) within the span.

• The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied / 20 dB bandwidth if the device is not transmitting continuously.

• The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / 20 dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video Ave.eraging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.
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).
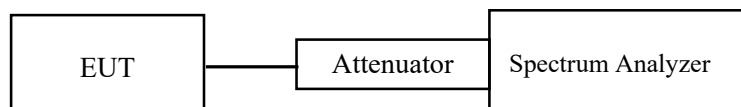
Test Data

Environmental Conditions

Temperature:	26℃
Relative Humidity:	57.3 %
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding from 2022-03-21 to 2022-03-29.

EUT operation mode: Transmitting

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

Ant 1

Mode	Channel	Frequency (MHz)	20 dB Emission Bandwidth (MHz)
BDR (GFSK)	Low	2402	0.822
	Middle	2441	0.816
	High	2480	0.810
EDR (π/4-DQPSK)	Low	2402	1.213
	Middle	2441	1.213
	High	2480	1.216
EDR (8DPSK)	Low	2402	1.219
	Middle	2441	1.216
	High	2480	1.216

20 dB EMISSION BANDWIDTH&99% Occupied Bandwidth:
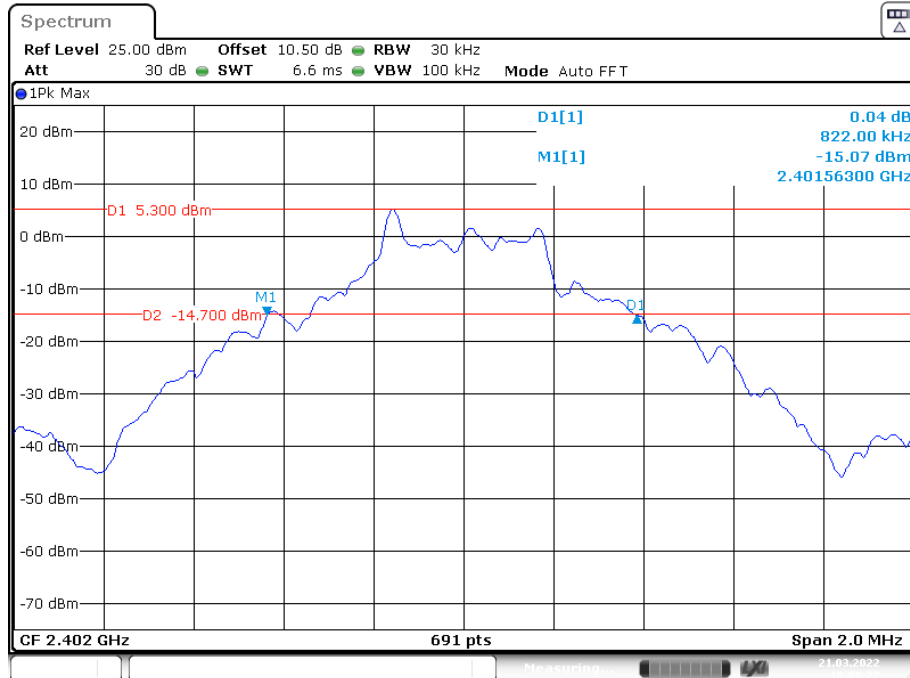
DH1_2402MHz

Date: 21.MAR.2022 18:08:27

DH1_2441MHz
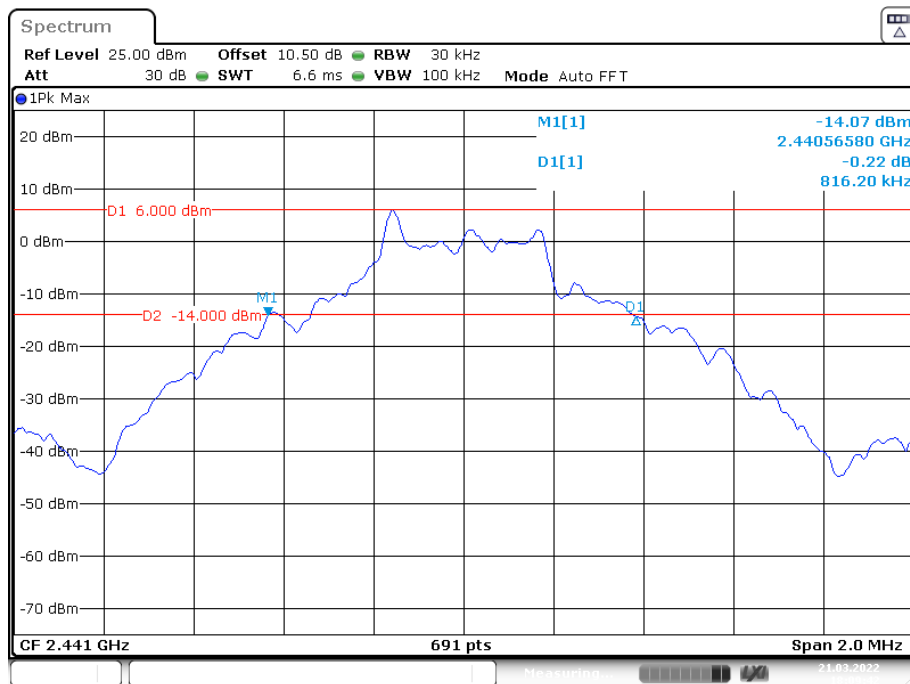
Date: 21.MAR.2022 18:09:43

DH1_2480MHz
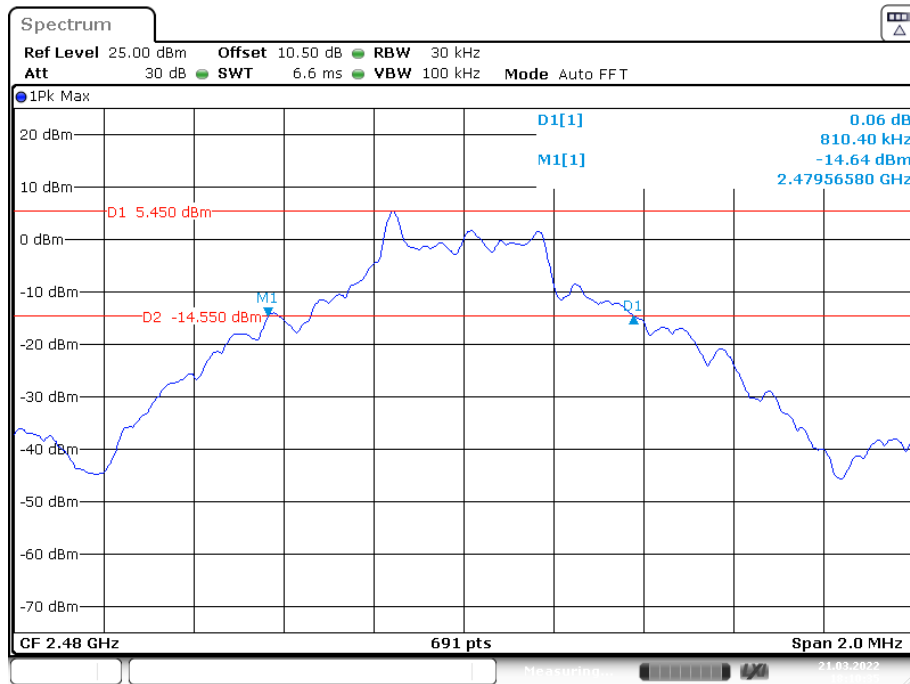
Date: 21.MAR.2022 18:10:35

2DH1_2402MHz
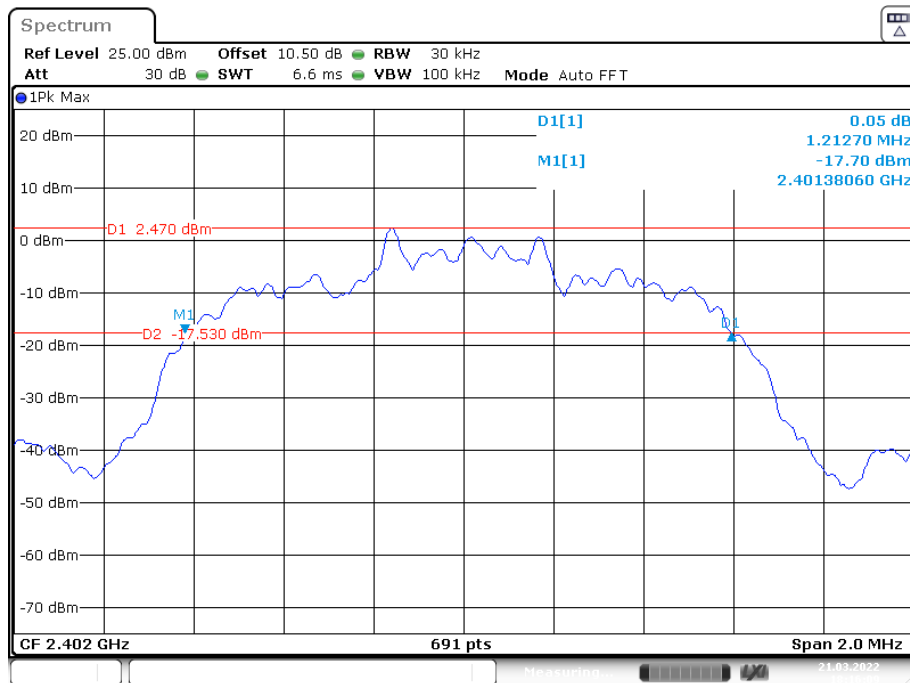
Date: 21.MAR.2022 18:16:09

2DH1_2441MHz
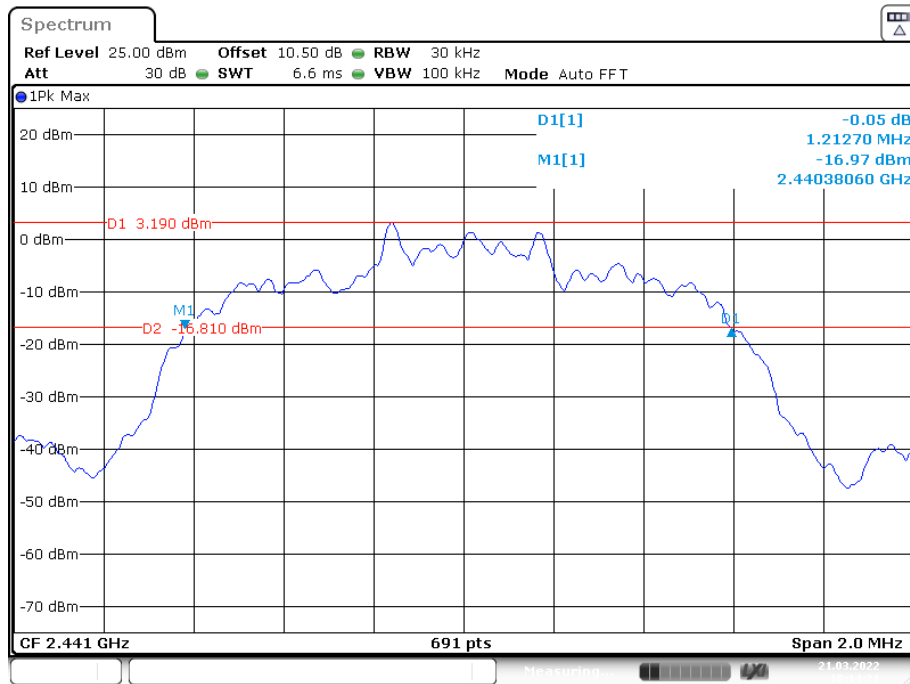
Date: 21.MAR.2022 18:14:21

2DH1_2480MHz
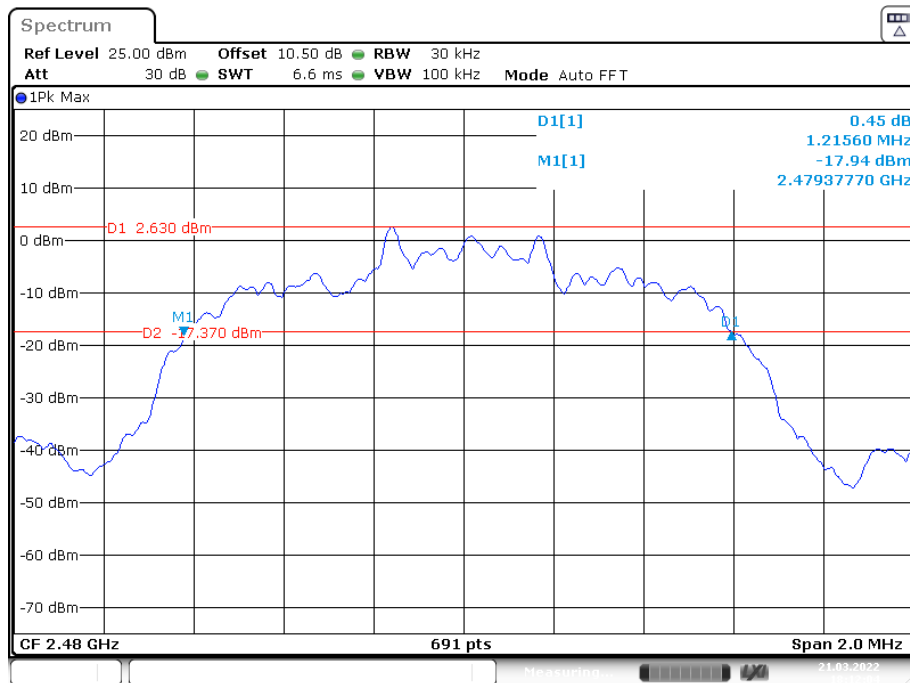
Date: 21.MAR.2022 18:12:04

3DH1_2402MHz
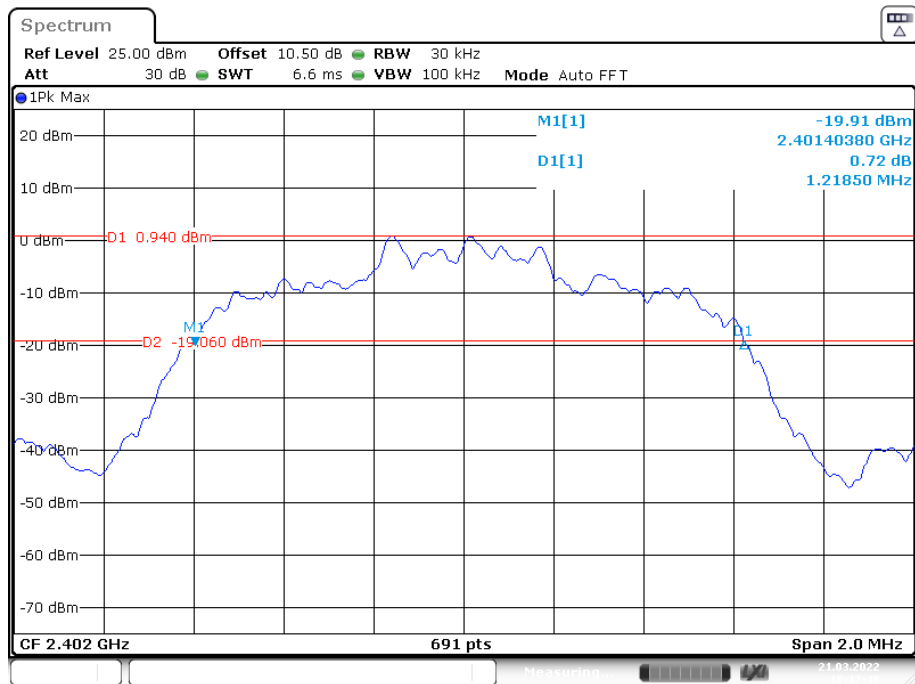
Date: 21.MAR.2022 18:17:48

3DH1_2441MHz
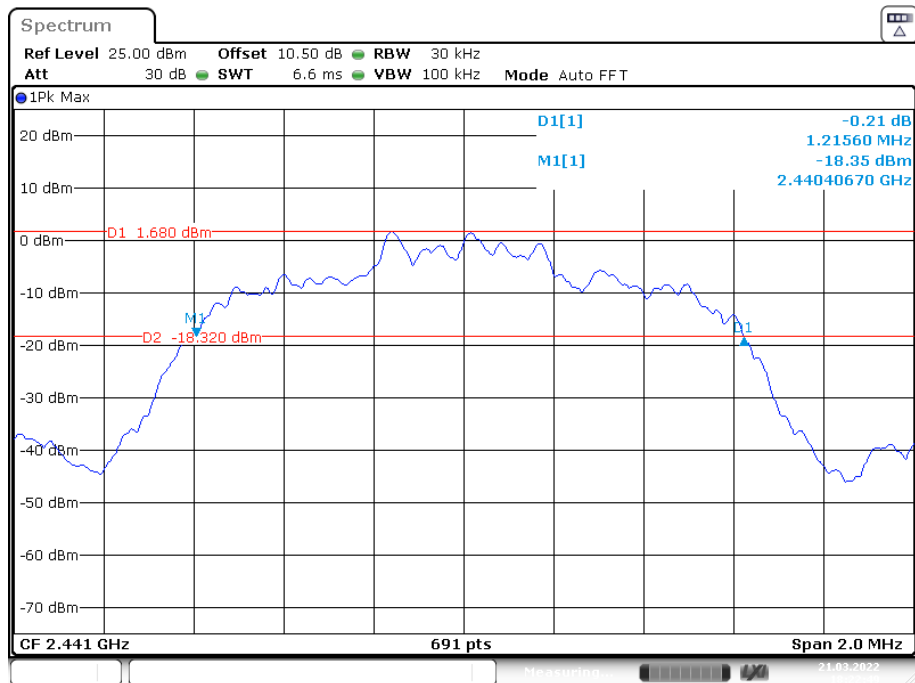
Date: 21.MAR.2022 18:22:49

3DH1_2480MHz
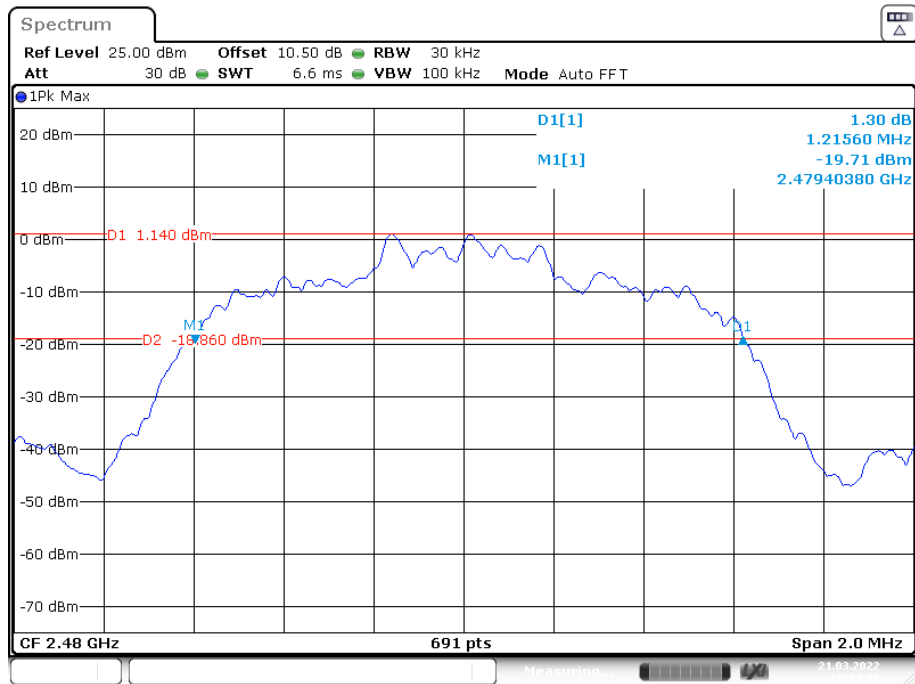
Date: 21.MAR.2022 18:24:11

Ant 2

Mode	Channel	Frequency (MHz)	20 dB Emission Bandwidth (MHz)
BDR (GFSK)	Low	2402	0.813
	Middle	2441	0.813
	High	2480	0.769
EDR (π/4-DQPSK)	Low	2402	1.213
	Middle	2441	1.213
	High	2480	1.213
EDR (8DPSK)	Low	2402	1.216
	Middle	2441	1.216
	High	2480	1.216

20 dB EMISSION BANDWIDTH&99% Occupied Bandwidth:
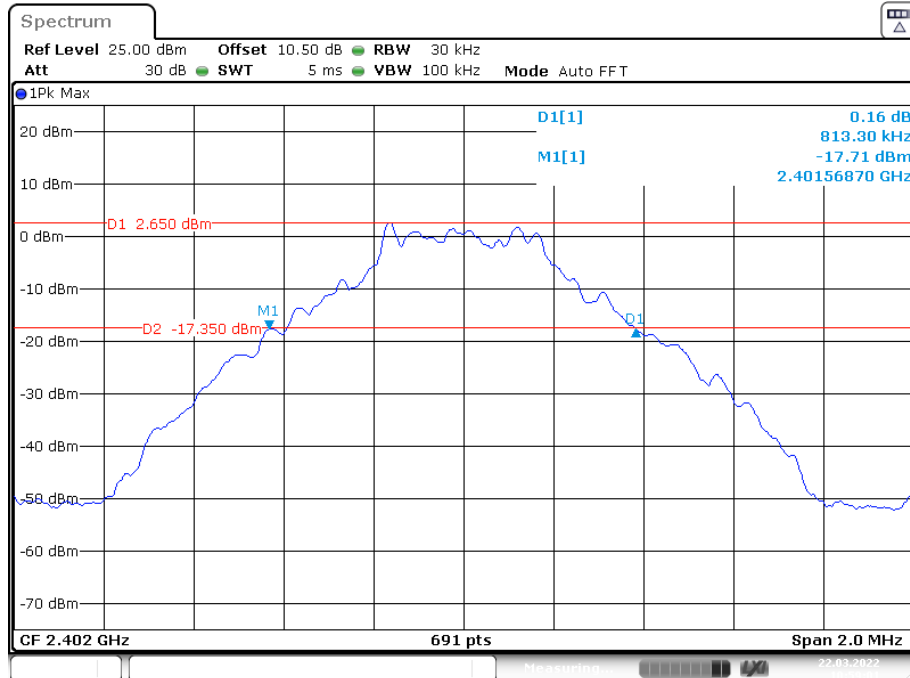
DH1_2402MHz

Date: 22.MAR.2022 10:59:01

DH1_2441MHz
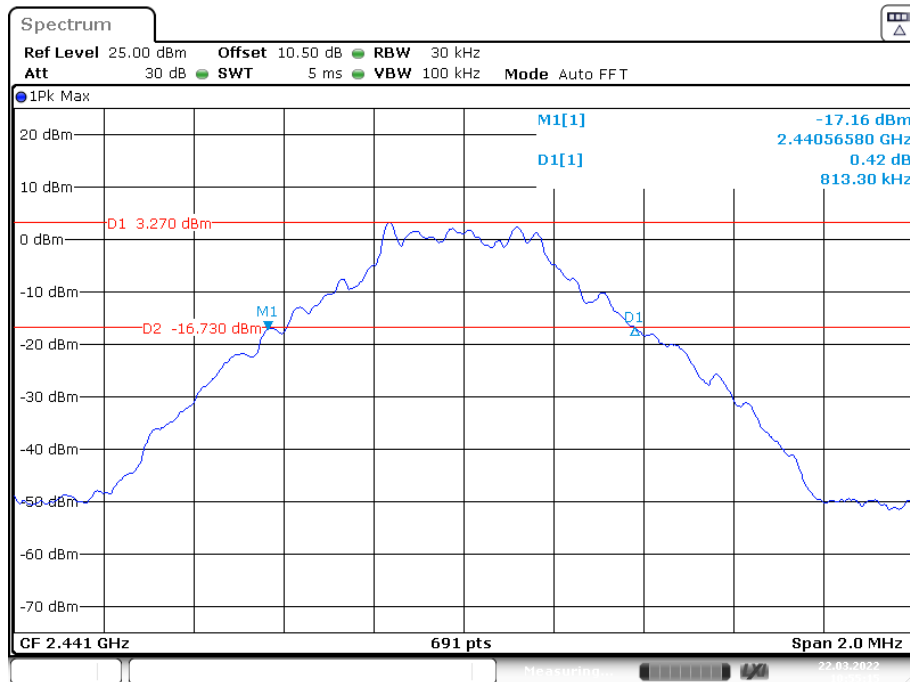
Date: 22.MAR.2022 10:55:15

DH1_2480MHz
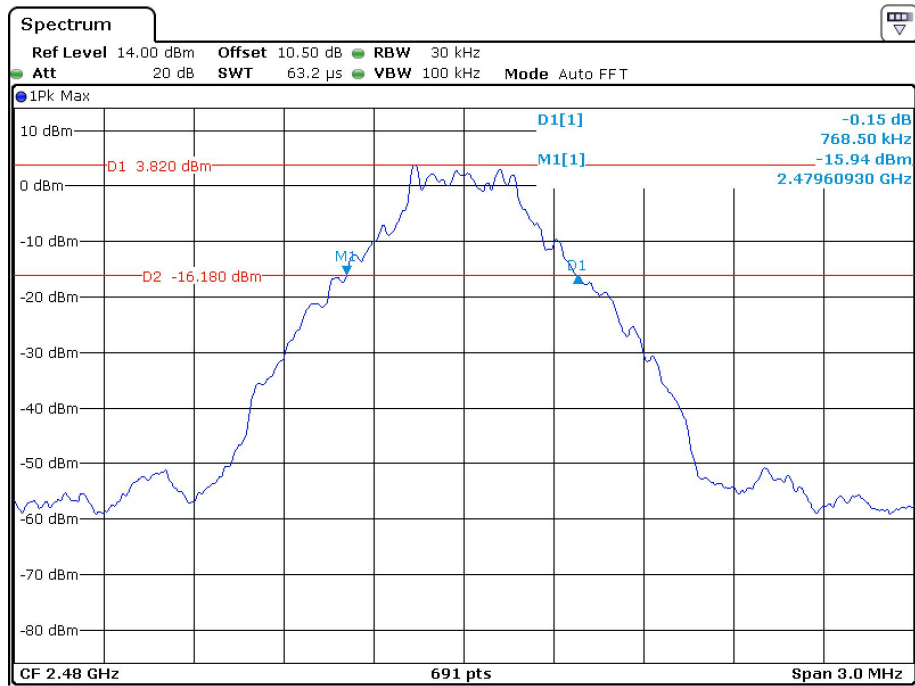
Date: 29.MAR.2022 11:25:07

2DH1_2402MHz
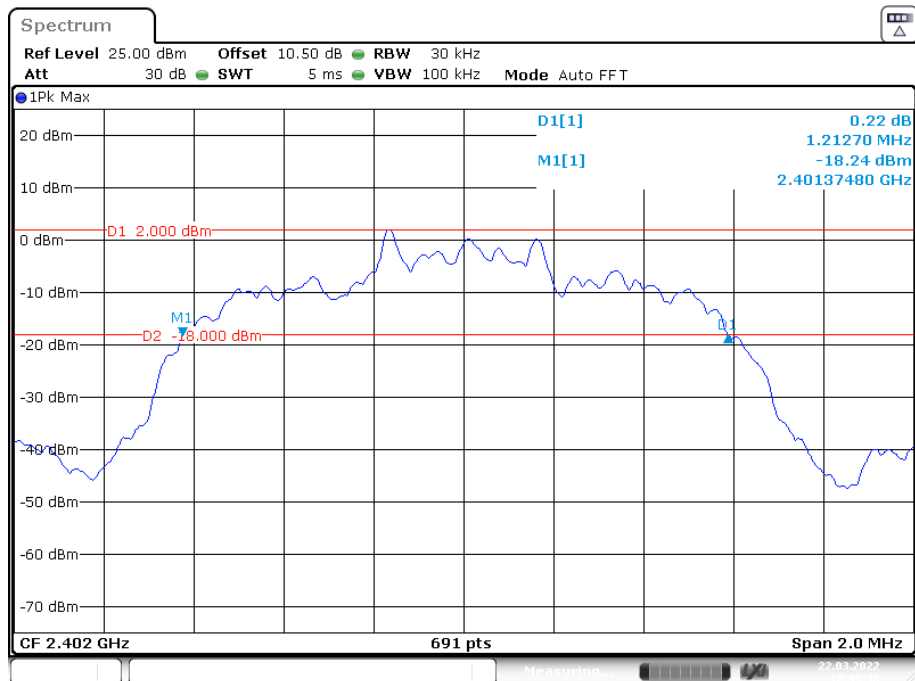
Date: 22.MAR.2022 10:49:46

2DH1_2441MHz

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB ● RBW   30 kHz
Att   30 dB ● SWT   5 ms ● VBW 100 kHz   Mode Auto FFT

● 1Pk Max

D1[1]   0.13 dB
                             1.21270 MHz
M1[1]   -17.56 dBm
                             2.44037480 GHz

D1 2.680 dBm

M1
D2 -17.320 dBm

CF 2.441 GHz   691 pts   Span 2.0 MHz
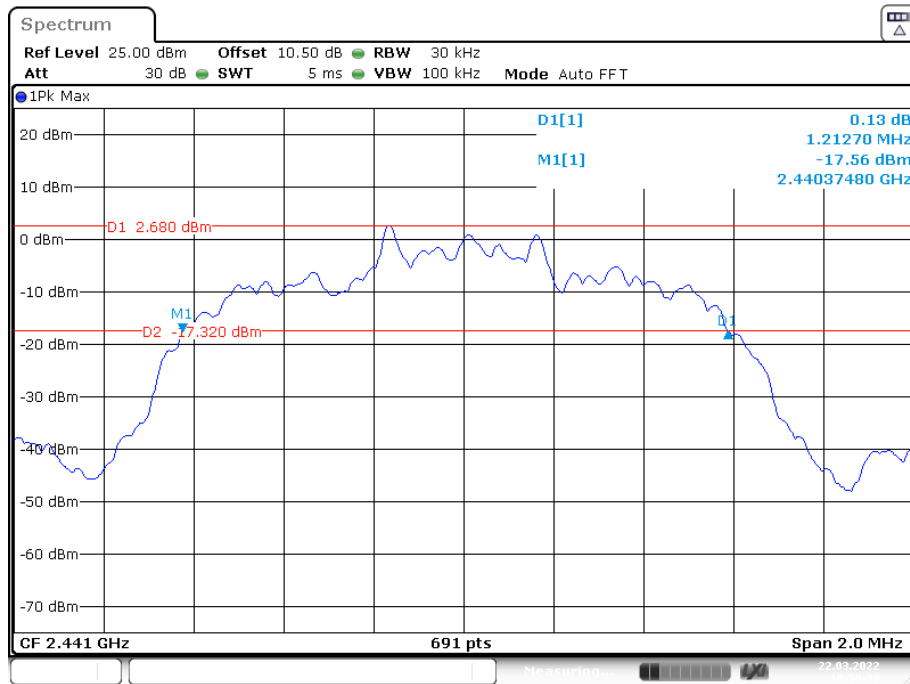
Date: 22.MAR.2022   10:50:32

2DH1_2480MHz

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB ● RBW   30 kHz
Att   30 dB ● SWT   5 ms ● VBW 100 kHz   Mode Auto FFT

● 1Pk Max

D1[1]   0.04 dB
                             1.21270 MHz
M1[1]   -18.02 dBm
                             2.47937480 GHz

D1 2.080 dBm

-17.92dBm   M1
D2 -17.910 dBm

CF 2.48 GHz   691 pts   Span 2.0 MHz
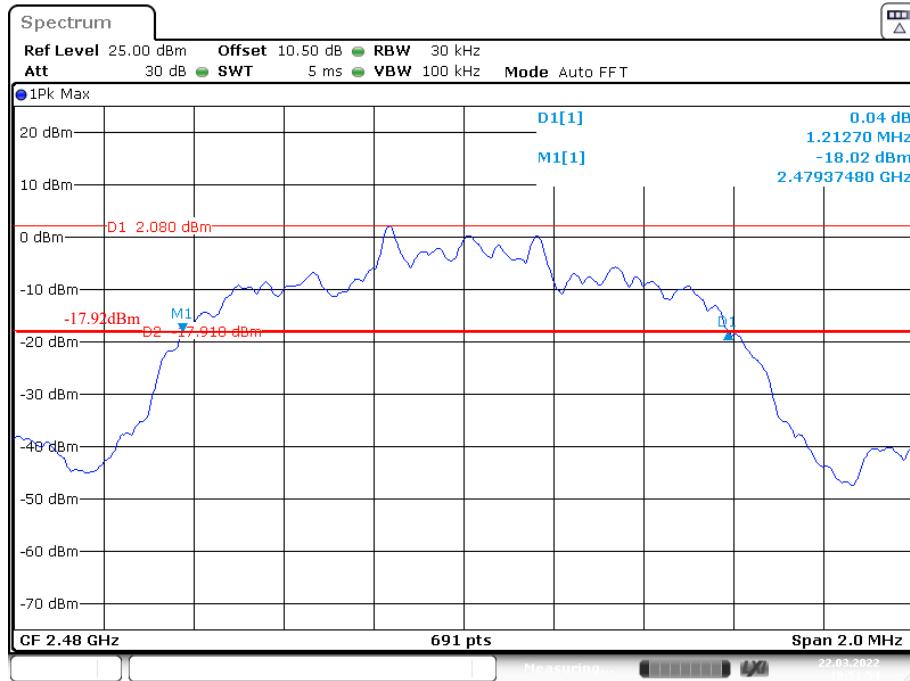
Date: 22.MAR.2022   10:51:54

3DH1_2402MHz
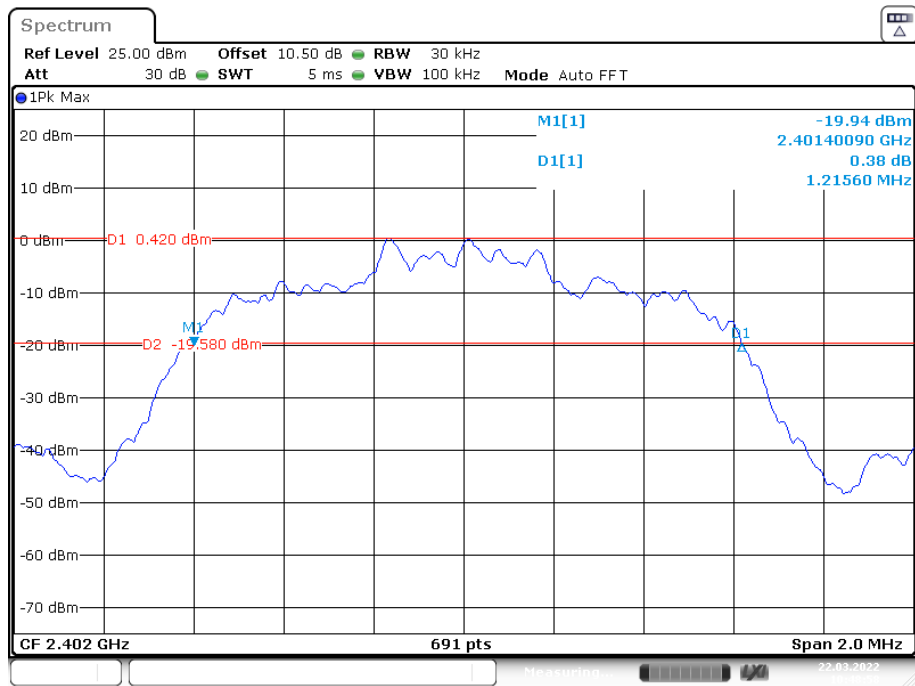
Date: 22.MAR.2022 10:48:58

3DH1_2441MHz
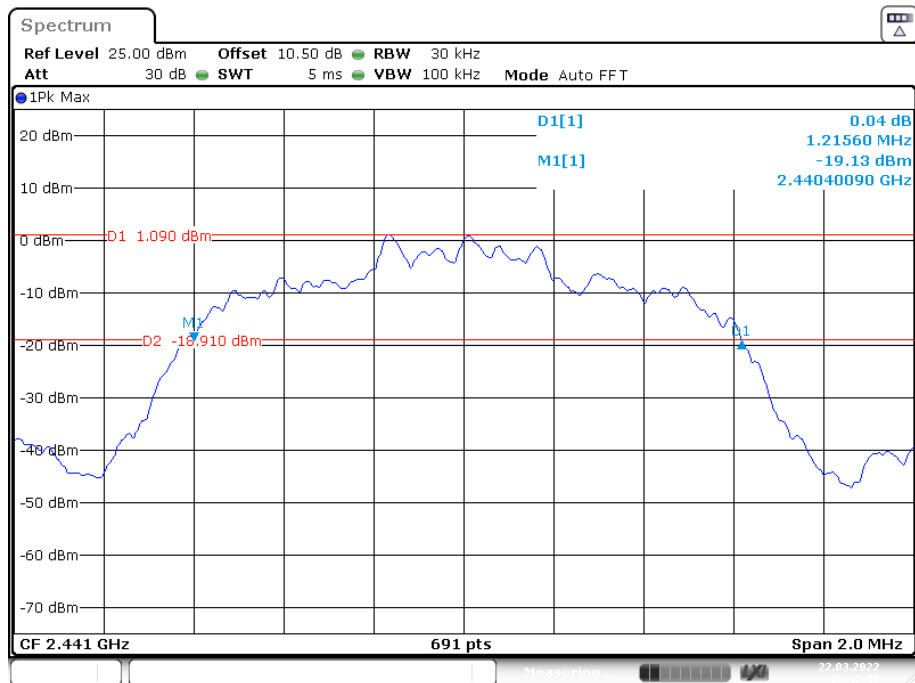
Date: 22.MAR.2022 10:47:50

3DH1_2480MHz
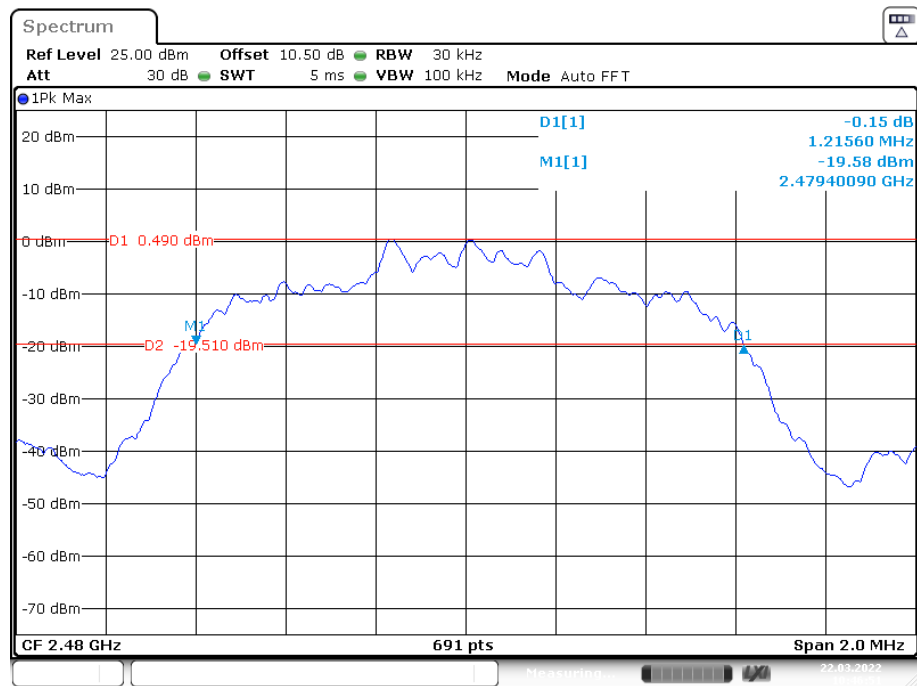
Date: 22.MAR.2022 10:46:50

FCC §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST

Applicable Standard

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The Ave.erage 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 Ave.oid or suppress transmissions on a particular hopping frequency provided that
a minimum of 15 channels are used.

Test Procedure

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

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

3. By using the max-hold function record the quantity of the channel.
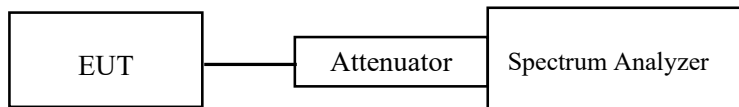
| EUT | — | Attenuator | Spectrum Analyzer |

Test Data

Environmental Conditions

Temperature:	26℃
Relative Humidity:	57.3 %
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding from 2022-03-21 to 2022-03-22.

EUT operation mode: Transmitting

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

Ant 1

Mode	Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)
BDR (GFSK)	2400-2483.5	79	≥15
EDR (π/4-DQPSK)	2400-2483.5	79	≥15
EDR (8DPSK)	2400-2483.5	79	≥15
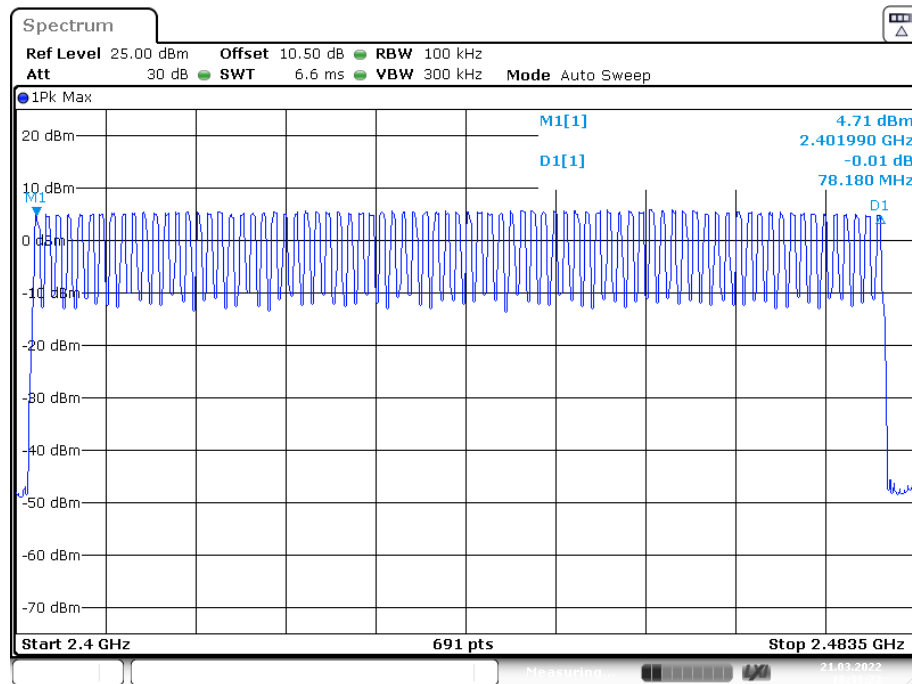
DH1_Hop

Date: 21.MAR.2022   18:31:23
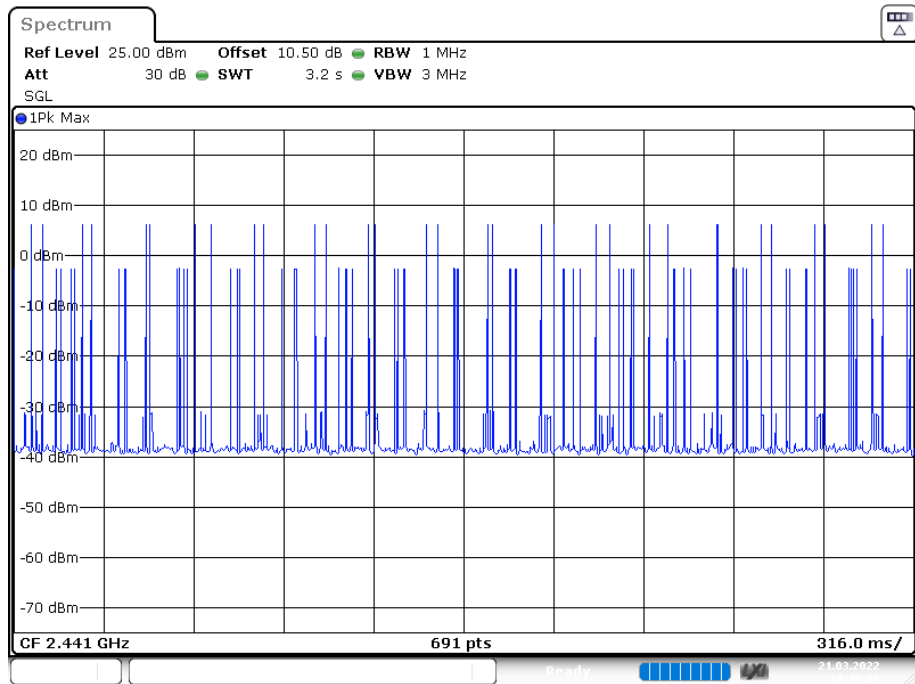
2DH1_Hop
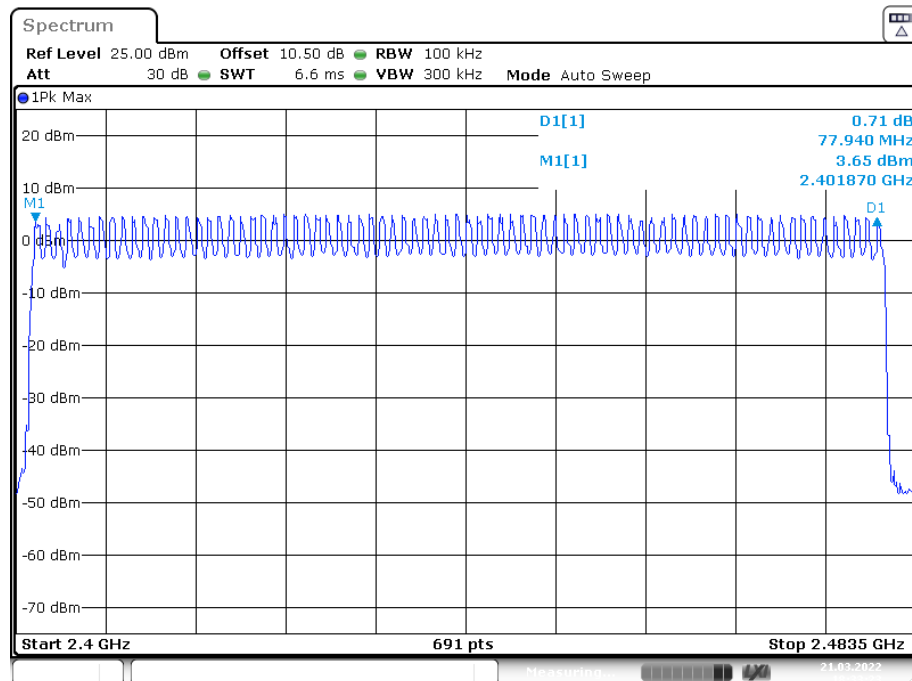
Date: 21.MAR.2022   18:33:24

3DH1_Hop
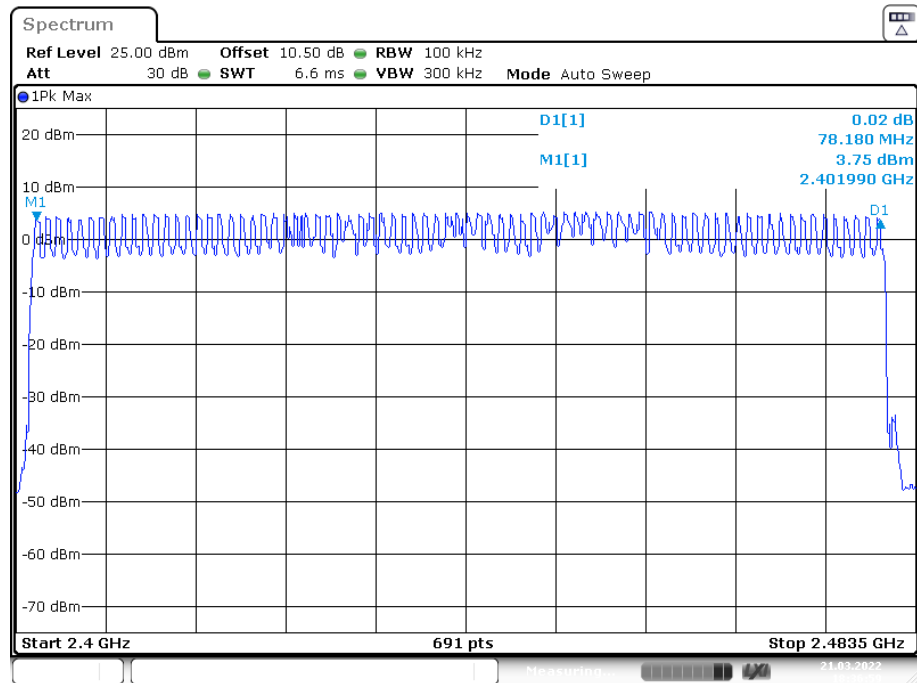
Date: 21.MAR.2022 18:37:00

Ant 2

Mode	Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)
BDR (GFSK)	2400-2483.5	79	≥15
EDR (π/4-DQPSK)	2400-2483.5	79	≥15
EDR (8DPSK)	2400-2483.5	79	≥15
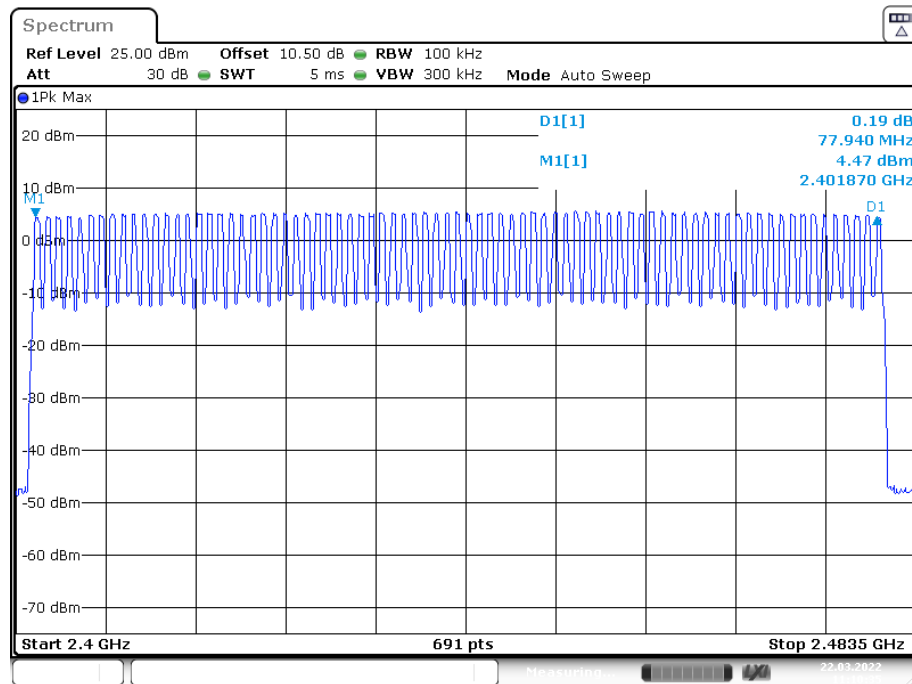
DH1_Hop

Date: 22.MAR.2022 11:10:35

2DH1_Hop
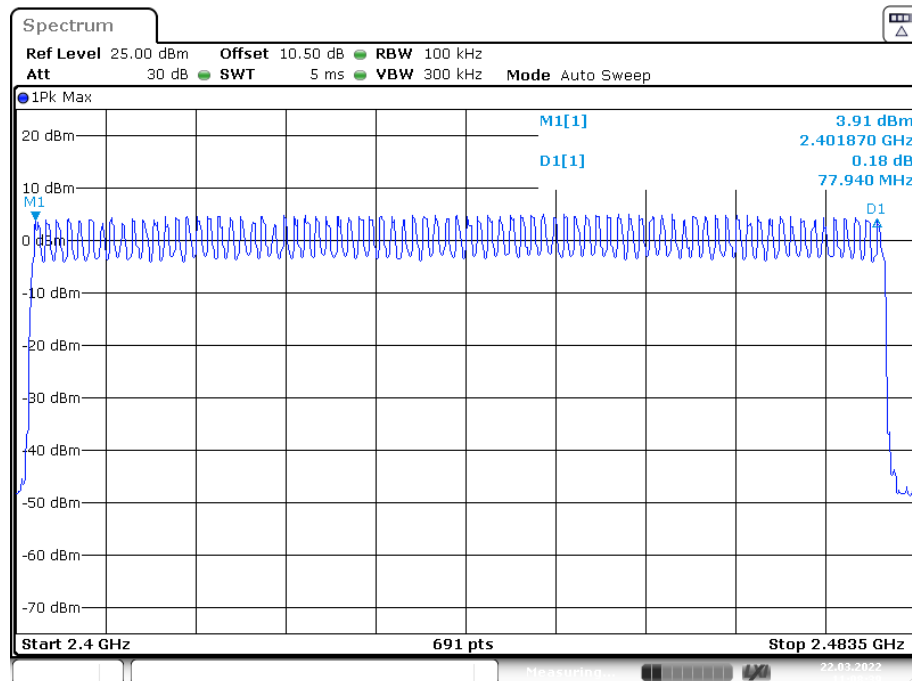
Date: 22.MAR.2022 11:08:40

3DH1_Hop
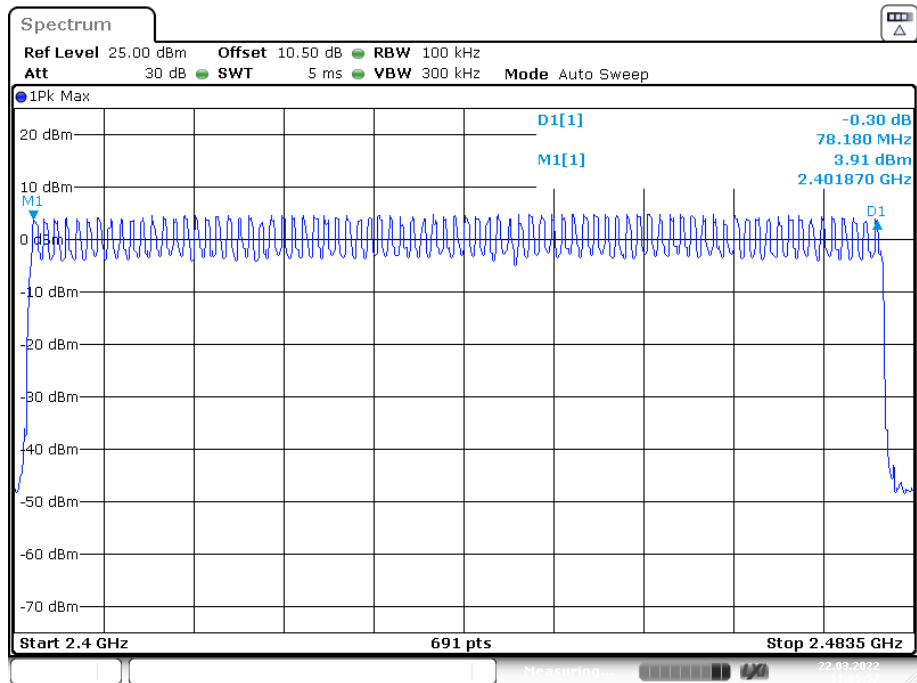
Date: 22.MAR.2022 11:05:57

FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME)

Applicable Standard

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. The Ave.erage 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 Ave.oid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

4.   The EUT was worked in channel hopping.
5.   Set the RBW to: 1MHz.
6.   Set the VBW ≥ 3×RBW.
7.   Set the span to 0Hz.
8.   Detector = peak.
9.   Sweep time = auto couple.
10. Trace mode = max hold.
11. Allow trace to fully stabilize.
12. Recorded the time of single pulses
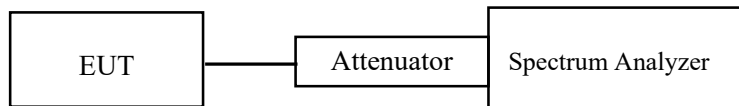
```
┌─────────────┐        ┌────────────┬──────────────────────┐
│     EUT     │────────│ Attenuator │  Spectrum Analyzer   │
└─────────────┘        └────────────┴──────────────────────┘
```

Test Data

Environmental Conditions

Temperature:	26℃
Relative Humidity:	57.3 %
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding from 2022-03-21 to 2022-03-22.

EUT operation mode: Transmitting
   Test Result: Compliance. Please refer to following table and plots.

Ant 1

Test Mode	Channel	Pulse Time [ms]	Total Hops [Num]	Result[s]	Limit[s]	Verdict
DH1	Hop	0.395	310	0.122	<=0.4	PASS
DH3	Hop	1.657	160	0.265	<=0.4	PASS
DH5	Hop	2.920	110	0.321	<=0.4	PASS
2DH1	Hop	0.399	320	0.128	<=0.4	PASS
2DH3	Hop	1.677	160	0.268	<=0.4	PASS
2DH5	Hop	2.942	110	0.324	<=0.4	PASS
3DH1	Hop	0.407	320	0.130	<=0.4	PASS
3DH3	Hop	1.664	160	0.266	<=0.4	PASS
3DH5	Hop	2.933	120	0.352	<=0.4	PASS

Note 1: A period time=0.4*79=31.6(S), Result= Pulse Time *Total hops
Note 2: Total hops=Hopping Number in 3.16s*10
Note 3: Hopping Number in 3.16s=Total of highest signals in 3.16s (Second high signals were other channel)

DH1_Hop

Date: 21.MAR.2022 18:46:28
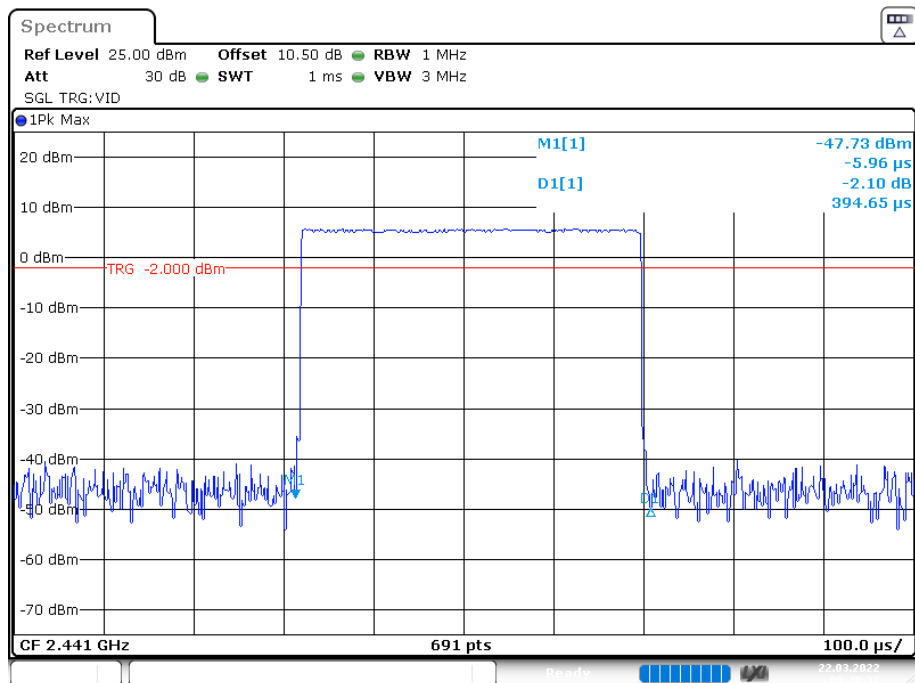
Date: 22.MAR.2022 09:40:38

DH3_ Hop

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB ● RBW 1 MHz
Att   30 dB ● SWT   3.2 s ● VBW 3 MHz
SGL
●1Pk Max

20 dBm

10 dBm

0 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

CF 2.441 GHz   691 pts   316.0 ms/

Date: 21.MAR.2022 18:49:30

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB ● RBW 1 MHz
Att   30 dB ● SWT   3 ms ● VBW 3 MHz
SGL TRG:VID
●1Pk Clrw

M1[1]   -46.91 dBm
                          -8.70 µs
D1[1]   0.79 dB
                          1.65652 ms

20 dBm

10 dBm

0 dBm
TRG -2.000 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

CF 2.441 GHz   691 pts   300.0 µs/

Date: 22.MAR.2022 09:38:56

DH5_ Hop
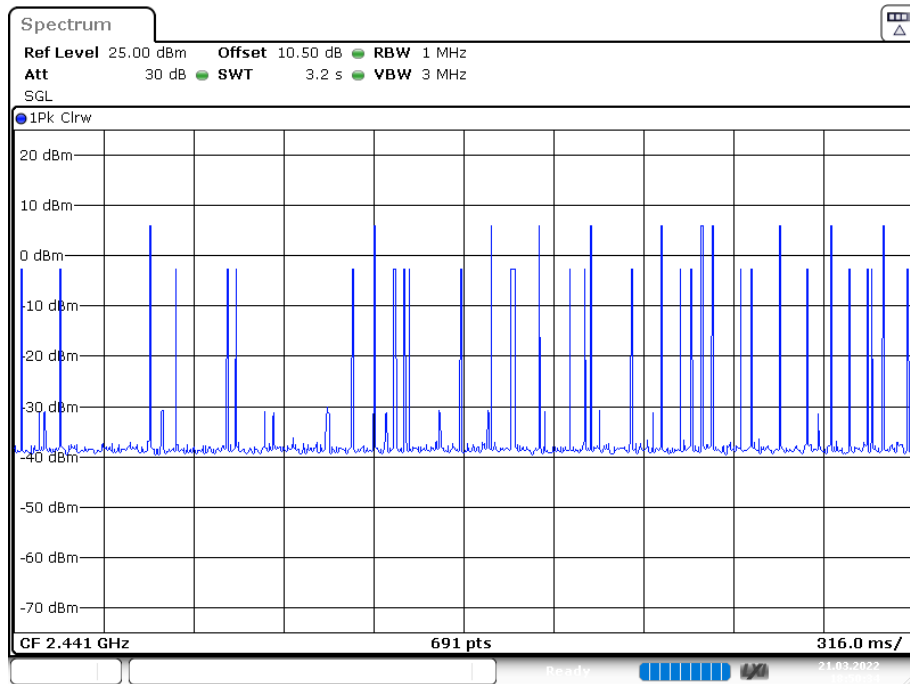
Date: 21.MAR.2022 18:50:35
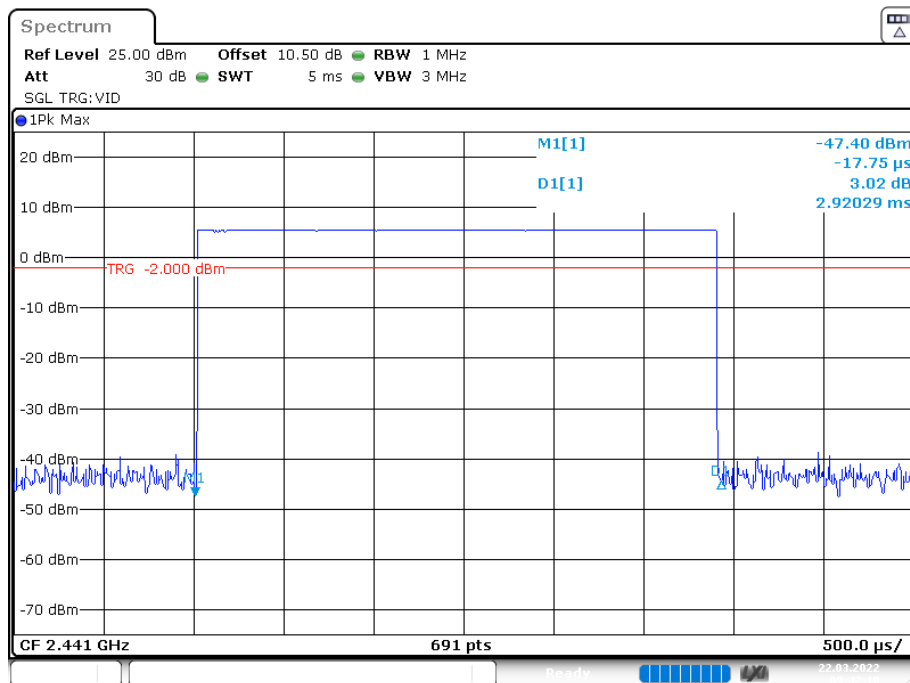
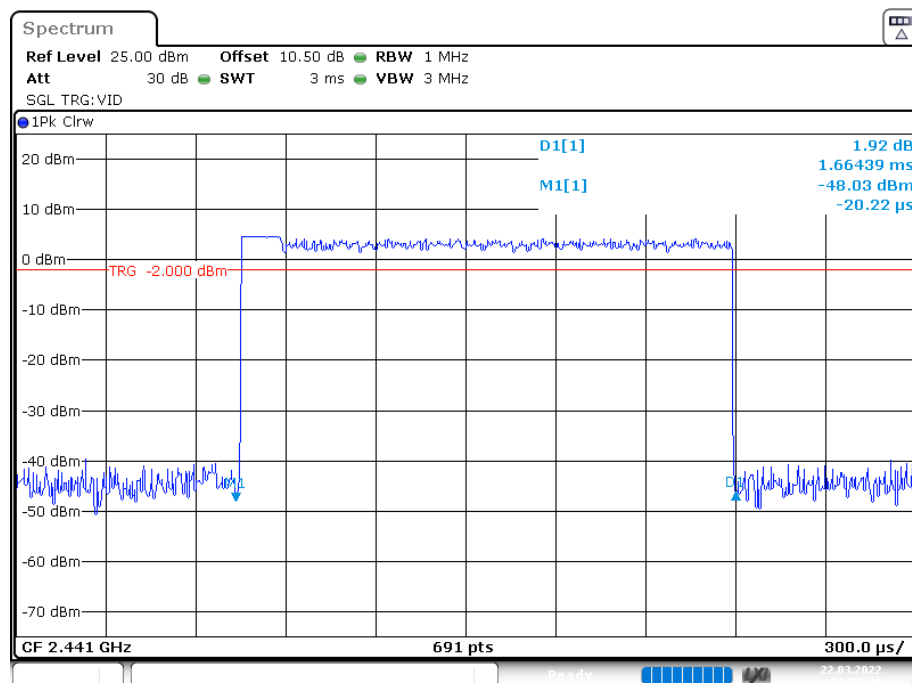Date: 22.MAR.2022 09:42:10

2DH1_Hop
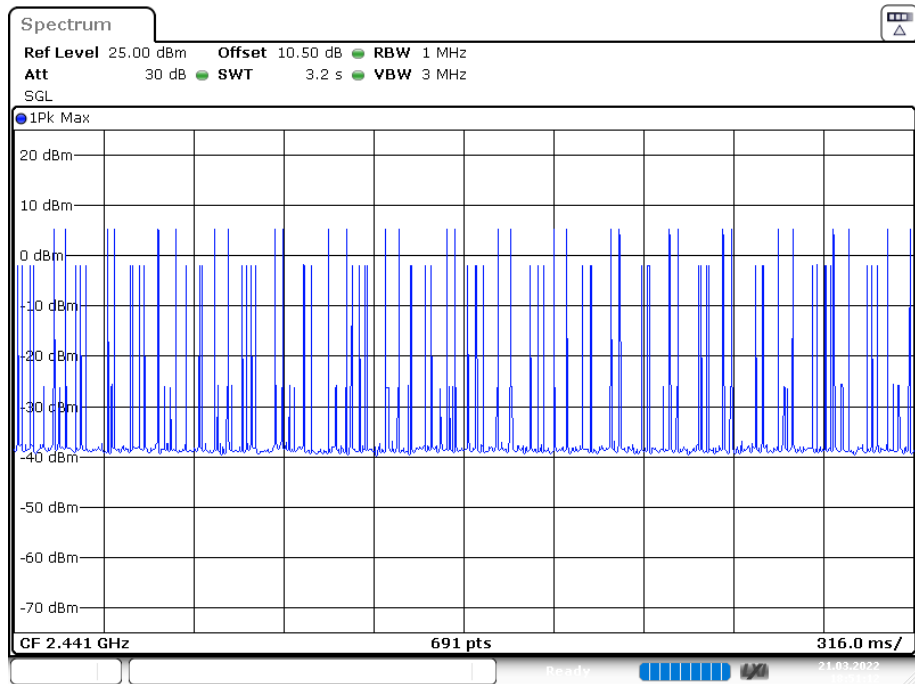
Date: 21.MAR.2022 18:51:13
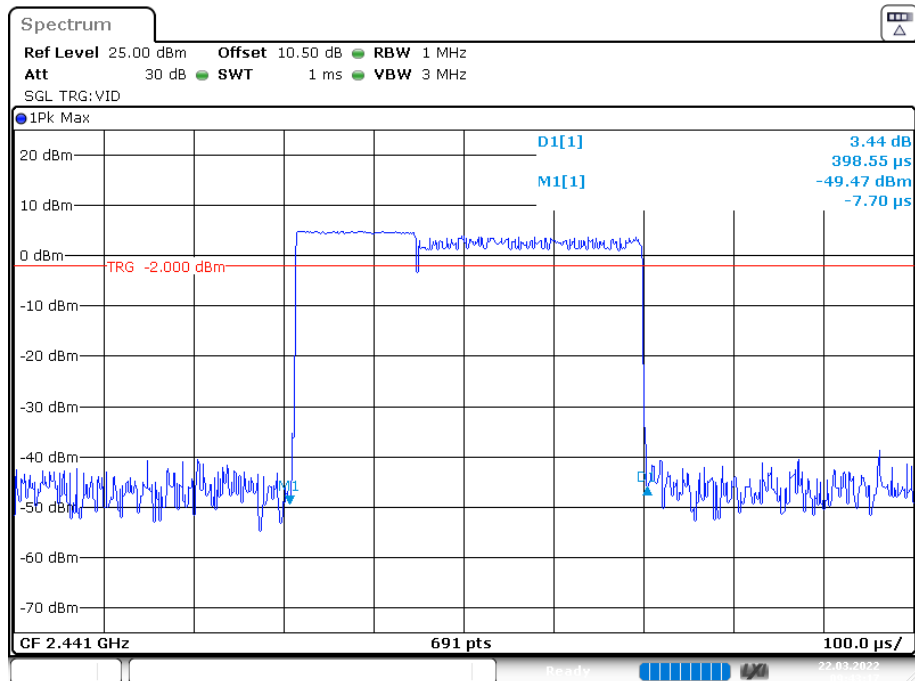
Date: 22.MAR.2022 09:43:18

2DH3_ Hop

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB RBW 1 MHz
Att   30 dB SWT   3.2 s VBW 3 MHz
SGL
●1Pk Max

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

CF 2.441 GHz   691 pts   316.0 ms/

Date: 21.MAR.2022 18:53:44

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB RBW 1 MHz
Att   30 dB SWT   3 ms VBW 3 MHz
SGL TRG:VID
●1Pk Max

M1[1]   -47.95 dBm
                 -16.40 μs
D1[1]   1.16 dB
                 1.67681 ms

20 dBm
10 dBm
0 dBm
TRG -2.000 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

CF 2.441 GHz   691 pts   300.0 μs/

Date: 22.MAR.2022 09:45:01

2DH5_ Hop
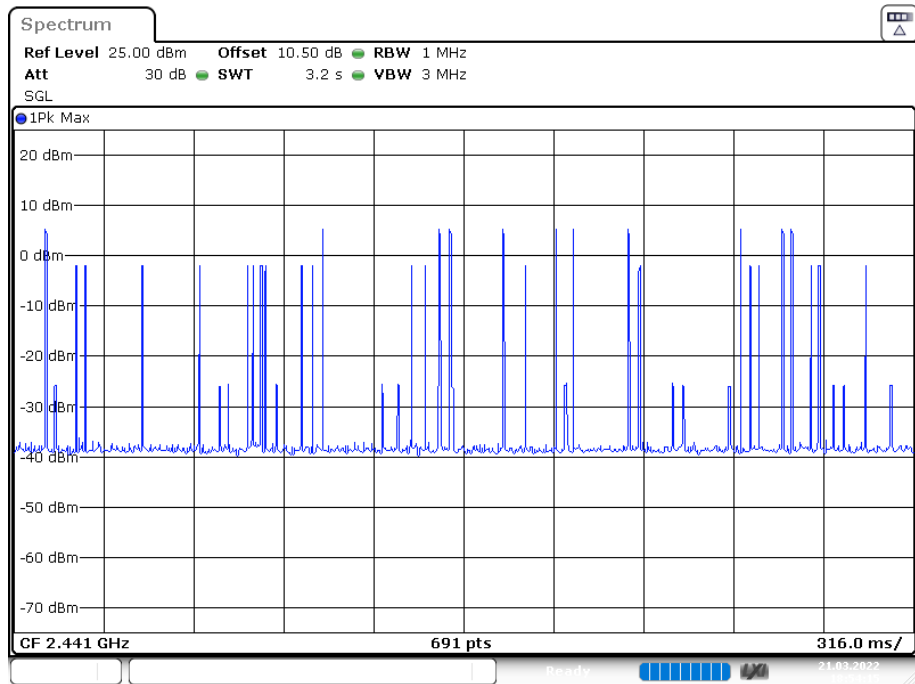
Date: 21.MAR.2022 18:54:15
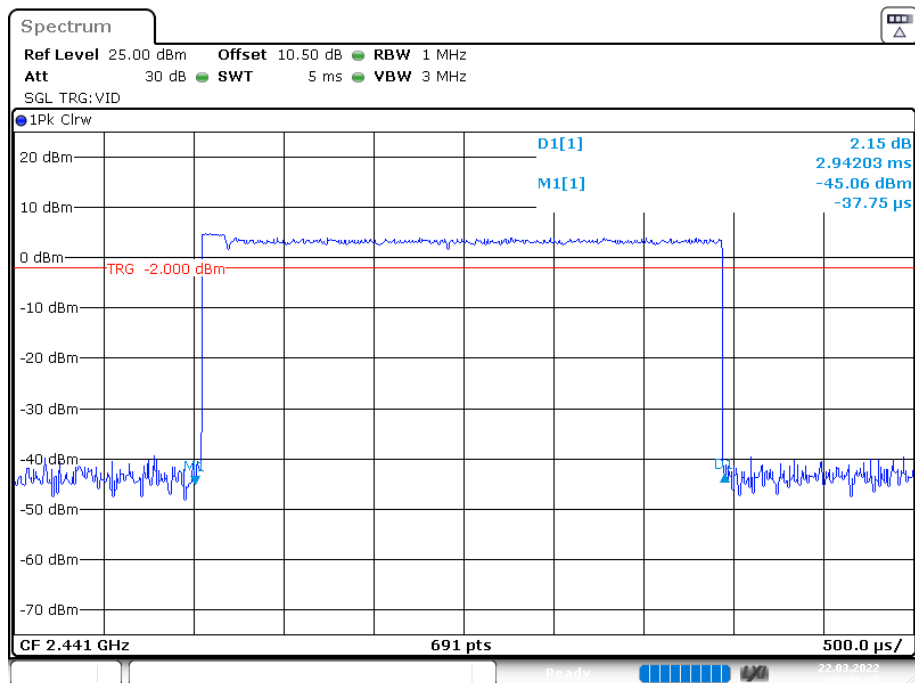
Date: 22.MAR.2022 09:46:26

3DH1_Hop

```
Spectrum
Ref Level 25.00 dBm    Offset 10.50 dB   RBW  1 MHz
Att          30 dB   SWT      3.2 s   VBW  3 MHz
SGL
●1Pk Max

20 dBm

10 dBm

0 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

CF 2.441 GHz                    691 pts                    316.0 ms/
```

Date: 21.MAR.2022 18:54:47

```
Spectrum
Ref Level 25.00 dBm    Offset 10.50 dB   RBW  1 MHz
Att          30 dB   SWT      1 ms   VBW  3 MHz
SGL TRG:VID
●1Pk Max
                                        M1[1]        -47.51 dBm
20 dBm                                                -10.22 µs
                                        D1[1]          -1.15 dB
                                                      406.57 µs
10 dBm

0 dBm
TRG -2.000 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

CF 2.441 GHz                    691 pts                    100.0 µs/
```

Date: 22.MAR.2022 09:48:47

3DH3_ Hop
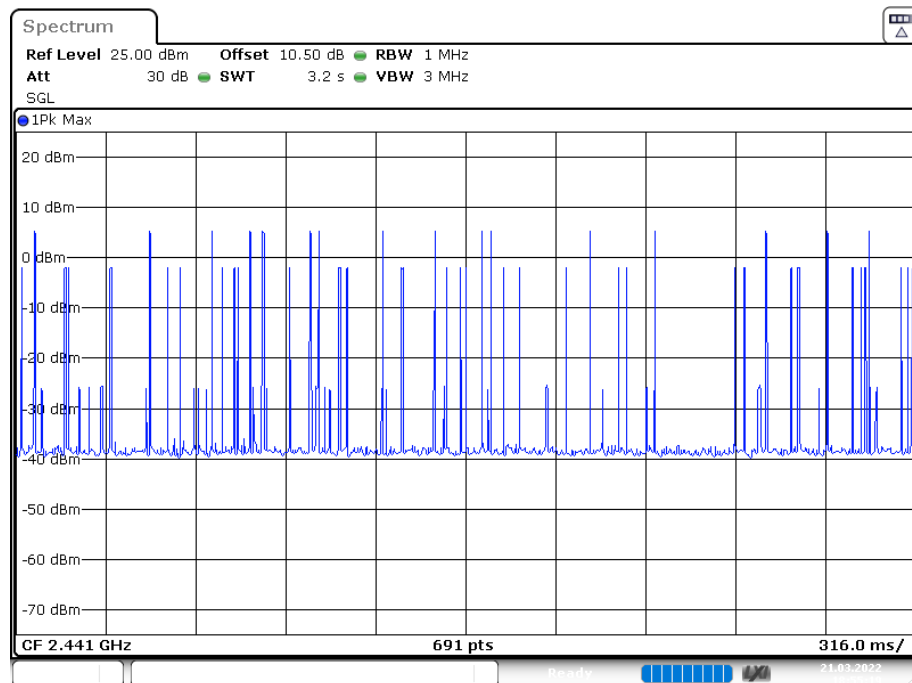
Date: 21.MAR.2022 18:55:19

Date: 22.MAR.2022 09:50:49

3DH5_ Hop
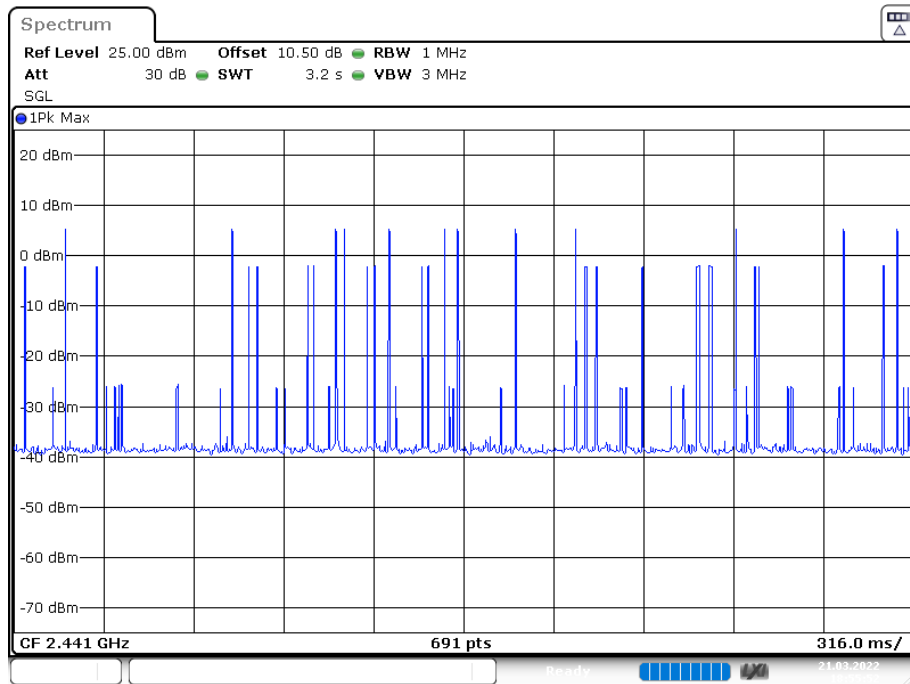
Date: 21.MAR.2022 18:55:53
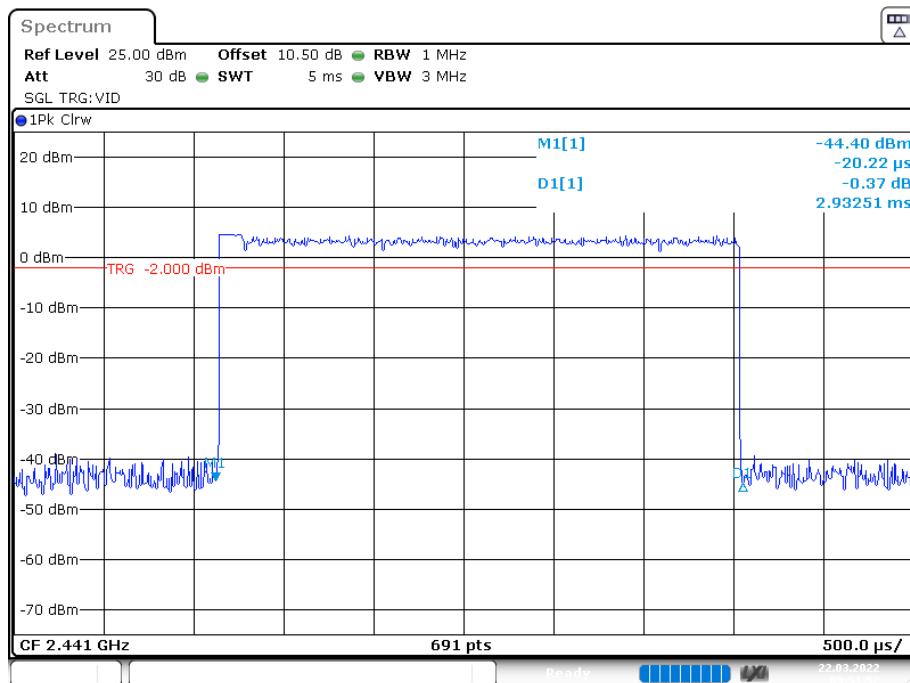
Date: 22.MAR.2022 09:51:53

Ant 2

Test Mode	Channel	Pulse Time [ms]	Total Hops [Num]	Result[s]	Limit[s]	Verdict
DH1	Hop	0.391	320	0.125	<=0.4	PASS
DH3	Hop	1.670	140	0.234	<=0.4	PASS
DH5	Hop	2.963	120	0.356	<=0.4	PASS
2DH1	Hop	0.402	320	0.129	<=0.4	PASS
2DH3	Hop	1.661	140	0.233	<=0.4	PASS
2DH5	Hop	2.949	100	0.295	<=0.4	PASS
3DH1	Hop	0.406	310	0.126	<=0.4	PASS
3DH3	Hop	1.657	180	0.298	<=0.4	PASS
3DH5	Hop	2.928	110	0.322	<=0.4	PASS

Note 1: A period time=0.4*79=31.6(S), Result= Pulse Time *Total hops
Note 2: Total hops=Hopping Number in 3.16s*10
Note 3: Hopping Number in 3.16s=Total of highest signals in 3.16s (Second high signals were other channel)
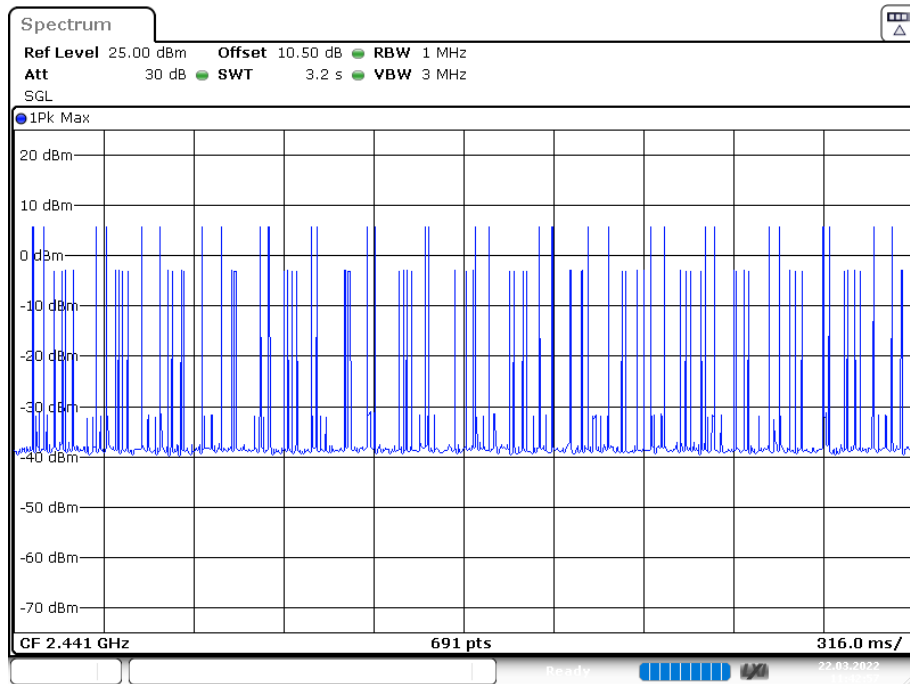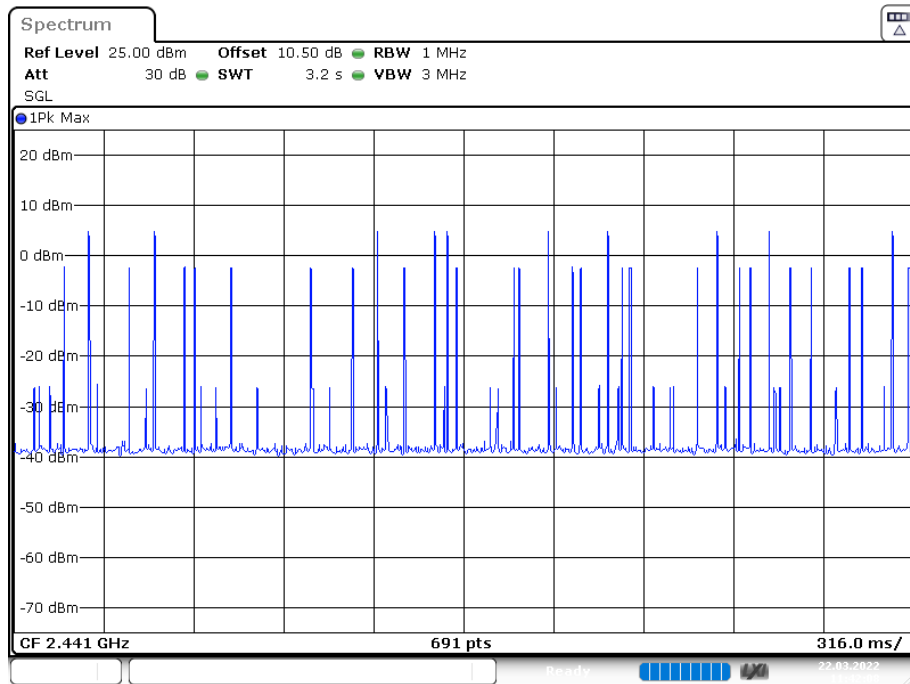
DH1_Hop

Date: 22.MAR.2022 11:42:57
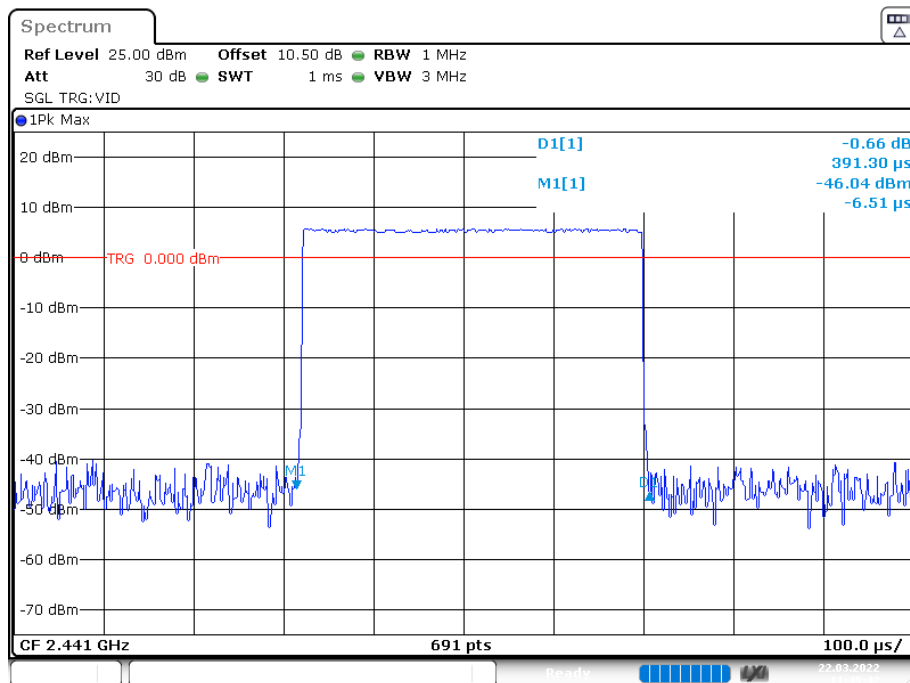
Date: 22.MAR.2022 11:49:42
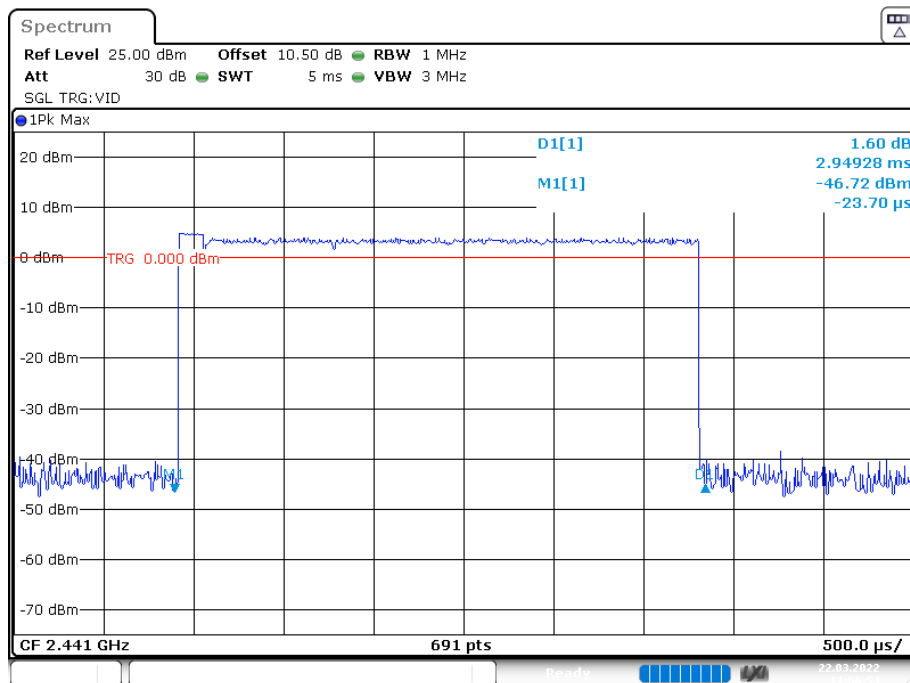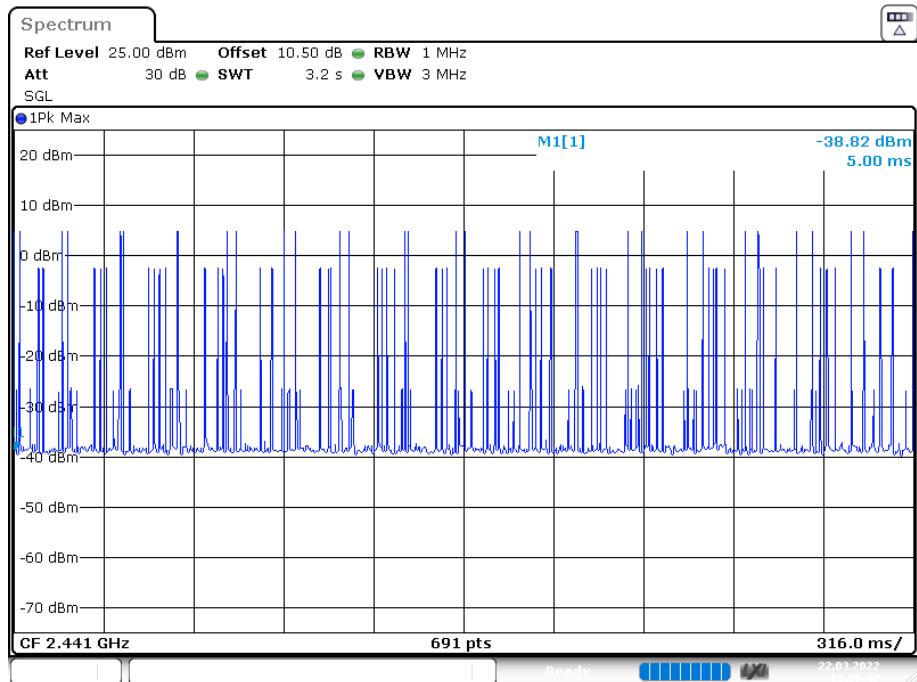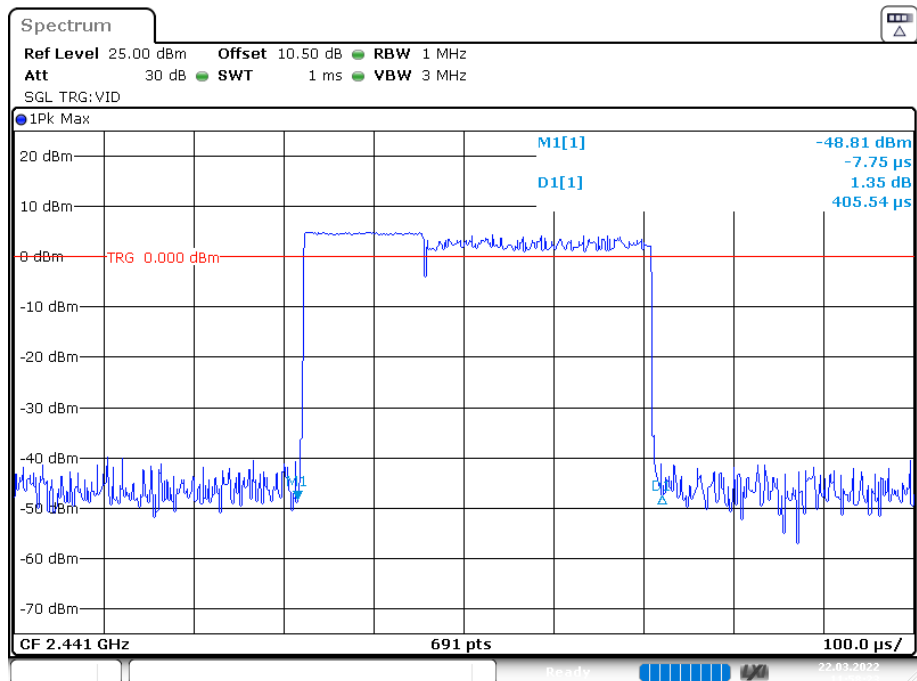
DH3_ Hop
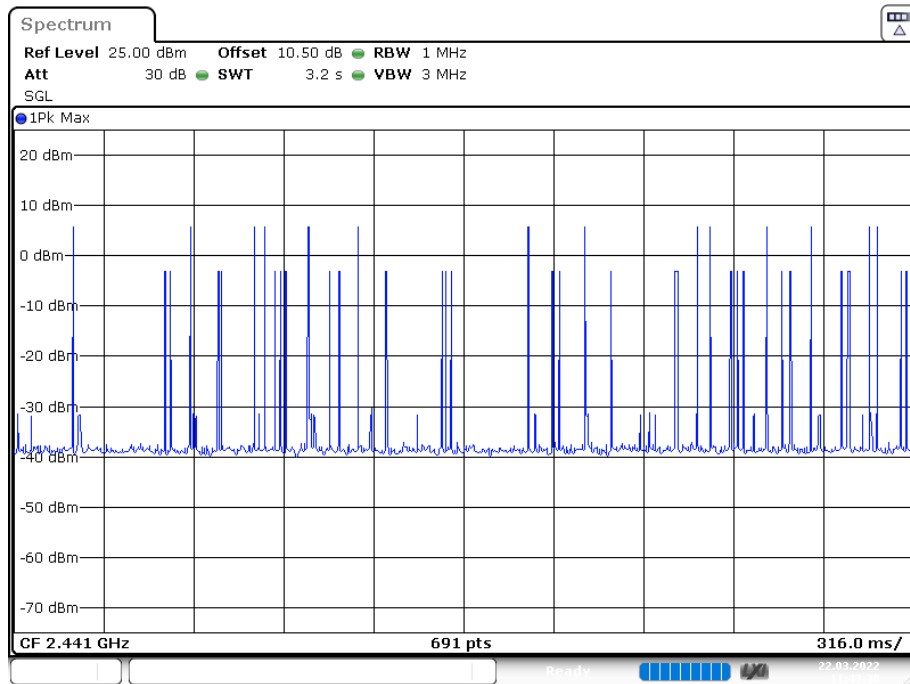
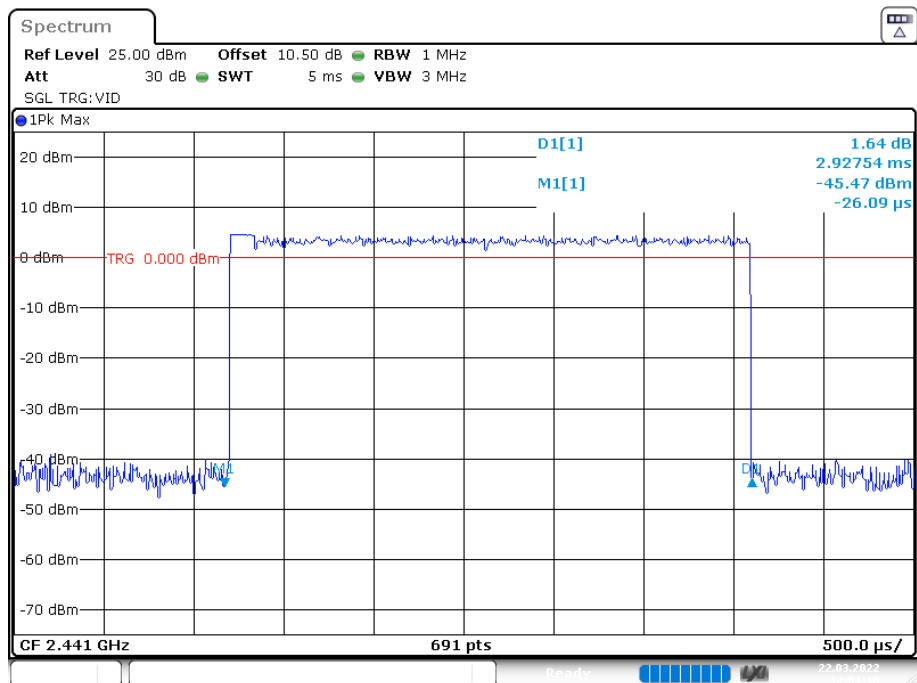Date: 22.MAR.2022 11:43:30
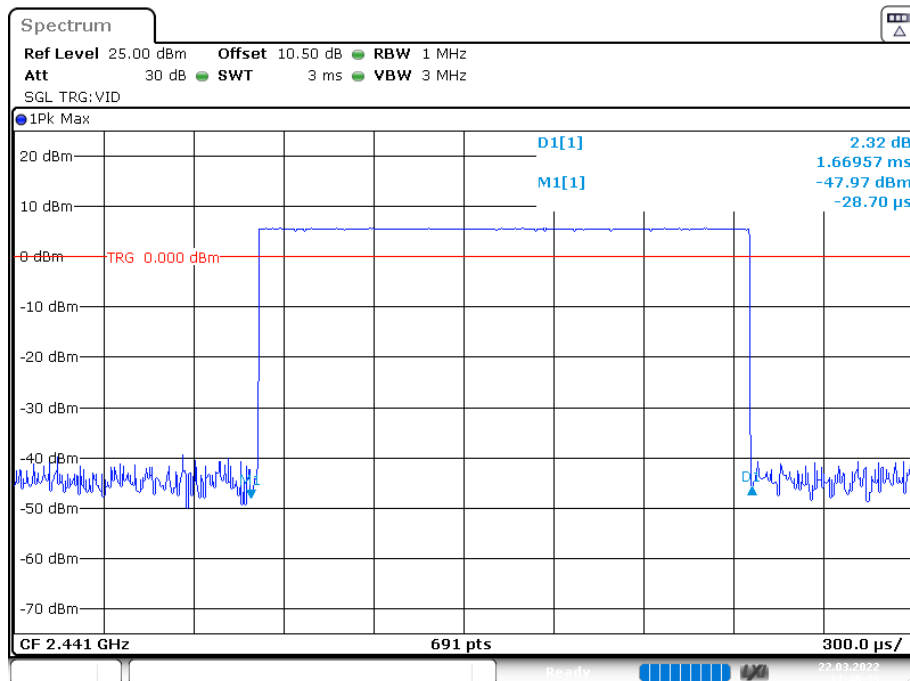
Date: 22.MAR.2022 11:48:33

DH5_ Hop

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB ● RBW 1 MHz
Att   30 dB ● SWT   3.2 s ● VBW 3 MHz
SGL
● 1Pk Max

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

CF 2.441 GHz   691 pts   316.0 ms/

Date: 22.MAR.2022 11:44:29

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB ● RBW 1 MHz
Att   30 dB ● SWT   5 ms ● VBW 3 MHz
SGL TRG:VID
● 1Pk Max

D1[1]   0.99 dB
                 2.96267 ms
M1[1]   -44.84 dBm
                  -31.14 µs

20 dBm
10 dBm
0 dBm   TRG 0.000 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

CF 2.441 GHz   691 pts   500.0 µs/

Date: 22.MAR.2022 11:51:13

2DH1_Hop
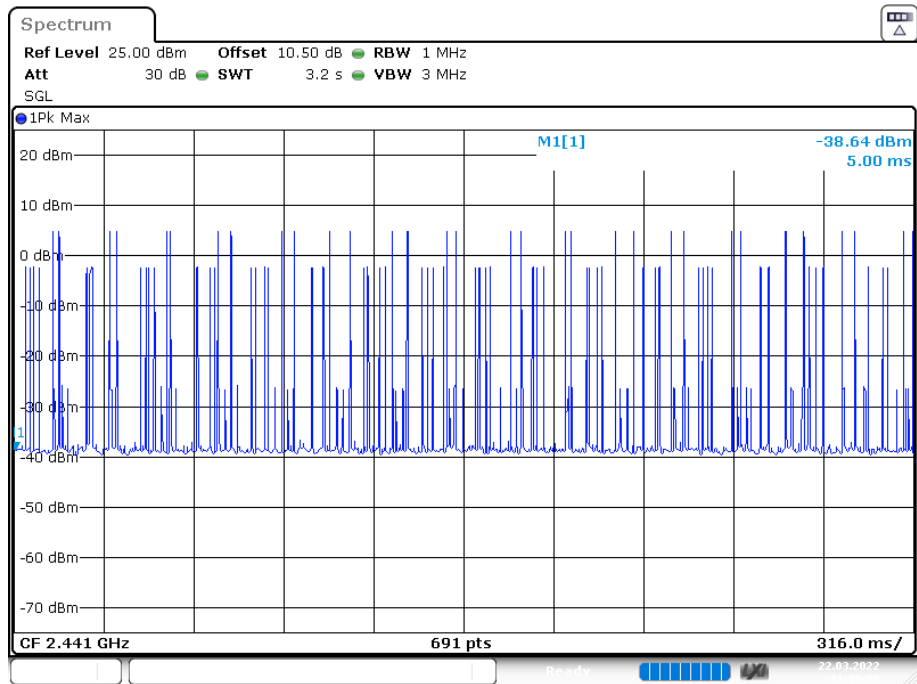
Date: 22.MAR.2022 11:39:03
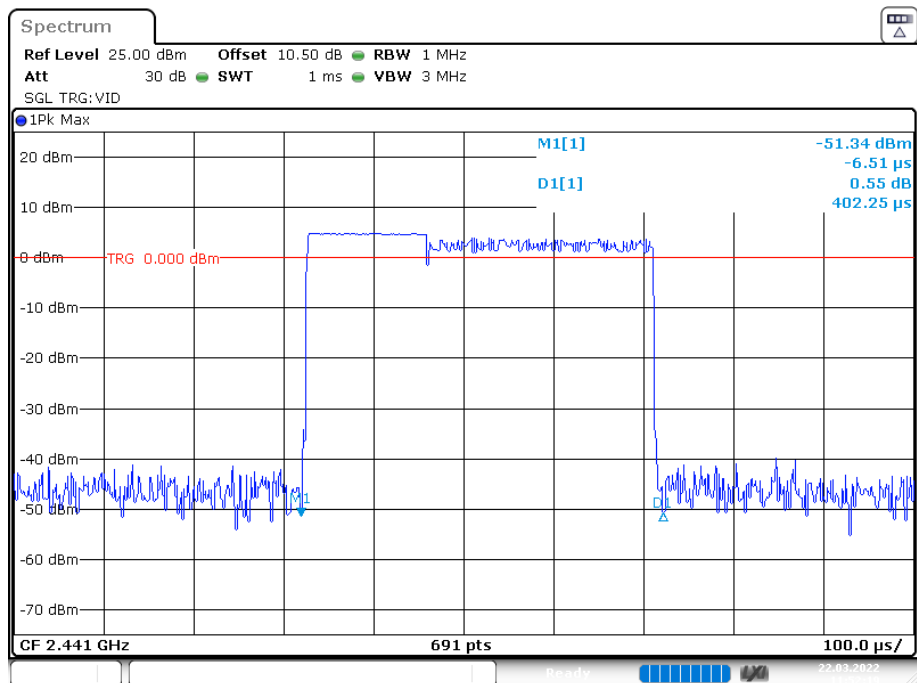
Date: 22.MAR.2022 11:52:19

2DH3_ Hop

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB ● RBW 1 MHz
Att   30 dB ● SWT   3.2 s ● VBW 3 MHz
SGL
● 1Pk Max

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

CF 2.441 GHz   691 pts   316.0 ms/

Date: 22.MAR.2022 11:39:53

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB ● RBW 1 MHz
Att   30 dB ● SWT   3 ms ● VBW 3 MHz
SGL TRG:VID
● 1Pk Max

                                                        D1[1]   1.84 dB
20 dBm   1.66087 ms
                                                        M1[1]   -46.88 dBm
10 dBm   -15.00 μs
0 dBm   TRG 0.000 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

CF 2.441 GHz   691 pts   300.0 μs/

Date: 22.MAR.2022 11:55:45

2DH5_ Hop

Date: 22.MAR.2022 11:42:09

Date: 22.MAR.2022 11:56:54

3DH1_Hop

Date: 22.MAR.2022 11:36:42

Date: 22.MAR.2022 11:58:24

3DH3_ Hop
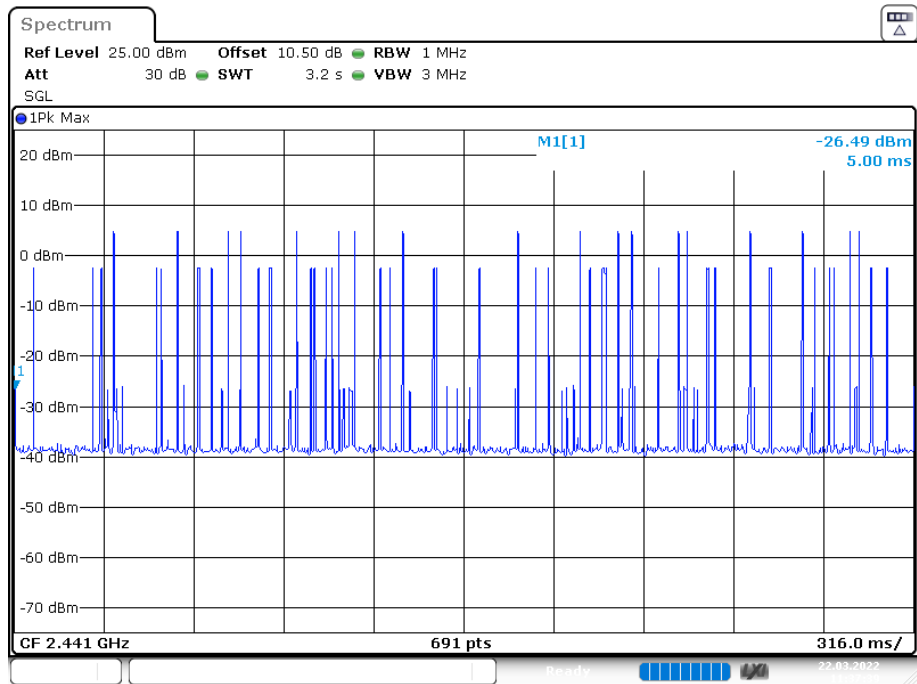
Date: 22.MAR.2022 11:37:39
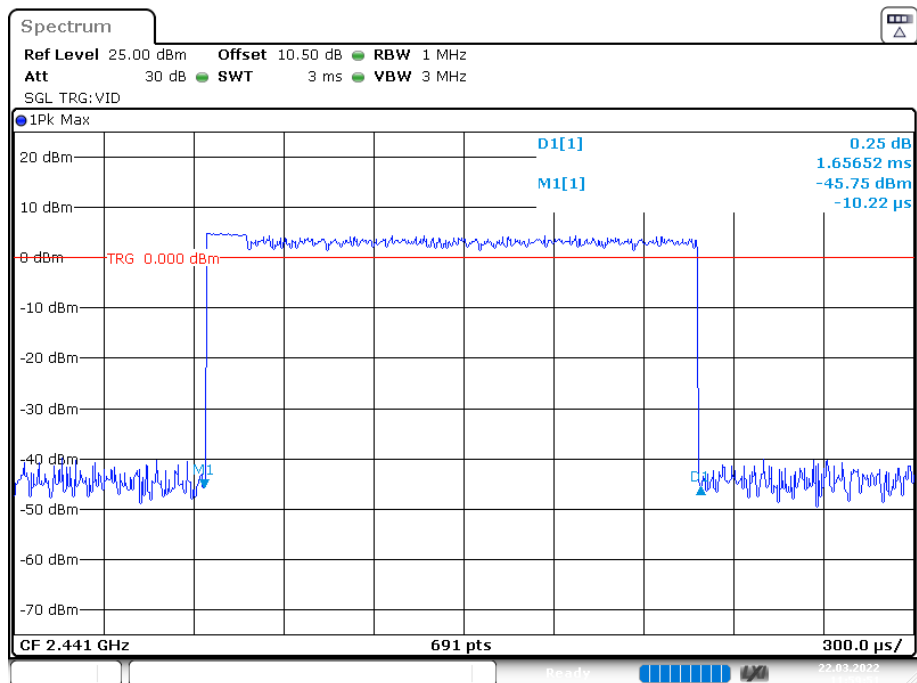
Date: 22.MAR.2022 11:59:51

3DH5_ Hop
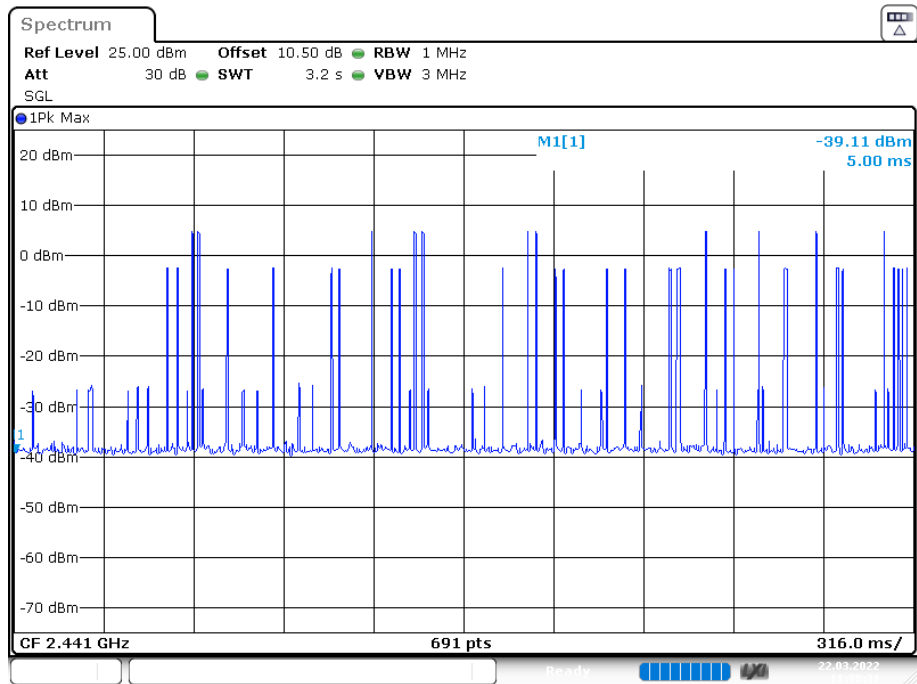
Date: 22.MAR.2022 11:38:31

Date: 22.MAR.2022 12:01:10

FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

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

Test Procedure

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

```
┌──────────┐        ┌────────────┐   ┌──────────────────┐
│   EUT    │────────│ Attenuator │   │ Spectrum Analyzer │
└──────────┘        └────────────┘   └──────────────────┘
```

Test Data

Environmental Conditions

Temperature:	26℃
Relative Humidity:	57.3 %
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding from 2022-03-21 to 2022-03-22.

EUT operation mode: Transmitting

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

Ant 1

Mode	Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
BDR (GFSK)	Low	2402	5.43	21
	Middle	2441	6.22	21
	High	2480	5.74	21
EDR (π/4-DQPSK)	Low	2402	4.54	21
	Middle	2441	5.42	21
	High	2480	4.98	21
EDR (8DPSK)	Low	2402	4.73	21
	Middle	2441	5.42	21
	High	2480	5.08	21

DH1_2402
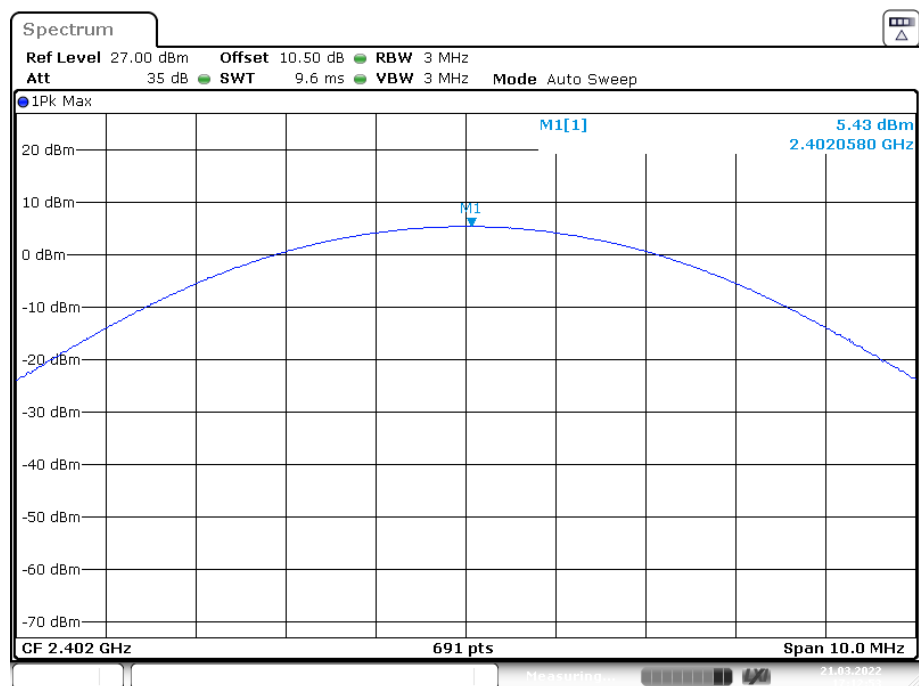
Date: 21.MAR.2022   17:12:53

DH1_2441
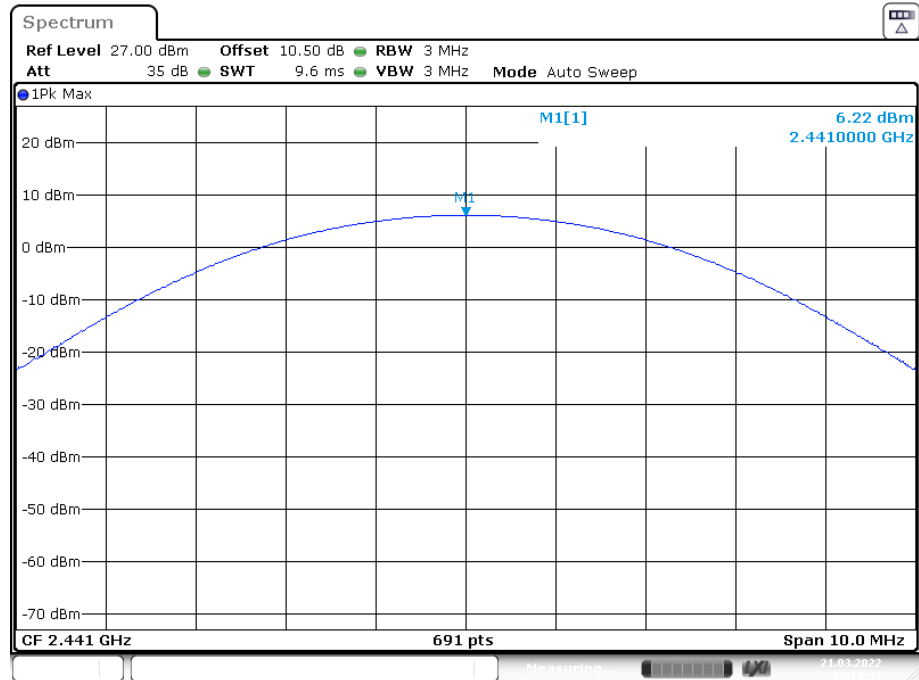
Date: 21.MAR.2022 17:13:37

DH1_2480
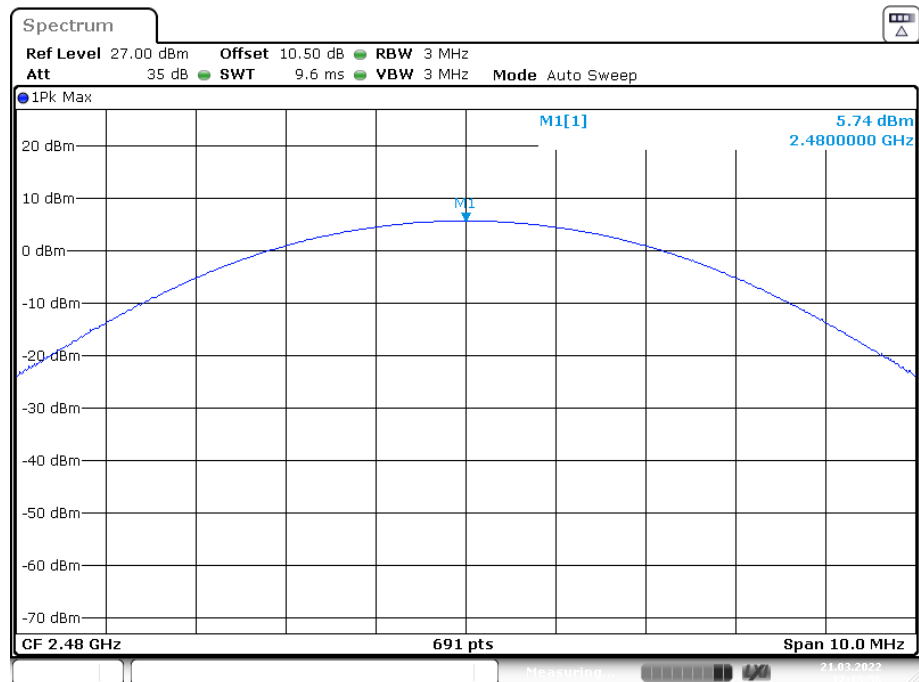
Date: 21.MAR.2022 17:13:56

2DH1_2402

Spectrum	

Ref Level 27.00 dBm   Offset 10.50 dB ● RBW 3 MHz
Att   35 dB ● SWT   9.6 ms ● VBW 3 MHz   Mode Auto Sweep

● 1Pk Max

M1[1]   4.54 dBm
                                         2.4020720 GHz

20 dBm
10 dBm   M1
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

CF 2.402 GHz   691 pts   Span 10.0 MHz
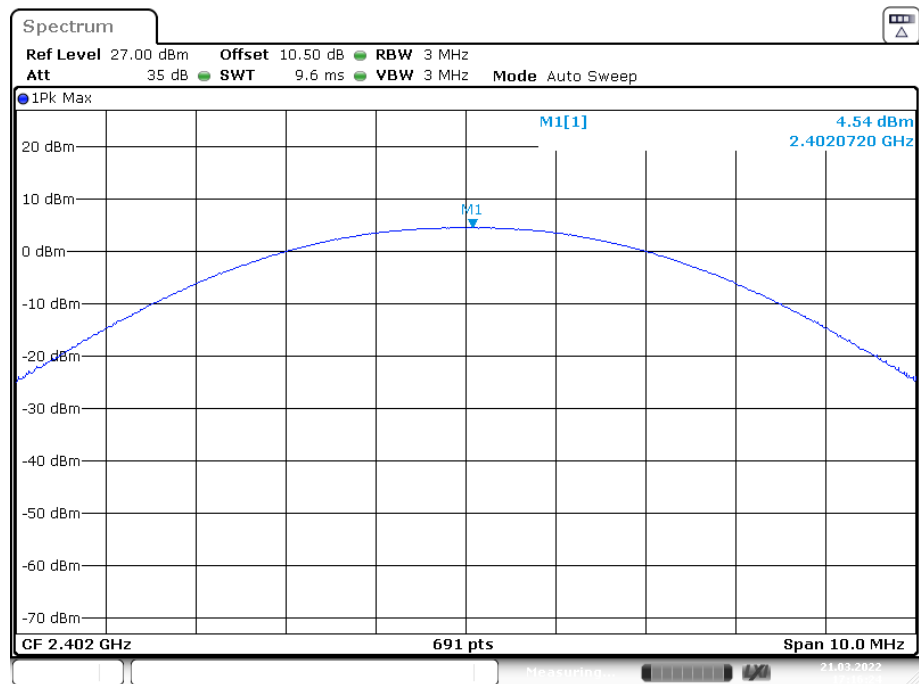
Date: 21.MAR.2022 17:16:24

2DH1_2441

Spectrum	

Ref Level 27.00 dBm   Offset 10.50 dB ● RBW 3 MHz
Att   35 dB ● SWT   9.6 ms ● VBW 3 MHz   Mode Auto Sweep

● 1Pk Max

M1[1]   5.42 dBm
                                         2.4409710 GHz

20 dBm
10 dBm   M1
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

CF 2.441 GHz   691 pts   Span 10.0 MHz
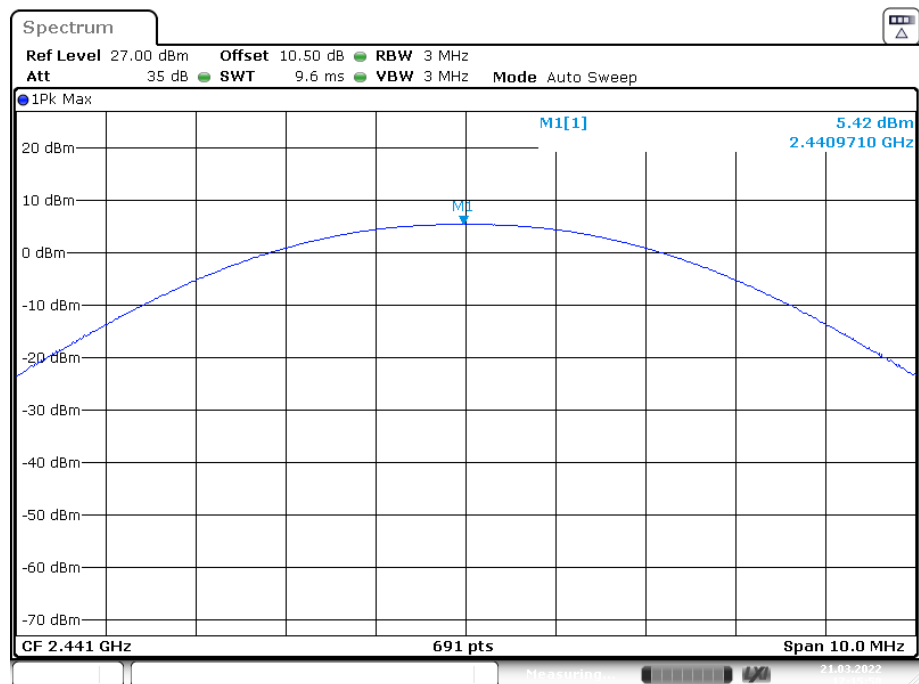
Date: 21.MAR.2022 17:15:58

2DH1_2480
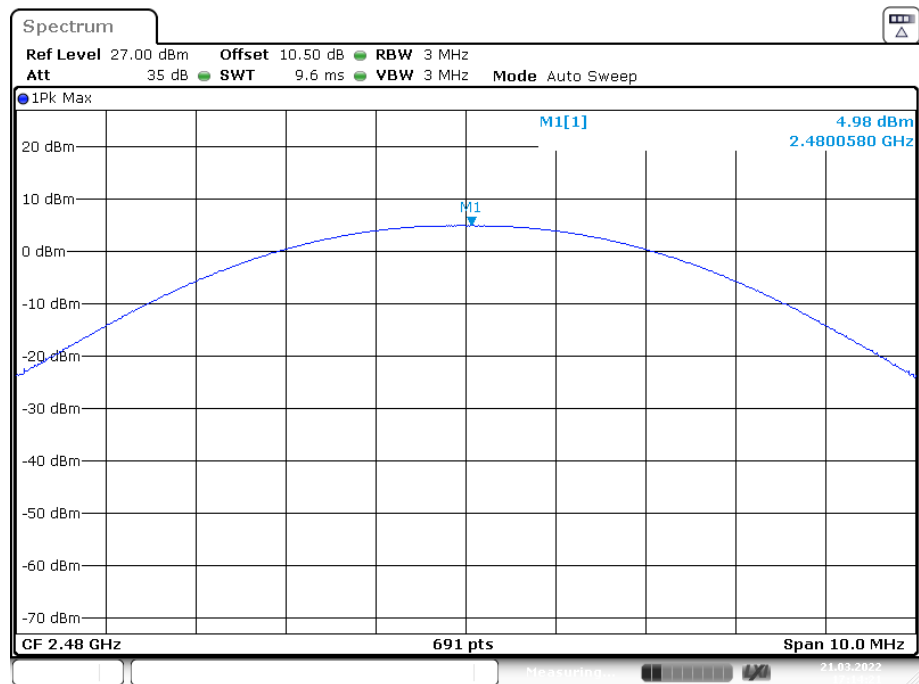
Date: 21.MAR.2022 17:14:22

3DH1_2402
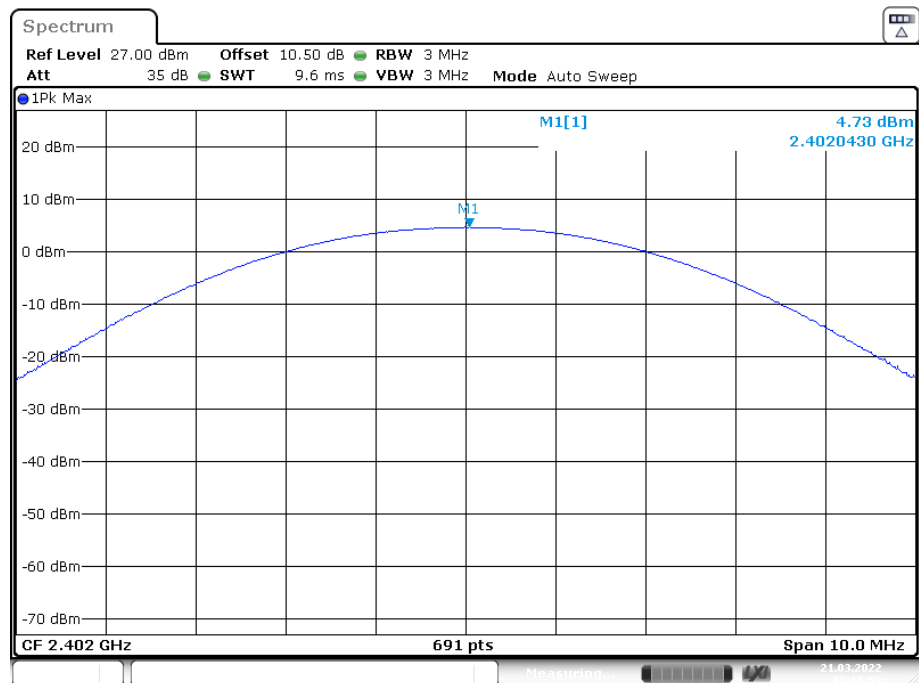
Date: 21.MAR.2022 17:16:59

3DH1_2441
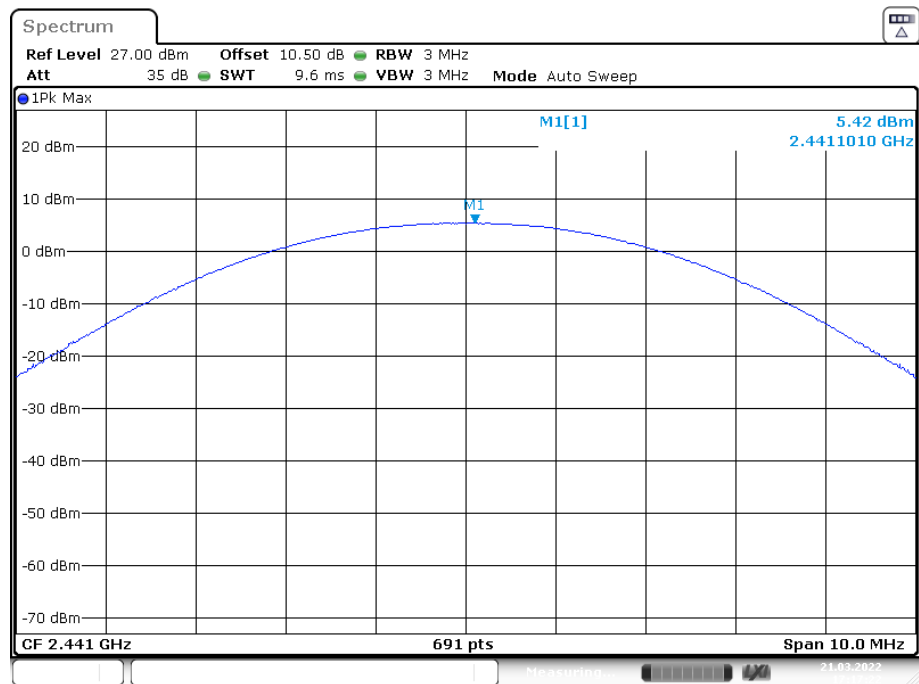
Date: 21.MAR.2022 17:17:22

3DH1_2480
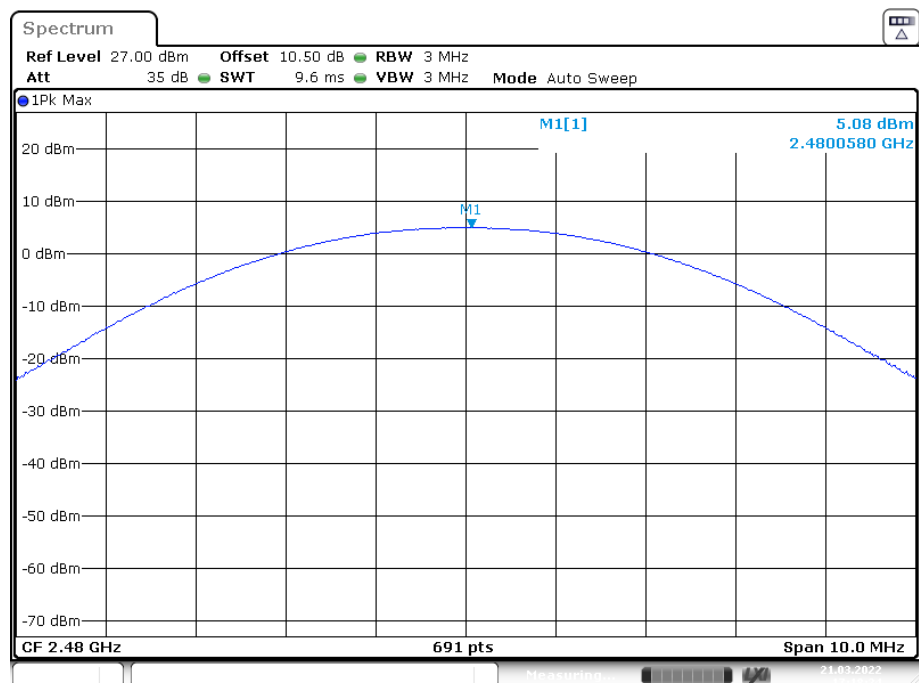
Date: 21.MAR.2022 17:18:24

Ant 2

Mode	Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
BDR (GFSK)	Low	2402	4.98	21
	Middle	2441	5.59	21
	High	2480	5.02	21
EDR (π/4-DQPSK)	Low	2402	4.08	21
	Middle	2441	4.75	21
	High	2480	4.20	21
EDR (8DPSK)	Low	2402	4.17	21
	Middle	2441	4.78	21
	High	2480	4.22	21

DH1_2402
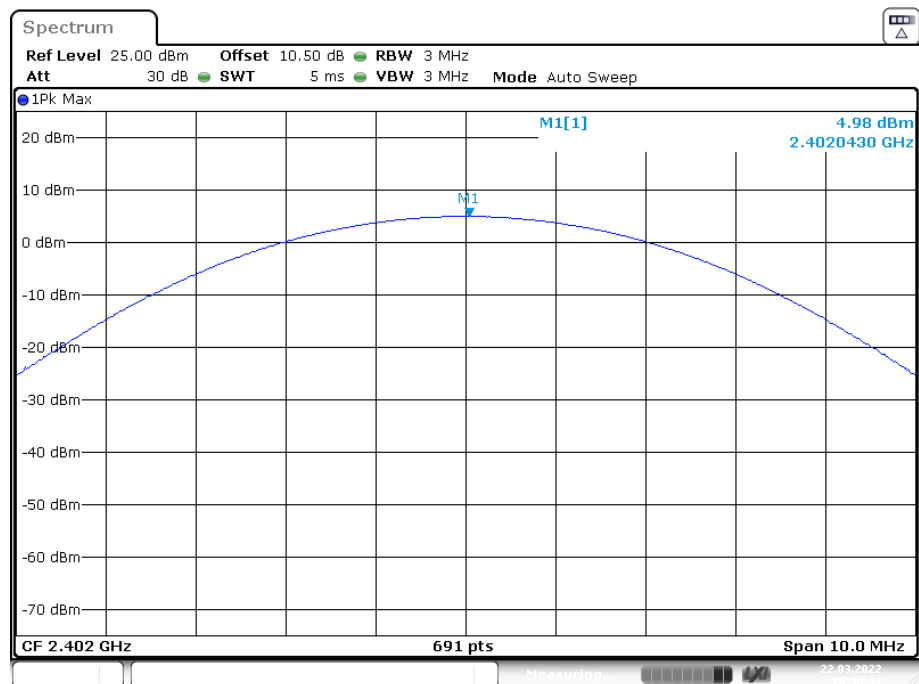
Date: 22.MAR.2022 10:40:31

DH1_2441
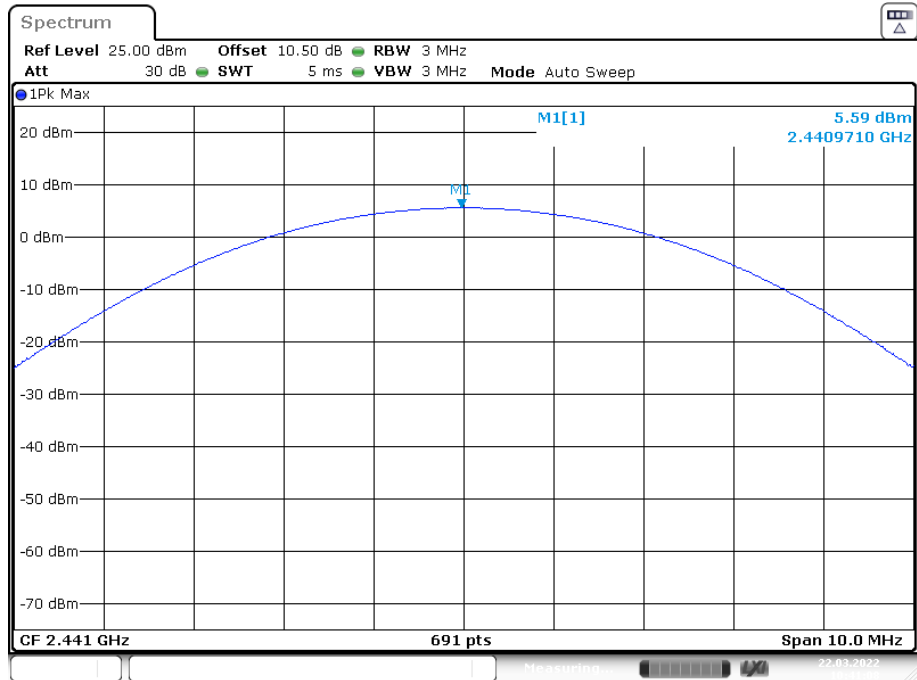
Date: 22.MAR.2022 10:41:08

DH1_2480
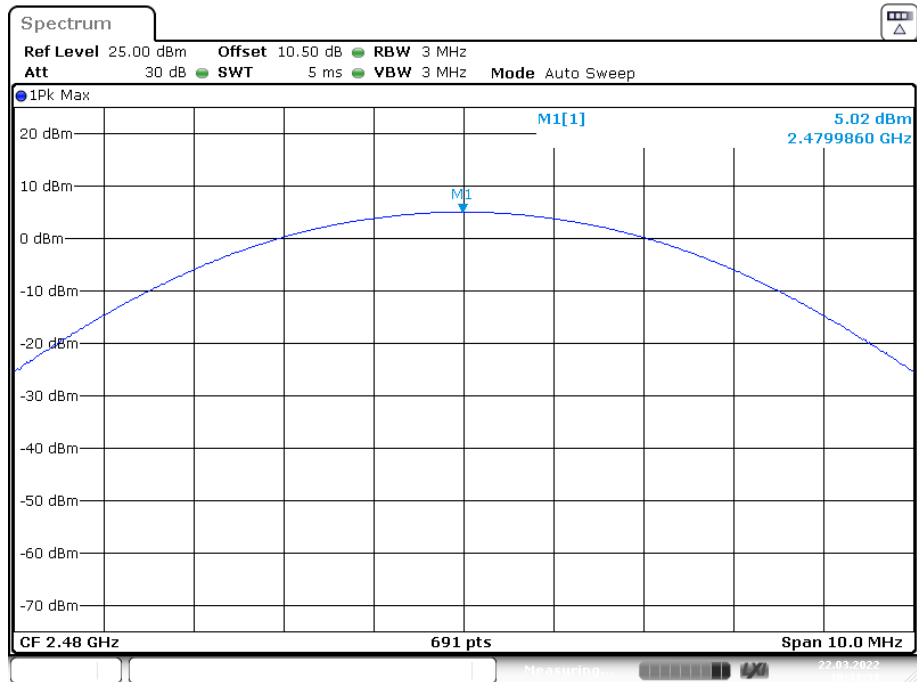
Date: 22.MAR.2022 10:41:31

2DH1_2402
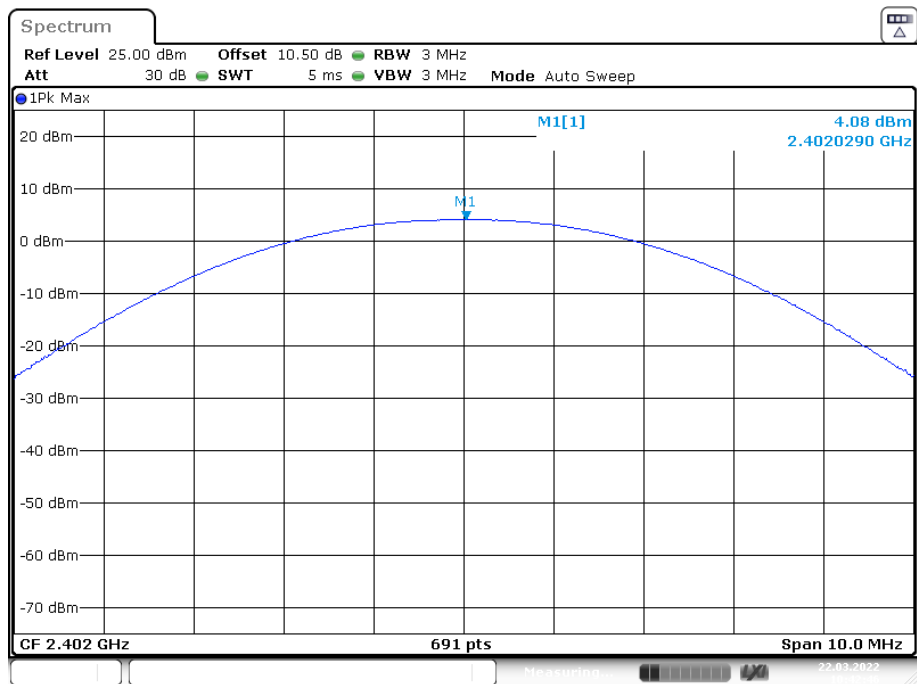
Date: 22.MAR.2022 10:42:46

2DH1_2441
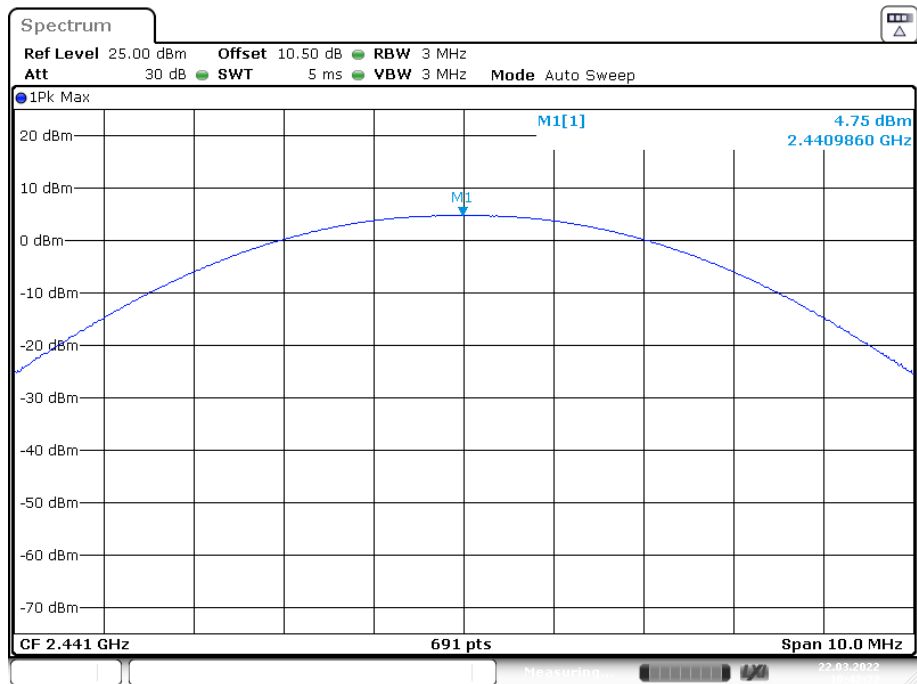
Date: 22.MAR.2022 10:42:22

2DH1_2480

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB ● RBW 3 MHz
Att   30 dB ● SWT   5 ms ● VBW 3 MHz   Mode Auto Sweep

● 1Pk Max

M1[1]   4.20 dBm
                                   2.4800720 GHz

20 dBm

10 dBm

0 dBm   M1

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

CF 2.48 GHz   691 pts   Span 10.0 MHz
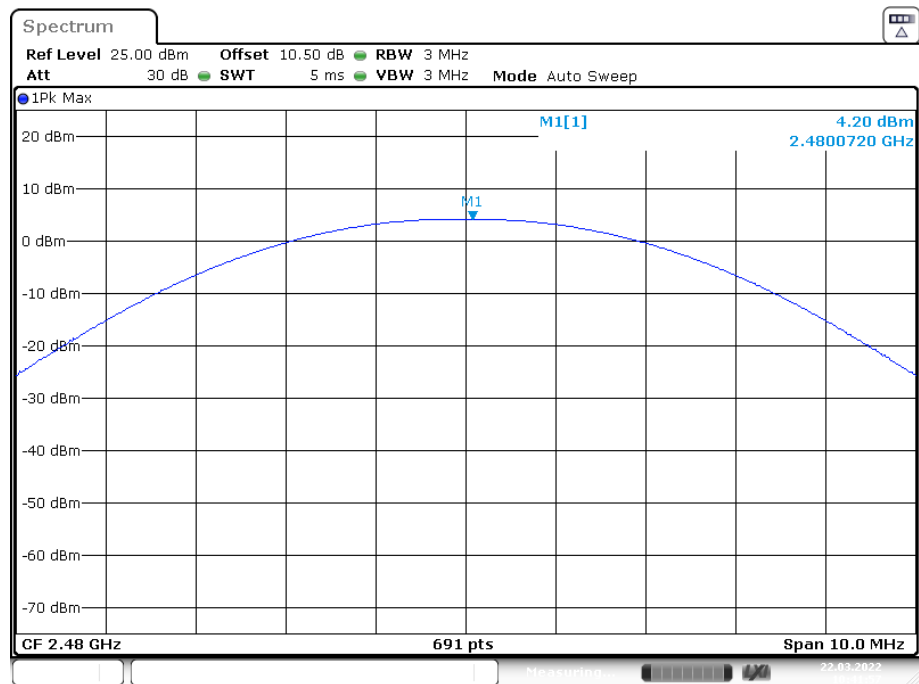
Date: 22.MAR.2022 10:41:57

3DH1_2402

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB ● RBW 3 MHz
Att   30 dB ● SWT   5 ms ● VBW 3 MHz   Mode Auto Sweep

● 1Pk Max

M1[1]   4.17 dBm
                                   2.4019860 GHz

20 dBm

10 dBm

0 dBm   M1

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

CF 2.402 GHz   691 pts   Span 10.0 MHz
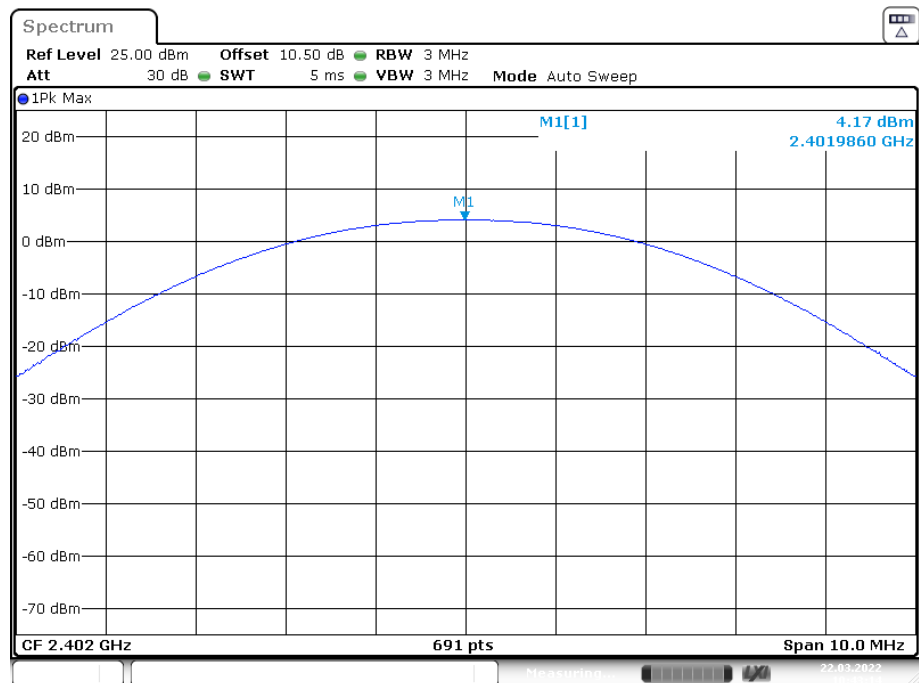
Date: 22.MAR.2022 10:43:14

3DH1_2441

Spectrum		
Ref Level 25.00 dBm	Offset 10.50 dB ● RBW 3 MHz	
Att 30 dB ● SWT	5 ms ● VBW 3 MHz	Mode Auto Sweep

● 1Pk Max

M1[1] 4.78 dBm 2.4409420 GHz

CF 2.441 GHz   691 pts   Span 10.0 MHz
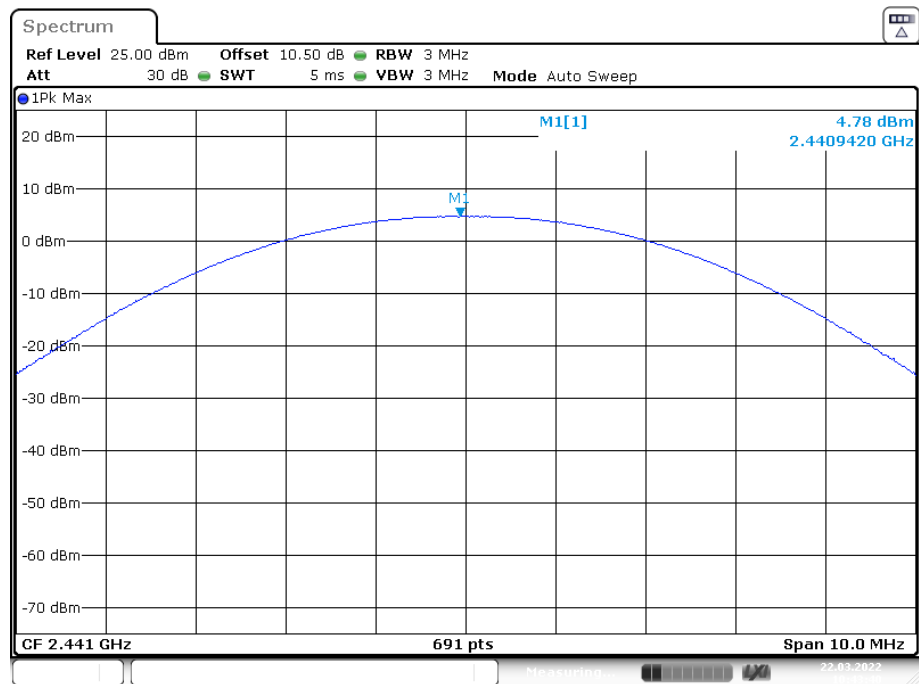
Date: 22.MAR.2022 10:43:40

3DH1_2480

Spectrum		
Ref Level 25.00 dBm	Offset 10.50 dB ● RBW 3 MHz	
Att 30 dB ● SWT	5 ms ● VBW 3 MHz	Mode Auto Sweep

● 1Pk Max

M1[1] 4.22 dBm 2.4799860 GHz

CF 2.48 GHz   691 pts   Span 10.0 MHz
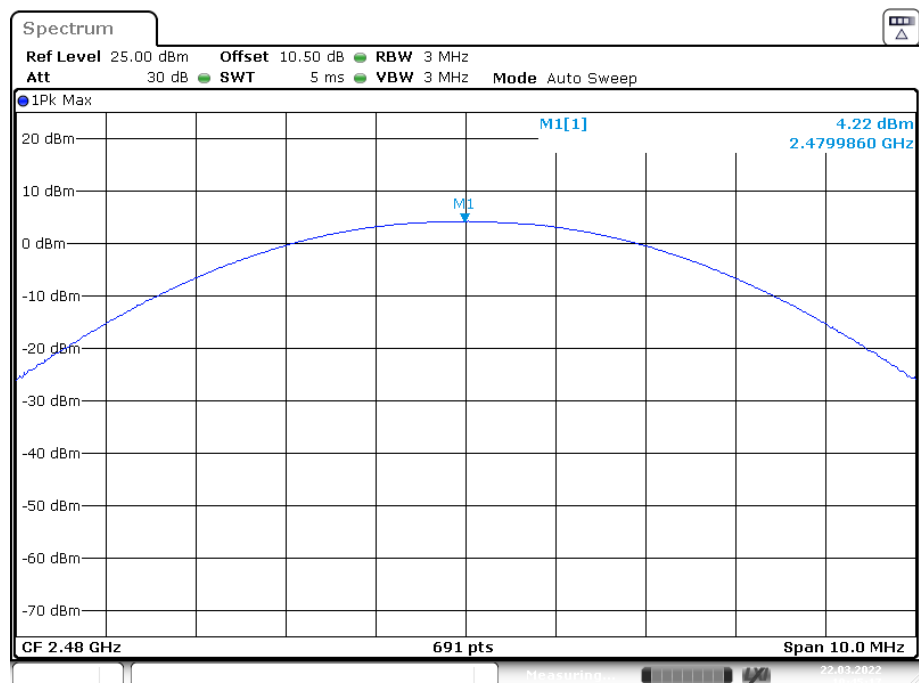
Date: 22.MAR.2022 10:45:17

FCC §15.247(d) - BAND EDGES TESTING

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS Ave.eraging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Procedure

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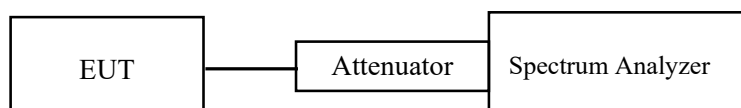
| EUT | | Attenuator | Spectrum Analyzer |

Test Data

Environmental Conditions

Temperature:	26℃
Relative Humidity:	57.3 %
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding on 2022-03-22 and 2022-03-29.

EUT operation mode: Transmitting

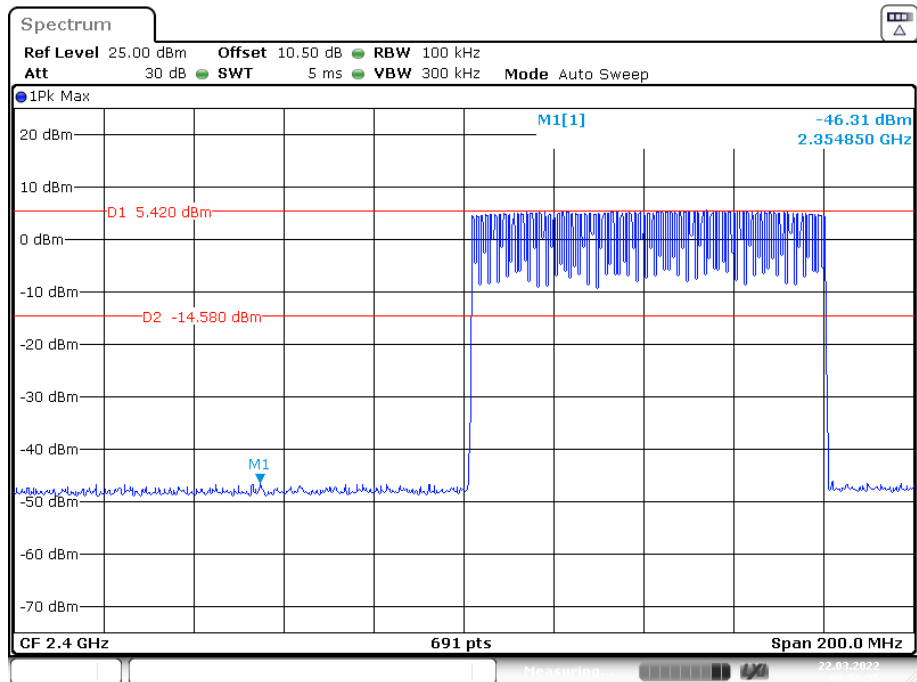Test Result: Compliance. Please refer to following plots.

Ant 1:

DH1_Low_2402MHz
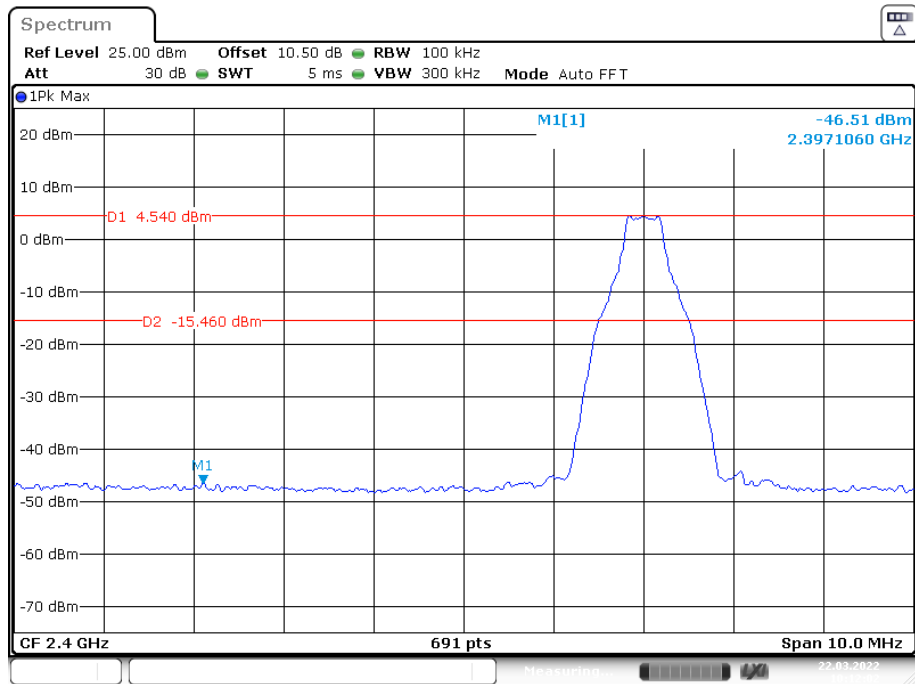
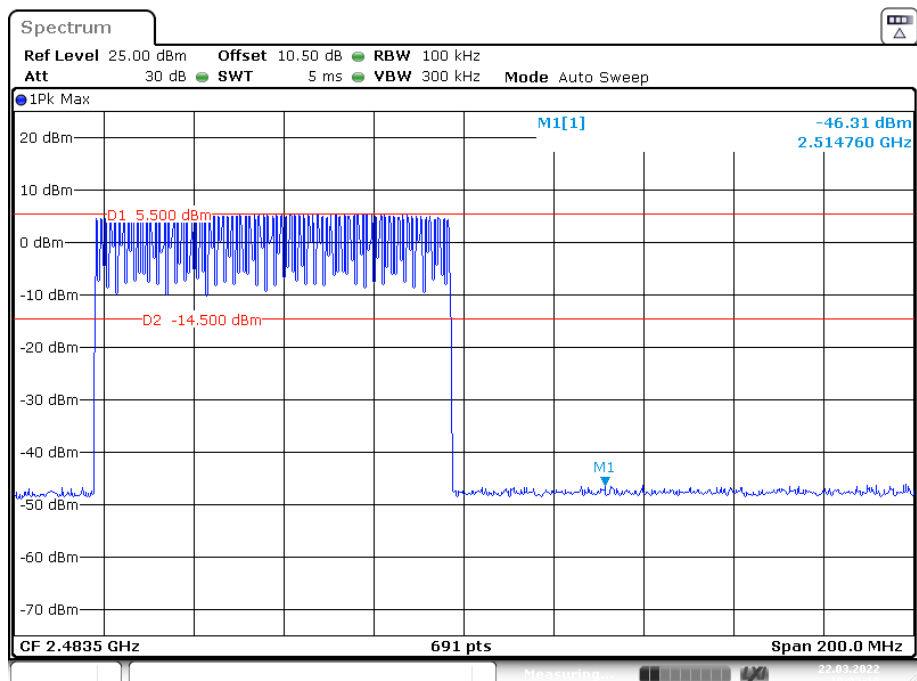

Date: 22.MAR.2022 10:12:02

DH1_High_2480MHz
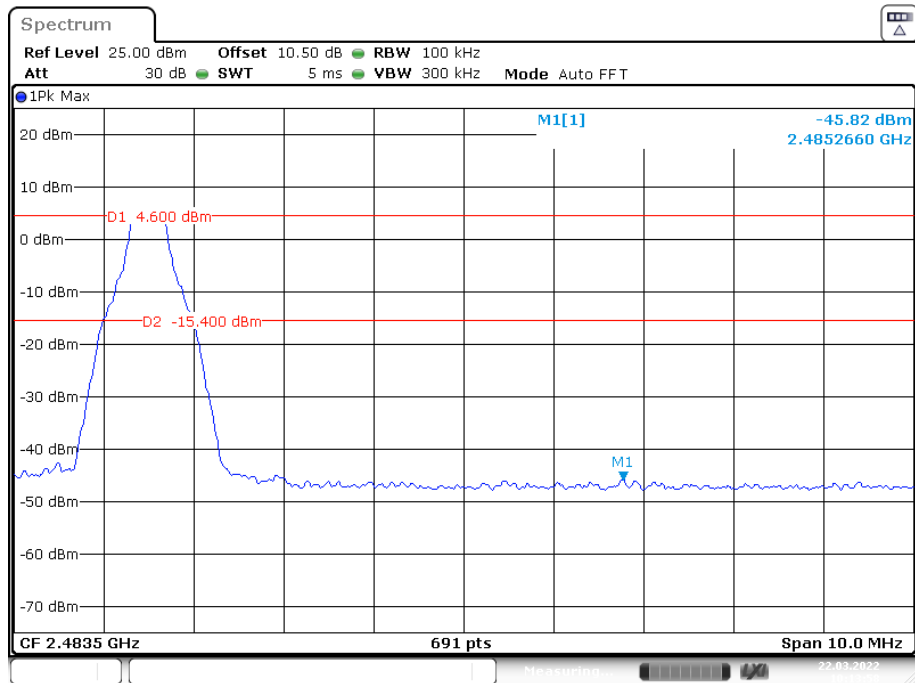
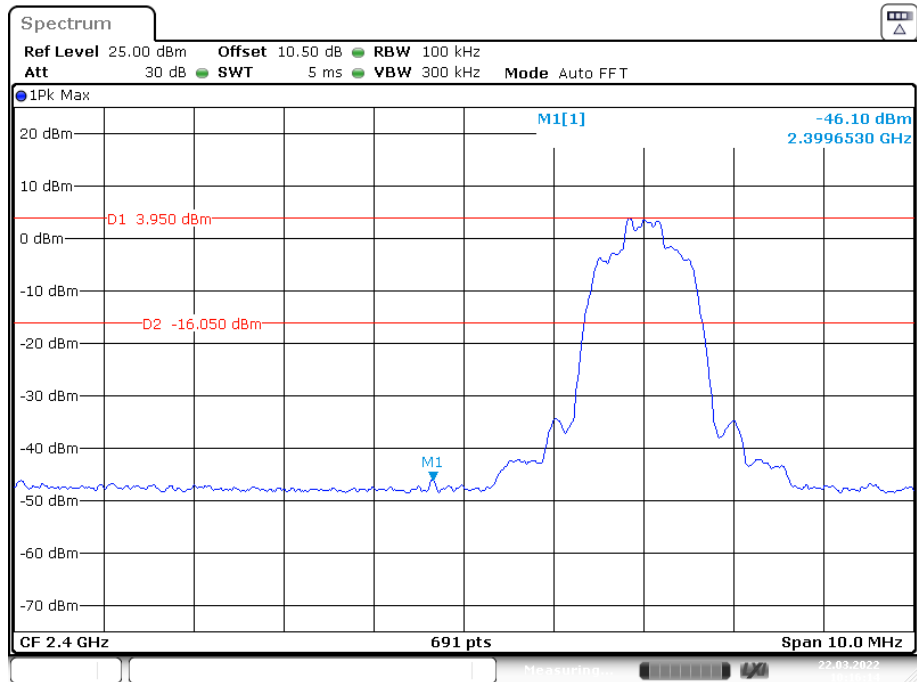Date: 22.MAR.2022 10:13:58

DH1_Low_Hop_2402MHz

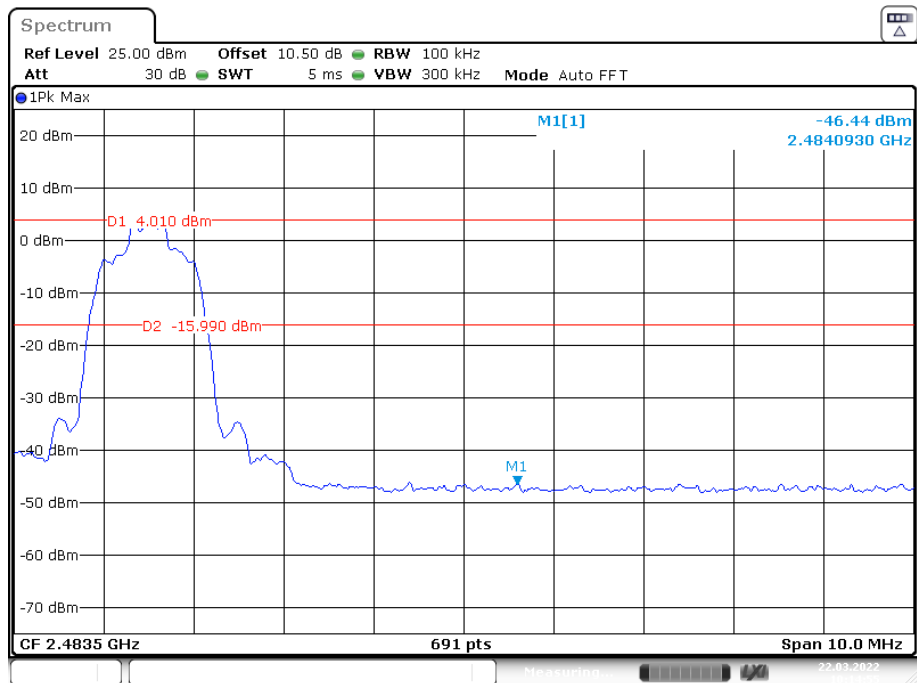Date: 22.MAR.2022 09:58:36

DH1_High_Hop_2480MHz
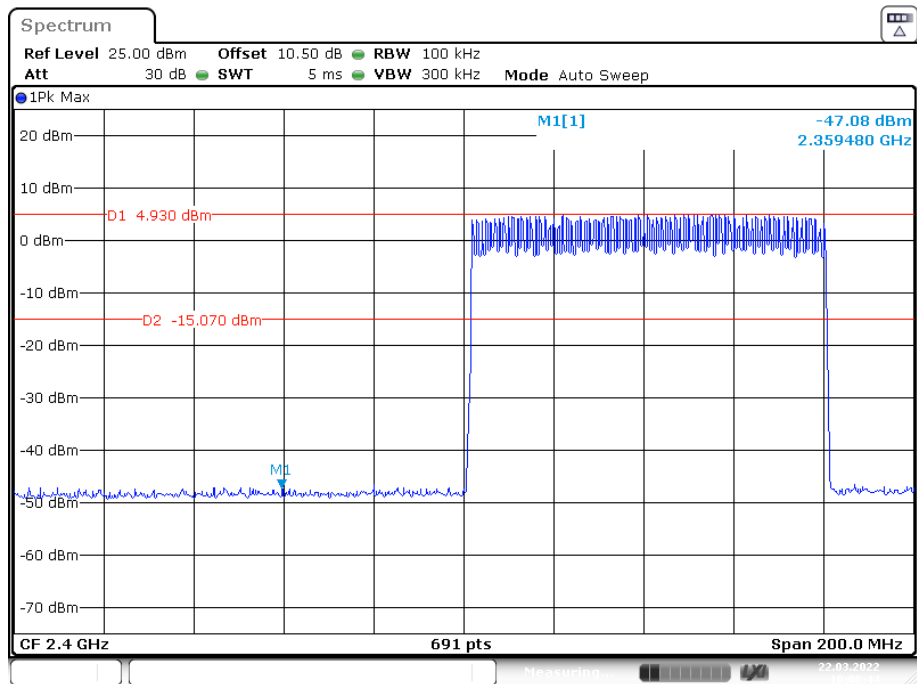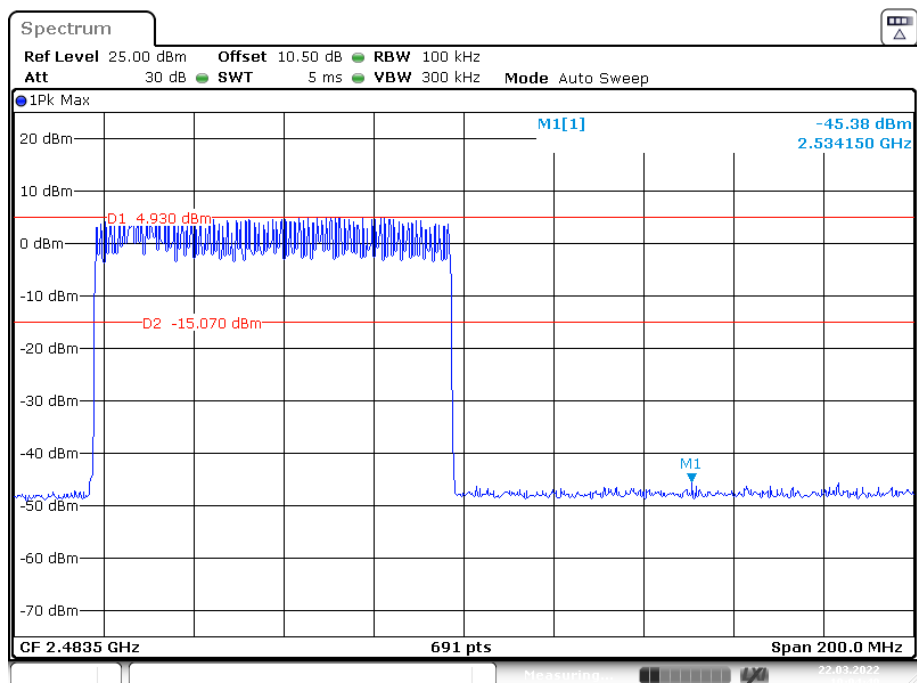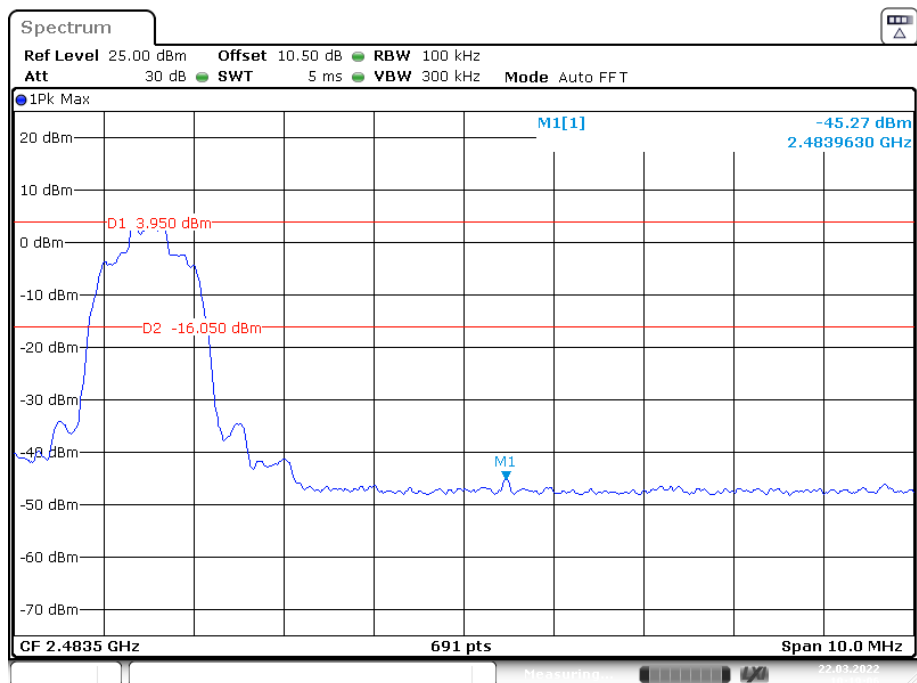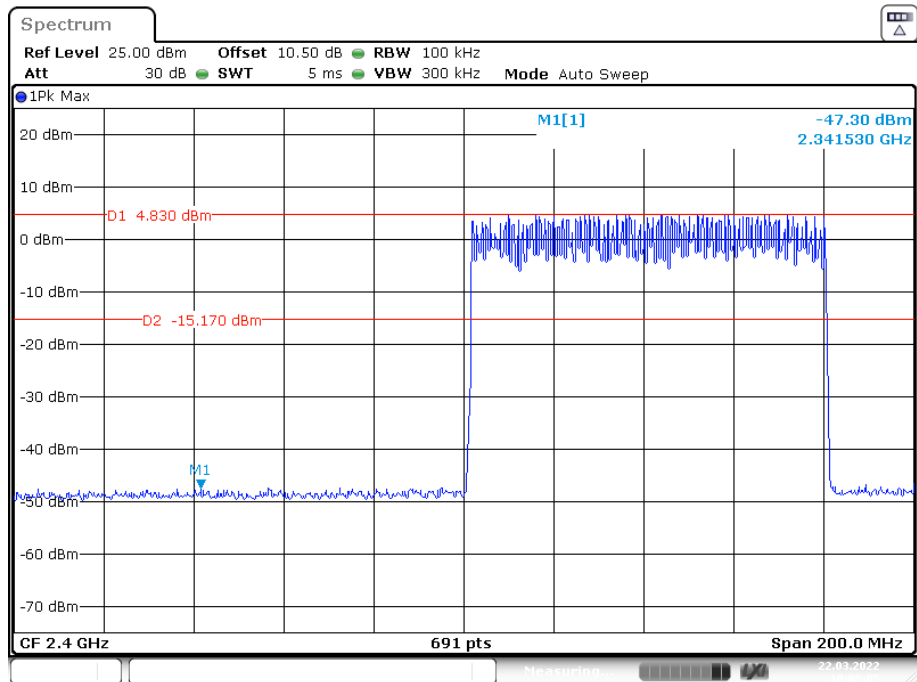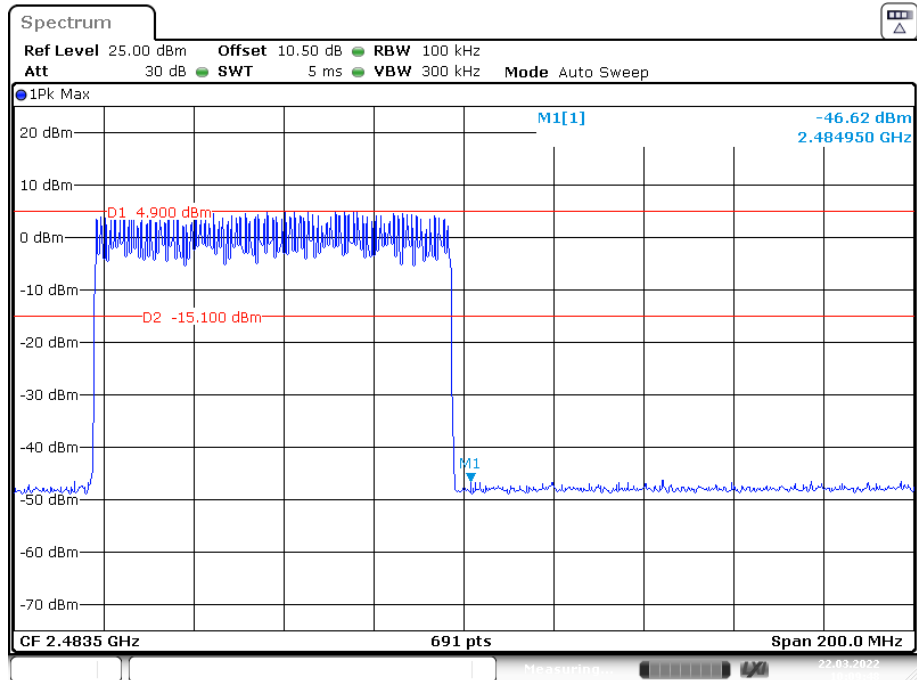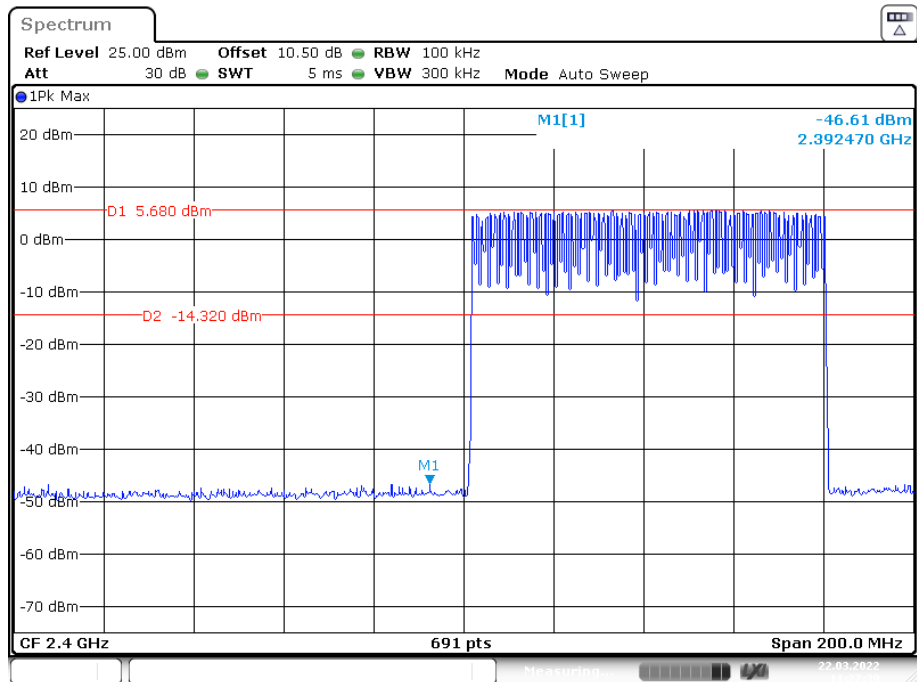

Date: 22.MAR.2022 10:02:11

2DH1_Low_2402MHz

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB ● RBW 100 kHz
Att   30 dB ● SWT   5 ms ● VBW 300 kHz   Mode Auto FFT

● 1Pk Max

M1[1]   -46.10 dBm
                     2.3996530 GHz

20 dBm

10 dBm

D1 3.950 dBm
0 dBm

-10 dBm

D2 -16.050 dBm
-20 dBm

-30 dBm

-40 dBm

M1
-50 dBm

-60 dBm

-70 dBm

CF 2.4 GHz   691 pts   Span 10.0 MHz

Date: 22.MAR.2022 10:16:14

2DH1_High_2480MHz

Spectrum

Ref Level 25.00 dBm   Offset 10.50 dB ● RBW 100 kHz
Att   30 dB ● SWT   5 ms ● VBW 300 kHz   Mode Auto FFT

● 1Pk Max

M1[1]   -46.44 dBm
                     2.4840930 GHz

20 dBm

10 dBm

D1 4.010 dBm
0 dBm

-10 dBm

D2 -15.990 dBm
-20 dBm

-30 dBm

-40 dBm
                                M1
-50 dBm

-60 dBm

-70 dBm

CF 2.4835 GHz   691 pts   Span 10.0 MHz

Date: 22.MAR.2022 10:14:54

2DH1_Low_Hop_2402MHz

Date: 22.MAR.2022 10:06:45

2DH1_High_Hop_2480MHz

Date: 22.MAR.2022 10:04:49

3DH1_Low_2402MHz
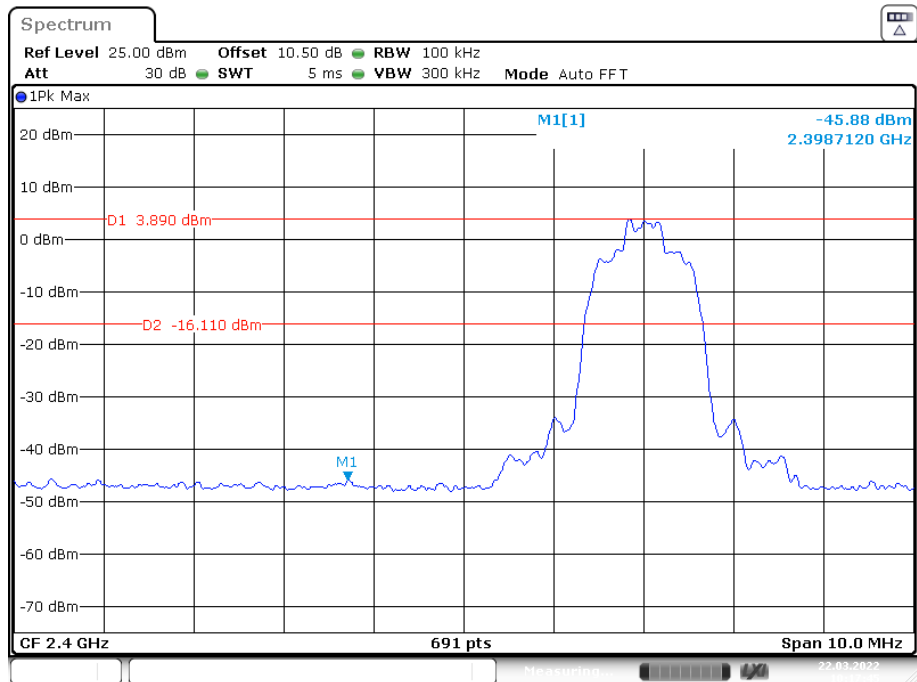
Date: 22.MAR.2022 10:17:45

3DH1_High_2480MHz

Date: 22.MAR.2022 10:19:06

3DH1_Low_Hop_2402MHz

Date: 22.MAR.2022   10:08:06

3DH1_High_Hop_2480MHz

Date: 22.MAR.2022   10:09:49

Ant 2:

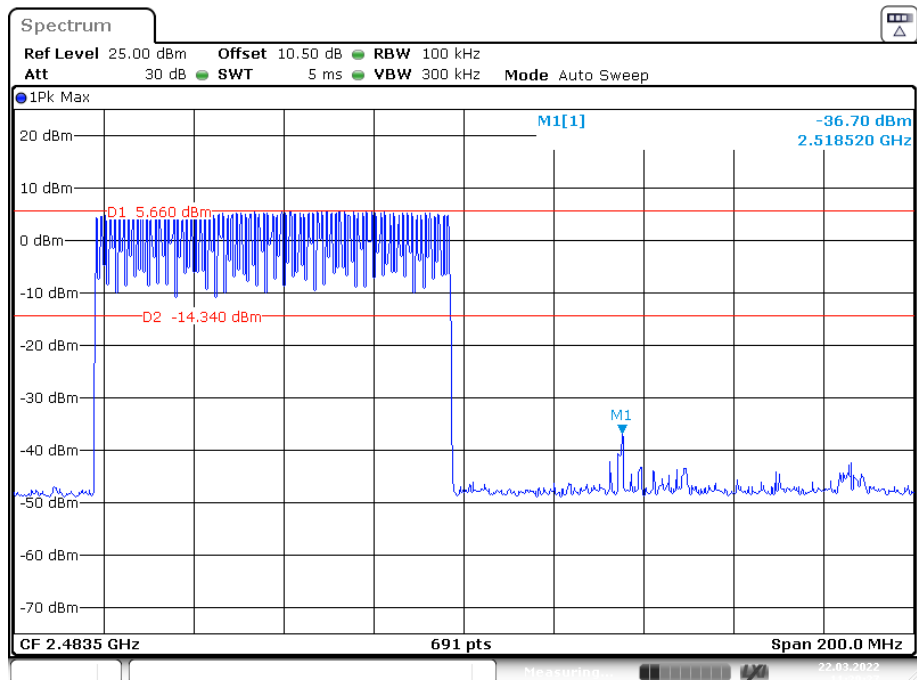**DH1_Low_2402MHz**
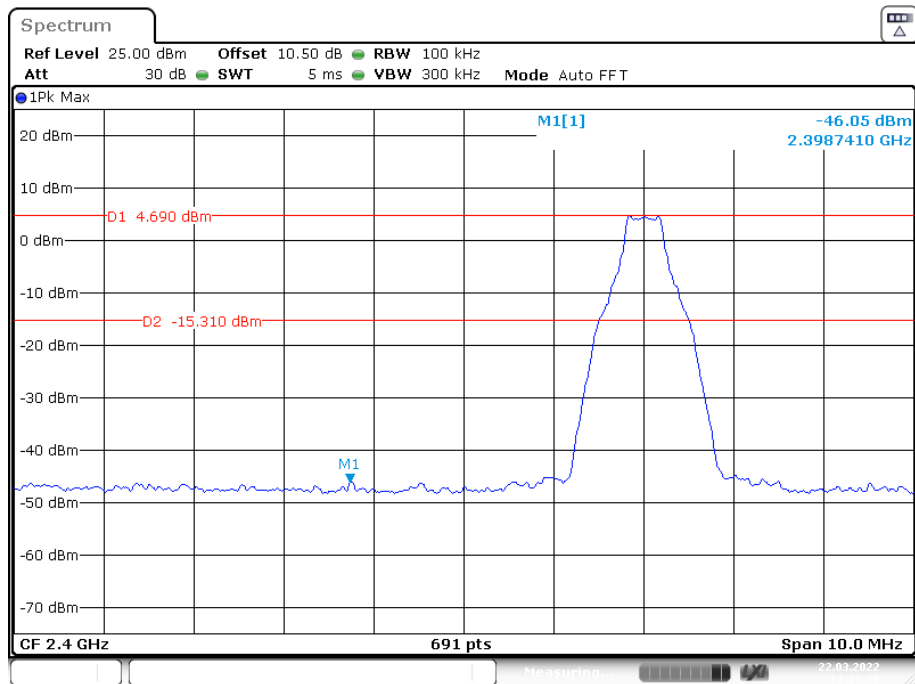
Date: 22.MAR.2022 11:23:39

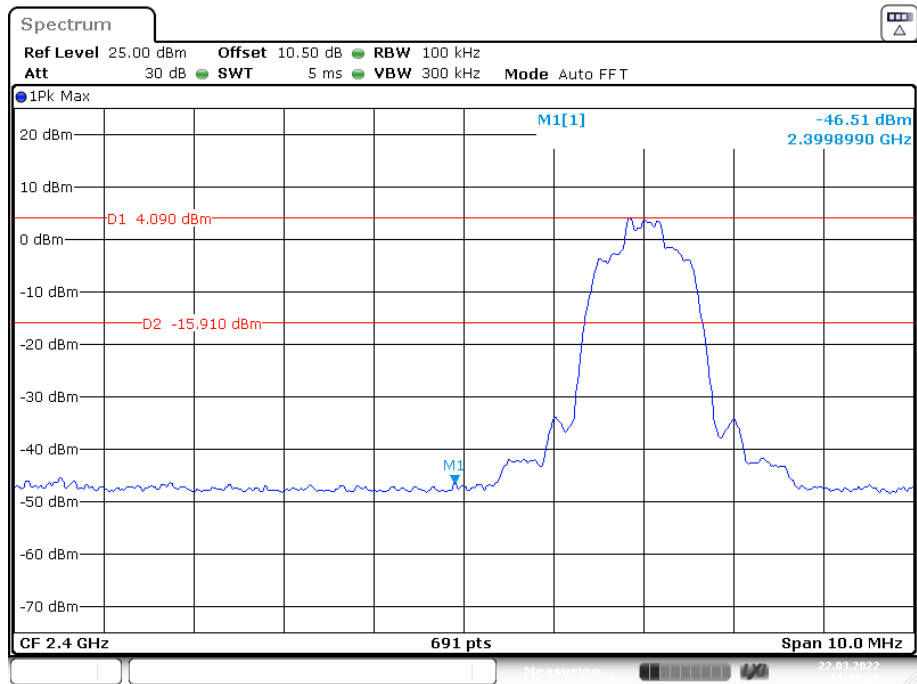**DH1_High_2480MHz**
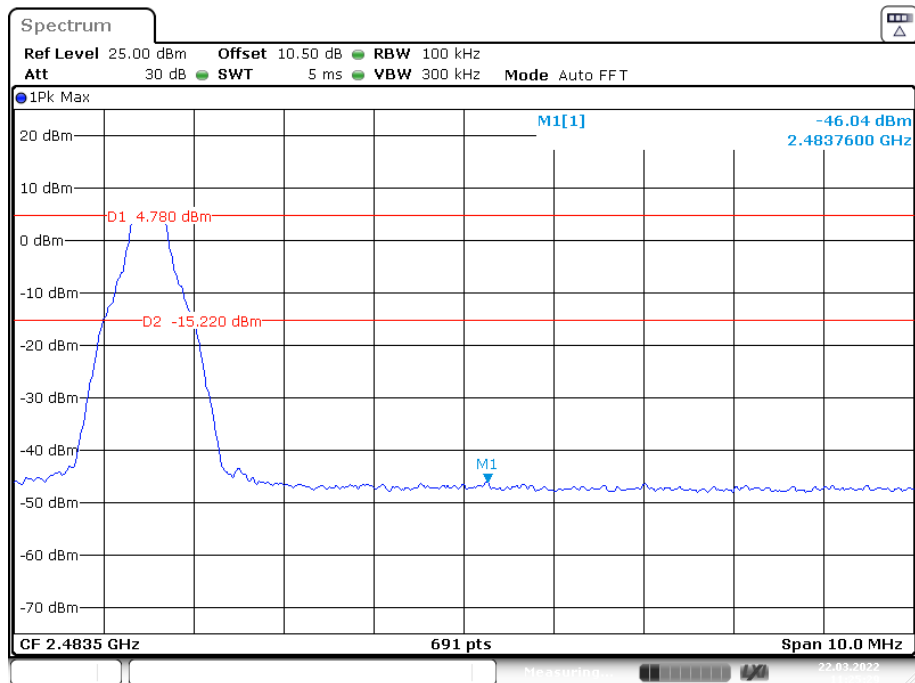
Date: 22.MAR.2022 11:25:29

DH1_Low_Hop_2402MHz

Date: 22.MAR.2022   11:27:40

DH1_High_Hop_2480MHz

Date: 22.MAR.2022   11:29:28

2DH1_Low_2402MHz

Date: 22.MAR.2022 11:22:18

2DH1_High_2480MHz
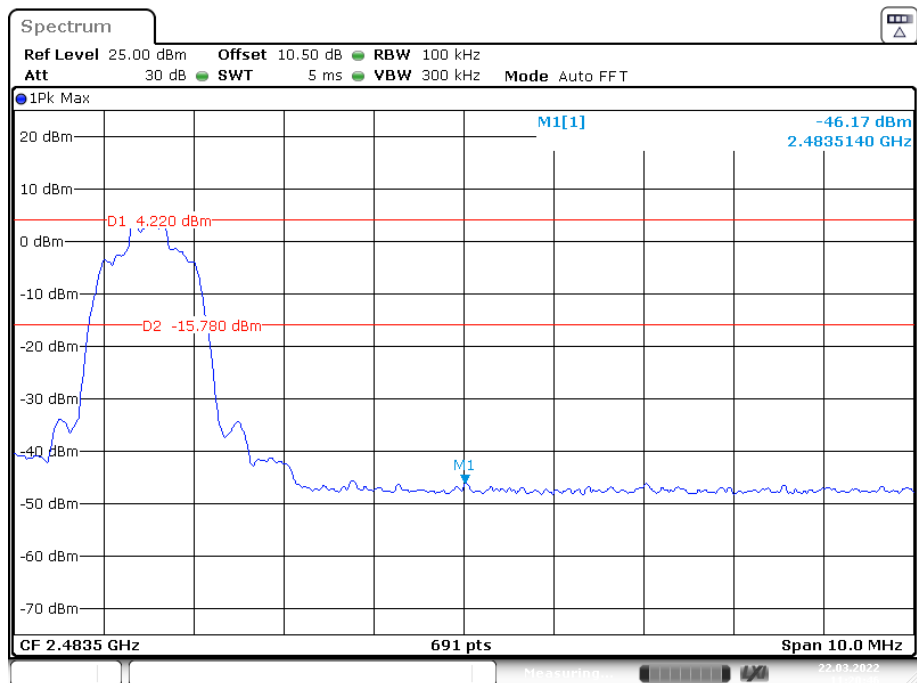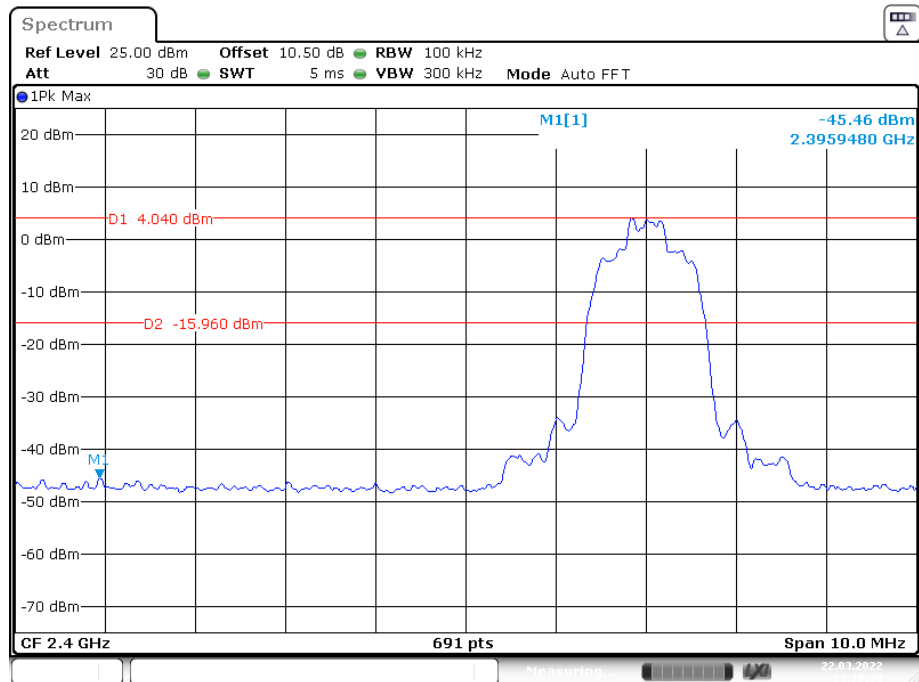

Date: 22.MAR.2022 11:20:46

2DH1_Low_Hop_2402MHz
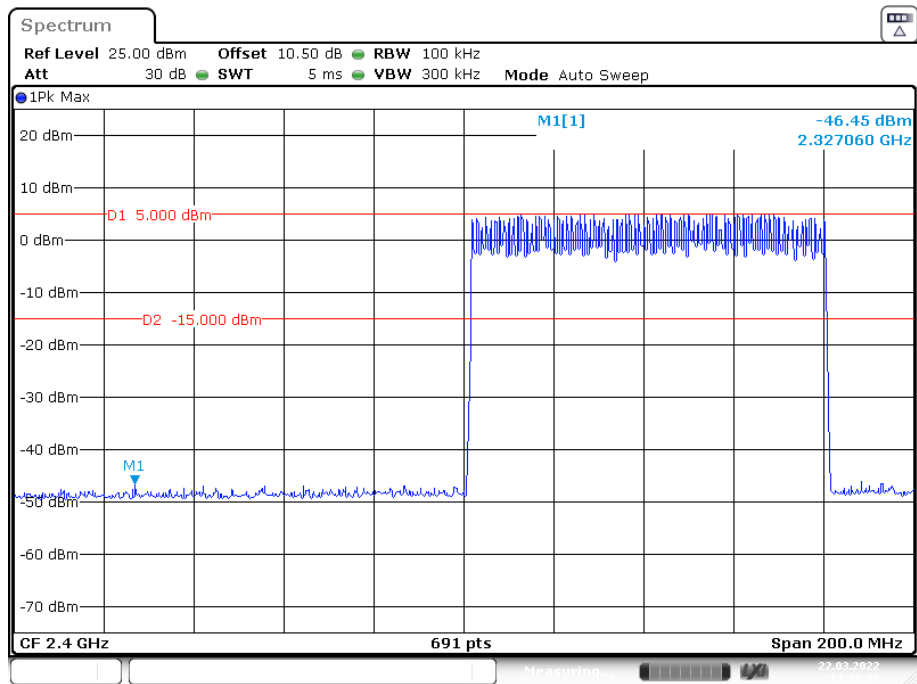
Date: 22.MAR.2022   11:32:35
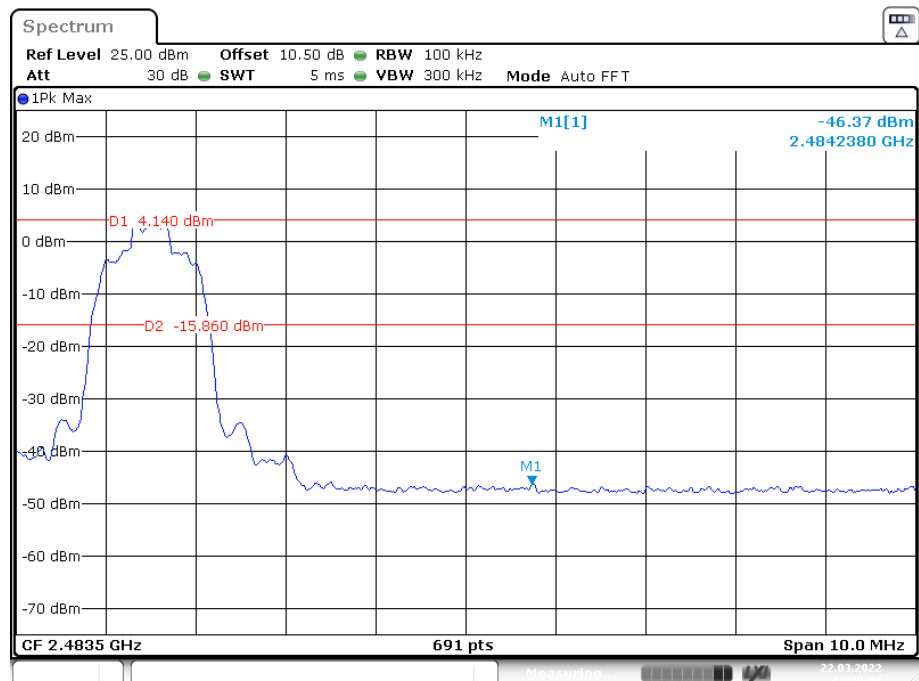
2DH1_High_Hop_2480MHz
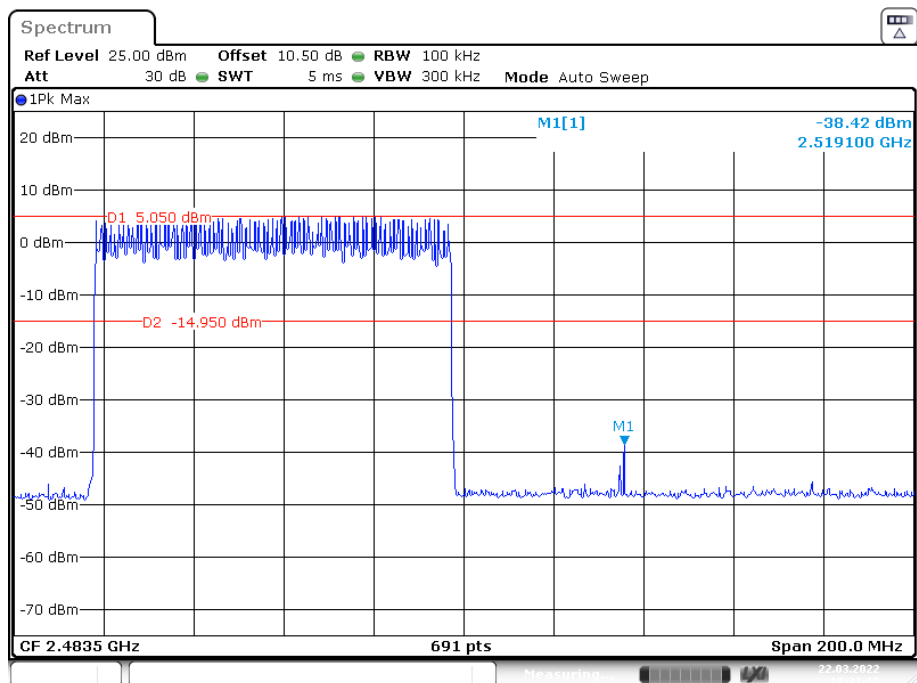
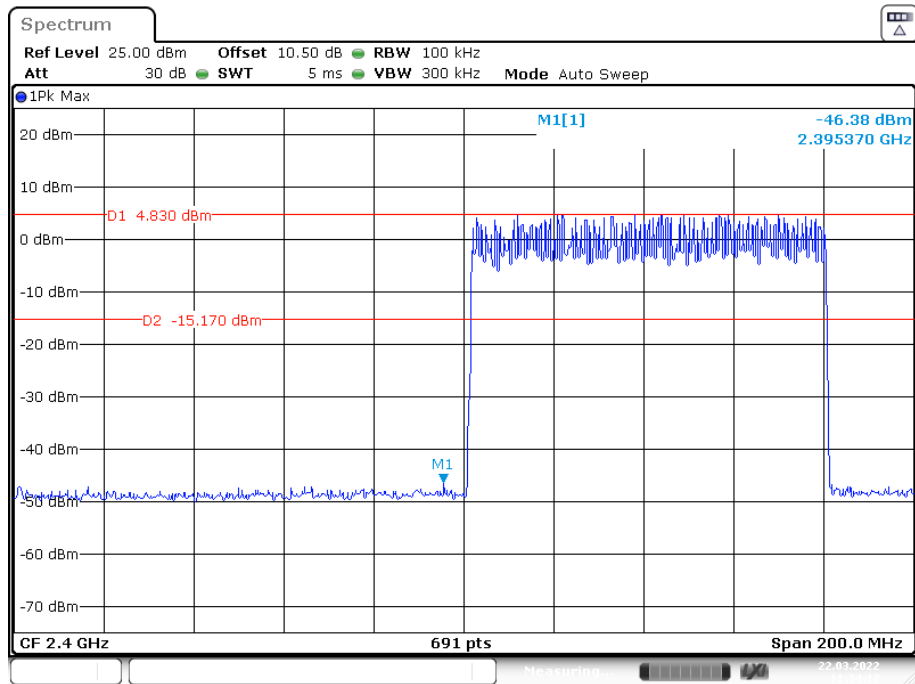Date: 22.MAR.2022   11:31:16

3DH1_Low_2402MHz

Date: 22.MAR.2022 11:18:30

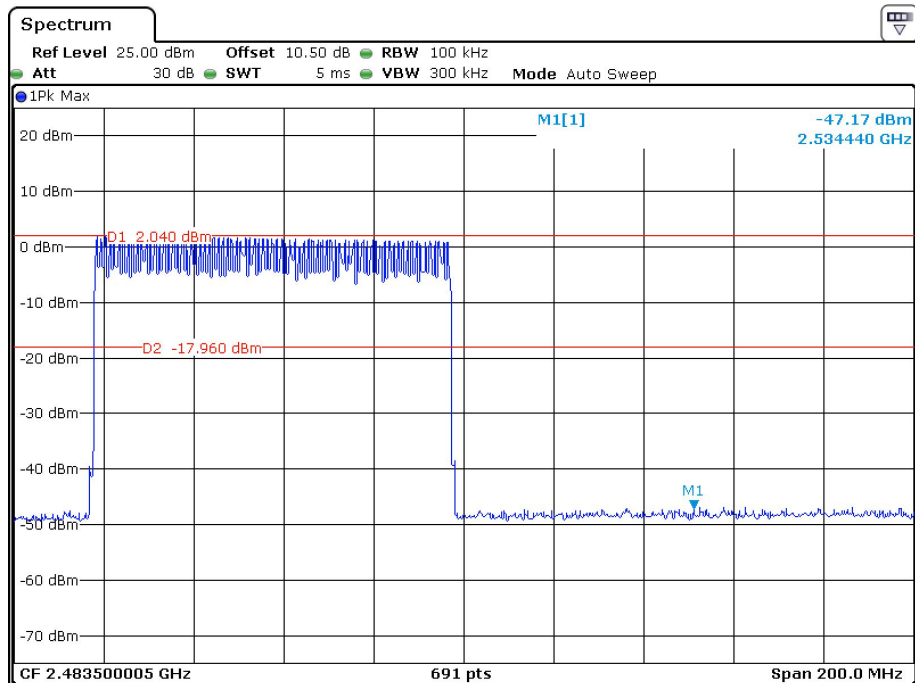### 3DH1_High_2480MHz

Date: 22.MAR.2022 11:20:03

3DH1_Low_Hop_2402MHz

Date: 22.MAR.2022   11:34:17

3DH1_High_Hop_2480MHz

Date: 29.MAR.2022   11:33:36

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